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# Academia Sinica

## A Message from the President

Academia Sinica was founded on June 9, 1928. Over the years, it has expanded from its initial 5 research institutes to encompass 24 research institutes and 7 research centers, which are organized into three divisions: Mathematics and Physical Sciences, Life Sciences and Humanities and Social Sciences.

As the foremost academic research institution in Taiwan, Academia Sinica has the mission to promote cutting-edge research in the humanities and sciences, cultivate academic talent and issue policy advisories to the government. In the past years, Academia Sinica has made tremendous efforts to formulate new approaches to academic research, assess research organization and reform, strengthen academic cooperation between domestic and overseas research institutions and universities as well as undertake a range of projects to foster academic excellence.

Academia Sinica's steadfast commitment to continually enhancing its research caliber in the humanities and sciences is clearly shown by the significant increase in articles published by its researchers in top-notch international scholarly journals, particularly in recent years. Based on the number of journal articles published as well as citation count and impact, Academia Sinica has emerged as one of the most distinguished research institutions in the greater China region. In 2011, its number of papers listed in the SCI, SSCI and A & HCI has reached an average of 2.6 per researcher. Furthermore, according to the ESI Essential Sciences Indicators, Academia Sinica has an average of 11.08 citations per paper in the last 11 years, which exceeds the world-wide average of 10.68, National Taiwan University's 8.83, National Singapore University's 11.03, Seoul National University's 9.77 and Peking University's 8.78.

Academia Sinica is firmly dedicated to raising standards of higher education among domestic universities and rendering them more internationally competitive. In order to nurture young talent, Academia Sinica has cooperated with numerous research universities in Taiwan to launch a series of interdisciplinary Ph.D. programs in cutting-edge research fields, culminating in the establishment of the Taiwan International Graduate Program (TIGP) in 2002. Academia Sinica's relentless efforts in this respect have proven successful: Many Ph.D. dissertations by TIGP students have been published in leading international journals. The majority of TIGP graduates are recruited for employment at internationally-renowned research institutes or offered positions at domestic high-tech companies, thus making significant contributions to the advancement of our society.



(Photo by Dai-Lan Tang, Scientific American)



Academia Sinica has also launched 6 Ph.D. programs in cooperation with domestic universities to foster innovative, inter-disciplinary research in the sciences. In addition, Academia Sinica has worked actively to establish cooperative ties with leading domestic and overseas universities and research institutions. As of now, 322 such partnerships exist.

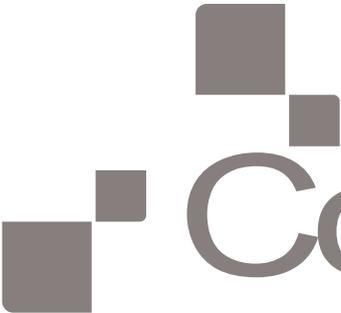
Academia Sinica is keenly aware that the true goal of specialized, well-grounded academic research is to resolve the urgent problems that confront our society today. For this purpose, in addition to translating important discoveries into commercial sectors, various committees have been established to draft policy advisories to the government for reference. Several policy advisories have been issued in recent years, including “Energy Strategies in Response to Global Warming”, “Analysis of Academic Competitiveness of Academia Sinica and Prospective Planning for Scientific and Technological Developments in Taiwan”, “Recommendations for Health Care Policies”, “Recommendations for Population Policies”, “Coping Strategies for Emerging Infectious Diseases”, “Recommendations for Laws for Differentiating Professors and Researchers from Civil Servants”, “Environmental Change and Land Use Planning Proposals”, and “Foresight Taiwan: Funding Research for Economic Gains”.

Sustainable development is clearly one of the most pressing challenges facing mankind in the 21<sup>st</sup> century. Academia Sinica is actively partaking in the quest to develop new approaches and technologies to tackle a range of issues related to this field. Academia Sinica is working wholeheartedly to promote research in sustainability science and the topics explored are closely related to the range of themes currently being addressed by the International Council for Science (ICSU) led by former Academia Sinica President Yuan-Tseh Lee. Our researchers are exploring sustainable development issues from the perspective of the earth sciences, green energy, agricultural technology, natural disaster prevention and relief measures, infectious disease epidemiology, health care for the elderly, sustainable development policy-planning and decision-making and international comparative studies.

In order to assist economic transition and facilitate the growth of the biotechnology industry in Taiwan, the government has launched a Diamond Action Plan for Biotech Takeoff. In accordance with these developments, Academia Sinica is working in cooperation with some other research institutes to develop the National Biotechnology Research Park in Nankang. The park will be built using environmentally sustainable construction and will feature a biotechnology platform focusing on research and development that will be closely linked to the basic scientific research conducted at Academia Sinica.

Looking to the future, Academia Sinica will continue to improve the domestic academic research environment and structure, establish standards of academic integrity, forge closer ties with universities and research institutions around the world as well as promote basic scientific research to develop innovative applications of new technologies for the benefit of humanity. In the upcoming years, our dedicated researchers will continue to explore the frontiers of knowledge through pioneering research in the humanities and sciences, making a lasting impact on society in Taiwan and throughout the world.

A handwritten signature in black ink, reading "Chun-Hy Wong". The signature is written in a cursive, flowing style.



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# Academia Sinica

## History and Mission

Academia Sinica, the foremost academic research institution in the Republic of China, was founded in 1928 to promote and undertake scholarly research in the humanities and sciences. After the government moved to Taiwan in 1949, Academia Sinica was re-established on its current premises in Taipei. The growth of Academia Sinica during this transitional period was initially slow due to political instability and meager budgets.

Thanks to the strenuous efforts of the past presidents, Academia Sinica surmounted many difficulties to attain its present success. It is now a modern research institution with a worldwide reputation and a proud tradition. Under the leadership of current President Chi-Huey Wong, Academia Sinica is making further progress in improving research facilities and output. Many of the twenty-four research institutes and seven research centers are now headed by world-renowned scholars and staffed by highly trained, motivated and creative young investigators. Major strides have also been made toward raising the standards of academic research and Academia Sinica is presently positioning itself to move its research activities to the international level. Aside from placing greater emphasis on opening up new areas of intellectual endeavor, Academia Sinica is also taking a leading role in launching new initiatives in applied research to meet a broad spectrum of societal needs in Taiwan.

In order to fulfill these goals, Academia Sinica has adopted various measures to promote the integration of research activities in the three divisions of mathematics and physical sciences, life sciences and humanities and social sciences; to improve the planning, implementation and evaluation of long-term projects in order to enhance the impact of the research activities; to harness basic research results for applications and technology transfer; to engage the entire academic and research community in Taiwan in a modern and forward-looking collective academic vision; to cultivate an intellectual environment that is conducive to the nurturing of young scholars and the recognition of outstanding scholarship in Taiwan; and to promote international cooperation and scholarly exchanges that will accelerate the overall development of academic research in Academia Sinica and the Republic of China.

## Past Presidents



Yuan-Pei Tsai  
(April 1928–March 1940)



Chia-Hua Chu  
(Sept. 1940–Oct. 1957)



Shih Hu  
(April 1958–Feb. 1962)



Shih-Chieh Wang  
(May 1962–April 1970)



**Chi-Huey Wong**  
( Oct. 2006–Present )



**Yuan-Tseh Lee**  
( Jan. 1994–Oct. 2006 )



**Ta-You Wu**  
( Oct. 1983–Jan. 1994 )



**Shih-liang Chien**  
( May 1970–Sept. 1983 )

## Organization

The current president of Academia Sinica is Dr. Chi-Huey Wong and the vice presidents are Dr. Shie-Ming Peng, Dr. Chien-Jen Chen and Dr. Fan-Sen Wang.

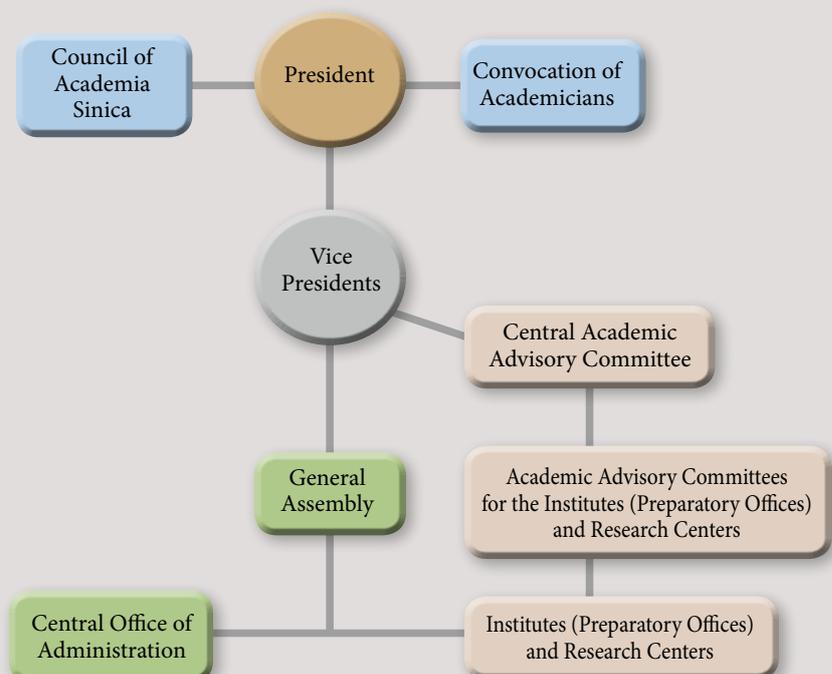
### Convocation of Academicians

The Convocation of Academicians, consisting of all the academicians of Academia Sinica with the president serving as chairman, is held biennially to elect new academicians and honorary academicians with outstanding academic achievements.

As of April 2012, there are 252 academicians (89 reside in Taiwan, 151 abroad and 12 in mainland China) and 12 honorary academicians. Academicians are grouped into three divisions according to their area of expertise: Mathematics and Physical Sciences (107), Life Sciences (84) and Humanities and Social Sciences (61).

The title of academician of Academia Sinica is a position held for life and without remuneration. The duties of the academicians are as follows:

1. To elect academicians and honorary academicians.
2. To elect members to the Council of Academia Sinica.
3. To formulate policies on academic research.
4. To plan and carry out research at the government's request.





# Academia Sinica

## **Council of Academia Sinica**

The Council of Academia Sinica is a decision-making body of 65 members, consisting of 31 ex-officio members (the president, vice presidents and directors of the institutes) and 34 members elected for three-year terms, as of April 2012. Among the members, 21 members are from the Division of Mathematics and Physical Sciences, 20 members from the Division of Life Sciences and 24 members from the Division of Humanities and Social Sciences. The council's functions are as follows:

1. To establish and review research policies.
2. To evaluate proposals concerning changes to the institutes and research projects.
3. To promote domestic and international academic cooperation.
4. To make plans for academic development when requested by the government.
5. To elect the candidates for the presidency of Academia Sinica when the presidency is vacated.
6. To formulate rules as authorized by the by-laws of Academia Sinica.

## **Central Academic Advisory Committee**

The Central Academic Advisory Committee was established on August 1, 1991. It is composed of the chairpersons of the advisory committees of the individual institutes and six to nine distinguished scholars nominated by the president of Academia Sinica.

Dr. Chien-Jen Chen, vice president of Academia Sinica, serves as the chairperson of the committee. The other two vice presidents, Dr. Fan-Sen Wang and Dr. Shie-Ming Peng, serve as its vice chairpersons.

Dr. Te-Chang Lee of the Institute of Biomedical Sciences currently serves as the executive secretary of the committee and is assisted by three vice executive secretaries – Dr. Huan-Cheng Chang of the Institute of Atomic and Molecular Sciences, Dr. Sue Lin-Chao of the Institute of Molecular Biology and Dr. Carl K. Y. Shaw of the Research Center for Humanities and Social Sciences.

The committee fulfills its mission by:

1. Gathering the latest research information relevant to the academic development of Academia Sinica.
2. Undertaking in-depth reviews of the research programs of individual institutes so as to promote the advancement of research at Academia Sinica.
3. Establishing standards of academic review procedures and assisting individual institutes with the recruitment, promotion and re-appointment of research fellows.
4. Promoting international academic cooperation and exchange.
5. Planning and implementing academic assignments as instructed by the president of Academia Sinica.



## Institutes (Preparatory Offices) and Research Centers

Currently, there are twenty-four institutes and seven research centers in Academia Sinica organized into three divisions: Division of Mathematics and Physical Sciences, Division of Life Sciences and Division of Humanities and Social Sciences. Academia Sinica's annual budget is about NT\$11 billion.



### Division of Mathematics and Physical Sciences

1. Institute of Mathematics
2. Institute of Physics
3. Institute of Chemistry
4. Institute of Earth Sciences
5. Institute of Information Science
6. Institute of Statistical Science
7. Institute of Atomic and Molecular Sciences
8. Institute of Astronomy and Astrophysics
9. Research Center for Applied Sciences
10. Research Center for Environmental Changes
11. Research Center for Information Technology Innovation

### Division of Life Sciences

1. Institute of Plant and Microbial Biology
2. Institute of Cellular and Organismic Biology
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5. Institute of Molecular Biology
6. Agricultural Biotechnology Research Center
7. Genomics Research Center
8. Biodiversity Research Center

### Division of Humanities and Social Sciences

1. Institute of History and Philology
2. Institute of Ethnology
3. Institute of Modern History
4. Institute of Economics
5. Institute of European and American Studies
6. Institute of Sociology
7. Institute of Chinese Literature and Philosophy
8. Institute of Taiwan History
9. Institute of Linguistics
10. Institutum Iurisprudentiae
11. Institute of Political Science
12. Research Center for Humanities and Social Sciences

## Research Fellows and Research Specialists

As of May 2012, there are 1013 research fellows and research specialists in Academia Sinica, including 88 distinguished research fellows, 331 research fellows, 250 associate research fellows, 170 assistant research fellows, 71 research assistants, 8 assistants, 20 research specialists, 23 associate research specialists, 50 assistant research specialists and 2 research technicians.



**Institutes (Preparatory Offices),  
Research Centers,  
and Libraries**





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會長都所保存或改會



# Institute of Mathematics

886-2-2368-5999 886-2-2368-9771 <http://www.math.sinica.edu.tw>

## Foreword

The Institute of Mathematics was founded in 1947, though initial planning for its operation in China had already begun in 1941. It was eventually relocated to Taiwan in 1949. Despite the difficulties faced during its initial years, it managed to train talented young scholars and was the focal point of research for several areas of mathematics in Taiwan. The institute began its major expansion in the late '70s and early '80s as resources and funding increased. It currently has twenty-six research staff in a diverse range of fields including: Applied Mathematics and analysis, geometry and mathematical physics, combinatorial mathematics and applications, probability theory and applications and number theory and algebra.

In recent years, the institute has actively promoted the coordination of mathematical research while also nurturing the next generation of mathematicians in Taiwan. These efforts include the provision of a number of postdoctoral and research assistant positions, six-week summer research projects for undergraduate students and offering a core curriculum for graduate study. In addition, the institute has invested its resources into sponsoring international conferences and hosting academic exchanges.

## Research Projects

The Institute of Mathematics has 26 research staff specializing in the most important areas of mathematics. Recent research projects cover the following areas:

**Applied Mathematics and Analysis:** Non-linear partial differential equations, kinetic theory, geometric analysis, dynamical systems

**Geometry and Mathematical physics:** Complex geometry, knot theory, integrable systems

**Combinatorial Mathematics and Applications:** Graph theory, combinatorial model theory, finite group theory and applications

**Computing Mathematics**

**Probability Theory and Applications:** Stochastic analysis, financial mathematics

**Number Theory and Algebra:** Arithmetic geometry, diophantine problem, commutative algebra, representation theory

## Significant Research Achievements

Important research results from the past two years include:

### 1. Quantitative Analysis of the Boltzmann Equation

For the Boltzmann equation of kinetic theory, exact quantitative studies were conducted of the boundary layers. Of particular interest is the analysis of the rich bifurcation phenomena for the transonic condensation/bifurcation.

### 2. Heisenberg geometry and spherical CR manifolds

- We deduced an ODE of  $p$ -area along the characteristic curves on a  $C1$  surface in the Heisenberg group and used it to study the behavior of the singular set.
- We proved the uniformability of spherical CR manifolds for either dimension  $\geq 7$  or dimension = 5 with an integrability condition on the Green's function.

### 3. Connections between symmetry and supersymmetry

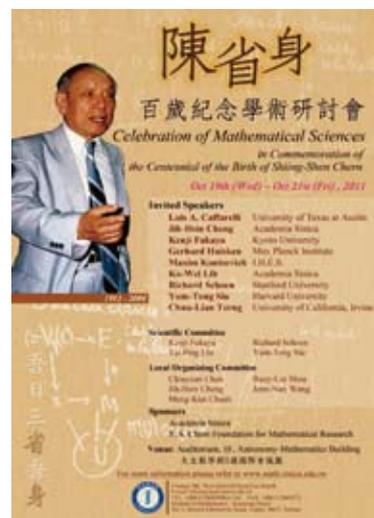
We proved that the general linear Lie algebras and the general linear Lie superalgebras share certain common important representation-theoretical invariants, called Kazhdan-Lusztig polynomials. Subsequently related results for infinite-dimensional Lie superalgebras were established.



↑ 2011 Cheng-Jung Hsu Lectures



↑ International Conference on Discrete Mathematics and Its Applications



↑ Celebration of Mathematical Sciences, in Commemoration of the Centennial of the Birth of Shing-Shen Chern

# Institute of Physics

☎ 886-2-2788-0058

📠 886-2-2783-4187

🌐 <http://www.phys.sinica.edu.tw>

## Foreword

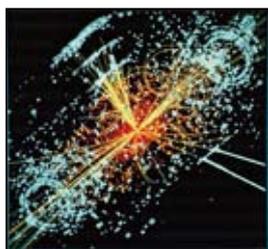
The Institute of Physics was founded in Shanghai in 1928 and reestablished in Taipei in 1962. Our mission is to conduct research at the forefront of physical science. Apart from local research projects, we also actively promote international exchange and collaborations. The physics building was named Ta-You Hall in 2000 to commemorate its first director, Dr. Ta-You Wu. At present, the Institute of Physics has 46 principle investigators, with research activities covering three major areas: nanoscience, complex systems and medium and high energy physics.

## Research Projects

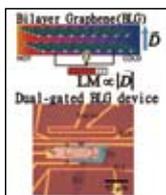
1. Theoretical and experimental nuclear physics
2. LHC (Large Hadron Collider) experiment at CERN
3. HEP World-wide LHC Computing Grid
4. CDF experiment in Fermi Lab
5. Neutrino and Dark Matter Physics
6. AMS experiment in the space shuttle
7. Particle phenomenology in B physics
8. Astro-particle physics and cosmology
9. Development of state-of-the-art research tools for nanoscience
10. Study on transport and thermoelectric properties in nanostructured materials
11. Manipulation and control of single atoms and single molecules
12. Study on biomolecular interactions using micro/nanofluidic devices
13. Theoretical modeling and simulations of nano-systems
14. Hydrodynamics and atmospheric physics
15. Physics of granular gas, granular flow and granular chain
16. Statistical and computational physics approach to complex systems
17. Biology-inspired physics
18. Macroporous 3D ordered structures for tissue engineering scaffolds
19. Single molecule studies of highly confined biological macromolecules
20. Dynamics of biological macromolecules and complex fluids

## Long Term Research Areas

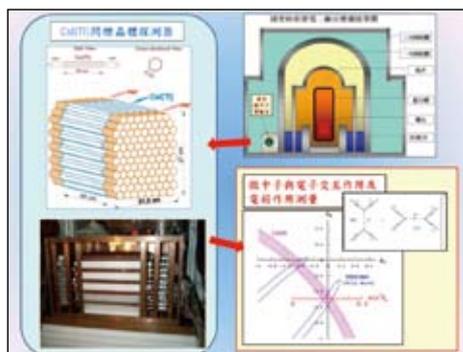
1. Nanoscience
2. Complex systems
3. Medium and high energy physics



↑ Jet event in a collider



↑ Demonstration of field-effect thermoelectricity in a dual-gated bilayer graphene device.



↑ TEXONO Collaboration completed measurements of neutrino-electron scattering cross-section and electroweak parameters with CsI(Tl) crystal scintillator at the Kuo-Sheng Reactor Neutrino Laboratory.

## Significant Research Achievements

In the past two years, the Institute of Physics has made important breakthroughs in several areas including:

1. Measurement of neutrino-electron scattering and electroweak parameters and new limit on low-mass dark matter searches at Kuo-Sheng Neutrino Laboratory.
2. Explained the density perturbation in the inflationary universe.
3. Resolved the B-CP puzzles in QCD factorization.
4. Using quantum field theory to explain the jet phenomena at the LHC.
5. Studied the mechanism of nonperturbative interactions between photon and quarks at few GeV.
6. The only Asia Tier-1 Centre in WLCG—ASGC is participating in the WLCG to build the biggest production Grid system in the world.
7. Developed the method of fabricating a single-atom tip and its application as an electron beam source.
8. Fabricated a CNT-based balance capable of resolving the mass of a Ag atom.
9. Developed a High Throughput Label-free Platform for Statistical Biomolecular Sensing.
10. Observed that the work function of the thin film can be precisely measured with high order Gundlach oscillation in scanning tunneling spectroscopy.
11. Development of high speed high resolution phase contrast X-ray microscopy and microradiology—achieved a world record resolution of 30nm with 8 keV photon.
12. Development of state-of-the-art nanoelectronic and nanofluidic devices—achieved sub-10nm features in size and channel height, respectively.
13. Studied novel physical properties of heavy fermion nanoparticles.
14. Discovered new iron-based oxypnictide superconductors.
15. Evaluated and improved the performance of Au NRs-based photothermal therapy.
16. Fabricated nanoparticles, nanosphere lithography and inert gas condensation.
17. Development of the guiding algorithm for 3D x-ray diffraction microscopy of nanostructures—achieved a world record resolution of 17nm.
18. Development of the technique and setup for thermodynamic measurements for single nanowires.
19. Demonstrated for the first time the “field-effect thermoelectricity” in a bilayer graphene device.
20. Developed ‘Spin Caloritronics’ to demonstrate the profound effect of a substrate on the spin-dependent thermal transport.
21. Understood the mechanism of the stretching of DNA by the viscoelastic properties of the flow field.
22. Used replicators in a fine-grained environment to establish a theory of polymorphism.
23. By means of particle-based simulations, we obtained the phase diagram that separates the occurrence of marching, rotating and swamping state of flocking.
24. Chondrocytes were successfully cultured in the 3D ordered foam for more than a month.

# Institute of Chemistry

☎ 886-2-2782-1889

☎ 886-2-2783-1237

🌐 <http://www.chem.sinica.edu.tw>

## Foreword

The Institute of Chemistry was established in 1928 in Shanghai, China. During the next two decades, despite difficulties encountered due to World War II, the institute managed to grow and contribute to chemistry research in China. In 1957, the Institute was reestablished in Nankang, Taiwan. The institute has expanded and evolved into a modern research center over the past 50 years. In the past decade, research efforts have focused on materials chemistry, chemical biology and catalysis. Presently, the institute occupies 8000 m<sup>2</sup> and has 28 research laboratories and a total work force of 300 including research assistants, technicians and graduate students from various universities.

## Research Projects

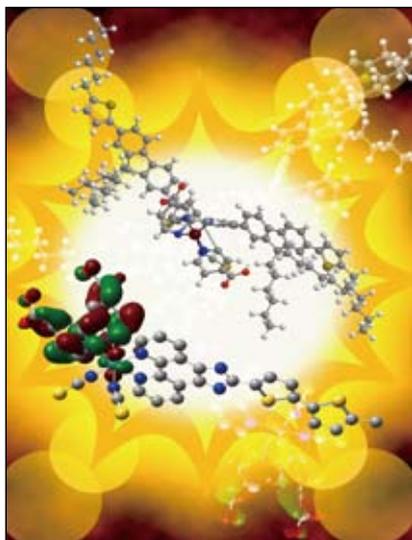
The Institute of Chemistry strives to play a major role in cutting-edge research in the 21<sup>st</sup> century. The current research areas cover important topics in chemistry with particular emphasis on materials chemistry and nanoscience/technology, synthetic chemistry and catalysis, and chemical biology. More specific topics include: solar cells, organic light-emitting diodes, organic field-effect transistors, surface chemistry, self-assembly, molecular electronics and machines, sustainable science, heterogeneous and homogeneous catalysis, green chemistry, drug discovery, nanomedicine, protein structure, biocatalysis, small molecule-biomacromolecule interactions and proteomics.

## Significant Research Achievements

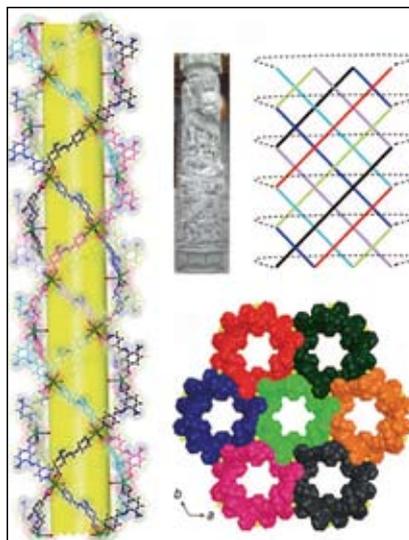
The institute has published more than 100 research papers each year in over 50 internationally renowned journals. Recent achievements include:

1. Toward optimization of oligothiophene antennas: new ruthenium sensitizers with excellent performance for dye-sensitized solar cells.
2. Through modification of metal nanoparticle surfaces to achieve the fabrication of highly efficient organic transistor/memory devices.

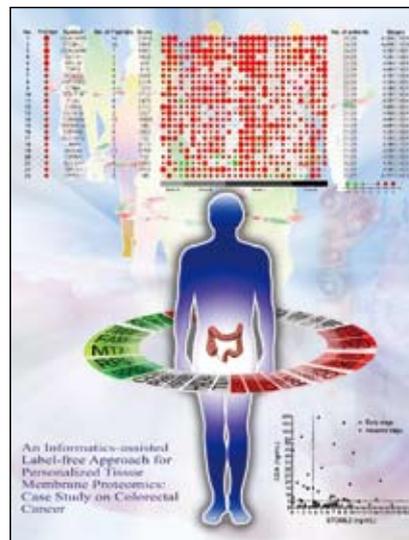
3. Innovative development of self-assembled arrays of single-walled metal-organic nanotubes.
4. Development of a new method to calculate singlet and triplet excitation energy transfer coupling.
5. Facile nitrite reduction reaction using a new *N*-confused porphyrin iron complex.
6. Bimetallic nickel aluminum mediated *para*-selective alkenylation of pyridine: direct observation of intermediates prior to C-H bond activation.
7. Tuning the regioselectivity and stereoselectivity in C-H activation of *n*-octanes by cytochrome P450 BM-3 with fluorine substituents.
8. Amino-linked heterocyclic carbene palladium, gold and silver complexes as anticancer agents triggering apoptotic cell death.
9. The RNA exit channel on RNA polymerase II was located by FRET analysis.
10. The aggregation properties of TDP-43 in ALS and the impact of its peptides on the TDP-43 proteinopathy were explored.
11. Zernike phase plate cryo-electron microscopy was used to facilitate single particle analysis of unstained asymmetric protein complexes.
12. Development of a personalized tissue membrane proteomics for the identification of biomarker candidates for colorectal cancer.



↑ Novel materials for high-performance dye-sensitized solar cells.



↑ Self-assembled arrays of single-walled metal-organic nanotubes.



↑ Personalized cancerous tissue membrane proteomics strategy.

# Institute of Earth Sciences

☎ 886-2-2783-9910

☎ 886-2-2783-9871

🌐 <http://www.earth.sinica.edu.tw>

## Foreword

Founded in 1982, the IES currently has 30 staff scientists and approximately 20 postdoctoral fellows and an engineering team that make up the main research workforce, with strong support provided by the administrative and logistic personnel. IES conducts research in two major disciplines: geophysics and geochemistry, for global as well as regional Taiwan studies.

## Research Projects

Study of the structure, dynamics and constitution of the Earth's interior, crustal deformations, origin of earthquakes, hydrology and neotectonics of Taiwan, early history of the solar system, genesis and evolution of the continental crust, petrogenesis of magmatic rocks, paleo-environmental change in Asia.

## Significant Research Achievements

Seismological studies include: Research on the rotational motion caused by far-field seismic waves; research on the great 2011 Tohoku earthquake in Japan including a quick waveform inversion for the slip distribution of the main shock and follow-up investigations of the source kinematic properties (Fig.1); development of an automatic system to provide real-time focal mechanism and ground motion estimations for earthquakes in Taiwan.

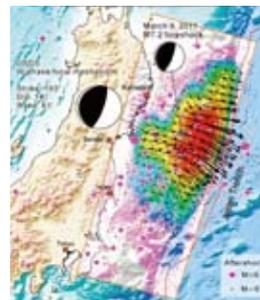
The Manila trench is the convergent boundary wherein the Sunda plate subducts eastward underneath the Philippine Sea plate. The convergence rate of about 91 mm/yr in the NW direction at the northern tip of Luzon continuously decreases southward to 55 mm/yr north of Mindoro. The oblique convergence has resulted in the Philippine Fault (PHF), a primary left-lateral strike-slip fault with a fault length of about 1200 km. Using the 12-year survey-mode GPS data in Luzon and an elastic dislocation model, the inferred slip-deficit rate falls in the range of 22~40 mm/yr on the PHF and decreases from north to south. The slip deficit rates are close to the inferred long-term fault slip rates of 24-40 mm/yr, suggesting the PHF is fully locked. The Philippine fault is likely to consume most of accumulated strike-slip motion along the plate boundary. On the other hand, the thrust-slip motion is possibly taken up by seismic or aseismic fault slip on the Manila subduction zone. We use GPS data, trench parallel gravity anomaly and bathymetry to infer plate coupling along the Manila subduction zone (Fig.2). Aseismic slip is predominately at latitudes 14°-18°N. The partially locked fault zone near 15°-16.5°N may be associated with the subducted Scarborough Seamount wherein oceanic floor is highly fractured. The great subduction zone earthquake propagates beneath the Scarborough Seamount seems to be unlikely.

The new volcanoclastic studies indicated that the Tatun Volcanic Group (TVG) in metropolitan Taipei had at least 3 obvious eruptions approximately 20 kyrs-10 kyrs. Further, the youngest dome collapse eruption happened around 6 kyrs. The results strongly suggest that the Tatun volcano is a definitely active volcano. The airborne particles (mineral) were found on the surface of TVG. This key-note record will become an extreme and unique case to establish the paleo-wind and rain system in northern Taiwan.

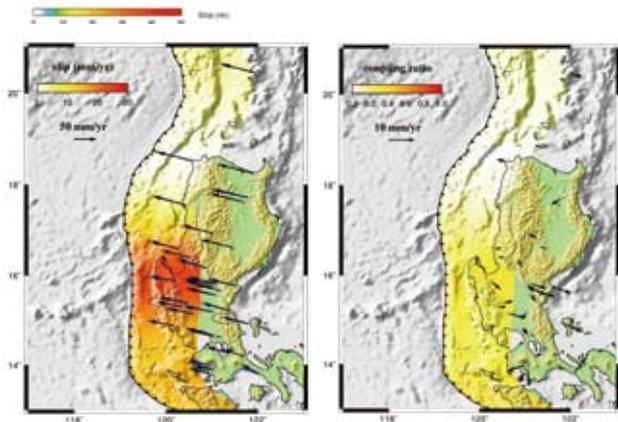
In 2011, the application of in situ Hf isotope analysis on single zircons recently developed at IES has further produced substantial amounts of exciting published results on the crustal signatures

from the Central Asia Orogenic Belt in Mongolia and Russia and the genesis of jadeite worldwide and gabbro from Emeishan in China.

The Ca isotopes were studied for a suite of differentiated meteorite clans and we have successfully identified for the first time a rare type of neutron rich Type IA supernova components present in the solar system. Studying the evolution of Cd in modern seawater by analyzing the Cd isotopes in seawater profile, the aerosols and the sinking particles collected at the SEATS in the South China Sea and the data suggested that the observed Cd isotopic fractionations were controlled by the aerosol inputs, instead of the commonly believed preferential uptake by phytoplankton in the surface water. Lastly, we have just started to analyze Fe, Zn, Cd and Mo isotopes in the leachates of samples from a gravity core in the Lake Baikal, in order to test if these stable isotopes can be used as environmental proxies to study the past climate changes in the Lake Baikal region.



← Fig.1 Map view of spatial slip distribution of the 2011 Tohoku-Oki earthquake. The slip values are shown in the color scale indicated at the bottom. The vectors indicate slip directions. The red star is the hypocenter reported by the JMA. The hypocenter of March 9, 2011 M7.2 foreshock reported by USGS is presented by open blue star. Aftershocks occurred within 2 months after the main shock are shown by solid circles. The beach balls show the USGS W-phase focal mechanisms (Lee et al. 2011).



↑ Fig.2 Slip deficit rate and plate coupling ratio derived from GPS inversion (a) Black and blue vectors indicate GPS observed and predicted interseismic velocities with respect to the Sunda Plate. Error ellipses indicate 95% confidence intervals of GPS velocities. Color scale indicates slip deficit rate. (b) Black vectors show residuals of horizontal velocities in (a). Color scale indicates plate coupling ratio.

# Institute of Information Science

886-2-2788-3799

886-2-2782-4814

http://www.iis.sinica.edu.tw

## Foreword

The Institute of Information Science (IIS) was formally established in September 1982 after a five-year preparation period and is one of the eleven institutes and research centers within the Division of Mathematics and Physical Sciences. The IIS presently has 37 full-time research fellows, 29 postdoctoral research fellows and over 300 full-time information technology specialists and part-time research assistants supporting research and development in information science and engineering. These are exciting and challenging times for IT research and the IT industry in Taiwan. Many emerging technologies and opportunities are on the horizon. The IIS, in working with the newly established CITI, looks forward to making concerted efforts in leading the fundamental and practical research in this important field. All members of the IIS prescribe to the motto, "Every job is a self-portrait of those who did it; autograph your work with quality," emphasizing excellence and synergistic teamwork effort.

## Research Projects

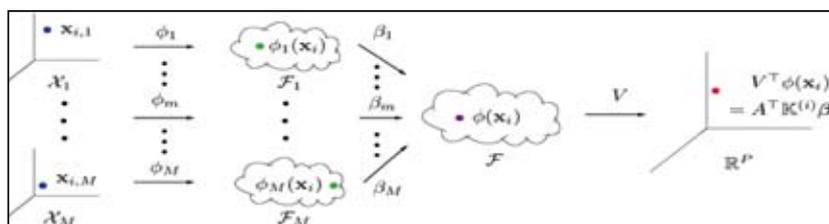
The mission of IIS is to conduct fundamental but high quality research in the area of information science, and to develop advanced application-driven systems that utilize and enhance cutting-edge technologies. Our research focuses on eight main categories that include Bioinformatics, Computer Systems, Data Management and Information Discovery, Multimedia Technology, Natural Language and Knowledge Processing, Network System and Service, Programming Languages and Formal methods, Theory and Algorithms.

## Significant Research Achievements

- 1. Multiple Kernel Learning for Dimensionality Reduction:** In solving complex visual learning tasks, adopting multiple descriptors to more precisely characterize the data has been a feasible way for improving performance. The resulting data representations are typically high dimensional and assume diverse forms. Thus finding a way to transform them into a unified space of lower dimension generally facilitates the underlying tasks, such as object recognition or clustering. To this end, the proposed approach (termed as MKL-DR) generalizes the framework of multiple kernel learning for dimensionality reduction and distinguishes itself with the following three main contributions. First, our method provides the convenience of using diverse image descriptors to describe useful characteristics of various aspects about the underlying data. Second, it extends a broad set of existing dimensionality reduction techniques to consider multiple kernel learning and consequently improves their effectiveness. Third, by focusing on the techniques pertaining to dimensionality reduction, the formulation introduces a new class of applications with the multiple kernel learning framework to address not only the supervised learning problems but also the unsupervised and semisupervised ones.
- 2. Design Strategies for Improving System Performance of Human Computation Systems:** We investigate an emerging human computation system, called Games with a Purpose (GWAP), which outsources certain steps of the computational process to humans in a form of computer games and solve the problems that are intuitive to humans but computer technologies cannot solve completely so far. We posit that, in order to collect human intelligence more efficiently, GWAP systems must be designed and played with strategies. We have developed a set of design strategies to improve the performance of GWAP systems in terms of efficiency and data quality and verified the designed strategies in real-world GWAP systems. In addition to publishing research papers in the top international conferences and journals, we have released the source codes and the experiment dataset to facilitate the development and research of future GWAP systems.
- 3. Cloud Storage and Data Management:** With the growth of data size in many application domains, the needs for data and storage management systems are continuously increasing. We develop a data management system for cloud, named SQLMR. SQLMR compiles SQL queries to a sequence of MapReduce jobs. Existing SQL-based applications are compatible seamlessly with SQLMR and users can manage Tera to PetaByte scale of data with SQL queries instead of writing MapReduce codes. We also devise a number of optimization techniques to improve the performance of SQLMR. The experiment results demonstrate both performance and scalability advantage of SQLMR compared to MySQL and two NoSQL data processing systems, Hive and HadoopDB. In addition, we develop a distributed file system called GFS. GFS allows an user to deploy and harness distributed storage without any OS kernel changes, special privileges or attention from the system administrator. Such property allows an end user to rapidly deploy GFS in a Cloud/Grid and access data transparently and securely.



↑ A snapshot of the ESP Lite game.



↑ Performing multiple kernel learning (MKL) for dimensionality reduction can transform the various feature spaces of high dimensions into a unified space of lower dimensions.



↑ System Architecture, Management Tool Interface and Performance Comparison of SQLMR

# Institute of Statistical Science

886-2-2783-5611

886-2-2783-1523

<http://www.stat.sinica.edu.tw>

## Foreword

In July 1980, during the 14<sup>th</sup> Convocation of Academicians of Academia Sinica, a group of twenty-one academicians, including Professors Yuan-Shih Chow, George C. Tiao and Ching Chun Li, drafted a resolution calling for the establishment of an Institute of Statistics. On July 1, 1982, the Preparatory Office was founded with Dr. Min-Te Chao as the director. Five years later, on August 3, 1987, the Institute of Statistical Science was officially established and Dr. Chao served as the founding director from 1987 to 1993. The successive directors were Dr. Ching-Zong Wei (August 1993-August 1999), Dr. Chen-Hsin Chen (August 1999- December 2002) and Dr. Ching-Shui Cheng (January 2003-December 2005). Since January 2006, Dr. Gwo Dong Lin served as acting director from January to June 2006. Dr. Ker-Chau Li has assumed the directorship since July 2006.

## Research Projects

The Institute of Statistical Science conducts fundamental research related to statistics and probability. The Institute currently has 38 research fellows, 26 postdoctoral fellows and approximately 61 research assistants. Major research areas include probability and its applications, mathematical statistics, biostatistics, bioinformatics and genetics, functional brain images, educational and behavioral statistics, mathematical finance, time series, spatial and environmental statistics, experimental designs, statistical machine learning, generalized association plots (GAP) and social networks.

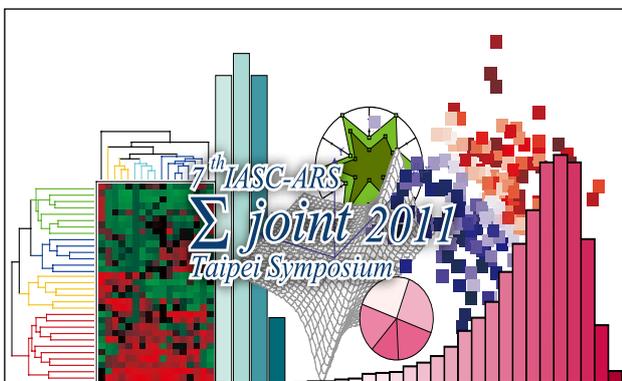
## Significant Research Achievements

In the past 3 years, researchers of the institute have published some 174 articles in SCI journals. In addition, 228 other articles and monographs have been published.

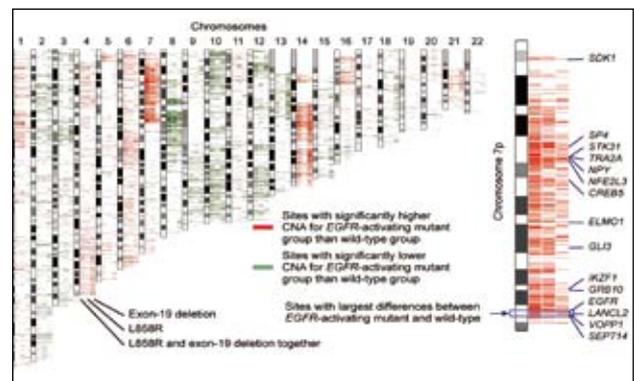
The international journal *Statistica Sinica* published by the institute has won the Outstanding Journal Award conferred by NSC for 8 successive years and has become one of the major statistical journals in the world.



↑ Statistica Sinica



↑ The institute hosted the Joint Meeting of the 2011 Taipei International Statistical Symposium and 7<sup>th</sup> Conference of the Asian Regional Section of the IASC (Joint2011) from December 16th to 19th, 2011. Joint2011 attracted more than 500 participants from 27 countries who delivered more than 250 presentations. This is by far the largest and most successful statistical conference ever held in Taiwan.



↑ Sites of differential CNA found in *EGFR*-activating mutation status comparisons. The sites of probe-blocks displaying the differential CNA in three comparisons, the *EGFR*-activating mutant group versus the wild-type group, the L858R mutant group versus the *EGFR* wild-type group and the exon-19 in-frame deletion group versus *EGFR* wild-type group are shown on the right side of each chromosome ideogram. A zoom-in version of chromosome 7p is given on the right, along with the locations of some notable genes.

# Institute of Atomic and Molecular Sciences

☎ 886-2-2362-0212

☎ 886-2-2362-0200

🌐 <http://www.iams.sinica.edu.tw>

## Foreword

In July 1982 during the 15<sup>th</sup> Convocation of Academia Sinica, fifteen academicians led by Dr. Y. T. Lee recommended that an institute of atomic and molecular sciences be founded. After the proposal was approved, a preparatory office was inaugurated on September 23, 1982 to lay the foundation for the new institute. An Advisory Board, headed by Dr. Y. T. Lee, was organized to provide guidance for its future development. On December 11, 1982 Dr. C. T. Chang was appointed Director of the Preparatory Office. Later, in July 1993, Dr. S. H. Lin replaced him as Director of the Preparatory Office. In April 1995 the Institute was formally established and Dr. S. H. Lin became the first Director. In October of 2001, Dr. K. Liu took the helm. From October 2004 to December 2010, Dr. Y. L. Wang assumed the directorship. Since January 2011, Dr. M. Y. Chou became the sixth director.

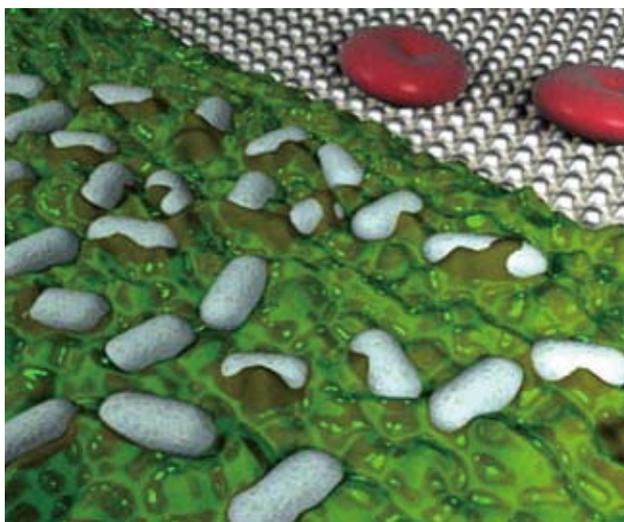
## Research Projects

The Institute of Atomic and Molecular Sciences (IAMS) was established to be an advanced institution for fundamental research related to atomic and molecular sciences. The ultimate goal is to improve our understanding of the chemical and physical principles relevant to the development of applied sciences, such as biophysical analysis, material science, energy research and laser technology. At present, there are thirty-nine principal investigators (including 9 adjunct PIs) in four research groups: 1. Chemical Dynamics and Spectroscopy, 2. Advanced Materials and Surface Science, 3. Biophysics and Bio-analytical Technology and 4. Atomic Physics and Optical Science.

## Significant Research Achievements

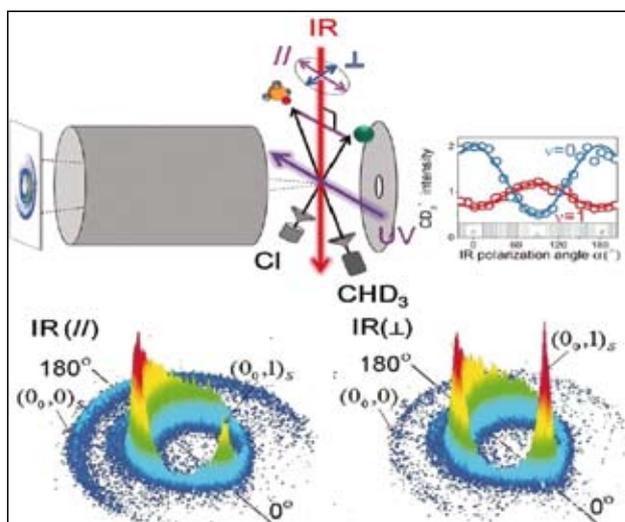
IAMS has made significant progress in the following areas during the last few years:

1. Fabricated nanomaterials for energy applications in fuel cells and solar cells.
2. Proved fluorescent nanodiamonds FND is an ideal probe for long-term tracking and imaging in vivo with good temporal and spatial resolution.



↑ A dual function biochip was developed that can not only effectively capture bacteria in human blood but also enhance the Raman signals of the bacteria, allowing for their analysis by surface enhanced Raman spectroscopy (SERS). This new technology was reported in the 15-November-2011 issue of Nature Communications (DOI: 10.1038/ncomms1546).

3. Using a fluorescent dye that binds to the G-quadruplex structure of human telomeric structure, a common feature of several different cancers, a microarray for detecting cancerous cells was developed and manufactured.
4. Precisely measured the photo-dissociation cross sections of ClOCl by using molecule-beam technique to clarify ozone degradation models.
5. Using the crossed-molecule beam technique to discover that exciting the C-H stretching mode in the F+CHD<sub>3</sub> reaction leads to unexpected slow down producing of the DF+CHD<sub>2</sub> reaction.
6. Significant steric control was demonstrated in the chemical reaction of Cl atom with CH stretch-excited CHD<sub>3</sub> molecules.
7. By manipulating the phase and amplitude of the harmonics of a laser beam instantaneous optical fields of various shapes were produced by Fourier synthesis of a series of optical harmonics.
8. Developed a dual function biochip that not only effectively captures bacteria in human blood but also enhances the Raman signals of the bacteria, allowing their analysis by surface enhanced Raman spectroscopy (SERS).



↑ Steric Control of the Cl + CHD<sub>3</sub> Reaction: experimental setup and CD<sub>3</sub> product images detected as the function of the IR laser polarization direction [published in *Science* 331, 900-903 (2011)].

# Institute of Astronomy and Astrophysics

☎ 886-2-3365-2200

☎ 886-2-2367-7849

🌐 <http://www.asiaa.sinica.edu.tw>

## Foreword

The Institute of Astronomy and Astrophysics (ASIAA) Preparatory Office was established in 1993, with Frank H. Shu chairing the Advisory Panel and with Typhoon Lee as the first director. Succeeding directors of the Preparatory Office are Dr. Chi Yuan, Dr. Kwok-Yung Lo, Dr. Sun Kwok and Dr. Paul T. P. Ho. ASIAA has become the full institute from June 1, 2010, with Dr. Paul T. P. Ho as the first and the current Director.

## Research Projects

Research topics carried out at the ASIAA range from solar system studies to cosmology, with our staff utilizing many of the frontier ground-based and space-borne observing facilities.

## Significant Research Achievements

### 1. The Submillimeter Array (SMA)

The SMA is a joint project between the Smithsonian Astrophysical Observatory (SAO) and ASIAA. Two of the eight 6-meter radio telescopes were built by the ASIAA in collaboration with universities and industry in Taiwan. Dedicated on Mauna Kea, Hawaii in November 2003, SMA is the first submillimeter array in the world. As of Dec 2011, some 380 papers have been published, about 170 of which have Taiwanese co-authors.

### 2. The Taiwan-America Occultation Survey (TAOS) and Trans-Neptunian Automated Occultation Survey (TAOS-2)

The TAOS consists of four 0.5-meter optical telescopes located on Lulin Mountain in Taiwan. They automatically monitor 1,000 stars every clear night to search for Trans-Neptunian objects (TNOs) through stellar occultations. By studying the TNOs, we can better understand the early history of our solar system. The ASIAA has also started the TAOS-2 project, to be sited in San Pedro de Martir Observatory in Mexico, to improve the sensitivity by 100 times. This will consist of three 1.3-meter telescopes which will be installed starting in 2012.

### 3. The Yuan Tseh Lee Array for Microwave Background Anisotropy (AMiBA)

The AMiBA is a platform-mounted interferometer sited on Mauna Loa in Hawaii to measure the properties of the cosmic microwave background and to detect clusters of galaxies at high redshift. It is designed, constructed and operated by the ASIAA, in major collaboration with National Taiwan University. The initial 7-element interferometer was dedicated in October 2006 and science operations have started since then. An expansion to the 13-element configuration was completed in 2009. Scientific studies continue to study the dark matter distribution in distant clusters of galaxies via the Sunyaev-Zeldovich Effect.

### 4. The Optical and Infrared (OIR) Instrumentation Program

To support follow-up observations of high-redshift clusters, the ASIAA negotiated for the observing time on international optical and infrared telescopes from 2003. Through participating in the

development of the Wide Field Infrared Camera (WIRCam) on CFHT and the HyperSuprime Cam (HSC) project on the Subaru Telescope, Taiwan has gained access to CFHT and the Subaru Telescope. ASIAA continues to collaborate in the development of the next generation instruments on these telescopes, the Infrared Spectropolarimeter (SPIRou) on CFHT and the Prime Focus Spectrograph (PFS) on Subaru Telescope.

### 5. Theoretical Institute for Advanced Research in Astrophysics (TIARA)

TIARA was established in 2004 to provide an integrated program of research and education in theoretical astrophysics. Forefront theoretical research is carried out at TIARA in a cooperative effort with the National Tsing Hua University. TIARA has organized a winter/summer school and 2-4 workshops or topical programs each year and facilitated interactions among researchers in the East Asian region via its active visitors program. Together with the forefront observational facilities being developed by ASIAA, the TIARA programs stimulate interest in astronomy by graduate students at universities and academic institutions, thus building and maintaining the human resources for future initiatives in theoretical and observational astronomy.

### 6. Atacama Large Millimeter/submillimeter Array - Taiwan (ALMA-T)

The ALMA, the largest ground based astronomical telescope ever built, is an international project of Europe, North America and East Asia. Taiwan has been invited to participate both by East Asia and North America. The array, composed of 66 high precision telescopes operating as an interferometer, is under construction in the Atacama desert in Chile and is scheduled to start the full operation in 2013. Early Science already begins in 2011. The ASIAA operates the East Asian Front End Integration Center, which is assembling and testing 22 of the front end receiver systems.

### 7. Submillimeter Very Long Baseline Interferometer (submm VLBI)

Submm VLBI will combine the SMA and ALMA and add a third station for intercontinental baselines. A promising site has been found in Greenland. Collaborating with SAO, the ASIAA has been awarded to take over and redeploy the ALMA-NA prototype 12m telescope. The scientific target is to prove directly the existence of black hole by imaging the shadow of a Super Massive Black Hole (SMBH) at the center of an Active Galactic Nucleus. This Greenland telescope will also pursue frontier science in the THz frequencies.



↑ Eight 12m antennas of ALMA. (Picture credit: The Joint ALMA Observatory)



↑ Two of the eight elements of the SMA were built by Taiwan. (Picture credit: Ming-Tang Chen)



↑ AMiBA has been upgraded to its new 13-element 1.2m reflector configuration in 2009 and resumed operations on Mauna Loa in Hawaii. (Picture credit: Chia-You Shih)

# Research Center for Applied Sciences

☎ 886-2-2652-5200

📠 886-2-2782-6672

🌐 <http://www.rcas.sinica.edu.tw>

## Foreword

The Institute of Applied Science and Engineering was inaugurated in June 1999. In 2003, Academia Sinica passed a by-law for establishing research centers. In February 2004, the Institute was renamed as Research Center for Applied Sciences (RCAS). Currently, the RCAS is an interdisciplinary research center, containing four research groups: Nano biotechnology, Optoelectronics, Mechanics & Engineering Science and Advanced Computation & Modeling. The center will continue to hire prominent research fellows, set up core facilities and carry out interdisciplinary research projects.

## Research Projects

The center will pursue fundamental and pioneering research with potential for scientific and engineering applications in collaboration with industries, government institutions and universities. Currently, “nanotechnology” is the major research area. The subjects of interest include: bio sensors and tags, nano electronic and photonic devices, nanometrology, multiscale mechanics, biomedical mechanics, electronic structure calculations, electron transport, near- and far-field optics simulation, etc.

## Significant Research Achievements

### 1. The Nano-biotechnology Group

We have utilized nanocontact printing and super-resolution microscopy to investigate the behavior of cells on the protein nanoarrays. It was found that the cell behavior was governed by the diameter of the protein nanoarrays and the density of focal adhesion molecules increases as the diameter of the protein nanoarrays decreases. It was also found that there exists a characteristic distance between focal adhesion molecules, vinculin, which was measured to be around 50 nm.

### 2. The Mechanics and Engineering Science Group

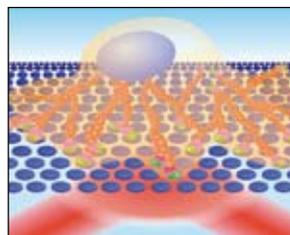
The three-dimensional morphology of bulk heterojunction polymer solar cell is the key toward enhancing the efficiency of solar cells. However, experimental characterization of the morphology of the bulk heterojunction layer is never trivial. We constructed a multiscale molecular simulation framework combining coarse-grained molecular dynamics simulation and spatial-discretization scheme to estimate relevant morphological properties such as specific interfacial area. Our results for the P3HT:PCBM blends are in excellent agreements with available experimental results. Hence, the molecular simulation framework we developed is a powerful tool in aiding the development of novel polymer solar cells.

### 3. The Optoelectronics and Advanced Materials Group

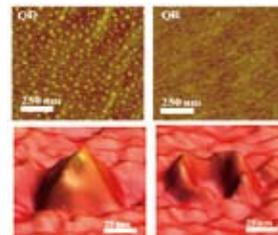
The development of Type-II GaSb/GaAs Nano-structure optoelectric devices on the work of novel optoelectronic devices, we have already demonstrated the device applications of type-II GaSb/GaAs quantum dots (QDs) in (a) room-temperature operation light-emitting diodes, (b) microdisk lasers and (c) high-temperature operation QD infrared photodetectors. Since dot-to-ring transition is observed with the presence of As atoms, ring formation through the control of background As/Sb flux ratios has also been established. GaSb quantum rings (QRs) have exhibited better optical characteristics than QDs. The results would be the room-temperature operation GaSb QR LEDs and QR solar cells with better device performances. Therefore, besides the light-emitting devices and detectors based on the GaSb nano-structures, GaSb QR or quantum-well (QW) solar cells can be an alternate application for this material system.

### 4. The Advanced Computation and Modeling Group

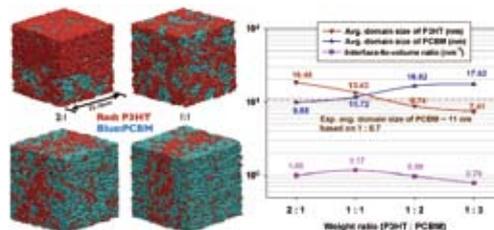
We have made advances in the framework of the time-dependent density-functional theory (TDDFT). We have established a relation between the scalar and tensor exchange-correlation (xc) kernels of TDDFT which facilitates construction of nonlocal xc kernels accurately accounting for many-body effects. We have included the full dielectric screening and band-structure effects in the calculation of low-energy photoemission in solids. We have also worked out the high-frequency (antiadiabatic) limit of xc kernel of an arbitrary quantum-mechanical system, which is complementary to conventionally used adiabatic regime. We have further developed a method based on meta-GGA exchange-correlation (xc) functional which is simple and efficient to handle the excitonic effect in semiconductors.



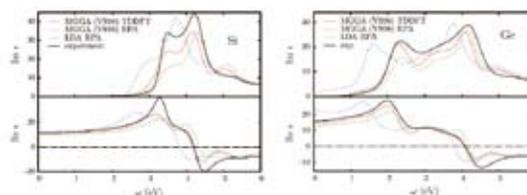
↑ The formation of focal adhesion on micro/nano patterned substrate was investigated by super-resolution microscopy.



↑ The AFM and STM images of GaSb/GaAs quantum dots quantum rings.



↑ Publications: Cheng-Kuang Lee, Chun-Wei Pao\*, Chih-Wei Chu (2011), "Multiscale molecular simulations of the nanoscale morphologies of P3HT:PCBM blends for bulk heterojunction organic photovoltaic cells", Energy & Environmental Science 4, 4124.



↑ Publications: V.U.Nazarov and G. Vignale, Phys. Rev. Lett. 107, 216402 (2011).

# Research Center for Environmental Changes

☎ 886-2-2653-9885

☎ 886-2-2783-3584

🌐 <http://www.rcec.sinica.edu.tw>

## Foreword

Since the rapid economic development in the 1970's, the environment in Taiwan has deteriorated severely. Per unit area emissions of air pollutants in Taiwan are now among the highest in the world. Air and water pollutants are health hazards and can adversely affect the entire ecosystem. In addition, air pollutants and land use changes can perturb regional climate significantly. The environmental impacts and scientific questions involved are multi-disciplinary, region-specific and complex. In order to effectively address these questions, Academia Sinica initiated an Environmental Change Research Project hosted by the Institute of Earth Sciences in November 1999. After about four years of development, the Research Center for Environmental Changes (RCEC) was officially established on January 1, 2004.

## Research Projects

The major research projects of the RCEC are focused on atmospheric chemistry, air quality, biogeochemical cycles of fresh water systems in Taiwan and surrounding oceans, water resources and regional climate changes.

## Significant Research Achievements

### 1. Changes of Extreme Weather in a Warming Globe

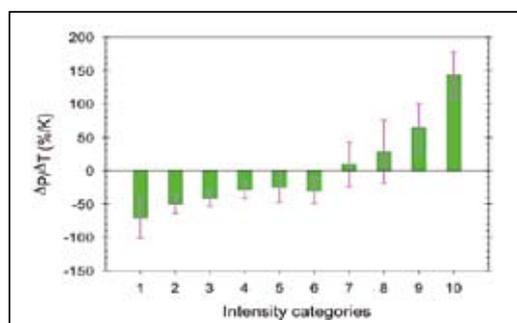
Scientists from the Research Center for Environmental Changes successfully quantify the relation between precipitation extremes and global temperature changes. The top 10% bin of precipitation intensity increases by about 110% for each degree increase in global temperature, while 30%-60% bins decrease by about 20%, about one order of magnitude greater than results from the latest climate models. Global warming has a greater effect on Taiwan's extreme rain falls. The top 10% bin of rain intensity almost doubled in the last 45 years and will keep increasing with temperature, resulting in more floods. Droughts due to reduced light rain will also increase. New national strategies for land-use, flood control and water resource management are imperative.

### 2. Urban Ozone Formation and Ozone Trends in East Asia

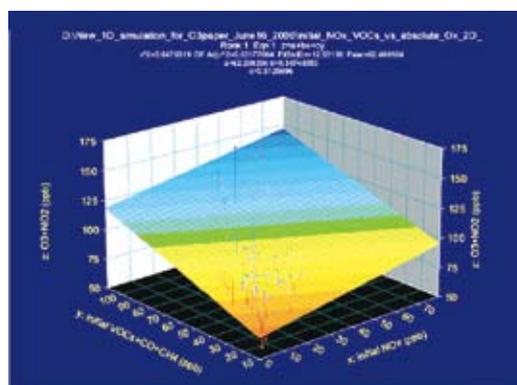
An observation constrained 3-dimensional photochemical-transport model should be able to use the measurements at Mauna Loa to "invert-model" the trends of background ozone in Asia. 3-dimensional OBM plots of  $O_x$  ( $O_3+NO_2$ ) vs. initial VOC and  $NO_x$  show that the concentration of  $O_3+NO_2$  will decrease significantly when VOC is reduced. When  $NO_x$  is reduced,  $O_3$  will INCREASE. Therefore, we conclude that  $O_3$  levels in southern Taiwan are VOC-limited, but more data are needed.

### 3. Enhanced burial of fossil organics in the Okinawa Trough since the LGM: Implying humid climate in Taiwan

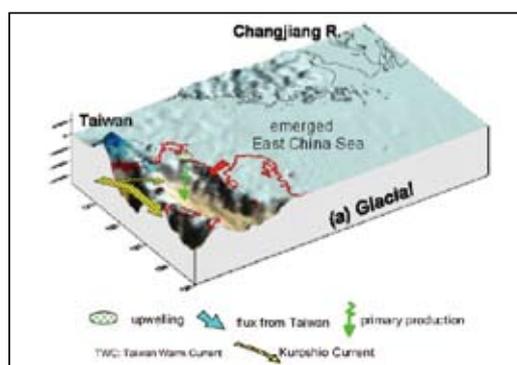
Sea level rise and/or cotemporaneous climate change may account for substantial changes in the burial of terrestrial organic carbon in the Okinawa Trough, of which fossil organic matter is an important component. Sedimentary rock erosion from the highlands of Taiwan is the most likely source of the FOC. A wetter climate with higher runoff and bedrock incision on land are inferred for the Holocene. This is the first report of global climate-driven variations in the relative burial rates of fossil and modern organics, thus providing new insight into the carbon biogeochemical cycle over the glacial-interglacial timescale.



↑ Changes in rain intensity in Taiwan from 1961 to 2005



↑ 3-dimensional depiction of the relationship between ozone and its precursors



↑ Enhanced burial of fossil organics in Okinawa Trough since LGM: Implying humid climate in Taiwan

# Research Center for Information Technology Innovation

☎ 886-2-2787-2300

📠 886-2-2787-2315

💻 <http://www.citi.sinica.edu.tw>

## Foreword

The Research Center for Information Technology Innovation (CITI) at Academia Sinica was founded in February 2007 to integrate the research and development activities in information technologies among various organizations in Academia Sinica and also to further promote IT-related multi-disciplinary research.

## Research Projects

CITI has four thematic centers: Digital Content & Technology Center, Grid & Scientific Computing Center, Taiwan Information Security Center, Intelligent & Ubiquitous Computing Center.

CITI also supports several mission-oriented projects, including Open Source Software Foundry (OSSF), Research Program on Open Content and Open Data-Creative Commons Taiwan, PLASH for location-based services and Open ID.

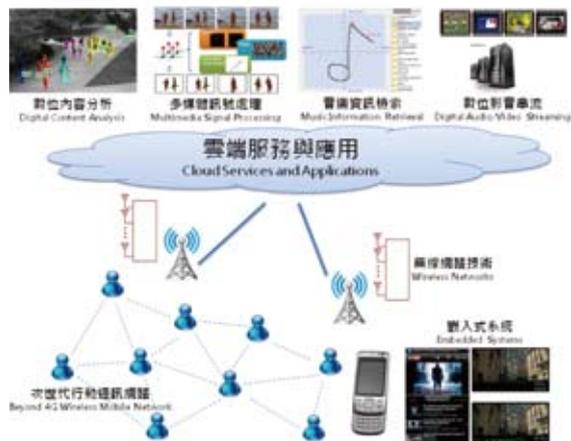
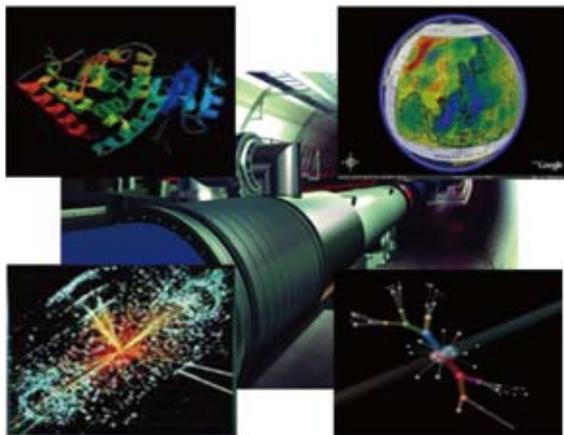
## Significant Research Achievements

The Digital Content and Technology Center is positioned to creatively promote the national digital archives and to facilitate the development of Taiwan's culture and society in digital archives. The Grid and Scientific Computing Center is one of leading high performance computing and communication centers in Taiwan and provides advanced and progressive grid computing services to scientists from various domains and countries in the Asia-Pacific region. The Taiwan Information Security Center integrates domestic security resources of universities/research institutes and is positioned to develop cutting-edge technology to sustain secure computing and counter rampant cyber-crime in the interconnected world. The establishment of the Intelligent & Ubiquitous Computing Center is motivated by the fast increasing demand for intelligent and ubiquitous computing. This thematic center is expected to conduct pioneering research on cloud computing, wireless networks, multimedia content processing and streaming, mobile data mining and embedded system, as well as to promote the collaborations between industrial and academic organizations. Research accomplishments of research fellows in CITI have been recognized by several important awards, including Academic Award from MOE, Distinguished Research Award from NSC, Champion in major technical contests and best paper awards from prestigious international conferences.

By conducting pioneering research work in information technology, CITI promotes collaborations between academic and industrial organizations and ultimately provides valuable research achievements to our society.



↑ Academia Sinica Digital Resources



# Institute of Plant and Microbial Biology

☎ 886-2-2789-9590

☎ 886-2-2782-7954

💻 <http://ipmb.sinica.edu.tw>

## Foreword

The forerunner of the Institute of Plant and Microbial Biology was the Natural History Museum of Academia Sinica, founded in Nanking in 1929. In 1934, the Natural History Museum was renamed the Institute of Botany and Zoology. In 1962, the Institute of Botany was formally reinaugurated in Taipei, with Dr. Hsien-Wen Li as its Director. After Dr. Li's retirement in 1972, succeeding Directors included: Drs. Tsung-Teh Kuo, Hong-Pang Wu, Ching-San Chen, Chang-Hung Chou, Shang-Fa Yang, Jei-Fu Shaw, Tuan-hua David Ho and Na-Sheng Lin. The current Director is Dr. Anthony Hwoonchung Huang. The institute's name was changed to the Institute of Plant and Microbial Biology in May 2005.

## Research Projects

The research work at the Institute is mostly basic in nature; however, some applied research is also conducted, including agriculture and biotechnology.

In light of the importance of multidisciplinary approaches in modern life science research, the research in the Institute of Plant and Microbial Biology is organized into two major intellectual foci:

1. Mechanisms of Plant Functioning
2. Plant-Microbial Interactions

The former research area can be divided into the emphases Arabidopsis Genetics and Development, Biochemistry and Cell Biology, Bioresources and Cereal Genomics.

These focused research programs will not only address challenging problems in plants, but also allow a proper balance between basic research and the development of potential biotech applications. Ultimately, all the research efforts in the future will be centered on the main theme of "Discovery, Utilization and Preservation of Unique Plant Resources in Taiwan".

Currently, there are 27 PIs, 6 Research Specialists, 32 administrators and technicians, with a total staff of around 300 (including postdoctoral fellows, graduate students and research assistants). The PIs engage in a diverse spectrum of research projects mainly supported by Academia Sinica, National Science Council and the Council of Agriculture.

## Significant Research Achievements

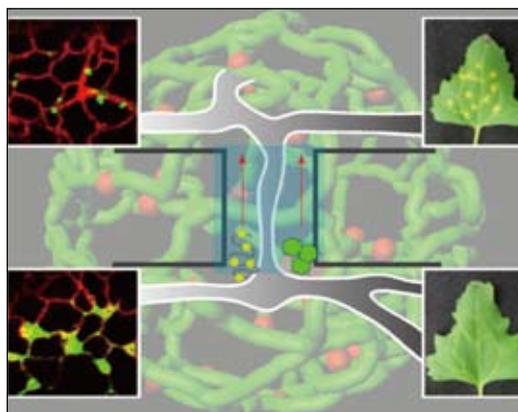
More than a decade ago, IPMB fellows made landmark scientific discoveries in rice breeding and genomics, regeneration via tissue cultures, virus satellite RNA and microbial circadian rhythm. Recently, several tremendous achievements in biologically significant issues such as "Arabidopsis circadian clock", "Ubiquitin/26S proteasome", "RNA long-distance trafficking", "Viral protein trafficking" and "*Agrobacterium tumefaciens* type VI secretion membrane protein" have been addressed by our colleagues and published in high-tier journals. In addition, the Institute has been granted many patents based on the research discoveries. Botanical Studies, formerly Botanical Bulletin of Academia Sinica, an international journal, published by the Institute of Plant and Microbial Biology and co-published by the Research Center for Biodiversity and Agricultural Biotechnology Research Center, has been recognized by the National Science Council fifteenth times as one of the top three international journals published in Taiwan.

During the past 5 years, IPMB has sponsored major international symposia and other high-profile seminars. In November 7-9, 2011, IPMB hosted a major International Symposium on Functional Rice Genomics with over 500 attendees from 17 different countries.

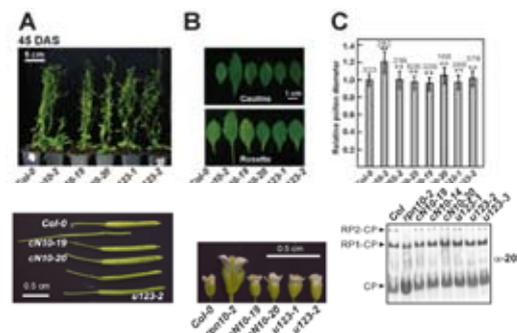
In addition to conducting research and education, IPMB has been actively engaging in extension of knowledge to the Taiwan community. We have been working closely with the Council of Agriculture, Forestry Bureau and regional farm commodity boards on many practical projects, including rice germplasm enhancement, reforestation and disease prevention and extermination. We have contributed our knowledge to the world community as well. For example, IPMB has assisted the planting of disease-resistant banana varieties in Uganda, as reported by *Nature News* in 2010 and *CNN News* in 2011.



↑ The 9<sup>th</sup> International Symposium of Rice Functional Genomics: The International Rice Functional Genomics Meeting is one of the world's biggest and most important rice genome research conferences. The 9<sup>th</sup> meeting was hosted by the Institute of Plant and Microbial Biology, Academia Sinica at November 7-9, 2011. More than 500 attendees from 17 countries participated this important event.



↑ A plant virus hitchhikes a ride to cross the cell boundary



↑ The defective proteasome but not substrate recognition function is responsible for the null phenotypes of the Arabidopsis proteasome subunit RPN10

# Institute of Cellular and Organismic Biology

☎ 886-2-2789-9515

☎ 886-2-2785-8059

💻 <http://icob.sinica.edu.tw>

## Foreword

The overall focus of the Institute of Cellular and Organismic Biology (ICOB) is the investigation of basic mechanisms by which cellular function and cell-cell interactions can coordinate to allow for the growth and development of an organism and its adaptation to an ever-changing environment. While the molecule-based understanding of cellular function is important, our emphasis is also on the coordination of cell-cell interactions in the growth, adaptation and development of the whole organism. We therefore strive to serve as a link between the molecular and cellular approach and that from the system biology and also as a conduit for collaborative efforts between physical sciences and biological sciences.

## Research Projects

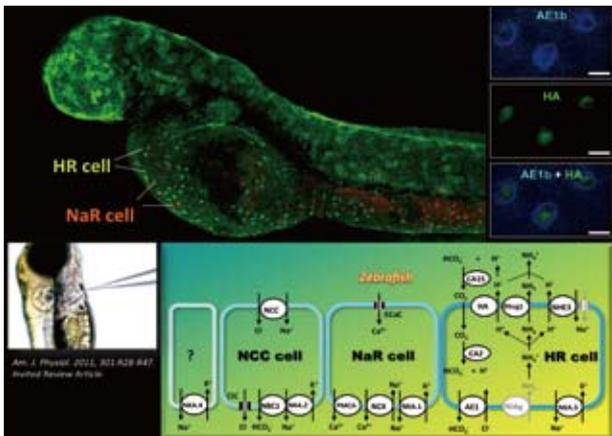
There are four areas that the current research effort of ICOB encompasses: (1) aquabiology and marine biotechnology, (2) cellular and organismic functional analysis through studies with model animal systems, (3) molecular basis of cellular function and dysfunction, and (4) cellular structural analysis.

1. Among the four research areas, aquabiology and marine biotechnology have the longest history in terms of its development and enjoy a strong reputation. Currently there are twelve principal investigators, over half of our institute's research groups, pursuing this area of research. Their work is greatly assisted by the Marine Research Station affiliated with ICOB, located in Jiao Shi. This seaside Marine Research Station is equipped with facilities for breeding and investigating various marine organisms. Investigators at ICOB were the first to introduce the use of zebrafish as a model system for aquabiology research to Taiwan's research communities. The various aspects of physiological studies of fish and other aquatic organisms are also unique strengths for ICOB.
2. The approach of investigating the cellular function from the point of view of a whole organism will rely heavily on the use of model systems and system biology. Besides the aforementioned zebrafish, our investigators also use mouse and *Drosophila* systems for investigating developmental biology, neurobiology, stem cell biology, DNA replication and repair. However, there are also somewhat unusual animal systems being developed for a specific problem for which a novel "model" system is particularly suited. These include the use of lobster cockroach for the social aggressive behavior analysis, heteropteran insects for pheromone specificity, amphioxus for chordate evolution, and hagfish for vertebral evolution and development.

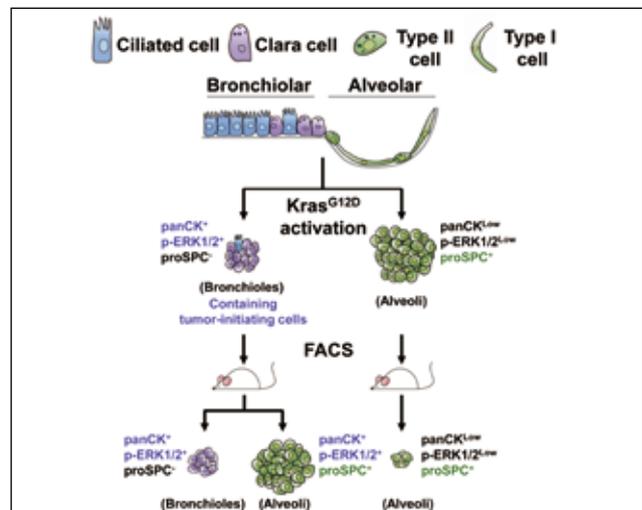
3. The area of molecular basis of cellular function and dysfunction covers a fairly diverse area at ICOB. They include the functional studies of the DNA helicases that are responsible for several rare human diseases (Bloom syndrome and Rothmund Thomson syndrome), transgenic mouse system for isolating lung stem cells that are prone to oncogenic transformation, signaling process regulating gamma-secretase in Alzheimer's disease, receptor-mediated delivery of cancer therapeutic agents, and cytotoxic action of arsenics.
4. The fourth area, the cellular structural analysis, is currently covered in many research groups both in ICOB and other institutes as well. However, the more advanced imaging analysis represents a focus for ICOB. Our direction will be more on the unique biological systems and techniques which can lead to development of cell imaging and structural analysis.

## Significant Research Achievements

ICOB continues to make contribution to aquabiology and marine biotechnology research and promotes the use of zebrafish and other model systems as a valuable model system for biomedical research. Our research teams have begun the post-genomics era by venturing into gene regulatory network in the growth and development of a whole organism using systems biology approach. These academic achievements can be highlighted by the recent publications in journals including *PNAS*, *PLoS One*, *Cancer Research*, *JBC*, *Molecular Biology of the Cell*, *American Journal of Pathology*, *Development*, *Developmental Biology*, etc.



↑ New model of ionic and acid-base regulation in zebrafish  
(*Am. J. Physiol.* 2011, 301:R28-R47, Invited Review Article.)



↑ Cancer-initiating Cells in *Kras*<sup>G12D</sup>-induced lung Adenocarcinoma  
(*Cancer Research* 71:7250 2011)

# Institute of Biological Chemistry

☎ 886-2-2785-5696

📠 886-2-2788-9759

💻 <http://www.ibt.sinica.edu.tw>

## Foreword

The Institute of Biological Chemistry (IBC) was established in 1977. At present, it comprises two research buildings, located on the Academia Sinica Campus and the National Taiwan University (NTU) campus. The institute has maintained close ties with the Graduate Institute of Biochemical Sciences at NTU, sharing resources in both teaching and research. The current director is Dr. Ming-Daw Tsai. The institute consists of more than 300 persons, including 35 investigators and specialists.

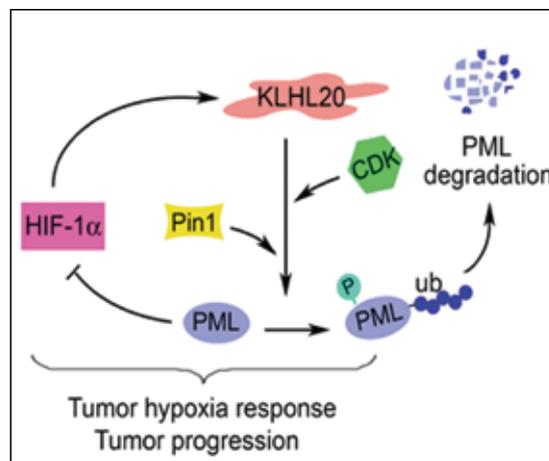
## Research projects

The IBC researchers have focused on the studies of fundamental biochemical mechanisms and the development of biochemical technologies. Areas that have been actively studied by our researchers include 1. Molecular and Cellular Biology, 2. Proteomics, 3. Glycosciences, 4. Chemical Biology and 5. Structural Biology and Molecular Biophysics.

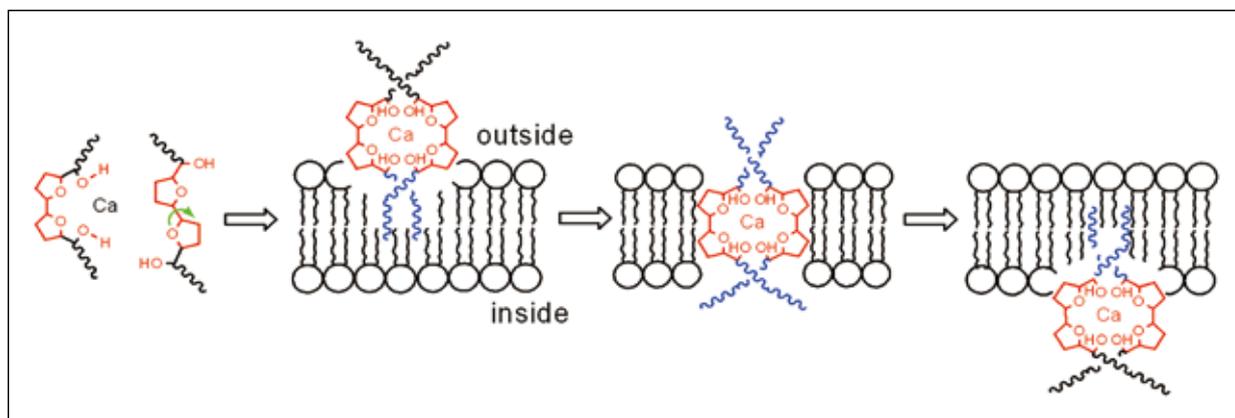
In recent years, the IBC researchers have developed two major research themes: (1) Biochemical basis of posttranslational regulation and cell signaling network and (2) Structural and mechanistic basis of protein function and drug design. Several research core facilities have been established for supporting the two research themes, including proteomics and mass spectrometry, structural biology (NMR and x-ray), biophysics, peptide synthesis and cell image. Throughout these studies, the institute aims to pursue quality and excellence in research with a deep commitment to promote collaboration among fellow scientists.

## Significant Research Achievements

The IBC has played a leading role in several competitive research areas. In the recent five years, about 500 research papers have been published in renowned international journals, including *Science*, *Cancer Cell*, *Nature Structural & Molecular Biology*, *Molecular Cell*, *Angewandte Chemie International Edition*, *EMBO Journal*, *Blood*, *PNAS*, *Plant Cell*, *Journal of Cell Biology*, *Journal of the American Chemical Society*, *Molecular and Cellular Proteomics*, etc. Several patents have been issued, demonstrating our significant contributions to biotechnology development. In addition, the IBC researchers have served as editors or editorial board members for international journals and received prestigious academic awards.



↑ Hypoxia triggers ubiquitin-dependent proteolysis of PML tumor suppressor through HIF-1-induced transactivation of *KLHL20*. Targeting PML to the Cul3-KLHL20 ligase requires PML phosphorylation by CDK1/2 and prolyl isomerization by Pin1. This HIF-1-induced, KLHL20-mediated PML destruction participates in a feedback mechanism to maximize HIF-1 induction by hypoxia, thereby potentiating tumor hypoxia responses.



↑ Calcium ions can be chelated by the hydroxylated tetrahydrofuran ring of acetogenins, which resulted in formation of hydrophobic acetogenin/ $\text{Ca}^{2+}$  complexes that can aid the cations in penetrating cell membranes and in elevating the intracellular calcium level.

# Institute of Biomedical Sciences

☎ 886-2-2789-9000

☎ 886-2-2785-3569

🌐 <http://www.ibms.sinica.edu.tw>

## Foreword

The Institute of Biomedical Sciences (IBMS) was founded in February 1981 with the opening of a Preparatory Office and was formally established in December 1993. Its mission is to elucidate disease mechanisms through basic research and use this knowledge for clinical applications in order to improve public health. Currently there are 57 full time researchers staff, 8 joint research members, 94 postdocs, 300 graduate students, 370 research assistants, 100 administrative and supporting staffs. Dr. Fu-Tong Liu, a physician-scientist, is our current director.

## Research Projects

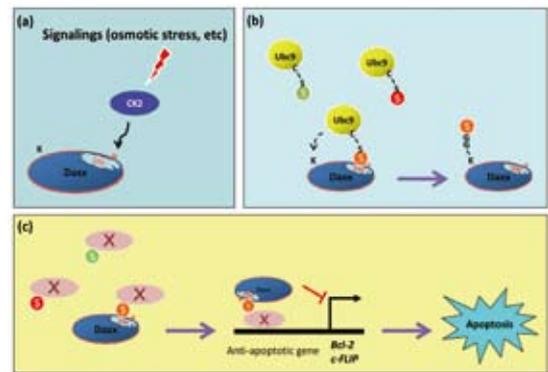
Currently, the IBMS investigators are engaging in research in seven general areas: epidemiology and genetics, cell biology and signal team-work is emphasized in the transduction, cancer, cardiovascular disease, infectious diseases and immunology, neuroscience and structural biology. In this post-genomic era, team-work is emphasized in the research of investigators at the IBMS. The investigators at the IBMS not only collaborate with each other to form groups but also establish program projects with colleagues from other institutes inside and outside of Academia Sinica for efficient research. We are focusing our efforts on exploring disease genes and risk factors, generating mouse models for human diseases, developing disease markers and new drugs, elucidating the molecular mechanisms underlying cell transformation and cancer metastasis, understanding the processes of virus and parasite infection, characterizing the cause and pathology of neural and cardiovascular diseases and using NMR, MRI and computational methods to determine the structures of proteins and living organisms.

Some of our research groups joined international consortiums: (1) to uncover the multiple genomic sites that may harbor breast cancer genes, (2) to map the human genetic diversity in Asia through the HUGO Pan-Asian SNP Consortium and (3) to use genetic and clinical data to formulate a universal algorithm that can better predict warfarin dosage to avoid bleeding complication.

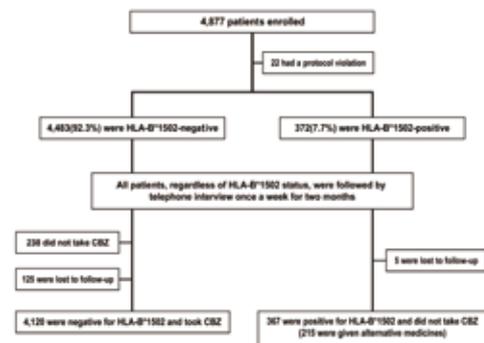
## Significant Research Achievements

The recent review (2011) of the 8 Institutes of the Life Science division of Academia Sinica, the reviewers pointed out that under the leadership of Dr. Yuan-Tsong Chen and more recently, Dr. Fu-Tong Liu, IBMS has made impressive progress. This is reflected not only by the publications in high-impact journals but also the emergence of mission-oriented, coherent research groups. IBMS is now recognized as a premier center for translational medical research. The work on Stevens Johnson Syndrome/ Toxic Epidermal Necrosis in relationship to HLA is a truly impressive success story, exemplifying the best of translational research. Such studies have mobilized the Taiwan medical community to work together to solve important health issues and placed IBMS on the world stage of genomic medicine. The arrival of Dr. Liu has brought new prospects of extending the already strong research in glycoscience at AS to translational medicine, eventually making IBMS and AS a world leader in glycomedicine.

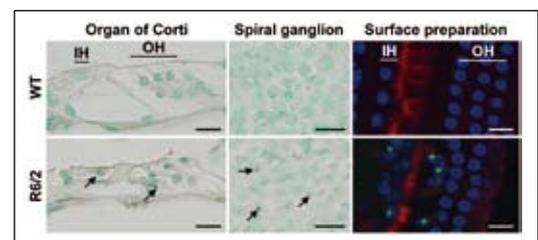
On the average, each IBMS principal investigator publishes two to three scientific articles in international journals each year, with an average impact factor of 5. Several discoveries made in recent years by IBMS investigators have been published in first-rate journals and made headlines in local and international media. Numerous IBMS principal investigators have received the Outstanding Research Award or the Special Research Award of the National Science Council, the Academia Award of the Ministry of Education, the Junior Research Investigators Award or the Academia Sinica Investigator Award of Academia Sinica and other awards conferred by private foundations. These figures rank the IBMS as one of the leading research institutes in the field of biomedical sciences in Taiwan.



↑ Daxx is signaling molecule in apoptotic pathway and also acts as a transcriptional corepressor.



↑ The identification of subjects carrying the HLA-B\*1502 allele and the avoidance of carbamazepine therapy in these subjects was strongly associated with a decrease in the incidence of carbamazepine-induced adverse drug reaction.



↑ Mouse models of Huntington's disease have auditory dysfunction and aggregate of mutant Huntingtin in the cochleae.

# Institute of Molecular Biology

☎ 886-2-2789-9222

📠 886-2-2782-6085

💻 <http://www.imb.sinica.edu.tw>

## Foreword

The Preparatory Office of the Institute of Molecular Biology (IMB) was founded in December of 1982, under the leadership of Professor Paul O. P. Tso. Scientists started their intensive research on July 1, 1986 under the directorship of Dr. James Wang. Drs. Ru-Chih C. Huang, Ray Wu and Chien Ho served as interim directors from 1987 to 1990. Dr. C. C. Wang of UCSF assumed the directorship from 1991 to 1994. In the meantime, the institute completed its preparatory status and officially established itself as an institute on March 1, 1993. Dr. James C.-K. Shen served as the director from 1995 to January 2004. Dr. Meng-Chao Yao assumed the directorship beginning February 2004.

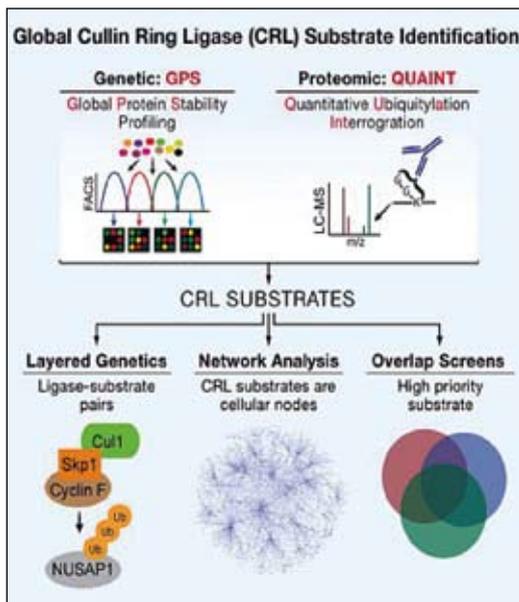
## Research Projects

At the Institute of Molecular Biology, research is being conducted at the molecular and cellular levels in diverse fields of biology. Main themes of research interest at the institute include:

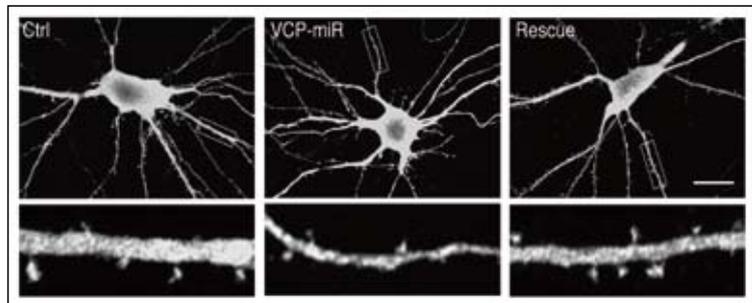
1. Nuclei Acids and Chromosome Biology
2. Developmental Biology and Neurobiology
3. Structural Biology
4. Plant Molecular Biology
5. Interaction between Virus and Its Host
6. Biochemistry and Cellular Physiology

## Significant Research Achievements

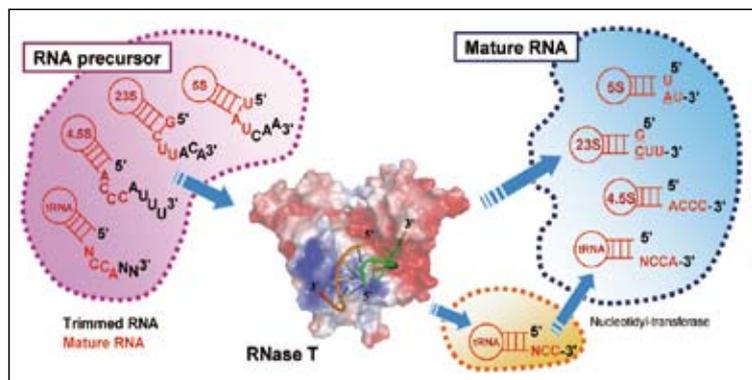
The goal of the institute has been to use molecular and structural biology as a tool to obtain advancements in biological research. Major efforts have been focused on chromosome biology, developmental biology and neuroscience. Major research results of IMB Principal Investigators have been published in internationally renowned journals such as *Cell*, *Nature*, *Science*, *Nature Chemical Biology*, *Journal of Clinical Investigation*, *EMBO J.*, *PNAS*, *Plant Cell*, *Molecular and Cellular Biology*, *PLoS Biology*, etc. These results are not confined to basic research but are also closely related to the development of biotechnology.



↑ Global Identification of E3 ligase substrates by GPS profiling.



↑ Valin-containing protein and neurofibromin interact to regulate dendritic spine density



↑ The RNase T dimer has an ideal architecture for binding a duplex with a short 3' overhang to produce a digestion product of a duplex with a 1-to-4 nucleotide 3' overhang, depending on the last base pair composition in the duplex region and the sequence of the 3' overhang.

# Genomics Research Center

☎ 886-2-2789-9930

☎ 886-2-2789-9931

🌐 <http://www.genomics.sinica.edu.tw>

## Foreword

The Genomics Research Center (GRC) of Academia Sinica was founded in January 2003, with major emphasis on the discovery and validation of disease targets and development of innovative technologies and therapeutic strategies. The current focus of GRC's research is on the understanding of genes associated with diseases and their functions. Through new discoveries, cutting-edge diagnosis tools and innovative therapeutic strategies are expected to be developed. After the founding Director, Dr. Chi-Huey Wong, was elected the President of Academia Sinica, Dr. Chung-Hsuan Chen assumed the directorship and continues to work on building a strong research team since 2007.

## Research Projects

The scientific pursuits in GRC with great potential to be among the world-leading research include cancer and infectious disease research, new drug design based on structure study of membrane protein, carbohydrate chemistry and biology, high throughput drug discovery, evolutionary bioinformatics, biological mass spectrometer development and fast biomarker search. Increased efforts will be placed on the pursuit of fundamental scientific advances through interdisciplinary programs and the extension of basic discoveries to

translational research.

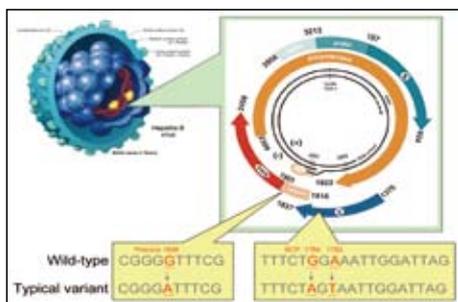
**Major research efforts are focused on the following programs:**

- 1. Chemical Biology:** The main thrust is to develop chemical and biological approaches to solve problems in living systems. Major efforts are directed toward identification and validation of important targets associated with cancer and infection, protein misfolding diseases, and understanding of the function of these targets at the molecular level.
- 2. Medical Biology:** The major focus is on translational medicine, molecular regulation and biomarkers of cancer and normal stem cells, and immunobiology. The ultimate goal is to develop new diagnostics and therapeutics with small molecules, biologics and cell-based approaches, so as to bridge the gap between laboratory research and clinical medicine.
- 3. Physical & Computational Genomics:** The major goals are (1) technology and instrumentation development, aiming to develop new tools with improved sensitivity and resolution for use in studying the dynamics of complex biological systems; (2) computational bioinformatic technology development, aiming to pursue functional and evolutionary genomics as well as structural informatics.

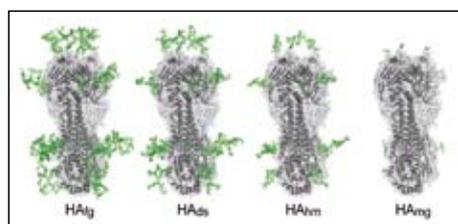
The GRC has established a Biotechnology Incubation Center to help nurture start-up companies advance the commercialization of the discoveries made at Academia Sinica. It aims to improve infrastructure and technology toward a prosperous pharmaceutical and biomedical device industry, resulting in new job opportunities and superior economic growth in Taiwan.

## Significant Research Achievements

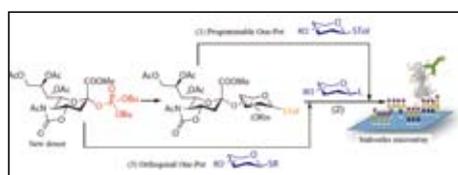
1. Potent immune-modulating and anticancer effects of NKT cell stimulatory glycolipids.
2. Discovery of cancer-enriched oligosaccharides in breast cancer stem cells and the involvement of fucosyl transferases in their biosynthesis, revealing a resolution for breast cancer vaccine
3. Success in oligosialic acid synthesis, bringing totally synthetic antibacterial vaccine one step closer
4. Development of glycan array and its applications for profiling cancers and influenza, and bioenergy technology
5. Unveiling the structures of influenza coat proteins and bacterial membrane protein, along with developing potent new antimicrobial drugs by enzyme engineering, for finding next-generation vaccines or antibiotics to conquer drug-resistant problem
6. Development of Tamiflu phosphonate congeners and glycolipid adjuvant with concise and flexible synthesis process
7. Installation of the ultra-high throughput drug screener, conducting high-throughput screening assays and providing drug candidate related information
8. Successful synthesis of heparan sulfate octasaccharide inhibiting the infection of herpes simplex type 1 virus
9. Discovery of the lung stem cell in SARS infection
10. Investigation on hepatocellular carcinoma and hepatitis B virus, the correlation of women with hepatitis B virus infection and its carcinogenic jeopardy, and the risk analysis in long-term HCV predictors and hepatocellular carcinoma
11. Derivation of stem-like multipotent cells from acinar cell transdifferentiation and identification of glycosphingolipids associated with early differentiations of human embryonic stem cells, leading to new regeneration therapeutic strategies
12. Discovery of the key mechanisms of epigenetic regulation by histone demethylase RBP2 and oncogenesis through modulation of DNA methyltransferase function by N-alpha-acetyltransferase 10
13. Pioneering immunotherapy against glycolipid proven effective for childhood neuroblastoma
14. Development of novel charge-monitoring laser-induced acoustic desorption mass spectrometry for measurement of cell and microparticle mass distribution and quantitative measurement of nano-/microparticle endocytosis
15. Completion of the genomics comparison between human and chimpanzee and Demonstration of gene family size conservation as a good indicator of evolutionary rates



↑ Associations between Hepatitis B virus genotype and mutants and the risk of hepatocellular carcinoma



↑ Removing the sugar coat of influenza hemagglutinin proved a better strategy in vaccine design



↑ Glycan array with a broad application

# Biodiversity Research Center

☎ 886-2-2789-9621

☎ 886-2-2789-9624

💻 <http://biodiv.sinica.edu.tw>

## Foreword

After two years of planning, the Biodiversity Research Center at Academia Sinica (BRCAS) was officially established in January 2004. In line with the “Convention on Biological Diversity,” BRCAS was formed with the hope of lowering species extinction, gene disappearance, resource reduction and ecosystem degradation. Dr. Wen-Hsiung Li became Director in January 2008.

## Research Projects

The mission of BRCAS is to promote, coordinate and sponsor basic biodiversity research in Taiwan; to advance domestic and international research collaboration; to integrate biological, biotechnological, ecological and socio-economical disciplines in pursuit of academic excellence and innovation; and to provide the scientific foundation for the conservation, education and sustainable use of biodiversity. The Center was formed also to render assistance to and enforce the “Biodiversity Action Plan”, ushered by the Executive Yuan of Taiwan and has contributed to governmental strategy planning on ecological conservation, preservation and sustainability.

The thematic center on Systematics and Biodiversity Informatics promotes the integration of biodiversity information. The Biodiversity Research Museum enhances the public’s awareness of our research collections and is also open to the public and schools for group visits.

The four foci of research in the BRCAS are as follows:

1. Marine Biodiversity and Ecosystems
2. Terrestrial Biodiversity and Ecosystems
3. Evolutionary Genetics and Genomics
4. Microbial Diversity and Bioinformatics

## Significant Research Achievements

The 23 researchers and research specialists of BRCAS conducted many biodiversity-related projects and made important contributions. They published papers in noted scientific journals, assisted government in making biodiversity-related policy and promoted biodiversity education. Researches are classifiable into the following categories: population genetics and molecular evolution; biological systematics; ecological and behavioral studies; preservation and restoration; and integration of biodiversity database and information network in Taiwan.

In 2011, BRCAS research faculty published about 76 SCI papers and held one international conference and 22 Seminars. Topics ranged from basic research to applied fields that contributed to the government policy-making.

## Zoological and Botanical Specimen Archives and Digitization in BRCAS

The Biodiversity Research Museum has maintained a collection of over 39,000 specimens which includes fishes, birds, insects, corals, crustaceans, polychaetes, echinoderms and mollusks. The Museum also serves as the specimen deposition and database center of the national cryobanking of wild animals project. The herbarium (HAST) focuses mainly on collections of eastern Asia. Currently we have housed over 131,000 vascular plant specimens, with a growth rate of ca. 5,000 sheets per year. HAST has ca. 70,000 duplicate specimens for exchange with circa 30 institutions worldwide.



↑ *Epilobium nankotaizanense* Yamam. is an endemic alpine species of Taiwan. In the summer, it produces very large, showy flowers on screes above 3,400 m altitude.



↑ The *Chamaecyparis* forest is a typical montane cloud forest at Chi-Lan Mountain in Taiwan. (*Chamaecyparis obtusa* Sieb. & Zucc. var. *formosana* (Hayata) Rehder)



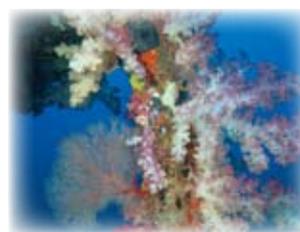
↑ *Aeoliscus strigatus* can be easily seen swimming in groups in vertical upside down positions, but will turn horizontally and rush away when in danger.



↑ *Spirobranchus giganteus*, commonly known as Christmas tree worms, are cone-like shape and magnificent twin spiral plumage, tube-building polychaete worms belonging to the family Serpulidae.



↑ *Cirrhitabranchus cyanopleura* are brightly colored. The juvenile is timid and usually inhabits near leaf or plate-shaped coral reefs, so they can immediately hide in the shadow when they feel threatened.



↑ Soft corals growing on the steel-frame-reef at Kueiwan. Soft corals such as Carnation coral, *Dendronephthya* (right, higher left), Gorgonian sea fan, *Melithaea* (lower left), growing prosperously on the A-type steel-frame reef emplaced at Kueiwan, Green Island in 2004.

# Agricultural Biotechnology Research Center

☎ 886-2-2651-5910

☎ 886-2-2651-5600

🌐 <http://abrc.sinica.edu.tw>

## Foreword

The Agricultural Biotechnology Research Center (ABRC) of Academia Sinica, formerly known as the Preparatory Office of the Institute of BioAgricultural Sciences (IBS), was founded in January 1998 through the concerted efforts of Drs. Ray Wu and Yuan-Tse Lee. Dr. Ning-Sun Yang was appointed as the founding director. IBS was officially transformed and renamed as the ABRC in August 2006. Dr. Na-Shang Lin was appointed as the interim director. Starting from January 2008, Dr. Ming-Che Shih has served as the current director, with Drs. Shu-Mei Liang and Lie-Fen Shyur as deputy directors. The center currently has a total of 17 principal investigators and 5 research specialists, along with various supporting staffs working either at the Nankang main campus of Academia Sinica or at the Biotechnology Center in Tainan County, emphasizing integrated research themes, innovative technology development and teamwork effort. The ABRC moved into the new Agricultural Technology Building in January 2010. The center has made strenuous attempts to consolidate its research activities and advance the development of agricultural biotechnology in Taiwan.



↑ New building and photos representing 4 research programs of ABRC

## Research Projects

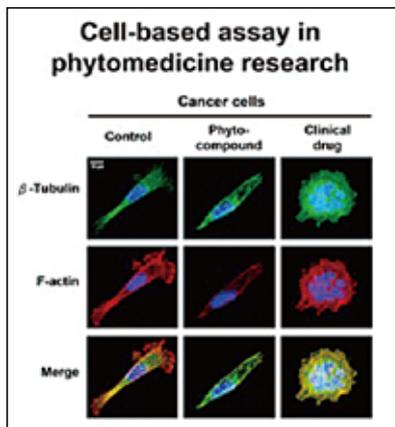
The ABRC pursues basic and mission-oriented research in agricultural biotechnology. The ABRC is actively engaged in theme-oriented and integrative research and currently has four major research programs, including Integrative Plant Stress Biology, Herbal Medicine Research, Molecular Vaccine Technology and Enzyme Biotechnology. We use a multidisciplinary approach that combines functional genomics, metabolomics, bioinformatics and proteomics in our research. The ABRC emphasizes and collaboration in research at both national and international levels and provides networking opportunities and information systems to serve the technological needs of the biotechnology industry in Taiwan.

## Significant Research Achievements

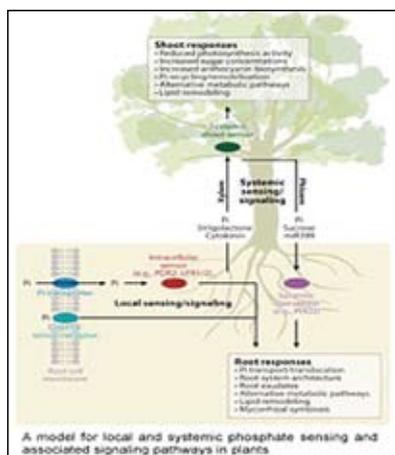
During the past few years, specific research projects designed to develop biotechnology-related agricultural programs have made very encouraging progress. Our key research areas are as follows:

1. The Integrative Plant Stress Biology Program has obtained good results in screening, characterization and use of drought-, chill-, heat-, heavy metal-, phosphate- flooding-, or pathogen-tolerant genes from tomato or model plants, using plant physiology, cell and molecular biology, functional analysis and plant genetic engineering approaches.
2. The Herbal Medicine Program has defined promising experimental systems for studies of anti-inflammatory, immune-modulatory and cancer-chemoprevention activities in response to phytochemicals from *Bidens pilosa*, *Wedelia chinensis*, *Echinacea purpurea* and other traditional medicinal plants.
3. The Molecular Vaccine Technology Program has established the platform technologies for gene-based vaccines, plant virus vectors and mammalian virus-like particles (VLP) against pig disease viruses and SARS viruses. Collaborations with National Institute for Animal Health on field trials and commercialization of vaccine products are being actively discussed with a number of private sectors.
4. Three laboratories are now involved in an academy-wide thematic project, working on biomass conversion for ethanol production.
5. Five research specialists are now participating in several integrated R&D projects. Associated core facilities/technical units have also been set up, employing DNA microarray, metabolomics, transgenic plants, experimental animal core facilities, high throughput DNA sequencing and other technology systems.

Important research findings and potential biotechnology applications have resulted in publications in *Plant Cell*, *Plant Journal*, *Plant Physiology*, *Cancer Research*, *BMC Genomics*, *J. Immunol.*, etc and a series of applications for international patents.



↑ Cell-based assay in phytomedicine research



↑ Significant result from Integrative Plant Stress Biology research program

# Institute of History and Philology

☎ 886-2-2782-9555    📠 886-2-2786-8834    🌐 <http://www.ihp.sinica.edu.tw>

## Foreword

The Institute of History and Philology (IHP) was founded by Fu Ssu-nien at Sun Yat-sen University, Canton in 1928. Under Fu's leadership, in less than a decade, the IHP advanced to the forefront in the fields of Chinese history, archaeology, linguistics, ethnology and folk custom surveys. In the winter of 1948, the IHP moved from Nanjing to Taiwan. In 1954, the institute settled in its current premises in Nankang, Taipei. The IHP is a research center dedicated to integrating multiple academic disciplines. Its members are currently undertaking studies of history, archaeology, anthropology and philology. In the past eighty plus years, the institute's achievements in research have received the respect and attention of academics both in Taiwan and abroad. Additionally, the Fu Ssu-nien Library, the Museum of the IHP and the digitization of the IHP's special collections have all made enormous contributions to the academic community.

## Research Projects

The IHP has two guiding principles for conducting research. First, the IHP respects the diversity of individual research and assists research fellows as much as possible to become leading scholars in their respective fields. Second, the institute facilitates research in several interdisciplinary subjects through the creation of special research units within the IHP. Simultaneously, the IHP strives to organize and publish academic materials written by its research fellows and to expand its digital holdings with the aim of establishing a platform for world-wide sinological research.

The IHP's four major research fields are as follows: 1) History, including the major areas of Chinese history as well as legal history, socio-cultural history, maritime history, world history, comparative history and historical material, book and record organization. 2) Archaeology, including research on the prehistoric cultures of Southeast Asian regions with Taiwan as a central focus, research of Asian continental regions with China proper as a focus and the reconstruction of early Taiwanese history, archaeometry, etc. 3) Anthropology, including investigation into the culture of healing and medicine, religions and rituals, history of minority or ethnic groups and cross-cultural comparative research. 4) Philology, including research on oracle bones, bronze wares and bamboo slips as a major focus of study. In recent years, paleography and early Chinese history have become a core area of research at the IHP.

In order to promote integrated research, the IHP has established eight research units including Cultural and Intellectual History, Legal History, Ritual and Religion, History of Life and Healing, Archaeology of Taiwan and Southeast Asia, World History, Artifacts and Images and Ancient Chinese Civilization. These research units or programs take specific topics as their basis for research, responding to changes in the academic world with flexibility.

## Significant Research Achievements

The IHP has already claimed a stronghold in the fields of the history of life and healing, legal history, Ming and Ch'ing dynasty cities and cultures, artifacts and images and other areas. The institute's noted publications in the recent past include the *Legal History Collection*, the *Medical History Collection* and *Paleography and Early Chinese History*. Multiple volumes of the *New Perspectives on Chinese History* series are also in the process of being published. The IHP has done great service to the academic community in cataloging and publishing the Ming and Ch'ing imperial archives, Chinese popular literature collections, rare books, archaeological relics and other important antique books, records and historical materials. *Scripta Sinica* and the creation of other digitalized archives under the IHP's auspices have contributed even more to the convenience of academic research. Furthermore, the IHP is currently publishing four scholarly journals, including *The Bulletin of the Institute of History and Philology*, *Disquisitions on the Past and Present*, *Asia Major* and the *Journal for Legal History Studies*. The books and periodicals published by the IHP already exceed 1,000 volumes.



↑ Tri-sectioned Yu Flask with a Swing Handle (Sacrificial Pit M1022, Hsi-pei-kang, Anyang, Honan)



← Ivory Ssu Spatula (Pit Horizontal 13C, Hsiao-t'un, Anyang, Honan)



↑ *Shui-hu Ssu-chuan Ch'üan-shu* (Compiled by Shih Nai-an, edited by Lo Kuan-chung, punctuated by Li Cho-wu; Ming dynasty)

# Institute of Ethnology

☎ 886-2-2652-3300    📠 886-2-2785-5836    💻 <http://www.ioe.sinica.edu.tw>

## Foreword

In 1928, Professor Tsai Yuan-pei, a major exponent of ethnology in China who later became President of Academia Sinica, established the Ethnology Section in the Institute of Social Sciences. In 1934, the Ethnology Section was transferred to the Institute of History and Philology. In 1955, after Academia Sinica relocated to Taiwan, a preparatory office was established to conduct ethnographic research on the Han Chinese and the nearly 200,000 indigenous Austronesian people in Taiwan. This preparatory office ultimately led to the establishment of the Institute of Ethnology in 1965, with Professor Ling Shun-sheng as its first director.

Since its establishment, the Institute of Ethnology has identified the following research areas as its key missions: the cultural history of the Chinese people, cultures and societies of Taiwanese indigenous people, folk culture and society of Taiwan's Han Chinese, and the Chinese communities in Southeast Asia. Currently, the Institute is considered Taiwan's leading anthropological research institution by both domestic and international scholars. For domestic anthropologists, the Institute plays a guiding role in identifying new research topics and directions, promoting popular anthropological education, and establishing new academic facilities. For international anthropologists, the Institute is the nexus for longitudinal research on Austronesian and Han Chinese in Taiwan. Owing to its professional expertise and scholarly reputation, as well as its superb research facility, the Institute has long played the key role in hosting visiting scholars, coordinating collaborative research projects, organizing international conferences, and fostering the exchange of knowledge.

## Research Projects

There are four major research areas, based on current research interests and team projects:

- 1. Cultural History & Ethnicity** : This area includes two research orientations. The first one is to construct or reconstruct the historical and developmental process of a group in order to understand its cultural components and meanings. The second is to compare and categorize cultural phenomena in order to construct or reconstruct people's movements and cultural dispersion.
- 2. The Interface between Culture & Psychology** : The development of cultural psychology, under the rubric of Chinese Indigenous Psychology, has achieved major theoretical breakthroughs and has received international recognition lately. This approach starts from the unconscious levels of cultural phenomena, such as bodily senses and emotion and moves towards social cognition and consciously constructed behavior patterns such as filial piety, conjugal relations and the family.
- 3. Contemporary Context of Socio-cultural Development** : Under the impacts of globalization and modern nation-state formation, this area explores how societies (including both the Han Chinese indigenous peoples) have experienced new and controversial social issues, such as meanings of ethnicity, mental illness, culture revivalism etc.
- 4. Cultural Performance & Narration** : This research area focuses on expressive cultural performances including popular rituals (such as seasonal festivals, religious ceremonies, rites of passages etc.) and performing arts (such as story-telling, theatrical performance,

group games and etc.). Researchers can use texts in performing art as a vantage point to understand the culture, or conversely, analyze performers as cultural transmitters in such performances.

## Significant Research Achievements

There are currently 30 full-time research fellows at the Institute, including 10 research fellows, 14 associate research fellows, 4 assistant research fellows, one research assistant and one assistant research technician. Aside from individual research projects, the Institute also develops integrated team projects in cooperation with other institutes at Academia Sinica as well as various colleges and universities. We hope to use teamwork to explore forward-looking research topics and conduct in-depth research. Cooperative research projects currently underway include:

1. Popular Religions of the Han Chinese
2. Shamans and Ritual Performances in Contemporary Contexts
3. Taiwanese Families and Intergenerational Relationships: Changes and Continuities in a Globalizing Era
4. Body Experience
5. Indigenous Mental Healing
6. Research Group on Medical Anthropology
7. Starting from Voice Research Team
8. Research Group on Society and Culture in the Early 21<sup>st</sup> Century



↑ 2011 International Conference on "Rediscovering Nüshu" (Photo by Wen-juan Yang)



↑ The 7<sup>th</sup> Chinese Psychologist Conference (Photo by Wen-juan Yang)



↑ Roots and Inheritance: Dr. Chih-Wan Liu's artifacts and book donations (Photo by Wen-juan Yang)

## Institute of Modern History

☎ 886-2-2782-4166    📠 886-2-2786-1675    🌐 <http://www.mh.sinica.edu.tw>

### Foreword

The Institute was formally established in April 1965 with Professor Kuo Ting-ye as its director. Subsequent directors have included Professors Liang Ching-chun, Wang Yu-chun, Lu Shih-ch'iang, Chang Yu-fa, Chen San-ching, Lu Fang-shang, Chen Yung-fa and Huang Ko-wu. Over the course of two five-year plans, the Institute recruited new members; held scholarly conferences; conducted oral history interviews; constructed a library, an archives building and research offices; and continuously built up its software and hardware capacities. Over the fifty years of its history, the Institute has become an international center for modern historical research.

### Research Projects

Research conducted at the Institute of Modern History encompasses the transformations in modern Chinese politics, military affairs, foreign policy, society, economics, culture, thought and other fields and especially emphasizes exploration of the formation of modernity. The Institute seeks to preserve its scholarly traditions while emphasizing a concern for contemporary social and human needs.

In order to promote research into the important issues mentioned above, the Institute's researchers have organized seven research groups that are distinct but nevertheless related: 1. Post-war developments on both sides of the Taiwan Straits; 2. Women's and gender history; 3. The construction and dissemination of knowledge in modern China; 4. Chinese urban history; 5. Hu Shih; 6. Chiang

Kai-Shek; 7. East Asia. On this basis, the Institute intends to assemble colleagues with similar interests inside and outside of the Institute to gather resources to carry out long-term and in-depth research on a number of important topics in modern history and in this way highlight the key features of the research of the Institute and participate in international scholarly circles.

### Significant Research Achievements

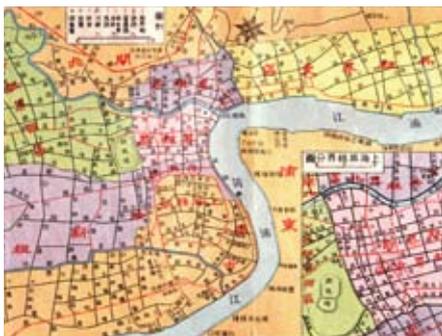
Thus far the Institute has published 92 monographs, 31 conference volumes, 20 volumes of source materials, 51 collections of historical materials, 92 oral history interviews, five diaries of prominent persons, as well as three journals: *Bulletin of the Institute of Modern History Academia Sinica*, *Research on Women in Modern Chinese History and Oral History*. Important research includes that on the late Qing Self-strengthening Movement and the monograph series on regional modernization in China. The Institute has also published important research on the history of China's foreign relations, cultural history, women's and gender history and Chinese urban history, among other topics.



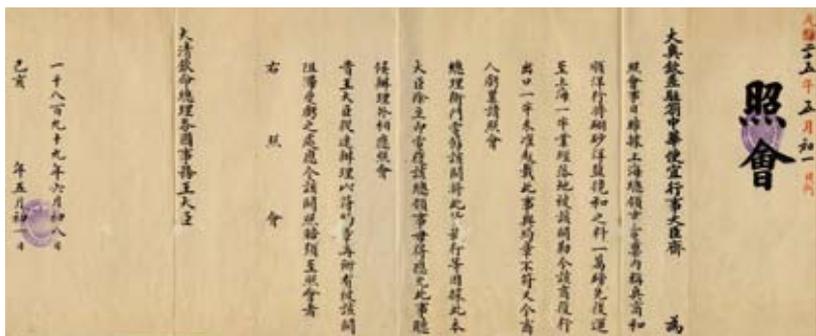
↑ MH Archives



↑ MH Archives



↑ MH Archives



↑ MH Archives

# Institute of Economics

☎ 886-2-2789-9761    📠 886-2-2785-3946    💻 <http://www.econ.sinica.edu.tw>

## Foreword

The Institute of Economics was officially established in February 1970 in Nankang, Taipei, after eight years of preparation. The Institute conducts scientific research in economics, and coordinates and promotes economic research activities in Taiwan. The Institute has 31 faculty members, including 4 distinguished research fellows, 15 research fellows, 5 associate research fellows and 7 assistant research fellows.

## Research Projects

The Institute of Economics pursues scientific research in economic theory and applications, with special focus on economic development problems and related policy issues in Taiwan. Our research projects include:

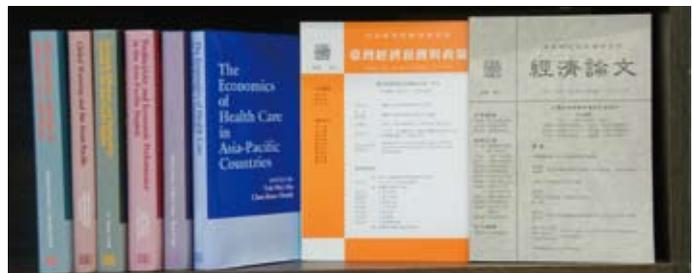
1. Macroeconomics, Growth Theory and Monetary Economics: Theory and Applications
2. Econometrics
3. Finance and their Applications
4. International Economics
5. Microeconomic Theory and Mathematical Economics
6. Population, Family, Labor and Health Economics
7. Agricultural, Environmental and Resource Economics
8. Industrial Organization, Regional Economics and International Economics
9. Public and Legal Economics
10. Public Policies

## Significant Research Achievements

Our faculty members' output has been published in, leading international scholarly journals including *American Economic Review*, *Econometrica*, *Journal of Econometrics*, *Journal of Economic Theory* and *Journal of Political Economy*.

During 2007-2011, in terms of per capita publication in international journals, the Institute is top-ranked both in Taiwan and East Asia.

The Institute publishes two scholarly journals: *Academia Economic Papers* and *Taiwan Economic Forecast and Policy* (both in Chinese). It also publishes a book series in association with the Edward Elgar Publishing Co., called *Academia Studies in Asian Economies*. The 9<sup>th</sup> volume of the *Academia Studies in Asian Economies* was published in 2004 and is entitled *Human Capital, Trade and Public Policy in Rapidly Growing Economies: From Theory to Empirics*.



↑ *Academia Studies in Asian Economies*, *Taiwan Economic Forecast and Policy* and *Academia Economic Papers*



↑ Mo-Huan Auditorium



↑ Entrance of the Institute of Economics, Academia Sinica

## Institute of European and American Studies

☎ 886-2-2789-9390    📠 886-2-2785-1787    🌐 <http://www.ea.sinica.edu.tw>

### Foreword

In August 1969, Dr. Shih-Chieh Wang, the late president of Academia Sinica, proposed the establishment of a permanent American studies institution in the Republic of China. In May 1972, the Center for American Studies was founded and in July 1974, the center was officially established as the Institute of American Culture, Academia Sinica. Expanding its research scope to include European studies, the institute officially assumed its current title in August, 1991.

### Research Projects

The Institute specializes in area studies and interdisciplinary research. Its main research areas include (1)cultural studies, (2)neo-pragmatism, (3)European Union studies, (4)U.S.-Taiwan-China relations, and (5) gender equality and public policy studies in Europe and the United States.

The researchers of the Institute have explored major areas of Western culture and civilization, including European and American literature and culture, American and German diplomatic history, the philosophy of language and mind, the structure and transformation of societies, history of art and sociology of culture, major legal issues, EU law and politics, political systems and behavior, and American foreign policy and international relations.

### Significant Research Achievements

Through sustained efforts, the Institute has distinguished itself in its research on British and American authors and minorities' literature, public policy in Western societies, annual reports on Sino-American relations and systems of government in the European Union. With an emphasis on the balance between critical reception and cultural differences, the Institute has initiated a series of regular conferences, seminars and lectures to promote and enhance European and American studies in the Republic of China on Taiwan. The Institute's researchers publish about 100 papers per year, both in domestic and international journals.

Since its inception, the Institute has published 93 monographs. The Institute's journal *EurAmerica*, a quarterly with over 41 published volumes, is a prestigious forum for the study of Europe and the United States in the Asia Pacific region. *EurAmerica* (formerly *American Studies*) won the National Science Council Award for Superior Academic Journal in 1998, 2002, 2003 and 2004, respectively.



↑ Conference posters



↑ *EurAmerica*

# Institute of Sociology

☎ 886-2-2652-5100    📠 886-2-2652-5050    💻 <http://www.ios.sinica.edu.tw>

## Foreword

The Institute of Sociology was established in January 2000 after a five-year preparatory period. Dr. Hei-yuan Chiu was appointed as the first director. He was succeeded by Drs. Ying-hwa Chang, Chih-ming Ka and Yang-chih Fu. Currently, Dr. Michael H. H. Hsiao serves as director. There are twenty-seven full-time faculty members in the Institute.

## Research Projects

Since its establishment, the institute has developed six major objectives: to promote indigenous research and establish the identity of Taiwanese sociology, to advance research on neighboring societies, to foster cross-national and comparative studies, to systematize existing research, to explore new research areas and to strengthen the professional status of sociology and actively participate in the community of sociologists. Major research projects in the upcoming years focus on organizations and networks, ethnicity and class, family and youth, Taiwan social change, economy and society, historical sociology, Asia-Pacific area studies and the history of Taiwanese sociology. To pursue the above-mentioned objectives, four thematic research teams have been formed: 1. Family and Life Course, 2. Society and Business, 3. Ethnicity, Nation and Modern States, 4. China Impact Studies.

## Significant Research Accomplishments

Various research achievements have been published by researchers of the institute. Books published in the past two years include: *Labor Sociology* (Chin-fen Chang), *Return to Reality: Political and Cultural Change in 1970s Taiwan and the Postwar Generation*, 2<sup>nd</sup> edition (A-chin Hsiau), *Chronicle of Zhudong Town: Demography and Social Lives* (Yu-hsia Lu, et al), *Asian Cross-border Marriage Migration: Demographic Patterns and Social Issues* (edited by Wen-shan Yang, et al), *Social Problems in Taiwan*, 2<sup>nd</sup> edition (edited by Hei-yuan Chiu and Ly-yun Chang), *Changing Faces of Hakka in Southeast Asia: Singapore and Malaysia* (edited by Michael H. H. Hsiao), *At the Edge of Empires: Examining Modernity in Taiwan* (edited by Horng-luen Wang, et al.). In addition, 50 articles in refereed journals, 51 book chapters in Chinese and in English were published.

The Institute organized numerous conferences, workshops and Spring Schools at national and international levels, including:

### I. International conferences:

1. IOS- IASA Joint Workshop of Young Sociologists
2. International Forum on the Past, Present and Future of Taiwan Studies beyond Taiwan: Europe, North America and Japan Compared
3. International Conference on Social Critique and Mobilization: A Dialogue between French and Taiwanese Sociologists
4. France-Taiwan Bilateral Conference on Globalization and Urban Dynamics in Asia: Taiwanese and French Perspectives
5. 2011 Taiwan-Hong Kong Sociology and Social Image Conference
6. Conference of “Social Structure and Firms in Transition in Taiwan”
7. EASS 2011 Symposium
8. The Fourth Conference of Taiwan Youth Project, 2011
9. Asian Sociology Workshop 2011: “Divergence and Convergence of Asian Sociologies: Theoretical and Empirical Perspectives”

10. AsiaBarometer Workshop 2011: “Risk, Social Trust and Social Inequality: A Comparative View”

### II. National conferences:

1. Conference on the Production, Adoption and Innovation of the Knowledge of Sociological Theory
2. The 15<sup>th</sup> Conference on the Taiwan Social Change Survey

### III. Workshops:

1. 2011 Workshop of Social Network Analysis
2. Workshop on Economic Sociology: Society and Ethnic Economics
3. Workshop on “Gender, Family & Labor Markets: Taiwan Perspectives”
4. Workshop on China Impact Studies
5. “Narrative and Society” Research Workshop
6. “War and Society” Research Workshop

### IV. Spring School on Sociology:

1. 2012 Spring Gala: Divergence and Convergence in Taiwanese Society



↑ Books published in the past two years.



↑ Conference posters of past two years.

# Institute of Chinese Literature and Philosophy

☎ 886-2-2788-3620    📠 886-2-2651-0591    💻 <http://www.litphil.sinica.edu.tw>

## Foreword

The Institute of Chinese Literature and Philosophy (ICLP) at Academia Sinica was officially established in July 2002, after thirteen years of preparation. Dr. Siao-chen Hu currently serves as its Director. The Institute now boasts twenty-nine research fellows. To foster innovative research, the Institute supports research projects envisioned by individual fellows while also encouraging collaboration among colleagues with different academic backgrounds but shared interests. Its research achievements—and such areas as Ming-Qing literature, Sinophone literature, studies of the Three Teachings, East Asian Confucian studies, studies of Confucian classics—have won high acclaim in both Taiwan and abroad.

## Research Projects

The Institute's five major research directions are Classical Chinese Literature, Modern Chinese Literature, Chinese Philosophy, Comparative Philosophy and Confucian Classics. Members of the Classical Chinese Literature group have made significant contributions to studies of Ming-Qing literature, literature and culture, literature and religion. Recently, researchers have explored the interaction between the "construction of knowledge" and the "production of literature" in Ming-Qing times. Texts of "trials and tribulations" also constitute their current research interest. The research foci of the members of the Modern Chinese Literature group are Sinophone literature, translation studies and Taiwan New Cinema and visual culture, etc. They are now exploring the idea of Sinophone literature and culture in a transcultural context. Studies of Confucian Classics of the Institute have covered the Qianlong-Jiaqing, the late-Qing and the Republican periods. Recently, researchers have delved into studies of Taiwanese classical scholarship from the late-Ming to the Japanese occupation periods. The researchers specializing in Chinese Philosophy have undertaken projects on the Three Teachings and Ming-Qing intellectual thought. Currently they strive to investigate the concept of life and death and the ultimate truth in East Asian philosophy.

The research scope of the Institute's Comparative Philosophy group encompasses contemporary Confucianism and East Asian religious traditions in the context of cross-cultural philosophy. Their new project explores the intellectual interactions between modern East Asia and the West.

## Significant Research Accomplishments

ICLP publishes two journals: *Bulletin of the Institute of Chinese Literature and Philosophy* and *Newsletter of the Institute of Chinese Literature and Philosophy*; the former won the National Science Council Award for Distinguished Academic Journal in 2003 and 2004 and has been listed as one of the THCI Core journals. Both journals are accessible on-line from the ICLP website. To share research results with the larger academic community and to cultivate further research interests, ICLP publishes volumes of collaborative projects and monographs by research fellows. To date, the Institute has published 155 books, in 226 volumes, covering such areas as classical and modern literature, contemporary Confucianism and philosophy, etc. Classical studies and critical editions of rare classical works are also one of ICLP's publication strengths. ICLP is also committed to creating and sharing digital databases for studies of *ci* poetry, Confucianism and Confucian classics.



↑ Publications of the Institute of Chinese Literature and Philosophy



↑ Conference Posters

# Institute of Taiwan History

☎ 886-2-2652-5350    📠 886-2-2788-1956    💻 <http://www.ith.sinica.edu.tw>

## Foreword

In order to promote advanced Taiwan studies, Academia Sinica initiated the Taiwan History Field Research Project in 1986 under the leadership of academician Kwang-chih Chang (Chinese archaeologist, 1931~2001). In 1988, the Taiwan History Field Research Office was set up by the joint efforts of four major institutes in the humanities and social sciences. In June 1993, the Council of Academia Sinica approved the establishment of the Preparatory Office of Taiwan History. The Institute of Taiwan History was formally inaugurated in July 2004 after two decades of collective scholarly efforts.

## Research Projects

The Institute of Taiwan History is the leading research institution in Taiwan studies aiming to foster first-rate indigenous scholarship and international research on Taiwan. As of May 2012, the institute consists of twenty full-time research fellows with multi-disciplinary backgrounds in history and the social sciences. The institute has set up five research groups focusing on major fields of research and collaborative projects spanning the period from the seventeenth to the twentieth century. The major themes and ongoing research topics of each group are as follows:

1. **Socio-economic History:** Agricultural reclamation and land ownership in frontier regions of Taiwan; commercial tradition and the development of trade in modern Taiwan.
2. **Colonial History:** Colonial bureaucracy and local administration in Taiwan; overseas Taiwanese in the Japanese empire and mainland China.
3. **Ethno-History:** The history of Taiwanese plain aborigines and Hakka sub-ethnic groups; regional studies on northern Taiwan and hill terrains areas.
4. **Cultural History:** Colonialism and modernity; political thought and comparative politics; native literature and language; religion, medicine and gender;

East Asia women's history.

5. **Environmental History:** Histories of diseases, natural disasters, resource management and colonial medicine in Taiwan and East Asia.

The members of the institute have been conducting the following collaborative projects: 1. Diverse Legacies and Self-creation in Post-war Taiwan History; 2. Environmental Changes and their Effects on Agriculture, Biodiversity and Society in Taiwan.

## Significant Research Accomplishments

The scholarly efforts of the ITH researchers are exemplified by the variety of publications that include monographs, journal articles, edited oral histories, diaries, source collections, local gazetteers and research references. The important empirical findings and theoretical insights of the Institute's leading journal *Taiwan Historical Research* along with other academic works have received wide acclaim both in Taiwan and abroad.

In addition to conducting advanced research and publishing its research achievements, the institute has frequently organized and sponsored international and domestic symposiums, conferences, workshops, as well as informal seminars and lectures. These events not only facilitate international scholarly exchanges but also encourage promising graduate students from various universities.

With the establishment of the Archives in 2009, the ITH has become the leading institution in Taiwan historical document collection and database compilation. The Archives have also significantly enhanced the general public's interest in the history of Taiwan. The special exhibition "Her History in Taiwan" has attracted more than 8,000 viewers from March to October 2011.



↑ Publication by ITH



↑ Archival collections of ITH, Academia Sinica



↑ Conference posters in 2011

# Institute of Linguistics

☎ 886-2-2652-5000    📠 886-2-2785-6622    💻 <http://www.ling.sinica.edu.tw>

## Foreword

In accordance with the long-term development policy of the Academia Sinica 'institutes for basic sciences and centers for intra-disciplinary research' and in order to explore the common biological, mathematical and cultural roots of human language with an aim to establishing its scientific and systematic knowledge, a preparatory office for the Institute of Linguistics was set up in 1997, resulting in a full-fledged institute in 2004. Currently, the institute's faculty comprises 17 full-time researchers. The overall objective of the institute is to achieve scientific and systematic knowledge about human language by conducting purely linguistic as well as interdisciplinary research on languages of Taiwan and genetically and areally-related languages. Important contributions have been made especially in linguistic structure analyses, linguistic computation and simulation, language archiving and cross-discipline studies.

## Research Projects

The major approaches to linguistic research conducted at this institute include the following:

- 1. Structural research:** Descriptive and typological analysis, historical comparison
- 2. Theoretical research:** Phonological, syntactic and semantic theory
- 3. Linguistic documentation:** Language archiving, corpus linguistics, geographical information system (GIS)
- 4. Cognitive research:** Neurolinguistics and cognitive development of language
- 5. Computational research:** Speech engineering, language modeling
- 6. Linguistic diversity research:** Documentation of endangered languages, language preservation, ecological linguistics

Apart from conducting individual research, research fellows of the institute also join various research groups according to their research interests. Currently there are three research groups, including Linguistic Structure and Typology Research Group, Corpus and Computational the Linguistics Research Group and Phonetics, Phonology and Speech Science Research Group. Research groups constitute cross-language and cross-discipline platforms allowing researchers to conduct collaborations. The two core laboratories of the Institute, the Phonetics Lab and the Cognitive and Neural Linguistics Lab, enable researchers to probe into various linguistic phenomena via conducting experimental studies in the lab.

## Significant Research Accomplishments

### Academic Publication

Over the years, the institute has produced several hundred items of research. Important research areas that have yielded output with considerable international impact include Sino-Tibetan reconstruction, migratory history of Formosan aborigines, salvage work on endangered languages of Taiwan, discovery of new Tibeto-Burman languages and dialects, application of geographic information system technology to dialectology, discourse prosody, discovery of cross-linguistic generalizations between word form and concept development and neural correlates of Chinese language processing. In 2000, the institute began issuing the international journal *Language and Linguistics*, which has since been recognized as one of the highest-quality linguistic journals in this country, indexed now inter alia by the SSCI and AHCI citation databases. The journal also has accompanying monographs in several series. Monographs that came off the press in the past three years include 2009: 1. *Old Chinese Medials and Their Sino-Tibetan Origins: A Comparative Study* 2. *Formosan Linguistics: Stanley Starosta's Contributions* 3. *A Corpus-driven Approach to Source Domain Determination*; 2010: 1. *Studies of Sinkang Manuscripts* 2. *Stratifying Zhuangzi: Rhyme and Other Quantitative Evidence* 3. *A Sinitic Historical Phonology: Phonological Restructuring of Written Chinese under the 5<sup>th</sup>-Century Turkic Sinification* 4. *Mongolian Monuments in 'Phags-pa Script: Introduction, Transliteration*

*Transcription and Bibliography*; 2011: 1. *A Sinitic Historical Phonology: Phonological Restructuring of Written Chinese under the 5<sup>th</sup>-Century Turkic Sinification* 2. *Tangut Philology: Collection of Papers by Professor Hwang-cherng Gong* 3. *Sino-Tibetan Comparative Linguistics: Collection of Papers by Professor Hwang-cherng Gong* 4. *Thao Texts and Songs, The Hakka Dialects of Sichuan* 5. *Comparative Phonology of the Central Xiāng Dialects*.

### Language Archiving

The Language Archiving Project of the Institute systematically creates digitized archives of language data. Since 2002, archived materials have been successively posted online for convenient searching and our online archiving webpages have become basic research portals for researchers on Chinese and Austronesian languages. The second phase of the project was launched in 2007 with the following sub-projects: Southern Min and Hakka, Formosan Language Archive, Sociolinguistics of Spoken Taiwan Mandarin, Tagged Corpus of Old Chinese and Pre-Qin Oracle Bone, Bronze, Bamboo and Wood Inscriptions Language Materials Archive.

### Academic Activities

Each year, the Institute hosts important international meetings and conferences on different linguistic themes. The conferences organized in the past few years, for instance, include the Workshop on Coordination and Comitivity in Austronesian Languages, the International Conference on the Tangut Language and the Religions and Cultures of the Northern China in the Age of the Xixia, the Liao and the Jin, the 7<sup>th</sup> Workshop on Formal Syntax & Semantics (FOSS 7), the 12<sup>th</sup> International Symposium on Chinese Languages and Linguistics, the International Symposium on Sino-Tibetan Comparative Studies in the 21<sup>st</sup> Century, the 2010 Taiwan Summer Institute of Linguistics: Min Studies, the Eighth International Symposium on Taiwanese Languages and Teaching, the 7<sup>th</sup> International Symposium on Chinese Spoken Language Processing, the 3<sup>rd</sup> Theoretical Phonology Conference, the International Workshop on Syntax-Semantics Interface, the International Committee for the Co-ordination and Standardization of Speech Databases and Assessment Techniques (Oriental COCOSA), the Workshop on the Representation of Time in Asian Languages, and the 12<sup>th</sup> conference on Min languages.



↑ Thao Texts and Songs / Paul Jen-kuei Li



↑ International Workshop on Syntax-Semantics Interface



↑ The 12<sup>th</sup> conference on Min languages

# Institutum Iurisprudentiae

☎ 886-2-2652-5400

📠 886-2-2785-9471

💻 <http://www.ias.sinica.edu.tw>

## Foreword

In pursuance of the principle of “establishing institutes for each fundamental discipline while setting up research centers for interdisciplinary studies,” the Academia Sinica established the Institutum Iurisprudentiae (Preparatory Office) (hereinafter IIAS) in July 2004. After seven years of coordinated efforts, IIAS passed the formal evaluation of Academia Sinica on April 23, 2011. The results of the evaluation were presented to the president of the Academia Sinica for approval. After the president’s careful consideration and approval, IIAS was formally established on July 1, 2011 with the expectation that this institute would be a positive model for local legal studies to emulate, and would lead Taiwan’s legal studies community to keep pace with the international community.

## Research Projects

With the twin aims of assuming a pivotal and leading role in Taiwan’s legal studies community in the short term and of distinguishing itself in the international legal academia in the near future, the IIAS specified six core research fields in its “Founding Proposal,” and concentrated its resources on these research fields to facilitate the making of significant, substantial academic breakthroughs. The six core research fields are: (1) Constitutional Structure and Human Rights, (2) Administrative Regulation and Judicial Remedies, (3) Law, Science and Technology, (4) Jurisprudence and Social Transformation, (5) Legal Development in China, Hong Kong, and Macau, and (6) Comparative Study of Judiciary Systems, Empirical Study of Judicial Behavior, and Legislative Studies.

## Significant Research Accomplishments

During the seven years since its founding, the IIAS has hosted 29 major academic conferences and published 19 books and 10 issues of its law journal. All IIAS publications have undergone double-blind peer review. Moreover, significant research results have been achieved and reported by IIAS research fellows in every one of the six core research fields. Below is a sketch of each field:

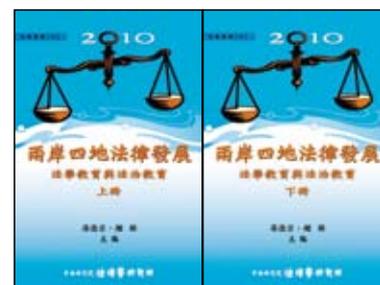
- Starting in 1997, the Law Division of the Institute for Social Sciences and Philosophy, the institutional predecessor of the IIAS, has held biennial symposia on Constitutional Interpretation: Theory and Practice. The symposia papers are peer reviewed and published in a series of books titled *Constitutional Interpretation: Theory and Practice*. Thus far, ten books of papers from these symposia have been published in the series *Constitutional Interpretation: Theory and Practice*. The papers from the seventh symposium were published under the title *Constitutional Interpretation: Theory and Practice No. 7* (2 volumes) in late December 2011. The Eighth Symposium on Constitutional Interpretation: Theory and Practice was held on December 9-10, 2011, featuring one keynote speech and 14 presentations in total. The presented papers are currently under revision and pending submission for the final review.
- Since 2005, the IIAS has been holding the “Conference on Administrative Regulation and Judicial Remedies” in conjunction with the Supreme Administrative Courts and the High Administrative Courts in Taipei, Taichung, and Kaohsiung, respectively. From 2006 until 2010, this seminal conference was held twice per year (in May and November). From 2011, this conference has been held annually. The conference papers are peer-reviewed and so far have been edited into eight books covering six conferences under the series title *Administrative Regulation and Judicial Remedies* (2005, 2006, 2007, 2008, 2009 and 2010). The papers presented at the 2011 Conference are currently under revision and await submission for final review.
- Starting in December 2006, the IIAS has held biennial symposia on Law, Science, and Technology, the papers from which are reviewed, edited and published in a biennial review. The first book in the series is the *Biennial Review of Law, Science, and Technology 2007 -- Legal Construction of Risk in the System of Public Health* (2008). Papers from the “Second Symposium on Law, Science, and Technology” were reviewed and edited in the *Biennial Review of Law, Science, and Technology 2009 – Science Management, Academic Freedom, and Diverse Democratic Values* (2010).
- The “First International Conference on Jurisprudence and Social Change” was held in October 2007. The papers presented at this conference were peer reviewed, edited and published as *Jurisprudence and Social Change* (2008). The “Second Conference on Jurisprudence and Social Change” has been rescheduled to be held in 2012.
- On June 2-3, 2006, the IIAS held the first “Conference on the Law Developments in Taiwan, Mainland China, Hong Kong, and Macau.” After peer review,

revision and editing, the conference papers were formally published as *2006 Cross-Strait, Four-Region: Law Developments in Taiwan, China, Hong Kong, and Macau (Volume One: Constitutional Review and Administrative Litigation; Volume Two: Civil Procedure and Criminal Procedure)* in 2007. This conference received high acclaim and widespread approval, so the participants from the four areas agreed to host this conference annually in turn. The 2007 conference was hosted by Sun Yat-Sen University in Guangzhou, China, on December 12-13, 2007. The University of Hong Kong and the University of Macao hosted the conferences on November 21-22, 2008, and November 16-17, 2009, respectively. On June 6-7, 2010, the IIAS held the conference, focusing on legal education reform in these four areas. The volume of papers, *2010 Cross-Strait, Four-Region: Law Developments in Taiwan, China, Hong Kong, and Macau*, was published in September 2011.

- On June 21-23, 2008, the IIAS held the “First International Conference on Empirical Legal Studies of Judicial Systems.” After undergoing double-blind peer review, the conference papers were published under the title *2008 Empirical Studies of Judicial Systems* in 2009. In July 2009, the IIAS also held the symposium on “Judicial Reforms of the Past Decade: Retrospect and Prospects.” The symposium records were published as *The Tenth Anniversary of the National Conference on Judicial Reform: Retrospect and Prospects (Symposium Records)*. The “Second International Conference on Empirical Legal Studies of Judicial Systems” was held on June 24-25, 2011. The conference papers are currently under final review and editing.

In addition, the inaugural issue of the Academia Sinica Law Journal was launched in March 2007 with nine highly regarded articles submitted

by renowned overseas scholars (from the United States, Germany, France, Japan, etc.). The first issue was published in September 2007 (with six papers). Since then, the journal has been published twice annually (in March and September). Ever since 2008, the Journal has held an annual contest to confer the “Academia Sinica Law Journal Award.” The recipient in 2008 was Professor Shu-fan Liu; in 2009 Professor Chueh-an Yen, in 2010 Professor Peng-hsiang Wang, and in 2011 Professors Kung-ping Chen, Kuo-Chang Huang, and Chang-Ching Lin.



↑ In 2012, the IIAS has already published 2 series books and 3 specialized books.

# Institute of Political Science

☎ 886-2-2652-5300    📠 886-2-2654-6011    🌐 <http://www.ipsas.sinica.edu.tw>

## Foreword

In July 1994, the Council of Academicians advised Academia Sinica to set up an institute of political science at AS. In October 1999, a planning commission for the Institute of Political Science at Academia Sinica (IPSAS) was formed. It came up with a formal proposal that was later approved by the Presidential Office in March 2001. The Preparation Office of the IPSAS was founded in August. The founding director is Dr. Yu-Shan Wu (2002~). He is advised by an Academic Consultative Committee headed by Academician Fo Hu (2002~). By the end of 2011 IPSAS has thirteen full-time research fellows. It is located on the fifth and six floors in the North Wing of the New Humanities and Social Sciences Building. The IPSAS is commissioned to explore carefully selected issues that are conducive to basic theoretical contributions, meet national priorities and conduct pioneering research in mainstream political science.

The emblem of the IPSAS is a white Ionic column from ancient Greece against a round blue background, circled by the name of the institution and its abbreviation at the bottom. It symbolizes the democratic spirit dating from ancient Greece and the aspiration of traditional Chinese intellectuals to be the mainstay of the society.

## Research Projects

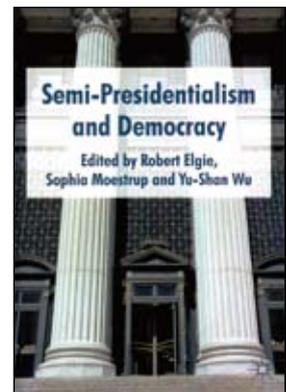
The IPSAS has set as its overall research agenda "theory-oriented, area-based comparative politics and international relations studies." Five research groups are designated under the overall goal. They are: 1. Taiwan politics and nascent democracies 2. Political and economic transitions in Mainland China and post-socialist countries 3. Cross-Strait relations and international relations theory 4. Political value change in East Asia and global democratic development 5. Methodology

## Significant Research Accomplishments

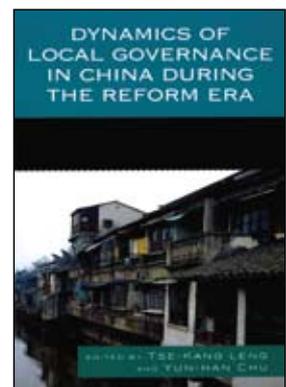
- 1. Taiwan politics and nascent democracies:** In *Semi-Presidentialism and Democracy*, we analyze global development of semi-presidentialism in institutional (including design, operation and impact dimensions) and comparative perspectives. The volume provides theoretical interpretation and case analysis, using both qualitative and quantitative approaches. It is by far the most comprehensive study of semi-presidentialism and extends the frontiers of the research of political institutions.
- 2. Political and economic transitions in Mainland China and post-socialist countries:** In *Dynamics of Local Governance in China during the Reform Era*, we analyze the modes of local governance in the rapidly changing social-economic environment in mainland China. The chapters of the volume explore into the outcomes of rural industrialization, religious revival, development of non-governmental organizations, change of political values, elite mobilization, resolution of disputes among firms and local government-business relations. They provide a multi-faceted analysis of the local governance patterns in China.
- 3. Cross-Strait relations and international relations theory:** In the research project of "Below the Storm: 60 Years of Cross-Strait Connections" jointly launched by IPSAS and the Institute of East Asian Studies at the University of California, Berkeley, a multi-disciplinary perspective is taken to explore into the development of cross-Strait relations. We deal with issues on historical relations, political analysis, religious connections, the impact of generations and genders, marriages and families, the role of the media and maritime and environmental issues. This is the first cross-disciplinary dialogue between scholars from Taiwan and the US. The project serves as an agenda setter in the study of cross-Strait relations.
- 4. Political value change in East Asia and global democratic development:** In the past, the empirical study of democracy is not equipped with a valid scale for measuring democratic legitimacy.

We design a democratic value scale in conjunction with the traditional democracy support scale and come up with four democratic orientations. The typology is then used for an analysis of thirteen political systems in East Asia. With this we effectively redress the biases in traditional ways to measure democratic legitimacy and present a fuller picture of the structure of political culture.

- 5. Methodology:** We build a new game model for the study of American legislative process. The new model is able to integrate all the existing models and treat them as specific cases. It proves to be of great theoretical and empirical value. The model discards the extreme hypothesis on perfect party discipline and allows for a wide range of discipline levels. The loosening of the hypothesis makes the new model more flexible and realistic. It also makes it possible to discuss the impact of different levels of party discipline on legislative deadlocks.



↑ *Semi-Presidentialism and Democracy*



↑ *Dynamics of Local Governance in China during the Reform Era*



↑ *Below the Storm: 60 Years of Cross-Strait Connections*

# Research Center for Humanities and Social Sciences

☎ 886-2-2782-1693

☎ 886-2-2785-4160

💻 <http://www.rchss.sinica.edu.tw>

## Foreword

The Research Center for Humanities and Social Sciences (RCHSS) was established on July 1, 2004. Its major mission is to conduct interdisciplinary research in the humanities and social sciences. It currently has seven thematic centers and five research programs. The research center is headed by a director and a deputy director. Each thematic center has an executive officer and each research program has a chairperson. The executive officer or chairperson leads a team of full-time, jointly appointed, adjunct and affiliated researchers to conduct well-defined research projects.

## Research Projects

RCHSS has three research clusters: Specific thematic research, area studies and data archiving and analysis. The thematic centers and research programs in the three clusters organize workshops, seminars and conferences regularly to promote and coordinate research in their specialized fields.

## Significant Research Achievements

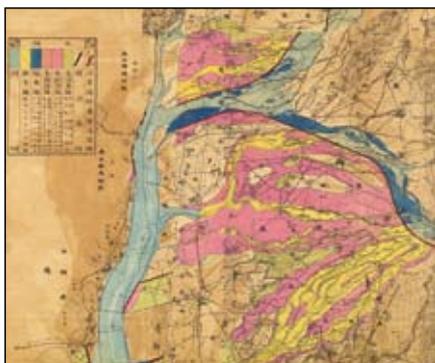
In the cluster of specific thematic research, the **Center for Political Thought** currently focuses on three research projects: “Taiwanese Citizenship: Theory and Practice”, “Constitutionalism and Its Fundamental Values” and “Comparative History of Political Thought”. Several workshops and major conferences have been held for each project since 2005. **The Center for Institution and Behavior Studies** published empirical research in legal issues and empirical and theoretical studies in network economics. Over the years, regular conferences related to network economics, empirical legal issues and contract theory were held. In 2011, the center also conducted a first-ever large-scale survey on the experience and resolution of legal disputes of Taiwanese citizens. **The Program for History of Health** has published *Health and Hygiene in Chinese East Asia: Policies and Publics in the Long Twentieth Century* (Angela KC Leung and Charlotte Furth eds., Durham and London: Duke University Press, 2010). **The Research Project on Data Mining and Learning** develops data mining and machine learning techniques and apply them to the analysis and classification of various text and personnel documents.

In the cluster of area studies, the **Center for Maritime History** explores issues concerning shipping, trade, port cities, maritime cultural intercourse and migration. In June 2012, the Center is scheduled to organize sessions on “The Transoceanic Exchange” under the “4<sup>th</sup> International Conference on Sinology”. **The Center for Archeological Studies** has set the theme of sustainability

as the focus, especially issues regarding the co-evolving relationships between people and their natural environments, long-term development of societies, as well as the preservation and proper management of cultural resources. An international conference on archaeology and sustainability was held in 2011. **The Center for Asia-Pacific Area Studies** supports individual and integrated projects on Asia-Pacific studies and develops substantial collaborations with related institutes in Japan, Vietnam and the United States. It publishes the *Asia-Pacific Forum* quarterly and monographs on Asia-Pacific studies. **The Program for Economic Development and Trade in East Asia** has worked on building a solid foundation for the study of Chinese economic development after 1978.

In the cluster of data archiving and analysis, the **Center for Survey Research** specializes in the research of survey methodology. It also regularly assists researchers at Academia Sinica in conducting face-to-face, telephone and web surveys. The Survey Research Data Archive (SRDA) maintained by the center is for public use and is perhaps the best in Asia. To promote the development of survey research and data archiving, the center issues the bi-annual *Survey Research—Method and Application*, SRDA Newsletter and SRDA e-Digest. **The Center for Geographic Information Science** has developed two historical GIS’s: the Chinese Civilization in Time and Space (CCTS) and the Taiwan History and Culture in Time and Space (THCTS). The two systems function as a basic research platform characterized by temporal depth and spatial breadth and provide a database for academic research in regional studies, environmental and epidemic history and other spatial analyses. **The Program for Historical Demography** and **the Program for the Study of the Family in Chinese Societies** have continued to enrich their panel data on demographic changes and family issues, promoted related studies through workshops and conferences and published English monographs.

The RCHSS also publishes the quarterly *Journal of Social Sciences and Philosophy* and a monograph series.



↑ GIS Center Digitalized Map



↑ Publications of the Research Center for Humanities and Social Sciences

## Libraries

 <http://aslib.sinica.edu.tw>

Libraries	TEL	Mon. – Fri.	Saturday	Sunday
<b>Mathematics and Physical Sciences</b>				
Library of Institute of Mathematics	886-2-2368-5999 #441-443	8:10-19:00	Closed	13:00-17:00
Library of Institute of Physics	886-2-2789-6710	9:00-17:00	Closed	Closed
Library of Institute of Chemistry	886-2-2789-8590	8:30-17:00	Closed	Closed
Library of Institute of Earth Sciences	886-2-2789-9773	8:00-12:00 / 13:30-17:30	Closed	Closed
Library of Institute of Information Science	886-2-2788-3799 #1201-1202	9:00-17:30	Closed	Closed
Library of Institute of Statistical Science	886-2-2783-5611 #201	8:30-17:00	Closed	Closed
Library of Institute of Atomic and Molecular Sciences	886-2-2362-4915	8:30-20:50	9:00-17:00	Closed
Library of Institute of Astronomy and Astrophysics	886-2-2366-5470	9:00-12:00 / 13:30-17:00	Closed	Closed
Libraries	TEL	Mon. – Fri.	Saturday	Sunday
<b>Life Sciences</b>				
Life Science Library	886-2-2789-9829	8:30-19:00	Closed	Closed
<b>Humanities and Social Sciences</b>				
Joint Library of Humanities and Social Sciences	886-2-2652-5284	8:30-17:00	Closed	Closed
Geographic Information Archives	886-2-2652-5272	Open on request	Closed	Closed
Fu Su-nien Library	886-2-2782-9555 #600-601	8:30-17:00	Closed	Closed
Library of Institute of Ethnology	886-2-2652-3369	8:30-16:50	Closed	Closed
Library of Institute of Modern History	886-2-2789-8291	8:30-17:00	Closed	Closed
Library of Institute of Economics	886-2-2782-2791 #500	8:30-17:00	Closed	Closed
Library of Institute of European and American Studies	886-2-2789-9390	8:20-17:20	Closed	Closed
Library of Institute of Chinese Literature and Philosophy	886-2-2789-5726	9:00-17:00	Closed	Closed
Library of Research Center for Humanities and Social Sciences	886-2-2782-1693 #208	8:30-17:00	Closed	Closed
Library of Center for Asia Pacific Area Study	886-2-2652-3369 886-2-2652-3373	8:30-16:50	Closed	Closed



# Central Office of Administration





# Secretariat Office

☎ 886-2-2789-9408

☎ 886-2-2785-3847

💻 <http://sec.sinica.edu.tw>

The Secretariat Office includes the following divisions: Conference Affairs Division, Planning and Activities Division and Records Division.

## Summary of key duties

- 1. Conference and Election Affairs:** Organizing the Convocation of Academicians, Council of Academia Sinica, General Assembly, quarterly meetings of domestic academicians, foresight planning meetings of academic and administrative chiefs, executive meetings, as well as holding elections of Academicians, Honorary Academicians, Council Members, Presidents of Academia Sinica and Research Fellow Representatives for the General Assembly.
- 2. Reports and Publications:** Compilation of administrative and annual budget planning reports, publishing policy recommendation reports, biennial summaries of the affairs of Academia Sinica, directories of Academicians and Council Members, ROC almanacs, lists of annual research achievements and theses, English and Chinese editions of the Academia Sinica Weekly Newsletter and E-news, the Knowledge Feast Series, English and Chinese multi-media introductions to Academia Sinica and the Academia Sinica Planner.
- 3. Planning and Activities:** Organizing public functions such as the Knowledge Feast Lecture Series, Lectures in Honor of Former Presidents, Open House Activities, Art and Cultural Activities, Popular Science Lectures and other events. Series media reports related to Academia Sinica. Preparation of speeches and public announcements as well as the arrangement of visitors' receptions and the issuance of gifts and cards for social occasions.
- 4. Public Announcements and Referrals:** In charge of making public announcements and receiving recommendations for academic awards and professional opinions. Updating the Academic Administration, Academic Activities, Academia Sinica Calendar and electronic bulletins sections of Academia Sinica's homepage.
- 5. Management of Official Documents:** In charge of the automation of official documents (e.g. the reception, verification, distribution, numbering, registration, proofreading, sealing and delivery of documents, the electronic exchange of documents and electronic bulletin announcements.) The revision of document regulations, the affixing and safekeeping of official seals, the dispatch of documents and the management of files (e.g. the receiving, archiving, cataloguing, filing, preservation, investigation and lending of files).



## Public Affairs Office

886-2-2787-2517  
886-2-2789-8826  
(Legislative liaison, Media liaison)

886-2-2651-8049  
886-2-2782-1151  
(Legislative liaison, Media liaison)

<http://otl.sinica.edu.tw>

Office of Public Affairs is in charge of intellectual property management, technology transfer, legal affairs, legislative liaison and media liaison.

### Summary of Key Duties

#### 1. Intellectual Property Management:

Responsible for protecting and managing Academia Sinica's intellectual property and encouraging the disclosure of new discoveries. Assists researchers in identifying the value of intangible and tangible research outcomes. Evaluates patentability and licensability of new inventions by conducting patent search, market and technology validation. Coordinates with patent attorneys to protect inventions through patent applications.

#### 2. Technology Transfer:

Responsible for marketing and licensing of Academia Sinica's technologies and products. Conducts technology assessment and market research for new inventions. Seeks and fosters contacts with potential licensees that are capable of developing and commercializing the innovations into products and services for the public benefit. Develops and negotiates license agreements. Cultivates relationships among industry, academia and government to foster partnerships and collaborations.

#### 3. Legal Affairs:

Assists in dealing with matters related not only to intellectual property rights accruing in the course of technology transfer but also other legal affairs. Provides legal services to the institutes, preparatory offices, or research centers of Academia Sinica. Assists in drafting guidelines, by-laws and regulations. Reviews contracts as well as compiles enactments and provides legal consultations.

#### 4. Legislative Liaison:

The legislative liaison team represents the Academy's interests in the Legislative Yuan. Duties include escorting the Academy's president and top officials to attend legislative committee meetings and public hearings; collecting information on legislative affairs and organizing responses to legislator's inquires to facilitate the progress of approval of budget and acts relating to the Academy. The team also settles media disputes incurred by legislative inquires, provides legislators with information and publications and handles public petitions related to the Academy.

#### 5. Media Liaison:

The media liaison team compiles press releases in Chinese and English on the latest academic achievements, activities and happenings at Academia Sinica; distributes information to members of the media, Academicians and the Academia Sinica administrative directors; and offers reader follow-up services. The team is responsible for organizing press conferences, arranging interviews between Academia Sinica researchers and the media, receiving members of the media on campus and providing media crisis management and other media liaison. It also updates the news section of the Academia Sinica website.



# General Affairs Office

☎ 886-2-2789-9418

📠 886-2-2785-0719

💻 <http://gao.sinica.edu.tw/>

The General Affairs Office is made up of six sections: Construction and Maintenance, Business, Procurement, Cashier, Campus Security and Environment and Safety.

## Summary of Key Duties

- 1. Facility Maintenance:** Repairing and maintaining campus buildings, dormitories, roads, landscapes, mechanical and electrical systems, fire fighting facilities, communication facilities and public facilities.
- 2. Construction Management:** Responsible for building construction, management and procurement of mechanical and electrical systems in buildings and any other construction-related affairs.
- 3. Campus Planning:** Guiding development of the Academia Sinica campus, including the National Biotechnology Research Park.
- 4. Business Management:** Managing Academia Sinica properties, vehicles, dormitories, offices, meeting facilities, Lingnan Fine Arts Museum, Center of Academic Activities, Gymnasium and kindergarten.
- 5. Procurement:** Handling the purchasing of general goods and services.
- 6. Cashier:** Handling cash payments and receipts, accounts payable and accounts receivable and the safekeeping of funds and fees.
- 7. Parking Services:** Responsible for the enforcement of parking and traffic regulations.
- 8. Campus Security:** Responsible for building access control, security patrol around campus and dormitories, resolving campus accidents and providing pertinent assistance, protecting the safety of head officers and maintaining order at particular meetings.
- 9. Environment and Safety Management:** Coordinating the operation, maintenance and management of environment, health and safety issues. The Environment, Health & Safety section provides staff with access to essential services in the following categories: Environmental protection (including energy management, toxic chemical substance management, water management, waste management, environmental monitoring and environmental hygiene control), landscape maintenance of A.S. campus, laboratory safety (including radiation safety, the general experimental safety, biosafety), fire prevention, occupational health. The monitor, maintenance and management issues of related facilities are including.
- 10. Center of Academic Activities:** The center offers a versatile space for various academic activities and comprises a lecture hall (700 seats), several conference rooms and a guesthouse (120 rooms) suitable for short visits to Academia Sinica. The center also incorporates three restaurants: a Chinese restaurant, a Western restaurant and a coffee shop. The center offers live facilities and excellent service for all kinds of events.
- 11. Gymnasium:** The Gymnasium was launched in 2001, incorporating a variety of modern facilities for top-notch sports that include a 6-lane indoor swimming pool (50m×16m×1.4m), a 140-meter jogging track, a fitness gym, a rhythmic gym, a basketball/volleyball court (720m<sup>2</sup>), 2 tennis courts (1,188m<sup>2</sup>), 3 badminton courts (570m<sup>2</sup>) and 3 table tennis courts (190m<sup>2</sup>). It is open to the employees of Academia Sinica, neighboring residents and public organizations.



↑ Toxic disaster exercise training



↑ Gymnasium



↑ Center of Academic Activities

# Academic Affairs Office

☎ 886-2-2789-9823

📠 886-2-2789-8045

💻 <http://aao.sinica.edu.tw/english>

Established on January 1, 2002, the Academic Affairs Office (AAO) is comprised of the Academic Development Section and the Academic Review Section. It carries out administrative tasks assigned by the Central Academic Advisory Committee. Its duties include general administrative affairs concerning academic collaboration and evaluation, appointment and promotion of research fellows, cultivation of young scholars and development of interdisciplinary research.

## Summary of Key Duties

### 1. Research and Development:

Collecting latest research information; promoting mid-and-long-term academic development projects; assisting the establishment of new research institutes (preparatory offices) and centers.

### 2. Review and Evaluation:

Establishing academic evaluation procedures; organizing review committees to assess recruitment and promotion of research fellows; formulating guidelines of assessing performance of research institutes (preparatory offices) and centers; evaluating the development of new research disciplines; undertaking administrative responsibilities of the Ethics Committee and Human Subject Research Ethics Committee.

### 3. Cultivation and Award:

Reviewing applications for the fellowships of doctoral candidates in the humanities and social sciences, Research Award for Junior Research Investigators, short-term domestic visiting scholars to Academia Sinica, postdoctoral fellowships, Career Development Award and Investigator Award. Reviewing applications for interdisciplinary or collective research projects such as the Thematic Research Program and Research Program on Nanoscience and Technology.

### 4. Projects Management:

Managing applications, signing of contracts and reimbursement of expenditures of projects subsidized or commissioned by external institutions.

### 5. Academic Services:

Promoting the Academic On-line Service System to process on-line applications and reviews of various programs; maintaining databases for easy access to research results, academic achievements and reviewers' information.

### 6. Others:

Ratifying AS faculty's applications for attending international conferences; providing administrative support to the Publication Committee and the Taiwan Tech Trek Program.



↑ Taiwan Tech Trek Program Award Ceremony.



↑ The Institutional Review of the Division of Life Sciences was held from August 29 to September 9, 2011.



↑ Books published by Academia Sinica are displayed at the 2012 Taipei International Book Exhibition.

# Computing Center

☎ 886-2-2789-8855    📠 886-2-2783-6444    💻 <http://ascc.sinica.edu.tw>

The primary mission of the Academia Sinica Computing Center is "to support the research undertakings and administrative computing needs of research units of Academia Sinica. "Since its establishment, the Computing Center has been striving to fulfill its founding purpose. To meet the development needs of information technology applications and service requirements of Academia Sinica, it drafts a range of proposals to help enhance research environment and administrative efficiency.

## Summary of Key Duties

1. Administrative Computing Services
2. Information Security Services
3. Network Maintenance Services
4. Public Computer System Maintenance Services
5. Mass Storage Services
6. Email Services
7. Library Automation Services
8. Research Databank Development Services
9. Multimedia Design Services
10. Information Training and Promotion Services
11. GIS Application Services
12. PC and Peripheral Equipment Supply and Maintenance Services
13. Joint Software Procurement Services



# Scientific Instrument Center

☎ 886-2-2789-9648    📠 886-2-2788-8371    💻 <http://www.assic.sinica.edu.tw>

The Scientific Instrument Center (SIC) was founded in 2005 as a unit of the Central Office of Administration in Academia Sinica. The mission of the SIC is to provide state-of-the-art research facilities for the entire campus in ten areas: biophysical characterization of proteins, confocal microscopy, DNA sequencing, electron microscopy, flow cytometric cell sorting, mass spectrometry, magnetic encephalography, microarray gene expression analysis, nuclear magnetic resonance and X-ray diffraction. The research facilities affiliated with SIC are open to all researchers in the Academia Sinica community. These research facilities are also available for use by academic or industrial researchers outside of Academia Sinica, dependent upon approval by the facility managers.

## Summary of Key Duties

1. SIC affiliated core facilities provide instrument-related services to all users in Academia Sinica.
2. Specialty shops make custom metal, acrylic, or electronic parts for users who need to re-design their instruments or need special accessory parts.
3. The SIC office provides personnel support, as well as funding for new instruments and instrument maintenance or repair.
4. The SIC office reviews the yearly performance of its shared research facilities and finds ways to improve the total operation efficiency and to better utilize campus-wide instrument resources.
5. The SIC office acts as administrative coordinator for all service activities, including account registration, instrument time slot reservation, collection of service fees and coordination of seminars and workshops.



# Personnel Office

☎ 886-2-2789-9855

☎ 886-2-2788-8459

🌐 <http://www.sinica.edu.tw/~hro>

The Personnel Office is comprised of three divisions responsible for personnel laws and regulations, appointment and promotion; performance appraisal and training, attendance and leave; pay and allowance, retirement and survivor benefits.

## Summary of Key Duties

- 1. Organization:** Handling issues regarding organization, personnel administration and related matters.
- 2. Regulations:** Handling the drafts, reviews and revisions of personnel regulations.
- 3. Appointment, Promotion and Transfer:** Handling the appointment of research personnel and research specialists; the examination, appointment, promotion and transfer of administrative and technical personnel.
- 4. Training:** Managing employee training, further education, lectures and research.
- 5. Performance Review:** Coordinating employee performance reviews, rewards and disciplinary action.
- 6. Remuneration:** Administering employee remuneration and benefits.
- 7. Retirement, Compensation and Insurance:** Handling employee retirement, compensation, severance and insurance.
- 8. Personnel Management:** Maintaining personnel information and managing contract-based personnel.



↑ Seminar on public administration ethics

# Ethics Office

☎ 886-2-2789-9448

☎ 886-2-2782-4516

🌐 <http://www.sinica.edu.tw/as/adm/anti-corru/index.htm>

The Ethics Office is endowed with the mission to promote and preserve the integrity of public servants as well as establish codes of conduct and ethical standards at Academia Sinica. The office reports to the chief of the institution.

## Summary of Key Duties

- 1. Prevention of corruption and malfeasance:** The drafting, promotion, and implementation of regulations on ethical standards of conduct, prevention of corruption and malfeasance, matters related to the declaration of public servants' property and handling of cases involving conflicts of interest.
- 2. Investigation of cases involving corruption and malfeasance:** Handling of cases involving corruption and malfeasance; reviewing and assessing of corruption risks.
- 3. Safeguarding confidential information:** Handling and coordinating the security of official, confidential information at Academia Sinica.



↑ Seminar on legal knowledge in daily life.

# Accounting Office

☎ 886-2-2782-4515

☎ 886-2-2785-5849

🌐 <http://proj1.sinica.edu.tw/~actweb>

The Accounting Office is comprised of the budgeting, auditing and accounts affairs divisions.

## Summary of Key Duties

- 1. Budgeting:** In charge of preparation, allocation of budgets and application for use of reserve funds.
- 2. Auditing:** In charge of examination of annual expenditure application documents, execution of annual revenue, examination of funding changes and project closing documents, application for the retaining of budgets and implementation of nonscheduled internal audits.
- 3. Account Affairs:** In charge of submitting the monthly and final accounting reports, submitting the performance reports and semi-annual accounting reports, accounting files, documents and account book sealing.
- 4. Statistics:** In charge of drawing up public statistical programs, summary of public statistics and preparation of timetables for the publication of preliminary statistical data.
- 5. Seminars:** In charge of accounting business seminars.



↑ Seminar on accounting business.

# International Affairs Office

☎ 886-2-2789-9446

☎ 886-2-2783-4496

🌐 <http://iao.sinica.edu.tw>

The Academia Sinica International Affairs Office is responsible for the promotion of higher education, international academic exchange, international organization affairs, organization of the Academia Sinica Lecture Series, international faculty services and arranging the visits of international VIPs to Academia Sinica.

## Summary of Key Duties

- 1. Higher Education:** One of the three main missions of Academia Sinica is to conduct and encourage academic studies. Academia Sinica, with the aim of employing its world-class resources and faculty to help promote higher education in Taiwan, implements this important task by collaborating with a consortium of key national research universities to provide interdisciplinary Ph.D. programs. Academia Sinica hosts two graduate programs: the Taiwan International Graduate Program (TIGP), which is designed to create a unique educational environment serving both international and local students; and the Degree Program (DP), which provides a more advanced higher education environment for domestic students. Both programs are conducted in close collaboration with local universities. Currently, the TIGP offers 10 interdisciplinary Ph.D. programs and the DP offers 6 interdisciplinary Ph.D. programs.
- 2. International Academic Exchange:** The Academic Exchange and Cooperation Committee develops close academic collaboration between prominent foreign research institutions and leading local universities. The committee oversees various academic cooperation agreements and promotes scholarly exchange and cooperative research projects. This section is also in charge of organizing academies-related international conferences, which can promote cooperation among academies on important subjects such as the role of the academies in creating a better world.
- 3. International Organization Affairs:** Academia Sinica participates in several international scientific organizations, such as the International Council for Science (ICSU), the Global Network of Science Academies (IAP), and the Academy of Sciences for the Developing World (TWAS). In addition the Academy sponsors domestic academic societies to join international scientific associations in order to promote domestic participation in the international scientific community.
- 4. Academia Sinica Lecture:** As part of our effort to establish Academia Sinica as one of the foremost innovative research institutions in the world, President Wong inaugurated the “Academia Sinica Lecture” in 2009. The Lectureship invites the most eminent scholars from around the world to give talks on issues pertaining to their chosen field. Invitation to speak as an Academia Sinica Lecturer is the highest honor of Academia Sinica. The honor is bestowed on Nobel Laureates and scholars of similar caliber from across the world. The initial lectures were in the fields of Mathematics and the Physical and Life Sciences, and were later expanded to include the Humanities and Social Sciences. Past Academia Sinica Lecturers include Dr. Roger Y. Tsien, Dr. Roger D. Kornberg, Dr. James D. Watson, Dr. Ryoji Noyori, Dr. Ada E. Yonath, and Dr. Eric S. Maskin.
- 5. International Faculty Services:** Academia Sinica provides various services to foreigners working at Academia Sinica. Services include: Visa/ARC processing, off-campus housing rental, babysitter introduction, free Chinese classes, arrangements for the primary education of foreigners’ children and publication of the handbook for foreigners.
- 6. Arrangement of the Visits of International VIPs to Academia Sinica:** This section arranges visits to Academia Sinica of honorary academicians, foreign institution/academy presidents and other international VIPs including visiting lecturers and visitors for other academic activities.



↑ R.O.C. President Ma attended the Academy Presidents' Forum in celebration of Academia Sinica's 80<sup>th</sup> anniversary.

## IRDR- International Centre of Excellence (IRDR-ICoE)

☎ 886-2-2787-2531

📠 886-2-2787-2537

💻 <http://irdr-icoe.sinica.edu.tw>

Integrated Research on Disaster Risk (IRDR) is a decade-long, interdisciplinary research program sponsored by ICSU in partnership with the International Social Science Council (ISSC), and the United Nations International Strategy for Disaster Reduction (UN-ISDR). It is a global initiative seeking to address the challenges brought by natural disasters, mitigate their impacts, and improve related policy-making mechanisms.

### Organization

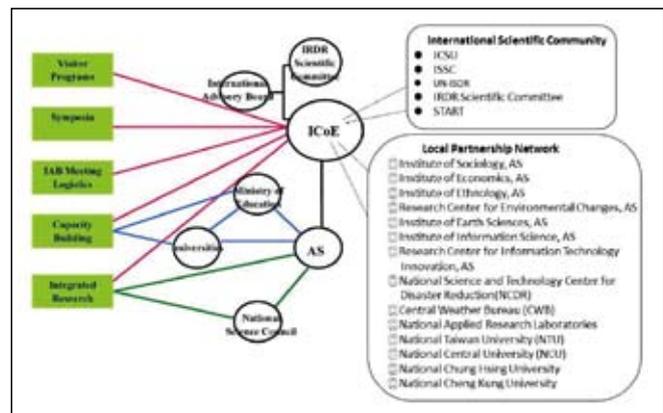
Dr. Chao-Han Liu is the Director of the ICoE. Dr. Yih-Hsiung Yeh serves as the Executive Secretary with Dr. Ching-Cheng Chang, Dr. Huang-Hsiung Hsu and Dr. Cheng-Hong Lin as the Coordinators for “Social & Economical Research”, “Atmospheric Science Research” and “Earth Observation & Research” fields respectively.

### Goals

1. To serve as an international platform for conducting integrated research on disaster risk from both the natural and social science perspectives.
2. To establish a partnership network on disaster reduction research within Taiwan and with the international scientific community.
3. To promote and coordinate interdisciplinary research on disaster risks at Academia Sinica.

### Programs

1. **Visitor Program:** Host short- and long-term visiting scientists
2. **Symposia:** Organize workshops and scientific meetings
3. **Capacity Building:** Cooperate with international organizations, esp. START
4. **International Advisory Board, IAB Meeting:** Convene IAB meetings and consult with board members with regard to scientific issues
5. **Integrated Research Programs**



↑ Framework for the Operation of IRDR-ICoE at Academia Sinica



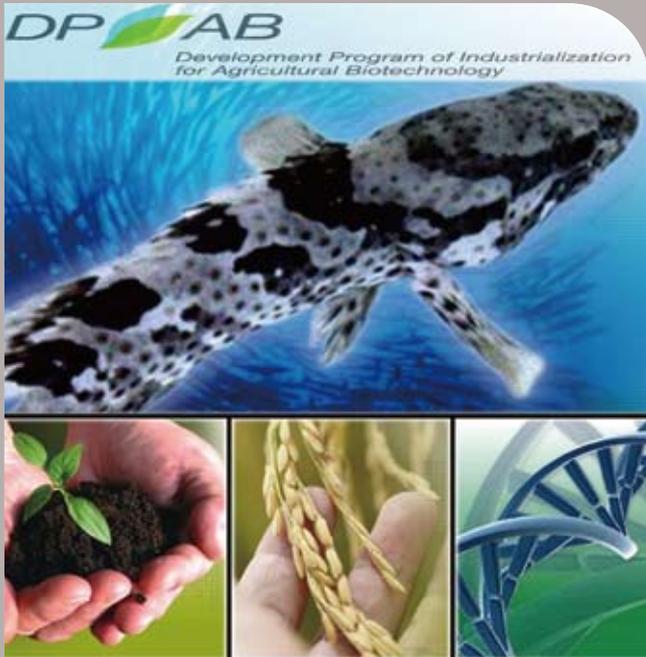
↑ IRDR-ICoE successfully held the “Cities at Risk: Building Adaptive Capacities for Managing Climate Change Risks in Asian Coastal Cities (CARII)” in Taipei from April 11-13, 2011. Many scientists and researchers from all over the world working on urban adaptation and risk were invited to participate in the symposium.



↑ The Advanced Institute on Forensic Investigation of Disasters-Southeast Asia hosted and organized by the IRDR-ICoE, in partnership with START (Global Change System for Analysis, Research and Training), ICSU and the IRDR program during March 12<sup>th</sup>-19<sup>th</sup>, 2012. During the Advanced Institute, the young researchers can have the opportunities to know more about the enhanced understanding, skills and resources to design, organize and carry out FORIN-related studies in their own countries.

**National Science and  
Technology Programs,  
Research in Sustainability Science,  
Graduate Programs at  
Academia Sinica**





# Development Program of Industrialization for Agricultural Biotechnology

☎ 886-2-2787-2128

☎ 886-2-2782-6594

🌐 <http://dpiab.sinica.edu.tw>

## Introduction

The agricultural industry, although accounting for only about 3% of our national GDP, is nevertheless vital to Taiwan's security and people's welfare. Today, the agricultural sector not only needs to provide its people with sufficient as well as healthy and nutritious food, it also has the mission of protecting and preserving the environment and ecosystem to promote the sustainable development of the country. In recent years, free trade and international competitiveness has put great pressure on Taiwan's agricultural industry, especially after Taiwan became a member of the WTO. To cope with this situation, the traditional model of agriculture business has to be transformed. Developments in agricultural biotechnology have made significant progress in recent years, and play a key role in the needed transformation.

Thanks to Taiwan's superior geographical location (with both sub-tropical and temperate climate zones) as well as its solid training programs for nurturing R&D talent in the agricultural sector, Taiwan can now draw on a wealth of successful past experiences in agricultural development as a basis for future progress. This will facilitate the advancement of agricultural biotechnology in Taiwan and promote the industrialization of emerging technologies.

Recognizing the central role of agricultural biotechnology to the agricultural industry in Taiwan, the government launched the inter-agency National Science and Technology Program for Agricultural Biotechnology (NSTP/AB) from 1999-2008. With the completion of the NSTP/AB at the end of 2008, the present five-year Development Program of Industrialization for Agricultural Biotechnology (DPIAB) was launched beginning in 2009. The goal of the DPIAB is to promote the industrialization of promising achievements accumulated during the ten-year period of NSTP/AB. Another goal of the DPIAB is to analyze global trends in agricultural bio-tech developments to identify Taiwan's areas of competitive advantage to organize top-down integrated projects in agricultural biotechnology. Academic-industrial cooperation on various levels play a key role in the program and the DPIAB welcomes the participation of renowned domestic and international bio-tech enterprises in this program.

Like NSTP/AB, the present program is also supported by multiple agencies, including the Council of Agriculture, Department of Health, Ministry of Education, National Science Council, Academia Sinica and the Industry Bureau of the Ministry of Economic Affairs. The Council of Agriculture is the major agency in charge of administrative coordination. The roles of the different agencies in the program are shown in the DPIAB planning scheme.

## Implementation and Administrative Infrastructure

The DPIAB was officially approved by the Executive Yuan on November 27, 2008. The ad-hoc committee providing guidance for the DPIAB held its first meeting on December 30, 2008. At this meeting, Dr. Jin-Leih Wu, distinguished research fellow of Academia Sinica, was nominated as director of the DPIAB office. The DPIAB office began its operations in early 2009.

## Program Goals

In order to fulfill its mission to promote the industrialization of agricultural biotechnology, the following goals have been set for the five-year DPIAB program:

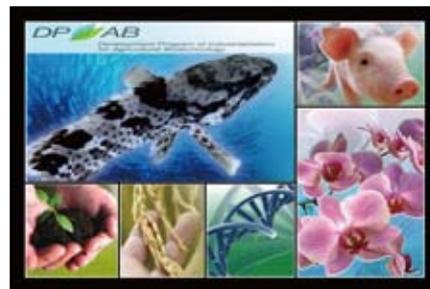
1. Increase 50% of agricultural industrial output value.
2. Enhance research efforts in pre-industrial technologies and focus on integrated, cross-disciplinary projects with market potential to reach the following goals:
  - ≥ 5 projects per year, with each project funding up to 10 million NT dollars per year for up to 3 years.
3. Develop or introduce at least 5 multi-functional bio-technologies.
4. Assist at least 50 corporations to develop new techniques and increase product value by collaboration of industry and academia in research.
5. Promote at least 10 cases, each with more than 50 million NT dollars investment.
6. Assist in the establishment of at least 5 international agricultural corporations, each with a total capital of above 100 million NT dollars and with international competitiveness.
7. Promote at least 5 projects with industrial talent training plans to enhance the potential of agricultural R & D in agricultural research institutions.

8. Establish assessment mechanisms for the commercialization platform to facilitate the commercialization of R&D products.

## Priority Areas

The DPIAB has chosen six priority areas in which it will invest the majority of its resources and efforts to attain valuable achievements in agricultural biotechnology. These areas were selected based on current global trends in biotech development and Taiwan's already existing areas of competitive advantage in the agricultural sector. The six priority areas are:

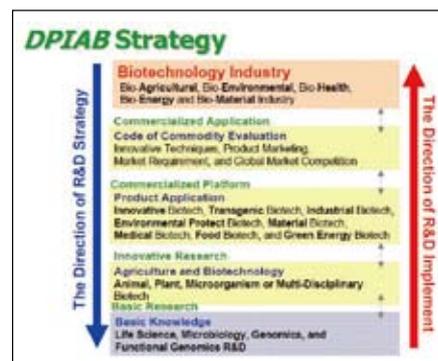
1. Aquaculture
2. Livestock and Poultry
3. Plant Seedlings
4. Orchids
5. Biopesticides & Biofertilizers
6. Chinese Herbs & Health Foods



↑ DPIAB Six Priority Areas



↑ DPIAB Planning Scheme



↑ DPIAB Strategy

# National Research Program for Biopharmaceuticals

☎ 886-2-2789-8060

📠 886-2-2789-8063

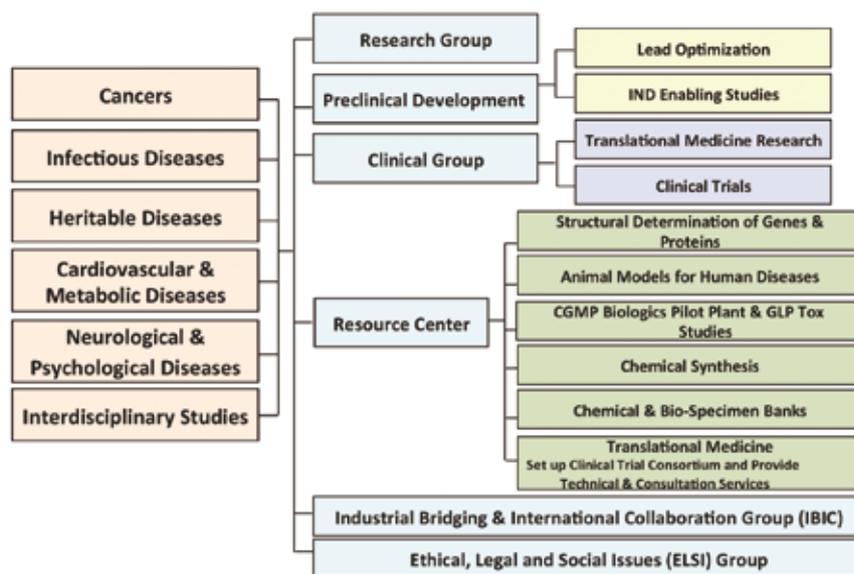
🌐 <http://nrpb.sinica.edu.tw>

According to the motion proposed in the 182<sup>nd</sup> National Science Council Committee Meeting, merger of the NSTPBP (National Science and Technology Program for Biotechnology and Pharmaceuticals) and the NRPGM (National Research Program for Genomic Medicine) could facilitate further consolidation of research infrastructures and the development of a strong biomedical industry. A 6-year new Program “National Research Program for Biopharmaceuticals (NRPB)” has been approved and launched in Year 2011. The Program Director is Dr. Pan-Chyr Yang. Co-Directors are Dr. Andrew H.-J. Wang and Dr. Yan-Hwa Wu Lee. The plan of the Program includes discovering new medicines and biomedical devices, streamlining the existing mechanisms for the R & D, concentrating the professional knowledge and skills in related fields and enhancing the communication and resource integration vertically and horizontally, aiming at achieving synergistic effect and the mission of this National Program.

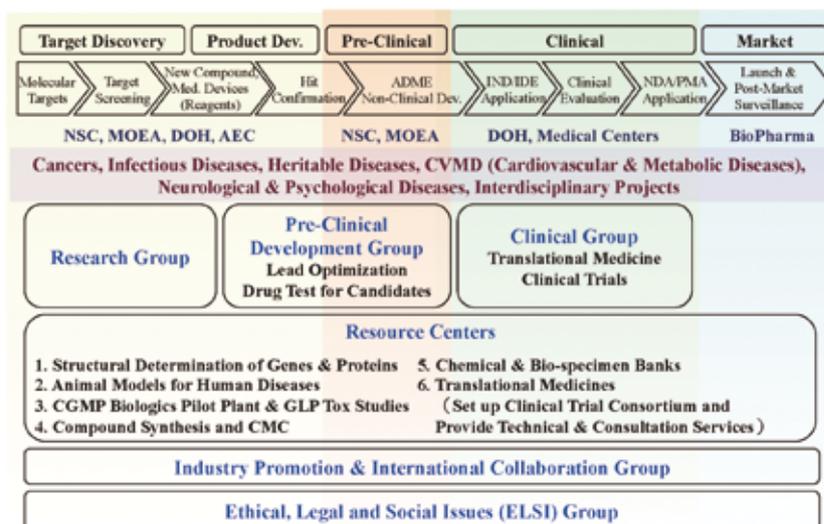
The National Research Program for Biopharmaceuticals is composed of six major groups, they are the Research Group, the Development Group, the Clinical Group, the Resource Center, the Industry Promotion and the International Collaboration Group and the ELSI (Ethical, Legal and Social Issues) Group. The participating governmental agencies include National Science Council, Ministry of Economic Affairs, Department of Health and Atomic Energy Council. The executive agencies include Academia Sinica, Development Center for Biotechnology, National Health Research Institutes, Center for Drug Evaluation, various universities, medical centers and the industries. To provide comprehensive support to NRPB, six groups of Resource Centers have been established. They are:

1. Structural Determination of Genes & Proteins
2. Animal Models for Human Diseases
3. CGMP Biologics Pilot Plant and GLP Tox Studies

4. Compound Synthesis at small Scales
5. Chemical and Bio-Specimen Banks
6. Translational Medicine (Set up Clinical Trial Consortium and Provide Technical & Consultation Services )



↑ Scopes & Structures



↑ Relations Between Each Groups

# National Nanotechnology Bridge Program

☎ 886-2-2789-8933

📠 886-2-2653-2160

🌐 <http://nano-taiwan.sinica.edu.tw>

## Origin

The National Nanotechnology Bridge Program was established in December 2009 by the National Science Council and executed by the Institute of Physics at Academia Sinica. The goal of this program is to facilitate and cultivate the achievements obtained over the years from the National Program on Nano Technology (NPNT), to attain the goal of "Nanotechnology Industrialization". The technical consulting council for the bridge program office evaluated summary reports about various patents, researches and human resources obtained from NPNT along with the market analysis reports, compiled by the efforts of bridge program office to guide the future direction of commercialization for the nanotechnology, which includes choosing the potential key fields, establishing the mechanism for technical promotion, building a service platform and integrating the researches among the academia and the industry funded by various government entities.

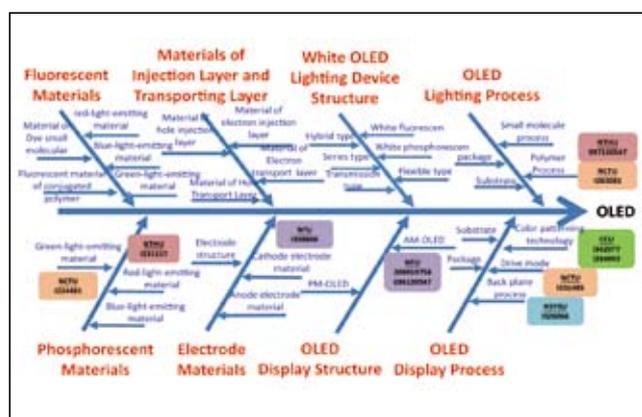
## Services

- **Technology:** R&D results Info, Fishbone diagrams
- **Patent:** Patent analysis, IP consulting
- **Talent:** Nano talents Info, Nano R&D team Info
- **Market:** Market and industry Info, Nano firms Info
- **Industrialization Services:** Outreach for technology partners, Counseling for technology transfer, Advise on start-up business model

## Bridge Service Platform

The website for the National Nanotechnology Bridge Program is aimed at serving as an effective and integrating "Industrialization Total Solution" service platform. The major services include collecting information, announcing critical news and messages about technology transfer, coordinating exchanges and networking among the industry and academia and etc.

- **Bridge Services:** Patent Inquiry, Patent Post, Funding Units, IP Consulting
- **Job Bank:** Job Information, Resume Search, Resume Post & Edit
- **Database:** Nano Express, Fishbone Diagrams, Industrial Reports, Company Database, Research Org. List
- **Forum:** General Discussion, International Activity
- **Information:** Latest Updates, Hot News, Newsletter



↑ Fishbone diagram



↑ Industrial-academic matching

## Taiwan e-Learning and Digital Archives Program

☎ 886-2-2652-5276    📠 886-2-2652-5280    🌐 <http://teldap.tw>

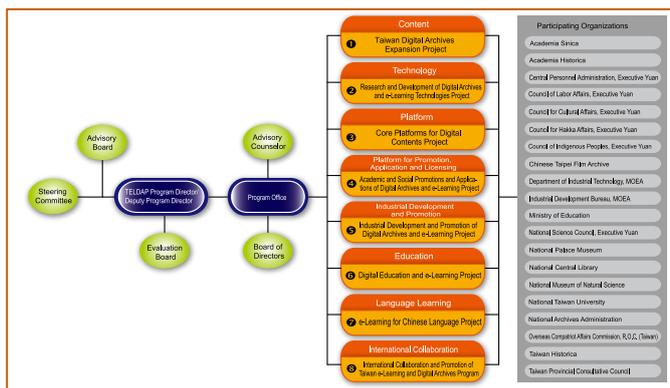
### Introduction

In 2002, the National Science Council under the Executive Yuan initiated the first stage of the National Digital Archives Program (2002-2006) and National Science and Technology Program for e-Learning (2003-2007). Both programs were merged in 2008 into “Taiwan e-Learning and Digital Archives Program” (TELDAP), which aims to promote the digitization of artifacts mainly from government-owned collections in order to preserve Taiwan’s cultural heritage in digital form and to build up the infrastructure of the industries related to digital contents.

TELDAP is divided into 8 sub-projects, under which 20 official departments and institutions, including Academia Sinica, have been endeavoring to establish rich digital contents.

### Objectives

To demonstrate Taiwan’s cultural and bio-diversity, TELDAP has also produced a diversified selection of digital courses which aim to enhance users’ learning efficiency. It is hoped that the achievements of TELDAP will not only increase Taiwan’s competitiveness and international exposure, but also facilitate the industrialization of digital archives and markets for e-learning, multimedia curriculum and etc.



↑ The organizational framework of TELDAP

↑ TELDAP continues to collect precious artifacts with reference to Taiwan via its established international network of 96 institutions from 14 countries

### Recent accomplishments



↑ Union Catalog



↑ Taiwan Academy



↑ e-books



↑ A Flora Enlightenment, 2010 Taipei International Flora Exposition



# Research in Sustainability Science

☎ 886-2-2787-2531~33、38

☎ 886-2-2787-2537、39

🌐 <http://irdr-icoe.sinica.edu.tw>

## Introduction

The Earth System (including Geosphere, Hydrosphere and Biosphere) is an integrated system with self-regulatory capacity. Human activities drive interactions within the system causing complex impacts to the environment. The increase of extreme climate events not only threatens human health and the ecosystem but also has tremendous impact on global energy resources, water resources and food supply.

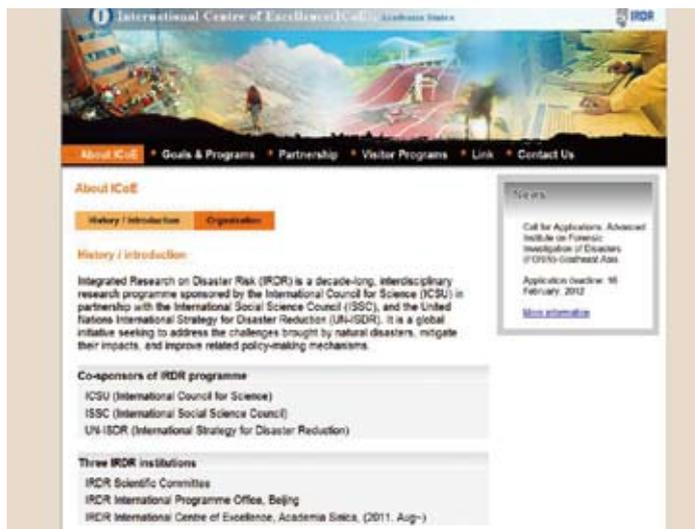
Sustainable Development has become an important issue for human society. Great efforts and large amounts of resources have been put into interdisciplinary research on Sustainability Science worldwide in order to find solutions to those problems. A new research program in Sustainability Science has been initiated at the Academia Sinica. The joint research effort will involve the participation of researchers from the three divisions of the Academy, crossing the boundaries between the Mathematical and Physical Sciences, Life and Medical Sciences, and Humanities and Social Sciences. A Research Center for Sustainability Science to be guided by an international Advisory Board is currently being established. Mission oriented research carried out by PI's from the Academy in collaboration with researchers from other institutions will be funded through the Center.

The Integrated Research on Disaster Risk-International Centre of Excellence (IRDR-ICoE) was established at

Academia Sinica in 2011 with the support of International Council for Science (ICSU). The goals of the Centre are “to serve as an international platform for conducting integrated research in disaster risks”, “to establish a partnership network of disaster reduction research” and “to promote and coordinate interdisciplinary research on disaster risks.” The IRDR-ICoE will be a part of the Research Center for Sustainability Science.

## Plan Objectives

- 1. Earth System Science:** An important pillar of sustainable development is the maintenance of the eco-system and the environment. In the context of climate change there is a need to better understand the interaction between the earth's surface, the atmosphere and the ocean through observation and applying monitoring data to help build prediction models. At the same time it is necessary to study the impact of environmental change on ecosystems and biodiversity, and find proper adaptation practices.
- 2. Green Energy:** Energy saving, carbon reduction, and discovering new energy resources are the keys to sustainable development, and are urgent research topics in Taiwan. By conducting basic research, we hope to develop new sustainable energy sources, energy storage technology and novel materials for energy saving and carbon reduction. Further research on Taiwan's energy policy will also be carried out.



↑ Integrated Research on Disaster Risk-International Centre of excellence, IRDR-ICoE) website <http://irdr-icoe.sinica.edu.tw>



↑ Taiwan 921 Earthquake (Photo shot by the Institute of Earth Sciences, Academia Sinica)

- 3. Natural Disaster Response:** By participating in the international Integrated Research on Disaster Risk (IRDR) program, researchers in environmental change, socio-economics, agriculture etc., will work together with scientists from other countries on disaster risks mitigation and adaptation policies.
- 4. Infectious Diseases:** To discover new technologies to detect emerging pathogens, to study the mechanisms and drug-resistance of specific pathogens, drug discovery, strengthening the efforts to collect and preserve biological material (specimens, strains), and the establishment of a local pathogen database.
- 5. Senior Citizen Health Issues:** With increasing average life expectancy and decreasing birth rate, the worldwide population is rapidly aging, leading to the increasing demand for elderly care. In addition, extreme climate conditions aggravate the impact on them both physiologically and psychologically. In-depth health care studies of the elderly will be conducted in the hope to develop more efficient methods of caring and new medicine.
- 6. Environmental History:** Disasters resulting from environment change and government mitigation policies

influence people's livelihood. To formulate appropriate policies, in-depth understanding of the history of long-term environment changes is needed. A link between historical disease databases and disaster databases will be established, and the inter-relationship between epidemics and natural disasters in Taiwan and China will be reviewed.

- 7. Establishment Economic Models for Sustainable Development:** Developing economic models which can be used to analyze, predict sustainable development for Taiwan and the Asian region, and to link the impact of economic development to environmental and ecological factors (including land, water, air quality, etc.), as well as population structure (aging) and health and other social and ecological elements.
- 8. Cross-national Comparative Study of Sustainable Development and Policy-Making Processes:** Analyzing of sustainable development in Europe and the United States and international organizations to find how general principles of environmental protection and legal norms are developed in the European Union, the United States, the United Nations and the International Court of Justice, the World Trade Organization (WTO) and Taiwan.



↑ Landslides caused by Typhoon Morakot (Photo taken by National Science and Technology Center for Disaster Reduction)



↑ The Ja.Bau.Li Estuary after the Typhoon Morakot (Photo taken by Center for Space and Remote sensing Research, National Central University)

# Graduate Programs at Academia Sinica

☎ 886-2-2789-8050    📠 886-2-2785-8944    🌐 <http://tigp.sinica.edu.tw> (TIGP)

☎ 886-2-2789-8023    📠 886-2-2785-8944    🌐 <http://asdp.sinica.edu.tw> (DP)

One of the three main missions of Academia Sinica is to conduct and encourage academic studies. Academia Sinica, with the aim of exploiting its world-class resources and faculty to help promote higher education in Taiwan, implements this important task by collaborating with a consortium of key national research universities to provide interdisciplinary Ph.D. programs. Currently, Academia Sinica hosts two graduate programs: the Taiwan International Graduate Program (TIGP), which is designed to create a unique educational environment serving both international and local students; and the Degree Program (DP), which provides a more advanced higher education environment for domestic students. Both programs are conducted in close collaboration with local universities.

## The Taiwan International Graduate Program (TIGP)

The first in Taiwan to offer all-English graduate study environment, the TIGP has been established through a joint-effort of Academia Sinica and a consortium of domestic research universities. Aiming to promote higher education in Taiwan so as to stay abreast of today's rapidly evolving scientific and technological world, the TIGP offers the following 10 interdisciplinary Ph.D. programs in cutting-edge research fields of science and technology. (Table 1. Summary of TIGP's Ph.D. programs and partnerships)

TIGP	Partner Universities	Departments/Institutes Involved
Chemical Biology and Molecular Biophysics (CBMB) ( <a href="http://www.sinica.edu.tw/~tigpcbmb/">http://www.sinica.edu.tw/~tigpcbmb/</a> )	National Taiwan University <a href="http://www.ntu.edu.tw">http://www.ntu.edu.tw</a>	1. Institute of Biochemical Sciences 2. Department of Chemistry
	National Tsing Hua University <a href="http://www.nthu.edu.tw">http://www.nthu.edu.tw</a>	1. Department of Life Sciences 2. Department of Chemistry
Molecular Science and Technology (MST) ( <a href="http://tigp.iams.sinica.edu.tw/MST.htm">http://tigp.iams.sinica.edu.tw/MST.htm</a> )	National Tsing Hua University <a href="http://www.nthu.edu.tw">http://www.nthu.edu.tw</a>	Department of Chemistry
	National Central University <a href="http://www.ncu.edu.tw/index.php">http://www.ncu.edu.tw/index.php</a>	Department of Physics
Molecular and Biological Agricultural Sciences (MBAS) ( <a href="http://www.sinica.edu.tw/~ibawww/mba/mba.html">http://www.sinica.edu.tw/~ibawww/mba/mba.html</a> )	National Chung Hsing University <a href="http://www.nchu.edu.tw">http://www.nchu.edu.tw</a>	1. Graduate Institute of Biotechnology 2. Department of Life Sciences
Molecular and Cell Biology (MCB) ( <a href="http://www.imb.sinica.edu.tw/mcb/">http://www.imb.sinica.edu.tw/mcb/</a> )	National Defense Medical Center <a href="http://www.ndmctsg.edu.tw">http://www.ndmctsg.edu.tw</a>	Graduate Institute of Life Sciences
Bioinformatics (Bioinfo) ( <a href="http://tigbbp.iis.sinica.edu.tw/">http://tigbbp.iis.sinica.edu.tw/</a> )	National Yang-Ming University <a href="http://www.ym.edu.tw">http://www.ym.edu.tw</a>	Institute of Biomedical Informatics
	National Tsing Hua University <a href="http://www.nthu.edu.tw">http://www.nthu.edu.tw</a>	Institute of Bioinformatics and Structural Biology
	National Chiao Tung University <a href="http://www.nctu.edu.tw">http://www.nctu.edu.tw</a>	Institute of Bioinformatics and Systems Biology
Nano Science and Technology (NST) ( <a href="http://www.phys.sinica.edu.tw/TIGP-NANO/">http://www.phys.sinica.edu.tw/TIGP-NANO/</a> )	National Taiwan University <a href="http://www.ntu.edu.tw">http://www.ntu.edu.tw</a>	1. Department of Chemistry 2. Department of Physics
	National Tsing Hua University <a href="http://www.nthu.edu.tw">http://www.nthu.edu.tw</a>	Department of Engineering and System Science
Molecular Medicine (MM) ( <a href="http://www.ibms.sinica.edu.tw/mmp/">http://www.ibms.sinica.edu.tw/mmp/</a> )	National Yang-Ming University <a href="http://www.ym.edu.tw">http://www.ym.edu.tw</a>	Program in Molecular Medicine
Computational Linguistics and Chinese Language Processing (CLCLP) ( <a href="http://clclp.ling.sinica.edu.tw/">http://clclp.ling.sinica.edu.tw/</a> )	National Tsing Hua University <a href="http://www.nthu.edu.tw">http://www.nthu.edu.tw</a>	Institute of Information Systems and Applications
	National Taiwan University <a href="http://www.ntu.edu.tw">http://www.ntu.edu.tw</a>	Graduate Institute of Linguistics
Earth System Science (ESS) ( <a href="http://www.rcec.sinica.edu.tw/tigp-ess/">http://www.rcec.sinica.edu.tw/tigp-ess/</a> )	National Central University <a href="http://www.ncu.edu.tw">http://www.ncu.edu.tw</a>	College of Earth Sciences
Biodiversity (Biodiv) ( <a href="http://biodiv.sinica.edu.tw/TIGP-BP/">http://biodiv.sinica.edu.tw/TIGP-BP/</a> )	National Taiwan Normal University <a href="http://www2.ntnu.edu.tw/en/modules/tinyd0/index.php?id=5">http://www2.ntnu.edu.tw/en/modules/tinyd0/index.php?id=5</a>	Department of Life Science

Since its inception in 2002, under the stewardship of the four successive directors – Dr. Sunney Chan (founding director), Dr. Ovid Tzeng, Dr. Chao-Han Liu and Dr. Shie-Ming Peng (current director) – the TIGP has grown and expanded both in terms of the number of interdisciplinary programs and the number and global distribution of students. As of December 2011, the TIGP has 339 Ph.D. students from 36 nations, making it a truly international community.

In addition to mentorship by prestigious faculty members and access to the state-of-the-art facilities of Academia Sinica, the TIGP also offers the following benefits: a monthly stipend of NT\$32,000 (~US\$1,000) for up to 36 months, free mandarin language courses at the elementary level and a convenient and fully-furnished on-campus student dormitory.

On top of the comprehensive curriculum offered to its Ph.D. students, the TIGP also provides exceptional opportunities to extend students' learning. For instance, the TIGP invites distinguished scholars to give presentations on their areas of expertise and life experience to provide guidance on students' career planning; the TIGP provides conference travel grants to encourage participation in international conferences so that students can acquire the most updated knowledge through interactions with distinguished scholars in their related fields; and through AS's substantial connections with top-notch overseas research institutions, the TIGP is able to make arrangements for students to visit and conduct research in renowned laboratories.



↑ The international community of the TIGP: A group photo taken at the 2011 welcome party

## The Degree Program (DP)

More recently, in 2007, Academia Sinica established the Degree Program (DP) to provide a more advanced higher education environment for domestic students. Similar in design to the TIGP, the DP is also co-established with domestic universities. Currently the DP offers 6 interdisciplinary Ph.D. programs.

DP	Partner Universities	Note
Cancer Biology and Drug Discovery Degree Program	China Medical University	Began to accept applications in 2009
	Taipei Medical University	Began to accept applications in 2011
Marine Biotechnology Degree Program	National Sun Yat-sen University	Began to accept applications in 2009
Translational Medicine	National Taiwan University Kaohsiung Medical University	Began to accept applications in 2010
	China Medical University Taipei Medical University National Yang-Ming University	Will start to accept applications in the 2012 academic year
	National Chung Hsing University	Began to accept applications in 2010
Genome and Systems Biology	National Taiwan University	Began to accept applications in 2010
Information and Network Systems	National Chiao Tung University	Will start to accept applications in the 2012 academic year



↑ The 6<sup>th</sup> TIGP Certificate Conferral Ceremony



↑ The TIGP Distinguished Lecture Series: University of California, Davis, Chancellor Emeritus, Dr. Larry N. Vanderhoef delivers a speech to the TIGP students and faculty

# Memorial Halls and Museums





# Hu Shih Memorial Hall

☎ 886-2-2782-1147, 2789-9720

☎ 886-2-2653-3302

🌐 <http://www.mh.sinica.edu.tw/koteki/>

## Visitor Information

Opening Hours: Tuesday to Saturday, 9:00-17:00 (Closed on national holidays)

Free Admission

Hu Shih, a famous scholar in modern China, served as Dean of the College of Humanities at Beijing University, ambassador to the United States, president of Beijing University and president of Academia Sinica. Hu Shih played a central role in China's modernization, both as a pioneer of vernacular literature and as an advocate of the New Culture Movement. The Hu Shih Memorial Hall is located at the site of Dr. Hu Shih's residence on the Academia Sinica campus in Nankang, Taipei where he lived from 1958 to 1962 while serving as Academia Sinica's President. Following his death on February 24, 1962, Academia Sinica formed a Hu Shih Memorial Hall Management Committee and the Hu Shih Memorial Hall was formally established on December 10 of that year. In January 1998, the memorial hall became formally affiliated with the Institute of Modern History. The memorial hall consists of three parts. The first part is former President Hu Shih's residence on the Academia Sinica campus in Nankang. The architecture, porticos, furnishings and other features of Hu Shih's former residence basically preserve the original flavor of his living arrangements. The second part, the exhibition room (erected in 1964 with the financial assistance of Mr. C. V. Starr, an American insurance company executive) exhibits Hu Shih's writings, personal objects, hand-written drafts, photographs and tape recordings, as well as documentaries of his life in Taiwan and other materials. The third part is Hu Shih's grave near the Academia Sinica campus. Academia Sinica and the Taipei City Government cooperated to construct the Hu Shih Park around the site of his grave and the work was completed in February 1974.

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分話。有七分證據，不  
能說八分話。

胡適




# Chien Shih-Liang Memorial Hall

☎ 886-2-2782-1889

☎ 886-2-2783-1237

## Visitor Information

Opening Hours: Monday to Friday, 9:00-17:00 (Closed on national holidays)

Free Admission

Professor Shih-Liang Chien was a famous Chinese chemist who received his Ph.D. in Chemistry from the University of Illinois in 1934 and subsequently served as professor and chairman of the Department of Chemistry of Peking University.

In 1949, Professor Chien moved to Taiwan and became professor of the Chemistry Department and Dean of Studies at National Taiwan University. He was then appointed as president of National Taiwan University in 1951. During his term as president, he established Taiwan's university alliance enrollment system that served as an excellent framework for higher education in Taiwan.

Professor Chien was elected as an Academician of Academia Sinica in 1964 and served as the fifth president of Academia Sinica in 1970. During his presidency, he directed seven Convocations of Academicians and established the Institute of American Culture, Institute of Earth Science, Institute of Biological Chemistry and Institute of Information Science. He also established four Preparatory Offices for Biomedical Sciences, Statistical Science, Atomic and Molecular Sciences and Molecular Biology. Professor Chien made enormous contributions to academic developments at Academia Sinica.

Professor Chien died of myocardial infarction in 1983 while he was the president of Academia Sinica. In memory of his academic achievements and contributions to Academia Sinica (especially to the Institute of Chemistry), the new laboratory building of the Institute of Chemistry was named as the Chien Shih-Liang Memorial Hall. The exhibition room (A107) in the memorial hall which displays Professor Chien's statue, documents, books, photos and other materials is open to the public to commemorate Professor Shih-Liang Chien as the former president of Academia Sinica and honor his contributions to Taiwan.



# Wu Ta-You Memorial Hall

☎ 886-2-2783-5386    📠 886-2-2783-3654    💻 <http://www.phys.sinica.edu.tw/~tywufund>

## Visitor Information

Opening Hours: Monday to Friday, 9:30-16:30 (Closed on national holidays)

Free Admission

Dr. Ta-You Wu (1907-2000) was a renowned scholar in contemporary China and an internationally acclaimed physicist. Dr. Wu taught at Peking University and Southwest United University in China, National Research Council of Canada and State University of New York at Buffalo. Later he served as the director of the Institute of Physics at Academia Sinica before becoming the president of this Academy (1983-1994).

Dr. Wu was a pioneer who introduced modern physics to China. He taught and inspired a number of famous physicists including Nobel Laureates Chen-Ning Yang and Tsung-Dao Lee. Throughout his life, Dr. Wu made an enormous impact on the development of modern physics in China and Taiwan. He is thus regarded as the father of contemporary Chinese physics. From his middle age years onwards, Dr. Wu began to lead scientific developments in Taiwan. In his capacity as first chairman of the Committee for Science Development, National Security Council and the National Science Council and the Science Education Advisory Committee for the Ministry of Education, Dr. Wu formulated many important policies to promote science and technology education in Taiwan.

After Dr. Wu's passing away in 2000, the Institute of Physics at Academia Sinica established the Wu Ta-You Memorial Hall, which is located on the 4<sup>th</sup> floor of the institute's building. The Wu Ta-You Memorial Hall was opened to the public on March 5, 2001. Dr. Wu's statue, books, manuscripts, photographs and documentary films are exhibited. Also on display is Dr. Wu's private collection, his office and living room during his tenure as the director of the Institute of Physics.



# Biodiversity Research Museum

886-2-2789 9579  
886-2-2787 2223

886-2-2789 9624

<http://museum.biodiv.tw>

## Visitor Information

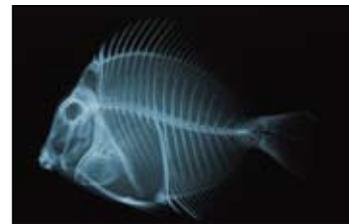
Opening Hours: Open only upon request. Please book at least one month in advance.

Free Admission

Combining ‘Herbarium, Institute of Botany’ and ‘Zoological Research Museum, Institute of Zoology’, the Biodiversity Research Museum was established in the Biodiversity Research Center (BRC), Academia Sinica in 2007. The Museum’s collections dated as early as 1961. The main goal of the Museum is to preserve voucher specimens for scientific studies and to document biodiversity on earth. Currently, our collections consist of specimens from various taxonomic groups, including approximately 131,000 plants, 24,000 fishes, 3,000 birds and 10,000 invertebrates (cnidarians, annelids, mollusks, arthropods and echinoderms). The fish collection, covering extensive local fish fauna, is the most comprehensive of its kind in Taiwan and adjacent areas.

The BRC sets up a ‘Collection Management Committee’ to oversee the policy and operation of the museum. Committee members are appointed from principal investigators within the institute. The chair of the Committee serves as the Museum Director while principal investigators in various taxonomic disciplines at the institute are in charge of corresponding collections. More than 460 type specimens are permanently housed in the Museum. Specimen exchange and research collaboration are encouraged, which take place regularly between the Museum and universities, herbaria, and botanical gardens worldwide.

The Research Museum has developed cutting-edge information management systems and online databases for the collections. Information on the museum specimens can be accessed via the internet (<http://museum.biodiv.tw>). In addition, the museum staff has developed a number of biodiversity websites including: Database for Native Plants in Taiwan (<http://taiwanflora.sinica.edu.tw>); Discover Plants of Taiwan (<http://taiwanplants.ndap.org.tw>); The Taiwan Malacofauna Database (<http://shell.sinica.edu.tw>); Taiwan Biodiversity National Information Network (TaiBNET, <http://taibnet.sinica.edu.tw>); Taiwan National Node (TaiBIF, <http://taibif.org.tw>) for Global Biodiversity Information Facility (GBIF); The Fish Database of Taiwan (<http://fishdb.sinica.edu.tw>); Digital Museum: The World of Fishes (<http://fishdb.sinica.edu.tw/~fishdmp/index.htm>); Digital Museum: Recovering the Freshwater Fishes in Taiwan (<http://fishdb.sinica.edu.tw/~fhfresh/index.html>). Particularly noteworthy is ‘The Fish Database of Taiwan’, which collaborates with the global ‘FishBase’ that is considered the most comprehensive biodiversity database for fishes. For public education and services, the Research Museum periodically holds special exhibitions and provides museum tours for students, teachers and other civic organizations.



↑ X-ray photograph of a spotted surgeonfish (*Acanthurus guttatus*)



↑ Dr. Tetsuo Koyama (Director, Makino Botanical Garden) and Dr. Ching-I Peng (Director, Biodiversity Research Museum) at the Museum



↑ Holotype specimen of *Begonia ravenii*, a handsome species endemic to Taiwan



↑ Pinned insect specimens in the Biodiversity Research Museum



↑ Field photo of *Begonia ravenii* from Taiwan

# Museum of the Institute of History and Philology

☎ 886-2-2652-3180

📠 886-2-2786-8834

💻 <http://www.ihp.sinica.edu.tw/~museum/tw>

## Visitor Information

Opening Hours: Wednesday and Saturday, 9:30-16:30

(Closed on national holidays and election days)

Free Admission



↑ Monthly and Seasonal Records of Military Supplies from the Kuang-ti South Platoon in the Yung-yuan Era (A27 Tsakhortei, Edsen-gol, Inner Mongolia)

## Visitor Information

Founded in 1928, the Institute of History and Philology (IHP) conducts research in various disciplines, including history, linguistics, archaeology, anthropology and philology. In accordance with its guiding spirit of “traversing the summits and valleys in search of historical materials”, the IHP has devoted various resources to archaeological excavations, field surveys and the collection of historical relics. The institute currently preserves more than 120,000 northern Chinese artifact pieces, over 10,000 Han dynasty wooden slip pieces, over 2,000 artifacts originating from the ethnic groups of southwestern China, more than 7,000 artifacts donated by famous French collectors (the Mortillet family), over 310,000 documents from the Grand Secretariat Archives of the Ch’ing Dynasty, more than 200,000 volumes of rare texts, manuscripts folk literature and a wealth of archaeological findings from excavations carried out across Taiwan in recent years.

In view of its mission and social responsibility to promote scientific research and educate the public, the IHP built a museum in 1986 dedicated to the preservation and organization of historical materials. In addition to holding regular exhibitions, annual special thematic exhibitions and public lecture series, the Museum of the Institute of History and Philology (MIHP) has also become a means by which the general public better understands the tasks and research undertaken at the IHP. Instead of traditional museum display, the MIHP exhibits new historical resources and research results through an organic presentation of the academic contexts and excavation backgrounds to which they belong. This museum display method demonstrates the MIHP’s continuing pursuit of new approaches to and new fields for historical research. The “Archaeological Space” on the first floor of the MIHP arranges artifacts chronologically. It displays, in detail, the excavations of graves from different eras, including the Neolithic Longshan, Shang dynasty and Chou dynasty periods. The “Historical Space” on the second floor divides the exhibitions thematically. Topics presented include the “Han Dynasty Wooden Slips from Edson-gol”, “Rare Texts”, “Archives of the Grand Secretariat”, “Artifacts from Ethnic Groups of Southwestern China”, “Ink Rubbings” and “Taiwanese Materials”. Each exhibition section is designed by IHP research fellows and provides detailed yet accessible introductions to the historical context and cultural significance of the artifacts displayed.

The MIHP publishes guidebooks, exhibition catalogues and other brochures in both Chinese and English. In recent years, in order to propagate the scholarly value of its collections, the MIHP has further invited IHP research fellows to publish the *Introduction to the Museum of the Institute of History and Philology*, a series which relates to the special exhibitions held at the museum. Written in a lively and engaging manner, these introductions are intended for perusal by people from all walks of life.



↑ Zoo-anthropomorphic Jade Earrings (Chula, Pingtung, Taiwan)



↑ Lu Fang-ting (Royal Tomb M1004, Hsi-pei-kang, Anyang, Honan)

# Museum of the Institute of Ethnology

☎ 886-2-2652-3308

☎ 886-2-2652-3310

💻 <http://www.ioe.sinica.edu.tw/tool/museum>

## Visitor Information

Opening Hours: Wednesday and Saturday, 9:30-16:30  
(Closed on national holidays and long holiday weekends)

Free Admission

## Chronology of Event

- 1956 Establishment of the special collections room of the Institute of Ethnology
- 1978 The collection room is renamed as the Ling Shun-sheng Memorial Collection Room
- 1988 The collection room is transformed into the Museum of the Institute of Ethnology

## Collections

In 1955, Dr. Ling Shun-sheng, the head of preparatory office of the Institute of Ethnology, led a research team to Tjaljaqavus Village (currently Lai-yi Village, Pingtung County, Taiwan) to study Paiwan culture and collect ethnographic artifacts. These artifacts constitute the museum's earliest collections.

In the ensuing years, the museum's collections steadily grew. Many artifacts were accumulated during extensive ethnographic research. The museum now holds more than 8,000 pieces including artifacts from Taiwan's indigenous groups, Han Chinese folk and religious artifacts and artifacts from Mainland China, Southeast Asia and the Pacific. The public can browse through information and photographs of these collections by accessing the Collection Database of IOE (<http://140.109.128.13/mie>) and Digital Archives of Institute of Ethnology (<http://ianthro.tw/collections>).



↑ Carved Central House-post of Chief *Zingrur* (Paiwan, Taiwan)

## Exhibitions

Since its founding, the museum has not only preserved artifacts, expanded its collections and supported academic research, but continued to hold exhibitions and promote development strategies. In short, the useum has become a multifunctional research museum.

Today, there are four long-term exhibitions in the museum, including those on Taiwan's Aboriginal Cultures, Archival Exhibition of China's Southern Frontiers in the 1930s, Folk Religion in Taiwan and Legacy of Dr. Ling Shun-sheng. Furthermore, the museum holds a special exhibition each year. As a supplement to the long-term exhibitions and a showroom for the latest research achievements, the special exhibition not only brings more of the Museum's collections to public view, but also promotes a better understanding and appreciation of ongoing research work in the institute.

Information on the current exhibitions is posted online. Please visit our website for additional information or contact us.



↑ Bark-cloth (Hawaiian)



↑ The Tiger Deity Statue  
(Ethnic Chinese, Taiwan)



↑ Man's Silver Knife  
(Jingpo, China)



↑ Chief's Plumed Headgear  
(Amis, Taiwan)



↑ Ceremonial Upper  
Garment (Atayal, Taiwan)



# Lingnan Fine Arts Museum

☎ 886-2-2789-9937

📠 886-2-2789-9938

💻 <http://Infam.sinica.edu.tw>

## Visitor Information

Opening Hours: Tuesday to Friday, 12:00-17:00 Saturday, 10:00-17:00

(Closed on Sunday, Monday and national holidays)

Free Admission



↑ Au Ho-Nien (Riverside) 1995



↑ Kapok blossom during the spring in lingnan, Si-Tu Qi



↑ Standing Duck, Ding Yan-yong



↑ Activities



↑ lecture course

Although best known as a research institution, Academia Sinica has been striving to promote art and culture. In 2002, after receiving a donation of more than one hundred Lingnan paintings from the well-established Lingnan painter Au Ho-nien, renovations were undertaken to accommodate the Lingnan Fine Arts Museum. The Lingnan School is famous for innovation in modern Chinese art history; its core values include promoting the revival of traditional Chinese painting and developing a modern genre by combining techniques of Western painting and Chinese ink painting. The School was named after its geographical region (namely “South of the five mountains” in Chinese), yet some critics believe that it is more appropriate to call it “School of Compromise” instead, which may suit the artists’ pursuit better.

The Lingnan Fine Arts Museum collections at the include works by Ju Lian (the founder of Lingnan school), Gao Jian-fu, Gao Qi-feng and Chen Shu-ren (the three masters of Lingnan School), Au Ho-nien and other Lingnan artists. The museum features the first professional archive of Lingnan paintings in Taiwan, tracing changes in the history of Chinese painting.

# Fu Ssu-nien Memorial Room

☎ 886-2-2782-9555 #600

☎ 886-2-2783-1892

🖥 <http://lib.ihp.sinica.edu.tw/pages/03-rare/MWSP/01/Fu.htm>

## Visitor Information

Opening Hours: Monday to Friday, 9:00-17:00 (closed on national holidays)

Free Admission

Fu Ssu-nien (1896-1950) was the founder of the Institute of History and Philology at Academia Sinica, the forerunner of “New Historical Studies,” one of the leaders of the May Fourth New Culture Movement and an educator and political critic who participated in a variety of social affairs. The Fu Ssu-nien Memorial Room displays items, documents, manuscripts and photographs belonging or pertaining to Fu Ssu-nien and allows visitors to understand the far-reaching importance of Fu Ssu-nien’s life.

The Fu Ssu-nien Memorial Room is located to the right of the Fu Ssu-nien Library lobby. A Chinese and English chronology of Fu Ssu-nien’s life is located on the right wall of the lobby near the entrance to the memorial room and papers and articles about Fu completed by IHP researchers are displayed within the hallway leading up to the room. The lobby and hallway outside of the memorial room are predominantly white, representing pure visual space and their ceilings of protruding beams symbolize the convergence of different research materials. A relief of Fu Ssu-nien, which is set on the central wall of the Fu Ssu-nien Library lobby, is from 1961 when the library was built.

The Fu Ssu-nien Memorial Room exhibits information about events from Fu Ssu-nien’s life, letters from his friends and items belonging or pertaining to Fu. We have divided Fu’s life into four major stages for the exhibit: 1) Fu Ssu-nien’s youth and study abroad, 2) Fu Ssu-nien’s return to China to the War of Resistance against Japan, 3) the Chinese War of Resistance against the Japanese and 4) Fu Ssu-nien’s later life. Representative materials are chosen for each of the stages and pertinent explanations are provided so as to connect the important events in Fu Ssu-nien’s life. The section on letters from Fu Ssu-nien’s friends displays notes sent from Tsai Yuan-pei, Hu Shih, Hsu Chih-mo and other friends to Fu. Based on these historical materials, we can better understand the intellectual exchanges which took place between Fu and his friends, the decision-making processes behind certain events and incidents, etc. The memorial room also exhibits items used by Fu Ssu-nien during his lifetime, including stamps, pipes, glasses, an ID card, etc.

Fu Ssu-nien acted as the first director of the IHP from its creation in 1928 to his death in 1950. During a period of national crisis, Fu Ssu-nien put his utmost effort into planning and developing institute affairs, deciding a new direction for Chinese historical research. Although during this era, the IHP had to relocate a total of nine times, academic study at the institute did not stagnate as a result. In an environment of great political difficulty and hardship, the IHP, with Fu Ssu-nien at the helm, continued to purchase books of all kinds, enlist the services of first-class scholars and personnel, publish academic books and papers, etc., establishing an excellent foundation for the development of the institute and allowing it to become a place of strategic importance within Sinology research. The Fu Ssu-nien Memorial Room has been established to display Fu Ssu-nien’s work in promoting the progress of the IHP.



↑ Photograph of Fu Ssu-nien taken in 1921 on Sister’s Avenue in London



↑ Exhibition Section on Letters from Fu Ssu-nien’s Friends and Items from Fu’s Life



↑ Lobby of the Fu Ssu-nien Library

# 2011 Significant Research Achievements

Faculty members at Academia Sinica have devoted themselves to their research with an aim to open up new areas of intellectual endeavor. Striving in the intense scientific race in R&D across the world, Academia Sinica constantly reviews its academic competitiveness and evaluates its future developmental strategies. To increase its international visibility, Academia Sinica has taken initiatives in enforcing internationalization, academic collaborations, and the recruitment of talents. Throughout the years, Academia Sinica and its research faculty have gained much recognition from the international community. Nevertheless, our ultimate concern remains enhancing the integral value of the community as a whole. Through the applications of research results and technology transfer, Academia Sinica seeks to contribute back to the society and increase the well beings of people in Taiwan. Furthermore, Academia Sinica strives to fulfill its social responsibility by giving advices on important political issues. In 2011, Academia Sinica published three proposals (seven were published in total over the last three years), in hope of settling the population issues, as well as the problems arisen by newly found infectious diseases and climate changes.





### Number of Papers and Cites of Universities and Research Institutions in Asia, 2001-2011

University / Research Institution	Papers Published	Average Cites Per Paper
RIKEN	21,245	18.76
UNIV TOKYO	77,157	14.73
UNIV HONG KONG	23,003	12.94
<b>ACADEMIA SINICA</b>	<b>14,695</b>	<b>11.08</b>
NATL UNIV SINGAPORE	36,932	11.03
CHINESE UNIV HONG KONG	19,632	10.93
SEOUL NATL UNIV	45,025	9.77
NATL TAIWAN UNIV	36,325	8.83
PEKING UNIV	33,455	8.78
CHINESE ACAD SCI	165,613	8.32

Source: ESI, updated MAR 2012

### Academia Sinica ranked among Top 1% of research institutions in 13 fields, 2001-2011

Field	Citations	Citations Per Paper
Physics	34,146	11.44
Chemistry	28,657	11.74
Biology & Biochemistry	15,955	12.90
Clinical Medicine	14,715	14.55
Molecular Biology & Genetics	11,971	17.22
Plant & Animal Science	11,317	10.69
Geosciences	8,058	9.80
Materials Science	7,497	14.31
<b>Microbiology (NEW)</b>	<b>3,664</b>	<b>15.79</b>
Engineering	3,395	5.41
<b>Environment/ Ecology (NEW)</b>	<b>2,080</b>	<b>9.59</b>
Computer Science	1,636	3.47
Agricultural Sciences	1,353	8.73

Source: ESI, updated MAR 2012

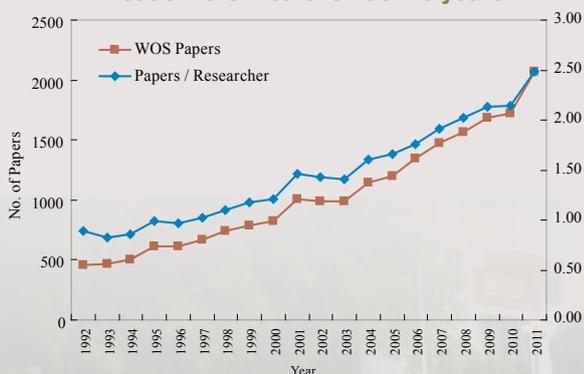
### Analysis of Published Papers

Academia Sinica endeavors to achieve excellence in research. The number and quality of its papers have been steadily increasing. Over the past twenty years, Academia Sinica has dramatically increased from 456 to 2,075 in its total number of papers (excl. meeting abstracts, editorials, etc.) collected in SCI, SSCI, and A&HCI. Also, each researcher published on average 2.48 SCI, SSCI, A&HCI papers in 2011, which are more than double the 0.89 twenty years ago. Besides, the graph of 5-year running average citations shows the enhancing quality of papers published by Academia Sinica, and its research excellence in comparison with other Asian famous universities and institutions.

On the other hand, according to the analysis in Thomson Reuters' Essential Science Indicators (ESI), Academia Sinica has reached 11.08 in its citations per paper in the past 11-year period, higher than 10.68, the citations per paper of the world. In addition, Academia Sinica was ranked among the top 1% of research institutions in 13 fields in the past 11-year period. In comparison with the 1999-2009 ESI data, two fields (viz. microbiology, and environment/ecology) of which are newly added.

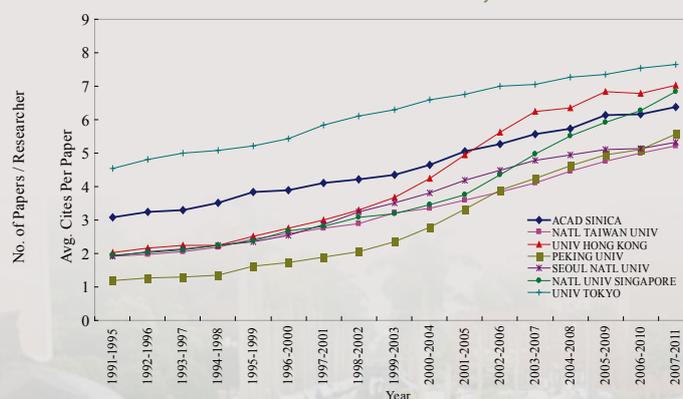
In 2011, institutes in the Division of Humanities and Social Sciences produced around 40 books published by domestic and international publishers, such as *Ruling All under Heaven with Filial Piety: The Xiaojing in Late Imperial China* (Taipei: Academia Sinica & Linking Publishing Company), *The Unfolding of a Complicated New World* (Taipei: Institute of Chinese Literature & Philosophy, Academia Sinica), *The Future of United States, China, and Taiwan Relations* (New York: Palgrave Macmillan), *L'anthropologie française entre sciences coloniales et décolonisation (1880-1960)* (Paris: Publications de la SFHOM), and *Chiang Kai-shek: Between Friend and Foe* (Tokyo: Takeda Random House Japan Co., Ltd.)

### Number of papers published by Academia Sinica over last 20 years



Source: WOS, accessed MAR 2012

### 5-Year Running Average Cites of Universities and Research Institutions in Asia, 1991-2011



Source: WOS, assessed APR 2012

## Intellectual Property Management and Technology Transfer

Academia Sinica attempts to benefit society through its outstanding research achievements. The Office of Public Affairs is responsible for protecting and managing Academia Sinica's intellectual property rights, encouraging the disclosure of new discoveries, developing partnerships and collaborations with private sectors, and promoting technology transfer. In 2011, Academia Sinica filed 88 patent applications, was granted 53 patents, and signed 74 licenses as well as 22 cooperative research and development agreements (CRADA). The licensing cases have reached 601 in the past 14 years. By technology transfer, Academia Sinica has assisted the establishment of start-up companies and provided them with crucial support for the commercialization and development of research outcomes of Academia Sinica with the goal of improving the development of Taiwan's industry and its international competitiveness.

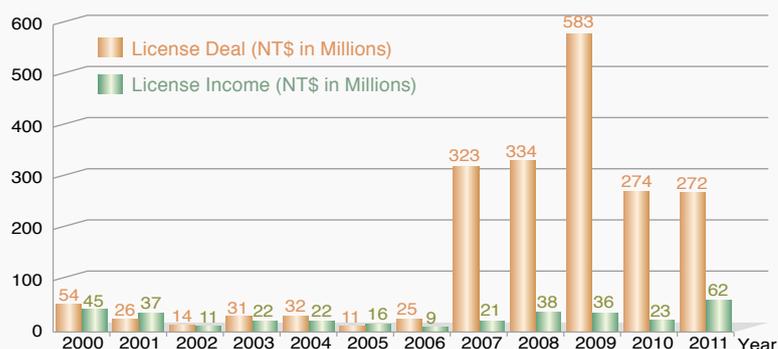
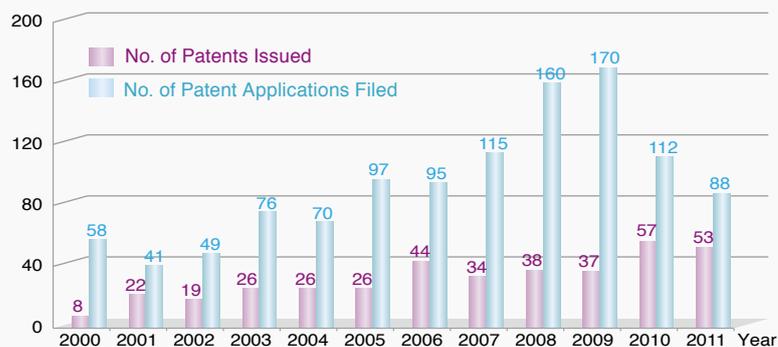
### License Agreements Executed in 2011

- Fish Oral Vaccine Technology of Bio-Encapsulated and Recombinant DNA Technology
- C2/M-Structured Cathode Material for Lithium-Ion Battery
- Anti c-Met Monoclonal Antibody scFv Fragment
- Virus Free Seeding of *Bambusa oldhamii* and *Dendrocalamus latiflorus*
- Anti-Dengue Virus Antibody DB16-1
- Cellular and Animal Models for Androgen-Stimulation on Benign Prostatic Hyperplasia (BPH) as Tools for Preclinical Study
- Development and Commercialization Rights for Anti-CεmX Antibodies
- "All-in-One" Multiple Function Mass Spectrometry
- Cooperation of Baculovirus Enhancer hr and Trans-Activators IE1 and IE2 for Promoter Stimulation in Mammalian Cells
- Astigmatic Detection System for Optical Profiler Application

### Intellectual Property Rights and Technology Transfer in 2011

Patent Applications Filed	88
Patents Issued	53 (25) *
License Executed	74
Licensing Deal (NT\$ in Millions)	272
Licensing Revenue (NT\$ in Millions)	62
Royalties(NT\$ in Millions)	8.7
CRADA Executed	22
CRADA Grant (NT\$ in Millions)	54

( ) \* Cases of US patents



## Awards and Honors

The outstanding academic competitiveness of Academia Sinica is demonstrated by the range of prestigious honors and prizes bestowed upon its researchers. In 2011, many researchers of Academia Sinica received important international honors and awards. For example, Yuan Tseh Lee was conferred the Ettore Majorana-Erice-Science for Peace Prize, the Kotos Medal and the Maria Skłodowska-Curie Medal; Maw-Kuen Wu was awarded the Nikkei Asia Prize; Many Academia Sinica researchers have also been recognized for their stellar research accomplishments through domestic awards and honors. For example, Chen-Yang Shen received the Wang Ming-Ning Award; Pei-Wen Hsiao received the National Innovation Award from the Institute for Biotechnology and Medical Industry. Many researchers were also recipients of the National Science Council awards: In the past five years, 42 Academia Sinica researchers were conferred the Outstanding Research Award, 13 won the Merit Research Fellow Award and 21 researchers were presented with the Ta-You Wu Memorial Award.

### List of Awards and Honors bestowed on Academia Sinica Researchers in 2011

#### International

Awards and Honors	Academia Sinica Researchers
Ettore Majorana-Erice-Science for Peace Prize	Yuan Tseh Lee
Humboldt-Forschungspreis	Kopin Liu
Kotos Medal	Yuan Tseh Lee
Maria Skłodowska-Curie Medal	Yuan Tseh Lee
TWAS Prize	Shun-Jen Cheng
TWAS Young Affiliate	Keng-Hui Lin
Stephen C. Soong Translation Studies Memorial Award	Sher-Shiueh Li
Nikkei Asia Prize	Maw-Kuen Wu
Senior Fulbright Research Grant	Tyng-Ruey Chuang, Yuju Lin
Harvard-Yenching Visiting Scholars Program	Ku-Ming Chang
Heritage Prize, Li Foundation	Hsueh-Chi Sherry Yen
Elinor Ostrom Prize	Fang-Yi Chiou
Distinguished Alumni Award, The Pennsylvania State University	Ovid J.-L. Tzeng
Prix Luc Durand-Reville	Li-Chuan Tai

#### Domestic

Awards and Honors	Academia Sinica Researchers
Ta-You Wu Memorial Award, National Science Council	Peng-Hsiang Wang, Shiann-Jong Lee, Pi-Chen Liu
Outstanding Research Award, National Science Council	Han-Chung Wu, Chin-Tao Wu, Chia Chou, Sher-Shiueh Lee, Jen-Der Lee, Shun-Jen Cheng, Chun-Hsien Yeh, Hanna S. Yuan, Chao-Ping Hsu, Tzzy-Jen Chiou, Shu-Peng Hwang
Merit Research Fellow Award, National Science Council	Hsien-Kuei Hwang
Academic Award, Ministry of Education	Shun-Jen Cheng, Alice Lin-Tsing Yu
National Innovation Award, Institute for Biotechnology and Medical Industry	Pei-Wen Hsiao
Award for Junior Research Investigator, Academia Sinica	Keiichi Umetsu, Wei-Bin Su, Fang-Yi Chiou, Shu-Peng Hwang, Shao-Hua Liu
Prize for Achievement in Forestry and Nature Conservation	Kwang-Tsao Shao
TienTe Lee Biomedical Award	Che Alex Ma
Exploration Research Award of Pan Wen Yuan Foundation	Mi-Yen Yeh
Wang Ming-Ning Award	Chen-Yang Shen
Lecture in Honor of Former President Hu Shih	Paul R. Katz
Broadcast Golden Bell Awards	Ovid J.-L. Tzeng



Academician Yuan Tseh Lee was bestowed the Kotos Medal & Maria Skłodowska-Curie Medal by the University of Warsaw and the Polish Chemical Society (Photo by Adam Myslinski, University of Warsaw).



The Junior Research Investigator Award of Academia Sinica acknowledges 15 junior researchers every year for their outstanding research and contribution in their related fields.



Pei-Wen Hsiao received the National Innovation Award from the Institute for Biotechnology and Medical Industry in recognition of his research in extract of *wedelia chinensis* in inhibiting androgen-regulated disease and using virus-like particles (VLPs) as a platform to develop VLP-based vaccines.



Che Alex Ma, Associate Research Fellow of Genomic Research Center is awarded the Young Scientist Award by the TienTe Lee Biomedical Foundation for his research in structure of membrane protein in drug discovery.

# Selected Abstracts of Significant Publications

In 2011, Academia Sinica had more than 4,200 scientific publications including journal articles, books and proceedings papers. Among them, 2,075 papers have been listed in SCI, SSCI and A&HCI, with an average of 2.5 papers per researcher. This current issue of research achievements highlights a selection of 56 key papers or books published in the last twelve months, covering a wide range of topics presented by each of the following divisions: Mathematics and Physical Sciences, Life Sciences, and Humanities and Social Sciences.

The Division of Mathematics and Physical Sciences is currently comprised of eight institutes and three research centers. The division's researchers published an average of 4.2 papers listed in SCI, SSCI and A&HCI in 2011. The total number of journal articles, books and proceedings papers has amounted to around 1,600, with an average of 5.5 publications per researcher. Important results include enhanced thermoelectric power in dual-gated bilayer grapheme, steric control of the reaction of vibrationally excited methane with chlorine atom, an overall picture of the gas flow in a massive cluster-forming region, etc. Moreover, some new technologies have been developed to contribute to social and technological advancements; for example, functionalized arrays of Raman-enhancing nanoparticles for capture and culture-free analysis of bacteria, high throughput label-free biomolecular sensing, synthesis and measurement of ultrafast waveforms, heteroleptic ruthenium sensitizers for efficient dye-sensitized solar cells, efficient and flexible calculations for regional and global tomography applications, etc.

The Division of Life Sciences has five institutes and three research centers. In 2011, researchers in this division published an average of 3.4 papers listed in SCI, SSCI and A&HCI. The total number of journal articles, books and proceedings papers has amounted to around 900, with an average of 4.2 publications per researcher. On basic research, the researchers have made crucial contribution on the understanding of molecular and cellular functions, plant and animal physiology, and ecological interaction. In addition, the progress on translational research is significant. The major accomplishments include understanding the role of bacteria associated with an Encrusting sponge covering the corals, the global analysis of the *Phalaenopsis aphrodite* transcriptome, the feedback regulation of plants under sustained stress, the genes involved in regulation of calcium homeostasis, the regulatory pathways of autophagy and apoptosis, the *in vivo* tumor imaging by nanoparticles, the investigation on pharmacogenomics and personalized medicine, the molecular pathogenesis of dementia, the development of novel antibiotics, the synthesis of heparan sulfate octasaccharides as inhibitors of Simplex virus type 1, the resolution of protein structure and function, and the regulation of intracellular signaling pathways.

The Division of Humanities and Social Sciences is comprised of ten institutes, one preparatory office and one research center. In 2011, researchers in this division altogether produced over 1,600 publications including journal articles, books and proceedings papers. On average, each researcher had 5.1 publications. The researches of the members of the institutes and center cover a wide range of important issues in humanities and social sciences, including cultural traditions and reconstruction of Taiwanese aboriginals, democratization and social moments in Taiwan, cultures of piety and temple and socio-political management, culture and politics in Qing and republican China, Cross-strait relation and EU in the global age, trust, labor market and accumulation of capital. All these results either deepen scholarly inquiry in humanities and social sciences, or bear relevance for public policy decisions.

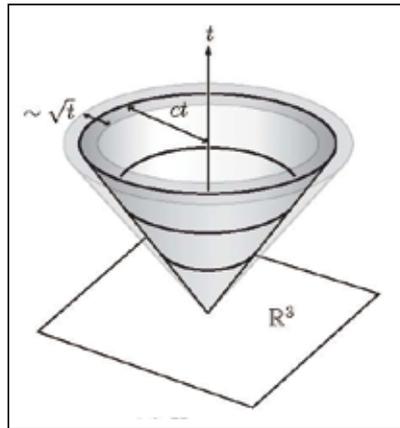
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## Solving Boltzmann Equation, Part I: Green's Function

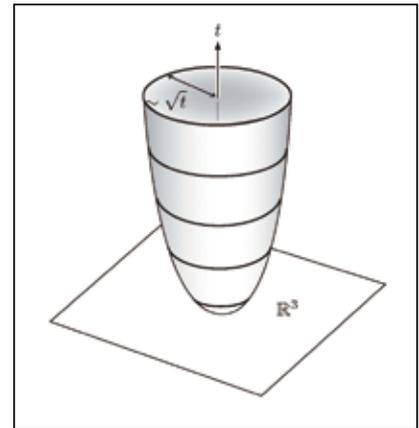
*Bulletin of the Institute of Mathematics, Academia Sinica (New Series) 6 (2011): 115-243.*

Tai-Ping Liu, Shih-Hsien Yu  
Institute of Mathematics

We present a comprehensive study of the Green's function for the Boltzmann equation in gas dynamics. The Green's function is constructed explicitly to consist of particle-like waves and fluid-like waves. For 3-dimensional case, the fluid-like waves contains the Huygens and Diffuse waves, see figures on the right:

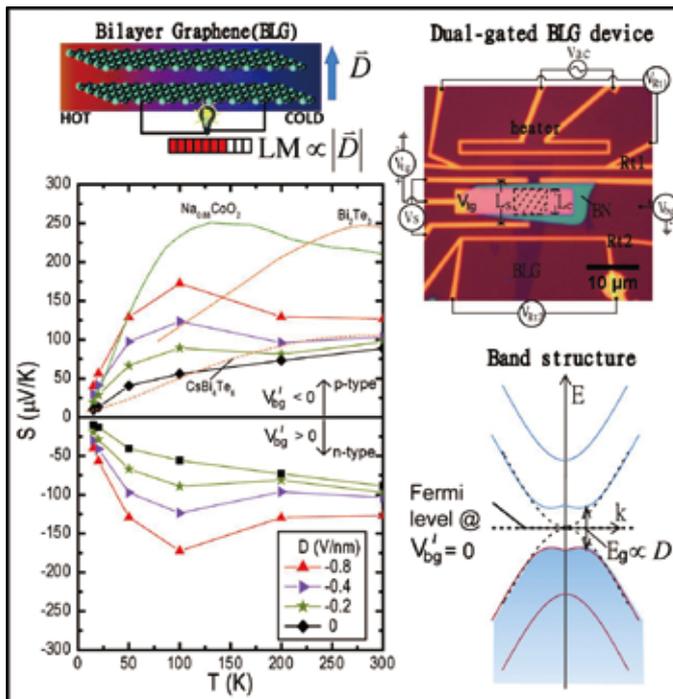


Huygens wave



Diffuse wave

## Enhanced Thermoelectric Power in Dual-Gated Bilayer Graphene



*Physical Review Letters 107 (2011): 186602.*

Chang-Ran Wang, Wen-Sen Lu, Lei Hao,  
Wei-Li Lee, Ting-Kuo Lee, Feng Lin, I-Chun Cheng, and  
Jian-Zhang Chen

Institute of Physics

The “field-effect thermoelectricity” is demonstrated for the first time in experiment. When applying a perpendicular electric field ( $D$ ) on a bilayer graphene, the thermoelectric power (TEP) can be amplified more than 4 folds while the carrier density remains the same. The value of TEP is comparable to or exceeding several known low temperature thermoelectric materials. The physical mechanism is rooted in the band-gap opening due to the inversion symmetry breaking by  $D$ , which largely increases the band curvature near the band edges. On the other hand, its polarity can be readily tuned by the gate voltage to be either electron-type or hole-type. Our results open up a new possibility in thermoelectric application using graphene-based device.

## High Throughput Label Free Biomolecular Sensing System

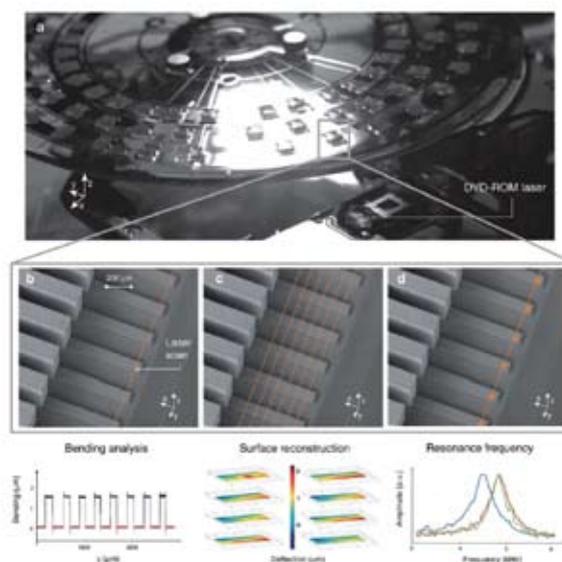
*Lab on a Chip* **11** (2011): 2411-2416.

Filippo G. Bosco, En-Te Hwu, Ching-Hsiu Chen, Stephan Keller, Michael Bache, Mogens H. Jakobsen, Ing-Shouh Hwang, and Anja Boisen

Institute of Physics

Micrometre sized cantilevers have been used for high resolution label free molecular recognition. The cantilever is typically functionalized with probe molecules designed to specifically bind certain target molecules in solution. The specific binding of target molecules causes the cantilever to deflect. Alternatively, the mass change of the cantilever can be monitored by measuring the resonant frequency change of the cantilever which is inversely proportional to the added mass. However, traditional beam deflection method can only measure 16 cantilevers in 30 minutes, which limits practical use of this sensing technique.

Research group of our institute have built up a high speed astigmatic detection system which can measure the motions of 500 cantilevers per second. When it is combined with the label free cantilever based bio-sensing technique (from Technical University in Denmark), the novel system offers a detection speed that is a thousand times faster than the traditional one. This high throughput bio-sensing system can be used for human diagnostics, security inspection, and environmental control.



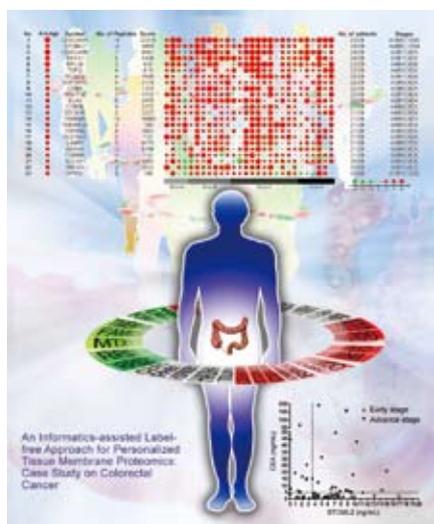
High throughput bio-sensing system (a) photo of the sensing system (b) bending measurement (c) 3D reconstruction (d) resonant frequency measurement.

## An Informatics-assisted Label-free Approach for Personalized Tissue Membrane Proteomics: Case Study on Colorectal Cancer

*Molecular & Cellular Proteomics* **10** (2011): 1–15.

Chia-Li Han, Jinn-Shiun Chen, Err-Cheng Chan, Chien-Peng Wu, Kun-Hsing Yu, Kuei-Tien Chen, Chih-Chiang Tsou, Chia-Feng Tsai, Chih-Wei Chien, Yung-Bin Kuo, Pei-Yi Lin, Jau-Song Yu, Chuen Hsueh, Min-Chi Chen, Chung-Chuan Chan, Yu-Sun Chang, and Yu-Ju Chen

Institute of Chemistry



*Mol. Cell. Proteomics*, **2011**, *10*, 1

Early cancer detection and effective personalized treatment is one of the most developing strategies for sustainable human health. We have devoted our efforts in developing new proteomic methodologies to identify abnormally expressed protein and post-translation modification in cancer. To search for cancer biomarker, a simple informatics-assisted label-free strategy was developed to facilitate the personalized membrane proteomic profiling of human tissues.

The model study on paired cancerous and adjacent normal tissues from CRC patients not only identified current clinical marker, CEA, but also discovered that STOML2 may be a noninvasive serological biomarker for early CRC diagnosis. The overall sensitivity of STOML2 for CRC detection was 71%, which increased to 87% when combined with CEA measurements. It is anticipated that this efficient strategy can be applied to other types of cancer in discovery-driven translational cancer research.

## Heteroleptic Ruthenium Sensitizers That Contain an Ancillary Bipyridine Ligand Tethered with Hydrocarbon Chains for Efficient Dye-Sensitized Solar Cells

*Chemistry-A European Journal* **17** (2011): 6781-6788.

Yung-Sheng Yen, Yung-Chung Chen, Ying-Chan Hsu, Hsien-Hsin Chou, Jiann T'suen Lin, and Da-Jong Yin

Institute of Chemistry

Our group has developed several series of organic dyes for high performance dye-sensitized solar cells. This paper describes new heteroleptic ruthenium complexes in which the ancillary bipyridine ligand is tethered with rigid aromatic segments containing hydrophobic hexyl substituents. Due to extended conjugation, the aromatic segments result in significant bathochromic shift and hyperchromic effect in the absorption spectra of these complexes when compared with **Z907** (note: **Z907** is one of the most stable ruthenium dyes when adsorbed on the TiO<sub>2</sub> surface). Dye-sensitized solar cells (DSSCs) based on the new dyes exhibit very impressive conversion efficiencies surpassing that of **Z907**-based and are comparable with that of **N719**-based standard cell. Appropriate interposed long hydrocarbon chains were found to induce more compact packing of the dyes and suppress the dark current. These dyes are potentially useful because of easy preparation of the ancillary ligands.

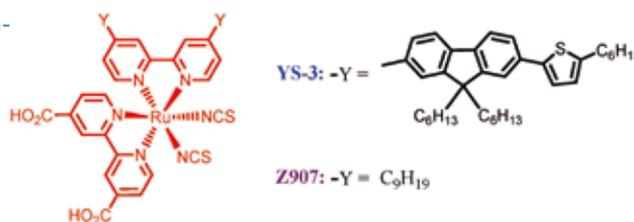


Figure 1. Structure of **YS-3** and **Z907**

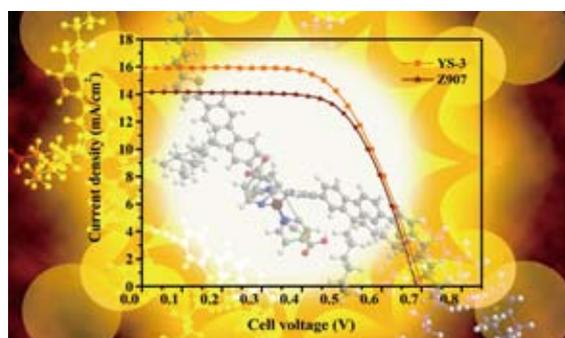


Figure 2. J-V curves of DSSCs based on YS-3 and Z907

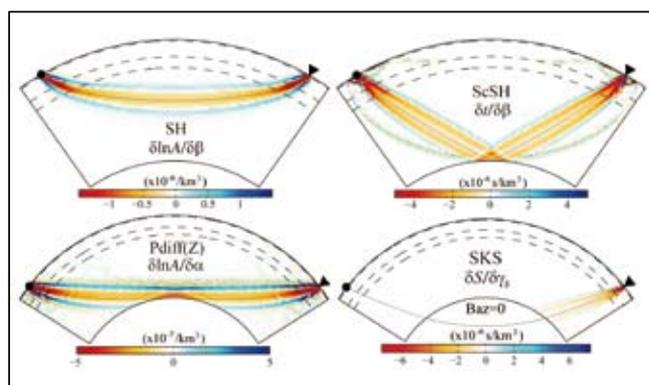
## An Efficient and Flexible Approach to the Calculation of Three-dimensional Full-wave Fréchet Kernels for Seismic Tomography: II—Numerical Results

*Geophysical Journal International* **185** (2011): 939-954.

Li Zhao, Sébastien Chevrot

Institute of Earth Sciences

Seismic tomography has been developed largely on the basis of the Born approximation, in which any waveform-derived seismic observable, such as a perturbation in the travel time of a seismic wave, is linearly related to the local perturbation of a model parameter, such as the speed of the wave. This linear relation defines a Fréchet kernel which can be expressed as the convolution of two strain Green tensors at the perturbation location, one from the source and the other from the receiver. In finite-frequency seismic tomography practices, tens of thousands of these Fréchet kernels must be calculated, which leads to an extremely high demand for computational efforts. A new approach has been developed in this study for computing the Fréchet kernels using pre-calculated databases of strain Green tensors. General expressions of Fréchet kernels in terms of the strain Green tensors are derived, which are then used to obtain specific expressions for the sensitivities of travel times and amplitudes of seismic waves to both isotropic and anisotropic perturbations of the elastic moduli. Fréchet kernels of the SKS-splitting intensity for anisotropic model parameters are also discussed in detail. Numerical examples of Fréchet kernels are presented for a variety of seismic phases to demonstrate the efficiency and flexibility of this new approach and its potential for both regional and global finite-frequency tomography applications.

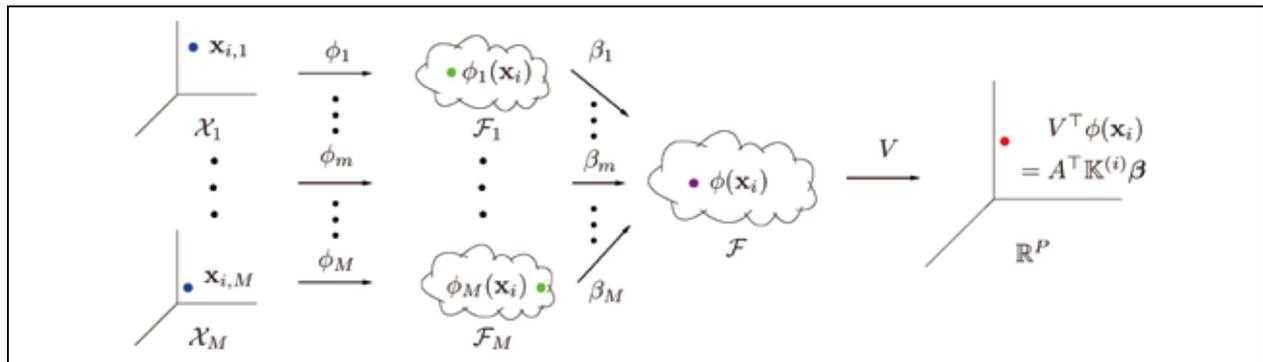


## Multiple Kernel Learning for Dimensionality Reduction

*IEEE Transactions on Pattern Analysis and Machine Intelligence* **33** (2011): 1147-1160.

Yen-Yu Lin, Tyng-Luh Liu, and Chiou-Shann Fuh  
 Institute of Information Science

In solving computer vision problems, adopting multiple descriptors to more precisely characterize the data has been a feasible way for improving performance. The resulting data representations are typically high dimensional and assume diverse forms. Thus finding a way to transform them into a unified space of lower dimension generally facilitates the underlying tasks, such as object recognition or clustering. To this end, the proposed approach (termed as MKL-DR) generalizes the framework of multiple kernel learning for dimensionality reduction, and introduces a new class of applications/techniques to address not only the supervised learning problems but also the unsupervised and semisupervised ones.

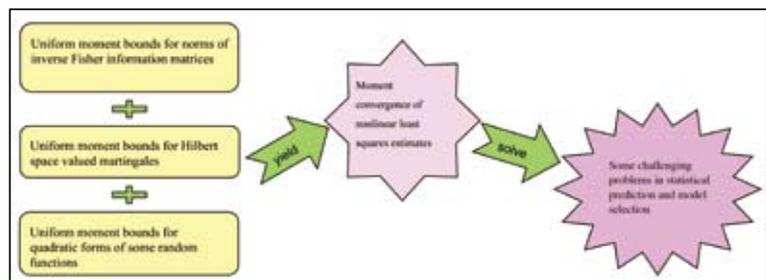


## Uniform Moment Bounds of Fisher's Information with Applications to Time Series

*Annals of Statistics* **39** (2011): 1526-1550.

Nagi Hang Chan and Ching-Kang Ing  
 Institute of Statistical Science

Investigations of the nonlinear least squares estimator (LSE) in (stochastic) regression models have a long history in statistics and probability. While fruitful results on its consistency and asymptotic normality have been obtained during the past several decades, see, e.g., Jenrich (1969), Wu (1981) and Lai (1994), relatively little is known about its moment properties. In particular, it is unclear whether the moments of the nonlinear LSE converge to the moments of its corresponding limiting distribution. Without this property, one can hardly calculate the estimator's mean squared error (MSE), and the mean squared prediction error (MSPE) of the corresponding (nonlinear) least squares predictor. Moreover, any model selection criterion is difficult to claim optimality from the MSPE point of view. Therefore, the lack of knowledge about the moment convergence of the nonlinear LSE can be viewed as a gap in the foundations of statistics. It took the authors several years to finally understand and establish the theoretical underpinnings of the desired moment convergence results which are: (i) uniform (over some parameter space) moment bounds for the inverses of Fisher's information matrices; (ii) uniform moment bounds for Hilbert space valued martingales; and (iii) uniform moment bound for quadratic forms of some random functions.



By making use of these theoretical tools, we derived the "first" moment convergence result of the nonlinear LSE in stochastic regression models. We also illustrated the usefulness of this result through time series models. Recently, we have also found the theoretical tools developed in this paper unexpectedly useful in dealing with model selection for spatial data and nonlinear time series data.

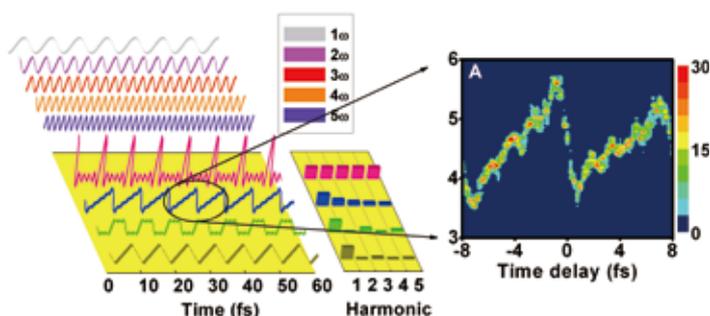
## Synthesis and Measurement of Ultrafast Waveforms from Five Discrete Optical Harmonics

*Science* **331** (2011): 1165-1168.

Han-Sung Chan, Zhi-Ming Hsieh, Wei-Hong Liang, A. H. Kung, Chao-Kuei Lee, Chien-Jen Lai, Ru-Pin Pan, and Lung-Han Peng

Institute of Atomic and Molecular Sciences

By manipulating the phase and amplitude of the harmonics of a laser beam instantaneous optical fields of various shapes are produced by Fourier synthesis. Example of waveforms synthesized include single-cycle cosine, saw tooth, square, and triangular shapes. For an input at 2406 nm, the time between adjacent peaks of the waveforms is  $\sim 8$  femtoseconds ( $8 \times 10^{-15}$  seconds). An all optical technique was developed to verify these shapes. These optical fields could be used to exercise full control of electron motion in matter in the nanometer and atomic scale.

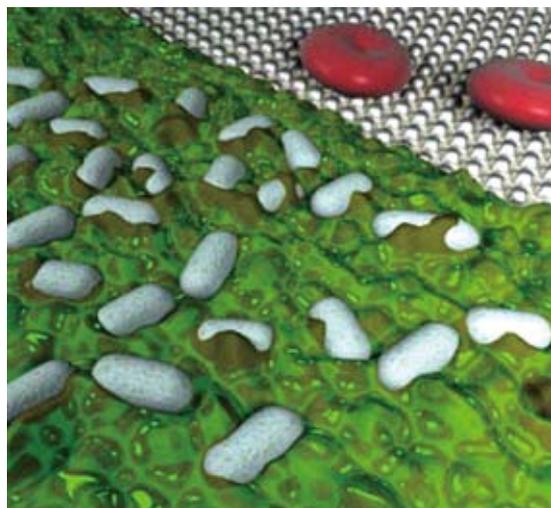


## Functionalized Arrays of Raman-enhancing Nanoparticles for Capture and Culture-free Analysis of Bacteria in Human Blood

*Nature Communications* **2** (2011): 538.

Ting-Yu Liu, Kun-Tong Tsai, Huai-Hsien Wang, Yu Chen, Yu-Hsuan Chen, Yuan-Chun Chao, Hsuan-Hao Chang, Chi-Hung Lin, Juen-Kai Wang, and Yuh-Lin Wang

Institute of Atomic and Molecular Sciences



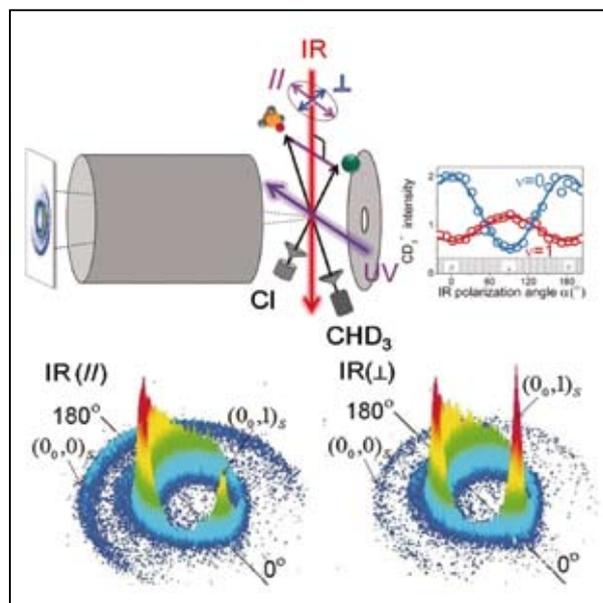
Detecting bacteria in clinical samples without using time-consuming culture processes would allow rapid diagnoses. Such a culture-free detection method requires the capture and analysis of bacteria from a body fluid, which are usually of complicated composition. Here we show that coating Ag-nanoparticle arrays with vancomycin (Van) can provide label-free analysis of bacteria via surface-enhanced Raman spectroscopy (SERS), leading to many folds of increase in bacteria capture, without introducing significant spectral interference. Bacteria from human blood can be concentrated onto a microscopic Van-coated area. Furthermore, a Van-coated substrate provides distinctly different SERS spectra of Van-susceptible and Van-resistant *Enterococcus*, indicating its potential use for drug-resistance tests. Our results represent a critical step towards the creation of SERS-based multifunctional biochips for rapid culture- and label-free detection and drug-resistant testing of microorganisms in clinical samples.

## Steric Control of the Reaction of CH Stretch-Excited CHD<sub>3</sub> with Chlorine Atom

*Science* **331** (2011): 900-903.

Fengyan Wang, Juisan Lin, and Kopin Liu  
Institute of Atomic and Molecular Sciences

Significant steric control was demonstrated in the chemical reaction of Cl atom with CH stretch-excited CHD<sub>3</sub> molecules. Compared to the analogous reactions of F and O atoms with CHD<sub>3</sub>, a conceptual framework is proposed that the feasibility of steric control will be governed by the tug-of-war between the initial directional preparation of the reactant and the reorientation effect exerted by the anisotropic interactions of the two reactants. Only for a reaction with weak re-steering effects, an active stereo-control could be effective.



Experimental setup and CD<sub>3</sub> product images detected as the function of the IR laser polarization direction.

## The Full Strength of Cluster Gravitational Lensing

*Astrophysical Journal* **729** (2011): 127-142.

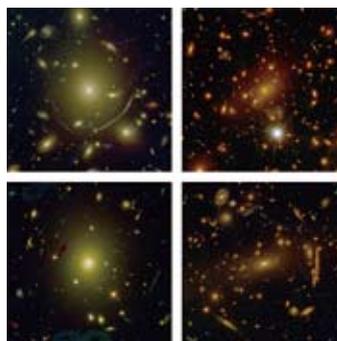
Keiichi Umetsu, Tom Broadhurst, Adi Zitrin, Elinor Medezinski, and Li-Yen Hsu  
Institute of Astronomy and Astrophysics

Clusters of galaxies are understood to be the most massive objects with extreme physical conditions ( $k_B T = 3-15$  keV,  $M = 10^{14}-10^{15} M_{\text{sun}}$ ) that have formed by gravitational instability from primordial density fluctuations in the Universe.

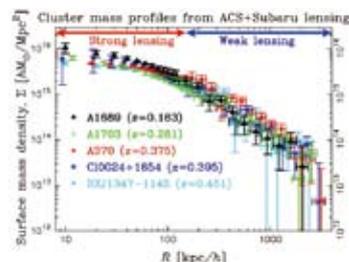
Clusters therefore contain a wealth of both astrophysical and cosmological information, related to the nature of dark matter and the emergence of cosmic structure over cosmic time.

Massive clusters can act as powerful gravitational lenses, bending the light from background sources and producing a variety of spectacular lensing phenomena, such as high flux amplification and multiple imaging in cluster cores (strong lensing), a small systematic distortion pattern of background galaxy images (weak lensing shear), and small characteristic variations in the number density of background galaxies (weak lensing magnification).

In the paper we have explored in greater depth the utility of high-quality lensing data for obtaining accurate cluster radial mass profiles, by combining all possible lensing information. To do this, we have developed a new Bayesian statistical method to construct model-independent cluster mass profiles over the full range of radius from an optimal combination of the complementary weak-lensing effects, namely shear and magnification. We applied this method to deep wide-field Subaru imaging of five high-mass clusters to recover their mass profiles. We show that the weak-lensing based profiles overlap well with independent, inner strong-lensing based profiles from high-resolution Hubble Space Telescope (HST) observations, and together are well described by the standard Navarro-Frenk-White form predicted for the family of cold-dark-matter dominated halos in gravitational equilibrium.



New HST images of the central regions of four massive clusters: (a) A383, (b) MACS1149, (c) A2261, (d) MACS1206. (M. Postman et al. 2012, *ApJS*, 199, 25.



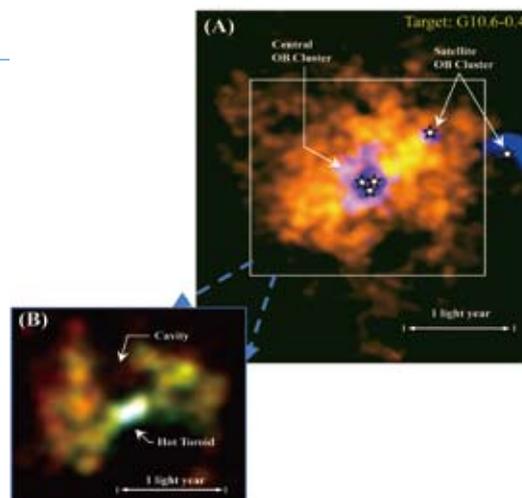
Full mass profiles for A1689 (triangles), A1703 (crosses), A370 (circles), Cl0024+17 (stars), and RXJ1347-11 (squares) over a wide range of radius, from  $10 \text{ kpc h}^{-1}$  to  $3000 \text{ kpc h}^{-1}$ , derived from HST strong-lensing ( $R < 150 \text{ kpc h}^{-1}$ ) and Subaru weak-lensing ( $R > 150 \text{ kpc h}^{-1}$ ) measurements, showing a continuously steepening radial trend out to and beyond the cluster virial radius ( $r_{\text{vir}} \sim 2 \text{ Mpc h}^{-1}$ ).

## An Overall Picture of the Gas Flow in a Massive Cluster-forming Region: The Case of G10.6-0.4

*Astrophysical Journal* **729** (2011): 100.

Huayu Baobab Liu, Qizhou Zhang, and Paul T. P. Ho  
Institute of Astronomy and Astrophysics

We used the Submillimeter Array (SMA) and the (Expanded) Very Large Array (VLA) to observe the selected rotational transitions of the CH<sub>3</sub>OH molecule and the CS molecule. The selected molecular line transitions are exclusively excited in high-density ( $>10^5$  n<sub>H2</sub>/cm<sup>3</sup>) environments. Our observations resolved the geometry and the kinematics of the OB cluster-forming massive molecular clump G10.6–0.4, which is deeply embedded in its parent giant molecular cloud, and is connected with molecular filaments exterior to this clump. We found that the overall geometry of this system resembles a scaled-up rotating-disk/contracting-envelope system in the well-known low-mass star forming model. In addition, we resolved the filamentary morphology of the massive molecular clump, which allows self-gravitational fragmentation and the subsequent local star formations to occur, within the short global-contraction timescale.



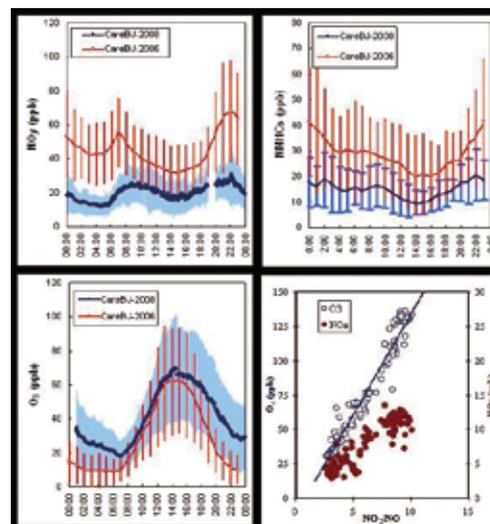
(A) The massive molecular clump traced by the CS 1-0 emission (Orange color;  $E_{up} \sim 2.4$  K), and the gas ionized by stellar radiation (blue color). (B) Three-color image showing the embedded warmer and denser gas traced by selected CH<sub>3</sub>OH transitions [R: CH<sub>3</sub>OH 5<sub>0,5</sub>-4<sub>0,4</sub> A+,  $E_{up} \sim 35$  K; G: the blended CH<sub>3</sub>OH 5<sub>2,4</sub>-4<sub>2,3</sub> E and 5<sub>2,3</sub>-4<sub>2,2</sub> E,  $E_{up} \sim 60$  K; B: CH<sub>3</sub>OH 5<sub>3,3</sub>-4<sub>3,2</sub> E,  $E_{up} \sim 97$  K].

## Photochemical Production of Ozone in Beijing during the 2008 Olympic Games

*Atmospheric Chemistry and Physics* **11** (2011): 9825–9837.

Charles C.-K. Chou, Chao-Yong Tsai, Chih-Chung Chang, Po-Hsiung Lin, Shaw C. Liu, and Tong Zhu  
Research Center for Environmental Changes

Field data from the CareBeijing-2006 and CareBeijing-2008 campaigns were analyzed to study the NO<sub>x</sub>-O<sub>3</sub> chemistry in Beijing, China. Investigation performed in the summer of 2006 found that the ozone production efficiency of NO<sub>x</sub> (OPE<sub>x</sub>) decreased hyperbolically with the morning peak level of NO<sub>x</sub> in Beijing. Accordingly, it was inferred that abatement in the emission of nitrogen oxides would not be effective towards reducing ozone concentrations in urban areas. This inference got validated in the 2008 campaign, when the emissions of primary air pollutants were reduced substantially for improving the air quality in Beijing during the Olympic Games. Observations showed that the averaged mixing ratio of O<sub>3</sub> in Beijing for August 2008 was higher than the campaign average of CareBeijing-2006 by 42%, whereas the levels of the total oxides of nitrogen (NO<sub>y</sub>) and non-methane-hydrocarbons (NMHCs) were reduced by 56 and 50 %, respectively. The contradictions between the reduction in precursors and the elevated O<sub>3</sub> levels were suggested being caused by the declined NO-O<sub>3</sub> titration and the shift in the photochemical regime.



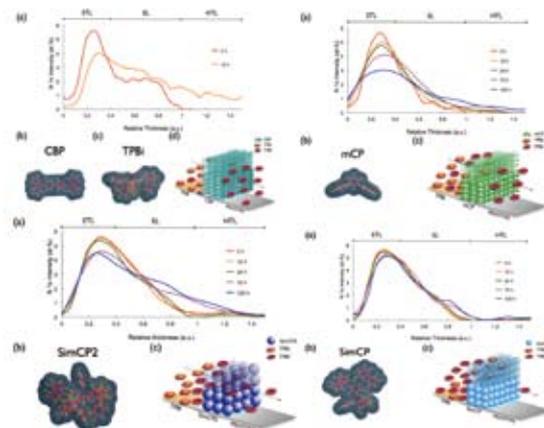
## Molecular Migration Behaviors in Organic Light-Emitting Diodes with Different Host Structures

*Organic Electronics* 12 (2011): 376-382.

Chi-Ping Liu, Wei-Ben Wang, Cheng-Wei Lin, Wei-Chun Lin, Chia-Yi Liu, Che-Hung Kuo, Szu-Hsian Lee, Wei-Lun Kao, Guo-Ji Yen, Yun-Wen You, Hsun-Yun Chang, Jwo-Huei Jou,\* and Jing-Jong Shyue\*

Research Center for Applied Sciences

Recently, it was observed that small molecules in organic light-emitting diodes (OLEDs) migrate toward the ITO anode and degrade its performance under a direct driving voltage while retaining their original structures. To prevent this bias-driven migration of small molecules, a chemical structure with a higher steric hindrance could be introduced as a blockade, thus molecular migration could be suppressed and the device half-life increased. In this work, OLED devices with different hosts, including CBP, mCP, SimCP2, and SimCP, with increasing steric hindrances are fabricated. The spatial distribution of the tracking molecules after operation for different lengths of time is examined by using X-ray photoelectron spectroscopy (XPS) with in situ high-energy C60+ and low-energy Ar+ co-sputtering for depth profiling. It is found that the bias-driven molecular migration is suppressed and the device half-life prolonged as the steric hindrance of the host increases.



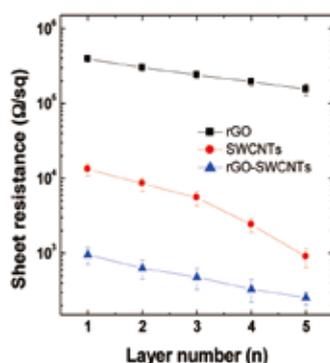
## Effective Work Function Modulation of Graphene/Carbon Nanotube Composite Films As Transparent Cathodes for Organic Optoelectronics

*ACS NANO* 5 (2011): 6262-6271.

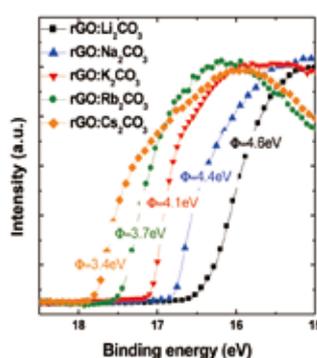
Jen-Hsien Huang, Jheng-Hao Fang, Chung-Chun Liu, Chih-Wei Chu

Research Center for Applied Sciences

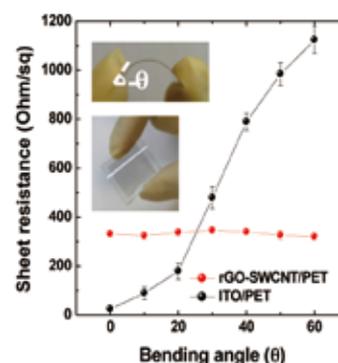
In this study, we developed highly conductive and transparent graphene-based electrodes with tunable work functions ( $\Phi_w$ ) by combining single walled carbon nanotubes with chemically reduced graphene. The  $\Phi_w$  of solution-processable, functional graphene/carbon nanotube-based transparent conductors were readily manipulated, varying between 5.1 and 3.4 eV, depending on the nature of the doping alkali carbonate salt. To our best knowledge, the work function of 3.4 eV is the lowest number for graphitic materials so far. This discovery potentially opens up a new route toward  $\Phi_w$ -tunable graphitic materials. To the alkaline doped carbon-based hybrid electrodes are readily employed as functional electrodes in inverted PVs exhibiting much-improved efficiencies. The ability to tailor the electrical properties of graphene-based transparent electrodes should boost the development of flexible and ITO-free optoelectronics.



Sheet resistances of rGO, SWCNTs, and the hybrid combination as a function of the number of layers.



UPS spectra of the rGO doped with various alkali carbonates.



Sheet resistances of rGO-SWCNT and ITO films on PET substrates, plotted with respect to the bending angle.

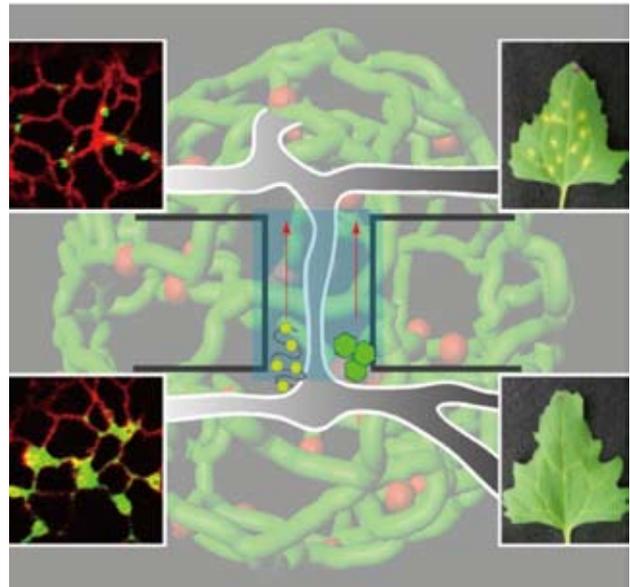
## A Plant Virus Hitches a Ride to Cross the Cell Boundary

*Journal of Cell Biology* **193** (2011): 521-535.

Chih-Hang Wu, Shu-Chuan Lee, and Chao-Wen Wang  
Institute of Plant and Microbial Biology

Spreading of *Potexvirus* through the plant intercellular junction plasmodesmata requires the triple-gene-block (TGB) proteins. TGBp3 is a small transmembrane protein featuring to target TGBp2 to and forms peripheral puncta in close proximity to the plasmodesmata. The nature and importance of the peripheral puncta; however, have long been a paradox.

Our group first established a yeast system that recapitulates targeting of TGBp2 by TGBp3 in the endoplasmic reticulum (ER). The yeast system sets the foundation for our further analyses to uncover a sorting signal present in TGBp3. This signal is necessary and sufficient for oligomerization and for targeting integral membrane proteins into puncta within curved ER tubules, and is crucial for viral pathogenesis. Thus, these findings support a model in which the sorting signal in TGBp3 drives its oligomerization to target infectious viral derivatives to cortical ER tubules for potexviral intercellular transmission.



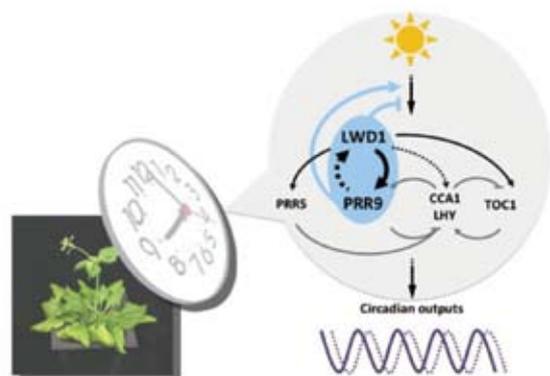
## The Discovery of a Positive Feedback Loop in Arabidopsis Circadian Clock

*The Plant Cell* **23** (2011): 486-498.

Ying Wang, Jing-Fen Wu, Norihito Nakamichi, Hitoshi Sakakibara, Hong-Gil Nam, and Shu-Hsing Wu  
Institute of Plant and Microbial Biology

The circadian clock in many organisms generates a ~24-h oscillation in biochemical, physiological, or behavioral processes to anticipate diurnal changes in the environment. The 24-h oscillation is generated by a negative feedback loop mechanism. A current model indicates that the Arabidopsis central oscillator is composed of several negative feedback loops. However, it remains unclear whether there exists additional forms of feedback loops in the central oscillator of Arabidopsis.

Our study indicated the presence of a positive feedback loop within the Arabidopsis circadian clock. LWD1 associated with the promoter of *PRR9* and directly activated its expression within this loop. LWD1's transcriptional activity also depended on functional *PRR9*. In contrast to the negative feedback loops' function in building 24-h oscillation, a positive feedback loop likely functions to stabilize the circadian system. The newly discovered positive feedback loop in the circadian system of Arabidopsis sheds new light on the future characterization of this complex network.



## Involvement of Calcitonin and Its Receptor in the Control of Calcium-Regulating Genes and Calcium Homeostasis in Zebrafish (*Danio rerio*)

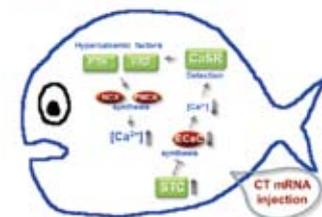
*Journal of Bone and Mineral Research* **26** (2011): 1072-1083.

Anne-Gaëlle Lafont, Yi-Fang Wang, Gen-Der Chen, Bo-Kai Liao, Yung-Che Tseng, Chang-Jen Huang, and Pung-Pung Hwang

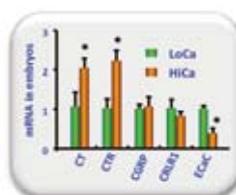
Institute of Cellular and Organismic Biology

Calcitonin (CT) is one of the hormones involved in vertebrate calcium regulation. It has been proposed to act as a hypocalcemic factor, but the regulatory pathways remain to be clarified. We investigated the CT/calcitonin gene-related peptide (CGRP) family in zebrafish and its potential involvement in calcium homeostasis. We identified the presence of four receptors: CTR, CRLR1, CRLR2, and CRLR3. From the phylogenetic analysis, together with the effect observed after CT and CGRP overexpression, we concluded that CTR appears to be a CT receptor and CRLR1 a CGRP receptor. The distribution of these two receptors shows a major presence in the central nervous system and in tissues involved in ionoregulation. Zebrafish embryos kept in high- $\text{Ca}^{2+}$ -concentration medium showed upregulation of CT and CTR expression and downregulation of the epithelial calcium channel (ECaC). Embryos injected with CT morpholino (CALC MO) incubated in high- $\text{Ca}^{2+}$  medium, showed downregulation of CTR together with upregulation on ECaC mRNA expression. In contrast, overexpression of CT cRNA induced the downregulation of ECaC mRNA synthesis, concomitant with the downregulation in the calcium content after 30 hours postfertilization. At 4 days postfertilization, CT cRNA injection induced upregulation of hypercalcemic factors, with subsequent increase in the calcium content.

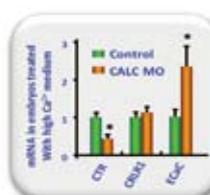
These results suggest that CT acts as a hypocalcemic factor in calcium regulation, probably through inhibition of ECaC synthesis.



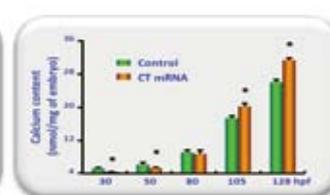
CT regulates expression and function of calcium transporters through interaction with other hormones.



High- $\text{Ca}^{2+}$  medium stimulated expression of CT and CTR.



Knockdown of CT suppressed CTR expression but stimulated ECaC expression.



Over expression of CT affected calcium content in zebrafish embryos.

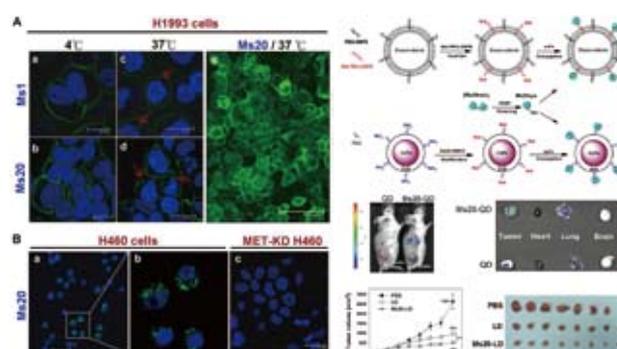
## Single Chain Anti-c-Met Antibody Conjugated Nanoparticles for *in Vivo* Tumor Targeting and Imaging

*Biomaterials* **32** (2011): 3265-3274.

Ruei-Min Lu, Yu-Ling Chang, Min-Shan Chen, and Han-Chung Wu

Institute of Cellular and Organismic Biology

Aberrantly expressed c-Met, the receptor for hepatocyte growth factor, has been implicated in human lung cancer as well as malignancy, metastasis and drug-resistance in other human cancers. Thus, this molecule could potentially be a target for antibody-based cancer therapy. Here, we utilized phage display to identify human single chain variable fragment (scFv) antibodies that specifically bind to c-Met protein. One anti-c-Met scFv strongly inhibited HGF to bind and activate c-Met. Conjugation of anti-c-Met scFv with liposomes enabled the efficient delivery of doxorubicin into the cancer cells where it subsequently exerted cytotoxic activity. *In vivo* fluorescent imaging assay by scFv-conjugated quantum dots demonstrated the potential clinical use of this scFv in tumor imaging. The use of targeted liposomes via anti-c-Met scFv made chemotherapeutic drugs significantly more efficacious than nontargeted liposomes in the treatment of human lung cancer xenografts. Taken together, our results suggest that anti-c-Met scFvs show great promise for their applications in tumor-targeted drug delivery and imaging (Wu et al., US patent filed 2010; Lu et al., *Biomaterials* 2011). Academia Sinica has out-licensing this patent to a biotechnology company for anti-cancer drug development.



Analysis of anti-c-Met scFv internalization in human lung cancer cells using confocal microscopy.

Anti-c-Met scFv conjugated nanoparticles were used in tumor imaging *in vivo* and improved therapeutic efficacy of antitumor drug.

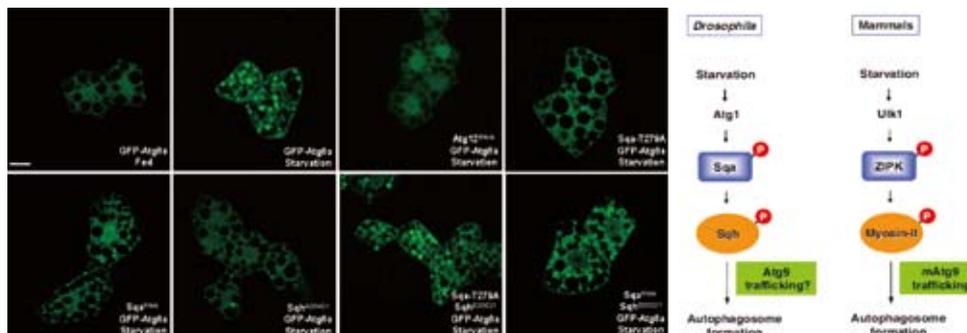
## Atg1-mediated Myosin II Activation Regulates Autophagosome Formation during Starvation-induced Autophagy

*The EMBO Journal* **30** (2011): 636-651.

Hong-Wen Tang, Yu-Bao Wang, Shiu-Lan Wang, Mei-Hsuan Wu, Shu-Yu Lin, and Guang-Chao Chen

Institute of Biological Chemistry

Autophagy is a membrane-mediated degradation process of macromolecule recycling. Although the formation of double-membrane degradation vesicles (autophagosomes) is known to have a central role in autophagy, the mechanism underlying this process remains elusive. The serine/threonine kinase Atg1 has a key role in the induction of autophagy. In this study, we show that overexpression of *Drosophila* Atg1 promotes the phosphorylation-dependent activation of the actin-associated motor protein myosin II. A novel myosin light chain kinase (MLCK)-like protein, Spaghetti-squash activator (Sqa), was identified as a link between Atg1 and actomyosin activation. Sqa interacts with Atg1 through its kinase domain and is a substrate of Atg1. Significantly, myosin II inhibition or depletion of Sqa compromised the formation of autophagosomes under starvation conditions. In mammalian cells, we found that the Sqa mammalian homologue zipper-interacting protein kinase (ZIPK) and myosin II had a critical role in the regulation of starvation-induced autophagy and mammalian Atg9 (mAtg9) trafficking when cells were deprived of nutrients. Our findings provide evidence of a link between Atg1 and the control of Atg9-mediated autophagosome formation through the myosin II motor.



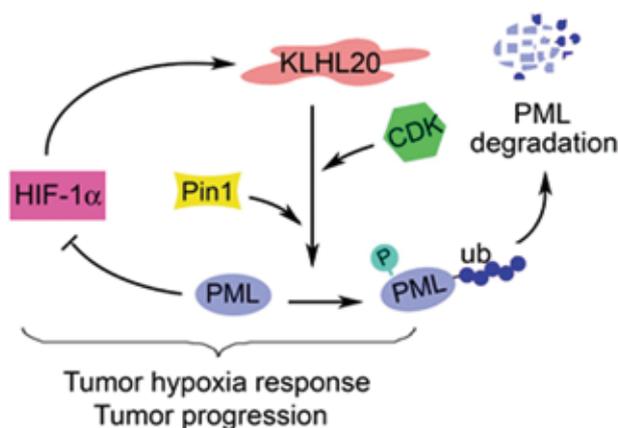
## A Cullin3-KLHL20 Ubiquitin Ligase-Dependent Pathway Targets PML to Potentiate HIF-1 Signaling and Prostate Cancer Progression

*Cancer Cell* **20** (2011): 214-228.

Yuan WC, Lee YR, Huang SF, Lin YM, Chen TY, Chung HC, Tsai CH, Chen HY, Chiang CT, Lai CK, Lu LT, Chen CH, Gu DL, Pu YS, Jou YS, Lu KP, Hsiao PW, Shih HM, and Chen RH

Institute of Biological Chemistry

Tumor hypoxia is associated with disease progression and treatment failure, but the hypoxia signaling mechanisms are not fully understood. Here, we show that KLHL20, a Cullin3 (Cul3) substrate adaptor induced by HIF-1, coordinates with the actions of CDK1/2 and Pin1 to mediate hypoxia-induced PML proteasomal degradation. Furthermore, this PML destruction pathway participates in a feedback mechanism to maximize HIF-1 $\alpha$  induction, thereby potentiating multiple tumor hypoxia responses, including metabolic reprogramming, epithelial mesenchymal transition, migration, tumor growth, angiogenesis, and chemoresistance. In human prostate cancer, overexpression of HIF-1 $\alpha$ , KLHL20, and Pin1 correlates with PML down-regulation, and hyperactivation of the PML destruction pathway is associated with disease progression. Our study indicates that the KLHL20-mediated PML degradation and HIF-1 $\alpha$  autoregulation play key roles in tumor progression.



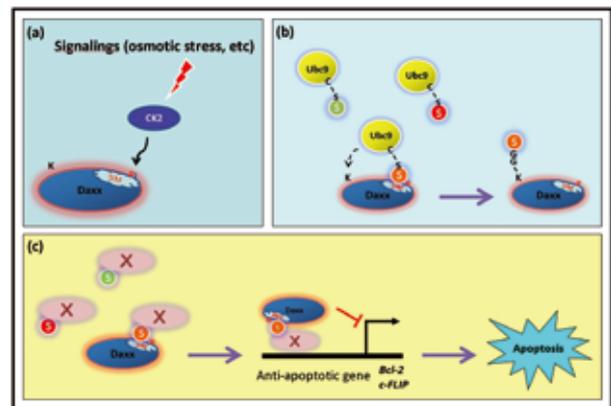
## Structural and Functional Roles of Daxx SIM Phosphorylation in SUMO Paralog-Selective Binding and Apoptosis Modulation

*Molecular Cell* 42 (2011): 62-74.

Che-Chang Chang, Mandar T. Naik, Yen-Sung Huang, Jen-Chong Jeng, Pei-Hsin Liao, Hong-Yi Kuo, Chun-Chen Ho, Yung-Lin Hsieh, Chiou-Hong Lin, Nai-Jia Huang, Nandita M. Naik, Camy C.-H. Kung, Shu-Yu Lin, Ruey-Hwa Chen, Kun-Sang Chang, Tai-Huang Huang, and Hsiu-Ming Shih

Institute of Biomedical Sciences

Daxx is a signaling molecule in apoptotic pathway and also acts as a transcriptional corepressor. This study described the structural basis of Daxx SUMO-interacting motif (SIM) in complex with SUMO-1 and the molecular details of how phosphorylation of the SIM motif enhances Daxx selective binding toward SUMO-1 (orange) over SUMO-2/3 (red and green). (a) Upon the stress stimulation, the Daxx SIM can be phosphorylated by Casein kinase II (CK2). (b) Phosphorylation increases the SUMO-1 binding affinity of Daxx SIM and enhances Daxx SUMO-1 conjugation. (c) Phosphorylation also facilitates Daxx to bind to SUMO-1-conjugated transcription factors and further suppress the anti-apoptotic gene expression such as *c-FLIP* and *Bcl-2*, sensitizing cells in response to stress-induced apoptosis. These findings not only provide a previously undescribed paradigm for regulation of protein sumoylation, in which sumoylation is modulated by SIM phosphorylation but also elucidate a role of Daxx in stress-induced apoptosis via its SIM phosphorylation.



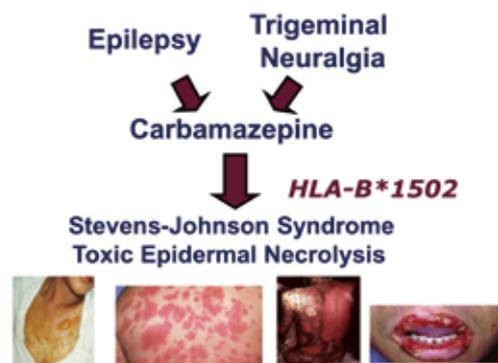
## Carbamazepine-Induced Toxic Effects and HLA-B\*1502 Screening in Taiwan

*New England Journal of Medicine* 364 (2011): 1126-1133.

Pei Chen, Juei-Jueng Lin, Chin-Song Lu, Cheung-Ter Ong, Peiyuan F. Hsieh, Chih-Chao Yang, Chih-Ta Tai, Shey-Lin Wu, Cheng-Hsien Lu, Yung-Chu Hsu, Hsiang-Yu Yu, Long-Sun Ro, Chung-Ta Lu, Chun-Che Chu, Jing-Jane Tsai, Yu-Hsiang Su, Sheng-Hsing Lan, Sheng-Feng Sung, Shu-Yi Lin, Hui-Ping Chuang, Li-Chen Huang, Ying-Ju Chen, Pei-Joung Tsai, Hung-Ting Liao, Yu-Hsuan Lin, Chien-Hsiun Chen, Wen-Hung Chung, Shuen-Iu Hung, Jer-Yuarn Wu, Chi-Feng Chang, Luke Chen, Yuan-Tsong Chen, and Chen-Yang Shen, for the Taiwan SJS Consortium\*

Institute of Biomedical Sciences

Stevens-Johnson Syndrome (SJS) and its related disease-Toxic Epidermal Necrolysis (TEN) are the two most serious adverse reactions with high mortality caused by drugs. Carbamazepine (CBZ), a very popular anticonvulsant and specific analgesic for trigeminal neuralgia, is the commonest cause of SJS/TEN in Southeast Asian countries. Our Institute has previously reported that CBZ-induced SJS/TEN is strongly associated with specific genotype, i.e. HLA-B\*1502, in Han Chinese. Based on this, a large prospective study was conducted in hospitals to prevent CBZ-SJS/TEN by identifying patients at-risk carrying the HLA-B\*1502. This study enrolled 5,000 patients, who had been prescribed CBZ and undergone prospective HLA-B\*1502 screening. It clearly demonstrates that, after exclusion of patients carrying the HLA-B\*1502 from CBZ treatment, no SJS/TEN cases were seen among all participants. This illustrates remarkable capability of HLA-B\*1502 screening to prevent SJS/TEN among CBZ users. This study suggests that personalized medicine can be extremely useful in the right clinical settings.



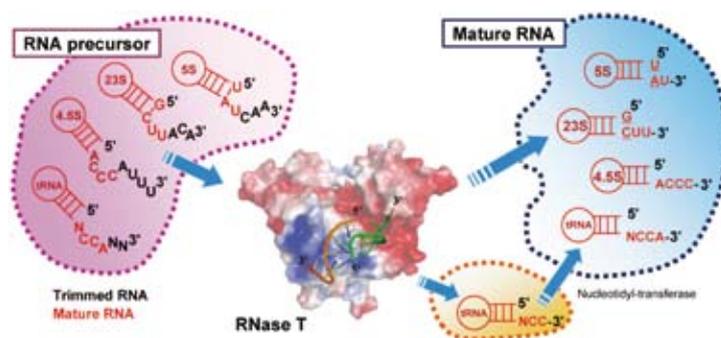
## Structural Basis for RNA Trimming by RNase T in Stable RNA 3'-end Maturation

*Nature Chemical Biology* 7 (2011): 236-243.

Y.Y. Hsiao, C.C. Yang, C.L. Lin, J.L.J. Lin, Y Duh, and H.S. Yuan

Institute of Molecular Biology

RNA maturation relies on various exonucleases to remove nucleotides successively from the 5'- or 3'-end of nucleic acids. However, little is known regarding the molecular basis for substrate selection and cleavage preference of exonucleases. Using RNase T as a model system, we dissect the structural basis of its substrate specificity and derive the general principles of the final 3'-end trimming process made by RNase T in stable RNA maturation. These results provide a working mechanism for the DEDD family exonucleases, dysfunction of some these enzymes linking directly to human diseases.



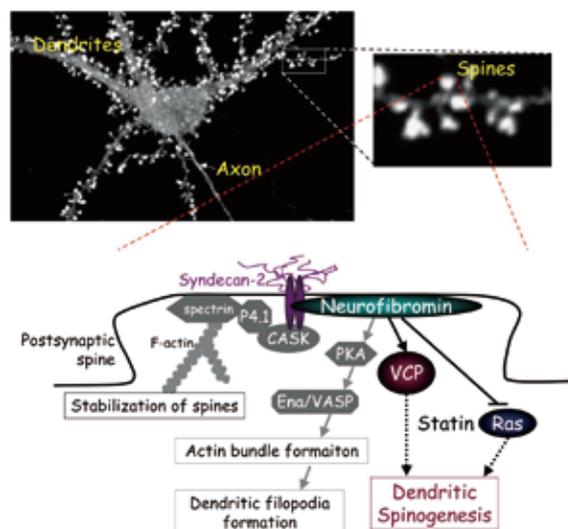
## Valosin-containing Protein and Neurofibromin Interact to Regulate Dendritic Spine Density

*The Journal of Clinical Investigation* 121 (2011): 4820-4837.

Hsiao-Fang Wang, Yu-Tzu Shih, Chiung-Ya Chen, Hsu-Wen Chao, Ming-Jen Lee, and Yi-Ping Hsueh

Institute of Molecular Biology

Inclusion body myopathy with Paget's disease of bone and frontotemporal dementia (IBMPFD) is an autosomal dominant disorder characterized by progressive myopathy that is often accompanied by bone weakening and/or frontotemporal dementia. Although known to be caused by mutations in the gene encoding valosin-containing protein (VCP), the underlying disease mechanism remains elusive. Like IBMPFD, neurofibromatosis type I (NF1) is an autosomal dominant disorder. Neurofibromin, the protein encoded by the *NF1* gene, has been shown to regulate synaptogenesis. In this study, we show that neurofibromin and VCP interact and work together to control the density of dendritic spines. Certain mutations identified in IBMPFD and NF1 patients reduced the interaction between VCP and neurofibromin and impaired spinogenesis. The functions of neurofibromin and VCP in spinogenesis were shown to correlate with the learning disability and dementia phenotypes seen in patients with IBMPFD. Consistent with the previous finding that treatment with a statin rescues behavioral defects in *NF1*<sup>+/-</sup> mice and providing further support for our hypothesis that there is a crosstalk between neurofibromin and VCP, statin exposure neutralized the effect of VCP knockdown on spinogenesis in cultured hippocampal neurons. The data presented here demonstrate that there is a link between IBMPFD and NF1 and indicate a role for VCP in synapse formation.



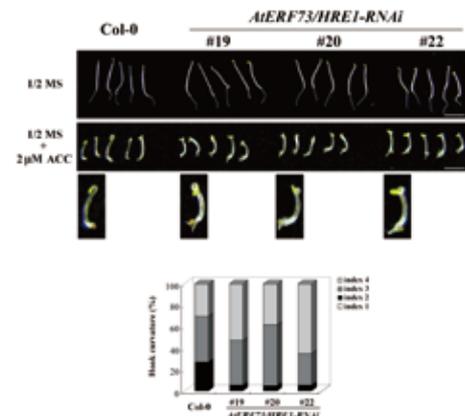
Dendritic spines are the locations of excitatory synapses of neurons in mammalian central nervous system. Our study shows that neurofibromin receives the signal from heparan sulfate proteoglycan syndecan-2 and controls dendritic spinogenesis through several pathways; VCP is one of them. The finding explains why mutations in VCP gene results in dementia.

## The AP2/ERF Transcription Factor AtERF73/HRE1 Modulates Ethylene Responses during Hypoxia in Arabidopsis

*Plant Physiology* 156 (2011): 202-212.

Ching-Ying Yang, Fu-Chiun Hsu, and Ming-Che Shih  
Agricultural Biotechnology Research Center

We report the characterization of the *AtERF73/HRE1* gene that is specifically induced during hypoxia. We show that a combination of hypoxia and ACC results in hyper-induction of *AtERF73/HRE1* expression. Our results suggest that, in addition to ethylene, an ethylene-independent signal is also required to mediate hypoxic induction of *AtERF73/HRE1*. We showed that hypoxia-inducible genes could be affected by *AtERF73/HRE1*-RNAi lines in two different ways: hypoxic induction of glycolytic and fermentative genes was reduced, whereas induction of a number of peroxidase and cytochrome P450 genes was increased. Taken together, our results show that *AtERF73/HRE1* is involved in modulating ethylene responses under both normoxia and hypoxia.



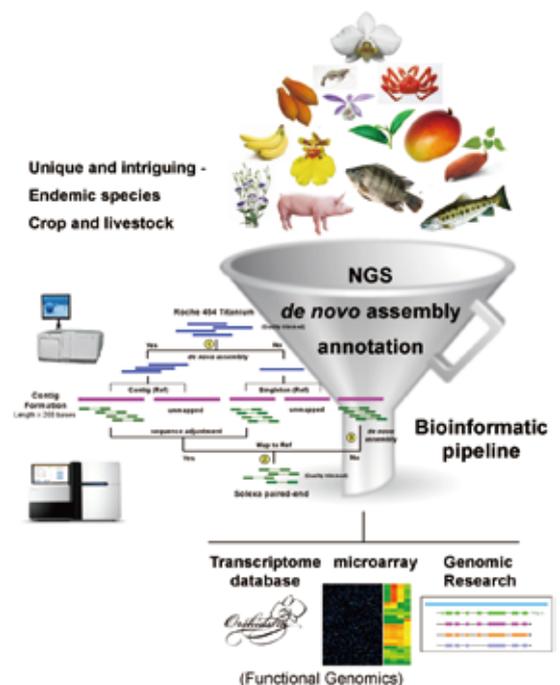
Effect of ethylene on the apical hook curvature in *AtERF73/HRE1*-RNAi lines.

## De Novo Assembly of Expressed Transcripts and Global Analysis of the *Phalaenopsis aphrodite* Transcriptome

*Plant and Cell Physiology* 52 (2011): 1501-1514.

Chun-lin Su, Ya-Ting Chao, Yao-Chien Alex Chang, Wan-Chieh Chen, Chun-Yi Chen, Ann-Ying Lee, Kee Tuan Hwa, and Ming-Che Shih  
Agricultural Biotechnology Research Center

Applying next generation sequencing technique to plant functional genomic studies, we have developed a Bioinformatic strategy to analyze large volume of sequence data without prior knowledge of genomic information. This process was first applied to the transcriptome analysis of *Phalaenopsis aphrodite*, a Taiwan native moth orchid. Genomic information of orchids is rather limited regardless of their unique and interesting biological features as well as high market value, thus impeding advanced molecular research. Sequencing output from two platforms, Roche 454 and Illumina/Solexa, was integrated in order to maximize assembly efficiency. We also designed an effective workflow of gene annotation followed by construction of a database, Orchidstra (<http://orchidstra.abrc.sinica.edu.tw>). The Orchidstra database provides a foundation for further functional studies such as design of an orchid specialized microarray chip. With proper *de novo* assembly and annotation process, transcriptome information can be enriched to facilitate gene discovery, functional annotation and expression profiling of other non-model organisms.



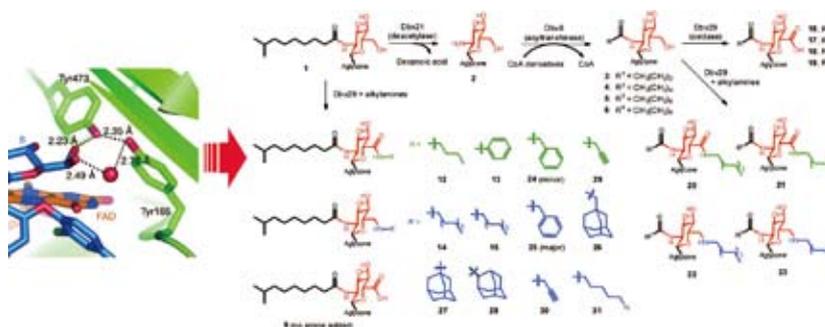
## Interception of Teicoplanin Oxidation Intermediates Yields New Antimicrobial Scaffolds

*Nature Chemical Biology* 7 (2011): 304-309.

Yu-Chen Liu, Yi-Shan Li, Syue-Yi Lyu, Li-Jen Hsu, Yu-Hou Chen, Yu-Ting Huang, Hsiu-Chien Chan, Chuen-Jiuan Huang, Gan-Hong Chen, Chia-Cheng Chou, Ming-Daw Tsai, and Tsung-Lin Li\*

Genomics Research Center

In the search for new efficacious antibiotics, biosynthetic engineering offers attractive opportunities to introduce minor alterations to antibiotic structures that may overcome resistance. Dbv29, a flavin-containing oxidase, catalyzes the four-electron oxidation of a vancomycin-like glycopeptide to yield A40926. Structural and biochemical examination of Dbv29 now provides insights into residues that govern flavinylation and activity, protein conformation and reaction mechanism. In particular, the serendipitous discovery of a reaction intermediate in the crystal structure led us to identify an unexpected opportunity to intercept the normal enzyme mechanism at two different points to create new teicoplanin analogs. Using this method, we synthesized families of antibiotic analogs with amidated and aminated lipid chains, some of which showed marked potency and efficacy against multidrug resistant pathogens. This method offers a new strategy for the development of chemical diversity to combat antibacterial resistance.



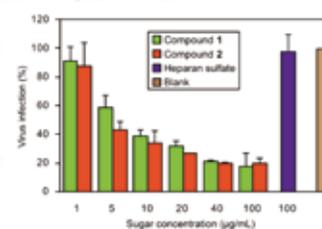
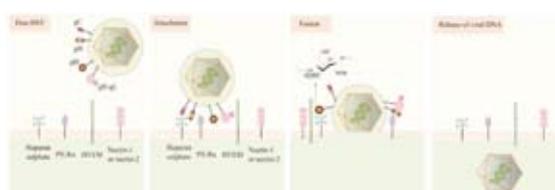
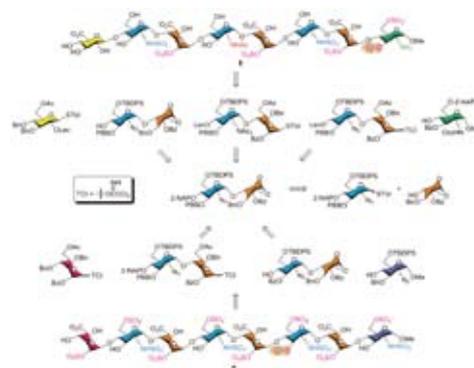
## Synthesis of Heparan Sulfate Octasaccharides that Inhibit the Herpes Simplex Virus Type 1 Host-Cell Interaction

*Nature Chemistry* 3 (2011): 557-563.

Yu-Peng Hu, Shu-Yi Lin, Cheng-Yen Huang, Medel Manuel L. Zulueta, Jing-Yuan Liu, Wen Chang, and Shang-Cheng Hung\*

Genomics Research Center

Cell surface carbohydrates play significant roles in a number of biologically important processes. Heparan sulfate, for instance, is a ubiquitously distributed polysulfated polysaccharide that is involved, among other things, in the initial step of herpes simplex virus type 1 (HSV-1) infection. The virus interacts with cell-surface heparan sulfate to facilitate host-cell attachment and entry. 3-*O*-Sulfonated heparan sulfate has been found to function as an HSV-1 entry receptor. Achieving a complete understanding of these interactions requires the chemical synthesis of such oligosaccharides, but this remains challenging. An efficient synthesis of two irregular 3-*O*-sulfonated heparan sulfate octasaccharides 1 and 2, making use of a key disaccharide intermediate to acquire different building blocks for the oligosaccharide chain assembly, has been carried out by Hung and coworkers. Despite substantial structural differences, the prepared 3-*O*-sulfonated sugars blocked viral infection in a dosage-dependent manner with remarkable similarity to one another.



## Bacteria Associated with an Encrusting Sponge (*Terpios hoshinota*) and the Corals Partially Covered by the Sponge

*Environmental Microbiology* 13 (2011): 1179-1191.

Sen-Lin Tang, Mei-Jhu Hong, Ming-Hui Liao, Wann-Neng Jane, Pei-Wen Chiang, Chung-Bin Chen and Chaolun A. Chen

Biodiversity Research Center

*Terpios hoshinota*, a blackish encrusting sponge, can cause the death of corals that threatens survival of corals in several reefs in the Western Pacific Ocean, including the coral reefs in Green Island and Orchid Island, Taiwan. In Taiwan, more than 30% of reef-builder corals died in some reefs of Green Island because of this sponge's overgrowth (Figure 1). Why the sponge can cause so many corals to die that remains unknown; however, massive bacteria inside the sponge has been blamed as an important factor of its aggression. Our study was to investigate the bacteria inside the sponge and the change in *Porites lutea*-associated bacteria, partially covered by the sponge, and anticipated to acquire more understanding of life cycle of the sponge. By surveying 16S ribosomal RNA genes, we identified a common feature of the sponge-associated bacteria that the bacterial community is a low-diversity community with a dominant group of cyanobacteria (61–98%). The cyanobacteria population is approximately  $4.9 \times 10^5$  cell/cm<sup>2</sup> and they, not *Aphanocapsa* sp. as suggested by previous reports, are a novel species of cyanobacteria, closely related to *Prochloron* sp. (Figure 2). The comparison of the bacterial communities isolated from sponge-free and the sponge-covered *P. lutea* showed that the sponge's covering caused changes in the coral-associated bacterial communities, with the presence of bacteria similar to those detected in coral's black-band disease, suggesting the sponge might benefit from the presence of bacteria associated with the unhealthy coral (Figure 3). The evidence of the coral being under stress was also supported by scanning electronic micrographs that the nematocysts were mostly released in the coral close to the margin of the sponge. This study is for the first time to reveal the bacterial composition inside *Terpios hoshinota* and provides more clues for the mechanisms of how the sponge kills the coral.

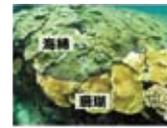


Figure 1. *Terpios hoshinota* covering the major part of coral colonies.

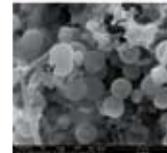


Figure 2. Electronic micrograph of the cyanobacteria (cy) inside *Terpios hoshinota*. Bar size is 10  $\mu$ m.

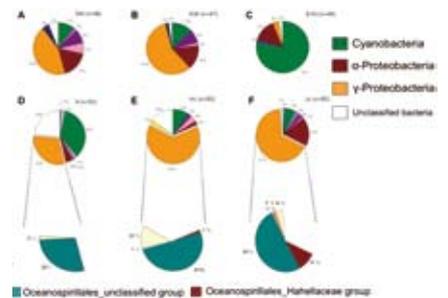


Figure 3. Bacterial compositions in samples, including seawaters (A, B), sponge (C), coral without sponge covering (D), coral distant from sponge (E), coral close to sponge (F). Four major bacterial groups are listed in the key. The details of  $\gamma$ -proteobacteria group was presented in the lowest row of the pile chart with the key.

## Sclerite Calcification and Reef-building in the Fleishy Octocoral Genus *Sinularia* (Octocorallia: Alcyonacea)

*Coral Reefs* 30 (2011): 925-933, DOI 10.1007/s00338-011-0765-z

M.-S. Jeng, H.-D. Huang, C.-F. Dai, Y.-C. Hsiao, and Y. Benayahu

Biodiversity Research Center

Stony corals, also known as the foundations of coral reefs, represent hundreds of species that deposit the calcium carbonate (mainly aragonite) that makes up the exoskeleton of coral reefs. Soft corals, on the other hand, are fleshy and soft, with tiny calcite sclerites embedded inside. In soft corals, sclerites are known to function as physical support, defense against predation, and may help the colony to withstand flow drag. As the sclerites do not form continuous structures, soft corals have long been considered not to be involved in coral reef architecture. A recent study by a group of Taiwanese and Israeli scientists, however, has shown that at least one group of soft corals can consolidate discrete sclerites into solid reef structures.

Nanwan Bay, southern Taiwan, more than 50% of the coral reef in the area was covered by soft corals (Alcyonacean corals). Living colonies were sampled to examine sclerite rocks. Among 46 colonies sampled from the *Sinularia* genus, which represented 22 species, contained a significant spiculite layer under the colony (Fig.1). Between the coral tissue and the solid sclerite rock was a thin transition zone of loosely cemented sclerites, indicating sclerite consolidation in process. Under scanning electron microscope (SEM), sclerites at the colony base were seen cemented by amorphous calcium carbonate, which covered the sclerites' surface microstructure. And under the transmission electron microscope (TEM), the colony base of the fast-growing *Sinularia gibberosa*, the area of sclerite consolidation, was seen to have granular vesicles distributed among the sclerites which may secrete calcium carbonate adhesives (Fig.2). Boulders of over 100 kilograms in weight and numerous rolling stones of spiculite were found across the beach. Radiographic images of sections from 10 spiculite boulders revealed delineated layers representing different densities of skeletal elements; a section from a spherical 18.5 kg boulder regular density banding of 3–6 mm intervals (Fig.3). This finding brings into question conventional understanding of reef corals.



Figure 1. Spiculites associated with living corals (*Sinularia nanolobata*)

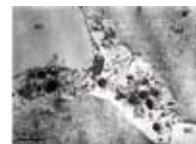


Figure 2. Cellular activity between sclerites at colony base.

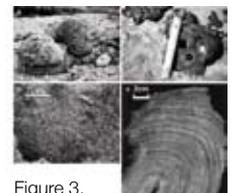


Figure 3. Spiculite masses found on the shore of Nanwan Bay.

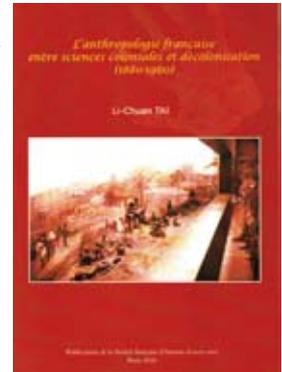
## *L'anthropologie française entre sciences coloniales et décolonisation (1880-1960)*

Paris: Publications de la SFHOM (2011), 340 pages.

Li-Chuan Tai

Institute of History and Philology

The anthropological field (in a broad sense of the term) has had a long history in France, and related academic activities and writings have been numerous. However, academic circles have made little analytical investigation into the knowledge development and institutionalization of French anthropology, and it is only in the past thirty years that considerable research on the topic has emerged. Most studies have indicated that the nineteenth century emphasized physical anthropology and was deeply influenced by concepts of natural history. However, as is commonly known, in the second part of the twentieth century, cultural anthropology became the new focus. Particularly, structural anthropology rose to popularity for a time during this period, broadly influencing research approaches in the humanities. But what was then the transformation process by which physical anthropology as the paradigm for anthropological studies gave way to cultural anthropology as the mainstream? Especially from the end of the nineteenth century to the middle of the twentieth century, that is, the period in which France's colonial empire prospered, what was the relationship between "colonial anthropology" and academic circles? This book begins with the overlap between these two basic questions, setting the main transition period in anthropology (1880-1960) as its scope and analyzing important institutionalization activities for anthropology during this time. The book is divided into the following three sections: The first section examines the period from 1880 to 1940 and analyzes how anthropology made a place for itself in the colonial science movement advocated by colonial circles. The second section, which covers the period from 1925 to 1940, investigates the constitution of an anthropological team that entered the university system with support from the colonial office. The section discusses how the scholars in this team integrated the already existing production method (centered on the museum) to organize the newly emerging anthropological discipline, and examines the relationship between fieldwork activities vigorously promoted at the time and the colonies. The third section, which focuses on the period from 1940 to 1960, analyzes the impact that changes in the global context of World War II and the decolonization process had on the anthropological field, including indigenous intellectuals' discussions related to the discipline, and the readjustment of concepts and methods raised by a new generation of anthropologists.



## Buddhist Funerary Temples, Penitential Rituals, and the Cult of the Dead in Tang-Song China

*Bulletin of the Institute of History and Philology* 82.2 (2011): 261-323.

Shu-Fen Liu

Institute of History and Philology

This paper adopts the perspectives of religious history, political history, and history of thought to explore the ways in which Tang-Song Buddhist funerary temples (*gongde fensi* 功德墳寺) shaped both Chinese ancestor worship and the development of Buddhism in China. Buddhist funerary temples were closely linked to the growth of mortuary rituals, especially penitential rites (*chanhui yishi* 懺悔儀式) that first appeared during the Northern and Southern Dynasties but flourished during the Tang-Song era. Politically, such temples offered emperors an opportunity to reward loyal officials by granting them the privilege of constructing sacred sites for the worship of their forbears. Religiously, funerary temples had a strong influence on Chinese representations of the cult of the dead. This is because the mortuary rituals performed at these temples were almost exclusively Buddhist, which helped this originally foreign religion enter the mainstream of Chinese ancestral worship.



Statues inside Sima Guang's Buddhist funerary temple



1085 imperial decree approving Sima Guang's establishment of a Chan Buddhist funerary temple.



Depiction of flower and incense offerings to Sima Guang.

## Performativity of Difference: Mapping Public Soundscapes and Performing Nostalgia among Burmese Chinese in Central Rangoon

*Asian Music* 42.2 (2011): 19-55.

Tasaw Hsin-Chun Lu  
Institute of Ethnology

This article examines the festive musical practices of Chinese immigrants from 1949 to 1988 in central Rangoon. Eschewing conventional interpretations of migrating music that view a diasporic community as a fixed unit, the author adopts the mode of ethnographic historiography and focuses on multiple micromusics that emerged in the Burmese Chinese community. This speaks to the music's performativity of difference whereby music is used as a strategic resource at different times to lay claim to subjectivity. It is embodied in a twofold research finding. First, on a microscopic level, the music helps articulate the differences between multiple micromusics in defining sub-ethnicities, classes, or political views within the community. Second, on a larger scope, the spatial and temporal intensity of this ethnic group's musical performances has formed a remarkable Burmese Chinese social space that sets it apart from other ethnic groups (mostly Burmans and Indians) in the city.



## Cultural Performance and the Reconstruction of Tradition among the Bunun of Taiwan

*Oceania* 81.3 (2011): 316-330.

Shu-Yuan Yang  
Institute of Ethnology

This article aims to understand the meanings and impact of the reconstruction of tradition and the objectification of culture among the Bunun, an Austronesian-speaking indigenous people of Taiwan. It situates the revival of tradition in the contexts of state appropriation and the development of ethnic tourism, and shows how the Bunun attempt to control their relationship with the state and the dominant society by reconstituting tradition in the present. The culturally specific ways in which the Bunun sustain local identity and sociality by reproducing their concept of personhood are highlighted. In doing so, the author seeks to move the analysis beyond the use of reified tradition as a political and identity symbol to address the broader theoretical concern of understanding tradition as a culturally specific mode of change.



## *Chiang Kai-shek: Between Friend and Foe*

Tokyo: 武田ランダムハウスジャンパン (2011), 248 pages.

Tzu-Chin Huang

Institute of Modern History

This book explores Chiang Kai-shek's relationship with Japan and is divided into five chapters: "Japan's Role in the Formation of Chiang Kai-shek's Personality", "From Friend to Foe: Key Turning Points in Relations with Japan", "Towards Full-Scale War", "Reconstruction of Sino-Japanese Relations" and "Chiang Kai-shek and Taiwan".

This book begins by describing how Chiang Kai-shek's experiences studying abroad in Japan during his formative years shaped his personality and created an indissoluble bond with Japan. In later years, as an ardent proponent of the "pan-Asianism" doctrine that Sun Yat-sen had advocated, Chiang expected sincerity from Japan in its relations toward China. He hoped that China and Japan could jointly guide the overall situation in Asia. However, experiences from the Northern Expedition to the Japanese invasion marked key turning points that soured relations between Chiang Kai-shek and Japan, which deteriorated from initial friendship to enmity and ultimately war.

The second focus of this book discusses Chiang's strategies towards Japan and the Communists. Chiang resolutely opposed the Communists on political grounds and condemned the Japanese for invading China. In particular, this part examines the process of how Chiang chose which would be the main enemy and which the secondary enemy from the 1920s to 1940s. He attempted to use the hostility between Japan and the Communists as a way to befriend "the enemy of my enemy".

However, in spite of a rocky relationship with Japan, Chiang signed a peace treaty with Japan later in his life when he retreated to Taiwan. The two countries developed friendly relations, together forming an Asian bulwark against Communism. Following the postwar changes in Asia, Chiang adopted a policy of "returning good for Japanese evil" which facilitated Japan's postwar recovery. In this way Chiang demonstrated great foresight in preserving the vitality of the struggle against Communism.



## *Ruling All under Heaven with Filial Piety: The Xiaojing in Late Imperial China*

Taipei: Academia Sinica and Linking Publishing Company (2011), 395 pages.

Miaw-Fen Lu

Institute of Modern History

This book examines the relationship between the *Xiaojing* (The Classic of Filial Piety) and the political and social culture of late imperial China. Taking the diverse nature of the *Xiaojing* into account, the author looks at the text from a variety of different perspectives, including political history, classical studies, education and intellectual history, gender issues, and ritual practices, to reveal the complex historical situations in which the *Xiaojing* intertwined with people's lives. In addition to the introduction and conclusion, the book includes three parts, nine chapters, covering over the period of Ming and Qing dynasties. The first part provides a long-term social and intellectual background for understanding the revival of the *Xiaojing* studies during the late Ming. The second part deals with the discourse and practice related to the text in the late Ming period, and the third part covers the changes from the 17<sup>th</sup> to the early 20<sup>th</sup> centuries. This study is the first in-depth monograph dealing with the cultural history of the *Xiaojing*; it illuminates various aspects of Chinese filial culture, as well as certain interrelated political and social developments in late imperial China.



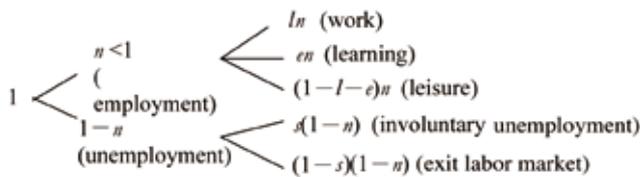
## Labor-Market Frictions Human Capital Accumulative and Long-Run Growth: Positive Analysis and Policy Evaluation

*International Economic Review* 52.1 (2011): 131-160.

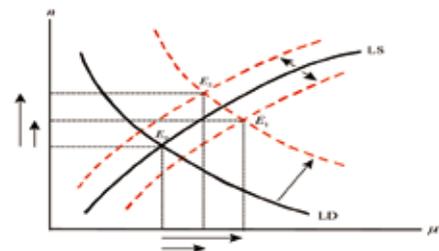
Been-Lon Chen, Hung-Ju Chen and Ping Wang

Institute of Economics

Existing human-capital based growth models do not exhibit labor market frictions. In this study, we construct a search model with endogenous human capital to study the growth effects of human capital policies. The population is normalized to unity and a fraction is employed and the remaining is unemployed. For those employed, a fraction is working, another fraction is learning, and the remaining fraction is taking leisure. For those unemployed, a fraction is searching for jobs and is thus involuntarily unemployed; the remaining fraction exits the labor market. Using this model, we find that employment, learning effort and output growth increase with more effective learning, better labor-market matching, lower job separation, or less costly vacancy creation. Moreover, while output growth, employment, vacancy creation, and learning and search effort are most responsive to changes in a human capital policy that directly affects learning effort, such a policy need not be more beneficial for welfare. The effects of human capital policies become larger as the severity of labor-market frictions rises. Using a quantitative method, we simulate the effects of the investment subsidies for elementary education and higher education. The results indicate that investment subsidies for higher education can better enhance economic growth.



Labor allocation



Effect of education policies

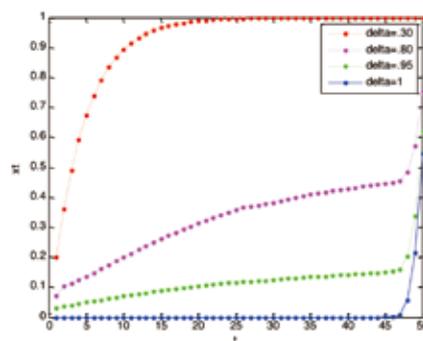
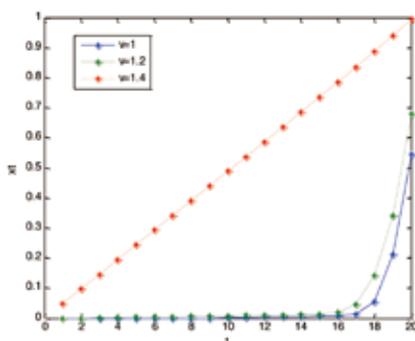
## Name Your Own Price at Priceline.com: Strategic Bidding and Lockout Periods

*Review of Economic Studies* (2011) accepted.

Chia-Hui Chen

Institute of Economics

A buyer suggests prices to  $N$  sellers in a time period and buys from the seller who accepts the bid first. The number of bidding rounds is determined by how frequently the buyer can make an offer. We show that with no limit on the frequency and without discounting, the price path is either kept flat initially with large jumps at the end or increasing steadily over time. Which class of path occurs in equilibrium depends on the buyer's trade-off between committing to a price ceiling versus finely screening the sellers' costs. With discounting, limiting the number of rounds mitigates the delay caused by the reluctance to raise bids in the first class of equilibrium, and therefore can benefit the buyer. This result suggests why, in reality, bargaining parties often take measures to make their offers rigid and consequently force themselves to make fewer offers.



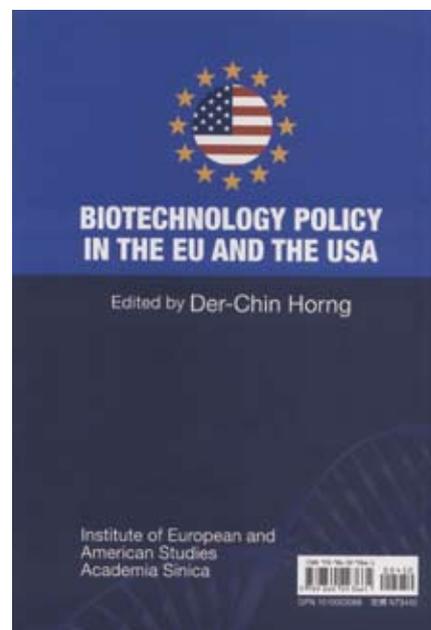
## *Biotechnology Policy in the EU and the USA*

Taipei: IEAS, Academia Sinica (2011), 766 pages.

**Der-Chin Horng** (editor)

Institute of European and American Studies

This book explores the most pressing issues raised by the impacts of biotechnology on EU and US law and policy including: (1) debates on biotechnology in the EU and the USA; (2) the risk analysis system of the European Food Safety Authority; (3) the role of experts and civil society in biotechnology disputes; (4) the impact of ethics on the German Patent Law; (5) the protection of personal genetic information in the EU, with special reference to privacy rights in the workplace and the prohibition of employment discrimination; (6) genetic characteristics in the French Bioethics law; (7) human tissue research and American law; (8) licensing complementary and alternative medicine under the US regulatory policies; (9) the bioethics of prenatal testing and disability discrimination; (10) the right to health and the global pharmaceutical intellectual property framework; and (11) the status of Codex in the WTO regime. This book is a collective effort by ten scholars.



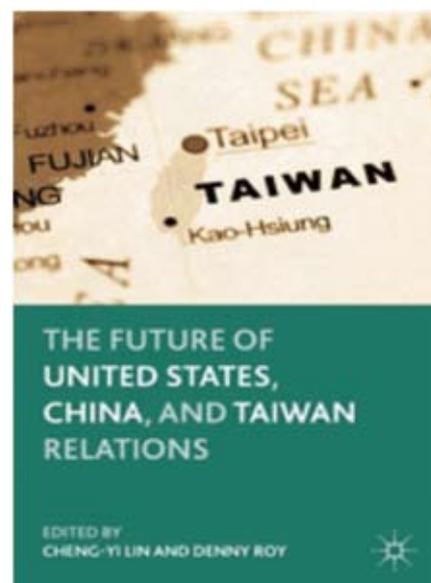
## *The Future of United States, China, and Taiwan Relations*

New York: Palgrave Macmillan (2011), 266 pages.

**Cheng-Yi Lin and Denny Roy** (editors)

Institute of European and American Studies

In March 2009, the Institute of European and American Studies of Academia Sinica held a conference designed to reevaluate and gauge the prospects of the Taiwan Relations Act. This book is based on the papers delivered and discussed at that conference. The rise of China as a great power in East Asia, the return of the Kuomintang (Nationalist Party) as the ruling political party in Taiwan, and new pressures on America's traditionally dominant position in the Asia-Pacific region create a crossroads in the relations between the United States, China and Taiwan. This book examines the background, current issues, and future possibilities for this triangular relationship, in which geostrategic interests grapple with the ideological battle between democracy and authoritarianism, the question of sovereignty over Taiwan, and Taiwan's own contested identity. At stake is not only Taiwan's destiny but also US-China relations.



## “Rosy Periwinkle”: The Politics of the Licensed Prostitutes Movement in Taiwan

Jeffrey Broadbent and Vicky Brockman (eds.) *East Asian Social Movements: Power, Protest, and Change in a Dynamic Region* (New York: Springer, 2011), pp.255-281.

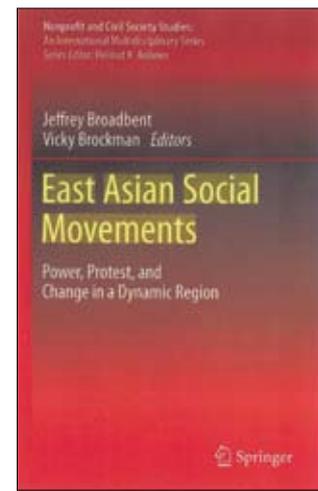
**Mau-Kuei Chang and Yu-Fen Chang**

Institute of Sociology

The push to abolish the licensing of prostitution in 1997 by Taipei City Government was the origin of Taiwan’s Sex Worker’s Rights Movement. At then Mayor Chen Shui-bian of the DPP, prompted by pressures of the KMT dominated Taipei City Council, advised by women’s rights associations, determined to eradicate the licensing practices of legal prostitution establishments. This act aroused the self-salvaging protests among veteran legal prostitutes. Their protests developed and later became Sex Workers’ Rights movement when allying with existing laborer’s activism.

This research covers the period between 1997 and 2006 of the movement. It proposes an “embedded-ness” perspective, which views emerging social movement actors and causes are actually learning from and constrained by pre-existing movements. Their identities and strategies are contingent upon the larger political environment of the time.

Factors that are important in shaping Sex Worker’s Rights Movement include Taiwan’s nationalistic politics and polarized partisan confrontation, and divergences of women’s movement. In general, this research submits that a movement’s repertoire and capability to mobilize social attention for its impact are shaped by external socio-political contingencies.



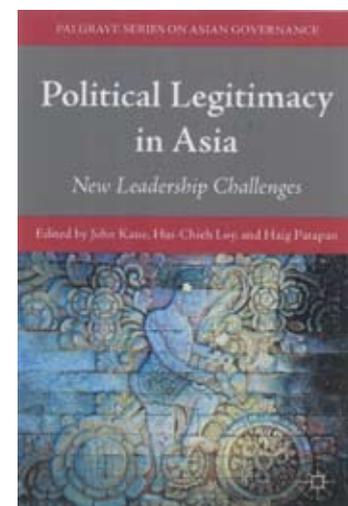
## Democratic Reform as a Formula for Legitimacy

John Kane, Hui-Chieh Loy and Haig Patapan (eds), *Political Legitimacy in Asia: New Leadership Challenges* (New York: Palgrave Macmillan, 2011), pp.59-87.

**Naiteh Wu and T. J. Cheng**

Institute of Sociology

This paper analyzes democratic transition from the perspective of legitimacy, an ingredient that has been given short shrift in the literature on Taiwan’s democratization. The notion of legitimacy has suffered many criticisms. We contend that it is useful in the study of democratic transition in general, and necessary in understanding the particular path of “transition by transaction,” which Taiwan traversed. The authoritarian regime in Taiwan tried different formulae of legitimacy to meet different challenges at different stages. When all formulae have been tried and failed, democratic reform becomes the last resort for overhauling legitimacy. But for the ruling elites to adopt democratic reform as the legitimacy formula, two preconditions must be met. First, a consensus on the desirability of democracy has to emerge among the ruling elites and among their core constituents. Second, the ruling elites have to feel confident in their ability in retaining power under competitive democracy. This paper then analyzes how these two conditions were met in Taiwan, which made possible the democratic transition in Taiwan.



## The Familial Connections and Relationships between Yu Yiao, Yang Fangcan, Gu Han, and Ding Shaoyi

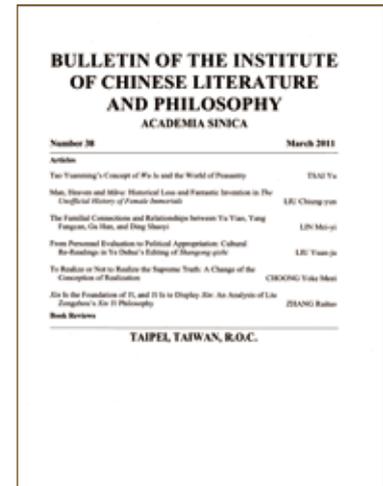
*Bulletin of the Institute of Chinese Literature and Philosophy* 38 (2011): 95-170.

Mei-Yi Lin

Institute of Chinese Literature and Philosophy

Explorations into writers' families and communities shed important new light on the works and the writers' inner selves. Traditional biographical studies, however, concerned mostly the life details of the writers, and seldom delved into the spectrum of the writers' families and communities. No man is an island entire of itself—one's experiences and momentous life events are often represented in the words of one's friends and families. These materials enrich our understanding of the works, the inner life, and the outer world of the writer, and should be brought into consideration in any attempt at a comprehensive account.

This paper examines the familial connections and relationships between the Yu, Yang, Gu, and Ding families of the late Qing period. The author will demonstrate that these four families constituted a tight network in which Yu Yiao was a centripetal figure. Yu was a late-Qing *ci* poet whose works are not generally available. For many years, the author has labored to collect Yu's writings, and some twenty, hitherto unexamined, manuscripts of his *shi* and *ci* poetry, among other biographical materials, are now in my collection. Taken together, these materials allow me to conduct a comprehensive study of the connections and relationships between the Yu, Yang, Gu, and Ding families, which in turn will hopefully break new ground in *ci* studies.



## The Unfolding of a Conflicted New World

Taipei: Institute of Chinese Literature and Philosophy, Academia Sinica (2011), 350 pages.

Siao-Chen Hu

Institute of Chinese Literature and Philosophy

There has been a renewed scholarly interest in the Republican Era. The enthusiasm exposes the competition between the ROC and the PRC for the discursive interpretation of twentieth-century history. The publication of *The Unfolding of a Conflicted New World* signals a new direction in this emerging intellectual vision. This research used newspapers and magazines as the source to reconstruct the cultural landscape of the early Republican era before the May Fourth movement. In so doing, the book bridged the manmade and unnecessary gap between “the classical” and “the modern” posed by most literary histories. This study is focused on two questions: the socio-cultural heteroglossia and the emerging paradigm of modern women writers. By portraying men and women writers in the transitional period, the book rewrote the literary history of the early twentieth century. In its revision of the early Republican Era, the book argues that the seemingly outdated fixation on traditional culture and aesthetics is an indispensable dimension for the continuation and renovations of cultural heritage.



Front cover, *The Unfolding of a Conflicted New World*.



Front cover, *Short Story Monthly* (supplementary issue)



Portrait photograph of Ms. Shi Shuyi, published in *The Ladies' Journal*.



Front cover, *The Ladies' Journal* 1.1.

## The Writing of De-Enslavement and the Tendency of Nationalization: Take Post-War Biographies in Taiwan as an Example

*Bulletin of Taiwan Historical Research* 4 (2011): 33-65.

Hsueh-Chi Hsu

Institute of Taiwan History

This article investigates post-war biographies written after World War II, such as *Taiwanese Contemporary Biographies* (1947), *Biographies of the Republic of China*, *Collection of Taiwanese Celebrities* (1953), *Biographies of Taiwanese Celebrities*, and *Biographies of the Southern Taiwan* (1957). It discusses the contents about de-enslavement and the tendency of nationalization in these texts. For example, these biographies delete the history about the participation in Kominhokokai (皇民奉公會) eternally. Instead, they described the patriotic events during the Japanese reign and the post-war phase. In addition, some characters with the experiences of the puppet regimes are also deleted from these texts, so there is a gap in post-war Taiwanese biographies. The instances of Xie Wen-da, Chen Xi-qing, and Wu Dun-li are the best illustration of the above phenomenon.

Based on above issues, how to interpret existing Taiwanese biographies and how to value these Taiwanese are serious problems for the modern research of Taiwan history. Furthermore, the evaluation should not depend on Japanese or Chinese texts. We should have our own standpoint. Those Taiwanese working for the puppet regime during the Japanese reign should accept as much attention as those Taiwanese working for the government at Chongqing.



## From Japanese Colonial Medicine to American-standard Medicine in Taiwan: A Case Study of the Transition in the Medical Profession and Practices in East Asia

Liping Bu, Darwin H. Stapleton and Ka-che Yip (eds.), *Science, Public Health and the State in Modern Asia* (London, New York: Routledge, 2011) pp.131-142.

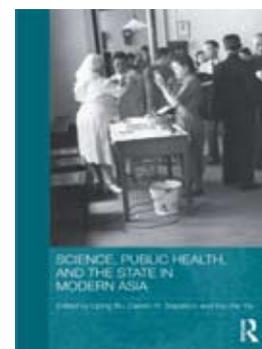
Michael Shiyung Liu

Institute of Taiwan History

This collection of essays by scholars from North America and Asia examines the transfer of scientific knowledge of medicine and public health approaches from Europe and the United States to different Asian societies and the local interaction with, and transformation of these public health models and approaches from the nineteenth century to the 1950s.

In colonial Taiwan (1895-1945), the Japanese imposed coercive social and political control, using a highly centralized police force to enforce the laws, including those dealing with sanitation and health. At the same time, it offered medical education to the Taiwanese elite, promoting modernization and gain the support of the people in Taiwan. Aside from colonial medical institutions and Japanese-educated elite of the native population, the Rockefeller Foundation (RF) and the League of Nations Health Organization exerted extensive influence in the health practices and policies in Asia. The RF's influence was exerted through activities and programs of the International Health Board (IHB) and the China Medical Board (CMB). The International Health Board (later IHD, in 1927) was the most influential health organization in the first half of the twentieth century.

As World War II ended, America exercised tremendous influence in the reconstruction of the medical system as well as in supporting the Nationalist government in post-war Taiwan. With the help of the CMB and RF connections, post-war health aid came in diverse forms of American assistance, such as rural reconstruction and military aid. The Americanization of Taiwan's medical system ran parallel to American efforts to shape post-war Japan's public health. The transition from Japanese colonial medicine to an American-standard therefore started. The author argues that the transition was, to a significant extent, driven by American self-interest and needs as well as by geopolitical considerations of a new international economic order and global health. In this respect, the transition in fact revealed similarities between the American post-colonial vision and the colonial model of health – shared by Japan and other colonial powers – that posited the transition to a new and modern developmental order based on public health improvements. The author demonstrates that the Americanization of the medical system in Taiwan was incorporated in the Cold War international politics and security concerns.



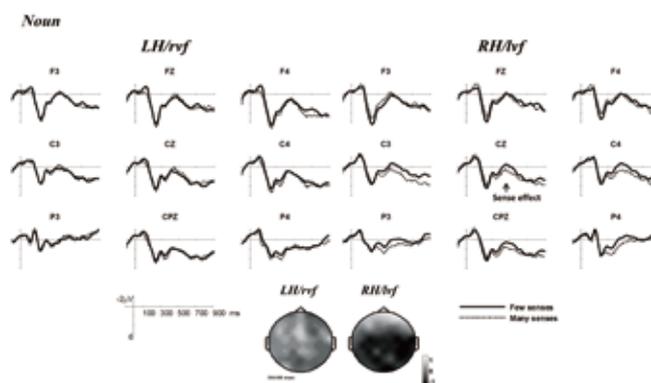
## Number of Sense Effects of Chinese Disyllabic Compounds in the Two Hemispheres

*Brain and Language* 119.2 (2011): 99-109.

Huang, C.Y., Lee, C.-Y., Huang, H.-W., and Chou, C.J.

Institute of Linguistics

The current study manipulated the visual field and the number of senses of the first character in Chinese disyllabic compounds to investigate how the related senses (polysemy) of the constituted character in the compounds were represented and processed in the two hemispheres. The ERP results in experiment 1 revealed crossover patterns in the left hemisphere (LH) and the right hemisphere (RH). The sense facilitation in the LH was in favor of the assumption of single-entry representation for senses. However, the patterns in the RH yielded two possible interpretations: (1) the nature of hemispheric processing in dealing with sublexical sense ambiguity; (2) the semantic activation from the separate-entry representation for senses. To clarify these possibilities, experiment 2 was designed to push participants to a deeper level of lexical processing by the word class judgment. The results revealed the sense facilitation effect in the RH. In sum, the current study was in support of the single-entry account for related senses and demonstrated that two hemispheres processed sublexical sense ambiguity in a complementary way.



Grand averaged ERPs for *Nouns* in the RVF/LH and LVF/RH; Topographic voltage maps (difference waves of few senses minus many senses) of the sense effect show that the distribution primarily locates in the central-to-parietal position.

## *ki* as a Marker of Coordination and Comitativity in Saisiyat

*Language and Linguistics* 12.1 (2011): 77-107.

Elizabeth Zeitoun, Tai-hwa Chu, and Lalo a Tahesh Kaybaybaw

Institute of Linguistics

The present paper is part of on-going research on the morphology of Tungbo Saisiyat (see Zeitoun et al. Forthcoming), a Formosan language spoken in north-western Taiwan in Miaoli County and focuses on coordination and comitativity.

It examines the syntactic distribution, use and functions of the comitative *ki* marker 'and, with' as opposed to the coordinator *=o* 'and, as well' and concludes that *ki* should be treated as a comitative case marker, as shown in previous analyses (Starosta 1974, Li 2004 [1978], Yeh 1991 and Hsieh 2009). We go a step further, however, by demonstrating that when followed by personal nouns, *ki* can be marked as plural (*cf. ki-l*) while *=o* cannot (*cf. \*=o-l*). Based on these findings, we argue that a new set of pronouns, i.e. the "comitative" *ki*-set should be recognized in Saisiyat, while the case marking system of this language needs to be further reassessed. At the same time, we show that *ki* can also function as a coordinator, as first hypothesized by Li (2004 [1978]:377). We provide a number of syntactic tests (word order, negation and verb classification) to distinguish the conjunctive and comitative usages of *ki*.



## The Role of Procedural Commitment in Informational Theory of Legislative Organization

*Journal of Theoretical Politics* 23.4 (2011): 532-558.

Fang-Yi Chiou

Institute of Political Science

Contrary to codified procedures, almost all informational theories of legislative organization assume that the House floor commits to a special rule for floor consideration prior to a committee proposal. Employing Gilligan and Krehbiel's (1989) theoretical framework, we demonstrate that whether to assume this procedural commitment has a profound impact on our understanding of how the floor can structure the committee's incentives to reveal information. In particular, we find that several of Krehbiel's (1991) primary hypotheses, particularly that regarding preference outliers, generally do not hold without procedural commitment. Underscoring the key role of procedural commitment in informational theories, our results not only open up important avenues upon which to construct a more defensible foundation for informational theory but also offer the hope of reconciling discrepancies between theoretical predictions and empirical regularities.

The role of procedural commitment in Krehbiel's (1991) informational theory

Informational Hypotheses	Krehbiel's (1991) Claims	Validity of the Hypotheses	
		With Procedural Commitment	Without Procedural Commitment
Specialization Hypothesis	Valid	Valid	Invalid
Preference Hypothesis	Valid	Valid	Invalid
Heterogeneity Hypothesis	Valid	? *	?
Low-cost Specialists	Valid	Valid	Invalid
Nonoutlier Committees	Valid	Valid	Invalid
Heterogeneous Committees	Valid	? *	?

\* See the debate between Krishna and Morgan (2001) and Krehbiel (2001)

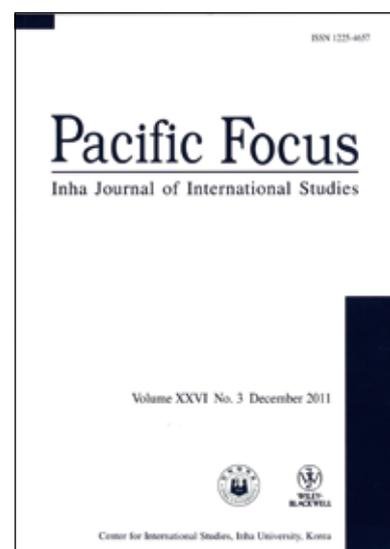
## Coping with China in Hard Times: Taiwan in Global and Domestic Aspects

*Pacific Focus* 26.3 (2011): 360-384.

Tse-Kang Leng

Institute of Political Science

This paper argues that in the post-democratization era, the Taiwanese state devotes itself to creating a comprehensive division of labor with China in favor of Taiwan. The Ma administration tries to adopt a policy of globalization with comprehensive engagements with China. However, political costs come with the efforts in deepening and institutionalizing such a unique relationship. On the domestic front, the redistribution effect of the trade pact buttresses opposition forces to request a halt to further integration. To cope with the rise of China in hard times, the Taiwanese state chooses to adopt two-track policies to re-intervene into economic spheres of influence while searching for political compromise with China. The state power is thus transformed and readjusted in a more complicated manner.



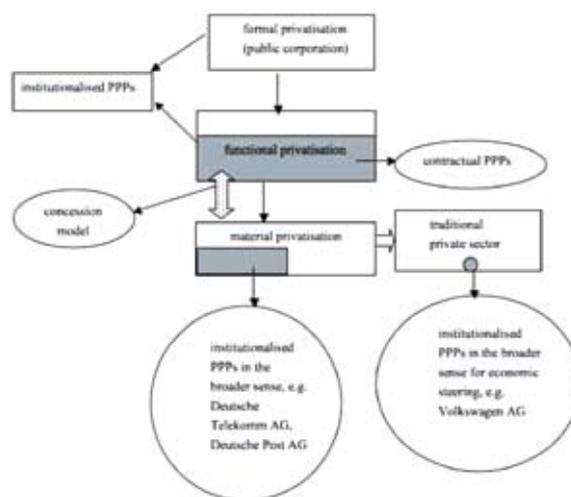
## A Preliminary Review of the Development of Public-Private Partnership (PPP) in the European Union Law: With Special Reference to the Controversies over the Application of Government Procurement Law to the Semi-Public Undertaking (Institutionalised PPP) in Germany

*National Taiwan University Law Journal* 40 (2011): 505-568.

Shwu-Fann Liou

Institutum Iurisprudentiae

Earnest discussion of the PPP in Germany was prompted by the Green Paper on PPP issued by the EU Commission in 2004. This study reviews the development of PPP in German administrative law from the perspective of EU legal system. After briefly introducing the concept and types of privatization, more in-depth discussion is devoted to the genesis, introduction and evolution of PPP in German legal system, charting its trajectory from informal partnership, to formal PPP founded on contractual basis, and to its latest form of project-oriented PPP (“Projekt-PPP”). In accordance with the typology in the Green Paper and new conceptions of EU Procurement Law, there are three types of PPP in the framework of “Projekt-PPP”: the typical contractual PPP, the concession model, and the institutionalized PPP. This paper provides preliminary doctrinal analysis on each type of PPP, and analyzes their overlaps with privatization. This is followed by an analysis on the guidelines of in-house procurement and the issue of the application of government procurement law to the semi-public undertakings, by looking into two seminal decisions of the ECJ. At a time when PPP is attracting increasing attention in Taiwan, it is hoped that a study from the comparative law perspective may have modest contribution to the formation of the policy on such an institution.



## The Problem of Right *in rem* Externality

*Academia Sinica Law Journal* 8 (2011): 227-257.

Tze-Shiou Chien

Institutum Iurisprudentiae

In the economic analysis of law, it is said that externality is a kind of market failure and it should be corrected by government interventions. However, this analysis has usually been abused. In the debate of whether the Numerus Clausus principle is a sound policy of property law, the argument of externality has been invoked. Merrill and Smith claim that the transactions which set up new kinds of right in rem would cause information externality on general people and those people who make routine legal transactions of property, and the Numerus Clausus principle is the corrective measure to internalize. This paper would argue that this externality is not real and therefore the claim of Numerus Clausus has no foundation. It is also a bad idea for revisionists of the Merrill and Smith model to include costs of notice system as externality not least because this would destroy Merrill and Smith's thesis. Contrary to externality claim, this paper argues that setting up new kinds of right in rem should be characterized as a process of internalization not a problem of externality. The Choice of baseline determines the relevancy and soundness of arguments!

## How the Chinese Government Promoted a Global Automobile Industry

*Industrial and Corporate Change* 20.5 (2011): 1235-1276.

Wan-Wen Chu

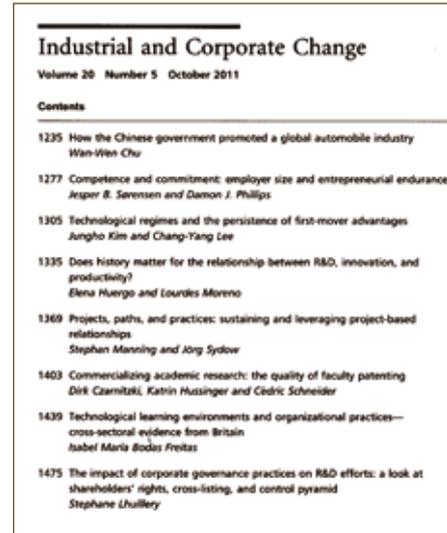
Research Center for Humanities and Social Sciences

The claim by China experts that the Chinese state lacks the capability to practice pro-active industrial policy throws China's future into doubt. This article argues the contrary, by examining the development of the Chinese automobile industry and the evolution of its industrial policy since 1978. The central state's policy may have been ineffective at first, but continued to improve, layer-by-layer, by taking into account results of local experiments, and being propelled by a strong catch-up consensus providing performance standards to establish national industries. China's learning process thus renders its industrial policy model effective in the long term.

No. of Brands and Share of Indigenous Cars, 2004-06

Item	2004	2005	2006
No. of Car Brands in China			
Total	110	115	156
Indigenous Brands	27	34	66
Share of Indigenous Brands (%)	24.55	29.57	42.31
Production of Passenger Cars (10,000 car)			
Total	248.3	311.8	430.2
Indigenous Brands	49.6	74.1	115.3
Share of Indigenous Brands (%)	19.98	23.77	26.80

Source: *China Automotive Industry Yearbook*, 2007.



## Trust and Trustworthiness Reputations in an Investment Game

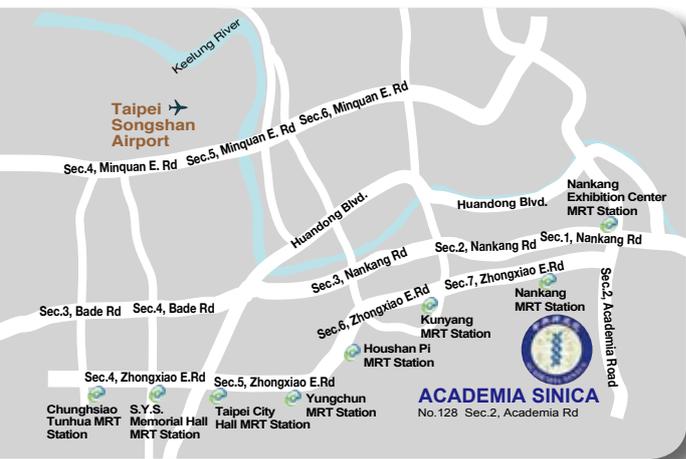
*Games and Economic Behavior* 72.2 (2011): 361-375.

Gary Charness, Ninghua Du, and Chun-Lei Yang

Research Center for Humanities and Social Sciences

Trust is an essential component of good social outcomes and effective economic performance. Reputation on the trustee's past behavior in the same role has proven to be greatly effective at raising the level of trust. In this study, we show that providing information on the trustee's past behavior as the trustor is equally effective as a reputation system. In fact, people still find it worthwhile to invest in a reputation as a trusting person, even though the immediate payoff for trusting is poor. This confirms the role of indirect reciprocity as a strategic notion based on reputation, whereby pro-social actions by one person towards a second person are sanctioned by a third party.





- 1 Main Entrance
- 2 Institute of Biomedical Sciences
- 3 Environment, Health and Safety Management Division
- 4 Institute of Cellular and Organismic Biology
- 4 Biodiversity Research Center
- 5 Institute of Molecular Biology
- 6 Institute of Biological Chemistry
- 6 Life Science Library
- 7 National Laboratory Animal Center, NLAC
- 8 Interdisciplinary Research Building for Science and Technology (under construction)
- 9 Mini-forest restoration area
- 10 Central Office of Administration
- 11 Biodiversity Research Center
- 11 Biodiversity Research Museum
- 12 Institute of Plant and Microbial Biology
- 13 Research Center for Information Technology Innovation
- 13 IRDR-International Centre of Excellence (IRDR-ICoE)
- 14 Tsai Yuan-Pei Memorial Hall
- 15 Institute of Statistical Science
- 16 Post office, garage, grocery store and Hi-Life convenient store
- 17 Ecopond
- 18 Genomics Research Center
- 19 Agricultural Technology Building
- 19 Agricultural Biotechnology Research Center (Agricultural Technology Building 1<sup>st</sup>-2<sup>nd</sup> Floor and 5-7<sup>th</sup> Floor)
- 19 Institute of Plant and Microbial Biology (Agricultural Technology Building 1<sup>st</sup>-4<sup>th</sup> Floor)
- 20 Center of Academic Activities (Bookstore, auditorium, conference rooms, guest rooms, breastfeeding room, Chinese and Western restaurants, coffee shop)
- 21 Institute of Chinese Literature and Philosophy
- 22 Institute of Earth Sciences
- 23 Gymnasium (Breastfeeding room)
- 24 Humanities and Social Sciences Building (HSSB)
- 24 Joint Library of Humanities and Social Sciences (1<sup>st</sup>-2<sup>nd</sup> Floor HSSB)
- 24 Institute of Linguistics (5-7<sup>th</sup> Floor of South Wing, HSSB)
- 24 Institute of Sociology (8-10<sup>th</sup> Floor of South Wing, HSSB)

● Ecological Research Park (West Entrance)  
● Ecological Research Park (East Entrance)

\* The Institute of Mathematics, Institute of Atomic and Molecular Sciences, Institute of Astronomy and Astrophysics and some buildings belonging to the Institute of Biological Chemistry are located on the National Taiwan University campus.

- 24 Research Center for Applied Sciences (11<sup>th</sup> Floor of South Wing, HSSB)
- 24 Research Center for Environmental Changes (11<sup>th</sup> Floor of South Wing, HSSB)
- 24 Institute of Political Science (5-6<sup>th</sup> Floor of North Wing, HSSB)
- 24 Institute of Taiwan History (7-8<sup>th</sup> Floor of North Wing, HSSB)
- 24 Institutum Iurisprudentiae (9-10<sup>th</sup> Floor of North Wing, HSSB)
- 25 Research Center for Environmental Changes (Laboratories)
- 26 Plant Molecular Breeding Greenhouse
- 27 Greenhouse Building
- 27 Biodiversity Research Center
- 28 Research Center for Environmental Changes (under construction)
- 30 Institute of Chemistry
- 31 Research Center for Humanities and Social Sciences
- 32 Institute of Information Science
- 33 Institute of Physics
- 33 Research Center for Applied Sciences (Laboratories)
- 33 Wu Ta-You Memorial Hall
- 34 Hu Shih Memorial Hall
- 35 Institute of Modern History
- 36 Institute of European and American Studies
- 37 Institute of History and Philology
- 37 Museum of the Institute of History and Philology
- 38 Fu Ssu-nien Library
- 39 Institute of Economics
- 40 Institute of Ethnology
- 40 Museum of the Institute of Ethnology
- 41 Lingnan Fine Arts Museum (Jin Mei Building)
- 42 Archive Building, Institute of Modern History
- 43 Building of Taiwan Archaeological Studies
- 50 Academia Sinica Dormitory Buildings
- 51 Temporary Parking
- 60 TIGP Teaching and Administration Building (TA Building)
- 60 Administrative office for TIGP, Degree Program, and Foreigners Services (2<sup>nd</sup>-3<sup>rd</sup> Floor of TA Building)
- 60 Kindergarten (1<sup>st</sup> Floor of TA Building)

## Directions

- By Bus: Buses 205, 212, 270, 276, 306, 620, 645, 679, Blue 25, minibus 1, minibus 5, and minibus 12 all go to Academia Sinica.
- By Train: Take bus 205, 212, 276, 306, 679, minibus 5 or minibus 12 to Academia Sinica at Nankang Train Station.
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2. Take the Bannan Line to the Nankang Exhibition Center (Exit 2). Then take bus 205, 212, 276, 306, 620, 645, 679, minibus 1, minibus 5 or minibus 12 to Academia Sinica.

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