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第三十三卷

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## **II**

# **Review of Research Projects**



## **GENERAL INTRODUCTION**

The Institute of Physics was founded in Shanghai in 1928 and was reestablished in Taiwan in 1962, with Dr. Ta-You Wu as its first Director. The succeeding Directors of the Institute were: Dr. W. N. Wang (1976-1977), Dr. E. K. Lin (1977-1989), Dr. L. T. Ho (acting, 1989-1990), Dr. T. T. Tsong (1990-1999), Dr. Y. D. Yao (acting, 1999-2002), Dr. Maw-Kuen Wu (2002-2004), and Dr. S. P. Li(acting, 2004- present). In 1966, the Institute, together with the National Tsing-Hua University and the National Taiwan University, co-organized the Physics Research Center, under the auspices of the National Science Council, in order to promote physics research in Taiwan. In 1970, an interdisciplinary research program for atmospheric science and fluid mechanics was initiated in the Institute of Physics, and later a similar program for biophysical research in 1975. During the First Five-Year Plan (1981-1985) of the Academia Sinica, the original two-story Physics Building was replaced by a four-story building at the same site in April, 1983. The Institute's scope of research was then further expanded to include theoretical physics, covering mainly field theory and particle physics, nuclear physics, and statistical and computational physics. Since the beginning of the Second Five-Year Plan (1986-1991), the Institute has continued to grow, both in research staff and facilities. To meet the demands of rapidly growing research activities in the Institute, a new ten-story building immediately adjacent to the original building was completed in 1999. The Physics Building is named the "Ta-You Hall" to commemorate its first director, who passed away on March 4, 2000.

At present, the Institute has 39 research staff: 2 distinguished research fellows, 22 research fellows, 8 associate research fellows, 4 assistant research fellows, 1 research technologist, and 2 associate research technologist. The Institute also maintains 300 temporary employees, which include visiting scholars, postdoctoral research associates, as well as research assistants and graduate students. Current research areas can be grouped into three main categories: Nanoscience, Complexity, Medium and High Energy Physics. Specific interests are in the areas of particle physics and cosmology, experimental high-energy physics, nuclear physics, condensed-matter and surface physics, statistical and computational physics, biophysics, as well as fluid mechanics and nonlinear physics. The Institute of Physics is expected to play an increasingly important role in the development of physics and technology in Taiwan.



### **The Institute of Physics Logo**

The logo for the Institute of Physics was the winning design from a logo submission contest held by the Institute. It was an idea born on April 15, 2003 by Dr. Chia-seng Chang, an Institute Fellow, with the following spirit in mind:

The letters I.O.P are drawn with the additive primary colors blue, green, and red, and they are placed in such a way that one can depict  $G$ ,  $\epsilon$ ,  $h$ ,  $k$ , the 4 fundamental constants which represent classical mechanics, electromagnetism, quantum mechanics, and statistical mechanics. With further imagination, one can conceive the number 1928 from the design, which is the year the IOP was founded.

### **Nanoscience Research Group**

Nanoscience and nanotechnology have become the major research focus in the Institute. We have already built up our capabilities and expertise during the past few years. To further enhance our research strength we have decided that all our efforts and interests will be grouping into the following categories:

- (i) Development of state-of-the-art research tools for nano-science
- (ii) Synthesis and characterizations of nano-structures, nano-materials
- (iii) Manipulation and control of single atom and single molecules
- (iv) Theoretical modeling and simulations of nano-system

The followings are the research groups that involve in nanoscience researches and summaries of their research activities:

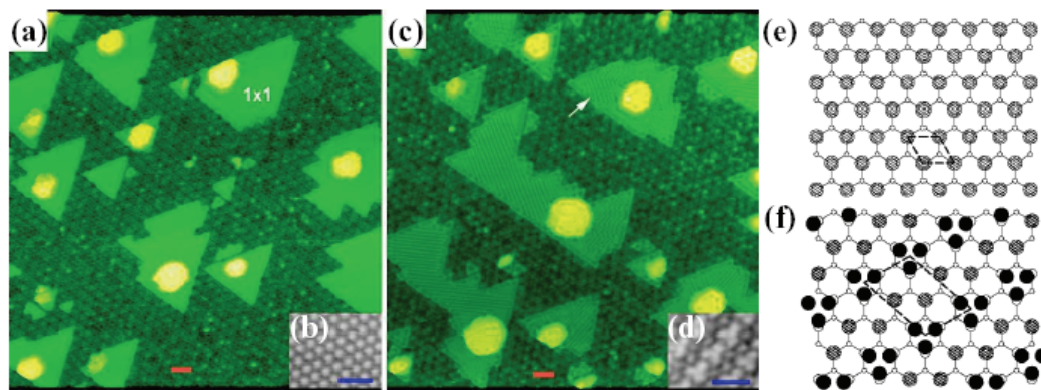
#### **I. Surface Physics and Nanoscale Microscopy**

This research group includes four faculty members and two joint appointment faculty members and routinely maintains a size of around 20 researchers comprised of visiting scholars, post-doctors, assistants, and students. We have established several major research tools such as scanning tunneling microscopy (STM), atomic force microscopy (AFM), field ion microscopy (FIM), transmission electron microscopy (TEM), photoemission electron microscopy (PEEM), low energy electron diffraction (LEED), Auger spectroscopy (AES), x-ray microscopy and etc. In past years, our focus has been on studying surface dynamics, film growth mechanisms, principles of atomic manipulation, quantum phenomena associated with low dimensionality, and microscopic instrumentations. In next five years, we plan to make progress in investigating the site-specific and shape-related properties of nanoscale objects with atom-resolvable STM; analyzing the real-time correlation between the functionality of a quantum dot or quantum wire and its

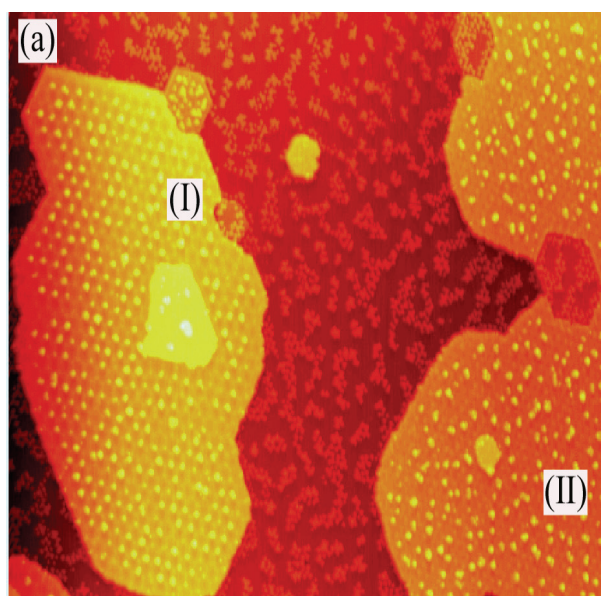
structure with the TEM/STM combined system; designing quantum phenomena laboratory at the atomic scale with ultra-low temperature STM equipped with superconducting magnet; improving the resolution of x-ray radiology to nanometer scale; and modeling nanomaterials with calculations and simulations. Some past research accomplishments are summarized in the following:

- We have observed interesting H-atom adsorption induced atomic rearrangements of a Pb monolayer on Si(111). (Phys. Rev. Lett. **94**, (2005) 045505)
- We have utilized the electronic Moirè patterns found on 2D lead (Pb) quantum islands as a template to grow self-organized 2D clusters (nanopucks). Both the size distribution and spatial arrangement of the Ag nanopucks are analyzed and found to be commensurate with the characteristics of the template island, which exhibits a bi-layer oscillatory behavior. (Phys. Rev. Lett. **94**, (2005) 136101)
- We have developed a new, simple, and easily reproducible method of preparing single-atom tips by electroplating Pd or Pt on single-crystal W(111) tips followed by thermal annealing in a vacuum. (Nano Lett. **4**, (2004) 2379)
- We have studied a reversible, temperature-driven structural surface phase transition of Pb/Si(111) nanoislands and found that the transition temperature decreased with decreasing island and domain size. (Phys. Rev. Lett. **93**, (2004) 106101)
- We have determined the structure of a type of surface magic cluster by a combination of scanning tunneling microscopy, density-functional calculations, and dynamical low energy electron diffraction. The unprecedented detailed structure information provided by the diffraction measurement is consistent with direct microscopic imaging and theoretical calculations. (Phys. Rev. Lett. **92**, (2004) 066103)
- We have investigated the structural, electronic, and optical properties of hydrogen passivated silicon nanowires along [110] and [111] directions with diameter  $d$  up to 4.2 nm from first principles. The size and orientation dependence of the band gap is investigated and the local-density gap is corrected with the  $GW$  approximation. Quantum confinement becomes significant for  $d < 2.2$  nm, where the dielectric function exhibits strong anisotropy and new low-energy absorption peaks start to appear in the imaginary part of the dielectric function for polarization along the wire axis. (Phys. Rev. Lett. **92**, (2004) 236805)
- We have used angle-resolved photoemission measurements of the electronic structure to show layer-resolved quantum well states in atomically uniform Pb films, which can be correlated with dramatic variations in thermal stability. The odd film thicknesses  $N = 5, 7$ , and 9 monolayers show sharp quantum well states. The even film thicknesses  $N = 6$  and 8 do not, but are much more stable than the odd film thicknesses. (Phys. Rev. Lett. **93**, (2004) 026802)
- We have shown that a ‘phase-contrast’ technique can image blood vessels in real

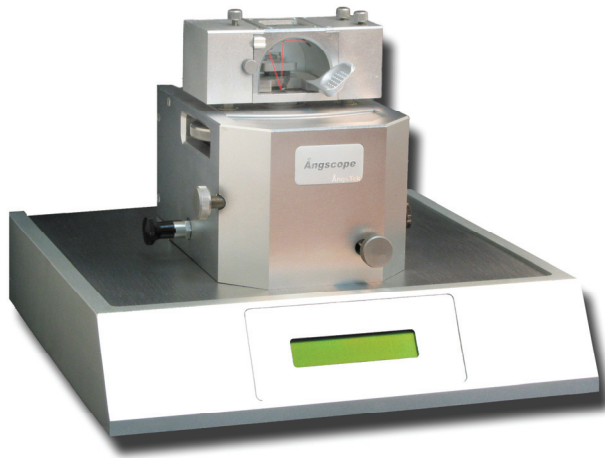
time and at resolutions of less than ten micrometres — a level of detail not seen before even with contrast agents. The technique used a beam of ‘white’ X-rays (containing a range of wavelengths), generated by a synchrotron accelerator. (Reported by Nature 427, (2004) 800)



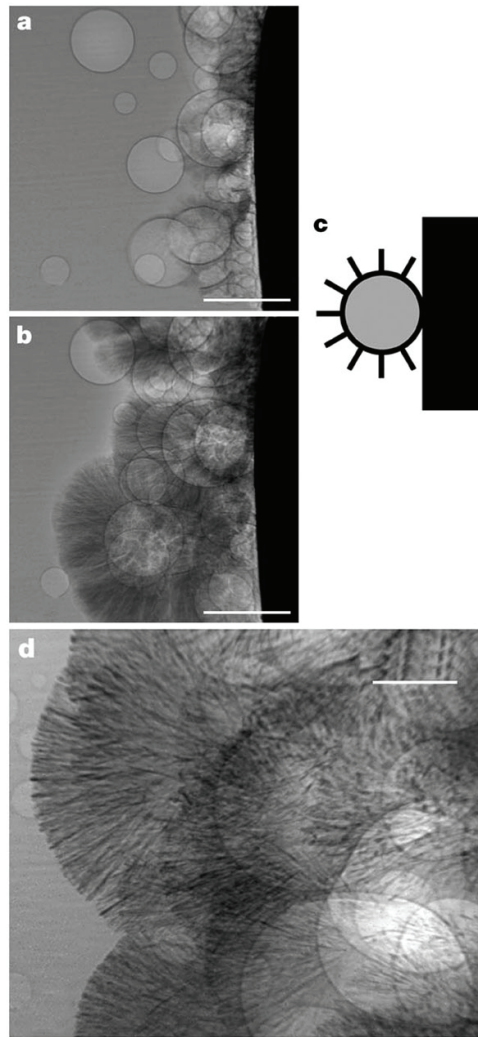
(a) Room-temperature STM topograph showing regions of the 1x1 phase surrounded by Si(111)-(7x7), taken at a sample bias of + 2 V and a tunneling current of 0.15 nA. Red scale bars: 5 nm. (b) High-resolution image of the 1x1 phase. Blue scale bars: 1 nm. (c) STM image of  $\sqrt{7}$  domains at 190 K, taken at a sample bias of + 2 V and a tunneling current of 0.15 nA. (d) High-resolution image of the  $\sqrt{7}$  phase. (e) and (f) illustrate the atomic models of the 1x1 and  $\sqrt{7}$  phases, respectively.



The electronic Moiré patterns found on 2D lead (Pb) quantum islands as a template to grow self-organized Ag nanopucks on islands.



Homemade Atomic Force Microscope



Phase-contrast microradiographs showing the growth of zinc on hydrogen bubbles. **a, b**, Images (taken 6 s apart) showing growth of zinc dendrites. **c**, Diagram of radial dendritic growth along the electric-field lines. **d**, Image showing the microstructure of the dendrites. Scale bars, 300  $\mu\text{m}$  (**a, b**) and 200  $\mu\text{m}$  (**d**).

## II. Optic materials and semiconductor physics

This research group consists of two faculty members and some research associates. The major research interest covers a broad range of topics concerned with the fundamental properties of shallow-levels in semiconductors and with impurity related issues of importance to semiconductor physics and technology, e.g., single and multiple donors and acceptors, shallow excited states of deep-level impurities, defect interaction on the atomic scale such as impurity-pair or complex formation. Crystal growth technique of some optical materials is also being studied hoping to manufacture useful tunable solid- state



lasers.

### III. Nanomaterial and low temperature physics

The nanomaterial and low temperature physics research group was first established in 1989. Now it involves two full-time faculty members and maintains a size of around 15 researchers comprised of visiting scholars, post-doctors, assistants, and students. Our research interests include phenomena that associated with strongly correlated electrons such as heavy fermion physics, Kondo effect and high temperature superconductivity. Other areas include the understanding of quantum-size effects on the above mentioned phenomena and others such as thermopower and thermoconductivity in alloys and/or semiconductors. We have developed our own research equipments such as a SQUID magnetometer operated in He<sub>3</sub> cryostat, low-temperature microcalorimeter, and measurements of thermopower & thermoconductivity, transport measurements to 20 Tesla in a dilution refrigerator; magnetic susceptibility and electrical resistivity measurements at high pressure up to 20 kilobars. We also have setups for the preparation of nanoparticles, thin film and single crystals. Some past research accomplishments are summarized in the following:

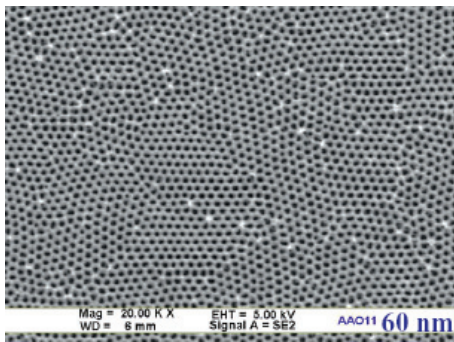
- We have observed several interesting quantum-size effects on the magnetism or superconductivity in nanomaterials of heavy fermion systems.
- We have developed new methods for the production of high quality magnetic/or superconducting nanoparticles and thin films
- We have developed a new wide-range low temperature sensor for calorimeter application using transition metal oxides.
- We have observed the coexistence of magnetic order and superconductivity in Ru-based double perovskite oxides.



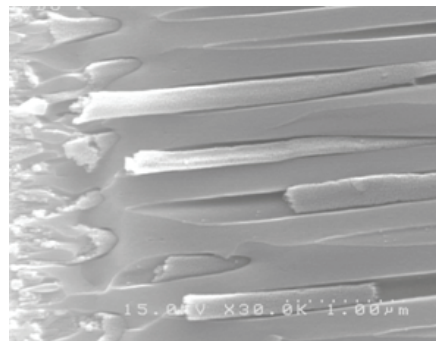
Dilution Refrigerator



Excimer laser ablation



$\text{Al}_2\text{O}_3$  template with  $d \sim 50$  nm



$\text{Y}_2\text{O}_3$  nanowire array with  $d \sim 150$  nm

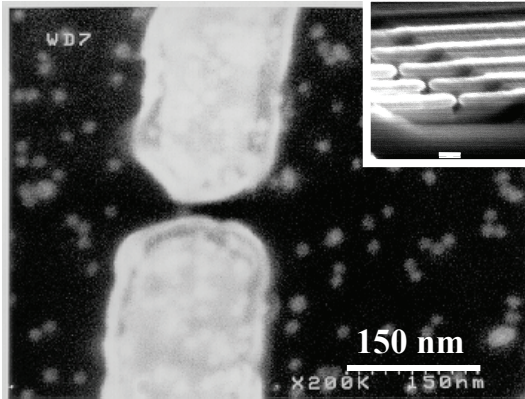
#### IV. Spintronics and magnetotransport physics

This research group was established more than twenty years. Currently it includes four full-time members of the institute and maintains about 40 researchers comprised of visiting scholars, post-doctors, assistants, and students. Our research areas cover wide-range of topics associated with interesting magnetic properties such as the interface properties between ultra-thin magnetic films on semiconductor; magnetic superlattices; magnetic coupling in multilayer magnetic/superconductor thin films, patterned magnetic nano-structures and etc. Other topics such as the magnetostriction of single-layered or multi-layered magnetic films; the magneto-optical effect; the piezoresistance (or the elastic

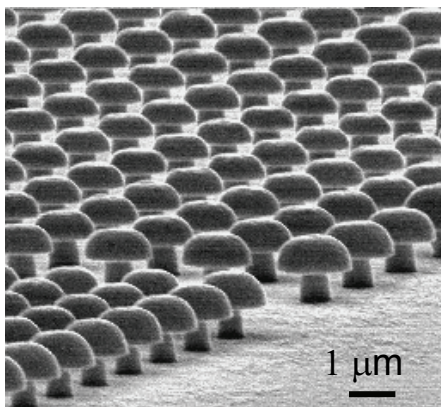
properties) of metal (magnetic or non-magnetic) films are also of our research interests. We have established the capabilities to create artificial nano-patterned magnetic structures and ultra-thin magnetic multilayer films. We have also developed a very sensitive technique to measure at low temperature the very small current perpendicular to plane (CPP) resistance of large area thin films with our SQUID pico-voltmeter setup. This technique provides us the possibility to further understand the interplay between spin-relaxation and Andreev reflection at the ferromagnetic/superconducting interface and to quantitatively study the Andreev reflection as functions of different physical quantities. We have built up a highly sensitive “Optical-cantilever” system that can be used to measure the saturation magnetostriction of a magnetic thin film. We have also built up a “Resistance-cantilever” system, which can be utilized to measure the strain gauge factor of a thin-film sample. A “Polar Kerr effect magnetometer” has been developed to study the polar Kerr rotation, polar Kerr ellipticity, and reflection coefficient of MO multi-layers.

## V. Quantum electronics physics

Taking advantage of modern electron-beam lithography technology, we are able to fabricate various nanometer-scaled electronic devices with the critical dimension as small as 30 nm. The objective is two-fold: to study novel (quantum) effects associate the small length scale of the devices and to utilize these effects for applications such as signal detection or information processing. The relevant length scales range from electron wavelength to phase breaking length, or spin relaxation length in magnetic systems. The materials that may be employed are superconductors, ferromagnets, semiconductors and novel materials such as carbon nanotubes and other synthesized nanowires, colloidal particles. These materials are patterned or arranged into one-dimensional narrow wires, quantum dots and point contacts. In area of fundamental research, we investigate superconductor-insulator phase transitions as well as interplay between magnetism and superconductivity. In addition, a project on shot noise properties in nanoelectronics is initiated. In application-oriented researches, we wish to study electron transport properties of devices with synthesized materials such as carbon nanotubes, colloidal particles or DNA molecules. Our recent research activities include: Transport properties of Multiwalled Carbon Nanotubes; Single electron memory cells with Au colloidal islands; Single electron transistors made of silicon; Spin injection in GaAs/AlGaAs heterostructures; Spin transport in ferromagnetic-superconductor-ferromagnetic single electron transistors; Quantum phase transitions in one-dimensional arrays of small Josephson junctions; and Fabrication of CdSe 2D photonic crystals.



An SEM image of the fabricated device; the gate electrode is not shown. The inset shows the suspended Au leads before attachment of Au particles; the scale bar is 150 nm. The source and drain electrodes are bridged by  $C_{60}$ -Au- $C_{60}$  nano-particles, acting as an electrometer, and the gate electrode is also attached by a chain of  $C_{60}$ -Au nano-particles, acting as a charge storage cell.



Two-dimensional arrays of high refractive index structures can be fabricated using a combination of e-beam lithography for pattern definition and electrochemical deposition for structure formation. The potential of this method is demonstrated for CdSe, where nanopillars, walls, and crosses are prepared. Such arrays have potential in optical device applications such as photonic crystals and waveguides.

## VI. Theoretical condensed matter physics

This group consists of two faculty members and more than 15 postdoctors, visiting scholars and research assistants including graduate students. The major research interests are High temperature superconductivity; Nano-materials; Protein structure prediction; Protein folding; Quantum Monte Carlo method. Cold trapped atoms: physics in low dimension, optical lattices, spinor Bose condensates and Fermionic superfluids; electric transport and noise properties in superconducting quantum point contacts; properties of unconventional superconductors

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Research Interest : Surface physics and chemistry; Principles of atomic manipulation; Quantum effects in low-dimensional systems; Nanostructure sciences, and Development of SPM.

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Ph.D., Chalmers University of Technology

Research interests : High operating temperature single electron transistors, Transport properties of nano-materials and bio-molecules, Physics and applications of Superconducting/Ferromagnetic nanostructures.

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Research Interest : Low temperature physics, Low temperature specific heat Heavy Fermion, Nanoparticle, Thermoelectricity, Ground freezing.

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Research fellow

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Ph.D., Purdue University, USA

Research Interest : Semiconductor Physics; Impurities and Defects in Crystals; Infrared Spectroscopy.

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Research Interests : Electron transport properties of ferromagnetic materials; Magnetostriction and application; Magnetic domains and domain walls; Magnetic anisotropy.

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Ph.D., National Tsing Hua University

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Ph.D., Michigan State University, USA

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Ting-Kuo Lee

Distinguished Research fellow

(For personal information, please see Complex System Research Group)

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Research interests : The growth mechanism, structure, physical properties and applications of magnetic, metal, oxide and diamond thin films. Methods of growing thin films: molecular beam epitaxy of single crystal metal and magnetic thin films and superlattices; magnetron sputtering of metal and oxide films and multilayers; microwave plasma chemical vapor deposition of diamond films. The film structure, composition, surface morphology and magnetic properties.

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Research Interests: Nanomaterials, mechanical properties, instrumentation

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Research Interests : Raman and Infrared spectroscopy, Laser and Nonlinear Crystals.

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Research Fellow  
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Ph.D., in Physics, Clarkson University, USA  
Research Interests: Nano-Science, Magnetism, Low Temperature Physics, Superconductivity, Electrical Optics, Thin Films, and Nanosize Structures and their Physical Properties. Published about 310 papers.

Sungkit Yip  
Research fellow  
Tel: 886-2-2789-6785 / [yip@phys.sinica.edu.tw](mailto:yip@phys.sinica.edu.tw)  
Ph.D., University of Illinois, Urbana-Champaign, USA  
Research Interests: Superconducting phenomena; Quantum fluids; Strongly correlated electron systems.

Postdoctoral Research Associates
----------------------------------

Shih-Hsin Chang ; Yuan-Yuan Hsu ; Ivo Klik ; Hong-Shi Kuo ; Sonnathi Neeleshwar ;  
Wen-Li Tsai ; Huang-Wei Chang ; Huan-Chin Chang ; Shh-Yun Chen ; Ya-Ping Chiu ;  
Chung-Li Dong ; Gade Narsinga Rao ; Wen-Hsing Hsieh ; Ren-Jay Kou ; Chatterjee  
Kuntal ; Jiu-Yong Luo ; Der-Chung Yan ; Tsung-Yeh Yang ; Chwen Yu ; Xng-Jian Guo ;  
Chun-Chuen Yang °



## Intermediate and High Energy Physics Research Group

### I. Theory Program

#### A. Particle Phenomenology

- (1)  $B$  meson wave function in  $k_T$  factorization
- (2) Transition to perturbative QCD in two-photon collisions
- (3) Weak phase from  $B \rightarrow \pi\pi$ ,  $K\pi$  decays
- (4) Polarizations in  $B \rightarrow VV$  decays
- (5) Final-state interactions in hadronic B decays
- (6) Radiative  $B$  decays
- (7) Out of equilibrium and RHIC physics
- (8) Photon production from nonequilibrium disoriented condensates in a spherical expansion
- (9) Loop gravity
- (10) p-brane production in fat brane or universal extra dimension scenario
- (11) Nonperturbative bound on high multiplicity cross sections in theory in three dimensions from lattice simulation
- (12) Neutrino mass and neutrino oscillation
- (13) Quantum bit commitment

#### B. Particle Astrophysics and Cosmology

- (1) Decaying superheavy dark matter and subgalactic structure of the Universe
- (2) Bound on the time variation of the fine structure constant driven by quintessence
- (3) Observational strategies of CMB temperature and polarization experiments
- (4) Density perturbation in inflationary universe
- (5) Correlated hybrid fluctuations from inflation with thermal dissipation
- (6) Off-equilibrium dynamics of the primordial perturbations in the inflationary universe

#### C. Theoretical Nuclear Physics

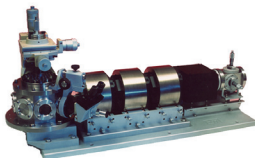
- (1) Cascade production in heavy-ion collisions at SIS energies
- (2) Two-level model and magnetic field effects on the hysteresis in n-GaAs
- (3) Tsallis information theory

### II. Nuclear Physics Experiment

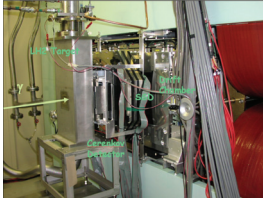
We have a on-site facility of 3MV 9SDH-2 pelletron tandem accelerator which was installed in 1989. Since then the accelerator became an important facility for experimental research in the low energy nuclear physics, accelerator based atomic physics, and applied accelerator technology. The accelerator system has two negative

ion sources, SNICS for solid source material and Alphasross for noble gases Helium-3 and Helium-4, capable of producing a wide range of ion beam species. The ion-beams for a given charged ( $q$ ) state with a maximum energy  $E=3(q+1)\text{MeV}$  can be obtained and selected by an analyzing magnet to meet experimental need. There are three beamlines available with different scattering chambers for various research needs, especially the newly-installed Oxford micro-beam system (Fig. 1). We have made the accelerator available for outside users. Every year a fraction of the machine time was provided to people of domestic institutions such as Institute of Atomic and Molecular Sciences, Academia Sinica, the National Tsing-Hua University, National Taiwan University and National Sun Yat-sen University

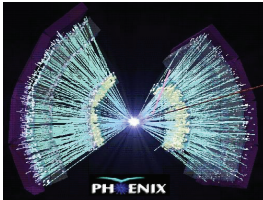
As for the high energy nuclear experiment, we participate at two international projects: SPring-8 LEPS experiment (Fig. 2) and BNL PHENIX experiment (Fig. 3). Photon beam with maximum energy up to 2.5 GeV can be generated from the backward Compton-scattering of incident eV laser photons with 8 GeV electrons circulating inside the storage rings of synchrotron facility, SPring-8 in Japan. We study the mechanism of interactions between photon and quarks at a few GeV via the reconstruction of  $\gamma N \rightarrow \phi N$  reaction. In year 2003, we published the first observation of pentaquark state  $\Theta^+$  (1540) which decays into neutron and kaon. The following confirmations by other experiments have triggered tremendous effort of studying pentaquark experimentally and theoretically. In Brookhaven National Lab, U.S., RHIC collider can create a collision of Au nuclei of center of mass energy to be 200 GeV. PHENIX experiment is capable of measuring the di-lepton and photon signal of Quark Gluon Plasma. The experimental confirmation of QGP will greatly help the understanding the effect of finite temperature and baryon density on QCD and also the story of universe creation.



The newly-installed Oxford micro-beam system.



Spring-8 LEPS experiment

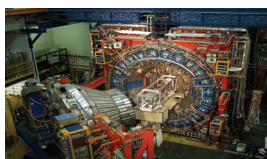


BNL PHENIX experiment

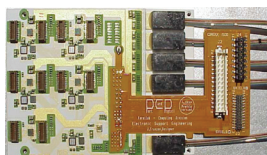
### III. Particle Physics Experiment

#### (A) Collider Experiment CDF at Fermilab

For the next decade, Fermilab Tevatron Collider remains the highest energy frontier of particle physics. With the completion of Main Injector (which will enhance the luminosity) and with the upgrade of the collider detectors (CDF and D0), Tevatron Run II provides the potential for discovery of new phenomena and opportunities for the precision measurements in hadron collider physics. The Collider Detector at Fermilab in Run II (CDF II) is a general-purpose solenoidal detector that combines precision charge particle tracking with fast projective calorimetry and fine-grained muon detection for the study of p anti-p collisions. Precision measurement of the top mass and the W mass are primary goals of CDF II. Search for Higgs and new phenomena beyond the Standard Model will be explored



detector to the CDF II detector.

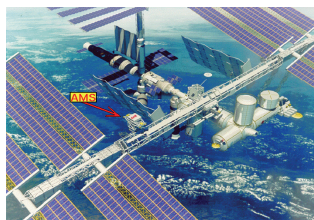


2: DOIM on Port Card

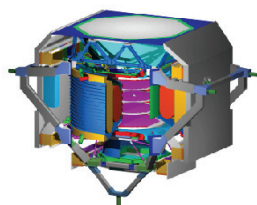
#### (B) AMS Experiment at International Space Station

The goal of the AMS experiment is to build the first precision magnetic spectrometer to be placed on the International Space Station in 2005 to search for anti-matter and dark matter in the Universe and to study cosmic ray physics and other exotic phenomenon. A

simplified detector successfully operated on board the space shuttle Discovery for 10 days in June 1998, already producing important results. The AS group is leading the Taiwan participation in AMS, which includes the construction of the superconducting magnet, electronics and computing systems, as well as simulation and analysis.



1. AMS at the International Space Station

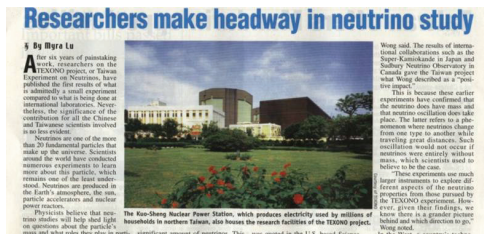


2. AMS Detector : Schematic Design

#### (C) Neutrino and Astro-particle Physics Group

The group was started in 1997 with the goal of pursuing an experimental program in neutrino and astro-particle physics in Taiwan. The TEXONO Collaboration, at present 40-member strong, has been built up, under the leadership of the Academia Sinica group, and with the participation of several major research institutes from Mainland China. The efforts represent the first big research collaboration among scientists from Taiwan and Mainland China. The "flagship experiment" is based on scintillating crystal and solid state detectors placed near the core of Kuo-Sheng Nuclear Power Plant II at the northern coast of Taiwan to study various low-energy neutrino interactions. This is the first particle physics experiment performed in Taiwan. World-level results have been achieved in the search of neutrino magnetic moment. Our efforts and achievement have been widely covered by the international press. Various R&D projects are pursued, in further enhancing the detector techniques, in developing methods to measure trace radiopurities, in developing advanced electronic modules and in exploring the feasibilities of future experiments in areas like Dark Matter searches and the investigations of sonoluminescence.

1. Headlines in Taiwan Journal, with the Kuo-Sheng Nuclear Power Plant.



## 2. TEXONO Collaboration Members.



## 3. The shielding and control room at the Kuo Sheng Neutrino Laboratory.



## (D) LHC-ATLAS at CERN and the GRID Project

The European Laboratory of Particle Physics (CERN) is building the World' s largest hadron collider, the Large Hadron Collider (LHC), which is expected to commission in 2006 and will allow us to explore the new frontier of physics at the TeV energy scale. Two general purpose detectors, namely ATLAS and CMS, are being constructed for LHC experiments. The high energy physics group of the Institute joined ATLAS Collaboration in September 1999. The main responsibility of the Taiwan team in ATLAS is to develop and produce compact opto-packages for the inner detectors (PIXEL and Semi-Conductor

Tracker (SCT)), as well as the high-speed (1.6GHz) transmitter and receiver modules for the optical link of the Liquid Argon Calorimeter (LAR). A miniature optopackage (1.6mm in height) which consists of two VCSEL's (Vertical Cavity Surface Emitting Laser) and one Epitaxial Silicon PIN diode has been developed by Taiwan for SCT to readout the 6 million channel silicon micro-strip detector. The SCT opto harness is now in production phase. The final design review (FDR) for the PIXEL optical link was held in February 2003. Our design is well received and become the baseline. The other responsibility for inner detectors is to provide the 12-channel VCSEL and PIN array modules for use in the readout driver (ROD) of both SCT and PIXEL.

#### **IV. Grid Computing**

Taiwan formally joined LCG project since September 2002. The Institute is working with the Computing Centre of Academia Sinica (ASCC) building up the LCG infrastructure in Taiwan. Academia Sinica will be the Tier-1 Center of LCG in Asia and the formal non-funded member of EGEE (Enabling Grid for E-ScienceE). In the meantime, Academia Sinica acts as first Regional Operation Center and Core Infrastructure Center of EGEE to provide Grid operation and support services for Asia Pacific Area.

Grid computing is expected to be the "next big thing" of information technology and application. It may very well change the way we use computing resources whether it is for commercial, industrial or research purpose. As in the case of World-Wide-Web, the need of high energy physics research is once again leading and guiding the revolution. ASCC and the Institute is working hard to keep Taiwan abreast of the ensuing change. With more than 70 sites joining in the LCG project, Taiwan plays a leading role in Asia. Proof by the Data Challenges in 2004, LCG becomes the first world-wide production quality Grid System for LHC requirements of PetaFLOPS-scale computing in 2008.

<b>Principal Investigators</b>
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Ph.D., National Chiao Tung University

Research Interests: High energy experiment, Radiation hard electronics/  
opto-electronics, optical data transfer system, electronic instrumentation.

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optical data transmission links.

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Research Interests: Theoretical physics; particle and field theory.

Hsiang-nan Li

Research Fellow

Tel : 886-2-2789-6726 / [hnli@phys.sinica.edu.tw](mailto:hnli@phys.sinica.edu.tw)

Ph.D., SUNY at Stony Brook, U.S.

Research Interest: Perturbative Quantum Chromodynamic, *B* physics

Simon C. Lin

Associate Research Fellow

Tel : 886-2-2789-9254 / [sclin@sinica.edu.tw](mailto:sclin@sinica.edu.tw)

Ph.D., University of Edinburgh, Scotland.

Research Interest: Computational Physics, Statistical

Mechanics, Scalable Algorithm in Simulated Annealing, Cluster

Computing, Internet Strategic Planning, Digital Library/Museum.

Guo-Ching Jon

Associate Research Technologist

Tel: 886-2-27896787 / [phjon@phys.sinica.edu.tw](mailto:phjon@phys.sinica.edu.tw)

Ph.D., Tohoku University, Japan

Research Interests: Experiment nuclear physics, Accelerator physics, Radiation protection.

Kin-Wang Ng

Research Fellow

Tel : 886-2-2789-6702 / [nkw@phys.sinica.edu.tw](mailto:nkw@phys.sinica.edu.tw)

Ph.D., University of Minnesota, USA.

Research Interests: Particle astrophysics and cosmology; early universe; inflationary cosmology and quantum fluctuations; dark matter; cosmic microwave background.

Ping-Kun Teng

Research Fellow

Tel : 886-2- 2789-6792 / [pkteng@sinica.edu.tw](mailto:pkteng@sinica.edu.tw)

Ph.D., Rensselaer Polytechnic Institute.

Research Interests: Particle physics, Nuclear Physics.

Yiharn Tzeng

Research Fellow

Tel : 886-2- 2789-6795 / [phtzengyh@ccvax.sinica.edu.tw](mailto:phtzengyh@ccvax.sinica.edu.tw)

Ph.D., Physics, UCLA

Research Interest: Theoretical Nuclear Physics, Intermediate Energy Nuclear Physics, Nuclear Many-Body Problems and Nuclear Structure, Quark Models, Hypernuclear Systems.



Henry Tsz-King Wong

Associate Research Fellow

Tel : 886-2- 2789-6789 / [htwong@phys.sinica.edu.tw](mailto:htwong@phys.sinica.edu.tw)

Ph.D. in Physics, California Institute of Technology, USA.

Research Interests: Neutrino Physics and Astrophysics, Astro-particle Physics, Particle Physics Instrumentation, Cross-Strait Academic Collaboration.

Hoi-Lai Yu

Research Fellow

Tel : 886-2-2789-6783 / [hlyu@phys.sinica.edu.tw](mailto:hlyu@phys.sinica.edu.tw)

My Projects Digital and Physics:

<http://www.phys.sinica.edu.tw/~hoilai/>

Ph.D., University of Pittsburgh, USA.

Research Interests: Field Theories, Cosmology, Non-equilibrium Physics, Digital Physics and Cosmology.

Yueh-Chung Yu

Associate Research Fellow

Tel : 886-2- 2789-6769 / [phycyu@phys.sinica.edu.tw](mailto:phycyu@phys.sinica.edu.tw)

Ph.D., University of North Texas.

Research Interest : Accelerator based atomic physics and materials characterization.

Postdoctoral Research Associates
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Chung-Hsien Chou ; Rong-Shyang Lu ; Hau-Bin Li ; Di Qing ; Zhong-Liang Ren ; Venkatesh Singh ; Chia-Ming Kuo ; Ashfaq Ahmad ; Mirta Ankush ; Yuh-Kuei Chang ; Shih-Yuin Lin ; Jie Jun Tseng ; We-Fu Chang ; Chun-Shie Wu ; Kosuke Odagiri ; Dmitry S. Oshuev ; Yen-Chu Chen ; Shang-Yuu Tsai ; Zheng-Tao Wei ; Seokcheon Lee ◦

## Complexity Research Group

Complex systems are systems consisting of many simple elements which interact with each other nonlinearly. In general, the most interesting aspect of complex systems is the cooperative behavior among the elements mediated by their nonlinear interaction. Such cooperative behavior is manifested in the spatial and/or temporal patterns, which give the systems a variety of structures. In our institute, there are ten faculty members and over ten postdocs and several graduate students working in different areas of complexity and non-linear science. Our studies of nonlinear and complex systems consist of the following directions.

### **I. Basic and Applied Research on Hydrodynamics and Atmospheric Physics**

Measurement of strong wind characteristics had been carried out the coastal area of Taiwan. Semi-Lagrangian cloud model, a nonlinear atmospheric fluid dynamic model with phase changes, has been developed for better understanding of meso-scale weather phenomena and numerical experiments of this model has been made using ensemble prediction technique to investigate the storm characteristics, such as the life cycle of the storm, precipitation area and amount of cumulated rainfall. (Bao-Shi Shau, Chung-Yi Tseng)

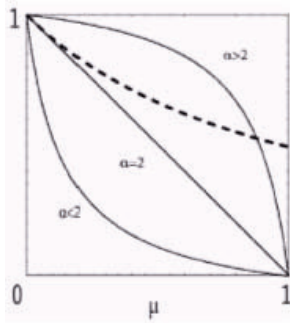
### **II. Non-linear Phenomena in Complex Systems**

Complex fluids, such as polymer and surfactant solutions, electrorheological fluids, and granular fluids, are among the most important materials studied in basic and applied sciences. We investigated phase transitions of binary liquid mixture with polymer and discovered a possible universality class at the critical point. In two-dimensional hopper flow experiments, we are searching for a basic understanding of the jamming phenomenon. On vertically vibrating platforms, we are studying the phase transitions of granular gas as well as the conformations of granular chains. (Kiwing To). Rheology data of protein and DNA solution may reveal the molecular structures as well as the formation mechanism of these biologically important macromolecules and single-molecule measurements have just been started (Chi-Keung Chan). Other nonlinear phenomena we studied include spiral wave dynamics in chemical reaction (Chi-Keung Chan); pattern formation in fracture phenomena(Kwan-tai Leung).

### **III. Statistical and Computational Physics Approach to Complex Systems**

Laboratory of Statistical and Computational Physics (LSCP, website: <http://www.sinica.edu.tw/~statphys/>) at our institute is devoted to frontier research in statistical and computational physics (SCP), applications of SCP to problems in physical, biological, and social sciences, sponsoring meetings in SCP, and promoting education and

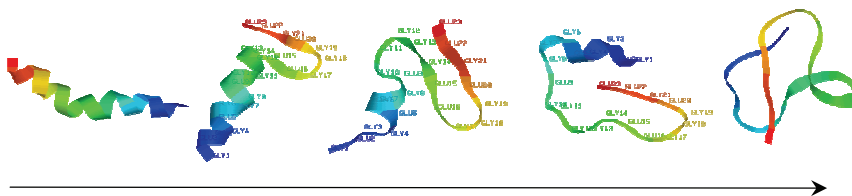
research of SCP in developing countries. The research topics at LSCP include: equilibrium critical systems, such as the Ising, dimer, and percolation models; non-equilibrium critical systems, such as sand-pile and avalanche models; synchronization in nonlinear coupled systems and analysis of physiological data; models of biological evolution; analytic and numerical studies of macromolecules, polymer, DNA, RNA, and proteins; stochastic dynamic model for stock-stock correlations; universality and scaling in statistical data of literary works. (Chin-Kun Hu, Simon C. Lin)



Exact phase diagram for an asymmetric avalanche process, which shows the critical density of particles  $\rho$  as a function of parameters  $\alpha$  and  $\mu$  of toppling rules in the model. This figure is taken from Phys. Rev. Lett. 87, 084301(2001)

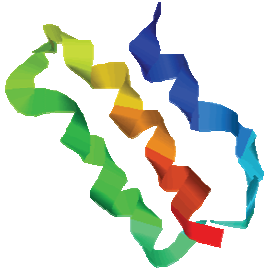
#### IV. Biology-Inspired Physics

Biological organisms are likely the most complex and the least understood systems that one can imagine, due to their intricate biochemical and physical interactions among macromolecules. Biology is essentially an experimental science with huge amount of data, physicists hope to distill basic principles from them. Because all biological processes operate in a thermal environment, statistical physics is an indispensable tool in studying them. Equipped with such tools, we have been studying theoretically: biological and physiological signals (such as heart beat); development of algorithms and simulations of macromolecules (DNA, RNA and proteins) with parallel computers (Chin-Kun Hu), development of new optimization algorithms to study complex systems including protein structure prediction (Ting-Kuo Lee); and collective behavior of self-propelled particles manifested in flocking models (Kwan-tai Leung). Moreover, Experimental studies on synchronized firing of neural net has also been carried out (Chi-Keung Chan).

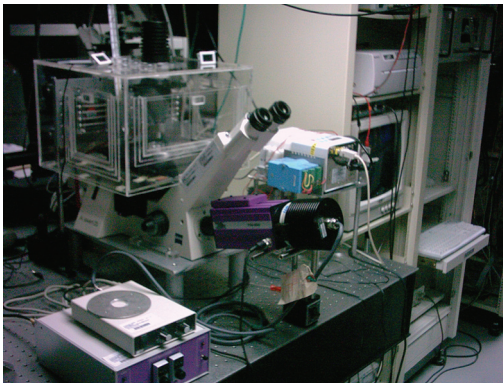


Breakdown of protein structure due to increasing side chains interaction

Breakdown of protein structure due to increasing side chains interaction.



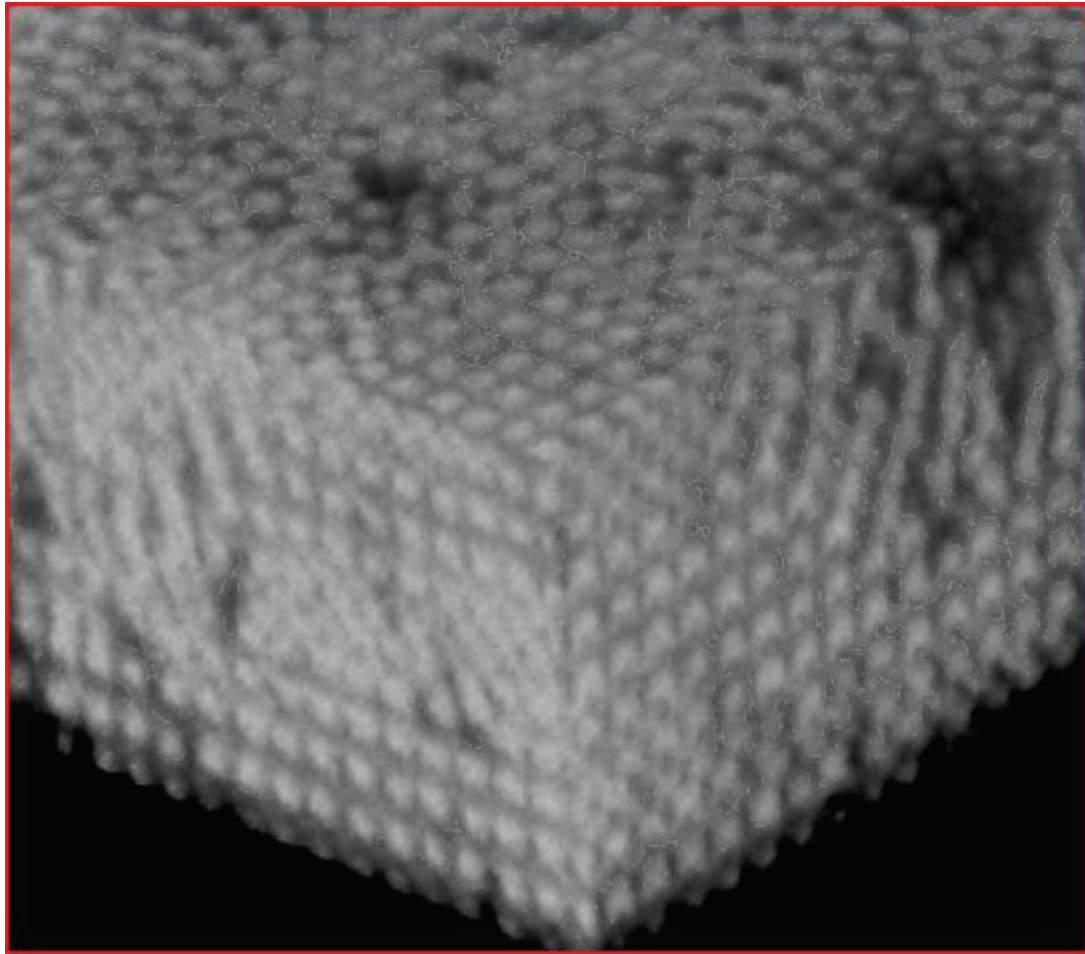
A 3-D protein structure obtained by using the optimization algorithm and a minimal energy model developed by us.



Experimental setup for synchronous firing of neural net.

## V. Self-assembly Phenomena in Colloidal Particles

I am interested in the self-assembly phenomena, particularly in colloidal systems. In nature we observe many ordered structure which happens on its own. It is important to understand self-assembly and to explore it since this is the key to the bottom-up approach of nanotechnology. We choose colloidal particles because they are ideal model systems. In many ways it is the analogy of atomic systems but their interaction can be measured directly and they can be observed in real time and real space(Keng-hui Lin).



Colloidal Crystal

## VI. Single-molecule Studies of Biological Macromolecules

Research of biological macromolecules provides golden opportunities to bridge our understandings of polymer physics to many biophysics topics. Through fluorescence microscopy techniques, the dynamics of the biopolymers in solution at the single molecular level can be clearly observed. In addition to the study of physics of various polymeric solutions, the end-grafted DNA brushes have also been constructed and studied at both mesoscopic and single molecule levels.

### Principal Investigators

Chi-Keung Chan

Research Fellow

Tel : 886-2-2789-6790 / [ckchan@gate.sinica.edu.tw](mailto:ckchan@gate.sinica.edu.tw)

Ph. D., Physics Department, University of Pittsburgh

Interests: nonlinear phenomenon in the dynamic behaviors of complex fluid systems, phase separation dynamics of simple fluids, polymer solutions and surfactant solutions, granular flows, Light scattering & imaging techniques, firing in neural net.

Chin-Kun Hu

Research Fellow

Tel : 886-2- 2789-6720 / [huck@phys.sinica.edu.tw](mailto:huck@phys.sinica.edu.tw)

Ph.D., National Tsing Hua University

Interests: Statistical and computational physics, nonlinear science, theoretical biophysics, complex systems.

Wen-Tau Juan

Assistant Research Fellow

Tel : 886-2-2789-6759 / [wtjuan@phys.sinica.edu.tw](mailto:wtjuan@phys.sinica.edu.tw)

Ph. D., National Central University

Research Interests: Experimental Polymer Physics, Experimental Soft Condensed Matter Physics, Experimental Low Temperature Plasma Physics, Nonlinear Physics, Biophysics.

Ting-Kuo Lee

Distinguished Research Fellow

Tel : 886-2- 2789-6791 / [tklee@phys.sinica.edu.tw](mailto:tklee@phys.sinica.edu.tw)

Ph.D., Brown University, USA.

Research Interest: High temperature superconductivity; Nano-materials; X-ray crystallography; Protein structure; Protein folding; Quantum Monte Carlo method.

Kwan-Tai Leung

Research Fellow

Tel: (886) 2-2789-6780 / [leungkt@phys.sinica.edu.tw](mailto:leungkt@phys.sinica.edu.tw)

Ph.D., University of California,

Ph.D., University of California, Santa Barbara

Research Interests: Nonequilibrium statistical mechanics; phase transitions & critical phenomena; modeling of complex systems.

Keng-hui Lin

Assistant Research Fellow

Tel : 886-2-27896763 / [khlin@phys.sinica.edu.tw](mailto:khlin@phys.sinica.edu.tw)

Ph.D., University of Pennsylvania, USA

Research Interest: Soft Condensed Matter, Biophysics, Nano-material assembly.

Kiwing To

Research Fellow

Tel : 886-2- 2789-6770 / [ericto@gate.sinica.edu.tw](mailto:ericto@gate.sinica.edu.tw)

Ph.D., Physics Department, University of Pittsburgh

Research Interests: Phase transitions and critical phenomenon;  
physics of fluids and hydrodynamics; electrorheological fluids;  
granular materials; polymer physics.

Chung-Yi Tseng

Research Fellow

Tel : 886-2-2789-6748 / [cyseng@phys.sinica.edu.tw](mailto:cyseng@phys.sinica.edu.tw)

Ph.D. in Meteorology, University of Oklahoma, U. S. A. ;

Research Interests: Meteorological Numerical Modeling,  
Atmospheric Radiation and Remote Sensing.

Tian-Yow Tsong

Distinguished Professor

Tel : 886-2-27896730 / [tsongty@phys.sinica.edu.tw](mailto:tsongty@phys.sinica.edu.tw)

Ph.D., Yale University, USA

Research Interest : **Biophysics**, Mechanisms of protein folding, Electrical properties of cell membrane, Ion pumps and theory of Brownian motors, Catalytic wheel and biological energy transduction

Postdoctoral Research Associates
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Ruben Ghulghazaryan ; Wen-Johg Ma ; Hayryan Shura ; Ming-Chya Wu ; Wen-Chang Yang ; Nan-Yow Chen ; Chi-Ho Cheng ; Noboru Fukushima ; Ju-Chun Huang ; Tomoya Isoshima ; kwai Kong Ng °





# **III**

## **List of Ongoing Research Projects**



## List of Ongoing Research Projects

中央研究院物理研究所九十四年度計劃清單一覽表

( 2004 年 8 月 ~ 2006 年 7 月 )

主持人	計 劃 名 稱	執 行 期 間	計 劃 編 號
余岳仲	高能離子佈值製作單晶薄膜	NSC94-NU-7-001-001	94/01/01-94/12/31
姚永德	圖案化奈米結構之製作及物性研究(3/3)	NSC94-2120-M-001-004	94/01/01-95/07/31
李定國	奈米國家型科技計畫-計畫辦公室運作經費	NSC94-3113-P-001-004	94/01/01-95/03/31
李世昌	建造AMS太空磁譜儀以搜尋反物質及暗物質(1/3)	NSC94-2745-E-001-001	94/05/01-95/04/30
李世炳	高中科學資優學生培育計畫--踏向科學的第一步(2/2)	NSC94-2514-S-001-001	94/08/01-95/07/31
李湘楠	B物理中的量子色動力學(3/3)	NSC94-2112-M-001-001	94/08/01-95/07/31
葉崇傑	超導之介觀現象及低溫原子陷阱中超流體(3/3)	NSC94-2112-M-001-002	94/08/01-95/07/31
李定國	變分法探討高溫超導體之模型(3/3)	94/08/01-95/07/31	NSC94-2112-M-001-003
陳志強	單分子DNA 流力特性之實驗研究(2/3)	94/08/01-95/07/31	NSC94-2112-M-001-009
胡進錕	臨界現象與生物聚合物研究-非線性與相變模型研究(2/3)	94/08/01-95/07/31	NSC94-2112-M-001-014
蔡俊謙	粒子現象學味物理之研究(2/2)	94/08/01-95/07/31	NSC94-2112-M-001-016
梁鈞泰	生物體結隊行爲之動力研究(1/2)	94/08/01-95/07/31	NSC94-2112-M-001-021
鄭海揚	重味物理現象學之研究(1/3)	94/08/01-95/07/31	NSC94-2112-M-001-023

主持人	計 劃 名 稱	執 行 期 間	計 劃 編 號
吳建宏	應力張量量子起伏與暴脹宇宙中的能量密度起伏	94/08/01-95/07/31	NSC94-2112-M-001-024
杜其永	二維顆粒管流之堵塞研究	94/08/01-95/07/31	NSC94-2112-M-001-025
曾詣涵	奇異物質之研究	94/08/01-95/07/31	NSC94-2112-M-001-030
章文箴	在Spring-8研究光致向量介子產生中之核物質效應及五夸克粒子的特性(VI)	94/08/01-95/07/31	NSC94-2112-M-001-034
余岳仲	輕中重離子在單元素與化合物薄膜的能量損失機制之研究	94/08/01-95/07/31	NSC94-2112-M-001-036
黃英碩	單原子探針的物理特性研究及應用(2/3)	94/08/01-95/07/31	NSC94-2112-M-001-011
蘇維彬	二維銀島結構中量子態的微擾效應之研究(2/2)	94/08/01-95/07/31	NSC94-2112-M-001-012
吳茂昆	新穎過渡金屬硫屬化合物之物性研究與應用-子計畫一:離子導電度對新穎過渡金屬氧化物金屬絕緣體轉變之影響(2/3)	94/08/01-95/07/31	NSC94-2112-M-001-015
李尙凡	由電子傳輸性質在球型碰撞與擴散領域決定鐵磁性材料的極化率與擴散長度(2/3)	94/08/01-95/07/31	NSC94-2112-M-001-017
李世炳	以數值模擬研究血液循環系統效率指標(1/3)	94/08/01-95/07/31	NSC94-2112-M-001-019
王子敬	台灣微中子實驗--低能區微中子物理及從聲致發光引出高能輻射之研究	94/08/01-95/07/31	NSC94-2112-M-001-028
鄧炳坤	CDF實驗物理研究(子計畫二)-CDF實驗粒子偵測器研製	94/08/01-95/07/31	NSC94-2112-M-001-031
侯書雲	CDF實驗物理研究(總計畫)及(子計畫一)-CDF實驗網格電算數據分析	94/08/01-95/07/31	NSC94-2112-M-001-032
李世昌	參與ATLAS實驗搜尋新物理現象及以精密質譜儀探測宇宙中之反物質及暗物質(IV)	94/08/01-95/07/31	NSC94-2112-M-001-035

主持人	計 劃 名 稱	執 行 期 間	計 劃 編 號
胡宇光	發展高速X光顯微照相術以研究材料與生物中之動態行爲(Ⅲ)	94/08/01-95/07/31	NSC94-2112-M-001-039
任盛源	軟磁薄膜之彈性性質研究(1/3)	94/08/01-95/07/31	NSC94-2112-M-001-040
劉鏞	稀釋磁性半導體薄膜,多層膜與奈米結構的研究與應用	94/08/01-95/07/31	NSC94-2112-M-001-041
姚永德	磁性微小結構之製作及其物性研究	94/08/01-95/07/31	NSC94-2112-M-001-043
陳洋元	非費米液體行爲系統之研究	94/08/01-95/07/31	NSC94-2112-M-001-044
張嘉升	奈米顆粒在量子化薄膜上之特性與相互作用	94/08/01-95/07/31	NSC94-2112-M-001-046
李世昌	參與研製ATLAS偵測器	94/08/01-95/07/31	NSC94-2119-M-001-004
陳啓東	奈米生物電子元件-生物分子的檢測(3/3)	94/08/01-95/07/31	NSC94-2120-M-001-005
張嘉升	在原子尺度下觀測及操控單一奈米精品與位置和結構有關的性質-子計畫一(3/3)	94/08/01-95/07/31	NSC94-2120-M-001-006
姚永德	奈米科學尖端研究設施之建構(3/3)	94/08/01-95/07/31	NSC94-2120-M-001-010
胡宇光	利用高相干性光源非破壞性分析及成像奈米及生物結構(2/3)	94/08/01-95/07/31	NSC94-2120-M-001-012
陳洋元	奈米材料之新穎物理性質與量子尺寸效應研究(1/3)	94/08/01-95/07/31	NSC94-2120-M-001-014
黃榮鑑	方形射流與橫向流交會之三維流場構造研究(3/3)	94/08/01-95/07/31	NSC94-2611-E-001-001
黃榮鑑	孤立波通過隆起底床引致碎波流場之三維數值研究(1/3)	94/08/01-95/07/31	NSC94-2611-E-001-002

主持人	計 劃 名 稱	執 行 期 間	計 劃 編 號
陳志強	台俄雙邊合作計畫--心肌和神經學科中可激發和振盪系統之同步和控制之研究(1/3)	94/08/01-95/07/31	NSC94-2112-M-001-047
陳啓東	以奈米線場效電晶體及光學感測器探討神經網路功能—電子束微影技術製備奈米線場效電晶體(子計畫二)(1/3)	94/08/01-95/07/31	NSC94-2627-M-001-007
林誠謙	全球網格與e-Science於高物理之應用	94/08/01-95/07/31	NSC94-2119-M-001-005
林耿慧	微流體元件裡的熱泳現象(1/3)	94/10/01-95/07/31	NSC94-2119-M-001-19
林誠謙	e-Science亞洲中心與亞洲執行委員會之建置	94/10/01-95/09/30	NSC94-3111-P-001-002-Y02
林誠謙	刀鋒式伺服器在尖端科學計算領域的研發—科學計算基礎架構建置及調校準則研發並發展計算材料的環境	94/08/01-95/07/31	NSC94-2745-P-001-003
林誠謙	刀鋒式伺服器在尖端科學計算領域的研發—科學計算基礎架構建置及調校準則研發並發展計算材料的環境	94/08/01-95/07/31	廣達
李定國	刀鋒式伺服器在尖端科學計算領域的研發(總計畫)	94/08/01-95/07/31	廣達
胡進錕	94年度第3屆第2年高級中學基礎科學資優人才培育計畫	94/03/01-95/02/28	教育部
胡進錕	94年度第4屆第1年高級中學基礎科學資優人才培育計畫	94/03/01-95/02/28	教育部
林誠謙	Windows高速電腦運算平台計畫	94/07/01-95/06/30	微軟
李尙凡	以鎖相放大器測量微磁結構中磁區壁移動與直流偏壓之關連	94/07/01-95/02/28	94-2815-C-001-003-M

# **IV**

## **Publication List of 2005**





### **Chan, C. K(陳志強)**

1. “Turbulent drag Reduction Characteristics induced by Calf-thymus DNA”, S. T. Lim, S. J. Park, C. K. Chan and H. J. Choi, *Physica A*, 350, 84 (2005)
2. “Effects of Turbulent Flow on Coil-Globule Transition of Lambda-DNA”, S. T. Lim, H. J. Choi and C. K. Chan, *Macromolecules*, Rapid Communication, in print (2005)
3. “Dynamics of a projectile during penetration into a granular bed”, M. Hou\*, Z. Peng, R. Liu, and K. Lu and C. K. Chan, *Phys. Rev. E.* 72, 062301 (2005)
4. “Projectile impact and penetration in loose granular bed”, M. Houa, Z. Peng, R. Liu, Y. Wu, Y. Tian, K. Lu and C.K. Chan, *Science and Technology of Advanced Materials*, 6, 855 (2005)

### **Chang, C. S.(張嘉升)**

1. W. B. Su, H. Y. Lin, Y. P. Chiu, H. T. Shih, T. Y. Fu, Y. W. Chen, C. S. Chang, and Tien T. Tsong, Correlation between Morphological Transition and Preferred Thickness of Pb and Ag Islands on Si(111)7x7, *Phys. Rev. B*71, 073304 (2005).
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**V**

**Academic Activities**



Attendance in International Conference  
 中研院物理所九十四年度出席國際會議表  
 (2005年1月 ~ 2005年12月)

會議名稱	會議期間	舉辦地點	出席人員	經費來源
第41屆冬季理論物理教授課程	94.02.04-94.02.13	波蘭華沙	鄭天佐	業務費
Biophysical Society 49th Annual Meeting	94.02.13-94.02.16	美國洛杉磯	鄭天佑	業務費+國科會
2005US Air Force/ Taiwan Nanoscience Initiative Workshop	94.02.16-94.02.24	美國夏威夷	李定國	國科會
國防應用相關之奈米材料研討會	94.02.21-94.02.25	美國夏威夷	姚永德	主題
Hydration and Thermodynamics of Molecular Recognition	94.03.01-94.03.05	亞美尼亞葉里溫	魯本久	業務費
CKM么正三角形研討會	94.03.15-94.03.18	美國加州	鄭海揚	國科會
CKM么正三角形研討會	94.03.15-94.03.18	美國	李湘楠	國科會
美國物理學會年會	94.03.21-94.03.24	美國洛杉磯	李定國	國科會
2005 APS meeting 國際會議	94.03.21-94.03.25	美國洛杉磯	歐敏男	業務費
2005 APS meeting 國際會議	94.03.21-94.03.25	美國洛杉磯	黃柏翰	業務費
2005 APS meeting 國際會議	94.03.21-94.03.25	美國洛杉磯	李秉中	業務費
2005 APS meeting 國際會議	94.03.21-94.03.25	美國洛杉磯	尼斯瓦	業務費
2005 APS meeting 國際會議	94.03.21-94.03.25	美國洛杉磯	蔡傳博	業務費

會議名稱	會議期間	舉辦地點	出席人員	經費來源
2005年美國物理學會三月會議	94.03.21-94.03.25	美國洛杉磯	周崇斌	業務費+國科會
2005年美國物理學會三月會議	94.03.21-94.03.25	美國洛杉磯	顏得宗	委託計畫+自理
2005年美國物理學會三月會議	94.03.21-94.03.25	美國洛杉磯	廖延宗	委託計畫+自理
2005年美國物理學會三月會議	94.03.21-94.03.25	美國洛杉磯	徐永源	中研院 博士後 研究費
2005年美國物理學會三月會議	94.03.21-94.03.25	美國洛杉磯	呂欣明	業務費
美國物理年會	94.03.21-94.03.25	美國洛杉磯	張嘉升	清大卓越計劃
美國物理年會	94.03.21-94.03.25	美國	陳洋元	本所
美國物理學會春季會議	94.03.21-94.03.25	美國洛杉磯	何侗民	本所
美國物理學會春季會議	94.03.21-94.03.25	美國洛杉磯	蘇維彬	清大卓越計劃
日本物理學會第60回年次大會	94.03.23-94.03.27	日本東京	磯島知也	業務費
日本物理學會第60屆年會	94.03.24-94.03.27	日本東京	胡進錕	本所
工研院奈米計劃顧問委員會	94.03.25-94.03.26	美國洛杉磯	李定國	國科會
日本物理年會	94.03.26-94.03.28	日本	黃英碩	本所
國際磁性研討會2005	94.04.04-94.04.08	日本名古屋	姚永德	本所
EGEE 3rd Conference	94.04.18-94.04.22	希臘雅典	蔡明宏	國科會

會議名稱	會議期間	舉辦地點	出席人員	經費來源
EGEE 3rd Conference	94.04.18-94.04.22	希臘雅典	翁維瓏	國科會
EGEE 3rd Conference	94.04.18-94.04.22	希臘雅典	何孟翰	國科會
太空反物質磁譜儀(AMS)國際合作計畫審查研討會議	94.05.01-94.05.04	美國休士頓	李世昌	主題+國科會
未來文明與生命會議	94.05.02-94.05.06	德國法蘭克福	余海禮	本所+自理
計算材料科學國際研討會	94.05.23-94.05.25	中國蘭州	胡進錕	本所+自理
「Roc manager meeting」及5月24至5月26日舉行之「Second EGEE-LCG Grid Operations Workshop」國際會議	94.05.23-94.05.26	義大利波隆那	江靖濤	國科會
「Roc manager meeting」及5月24至5月26日舉行之「Second EGEE-LCG Grid Operations Workshop」國際會議	94.05.23-94.05.26	義大利波隆那	蔡明宏	國科會
自旋電子與奈米磁性會議	94.05.24-94.06.03	法國Cargese Corsica	黃斯衍	本所
The 4th Asia-Pacific Workshop on Strongly Correlated Systems	94.05.27-94.05.30	中國北京	鄭智豪	業務費
第四屆強相關聯系統亞太區國際研討會	94.05.27-94.05.30	中國北京	周崇斌	國科會+業務費
第四屆強相關聯系統亞太區國際研討會	94.05.27-94.05.30	中國北京	黃信銘	業務費
第四屆強相關聯系統亞太區國際研討會	94.05.27-94.05.30	中國北京	李定國	本所
最優化研討會	94.05.28-94.05.30	中國上海	鄒忠毅	主題

會議名稱	會議期間	舉辦地點	出席人員	經費來源
Rugged Free Energy Landscapes : Common Computational Approaches Spin Glasses, Structural Glasses and Biological Macromolecules	94.06.06-94.06.08	法國里昂	海耳倫	業務費
9th Annual Global Chinese Conference on Computers in Education	94.06.06-94.06.10	夏威夷	吳仕強	業務費+自理
2005弱作用力及微中子物理國際會議	94.06.06-94.06.12	希臘	王子敬	國科會+本所+E16
Nobel Symposium 131 - Controlled Nanoscale Motion in Biological and Artificial systems	94.06.11-94.06.19	瑞典	鄭天佑	本所
原子解析度顯微鏡50週年慶祝研討會	94.06.14-94.06.19	美國賓州大學	鄭天佐	本所
量子色動力學及強子物理國際會議	94.06.16-94.06.20	中國北京	鄭海揚	國科會
ASME 流力工程夏季學術研討會	94.06.18-94.06.24	美國休士頓	關文儉	本所
ASME流力工程夏季學術研討會	94.06.19-94.06.23	美國休士頓	黃榮鑑	國科會
V INTERNATIONAL CONFERENCE on NON-ACCELERATOR NEW PHYSICS	94.06.19-94.06.26	俄羅斯都布那	盛偉德	業務費
國際複雜網路研討會	94.06.23-94.06.24	韓國	胡進錕	國科會+自理
複雜網路國際會議2005	94.06.23-94.06.24	韓國首爾	李世炳	主題
第十七屆離子束分析國際會議	94.06.26-94.07.01	西班牙塞維爾	余岳仲	本所
半侷部質量會議	94.06.26-94.07.10	中國北京	余海禮	本所

會議名稱	會議期間	舉辦地點	出席人員	經費來源
2005 Liquid Matter Conference	94.07.02-94.07.06	荷蘭	杜其永	本所+國科會
第13屆掃描穿隧顯微術及相關技術國際會議	94.07.03-94.07.08	日本Sapporo	黃英碩	國科會
第十屆國際半導體介面組成會議	94.07.03-94.07.08	法國	魏金明	國科會
第13屆掃描穿隧顯微術及相關技術研討會	94.07.03-94.07.08	北海道札幌	張嘉升	國科會
第13屆掃描穿隧顯微術及相關技術研討會	94.07.03-94.07.09	日本北海道札幌	胡恩德	本所
第13屆掃描穿隧顯微術及相關技術研討會	94.07.03-94.07.09	日本北海道札幌	洪紹剛	本所主題
第13屆掃描穿隧顯微術及相關技術研討會	94.07.03-94.07.09	日本北海道札幌	胡恩德	主題
亞澳第三屆真空暨表面科學研討會	94.07.03-94.07.09	新加坡	張仕欣	主題
Recent Challenges in Novel Quantum Systems & Quantum Phase Transitions and Non-Equilibrium Phenomena in Cold Atomic Gases	94.07.04-94.07.15	義大利	葉崇傑	國科會
School on Quantum Phase Transitions and Non-Equilibrium Phenomena in Cold Atomic Gases	94.07.10-94.07.23	義大利Trieste	鄭智豪	本所
第十屆表面物理研討會	94.07.10-94.07-17	布拉格	鄭天佐	本所
第八屆國際表面結構研討會	94.07.17-94.07.22	德國	郭鴻曦	主題
Cyberinfrastructure Summer Institute for Geoscientist (CSIG)	94.07.18-94.07.22	美國聖地牙哥	江靖濤	國科會科發基金

會議名稱	會議期間	舉辦地點	出席人員	經費來源
The 8th International Conference on the Structure of Surfaces 研討會	94.07.18-94.07.22	德國	黃英碩	主題+國科會
2005年歐洲高能物理國際會議	94.07.19-94.07.27	希臘里斯本	蔡俊謙	本所 國科會
IMPF2005及亞太物理學會聯合會理事會	94.07.23-94.07.29	吉隆坡	鄭天佐	本所
第二十三屆國際半導體缺陷會議及第三屆國際自旋電子與量子資訊技術會議	94.07.24-94.08.05	日本淡路島	何侗民	本所
2005年前端物理國際會議	94.07.25-94.07.29	吉隆坡	吳建宏	本所
International Meeting on Frontiers of Physics, IMFP2005	94.07.25-94.07.29	馬來西亞	陳志強	本所+ 國科會
第三屆亞太少體物理學會議	94.07.25-94.07.30	泰國	章文箴	本所
強關聯電子系統國際研討會	94.07.25-94.08.07	澳大利	李尚凡	本所+ 國科會
電子強關聯系統國際會議	94.07.26-94.07.30	奧地利維也納	董崇禮	國科會
2005電子強關連系統國際會議	94.07.26-94.07.30	奧地利維也納	陳洋元	國科會
強關聯電子系統國際研討會	94.07.29-94.07.30	澳大利	李尚凡	本所 國科會 法國在台協會
顯微術與微分析2005	94.07.30-94.08.04	夏威夷	鄭天佐	本所
2005國際奈米技術暨先進材料會議	94.08.08-94.08.10	香港	李定國	國科會
第24屆國際低溫物理研討會	94.08.09-94.08.19	美國奧蘭多	徐永源	本院研究 經費
從亞洲觀點:以物理為主軸展望未來100年對工程,生命科學及技術影響之研討會	94.08.10-94.08.12	新加坡	吳茂昆	國科會



會議名稱	會議期間	舉辦地點	出席人員	經費來源
24屆國際低溫物理會議	94.08.10-94.08.17	美國奧蘭多	陳洋元	本所
2005年前沿粒子物理主題研討會	94.08.13-94.08.16	中國北京	李湘楠	自理
第23屆微分幾何在理論物理之應用	94.08.20-94.08.24	中國天津市	胡進錕	國科會
第四屆海峽兩岸奈米科學與技術研討會	94.08.22-94.08.25	中國雲南麗江	蔡麗珠	國科會
2005國際物理模擬流場與擴散現研討會	94.08.24-94.08.26	加拿大	蕭葆義	本所
ERATO量子資訊科學會議 (2005)	94.08.26-94.08.30	日本	張志義	本所
2005 超聲學物理國際會議	94.08.28-94.09.01	中國北京	王子敬	本所
第十一屆國際夏季學校：統計物理中的基本問題	94.09.04-94.09.17	比利時魯汶佛雷斯塔	吳明佳	本所
2005年國際表面物理研討會	94.09.06-94.09.15	Wroclaw	鄭天佐	本所
TAUP 2005	94.09.08-94.09.14	西班牙薩拉哥薩	李浩斌	本所
香山會議2005：奈米科技與同步輻射	94.09.11-94.09.14	中國北京	胡宇光	本所
XXXI IAHR CONGRESS Water Engineering for the Furture - Choices and Challenges	94.09.11-94.09-16	韓國漢城	楊文昌	本所
第六屆亞太風工程研討會	94.09.12-94.09.14	韓國首爾	蕭葆義	本所
PSI-K 2005	94.09.17-94.09.22	德國	周至品	國科會
第三十屆國際紅外線及毫米波會議	94.09.19-94.09.23	美國威廉斯堡	何侗民	國科會

會議名稱	會議期間	舉辦地點	出席人員	經費來源
台日第二屆磁性研討會	94.09.19-94.09.23	日本東京	姚永德	對方付費
「EGEE CIC-on-duty meeting (COD-4)」、「Joint OSG and EGEE Operations Workshop」、「EGEE All ROC Managers Meeting (ARM-5)」	94.9.25-94.10.01	英國牛津阿賓格頓 (Abingdon)	蔡明宏	國科會
基礎科學前沿會議	94.09.27-97.09.29	越南河內	王子敬	國科會
第五屆金屬硫蛋白國際會議	94.10.08-94.10.13	中國北京	陳南佑	主題
味動力學研討會	94.10.08-94.10.15	法國	李湘楠	國科會
8th International Frumkin Symposium	94.10.18-94.10.22	莫斯科	安東尼	本院應科經費
2005粒子與核子物理國際會議	94.10.24-94.10.28	美國新墨西哥	曾詣涵	本所
第25屆國際純物理與應用物理聯盟大會	94.10.26-94.10.28	南非開普敦	李定國	國科會
第25屆國際純物理與應用物理聯盟大會	94.10.26-94.10.29	南非	胡進錕	國科會
第八屆第一原理電子結構計算亞洲研討會	94.10.30-94.11.02	上海	邱雅萍	本所
第五十屆國際磁學暨磁性材料會議	94.10.30-94.11.03	美國聖荷西 (San Jose, USA)	張晃暉	本院研究經費
第五十屆國際磁學暨磁性材料會議	94.10.30-94.11.03	美國聖荷西 (San Jose, USA)	周群淵	主題
第五十屆磁學及磁性材料年會	94.10.30-94.11.03	美國	袁輔德	本所
第五十屆國際磁學暨磁性材料會議	94.10.30-94.11.03	美國聖荷西	姚永德	本所

會議名稱	會議期間	舉辦地點	出席人員	經費來源
第50屆磁學與磁性物質年會	94.10.30-94.11.03	美國聖荷西市	李尚凡	國科會
APCTP Conference on Bio-complexity	94.11.02-94.11.05	韓國首爾	陳志強	本所+國科會
Strongly Correlated Electron Systems會議	94.11.04-94.11.05	香港	李定國	國科會
第二屆有關薄膜附著性之國際研討會	94.11.09-94.11.11	美國	任盛源	本所+國科會
SC 2005	94.11.12-94.11.18	美國西雅圖	蔡明宏	國科會
第四屆國際表面科學暨奈米技術	94.11.13-94.11.17	日本東京	張淵智	國科會
第四屆國際表面科學暨奈米技術會議	94.11.13-94.11.17	日本東京	張嘉升	本所
第四屆國際表面科學暨奈米技術會議	94.11.13-94.11.19	日本東京	黃英碩	本所
第十二屆全國磁學和磁性材料會議	94.11.16-94.11.21	中國福建省	陳啟東	國科會
複雜系統的結構、非線性動力學與統計物理論壇	94.11.20-94.11.27	北京中國	吳明佳	本所
複雜系統的結構、非線性動力學與統計物理論壇	94.11.20-94.11.27	北京中國	馬文忠	本所
複雜系統的結構、非線性動力學與統計物理論壇	94.11.20-94.11.27	北京中國	張純綾	本所
HEP Data Grid 2005	94.11.21-94.11.22	日本東京	蔡明宏	主辦單位
HEP Data Grid 2005	94.11.21-94.11.22	日本東京	林誠謙	對方付費
複雜系統的結構,非線性動力學與統計物理論壇	94.11.21-94.11.25	中國北京	胡進錕	國科會

會議名稱	會議期間	舉辦地點	出席人員	經費來源
第十三屆量子資訊技術會議	94.11.24-94.11.25	日本仙台	張志義	本所
2005 MRS Fall Meeting	94.11.28-94.12.02	美國波士頓	邱雅萍	傑人會
HPC Asia 2005, The 8th International Conference on High Performance Computing in Asia Pacific Region	94.11.29-94.12.04	中國北京	謝璨隆	本所
HPC Asia 2005, The 8th International Conference on High Performance Computing in Asia Pacific Region	94.11.29-94.12.04	中國北京	侯書雲	本所
第三世界科學院第16屆會員大會	94.11.29-94.12.03	埃及亞力山大港	鄭天佐	院方經費補助
J-PARC 強子構造研討會	94.11.30-94.12.02	日本筑波	鄭海楊	本所
HPC Asia 2005	94.11.30-94.12.03	北京中國	張智強	國科會
The 7th General Council <Meeting of the Asia Pacific Center for Theoretical Physics	94.12.02-94.12.03	韓國浦項	鄭海楊	對方付費
第二屆亞洲磁性研討會	94.12.08-94.12.10	韓國	姚永德	國科會
Asia Nano Forum 2nd SUMMIT MEETING	94.12.08-94.12.10	澳洲	李定國	本所+主題
CUROUCHER FOUNDATION— ADVANCED STUDY INSTITUTE ON Frontiers in Computational Methods and Their Applications in Physical Sciences	94.12.08-94.12.13	香港	吳桂光	主題
第45屆美國細胞生物學會年度大會	94.12.09-94.12.15	美國舊金山	曾邦彥	本所

會議名稱	會議期間	舉辦地點	出席人員	經費來源
Advanced Study Institute(ASI) on Frontiers in Computational Methods and Their Applications in Physical Science	94.12.11-94.12.13	香港	李定國	本所+主題
BIOCOMP 2005	94.12.11-94.12.18	Naples義大利	鄭天佑	本所
第十三屆國際半導體元件物理會議	94.12.13-94.12.17	印度新德里	陳啟東	本所

## Institute Sponsored Meetings

### 本所協辦會議

研討會名稱	會議期間	地點	主辦人
生物物理與軟物質研討會	94.01.30 - 94.01.31	救國團 墾丁青年活動中心	陳志強
Second Joint Taiwanese-Swiss Workshop on "Nanotechnology: towards novel materials"	94.06.21 - 94.06.24	中研院物理所	胡宇光
2005台灣暑期統計與非線性物理會議 2005 Taiwan Summer Symposium on Statistical and Nonlinear Physics	94.07.31 - 94.08.06	中研院物理所	胡進錕
3rd International Conference in Flavor Physics	94.10.03 - 94.10.08	中央大學	王子敬
生物物理營	94.10.15 - 94.10.16	中央大學	陳志強
第三屆台日雙邊奈米科技研討會 Third Joint Taiwan-Riken Nanotechnology Workshop	94.11.24 - 94.11.25	中研院物理所	李定國 張嘉升 陳啟東
REGIONAL BIO-SOFT MATTER DAYS	94.12.19 - 94.12.21	台灣大學	陳志強

Seminars  
中央研究院物理研究所九十四年度演講一覽表  
(2005 January ~ December)

演講題目	演講者	所屬機構	日期
Softmatter and Biophysics Journal Club: Electroporation of Cell Membranes: Phenomenon and	鄭天佑	中央研究院物理研究所	2005/1/3
Excitonic Artificial Atoms: Multi-Excitons in Semiconductor Quantum Dots.	鄭舜仁	交通大學電子物理系	2005/1/3
Parallel SMMP for Protein Simulations	魯本久	中央研究院物理研究所	2005/1/4
Nanopatterned structures for Nano Bio-Science and Technology	周家復	Arizona State University	2005/1/4
Single Molecule Studies of Polymer Brushes	Wen-Tau Juan	Department of Physics, Stanford	2005/1/10
Magnetoresistance of planar-type magnetic nanostructures fabricated by atomic force microscopy	Y. Takemura	日本橫濱大學	2005/1/10
Black Hole Backreaction Modeled by Moving Charges, Detectors and Mirrors in a Quantum Field	Bei-Lok Hu	University of Maryland	2005/1/11
Gravitational Radiation Reaction from Stochastic Field Theory	Bei-Lok Hu	University of Maryland	2005/1/12
Recently developed lithography techniques in MBE Lab.	余進忠	中央研究院物理研究所	2005/1/12
Nanomaterials and Nanotechnology at NIMS	Yoshio BANDO		2005/1/14
Introduction of NIMS	Takahiro Fujita		2005/1/14
Nanoscience Research Promotion at RIKEN	Eiichi MARUYAMA		2005/1/14
Softmatter and Biophysics Journal Club: Effective temperature in nonequilibrium steady states of Langevin systems with a tilted periodic potential	Kumiko Hayashi	Dept of Physics, University of Tokyo	2005/1/17
Ultrafast Hydration Dynamics: The Future Probe for Protein	Samir Kumar Pal S. N. Bose	National Centre for Basic Sciences, India	2005/1/17
Molecular recognition and Nanomechanics 1	Thomas Thundat	Oak Ridge National Lab	2005/1/18
Molecular recognition and Nanomechanics 2	Thomas Thundat	Oak Ridge National Lab	2005/1/18
Charge and orbital ordering in Fe <sub>3</sub> O <sub>4</sub> and SrRuO <sub>3</sub>	Horng-Tay Jeng		2005/1/19
Role of Environmental Dynamics on Protein Function	Samir Kumar Pal S. N. Bose	National Centre for Basic Sciences, India	2005/1/19

演講題目	演講者	所屬機構	日期
Microrheology of Complex Fluids	Penger Tong	Hong Kong University of Science and	2005/1/25
Phase transitions on complex networks	Byungnam Kahng	Department of Physics, Seoul National University	2005/2/4
Lecture on Low Temperature Physics	小林俊一	日本東京農工大學	2005/3/1
High resolution ion microprobe	Marian Cholewa	Singapore Synchrotron Light Source (SSLS)	2005/3/1
液態水的奇異性質	牟中原	台灣大學化學系	2005/3/3
Neutrino oscillations and collider test of the R-parity violating minimal supergravity model	Dong-Won Jung	KAIST	2005/3/4
Recent ARPES Results from Cuprates	Zhi-xun Shen	Standford University	2005/3/7
Cells, Gels and the Engines of Life: A Book Review	H. R. Jiang	Institute of Physics, Academia Sinica	2005/3/7
Chiral Aspects of Parton Physics	陳俊偉	台灣大學物理系	2005/3/10
Fine tuning and split supersymmetry	Kingman Cheung	NTHU	2005/3/11
知識進化演算法及其應用	鄒忠毅	中國文化大學物理系	2005/3/14
Constraining the weak phase gamma	蔣正偉	NCU	2005/3/18
Softmatter - Biophysics Journal Club: Structural polymorphism of the cytoskeleton: A model of linker-assisted filament	陸駿逸	台大化學系	2005/3/21
中國人的智慧	蔡志忠		2005/3/24
Comparison of Bioenergy and Physiological Markers in Qigong and Acupuncture Research.	Shin Lin	University of California, Irvine	2005/3/25
The generalized parton distributions of the nucleon in the NJL model based on the Faddeev	Hirobumi Mineo	NTU	2005/3/25
Measuring Non-Spherical Hadron Amplitudes	Aron Bernstein	MIT	2005/3/28
Softmatter - Biophysics Journal Club : A Physical Theory of the Living State: A book review	C. K. Chan	中央研究院物理研究所	2005/3/28
Ab initio studies of spin Hall effect and magnetic nanostructures	郭光宇	台灣大學物理系	2005/3/30
Microstructure, Fluid-Gel Transition, and Gel Mechanics In Polymer-Colloid Suspensions	Yeng-Long Chen	Univ. of Wisconsin	2005/3/30
Discovery of Supramolecular Materials with Lithium Ions Storage	林寬鈺	中興大學	2005/3/30
Study of Theta in lattice QCD with exact chiral symmetry	Tung-Han Hsieh	NTU	2005/4/1
Softmatter - Biophysics Journal Club : Coexisting attractors in structurally perturbed population	Brajendra Kumar Singh	中央研究院物理研究所	2005/4/4



演講題目	演講者	所屬機構	日期
The application of characteristic initial value problem in quasi-local energy expression	吳小寧	NCU	2005/4/8
Softmatter - Biophysics Journal Club: Cell contractility, cell adhesion, and cell	Hsuan-Yi Chen	Dept of Phys., National Central University	2005/4/11
Revealing the Mechanism for Confinement and Chiral Symmetry Breaking with Duality	陳文峰	國家理論科學研究中心 物理組	2005/4/14
Global properties of wave maps on black holes	Makoto Narita	NCU	2005/4/15
A rejection-free Monte Carlo method for the hard-disk system	Hiroshi Watanabe	Department of Complex Systems Science Nagoya University	2005/4/15
Softmatter - Biophysics Journal Club : Some basics of biological microcalorimetry	T. Y. Tsong	中央研究院物理研究所	2005/4/18
Attraction between like-charged colloidal particles at aqueous interfaces	童澎爾	香港科技大學	2005/4/21
Softmatter - Biophysics Journal Club: Tension-Induced Straightening Transition of Self-Assembled Helical Ribbons	Zicong Zhou	淡江大學	2005/4/25
Plausible Neural Networks - An intelligent self-organized network system	Yean Yan Chen	PNN Technologies	2005/4/25
Lecture on Low Temperature Physics	小林俊一	日本東京農工大學	2005/4/26
Lecture on Low Temperature Physics	小林俊一	日本東京農工大學	2005/4/27
Recent advance in d-wave pairing symmetry in cuprate superconductors	Chang-Chyi Tsuei		2005/4/27
Quantum Technology	管希聖	台灣大學物理系	2005/4/28
Quantum spinodial decomposition and the collapse transition in mixtures of cold atoms	S. T. Chui	University of Delaware, USA	2005/4/29
CP-phase dependence of neutrino oscillation probability in matter	Yoshiaki Umeda	NCTU	2005/4/29
場離子顯微術對原子間交互作用力的研	傅祖怡	師範大學物理系	2005/4/29
STM Study of Co on Si Surfaces.	姚永德	中央研究院物理研究所	2005/4/29
Live cell imaging- focusing neurite outgrowth	林奇宏	陽明大學	2005/5/2
Advances in High k Dielectrics for Nano Electronics	郭瑞年	清華大學物理系	2005/5/5
CMB constraint on holographic dark energy model	林豐利	NTNU	2005/5/6
Visualizing the scientific world and its evolution	陳啟明	台灣師範大學	2005/5/9

演講題目	演講者	所屬機構	日期
奈米/非晶複合結構金屬, 材料之研究	聶若光	中山科學院第五所	2005/5/12
Charge-Orbital Ordering of Solids Investigated by Soft X-ray spectroscopy	黃迪靖	國家同步輻射研究中心	2005/5/12
Annihilation and New Physics Effects in B Decays (II)	楊桂周	CYCU	2005/5/13
心臟病學的複雜現象	蕭又新	國立東華大學	2005/5/16
Electron Transport, Optical, and Mechanical Properties of Nanostructures	Steven G. Louie	Department of Physics, University of California at	2005/5/18
Light-front field theories at finite temperature	Ashok Das	University of Rochester	2005/5/18
Cosmological Phase Transitions	李大興	國立東華大學物理系	2005/5/19
Two-photon exchange in elastic electron-nucleon scattering at large momentum transfer	Yu-Chun Chen	NTU	2005/5/20
Optical response of soft magneto-polarized insulators by torsional magneto-mechanical waves	Sergey Bastrukov	Lab. of Informational Technologies JINR, Dubna, Russia	2005/5/23
Probing Vesicle Dynamics in Single Hippocampal Synapses	Shtrahman	University of Pittsburgh	2005/5/23
Bio-sensing devices based on semiconductor technologies	Yuji Miyahara	National Institute for Materials Science	2005/5/25
Line defects and Complex-oscillatory Spiral Waves	Kyoung J. Lee	Center for Neuro-dynamics, Korea University	2005/5/26
Complex-oscillatory Spiral Waves in Confluent Cardiac Cell Cultures Induced by Localized	Kyoung J. Lee	Center for Neuro-dynamics, Korea University	2005/5/27
From Stringy Ward Identities to High Energy Symmetry of String	詹傳宗	NCTS	2005/5/27
Electrostatic interactions in the folded, unfolded, complexed and transition states of proteins	Zhou Huan-Xiang	Institute of Molecular Biophysics, Florida State	2005/5/30
How do biomolecular systems achieve and regulate speed?	Zhou Huan-Xiang	Institute of Molecular Biophysics, Florida State	2005/6/2
Non decoupling effects in Higgs decays in 2 Higgs doublets Model	Abdesslam Arhrib	NCTS/Tanger Univ.	2005/6/3
Quantum Percolation in Antiferromagnets	Stephan Haas	Department of Physics and Astronomy, University of Southern California	2005/6/6
Numerical Studies of an Artificial Molecular Motor	Zuckermann Simon	Fraser University, Canada	2005/6/6
Lecture on Low Temperature Physics	小林俊一	日本東京農工大學	2005/6/14

演講題目	演講者	所屬機構	日期
Strings and the Cosmos	Edna Cheung	Perimeter Institute, Canada	2005/6/17
Constructing biomolecular hybrid devices using synthetic biology	Dean Ho	UCLA	2005/6/22
Security Policy Management for Global Information Infrastructure	邵家健	國立交通大學資訊工程 系	2005/6/23
Factorization and polarization in B meson heavy-heavy decays	Zheng-Tao Wei	NCTS	2005/6/24
Imaging Magnetic Noise Sources in Magnetic Recording Heads	劉思煌	Physics Dept. and Center for Materials Research and Analysis	2005/6/27
Hadron Collider Phenomenology	袁簡鵬	Michigan State University	2005/6/29
3D Coherent Diffraction Microscopy and Its Applications	John Miao	UCLA	2005/6/30
The Taiwan Neutrino Experiment <台灣微中子實驗>	王子敬	中央研究院物理研究所	2005/6/30
The Dark Matter Annihilation Rate and Its QCD Correction	姜偉宜	University of Illinois, Chicago	2005/7/11
The Secret behind the Dolphin -- Gray's Paradox	潘文華	工研院材料所	2005/8/9
Dimensional Crossover of Ising Spin-glass 3D Thin Films: Scaling Study With Monte Carlo Simulation	Charles Yang	University of California	2005/8/16
ethe-Salpeter Approach with the Separable Interaction for the Deuteron	Valery V. Burov	Joint Institute for Nuclear Research, Russia	2005/8/16
Magnetism of Nano-Structured Materials	Mohammad Ghafari	Institut für Nanotechnologie, Forschungszentrum Karlsruhe,	2005/8/29
Recent activities in Unite Mixte de Physique	F. Petroff	CNRS Thales, France	2005/8/29
Perpendicular-Current Spin-Polarized Transport in Superconductor/Ferromagnet Multilayers (I)	Professor W. Pratt	Michigan State University	2005/9/2
Perpendicular-Current Spin-Polarized Transport in Superconductor/Ferromagnet Multilayers (II)	Professor W. Pratt	Michigan State University	2005/9/5
Cavities enveloping triangulation and its applications	Jan Busa	Department of Mathematics , Technical University in Kosiec, Slovak	2005/9/6
Spintronics at Nanoscale	林秀豪	清華大學物理系	2005/9/7

演講題目	演講者	所屬機構	日期
Nano/Microscale Modeling and Biomedical chips	Chun-Ping Jen	Arizona State University	2005/9/8
Efficient routing on scale-free networks based on local information	汪秉宏	中國科技大學物理系	2005/9/13
Magnetic and Electronic Properties of organic Solids	Kai-Lun Xao	Huazhong University of Science &	2005/9/13
原子間對勢的Chen-Mobius反演方法及其應用	王懷玉	北京清華大學物理系	2005/9/16
Myelin Formation and Coiling	黃仲仁	Physics Department, University of Chicago	2005/9/19
A fully explicit optimal two-stage numerical scheme for solving reaction-diffusion-chemotaxis	Jui-Ling Yu	Michigan State University	2005/9/20
巨細靡遺--X光透視顯微鏡下的世界	胡宇光	中央研究院物理研究所	2005/9/20
What if theta_13 is very small?	Harry Chi-Sing Lam	McGill Univ./ Univ. of British Columbia	2005/9/23
Nanogold-Assisted PCR with Enhanced Specificity	C. K. Chan	Institute of Physics, Academia Sinica	2005/9/26
Theoretical Study of Atomic Processes in Parallel Computing	張圖南	國家理論科學研究中心	2005/9/27
Magnetic Images of Quantized Vortices and Superconductivity by Scanning SQUID Microscopy	井口家成	Tokyo Institute of Technology	2005/9/28
Bose-Einstein condensation in relativistic quasi-chemical equilibrium system	Eiji Nakano	Physics Department, National Taiwan University	2005/9/30
Search for network modules in C. elegans brain	P. Y. Lai	National Central University	2005/10/3
The Spin Hall effect	Shoucheng Zhang	Department of Physics, Stanford University	2005/10/6
Links between erosion, runoff variability and seismicity in the Taiwan orogen	陳宏宇	國立台灣大學地質學系	2005/10/6
由"自然雜誌"的改變看科學實證和文化意義	江才健	知識通訊評論	2005/10/6
Ultrafast Optical Studies of Nitride-based Semiconductor	鄭功榮	Department of Physics, Arizona State University, USA	2005/10/12
Josephson Multi-Qubit Systems	蔡兆申		2005/10/12
Recent Results from the SNO Experiment	Melin Huang	University of Texas, Austin, USA	2005/10/14
There' s something about InN	杜立偉	國立中山大學物理系	2005/10/18
Physics of Superconducting Tunnel Junctions in Anisotropic > d-wave High-Tc Superconductors\"	井口家成	Tokyo Institute of Technology	2005/10/19

演講題目	演講者	所屬機構	日期
The FLASH Experiment	Feng-Yin Chang	National Chiao Tung University	2005/10/21
Tao's phenomenon in superconducting powders	李尚凡	中央研究院物理研究所	2005/10/24
Journal Club:Natural Frequency of Biological Motors	Cheng-Hung Chang	NCTU	2005/10/24
Lecture on Low Temperature Physics	小林俊一	日本東京農工大學	2005/10/27
Lecture on Low Temperature Physics	小林俊一	日本東京農工大學	2005/10/28
Large electroweak penguin effects in B and K Physics	Makiko Nagashima	NTU	2005/10/28
Light-like linear dilaton and cosmological singularity	陳江梅	國立中央大學	2005/11/2
CP violation in B decays in left-right models	Soo-hyeon Nam	National Central University	2005/11/4
The anomalous Hall and Nernst effects in the spinel CuCr <sub>2</sub> Se <sub>4</sub>	Wei-Li Lee	Johns Hopkins University	2005/11/8
Superconductivity and Metal-Insulator Transition in Chemical-vapor-deposition Diamond Films	Yoshihiko Takano	National Institute for Materials Science (NIMS)	2005/11/8
Realspace imaging of attractive colloid systems: phase separation, aggregation and gelation	Peter Lu	Harvard University	2005/11/11
Real Physics from imaginary black holes and imaginary sources	John E. Wang	Center for Theoretical Scienc	2005/11/11
Microscopic dynamics in liquid metals: From hydrodynamics to single-particle motions	Teng-Ming Wu	NCTU	2005/11/14
CP Violation in Kaon and B Meson Systems	鄭海揚	中央研究院物理研究所	2005/11/15
Enhanced and Repulsive Casimir	Larry Ford	Tufts University	2005/11/16
Theory of the spin-dependent proximity effects in d-wave superconductor/half-metal	Nobukatsu Yoshida	University of Tokyo	2005/11/17
Constraints on the new particle in $\Sigma^+ \rightarrow p \mu^+ \mu^-$	Yu-Kuo Hsiao	National Tsing Hua University	2005/11/18
Protein motors that make their own tracks: helicases	Hsuan-Yi Chen		2005/11/21
Wigner transform and analysis of entanglement	許祖斌	國立成功大學物理系	2005/11/22
Model of Gemonetric Neutrino Mixing and Leptogenesis	何小剛	台灣大學物理系	2005/11/25
The elasticity of biomembrane	涂展春		2005/11/28
A trend of perpendicular magnetic recording media	Po-Wen Wang	APT Photonics Company, U. S. A.	2005/11/29
Building the Asia e-Science Center	林誠謙	中央研究院物理研究所	2005/11/29
Hey Man, What Do You Mean By The Spinodial Positive Mass Theorem?	Yun-Kau Lau	Chinese Academy of Science	2005/11/30

演講題目	演講者	所屬機構	日期
In Search of Fusion	劉全生	國立中央大學	2005/12/6
Exploring Quantum Relativity	Otto Kong	National Central University	2005/12/9
Long-range Cooperativity in Yeast Mating Polarization	郭青齡		2005/12/12
Dynamics of one-dimensional electrons and exotic elementary	Yoshio Kuramoto	Department of Physics, Tohoku	2005/12/15
CP Violation in Charged Higgs Decays in MSSM	T. C. Yuan	National Center for Theoretical Science	2005/12/16
Probing cells including bacteria and cell behavior by emerging impedance spectroscopy	John H. T. Luong	Biotechnology Research Institute, National Research	2005/12/20
簡介當前奈米科技相關之材料、製成、元件、物理及用途	張亞中	中央研究院 應用科學研究中心	2005/12/20
Byzantine Philosophy, Culture, and its Connection with the East	Jonah George Mourtos	Orthodox Church of Taiwan	2005/12/21
Meta-stable excited states of a closed QD probed by Al-SET	Jeng-Chung Chen	Department of Basic Science, University of Tokyo	2005/12/22
How Two-Foot Molecular Motors May Walk?	Kazuhiko KINOSITA	Waseda University	2005/12/22
Mechanism of Chemo-Mechanical Energy Transduction in a Rotary Molecular Motor Revealed by Single-Molecule Physiology	Kazuhiko KINOSITA	Waseda University	2005/12/23

**Visiting Scholars**  
 中央研究院物理所九十四年度訪問學人表  
 ( 2005 年 1 月 - 2005 年 12 月 )

訪 問 學 人	所 屬 機 構	訪 問 期 間
鄧立詩	土耳其 Middle East Tech. Univ.	2004.06.01 - 2006.08.31
路家棋	南京大學	2004.12.04 - 2005.12.03
Edik Hayryan	亞美尼亞籍	2004.12.22 - 2005.01.21
Guo, Chin-Lin	美國 Harvard University	2004.12.22 - 2005.01.04
周家復	美國 Arizona State University	2004.12.30 - 2005.01.07
梁宗嶽	美國 University of Delaware	2005.01.01 - 2005.01.22
王長海	新加坡大學	2005.01.01 - 2005.03.15
伊士麥林尼可	亞美尼亞籍	2005.01.01 - 2005.04.30
李匡邦	美國 麻州大學	2005.01.01 - 2005.01.31
曹慶堂	淡江大學物理系	2005.01.01 - 2005.06.30
羅玉林	聖約翰技術學院機械系	2005.01.01 - 2005.06.30
洪東興	銘傳大學電腦資訊系	2005.01.01 - 2005.06.30
阮文滔	美國 Stanford Univ.	2005.01.03 - 2005.01.13
Mildred Dresselhaus	美國 Electrical Engineering and Physics at MIT	2005.01.09 - 2005.01.13
Siegmar Roth	德國 Max Planck Institute for Solid State Research	2005.01.09 - 2005.01.16
胡比樂	美國 馬里蘭大學	2005.01.09 - 2005.01.17
蔡志申	中正大學物理系	2005.01.15 - 2005.02.15
彭逸凡	暨南大學土木工程系	2005.01.16 - 2005.02.15
郭華丞	中興大學物理系	2005.01.16 - 2005.02.20
江祖永	中央大學物理系	2005.01.17 - 2005.02.28
Thomas Thundot	美國 Oak Ridge National Lab.	2005.01.17 - 2005.01.18
Samir Kuar Pal	印度 S. N. Bose National Center for Basic Science	2005.01.17 - 2005.01.22
湯兆倫	中正大學物理系	2005.01.18 - 2005.02.20
鄒忠毅	文化大學物理系	2005.01.21 - 2005.02.20
蔡宗儒	海洋大學光電所	2005.01.23 - 2005.02.23
崔瑩鎮	韓國 Inha University	2005.01.24 - 2005.02.01
V. B. Priezhev	俄羅斯籍 Lab of Theoretical Physics, Joint Institute for Nuclear Research	2005.01.26 - 2005.03.26
Ravindra E. Amritkar	印度 Physical Research Laboratory, Ahmedabad	2005.01.30 - 2005.02.28

訪問學人	所屬機構	訪問期間
Bingham Kahng	韓國 Seoul National University	2005.01.31 - 2005.02.06
童若軒	中國科學院	2005.02.01 - 2005.03.15
呂宗昕	台灣大學化工系	2005.02.01 - 2005.06.30
Ho Meoyng Choi	韓國 Kyungpook National University	2005.02.20 - 2005.02.27
Dong-Won Jung	韓國 Korea Advanced Institute of Science and technology	2005.02.21 - 2005.03.06
小林俊一	日本東京農工大學	2005.02.24 - 2005.03.06
Marian Cholewa	Singapore SSSL	2005.02.27 - 2005.03.01
Ogata Masao	日本東京大學	2005.02.27 - 2005.03.02
陳方玉	中央大學物理系	2005.03.01 - 2005.06.30
孫成軍	新加坡大學	2005.03.05 - 2005.03.30
周永忠	新加坡大學	2005.03.05 - 2005.03.30
嵇維娜	中國南京大學	2005.03.28 - 2005.06.12
鍾家杭	中國 南京大學	2005.03.28 - 2005.06.16
李金	中國 中科院高能研究所	2005.04.03 - 2005.05.10
R. C. Verma	Punjabi Univeristy	2005.04.15 - 2005.07.14
童彭爾	香港科技大學	2005.04.18 - 2005.04.23
Fun Heong Kun	馬來西亞 Universiti Sains Malaysia	2005.04.20 - 2005.04.27
小林俊一	日本東京農工大學	2005.04.20 - 2005.04.28
黃翰雄	中國原子能科學研究所	2005.04.22 - 2006.04.21
陳廷楊	中國 南京大學物理系	2005.04.28 - 2005.05.08
平加倫	中國 南京師範大學	2005.04.28 - 2005.05.08
伍法岳	美國東北大學	2005.05.09 - 2005.05.27
黃政哲	美國 明尼蘇達大學	2005.05.12 - 2005.05.25
Yasuhiro Horike	日本 Naitonal Institute for Material Science	2005.05.22 - 2005.05.24
Yuji Hiyahara	日本 Naitonal Institute for Material Science	2005.05.22 - 2005.05.24
Kyoung Jin Lin	韓國 Korea University	2005.05.26 - 2005.05.28
Rachel A. Segalman	美國柏克來大學	2005.05.29 - 2005.06.02
Huan-Xiang Zhou	美國 Florida Univ.	2005.05.29 - 2005.06.04
何健民	美國Wichita State Univ.	2005.06.01 - 2005.07.12
李匡邦	美國麻州大學	2005.06.01 - 2005.08.31



訪問學人	所屬機構	訪問期間
胡比樂	美國 馬里蘭大學	2005.06.08 - 2005.06.15
Olga S. Roanova	俄國 莫斯科州立大學	2005.06.10 - 2005.08.10
小林俊一	日本東京農工大學	2005.06.12 - 2005.06.17
曾文哲	淡江大學物理系	2005.06.13 - 2005.09.12
李大興	東華大學物理系	2005.06.15 - 2005.09.15
陳宣毅	中央大學物理系	2005.06.20 - 2005.09.20
Amarji Soni	美國布魯克海汶國家實驗室	2005.06.22 - 2005.06.23
Olga S. Roanova	Moscow State Univ.	2005.06.22 - 2005.08.22
蔡宗儒	海洋大學光電所	2005.06.23 - 2005.09.23
郭華丞	中興大學物理系	2005.06.26 - 2005.09.12
施藹克	美國加州大學柏克萊分校	2005.06.27 - 2005.07.08
John Miao	美國 UCLA	2005.06.30 - 2005.07.01
Nguyen Ai Viet	越南 NCNSTV	2005.07.01 - 2005.07.31
何大韜	中國 揚州大學物理系	2005.07.01 - 2005.08.15
譚言正	嘉義大學應用物理系	2005.07.01 - 2005.09.01
蔡志申	中正大學物理系	2005.07.01 - 2005.09.15
湯兆倫	中正大學物理系	2005.07.01 - 2005.09.15
彭逸凡	暨南大學土木工程系	2005.07.01 - 2005.09.30
林志明	新竹師範學院自然科學教育學系	2005.07.01 - 2005.12.31
黎璧賢	中央大學物理系	2005.07.01 - 2005.09.30
傅彥培	東華大學物理系	2005.07.01 - 2005.12.31
馬遠榮	東華大學物理系	2005.07.01 - 2005.09.30
曹慶堂	淡江大學物理系	2005.07.01 - 2005.09.15
梁宗嶽	美國德拉瓦州大學	2005.07.06 - 2005.07.27
Jaroslav Skrivanek	斯洛伐克籍	2005.07.08 - 2005.08.07
姜偉宜	美國伊利諾大學芝加哥校區	2005.07.11 - 2005.07.15
梁培德	美國波特蘭大學	2005.07.11 - 2005.08.15
厚美瑛	中國科學院	2005.07.15 - 2005.08.14
Baruch Meerson	以色列 Institute of Physics, Hebrew University of Jerusalem	2005.07.19 - 2005.08.18
Jan Busa	斯洛伐克籍	2005.07.26 - 2005.09.07

訪問學人	所屬機構	訪問期間
Bertrand I Halperin	美國 Harvard University	2005.07.31 - 2005.08.07
李梅樹	波蘭 Institute of Physics, Polish Academy of Science	2005.08.01 - 2005.11.30
小林俊一	日本東京農工大學	2005.08.18 - 2005.08.20
William Pratt	美國Michigan State Univ	2005.08.23 - 2005.08.29
王懷玉	北京清華大學	2005.09.01 - 2005.10.31
姚凱倫	中國華中科技大學	2005.09.06 - 2005.09.16
揭泉林	中國武漢大學	2005.09.06 - 2005.09.16
劉祖黎	中國華中科技大學	2005.09.06 - 2005.09.16
周家復	美國Arizona State Univ.	2005.09.06 - 2005.09.21
藍志成	加拿大 Univ. of British Columbia	2005.09.15 - 2005.10.14
凌意	中國江西南昌大學	2005.09.15 - 2005.11.15
Frank Eisenmenger	德國	2005.09.29 - 2005.10.22
Syamal Kumar Dana	印度	2005.10.01 - 2005.10.14
Shouchen Zhang	Stanford University	2005.10.05 - 2005.10.08
Cong-Feng Qiao	中科院研究生院	2005.10.08 - 2005.10.22
呂才典	中科院高能物理研究所	2005.10.08 - 2005.10.22
曹俊 Weiguo Li	中科院高能物理研究所	2005.10.08 - 2005.10.22
楊金民	中科院理論物理研究所	2005.10.08 - 2005.10.22
劉純	北京中科院理論物理研究所	2005.10.09 - 2005.10.29
王孫崇	Univ. of Toronto	2005.10.10 - 2005.10.21
小林俊一	日本東京農工大學	2005.10.25 - 2005.10.29
戈鵬平	中科院神經科學研究所	2005.11.06 - 2005.11.20
Yoshihiko Takano	日本	2005.11.07 - 2005.11.09
Sumio Ishihara	日本	2005.11.07 - 2005.11.09
Peter Lu	Harvard University	2005.11.11 - 2005.11.13
Nobukatsu Yoshida	University of Tokyo	2005.11.16 - 2005.11.18
Neil Donmond	Univ of Cambridge	2005.12.14 - 2005.12.19
Yevgeni Mamasakh	Yerevan State Univ.	2005.12.15 - 2006.02.15
Yoshio Kuramoto	Tohoku Univ.	2005.12.15 - 2005.12.17
Jeng Chung Chen	University of Tokyo	2005.12.21 - 2005.12.24

訪問學人	所屬機構	訪問期間
Kazuhiko Kinoshita	Dept. of Physics, School of Science & Engineering	2005.12.21 - 2005.12.25
高鐘	University of Oklahoma	2005.12.23 - 2006.01.06