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Publisher
Maw-Kuen Wu
Editors
Yeng-Long Chen
Edwin Hu
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Wen-Tau Juan
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Hoi-Lai Yu

Executive Editors
I-Tzu Huang

中央研究院物理研究所年報

發 行 人
吳茂昆

編 輯
陳彥龍
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阮文滔
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執行編輯
黃懿姿

中 央 研 究 院
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ANNUAL REPORT
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朱明禮 Ming-Lee Chu	研究技師/ 高能實驗、抗輻射電子光電元件、系統 光通訊,電子儀器 Senior Research Scientist/ High energy experiment, Radiation hard electronics, opto-electronics, optical	413 2789-6796	詳見 50 頁 Please see page 50.
林志勳	研究副技師/高能物理實驗，抗輻射及高可靠度電	P405 886-2-2789-6731	詳見 51 頁 Please see page 51.

Chih-hsun LIN	子元件系統，電子儀器，低噪音前端放大器 Associate Research Scientist/ High energy physics experiment, Radiation hard and high reliability electronics for space application, Electronic instrumentation, low noise front-end amplifier.		
薛韻馨 Shiue,Jessie	研究副技師/奈米材料、 材料機械性質 Associate Research Scientist/ Nanomaterials, mechanical properties	P405 2789-6762	詳見 33 頁 Please see page 33.

Joint Appointment Faculty

陳正弦 Cheng-Hsuan Chen
National Taiwan University
Electron Microscopy, Nano-Science

陳福榮 Fu-Rong Chen
National Tsing Hwa Univeristy,

張家靖 Chia-Ching Chang
National Chiao Tung University,
Department of Biological Science and Technology

蔣正偉Cheng-Wei Chiang
National Central University
Particle Physics, Theoretical High Energy Physics

陳宣毅 Hsuan-Yi Chen
National Central University, Department of Physics

傅祖怡 Tsu-Yi, Fu
National Taiwan Normal University
Atomic Resolution Microscopy

吳明佳 Ming-Chya Wu
National Central University,
Statistical Physics

蕭葆羲 Bao-Shi Shiau
National Taiwan Ocean University
Wind Engineering, Environmental Engineering in Ocean and Atmosphere.

王林玉英 Yuh Ying L. Wang
National Taiwan Normal University
Hemodynamics.

魏金明 Ching-Ming Wei
Institute of Atomic and Molecular Sciences, Academia Sinica
Surface Science, Kikuchi Electron Holography, Ab initio Total Energy Calculations.

Adjunct Faculty

江海邦 Hai-Pang Chiang
Optoelectronic Physics, Applied Optics, Laser Spectroscopy

簡來成 Lai-Chen Chien
Computational Fluid Physics, Microgravity Fluid Dynamics, Space Material Processing.

郭子斯 Thomas T. S. Kuo
Nuclear Physics.

謝雲生 Wan-Sun Tse
Raman and Infrared spectroscopy, Laser and Nonlinear Crystals.

王建萬 Chang-Wan Wang
Experimental Nuclear Physics,

王唯工 Wei Kung Wang
Biophysics

楊維邦 Wai-Bong Yeung
Elementary Particle Physics, Field Theory, Theory of Gravitation, Physics of Ferrofluid.

黃榮鑑 Robert R. Hwang
National Taiwan Ocean University
Vortex Dynamics, Turbulent Diffusion Processes, Fluid Dynamics, Wave Mechanics.

姚永德 Yeong Der Yao
Solid State Physics

何侗民 L. Tung-Min Ho
Semiconductor Physics; Impurities and Defects in Crystals; Infrared Spectroscopy.

Visiting Scholars and Postdoctoral Research Associates

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Hong-Ju Shih	(施宏儒)		

* 已離職人員

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), Dr. S. P. Li(acting, 2004- 2006) , and Dr. Maw-Kuen Wu (2006- 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 42 research staffs: 2 distinguished research fellows, 22 research fellows, 8 associate research fellows, 7 assistant research fellows, 1 senior research scientist, and 2 associate research scientists. 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，c，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.

Computer Room

The scientific computing facilities of our institute have grown dramatically in the past two years. Not only have more computing nodes been added, but the Computer Services provide more services for our research staffs and the administrations. In brief, we have been concentrating on three topics: 1) providing high performance computing cluster for heavy numerical computation, 2) maintaining a convenient, stable and secure networking environment inside and outside our institute and, 3) continuing the development of automated administration and library systems.

Currently our institute hosts a blade cluster (IPASCC) with more than 600 cores, over 1 teraflop of computing power for serial and parallel computing. The IPASCC provides a stable computational physics platform for all PIs. The science projects includes modeling the structure and properties of new superconducting and semiconducting materials, predicting the complex self-assembled patterns of macromolecules, and simulating the market forces in an election. In addition, we have collaborations with the Taiwan-GRID project and the National Center for High Performance Computing to develop large scale computing applications and share computing resources.

The Computer Services provide convenient and secure access to the internet throughout the institute. Wireless access points have been installed, and a GIGA firewall and a mail filtering system protect our computers from hackers and viruses. To facilitate the Institute's daily operations, the Computer Services have developed an online administration (OA) system to automate most routine procedures. Personnel and asset management, accounting and purchasing, seminar and meeting room

scheduling, NSC project management, PIs' profiles, job descriptions of administration staff and internal documentation circulation can all be done or inquired online. We continue to add more functions to the system, and we are cooperating with ASCC to achieve the goal of exchange data through web service and integrate with the ASCC OA systems.

Electronics Shop

Administrative support

i. Indiviual lab. electricity planning, buliding air control maintance.
ii. Acadamic acvitity multi-medium survice

1. Electroinic/Electrical parts
   i. Stock room
   ii. Part consultation
   iii. Procurement of parts
2. Electronic/instrumentation design support
   i. Design consultation
   ii. Implementation support (make pcb, pcb assembly etc)
   iii. Electronic CAD software lab. (B203)
   ECAD Software: PROTEL/Altium DXP 2004
      1. Institute licensed, can install to institute owned PC。
      2. Schematic design, PLD design, Analog/digital simulation
      3. PCB layout
   iv. Hardware assembly testing lab. (B203)

Library

INTRODUCTION

The physics library was founded in 1962 as an academically specialized library. Its mission is to provide a perfect research environment for colleagues who are affiliated with the institute and scholars from the physics community in Taiwan.

COLLECTION

The collected materials cover a wide range of areas in physics, mathematics and applied sciences. There are over 40,000 books (including more than 25,000 bound volumes of journals) and about 300 journals.

Academic database or online journal database such as Web of Science, AIP , IoP, Interscience and Science Direct are also included in our recent collections

SERVICE

These include:

---All library materials such as books, journals, are open to the public. Members of the institute can check out most materials with a library card. Users not belong to the institute are limited to the use of these materials within the library.

---Library users can consult the librarians either on-site, through telephone, fax or by mail.

---Inter-library cooperative services. The Physics Library is a member of the "Interlibrary Cooperation Association". Besides assisting our institute colleagues to get the scientific papers from other libraries, we also provide our library materials to other libraries through the "Inter-Library Cooperative Services".

---DDS (Document Delivery Service) is available. Users can obtain the research papers they need through the internet.

---Photocopying services. There are two photocopiers. Library user can photocopy materials he/she needs as long as it does not violate the copyright law of the R.O.C.

---All library news is now sent to the library users through their e-mail account.

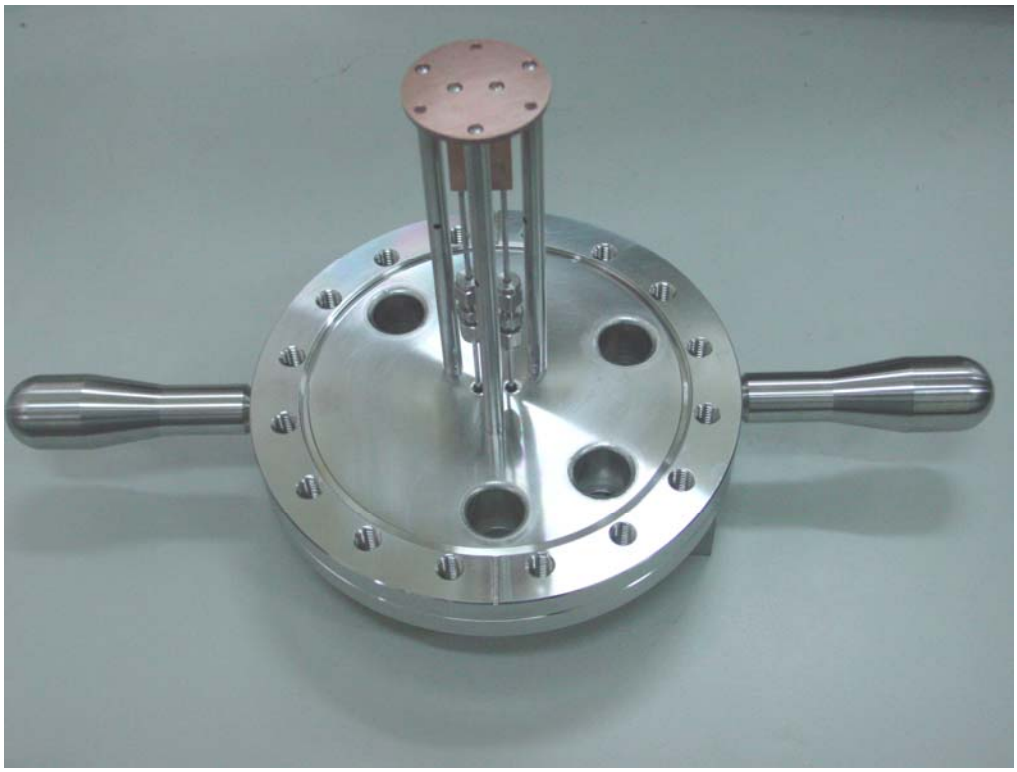
Machine Shop

Over the past eighteen years, the Machine Shop has, with the support of the members of the Institute, grown and matured significantly. The level of workmanship has been raised, and our technical skill now ranges from the simplest mechanical machining to high precision fabrication and production. To continue to meet the needs of Institute members, we have assembled a variety of tools and machinery, for example: Swiss made milling and drilling machine, wire saws, electric discharge machines, soldering facilities, and support for vacuum systems. Furthermore, we have a near complete stock of machine parts and items.

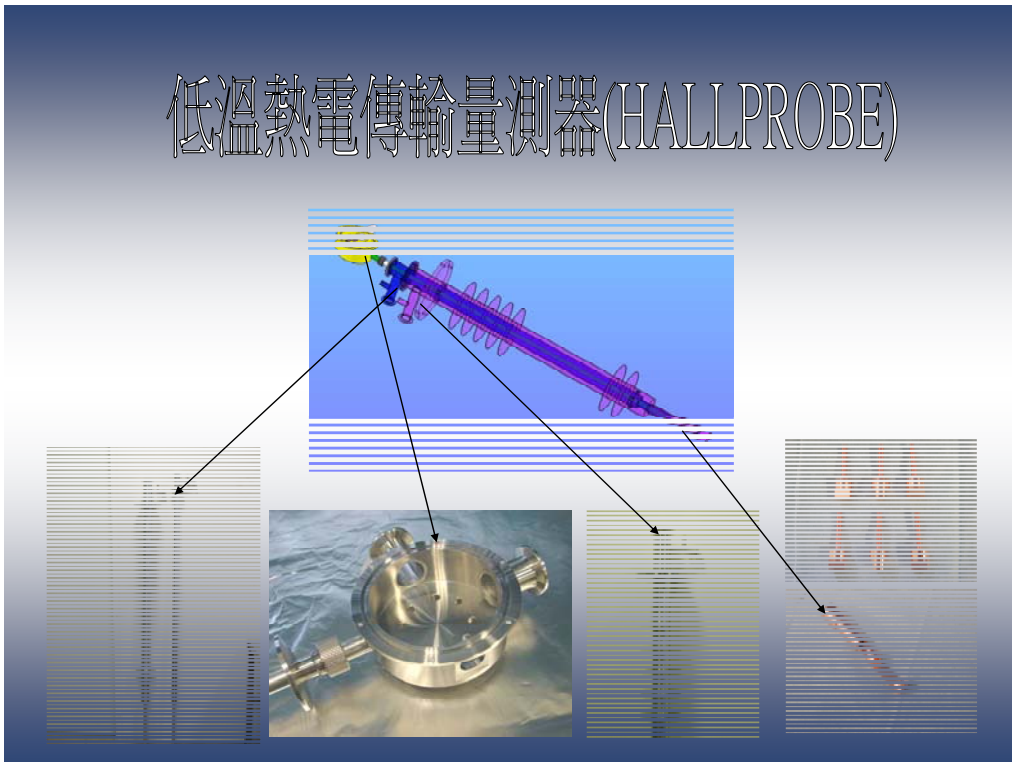
We have also organized periodic machinery training sessions for students and assistants, with the hopes of raising student’s design and production capabilities. In this way, we hope to do what we can to help raise the overall research standards of the Institute.

Through hard work and team work, we hope to provide the best for the Institute of Physics.

Below are shown some examples of our work and results:



（STM　cooling　system）



（HALLPROBE）

Nanoscience Research Group

Nanoscience and nanotechnology have become one of the major research focuses in the Institute. Owing to the diverse nature of condensed matter physics, in past years we have largely placed our own effort on individual research interests and, indeed, various significant impacts have been made. During these last few years, a core facility has been set up with the support of both National Nano Program and Academia Sinica. In order to build on our strengths and tighten up our endeavors along the way, we have emphasized the following directions:

(i) Study on energy-related transport and thermoelectric properties in nanostructured materials;
(ii) Characterization and manipulation of a single nanostructure or bio-molecule with atomic precision;
(iii) Development of state-of-the-art research instruments and tools for nano-science, and for the detection and manipulation of single biomolecules;
(iv) Study on biomolecular interactions using micro/nanofluidic devices.
(v) Theoretical modeling, calculations and simulations of nano-system.

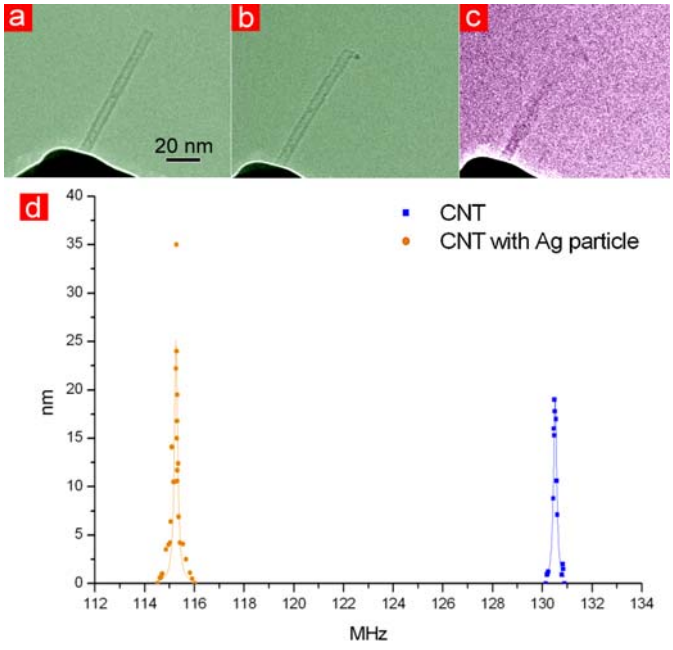
The followings are the research groups that involve in various nanoscience researches and summaries of their research activities:

(1) Surface Physics and Nanoscale Microscopy

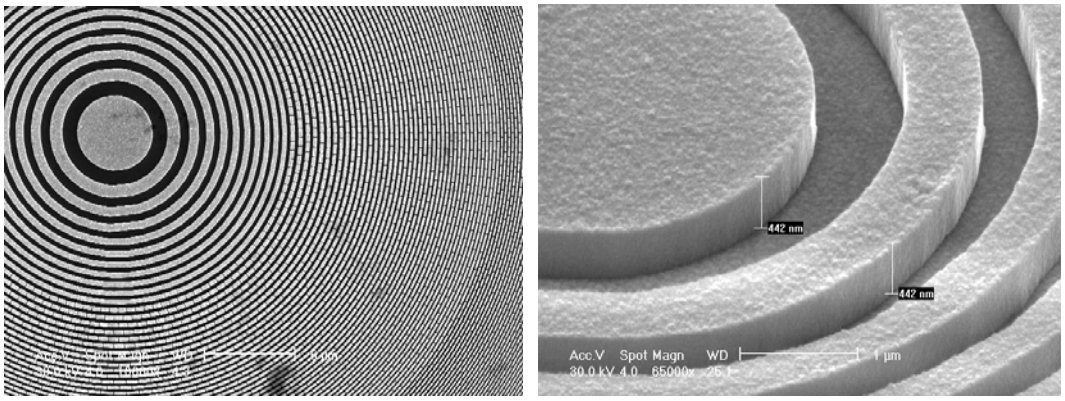
This research group includes five faculty members and four joint appointment faculty members and routinely maintains a size of around 50 researchers comprised of visiting scholars, post-doctors, assistants, and students. We have established several major research tools such as scanning tunneling microscopy (STM), atomic force microscopy (AFM), field ion microscopy (FIM), transmission electron microscopy (TEM), X-ray microscopy and etc. In the past years, our focus has been on studying quantum phenomena associated with ultrathin metal films, control and tailoring of carbon nanotubes, imaging and force measurements of biological molecules, properties and applications of single atom tips, development of precision tools and instruments, and imaging the live cells with X-ray microscopy. In next five years, we plan to make progress in imaging a single biomolecule on a substrate with UHV STM/AFM system; analyzing the real-time correlation between the functionality of a quantum dot or quantum wire and its structure with the TEM/STM combined system; investigating the surface spin at the atomic scale with ultra-low temperature STM equipped with superconducting magnet; improving the resolution of x-ray radiology to 10 nanometers; and modeling nanomaterials with calculations and simulations.

Some past research accomplishments are summarized in the following:

- We have observed that the energies of the empty quantum well states in Pb islands grown on Cu(111) surface are affected by the image potential. (Phys. Rev. Lett. **102**, (2009) 196102)
- We have developed a new, simple, and easily reproducible method of preparing Ir (210) single-atom tips by thermal treatment in oxygen. We have shown that the Ir single-atom tip can emit a variety of gas ion beams, such as He^+, H_2^+, N_2^+, and O_2^+, with high brightness and stability. (Nanotechnology **20**, (2009) 335701)
- We demonstrate the nanoscale precision of engineering and devising a MWNT with two examples – a probe for investigating the single nanoparticle effect and a balance with ultimate mass resolution of an atom. (Small **4**, (2008) 2195)
- We have discovered a phenomenon about the signal inversion during the EFM amplitude measurement on a doped semiconductor surface, which has been utilized to map out the local dopant concentration around the gate edges on a sub-45-nm CMOS device. (Appl. Phys. Lett. **93**, (2008) 253102)
- We have successfully fabricated a gold Fresnel zone plates (FZPs) and yielded unprecedented resolution levels in hard-x-ray microscopy. Tests performed on a variety of specimens with 8-10 keV photons demonstrated a first-order lateral resolution below 40 nm based on the Rayleigh criterion. (Appl. Phys. Lett. **92**, (2008) 103119)
- We have observed that the work function of the thin film can be precisely measured with high order Gundlach oscillation in scanning tunneling spectroscopy. (Phys. Rev. Lett. **99**, (2007) 216103)



An atom balance fabricated with a peeled multiwall carbon nanotube and the shift in resonance frequency, after the attachment of a 3 nm Ag particle, showing the mass sensitivity of a single Ag atom.



Zernike contrast image of a 180nm-thick Siemens star test pattern with 30-nm minimum separation at the center

(2) Nanomaterial and low temperature physics

- High Tc Superconductors
- Magnetic Materials
- Size Effect in Nano Materials
- Heavy Fermion
- Thin Film
- Thermoelectric materials
- Temperature sensor

The nanomaterial and low temperature physics research group was established in 1989. It involves two full-time faculty members and maintains a size of around 20 researchers comprised of visiting scholars, post-doctors, assistants, and students. Our research interests include phenomena that associated with strongly correlated electron systems 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 He_3 SQUID magnetometer, low-temperature microcalorimeter, and thermopower & thermoconductivity measurement systems. Magnetic susceptibility and electrical resistivity measurements can be achieved for magnetic field up to 20 T and pressure up to 20 kbars in a dilution refrigerator. 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 magnetisim 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.

Major research achievements：

1. A world-class high-pressure thermal-relaxation microcalorimeter

We have developed a high-pressure thermal-relaxation microcalorimeter. It integrates our earlier developed thermal-relaxation microcalorimeter with a pair of diamond anvils, covering the temperature range of 0.3-30 K and applied pressure up to 10 Kbar.

2. Measuring system for electrical and thermal transport properties of a single nanowires:A single nanowire is suspended in vacuum with its two ends in contact with the substrate for thermal insulation. By applying the 3ωmethod, the intrinsic thermal and transport properties of the nanowire can be obtained. The results on a single Ni nanowire (Φ= 200 nm and L= 10 um) have been reported (Applied Physics Letter).

3. Initiating an innovative research field -- novel physical properties of heavy fermion nanoparticles

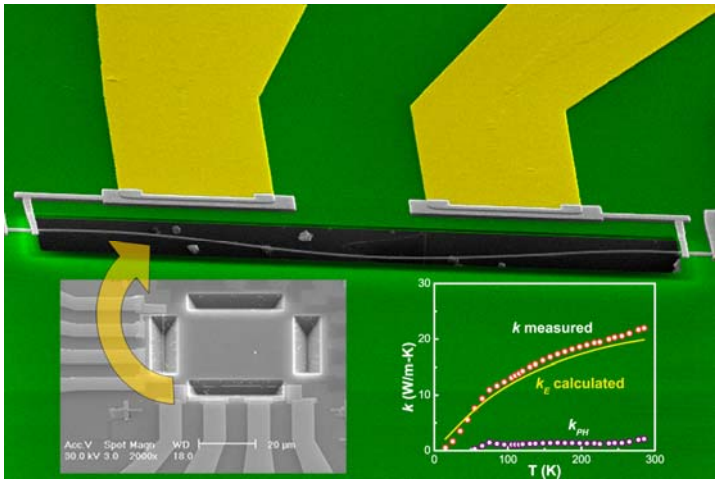
3-1. Kondo enhancement and antiferromagnetic order suppression in nanoparticles: In 8 nm-$CeAl_2$, magnetic ordering completely disappears and the Kondo temperature decreases to 0.65 K (from 5 K for bulk $CeAl_2$). Meanwhile, the extrapolated γ reaches 9000 mJ/mol Ce K^2 as the temperature approaches zero. This value falls in the highest range ever reported for heavy fermion compounds and was reported to PRL.

3-2. Different size effect between ferromagnetic and antiferromagnetic ordering :In Ce_3Al_{11} nanoparticles, the ferromagnetic transition remains at T_C=6.2 K, but no antiferromagnetic transition is visible down to 1.8 K. Meanwhile, a slightly smaller Curie constant of nanoparticles as compared to that of the bulk indicates a certain degree of demagnetization of Ce ions with size reduction(Phys. Rev. Lett. 84, 4990, 2000).

3-3. Lattice Disorder and Size-Induced Kondo Behavior in $CeAl_2$ and $CePt_{2+x}$:When the size of $CeAl_2$ and $CePt_{2+x}$ particles is reduced to the nanometer scale, antiferromagnetism is suppressed and Kondo behavior predominates, with the Kondo temperature T_K either decreasing ($CeAl_2$) or increasing ($CePt_{2+x}$) relative to the bulk. Extended x-ray absorption fine structure (EXAFS) measurements show that these nanoparticles are significantly distorted. (Phys. Rev. Lett. 97, 097204, 2006)

3-4. The evolution of Kondo interactions and magnetic correlation with size variation and Core (magnetic)- shell (nonmagnetic) model in $CePt_2$： The Kondo effect predominates at small particle size with trivalent, small Kondo temperature magnetic regions coexisting with strongly mixed valent, large T_K nonmagnetic regions. The distribution configuration of magnetic and nonmagnetic Ce ions can be sketched by a core (magnetic)- shell (nonmagnetic) model(Phys. Rev. Lett, 98, 157206, 2007)

3-5. Observation and origin of size-dependent ferromagnetism in capped CdSe quantum dots：We have made observations of RTFM in CdSe quantum dots (QDs) capped with TOPO (tri-n-octylphosphine oxide) but without any doping. Meanwhile, our detailed studies of the QDs show charge transfer from surface Cd to oxygen atoms of TOPO. (Advanced Materials).



The scanning electron microscope (SEM) image of the Ni-NW with dimensions 100 nm×180 nm×35 μm, the Ni-NW was suspended above a groove on a Si/ Si_3N_4 substrate.

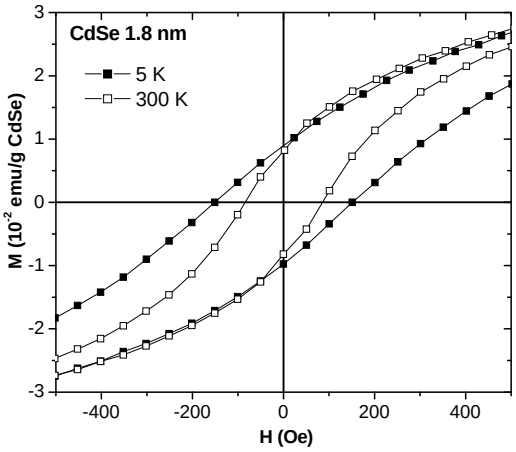


Fig. Hysteresis loops observed in 1.8 nm CdSe at 5 K and 300 K. The insets show the raw data (bottom right) and the data after subtracting the high-field diamagnetic component (top left).

(3) Spintronics, magnetic nanostructures and magnetotransport physics

Magnetic Nano-structures

The idea that the spins of electrons or holes in electrical currents can be an extra dimension one can control under sub micron character length has triggered the area of Spintronics. Magnetic metals are natural candidates for this possibility, apart from other ways to generate spin currents from spin Hall effect etc. In magnetic nano-structures, it is important to understand the interplay of different anisotropy and magnetization reversal process by the formation of vortex or domain walls.

We systematically studied the magnetization reversal for different aspect ratio (short axis / long axis) pseudo spin valve elliptical rings. The transition of magnetization reversal process from one-step to two-step magnetoresistance curves is clearly observed. In small aspect ratio elliptical rings, the structure is close to a bar shape with a narrow gap along the long axis. The magnetizations reverse like a single domain spin valve bar structure. In large aspect ratio elliptical rings and circular rings, double switching was observed. Switching between bidomain state and vortex state manifest itself as extra sharp steps in the MR curves. Close to the transition between these two behaviors, detail line-width and shape variation are important factors which can induce transient states. This result is important for information storage and processing area, e.g. the development of magnetic random access memories. This result has been published in Applied Physics Letters. Other research directions involving the study of dynamic behaviors and of domain wall movements are also on-going.

Magnetic nanoparticles: Two methods have been used to fabricate nanoparticles, nanosphere lithography and inert gas condensation. First, nanoparticles were prepared by thermally evaporating pure materials to deposit different thick layers on tops of polystyrene nanospheres with different sizes, as shown in fig. 1. The size of nanoparticles was influenced by both the layer thickness and the size of nanospheres. The saturation magnetizations were dependent on the layer thickness and the size of nanospheres, as shown in fig. 2. Second, amorphous nanoparticles were collected from a liquid nitrogen cooled cooper plate in an inert gas atmosphere (He). The size of nanoparticles was dependent on the He gas pressure. The saturation magnetizations were dependent on the He pressures and the density of nanoparticles. The room-temperature ferromagnetism in nanoparticles was attributed to the quantum size effect, distinct nanostructures and the magnetic coupling among nanoparticles. The surface effect or the dopant effect on the magnetic properties has been studied by

capping a layer on top of the nanoparticles. The magnetization has been enhanced by capping different specific materials. These results are interesting and partial results have been published recently in Applied Physics Letters (APL 90, 182508, 2007 and APL 91, 82505, 2007) and Advanced Materials (20, 779, 2008).

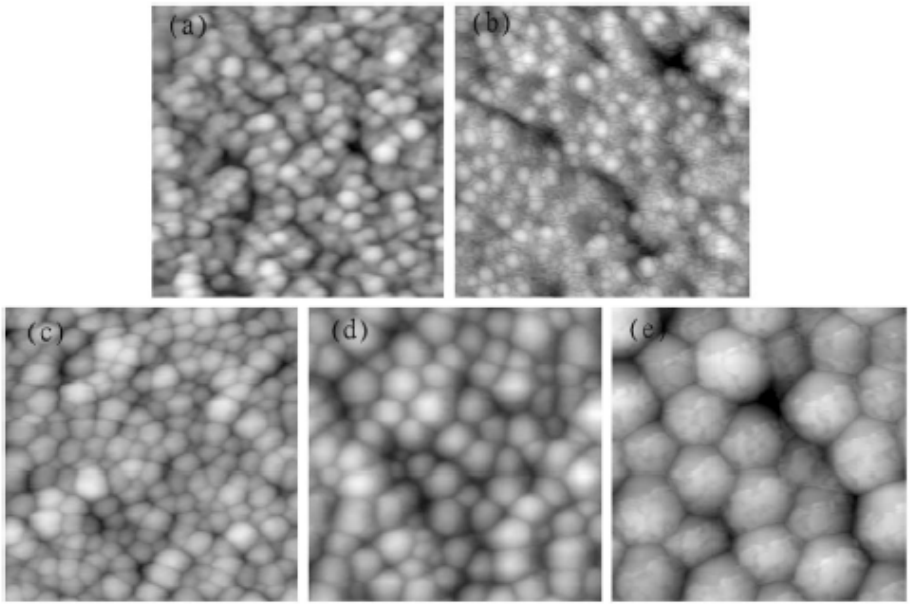


FIG. 1. AFM images of (a) nanospheres with a diameter of 20 nm without depositing Ge layer, 5 nm thick Ge layers deposited on nanospheres with diameters of (b) 20 nm, (c) 30 nm, (d) 50 nm, and (e) 100 nm. All images have the same size of 500 nm.

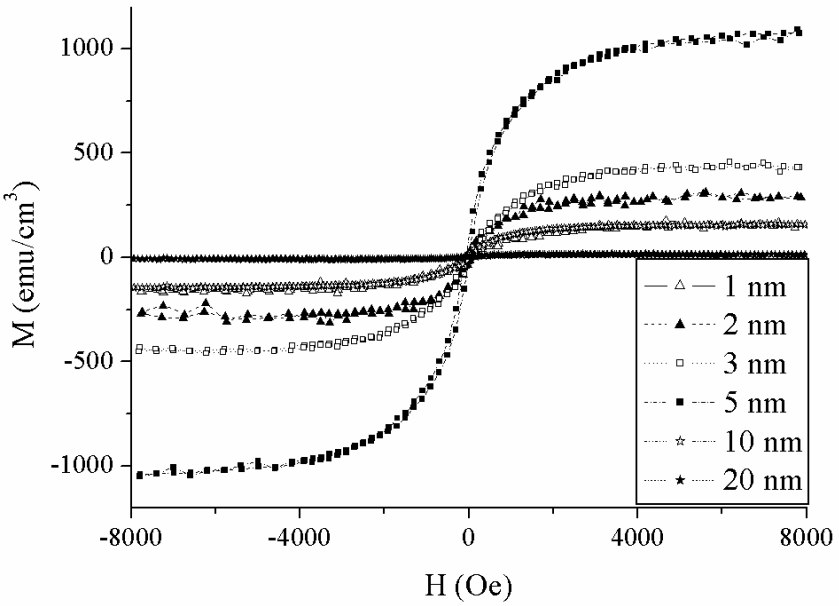


FIG.. 2. M-H loops of Ge layers with different thickness of 20 nm nanospheres.

FeCoGa (Co-Galfenol):

$Fe_{81-X}Co_XGa_{19}$ (with x ranging from 0 to 19 at.%Co) films were made by the dc magnetron sputtering method. We have studied the structural (phases, texturing, and grain size D), magnetic (saturation magnetostriction λ_S and coercivity H_C), mechanical (Young's modulus E_f and hardness H_f), and electrical (electrical resistivity ρ) properties of these films. The main results are: [i] all the films are (110) textured; [ii] the bct phase (with twinned grains) coexists with the bcc phase only in the case of $x \leq 3$ at.%Co; [iii] λ_S increases steadily from 42 ppm to 86 ppm, as x increases from 0 to 19 at.%Co; [iv] ρ reaches the saturation limit, about 200 $\mu\Omega$cm, when $19 \geq x \geq 15$ at.%Co. In conclusion, we report that the $Fe_{62}Co_{19}Ga_{19}$ film has the optimal magnetic and electrical properties among all the FeCoGa films : λ_S = 86 ppm, $\lambda_{\parallel}^{S}$ = 110 ppm, H_S = 50 Oe, H_C = 25 Oe, and ρ = 205 $\mu\Omega$cm. These properties suggest that the $Fe_{62}Co_{19}Ga_{19}$ film is a good candidate for application in a thin-film actuator device.

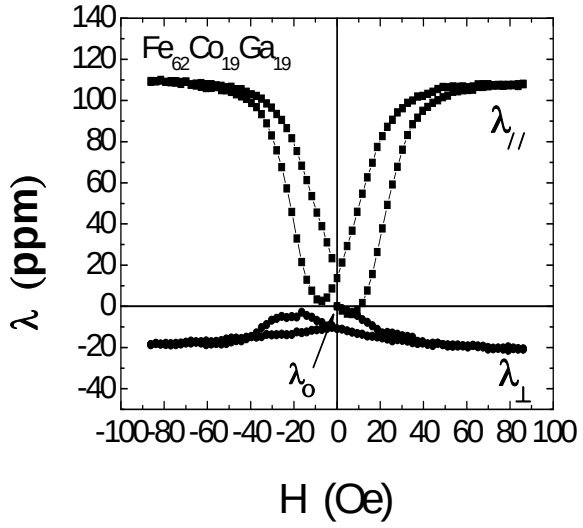


Fig.3 The longitudinal and transverse magnetostrictions ($\lambda_{\parallel}$ and $\lambda_{\perp}$) plotted as a function of the external field H.

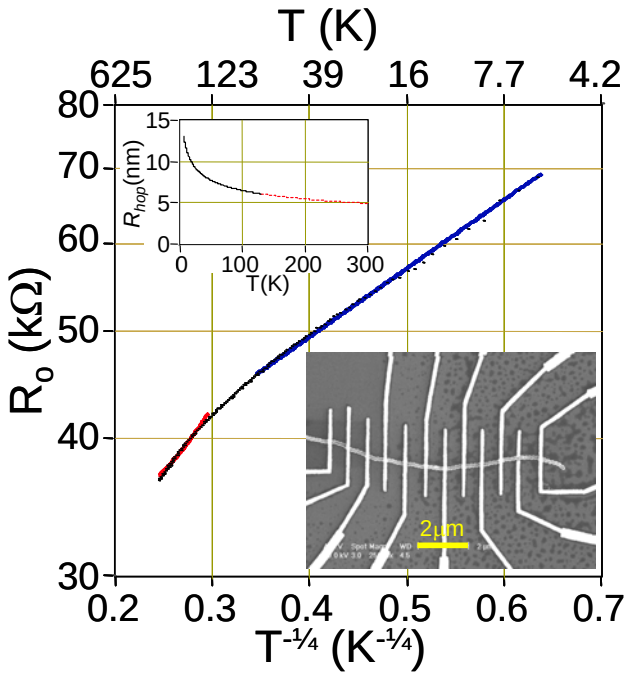
(4) Quantum electronics physics

Taking advantage of modern electron-beam lithography technology, we are able to fabricate various nanometer-scaled structures and electronic devices with the critical dimension well below 100 nm. Our research directions can be largely divided into two categories: to study novel (quantum) effects associate the small length scale of the

devices and to investigate possible applications of the fabricated nano-devices. In the first category, we study superconductor-insulator phase-transition in arrays of Josephson junction arrays, transport in superconducting single electron transistors and in nanowires of various materials (such as silicon, carbon nanotube). In the second category, attempts have been made on manipulation and detection of molecule monolayer. In the following, we present high lights of our recent research works.

1. Electron hopping conduction in highly disordered carbon coils

The electric transport in a single carbon coil was measured from ambient temperature to 64 mK. The temperature-dependent resistance was analyzed with the Efros-Shklovskii variable range hopping model, indicating three-dimensional electron hopping conduction in the disordered helical wires. The analysis also provides a basic understanding of the electron transport with an electron hopping length of 5 nm inside the disordered carbon coils. [Carbon 47, 1761-69 (2009).]



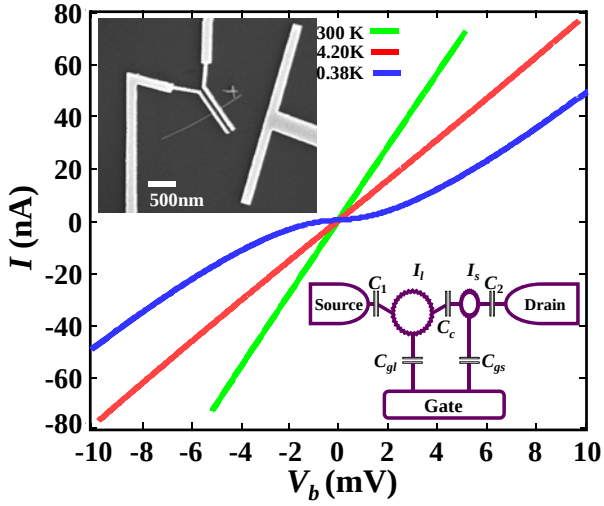
Electric transport measurement of carbon coils. (main panel) The $R_0(T)$ dependence with a fitting to ES-VRHC behavior at temperatures below 94 K. Dashed curve shows an extension to 300 K. The exponent *s* and ES-temperature T_{ES} are 0.1136 and 0.1744 K, respectively. The corresponding actual temperatures are labeled at the top for reference. (upper inset) The mean hopping distance as a function of temperature, in which the dotted curve shows an extrapolation using the theory of VRHC. (lower inset) An SEM image of the measured carbon coil of 150 nm wire diameter. The scale bar is 2 μm.

2. Coulomb blockade behavior in an indium nitride nanowire with disordered surface states

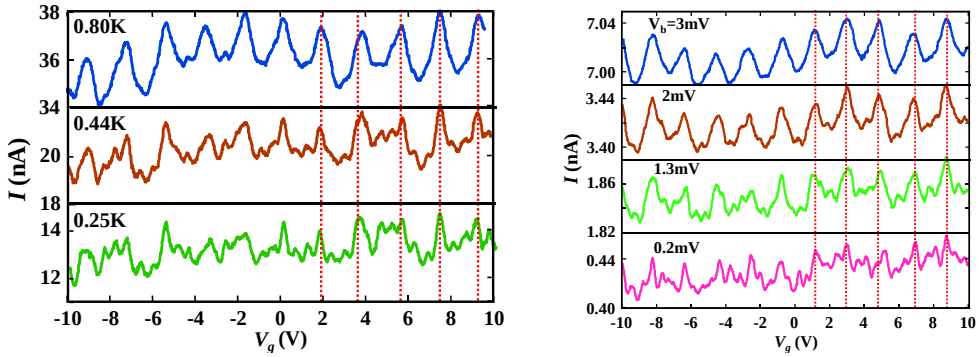
Meticulous Coulomb oscillations are observed in a single electron transistor based on an individual indium nitride nanowire at low temperatures. While the device shows single period Coulomb oscillation at high temperatures or at high bias voltages, additional satellite peaks along with the main Coulomb peak appear at low temperatures and low bias voltages. The quasiperiodic structure is attributed to the mixing of dissimilar Coulomb oscillations arising from two serially coupled islands

embedded inadvertently in the surface metallic states of the nanowire. The proposed model is numerically simulated with good agreement with the experimental data.

[Applied Physics Letters 95, 092110 (2009)]



I-V_b characteristics at *T*=0.38K (blue), 4.2K (red) and 300K (green) showing unambiguous Coulomb blockade effect at low temperature. Top left inset is the scanning electron micrograph of the measured device. The bottom right inset is the schematic employed in modeling the measured device.



(left) Coulomb oscillations at *T*=0.8K (purple), 0.44K (brown) and 0.25K (green) clearly showing satellite peaks in the vicinity of major peak at lower temperatures. All the curves are taken at V_b=1mV. The vertical red-dotted lines are guide to the eye, representing the major peak position at several temperatures. (right) Coulomb oscillations at V_b=3mV (purple), 2mV (brown), 1.3mV (green) and 0.2mV (magenta) showing clear onset of satellite peaks in the vicinity of major peak at lower bias voltages. All the curves are taken at *T*=0.35K. The vertical red-dotted lines are guide to the eye, denoting the major peak position at different bias voltages.

(5) Theoretical condensed matter physics

This group consists of three 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; Quantum Monte Carlo method; Electronic structures of transitional-metal oxides; surface science theory; theory of low temperature quantum systems; and properties of unconventional superconductors.

Research Summary:
***Ab Initio calculation studies*:**

1. SrRuO3: There has been a long debate whether the strong correlation is important or not in the relatively extended Ru-4d orbital. With on-site Coulomb repulsion included, we investigate the electronic and magnetic properties of SrRuO3 and $SrTi_xRu_{1-x}O3$. We found an orbital ordered half-metallic ground state agree with the high spin polarization at Ef observed in Andreev reflection experiments. We also found that the metal-insulator transition upon Ti doping level is induced by the strong correlation. (Phys. Rev. Lett. 97, 67002 (2006), Phys. Rev. B 77, 085118 (2008)).
2. TbMnO3: This multiferroic material is a very hot topic in recent years. In cooperation with experimentalists in NSRRC, we investigated the electronic structures of TbMnO3. We found the orbital ordering pattern to be similar to that of LaMnO3. The obtained orbital ordering is presumably responsible for the bonding anisotropy observed in xray spectroscopy. (Appl. Phys. Lett. 91, 054108 (2007), Appl. Phys. Lett. 94, 044105 (2009)).
3. La0.7Ce0.3MnO3 and Cd2Re2O7: There is no consensus in the carrier properties upon doping levels as well as temperatures in these two compounds for years. In cooperation with experimentalists in NCTU, we demonstrated the carrier in the former is actually hole rather than electron, while the carrier in the later changes from hole to electron upon cooling. Surprisingly we found a quasi 2D Fermi surface in low-T Cd2Re2O7 with no layer structure therein. This could be related to the superconductivity observed at about 1K. (Phys. Rev. B 72, 132410 (2005), Journal of Physics: Cond. Matter 21, 195602 (2009)).
4. Be(1010) and Mg(1010) surface: In cooperation with ARPES experiments we investigated the surface states (SS) and surface resonances of Be(1010) and Mg(1010) surfaces. The SS of the former reside in the large projected bulk band gaps from A to G, while the surface states of the latter locate in the small bulk band gaps. Through first-principles investigations, the very short decay length (~4ML) of Be(1010) SS and the extremely long decay length (~50ML) of Mg(1010) SS are found to be related to the somewhat covalent localized picture of Be and the metallic delocalized picture of Mg, despite that both Be and Mg belongs to the same family (Phys. Rev. B 77, 045405 (2008), PRB 80, 085419 (2009)).
5. Armchair graphene nanoribbons: Using three different theoretical approaches including analytic analysis, dynamical mean field renormalization group method, and first-principles calculations, we found a itinerant electronic mediated localized ferromagnetism in armchair graphene nanoribbons upon proper hole dopings. This could be potential for future spintronics if the predicted ferromagnetism could be

realized in experiments. (Phys. Rev. B 79, 035405 (2009)).

Research in cold atomic gases :

(a) We study the physics of fermions under Feshbach resonances. We predicted the breakdown of the smooth BEC-BCS crossover in the system of two-species fermions under Feshbach resonances with population imbalance. (b) We studied quantum magnetism of spinor Bosons in optical lattice. We predicted novel magnetic phases as well as pointed out that these ordered state can be easily reached by adiabatically turning on of the lattice.

Research in non-centrosymmetric superconductors:

Implications of the absence of inversion centers in superconductors are studied theoretically. Broken symmetry effects arising from singlet and triplet mixing, such as magneto-electric effects, are studied in the bulk as well as near interfaces and Josephson junctions. Topological classification of these states has been proposed.

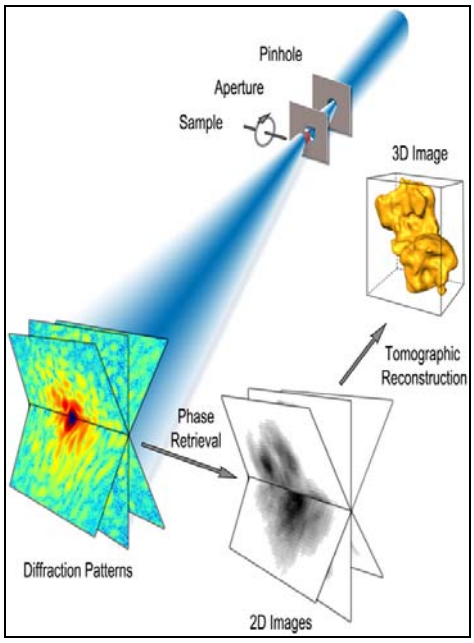
(6) Computational physics

3D image reconstruction of non-crystalline objects by using x-ray diffraction microscopy or electron diffraction microscopy

With the advance in nanoscience and nanotechnology, x-ray diffraction microscopy, a newly developed imaging technique, is becoming more and more important in the structural determination of non-crystalline micro- or nano-objects including biological specimens. However, to reconstruct a high resolution 3D image there are a number of obstacles to overcome in both experimental techniques and theoretical algorithms. The major problems in image reconstruction are the lack of phase information in experimental data, lack of data at high angles and at the central pixels of detectors due to the beam stop, alignment of projected 2D images correctly, etc.. In addition, the sensitivity of biological samples to radiation damages will restrict the number of projections to be taken by experiments with less data available for image reconstruction. In the last several years we have developed a series of methods to resolve these issues. First we developed a new phase retrieval method – the guided hybrid input-output (GHIO) algorithm (Phys. Rev. B76, 064113 (2007)) which has now been successfully applied to a GaN-Ga_2O_3 core shell structure (Phys. Rev. Lett.97, 215503 (2006)), resonant x-ray diffraction microscopy for buried structures (Phys. Rev. Lett. 100,025504(2008)), and also used in the study of a nano crystal by electron microscopy (Applied Phys. Lett. 95, 111908(2009)). Then a new alignment method is developed (Phys. Rev. B **79**, 052102 (2009)). Recently we have

developed a direct 3D reconstruction method to specifically treat data with only a limited number of projections. It will be very useful for radiation-sensitive samples. All these methods could be also applied to reconstruct 3D objects by using cryo-electron microscopy.

The method was demonstrated by carrying out a quantitative 3D imaging of a heat-treated GaN particle with each voxel corresponding to 17 × 17 × 17 nm^3. We observed the platelet structure of GaN and the formation of small islands on the surface of the platelets, and successfully captured the internal GaN-Ga_2O_3 core shell structure in three dimensions.



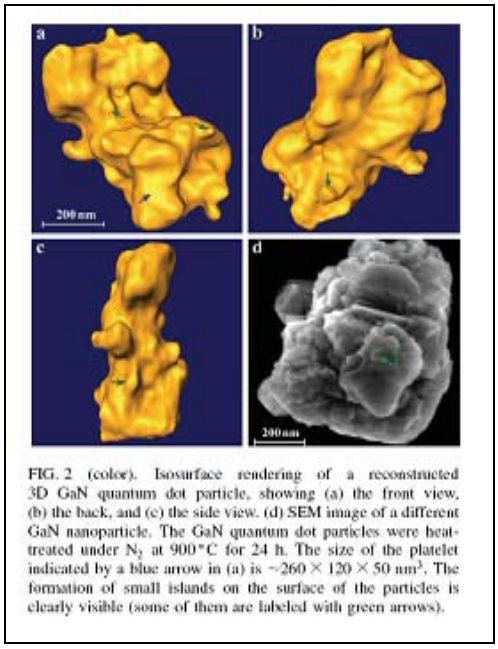


FIG. 2 (color). Isosurface rendering of a reconstructed 3D GaN quantum dot particle, showing (a) the front view, (b) the back, and (c) the side view. (d) SEM image of a different GaN nanoparticle. The GaN quantum dot particles were heat-treated under N_2 at 900 °C for 24 h. The size of the platelet indicated by a blue arrow in (a) is ~260 × 120 × 50 nm^3. The formation of small islands on the surface of the particles is clearly visible (some of them are labeled with green arrows).

Fig.1. Schematic layout of the 3D x-ray diffraction microscope, combining *ab initio* phase recovery with tomographic image reconstruction.

Principal Investigators

Jason, Chia-Seng Chang
Research Fellow
Tel : 886-2-2789-6722 / jasonc@sinica.edu.tw
Ph.D., Arizona State University, USA
Research Interest： Surface physics and chemistry; Principles of atomic manipulation; Quantum effects in low-dimensional systems; Nanostructure sciences, and Development of SPM.

Chii-Dong Chen
Research Fellow
Tel : 886-2-2789-6766 / chiidong@phys.sinica.edu.tw
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.

Yang-Yuan Chen
Research Fellow
Tel: 886-2-2789-6725 / cheny2@phys.sinica.edu.tw
Ph.D., University of California, Irvine, USA
Research Interest： Low temperature physics, Low temperature specific heat Heavy Fermion, Nanoscience, Thermoelectricity, Ground freezing.

Chia-Fu Chou
Research Fellow
Tel：886-2-2788-0058 / cfchou@phys.sinica.edu.tw
PhD., State University of New York
Research Interests：Single-Molecule Biophysics；Biophotonics；Micro/nanofluidics；Nanobiotechnology；Liquid crystals.

Ing-Shouh Hwang
Research Fellow
Tel: 886-2-2789-6764 / ishwang@phys.sinica.edu.tw
Ph.D., Harvard University, USA
Research interest： Surface science; Semiconductor physics; Scanning probe microscopy; Surface atomic and molecular dynamics; Mechanism of epitaxial growth.

Yeu-Kuang Hwu
Research Fellow
Tel : 886-2-2789-6721 / phhwu@sinica.edu.tw
Ph.D., University of Wisconsin Madison, USA
Research Interests： Application Research of Synchrotron Radiation, Photoelectron Spectromicroscopy Using Synchrotron Radiation.

Shien-Uang Jen

Research Fellow
Tel : 886-2-2789-6707 / physjen@gate.sinica.edu.tw
Ph.D., Carnegie-Mellon University, USA
Research Interests： Electron transport properties of ferromagnetic materials; Magnetostriction and application; Magnetic domains and domain walls; Magnetic anisotropy.

Horng-Tay Jeng
Assistant Research Fellow
Tel：886-2-2789-6765 / jeng@phys.sinica.edu.tw
Ph.D., National Tsing Hua University
Research Interests：computational physics, electronic structures of transitional-metal oxides, solid state physics, surface science, atomic and molecular physics.

Shang-Fan Lee
Associate Research Fellow
Tel : 886-2-2789-6767 / leesf@phys.sinica.edu.tw
Ph.D., Michigan State University, USA
Research interests include transport and magnetic properties and quantum phenomenon in metallic thin films and nano-structures.

Ting-Kuo Lee
Distinguished Research Fellow
Tel : 886-2- 2789-6791 / tklee@phys.sinica.edu.tw
Ph.D., Brown University, USA.
Research Interest: High temperature superconductivity; Strongly correlated electronic systems,Optimization algorithms; X-ray diffraction microscopy.

Lee ,Wei-Li
Assistant Research Fellow
Tel: 886-2-2789-6700 / wlee@phys.sinica.edu.tw
Ph.D. Dept. of Physics, Princeton University
Research Interests：Transport properties in novel magnetic materials,Strongly correlated electronic systems,Spin transport in magnetic nanostructures,Spin electronics.

Yung Liou
Associate Research Fellow

Tel : 886-2-2789-6723 / yung@phys.sinica.edu.tw
Ph.D., The Pennsylvania State University, USA
Research interests：The growth mechanism, physical properties and applications of magnetic thin films. Molecular beam epitaxy of thin films and superlattices; magnetron sputtering of films and multilayers. The film structure, composition, surface morphology and magntic properties.

Jessie Shiue
Associate Research Scientist
Tel: 886-2-2789-6762 / yshiue@phys.sinica.edu.tw
Ph.D., Rutgers University, USA
Research Interests: Nanomaterials, mechanical properties, instrumentation.

Wei-Bin Su
Associate Research Fellow
Tel: 886-2-2789-6711 / wbsu@phys.sinica.edu.tw
Ph.D., National Tsing Hua University
Research Interest：Surface science, Scanning probe microscopy, Epitaxial growth of metal on semiconductor, Nanoscience, Observation of surface electronic structure.

Maw-Kuen Wu
Distinguished Research Fellow & Director
Tel: (O) +886-2-2789-6716；Fax: +886-2-2788-9827
E-mail: mkwu@phys.sinica.edu.tw
Ph. D., Physics, University of Houston, USA
Research Interest：Low Temperature Physics, High pressure physics, Superconductivity and Magnetism, Materials research in microgravity.

Sungkit Yip
Research fellow
Tel: 886-2-2789-6785 / 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

Xiaoqing Ca；Che-Cheng Chang；Chung-Chieh Chang；Yuan-Chih Chang；Chi-Liang Chen；Horng-Shyang Chen；Kuo-Chi Chen；Nan-yow Chen；Ta-Kun Chen；Tsung-Yu Chen；Eddy Chou；Ming-Chiang Chung; ；Lei Hao；Jaywant Parab Harshala；I-Lin Ho；Chia-Hao Hsu；Su-Yen Huang；Tzu-Wen Huang；Yu-Chuen Huang；Ivan Kempson；En-Rong Lee；Yi-Hsien Lee；Hsiuan-Chin Lin；Yong-Han Lin；Chi-Jen Liu；Chi-Ken Lu；Shin-Ming Lu；Jiu-Yong Luo；Min-Nan Ou；Deepak Rajaram Patil；Jyh-Tzong Shiue；Alessandro Taloni；Leichle Thierry；Cheng-Liang Wang；Cheng-En Wu；Sing-Lin Wu；Der-Chung Yan；Kuo-Wei Yeh；Tseng,Jiun-Yi；Fu-Te Yuan；Li Zhao.

Complexity Research Group

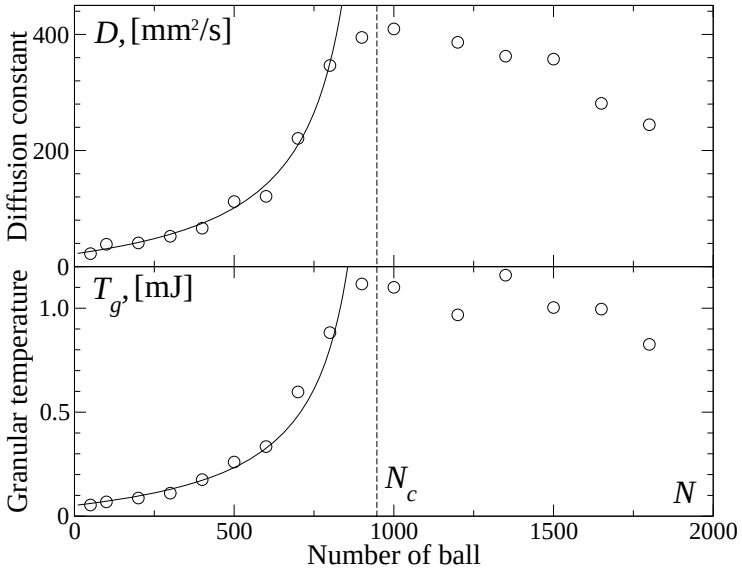
Broadly speaking, complex systems are those consisting of many simple elements that interact with each other. The most interesting aspect of complex systems is the cooperative behaviors of the elements as a result of their nonlinear interactions. Such cooperative behaviors are manifested in the spatial and/or temporal patterns, which give rise to novel structures and functions. In our institute, there are nine faculty members and a number of postdocs and graduate students working in this field. Areas of studies include the followings:

(1). Physics of granular gas, granular flow and granular chain

Vibrated granular materials are out of thermal equilibrium and characterized by strong dissipations. Due to the interplay of energy input and dissipation in the system, many novel spatial temporal patterns can be observed. Major achievements are: 1) Understanding the mechanism of a granular clock; 2) Understanding the mechanism of the stretching of DNA by the viscoelastic properties of the flow field (Chi-Keung Chan).

We have also investigated the diffusive dynamics of a quasi-two-dimensional granular gas (Q2DGS) composed of plastic balls confined in a vertically vibrating thin box. The motion of the particles in the Q2DGS was found to follow the Langevin equation with the top and bottom of the box acting as an effective viscous fluid. Surprisingly, we found that both the granular temperature T_g and the diffusion constant D increased with the number of ball (N) in the box for small N as shown on the right of the figure below.

Based on the velocity distributions and the two different kinds of horizontal motions observed in the experiments, we proposed a simple two-state model to explain the unusual diffusion behavior. We also studied the dynamics of mono-dispersed granular gas in a box with two connected partitions by molecular dynamic simulations. We found that oscillations could happen even in granular gas consisting of one kind of molecule. We also continued our research on the jamming probability of metal spheres flowing through a two-dimensional silo inclined at different angle to the horizontal plane. Surprisingly, we found that the jamming probability was insensitive to the value of the angle (Kiwing To).



Using cyclically sheared two-dimensional grains, we have set up an experimental system for the purpose of investigating the transitions between different regimes, among which the idealized collisional dynamics (like molecular gases) and the so-called quasi-static behaviors (like stationary sands or soil) are believed to be the two extreme cases. Experimental results have demonstrated the importance of dissipation, which leads to clustering and consequently the coexistence of the two different states at low density. These findings have motivated us to extend the studies into using photoelastic materials to further investigation of the force distribution inside the clusters and other possible scenarios when the clusters might have been removed by imposing mechanical vibrations to the substrate. Parallel studies using photo-elastic materials, or foams, may supplement our understandings of the rheological changes as the transitions occur (Jih-Chiang Tsai).

(2). 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. Recent results completed at LSCP include (Chin-Kun Hu and Ming-Chya Wu): 1. Solved a puzzle about finite-size corrections for the dimer model on N×∞ square lattice and calculated finite-size scaling function for the dimer on the triangular lattice. 2. Found scaling and universal behavior in transition to synchronous chaos with local-global interactions and routes to synchronization for coupled map lattice on scale-free networks. 3. Developed general algorithm and computer packages ARVO and CAVE to calculate volume, surface area, and properties of cavities in macromolecules (e.g. protein, DNA, RNA, etc). 4. Used GROMOS96 force field to simulate C-terminal β-hairpin of protein G and found that the free energy landscape of the beta-hairpin is consistent with a two-state behavior with a broad transition state. 5. Used Go-like model and MD simulations to study unfolding and refolding of immunoglobulin domain I27 and ubiquitin upon force quench and found that the dependence of the refolding time on quenched force is consistent with that observed in experiments; predicted the unfolding pathways. 6. Studied molecular models of biological evolution to obtain related phase diagrams for very general fitness functions; studied asexual and diploid models with general smooth fitness landscapes and recombination. 7. Proposed temporal transfer entropy (TTE) to analyze causality between two time series and used TTE to construct a scheme for chaotic communications. 8. Used replicators in a fine-grained environment to establish a theory of polymorphism.. 9. We found that velocity distribution of monomers in the system of non-equilibrium polymer chains follows q-statistics. 10. We used phase statistics to classify human ventricular fibrillation signals into three types and found that one of them is fatal.

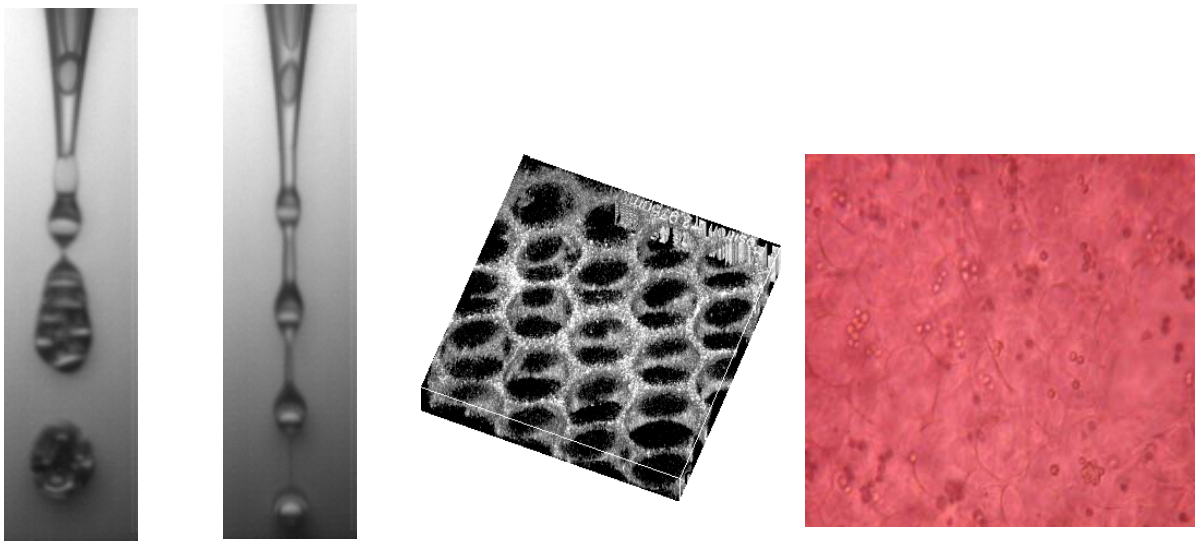
(3). Biology-Inspired Physics

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. Because all biological processes operate in a thermal environment, statistical physics is an indispensable tool in studying them. Experimentally, we try to understand the rich dynamics in networks of excitable and oscillatory systems. Such systems are the BZ reactions, neuronal networks, cardiac tissues and slime mould. We are studying the pattern formation, synchronization and effects of external stimuli on the dynamics of the system, specifically, the effects of heterogeneities. Major achievements include 1) Discovery of the difference in firing patterns in neuronal network with and without glia; 2) Understanding of the synchronization of cardiac cells in the presence of fibroblast (Chi-Keung Chan).

Theoretically, we address the problem of biological flocking. By means of particle-based simulations, we obtain the phase diagram that separates the occurrence of marching, rotating and swamping state. Vortices are found to split into 2, 3 or more subgroups depending on the density and speed of the particles. Such a splitting is seen as the driving force behind a vortex-to-marching transition (Kwan-tai Leung).

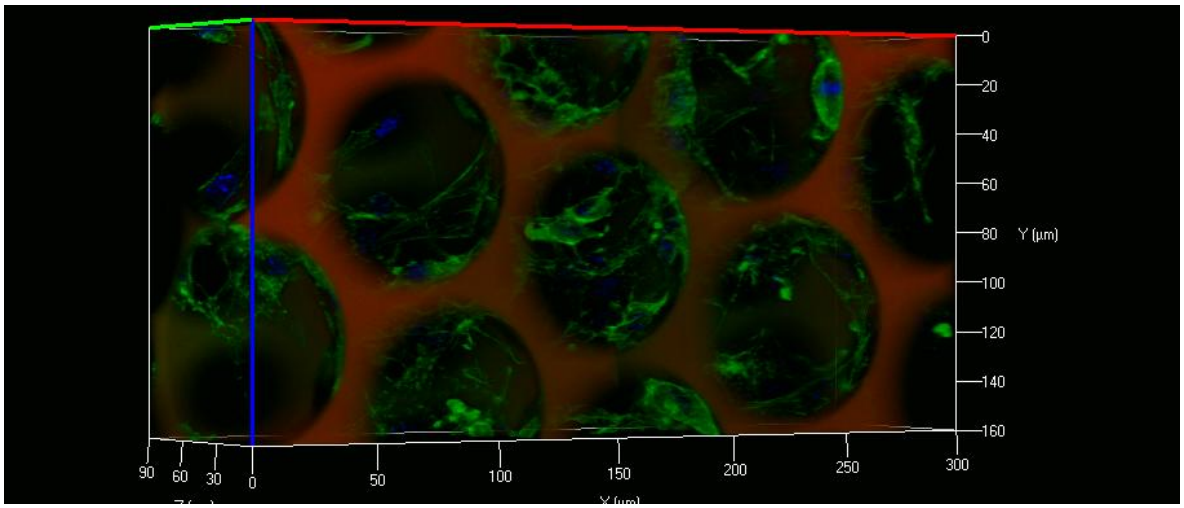
(4). Macroporous 3D Ordered Structures for Tissue Engineering Scaffolds

We invented a simple, inexpensive and fast microfluidic method to fabricate three-dimensional ordered macroporous gel and use it as tissue engineering scaffolds. The microfluidic device consists of two concentric micropipettes where one is nested inside the other. Nitrogen gas and aqueous alginate solution with Pluronic F127 are pumped through the inner and the outer channel respectively. The bubble flow exhibit interesting dynamic patterns at different flow rate and gas pressure. Under appropriate conditions, bubbles of a uniform size are generated within the device at few thousand Hz. Monodisperse bubbles are collected and self-assemble into crystal structures as wet foam. The alginate solution between bubbles is crosslinked by divalent calcium ions and turns into 3D ordered macroporous gel where the pores are highly interconnected. Chondrocytes are successfully cultured in the 3D ordered foam for more than a month (Keng-hui Lin).



(a) (b) (c) (d)

(a) and (b), flow patterns at different air pressure and liquid flow rate. (c) 3D confocal image of scaffold. (d) chondrocytes cultured on the 3D scaffolds.

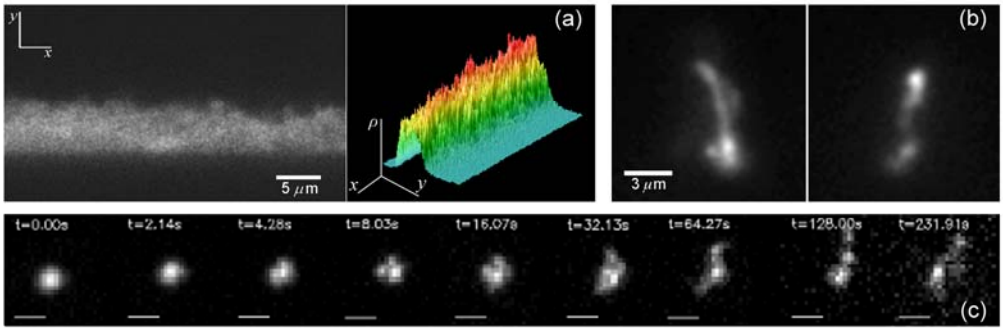


Gelatin scaffold in red and fibroblast cells are labelled with phalladin in green and DAPI in blue.

(5). Single Molecule Studies of Highly Confined Biological Macromolecules

The idea of confining long-chain macromolecules to surfaces has always intrigued polymer scientists. Although lots of efforts have been made in the studies of bulk characters of confined polymer chains, our knowledge on these molecules at microscopic level is still very limited. Our research interests are mainly focused on understanding the static and dynamic behaviors of highly confined polymer molecules. Two model systems, the densely end-tethered polymer brushes and the fully adsorbed polymers on glass-supported lipid membranes, have been intensively studied from the single molecule aspect for past years. A novel assay has been developed to construct high density end-grafted polymer layers on solid-liquid interface through end-tethering DNA molecules at grafting density above 25 molecules/ R_g^2. We have demonstrated the first single molecule study of polymer brushes with the fluorescent microscopy technique. We are able to visualize the conformation and the dynamics of individual polymer molecule in this model polymer coated layer, and understand the detailed response of the polymer brush to the shear flow. Our very recent finding also shows the diffusivity of small molecules in such an entropy-driven brush layer could be strongly retarded. This finding might be relevant to how this tailor-made surface protects the substrate. Through monitoring the adsorption and the relaxation of DNA molecules on the glass-supported charged lipid membranes, the response of individual chain-like macromolecule to the sudden variation of the system geometry has been studied. Following a rapid adsorption, a multi-stage anomalous swelling governed by the interplay between the polymer topology and the dynamics of the charged lipid molecules on the membrane has been observed for the first time. Our analysis also shows a novel spatial-temporal pattern of the adsorbed DNA molecule at scales of a

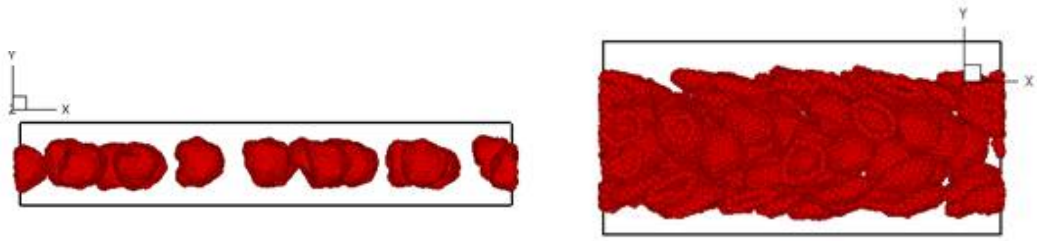
few Kuhn steps and a few seconds. This new finding may have implications in stretching biopolymers into locally straight segments using different confined geometries (Wen-Tau Juan).



(a) Dye labeled DNA brushes and the corresponding monomer density distribution. (b) Typical conformation of individual molecules inside the brush layer. (c) The swelling process of the DNA molecule after the adsorption. The scale bar is 2 microns.

(6). Dynamics of Biological Macromolecules and Complex Fluids

The dynamics and conformation of soft particles such as DNA, proteins, and cells in highly confined systems are of interest to microfluidic applications, nano-material design, and biophysical processes. Theoretical and computer modeling have allowed us to investigate the dynamics of large, micron-sized, DNA and soft particles undergoing flow in microchannels. Our investigation into the effects of electrostatic, hydrodynamic, and entropic on soft particle dynamics could reveal new methods for DNA/protein/cell manipulation in small systems (Yeng-Long Chen).



Deformed soft particles undergoing pressure-driven microfluidic flow in a small and a large channel.

(7). Hydrodynamics and Atmospheric Physics

Dispersion of emitted airborne pollutants in urban environment is mainly affected by the buildings density and wind attack angles on the buildings. Due to the complexity of the buildings arrangements in the urban region, it is difficult to predict precisely the

dispersion of pollutant by the numerical model. Field study can achieve the goal in a more precision status. But works of the field investigation cost much. Wind tunnel experimental simulation is therefore a feasible alternative. Experiments of wind tunnel study on the dispersion of pollution in urban environment of cubic building array in-line configuration for different wind attack angles were conducted in cooperation with the Environmental Wind Tunnel Laboratory of National Taiwan Ocean University (NTOU). Results indicate that as decreasing the ratio of building gap and width, G/H, the pollution concentrations spread wider in lateral. It means that the higher building density arrangement in urban region favors the dispersion and transport of pollution (Bao-Shi Shiau).

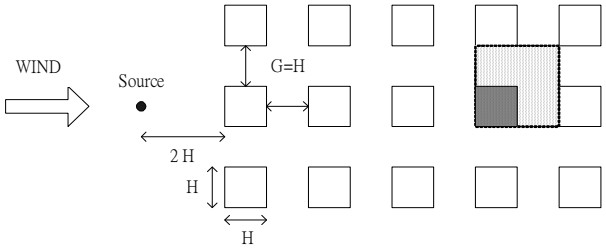
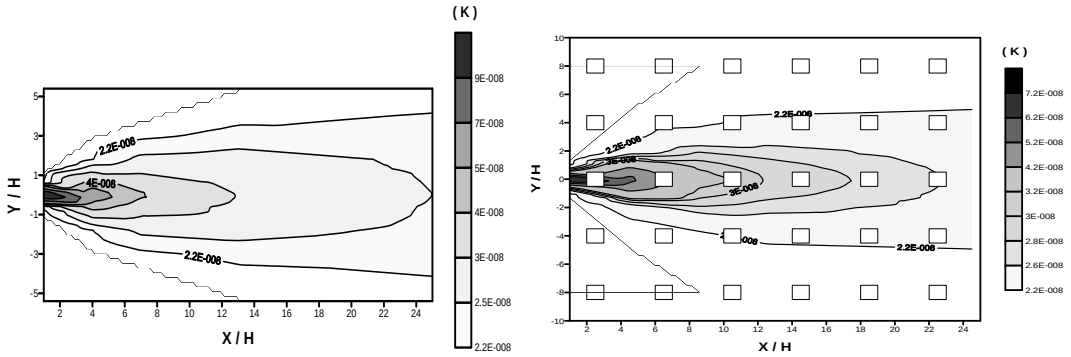


Fig. 1. View of the Environmental Wind Tunnel (Total length 22.6 m, and test section: 12.6m (L) x 2 m (W) x 1.4~1.6 m (H); speed range 0~20 m/s; Motor power of the 10-blade axial fan: 75 HP)

Fig. 2. Schematic diagram of the arrangement of the cubic buildings and location of the source; wind attack angle $\theta=0^0$, G=H



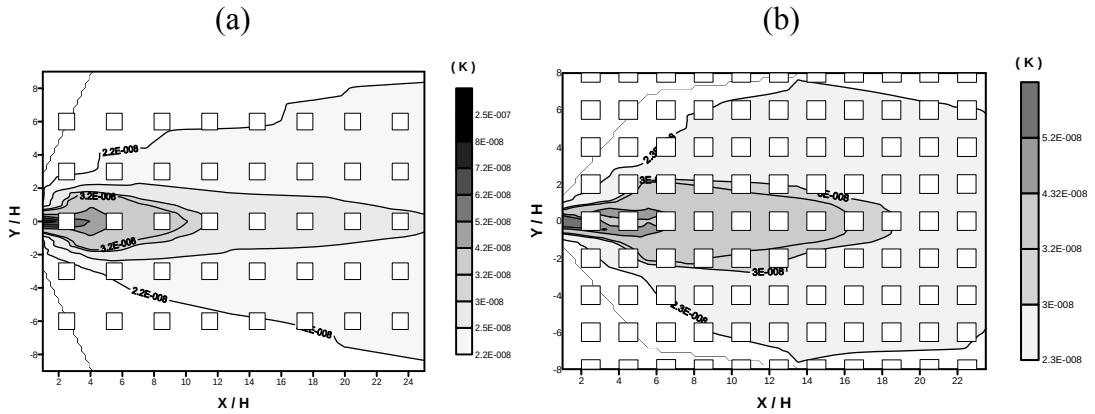


Fig. 3. Dimensionless concentration contours in horizontal plane for different building array gap at Z/H=0.5, θ=0^{o}; (a)open terrain, (b)G/H=3, (c)G/H=2, (d)G/H=1

Principal Investigators

Chi-Keung Chan
Research Fellow
Tel : 886-2-2789-6790 / 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.

Yeng-Long Chen
Assistant Research Fellow
Tel : 886-2-2789-6747 / yenglong@phys.sinica.edu.tw
Ph. D., Department of Chemical Engineering, University of Illinois at Urbana-Champaign
Interests: polymer physics, fluid dynamics, equilibrium and non-equilibrium statistical mechanics, entropy-driven phase separation, collective phenomena of self-driven particles.

Chin-Kun Hu
Research Fellow
Tel : 886-2- 2789-6720 / 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
Ph. D., National Central University
Research Interests: Experimental Polymer Physics, Experimental Soft Condensed Matter Physics, Experimental Low Temperature Plasma Physics, Nonlinear Physics, Biophysics.

Kwan-tai Leung
Research Fellow
Tel: (886) 2-2789-6780 / leungkt@phys.sinica.edu.tw
Ph.D., University of California, Santa Barbara
Research Interests: Nonequilibrium statistical mechanics; phase transitions & critical phenomena; modeling of biological motility.

Keng-hui Lin
Assistant Research Fellow
Tel : 886-2-2789-6763 / 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
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.

Jih-Chiang Tsai
Assistant Research Fellow
Tel：886-2- 2789-6729 / jctsai@phys.sinica.edu.tw
Ph.D., Physics Department, University of Pennsylvania
Research Interests: Physics of granular materials, foams, and fluids

Postdoctoral Research Associates and Visiting Scholars

Shura Hayryan；Hwa-Yi Hsu；Yao-Chen Hung；Po-Keng Lin；Wen-Jong Ma；Karen Petrosyan；Li-Lin Wang；Dmitri Yuri Lando (from Belarus National Academy of Sciences)；David B. Saakian (from Yerenan Physics Institute)。

Intermediate and High Energy Physics Research Group

(1). Theory Programs

The ulimate goal of theroretical particle physics research is to discover the fundamental structure of matter. Developments of the theory will depend not only on the self consistency of the theory itself but also hints and directions from experimental data from experiments in accelerators like, LHC, RHIC... , and particle astrophysics and cosmology. In the following, we enlist our research topics in three major categories according to the nature of their corresponding experimental data.

A. Particle Phenomenology

(1) Higher-order calculations in k_T factorization
(2) Jet substructure in colliders
(3) Resolving B-CP puzzles in QCD Factorization
(4) Scalar and pseudoscalar glueballs
(5) Radiative decays of B mesons
(6) Scalar mesons in D decays
(7)Quantum gravity
(8) Nonperturbative bound on high multiplicity cross sections in theory in three dimensions from lattice simulation
(9)Neutrino mass and neutrino oscillation
(10)Quantum bit commitment
(11)Quantum teleportation
(12)Application of Statistical Physics Methods to Social and Economic Systems

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

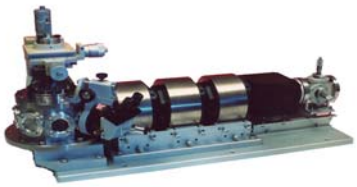
C. Theoretical Nuclear Physics
(1)Cascade production in heavy-ion collisions at SIS energies
(2)Two-level model and magnetic field effects on the hysteresis in n-GaAs

(2). Experimental Nuclear Physics

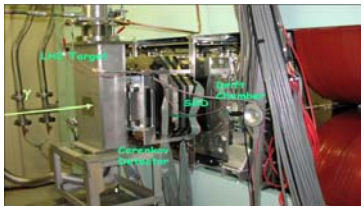
We have an on-site facility of 3 MV (NEC 9SDH-2) tandem accelerator which was installed in 1989. Since then the accelerator became an important facility for experimental research in accelerator based atomic and applied physics. The accelerator system has two negative ion sources, SNICS for solid source material and Alphatross 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) 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（i.e. ion-solid interaction, Rutherford backscattering, Particle induced X-ray emission, ion irradiation, etc.）, 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, 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 non-perturbative interactions between photon and quarks at a few GeV via the reconstruction of $\gamma N \rightarrow \phi N$ reaction. In the future, we will produced solid polarized HD target under the condition of 17-Tesla magnetic field and 15-mK low temperature. With the usage of 2.5 GeV linearly polarized photon beam, double polarization quantities will be measured for the investigation of strangeness content in

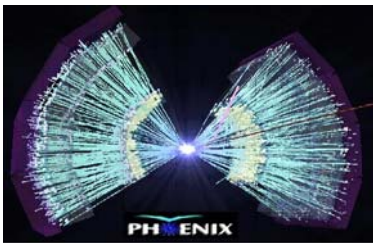
the nucleon. In Brookhaven National Lab, U.S., RHIC collider can crate a collision of Au nuclei of center of mass energy to be 200 GeV. PHENIX experiment is capable of measuring the di-lepton and photon signal of Quark Gluon Plasma. The experimental confirmation of QGP will greatly help the understanding 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



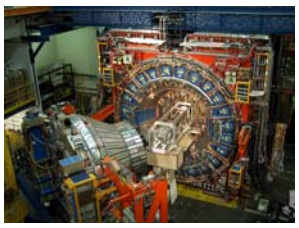
BNL PHENIX experiment

(3). Experimental Particle Physics

(A) Collider Detector at Fermilab

The Fermilab Tevatron Collider provides experimental study of the highest energy frontier of particle physics. The Tevatron Run II program includes the construction of the Main Injector and the upgrade of the collider detectors (CDF and D0), The beam interaction luminosity has increased to $2x10^{32}$. The data taking rate of each detector is an order of magnitude higher than in Run I. The large amount of experimental data provides great potential for precision measurements of particle physics and discovery of new phenomena. The Academia Sinica group participates in the CDF Run II experiment. In collaboration with Fermilab, we developed the first large scale optical link readout system for the CDF silicon tracker. The "Dense Optical Interface Module" is designed and constructed in Taiwan. We also developed a high speed

computing model for CDF data processing capable of 25 M events (3 TByte) daily throughput. This is the highest ever developed for high energy experiment.

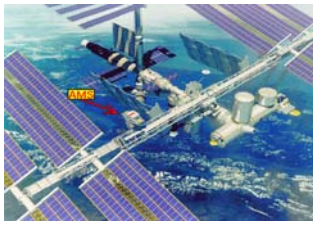


1: Insertion of the silicon track into the CDF II detector.

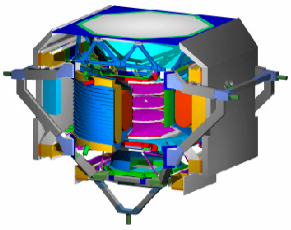
2: Silicon tracker read out Port Card mounted with the "Dense Optical Interface Modules" (black chips with optical filbers)

(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 2009 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. Schematic drawing of the AMS Detector.

(C) Neutrino and astro-particle physics

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.

Researchers make headway in neutrino study

By Myra Lu

After six years of painstaking work, researchers on the TEXONO project, or Taiwan Experiment on Neutrinos, have published the first results of what is admittedly a small experiment compared to what is being done at international laboratories. Nevertheless, the significance of the contribution for all the Chinese and Taiwanese scientists involved is no less evident.

Neutrinos are one of the more than 20 fundamental particles that make up the universe. Scientists around the world have conducted numerous experiments to learn more about this particle, which remains one of the least understood. Neutrinos are produced in the Earth's atmosphere, the sun, particle accelerators and nuclear power reactors.

Physicists believe that neutrino studies will help shed light on questions about the particle's

The Kuo-Sheng Nuclear Power Station, which produces electricity used by millions of households in northern Taiwan, also houses the research facilities of the TEXONO project.

Wong said. The results of international collaborations such as the Super-Kamiokande in Japan and Sudbury Neutrino Observatory in Canada gave the Taiwan project what Wong described as a "positive impact."

This is because these earlier experiments have confirmed that the neutrino does have mass and that neutrino oscillation does take place. The latter refers to a phenomenon where neutrinos change from one type to another while traveling great distances. Such oscillation would not occur if neutrinos were entirely without mass, which scientists used to believe to be the case.

"These experiments use much larger instruments to explore different aspects of the neutrino properties from those pursued by the TEXONO experiment. However, given their findings, we know there is a grander picture behind and which direction to go," Wong noted.

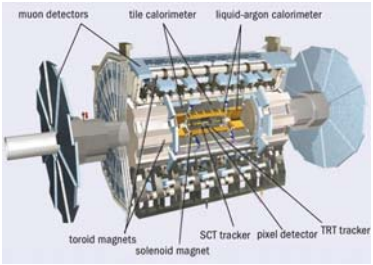
1. Headlines in Taiwan Journal, with the Kuo-Sheng Nuclear Power Plant.

2. TEXONO Collaboration Members.

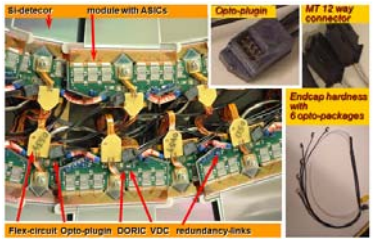
3. The shielding and control room at the Kuo Sheng Neutrino Laboratory.

(D) The CERN LHC ATLAS experiment

The European Laboratory of Particle Physics (CERN) is constructing the Large Hadron Collider (LHC) scheduled for commissioning in 2008. It will provide experimental usage of proton-proton collisions at center of mass energy of 14 TeV. The ATLAS detector is constructed for high energy experiment at LHC. The Academia Sinica high energy group joined the ATLAS Collaboration in September 1999. Our responsibility includes the development and construction of compact opto-packages for the optical links of the Inner Detector (PIXEL and Semi Conductor Tracker (SCT)), and the high-speed (1.6GHz) optical transmitter and receiver modules for Liquid Argon Calorimeter (LAr). A miniature opto-package (1.6mm in height) which consists of two VCSEL's (Vertical Cavity Surface Emitting Laser) and one epitaxial Silicon PIN diode has been developed for SCT to readout the 6 million channel silicon micro-strip detector. 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. We have prepared to search for new physics by looking for Higgs and magnetic monopoles in the first data to come.



1. Schematic drawing of the ATLAS detector.



2. Opto-packages mounted on the Semi-Conductor Tracker detector modules.

(E) Grid Computing

The WLCG (Worldwide LHC Computing Grid) infrastructure is being established to store, manage and analyze the unprecedented amounts of data – tens of millions of Gigabytes per year - that will be produced by the experiments of the Large Hadron Collider, the world's biggest particle physics accelerator at CERN. By 2008, WLCG will integrate the equivalent of over one hundred thousand of today's PCs from over 200 institutes (in over 40 countries) into a computing and data grid system. In 2005, ASGC (Academia Sinica Grid Computing), led by Dr. Simon C. Lin, has formally

become one of the 11 Tier-1 centers (the only Tier-1 in Asia) providing services, coordination and support for WLCG. ASGC has proven to be one of the most reliable Tier-1 Centers worldwide.

ASGC participates the WLCG technology development, including (1) GSTAT which is a Grid information monitoring system now widely used by over 200 WLCG institutes, (2) gLite middleware certification and testing, and (3) distributed analysis tools for LHC. In addition, ASGC also leads in the development of important Grid technologies such as Grid Application Platform (GAP) and the interoperability of two major Grid storage systems: SRM and SRB.

Based on the experiences of WLCG, ASGC joins the European Union e-Science flagship project (Enabling Grid for E-sciencE, EGEE) providing grid services to scientists from various domains. As the Asia Federation Coordinator, ASGC is helping 9 Asian countries to participate the EGEE activities, especially, the application area. In April 2006, a collaboration of ASGC, AS Genomics Research Center and European laboratories has analyzed 300,000 possible drug candidates against the Avian Flu Virus H5N1 by using the WLCG infrastructures. Over 2000 computers were used during 4 weeks; this is equivalent to 137 years on a single computer. This is the biggest cross-continental public collaboration project ever in drug discovery. The story was widely reported by the international media such as BBC.

Principal Investigators

Wen-Chen Chang
Associate Research Fellow
Tel: 886-2-2789-6794 / changwc@phys.sinica.edu.tw
Ph.D., SUNY at Stony Brook, U.S.
Research Interest: Relativistic Heavy Ion Collisions, Quark Nuclear Physics, Vector Meson Photoproduction.

Hai-Yang Cheng
Research Fellow
Tel : 886-2-2789-6768 / phcheng@ccvax.sinica.edu.tw
Ph.D., Purdue University
Research Interest: Particle Physics Phenomenology.

Chi-Yee Cheung
Research Fellow
Tel : 886-2- 2789-6788 / cheung@phys.sinica.edu.tw

Ph.D., University of Washington, U.S.A.
Research Interests : Medium and High Energy Physics.

Ming-Lee Chu
Senior Research Scientist
Tel : 886-2-2789-6796 / chu@phys.sinica.edu.tw
Ph.D., National Chiao Tung University
Research Interests: High energy experiment, Radiation hard electronics/ opto-electronics, optical data transfer system, electronic instrumentation.

Suen Hou
Associatc Reasarch Fellow
Tel : 886-2-2789-6703 / suen.hou@cern.ch
Ph.D., University of Maryland
Research Interests: Experimental high energy physics, instrumentation.

Shih-Chang Lee
Research Fellow
Tel : 886-2-2789-6706 / sclee@sinica.edu.tw
Ph.D., Princeton University.
Research Interests: Particle physics, field theory, nonlinear physics.

Sai-Ping Li
Research Fellow
Tel : 886-2-2789-6728 / spli@phys.sinica.edu.tw
Ph.D., University of Washington, Seattle, USA.
Research Interests: Theoretical physics; particle and field theory.

Hsiang-nan Li
Research Fellow
Tel : 886-2-2789-6726 / 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
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.

Chih-hsun LIN
Associate Research Scientist
TEL: 886-2-27896731 / chihhsun.lin@phys.sinica.edu.tw
Ph. D., National Central University
Research Interests: High energy physics experiment, Radiation hard and high reliability electronics for space application, Electronic instrumentation, low noise front-end amplifier.

Kin-Wang Ng
Research Fellow
Tel : 886-2-2789-6702 / 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
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
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
Reasarch Fellow
Tel : 886-2- 2789-6789 / htwong@phys.sinica.edu.tw
Ph.D. in Physics, California Institute of Technology, USA.

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

Hoi-Lai Yu
Research Fellow
Tel : 886-2-2789-6783 / 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
Ph.D., University of North Texas.
Research Interest：Accelerator based atomic physics and materials characterization.

Tzu-Chiang Yuan
Associate Research Fellow
Tel：886-2- 2789-67605/ tcyuan@phys.sinica.edu.tw
Ph.D., Northeastern University
Research Interests: Particle Physics Phenomenology, Dark Matter

Song-Ming Wang
Assistant Research Fellow
Tel：886-2-2789-6793/ smwang@fnal.gov
Ph.D., University of Iowa, U.S.A.
Research Interest：Experimental high energy Physics

Postdoctoral Research Associates

Yang Hwan Ahn；Chung-Chieh Chang；Yen-Chu Chen；Yu-Chun Chen；Muhammed。Deniz；Kiran Kumar Guthikonda；Ron-Chou Hsieh；Yu-Kuo Hsiao；Jyh-You Hsu；Chia-Ming Kuo；Seokcheon Lee；Hau-Bin Li；Shin-Ted Lin；Rachid Mazini；Ankush Mitra；Di Qing；Zhong-Liang Ren；Shang-Yuu Tsai；Jie Jun Tseng；Chun-Hsien Wu；Jike Wang；Suijian Zhou；Yue Zhou

III

List of Ongoing Research Projects

List of Ongoing Research Projects

中央研究院物理研究所九十七-九十九年度計劃清單一覽表

(2008 年 8 月 ~ 2010 年 7 月)

主持人	計　劃　名　稱	執行期間	計劃編號
杜其永	顆粒鍊實驗研究	2006.08.01-2010.07.31	NSC95-2112-M-001-030-MY3
曾詣涵	特異核之研究	2006.08.01-2009.10.31	NSC95-2112-M-001-032-MY3
章文箴	在日本SPring-8研究非微擾光致向量介子產生及尋找五夸克粒子	2006.08.01-2009.10.31	NSC95-2112-M-001-046-MY3
李湘楠	超級B工廠的物理	2006.08.01-2009.07.31	NSC95-2112-M-001-050-MY3
陳彥龍	極小侷域內高分子流體動力學和相變之理論研究	2006.08.01-2009.12.31	NSC95-2112-M-001-051-MY3
吳建宏	暴脹宇宙的能量密度起伏	2006.08.01-2009.10.31	NSC95-2112-M-001-052-MY3
李定國	以數值方法研究強關聯電子系統	2006.08.01-2009.12.31	NSC95-2112-M-001-061-MY3
阮文滔	溶液中高分子之單分子研究	2006.8.1-2009.7.31	NSC95-2112-M-001-069-MY3
葉崇傑	低溫原子中之多體問題	2006.8.1-2009.12.31	NSC95-2112-M-001-054-MY3
陳啟東	能量耗散對庫柏電子對相干傳輸的影響	2006.08.01-2009.07.31	NSC95-2112-M-001-062-MY3
陳彥竹	在CDF實驗中對新物理的探求	2006.08.01-2009.07.31	NSC95-2112-M-001-067-MY3
黃英碩	奈米級像散式量測系統之開發	2006.12.1-2009.11.30	NSC95-3114-P-001-008-MY3
張嘉升	物理學門(凝態組)研究發展及推動計畫	2007.1.1-2007.12.31	NSC96-2114-M-001-001

主持人	計　劃　名　稱	執行期間	計劃編號
郭鴻曦	以電化學掃描穿隧顯微術研究單一分子在水溶液中之動態行為	2007.2.1-2009.7.31	NSC96-2112-M-001-012-MY2
吳茂昆	國際學術網路連線、維運與全球e-Science研究應用	2007.01.01-2010.3.31	NSC96-2911-M-001-001-MY3
周家復	以微奈米流體元件製備之粒子捕捉阱，探討電場對聚集生物分子及其對生物感測器內反應動力學上的效應	2007.08.01-2010.07.31	NSC96-2112-M-001-024-MY3
梁鈞泰	運動性生物個體之動力學研究	2007.08.01-2010.0.7.31	NSC96-2112-M-001-025-MY3
陳志強	非局部相互作用對可激發系統影響之研究	2007.08.01-2010.07.31	NSC96-2112-M-001-035-MY3
胡進錕	統計和計算物理在複雜系統之應用	2007.08.01-2011.07.31	NSC96-2911-M-001-003-MY3
李尚凡	磁性材料中電流引發磁矩翻轉之研究	2007.08.01-2010.07.31	NSC96-2112-M-001-033-MY3
吳茂昆	新穎過渡金屬硫屬化合物之磁性與超導研究-子計畫一:新穎過渡金屬硫屬化合物之磁性與超導研究	2007.08.01-2010.07.31	NSC96-2112-M-001-026-MY3
李偉立	以新穎奈米結構製程技術，探索奈米結構元件之自旋相關特性	2007.04.01-2010.08.31	NSC96-2628-M-001-007-MY3
黃英碩	非接觸式原子力顯微術在水中及在真空中的應用	2007.08.01-2010.07.31	NSC96-2628-M-001-010-MY3
李世昌	AMS-02熱控系統研製、測試][及運作計畫	2007.01.01-2009.10.31	NSC96-2745-P-001-001-MY2
吳茂昆	奈米國家型科技計畫辦公室運作計畫	2008.01.01-2009.03.31	NSC97-3113-P-001-001-PO
李尚凡	磁性奈米結構的點接觸量測-台法合作計畫(3/3)	2008.02.01-2009.10.31	NSC97-2112-M-001-001
鄭海揚	重味物理之探討	2008.08.01-2011.07.31	NSC97-2112-M-001-004-MY3

主持人	計　劃　名　稱	執行期間	計劃編號
余海禮	量子重力研究	2008.08.01-2011.07.31	NSC97-2112-M-001-005-MY3
李世炳	以物理方法研究社會科學課題-總計畫暨子計畫一：以 統計物理方法研究社會現象暨子計畫三：統計物理方法	2008.08.01-2011.07.31	NSC97-2112-M-001-008-MY3
王子敬	台灣微中子實驗-製作超低 探測器以觀察微中子與原子核之同調散射及找尋暗物質	2008.08.01-2009.10.31	NSC97-2112-M-001-010
余岳仲	離子撞擊於物質內之能量損失及輻射損傷效應研究	2008.08.01-2011.07.31	NSC97-2112-M-001-011-MY3
王嵩銘	強子對撞實驗物理：CDF與Atlas實驗新物理及粒子搜尋-強子對撞實驗物理：子計畫一：CDF實驗Higgs boson	2008.8.1-2009.7.31	NSC97-2112-M-001-015
林耿慧	新式膠體粒子的製作，組裝與行為	2008.08.01-2009.07.31	NSC97-2112-M-001-016
任盛源	高導磁磁性膜件之超高頻磁阻抗研究	2008.08.01-2011.07.31	NSC97-2112-M-001-023-MY3
劉　鏞	奈米結構半導體的磁性研究	2008.08.01-2011.07.31	NSC97-2112-M-001-024-MY3
鄭弘泰	過渡金屬氧化物及奈米系統之電子結構研究	2008.08.01-2009.12.31	NSC97-2112-M-001-025
薛韻馨	超導氧化物奈米級結構之製作及物性探討	2008.08.01-2010.07.31	NSC97-2112-M-001-026-MY2
吳茂昆	科普活動計畫(C類)---與物理的第一次接觸	2008.08.01-2009.10.31	NSC97-2515-S-001-001
林誠謙	數位典藏與數位學習國家型科技計畫.數位典藏與學習 之海外推展暨國際合作計畫—數位典藏與學習之海外推	2008.04.01-2009.05.31	NSC97-2631-H-001-003
林誠謙	台灣WLCG Tier-2與高能物 理網格應用共通平台之建置	2008.08.01-2009.07.31	NSC97-2911-M-001-012
侯書雲	強子對撞實驗物理：CDF與Atlas實驗新物理及粒子搜尋-總計畫暨子計畫二：ATLAS實驗di-boson物理研究暨AT	2008.08.01-2010.01.31	NSC97-2911-M-001-013

主持人	計　劃　名　稱	執行期間	計劃編號
李世昌	參與ATLAS實驗搜尋新物理 現象-08暨以精密磁譜儀探 測宇宙中之反物質及暗物質-08	2008.08.01-2009.10.31	NSC97-2911-M-001-014
陳志強	台俄國合計畫—複合介質之動力學與控制以及其在心臟之應用	2008.08.01-2011.07.31	NSC97-2923-M-001-002-MY3
張嘉升	中央研究院奈米科技核心設施服務計畫(3/3)	2008.08.01-2009.12.31	NSC97-2120-M-001-004
胡宇光	利用相位與繞射對比強化的動態奈米生醫影像(2/3)	2008.08.01-2009.12.31	NSC97-2120-M-001-006
陳洋元	以奈米科技研發高ZT熱電材料以為能源之應用(1/3)	2008.08.01-2009.10.31	NSC97-2120-M-001-007
張嘉升	吸附、雜質、及襯底對單一奈米結構的原子重組及物性的影響(3/3)	2008.08.01-2009.12.31	NSC97-2120-M-001-008
蘇維彬	掃描穿隧能譜術於強磁場中的表面電性結構之研究	2008.08.01-2011.07.31	NSC97-2628-M-001-008-MY3
黃榮鑑	波浪與透水結構物互制之研究(Ⅱ)	2008.08.01-2010.07.31	NSC97-2221-E-001-024
陳啟東	奈米線場效電晶體探討與胞吐機轉相關蛋白間的交互作用—以SOISiNW場效應電晶體研究DNA雜交(子計畫二)	2008.08.01-2009.07.31	NSC97-2627-M-001-002
林誠謙	建立亞洲聯盟並推展歐盟EGGE III計畫	2008.05.01-2010.04.30	NSC97-2923-I-001-002-MY2
胡宇光	利用奈米醫學及微聚焦Ｘ光加強癌症之放射治療	2009.01.01-2009.08.31	NSC98-3011-P-001-001
張嘉升	物理學門(凝體組)研究發展及推動計畫	2009.01.01-2009.12.31	NSC98-2114-M-001-002
吳茂昆	第二期奈米國家型科技計畫辦公室運作計畫(Ⅰ)	2009.01.01-2010.03.31	NSC98-3113-P-001-004-PO
林誠謙	數位典藏與學習之海外推展暨國際合作計畫-總計畫-- 位典藏與學習之海外推展暨國際合作計畫-總計畫	2009.02.01-2010.04.30	NSC98-2631-H-001-016

主持人	計　劃　名　稱	執行期間	計劃編號
李世昌	研製AMS-02太空磁譜儀熱控系統及超導磁鐵驗證	2009.05.01-2010.04.30	NSC98-2745-M-001-001
王嵩銘	強子對撞實驗物理：CDF與Atlas實驗物理—強子對撞實驗物理：子計畫一：CDF實驗Higgs boson搜尋與準備	2009.08.01-2010.07.31	NSC98-2911-M-001-008
吳茂昆	科普活動：發掘及培養高中生物理科學潛能計畫	2009.08.01-2011.07.31	NSC98-2515-S-001-001-MY2
林耿慧	微流體製做均一泡泡之研究與應用	2009.08.01-2010.07.31	NSC98-2112-M-001-006
陳彥龍	微奈米尺度內軟物質粒子之動力及熱力學研究	2009.08.01-2012.07.31	NSC98-2112-M-001-004-MY3
吳建宏	宇宙微波背景磁模偏振及其偵測之理論研究	2009.08.01-2012.07.31	NSC98-2112-M-001-009-MY3
阮自強	在大型強子對撞機中探討標準模型以外的新物理	2009.08.01-2012.07.31	NSC98-2112-M-001-014-MY3
李湘楠	大型強子對撞機物理中的量子色動力學	2009.08.01-2012.07.31	NSC98-2112-M-001-015-MY3
張嘉升	量測單一奈米或生物結構之扭轉特性	2009.08.01-2012.07.31	NSC98-2112-M-001-016-MY3
葉崇傑	冷原子量子多體理論	2009.08.01-2012.07.31	NSC98-2112-M-001-019-MY3
陳啟東	超導量子位元與微波共振腔的耦合之研究	2009.08.01-2012.07.31	NSC98-2112-M-001-023-MY3
吳茂昆	新穎材料開發關鍵核心設施計畫-新穎強關連材料高壓 法合成及晶體生長	2009.06.01-2010.12.31	NSC98-2119-M-001-025
胡宇光	利用相位與繞射對比強化的動態奈米生醫影像(3/3)	2009.08.01-2010.07.31	NSC98-2120-M-001-002
陳洋元	以奈米科技研發高ZT熱電材料以為能源之應用(2/3)	2009.08.01-2010.07.31	NSC98-2120-M-001-003

主持人	計　劃　名　稱	執行期間	計劃編號
陳啟東	超導量子位元與微波共振腔的耦合研究設備	2009.08.01-2010.07.31	NSC98-2120-M-001-005
張嘉升	北台灣奈米科技核心設施服務計畫-中央研究院(1/3)	2009.08.01-2010.07.31	NSC98-2120-M-001-006
李世昌	以精密磁譜儀探測宇宙中之反物質及暗物質-09暨參與ATLAS實驗搜尋新物理現象-09	2009.08.01-2010.07.31	NSC98-2628-M-001-009
章文箴	費米實驗室E906實驗：利用Drell-Yan反應測定核子中 反夸克分佈和相關核結構效應	2009.08.01-2010.07.31	NSC98-2628-M-001-012
王子敬	台灣微中子實驗-製作超低 能探測器以研究微中子與暗物質物理	2009.08.01-2010.07.31	NSC98-2628-M-001-013
林誠謙	高能物理計算分析核心平台之建置與研發	2009.08.01-2010.07.31	NSC98-2911-M-001-010
侯書雲	強子對撞物理(總計畫)CDF 與Atlas實驗物理-總計畫CDF與Atlas實驗新物理及粒子搜尋暨雙玻子生成與新物理	2009.08.01-2010.07.31	NSC98-2911-M-001-011
黃榮鑑	波浪與透水結構物互制之研究(III)	2009.08.01-2010.07.31	NSC98-2221-E-001-021
陳啟東	奈米線場效電晶體探討與胞吐機轉相關蛋白間的交互作用-以SOISiNW場效應電晶體研究DNA雜交(子計畫二)	2009.08.01-2010.07.31	NSC98-2627-M-001-002
李定國	高溫超導體的非均勻態	2009.08.01-2012.07.31	NSC98-2112-M-001-017-MY3
呂欣明	電子在碳六十中的散射研究	2009.08.01-2011.07.31	NSC98-2112-M-001-025-MY2
鄭弘泰	金屬氧化物及奈米材料之電子結構研究	2009.08.01-2010.07.31	NSC98-2112-M-001-021
黃英碩	產學合作計畫-以光像散機 制為基礎之多功能原子力顯微鏡(1/3)	2009.08.01-2010.07.31	NSC98-2120-M-001-007-CC2

主持人	計　劃　名　稱	執行期間	計劃編號
李定國	籌備LT26會議相關的分支會議加強在IUPAP-C5小組會員的交流	2009.08.01-2010.07.31	NSC98-2911-I-001-027
吳茂昆	奈米國家型科技計畫-奈米 國際展覽專案	2009.08.01-2010.07.31	NSC98-3011-P-001-003
胡進錕	統計與非線性物理之學術研究與會議	2009.08.01-2010.07.31	NSC98-2911-I-001-028
蔡日強	顆粒流的相變行為	2009.12.01-2012.07.31	NSC98-2112-M-001-026-MY3
張嘉升	建立自然科學學門研究績效評估機制—建立物理學門研究績效評估機制(總計畫暨子計畫一)	2009.12.01-2010.06.30	NSC98-2114-M-001-044
吳茂昆	奈米國家型科技計畫研發成果第一年度產學橋接計畫	2009.12.01-2010.11.30	NSC98-3114-P-001-001-Y
陳志強	A study of the Dynamics of slime mould	2009.07.01-2010.02.28	98-2815-C-001-003-M
吳茂昆	奈米國家型科技計畫—衛生署98及99年度相關研究計畫徵求、審查及計畫管考	2008.12.12-2009.12.31	
陳洋元	透明導電薄膜(ITO)物性量測分析	2009.04.01-2010.03.31	

IV

Publication List of 2009

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A. Adare et al. PHENIX Collaboration, 2009, " Gluon-Spin Contribution to the Proton Spin from the Double-Helicity Asymmetry in Inclusive π0 Production in Polarized p+p Collisions at sqrt[s] =200 GeV ", *PHYSICAL REVIEW LETTERS*, 103, 012003. (SCI: 7.18, ranking: 7.4%)

M. Sumihama et al. LEPS Collaboration, 2009, "Backward-angle η photoproduction from protons at Eγ=1.6–2.4 GeV", *PHYSICAL REVIEW C*, 80, 052201. (SCI: 3.124, ranking: 25%)

K. Hicks et al. LEPS Collaboration, 2009, "Cross Sections and Beam Asymmetries for K+ Sigma*- photoproduction from the deuteron at E(gamma) = 1.5-GeV - 2.4-GeV", *PHYSICAL REVIEW LETTERS*, 102, 012501. (SCI: 7.18, ranking: 7.4%)

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A. Adare et al. PHENIX Collaboration, 2009, "Measurement of Bottom Versus Charm as a Function of Transverse Momentum with Electron-Hadron Correlations in p+p Collisions at sqrt[s] =200 GeV ", *PHYSICAL REVIEW LETTERS*, 103, 082002. (SCI: 7.18, ranking: 7.4%)

N. Muramatsu, J.Y. Chen, W.C. Chang et al. LEPS Collaboration, 2009, "Near-Threshold Photoproduction of Λ(1520) from Protons and Deuterons ", *PHYSICAL REVIEW LETTERS*, 103, 012001. (SCI: 7.18, ranking: 7.4%)

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張嘉升（CHANG, JASON CHIA-SENG）

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M. C. Yang, C. L. Lin, W. B. Su,S. P. Lin, S. M. Lu, H.Y. Lin, C. S. Chang, W. K. Hsu, and Tien T. Tsong,, 2009, "Phase Contribution Of Image Potential On Empty Quantumwell States In Pb Islands On The Cu(111) Surface,", *PHYSICAL REVIEW LETTERS*, 102, 196102. (SCI: 7.18, ranking: 7.4%)

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陳彥龍（CHEN, YENG-LONG）

S. Ramakrishnan*, S. A. Shah, L. Ruggeri, Y. L. Chen, K. S. Schweizer, and C. F. Zukoski , 2009, "Collective Diffusion in Colloid-Polymer Suspensions: Relative Role of Thermodynamics and Hydrodynamics", *Langmuir*, 25, 10507. (SCI: 4.097, ranking: 20.4%)

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Y.Y. Chen*, P.C. Chen, C. B. Tsai, K.I. Suga and K. Kindo, 2009, "Low-Magnetoresistance RuO2-Al2O3 Thin Film Thermometer and its Application", *International Journal of Thermophys*, 30, 316-324. (SCI: 0.889, ranking: 59.1%,76.1%,61.6%,75.8%)

陳志強（CHEN, CHI-KEUNG）

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Shu-Ping Lin, Chien-Yuan Pan, Kun-Chang Tseng, Ming-Chou Lin, Chii-Dong Chen, Chia-Chang Tsaia, Shu-Han Yua, Ying-Chieh Sun, Tsung-Wu Lin, Yit-Tsong Chen, 2009, "A Reversible Surface Functionalized Nanowire Transistor to Study Protein-Protein Interactions", *Nano Today*, 4, 235-243. (SCI: 8.795, ranking: 6%,9.5%)

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Ping-I Lin, Hui-Shan Chiu, Hsing-Chen Wu, Wen-Hsing Hsieh, Chii-Dong Chen and Yit-Tsong Chen, 2009, "Electric Hopping Conduction in Highly Disordered Carbon Coils", *CARBON*, 47, 1761-

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陳彥竹（CHEN, YEN-CHU）

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陳啟亮（CHEN, CHI-LIANG）

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周家復（CHOU, CHIA-FU）

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黃英碩（HWANG, ING-SHOUH）

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Jia Jun Zhang, Chong Sheng Li, Jun Gao, Hao Zhang, Zhao Li, C.-P. Yuan, Tzu-Chiang Yuan, 2009, "Next-to-Leading-Order QCD Corrections to the Top-Quark Decay via Model-Independent Flavor-Changing Neutral-Current Couplings", *PHYSICAL REVIEW LETTER*, 102(7). (SCI: 7.18, ranking: 7.4%)

Kingman Cheung, Wai-Yee Keung, Tzu-Chiang Yuan, 2009, "Phenomenology of iquarkonium",

NUCLEAR PHYSICS B, 811, 274-287. (SCI: 4.158, ranking: 24%)

Kingman Cheung, Wai-Yee Keung, Tzu-Chiang Yuan, 2009, "Phenomenology of unparticle physics", *INTERNATIONAL JOURNAL OF MODERN PHYSICS A*, 24:3508-3514. (SCI: 0.982, ranking: 75%,80%)

Kingman Cheung, Wai-Yee Keung, Tzu-Chiang Yuan, 2009, "Top Quark Forward-Backward Asymmetry", *PHYSICS LETTER B*, Volume 682, Issue 3, Pages 287-290. (SCI: 4.034, ranking: 10.3%)

V

Academic Activities

Attendance in International Conference
中研院物理所九十八年度出席國際會議表
（2009年1月 ~ 2009年12月）

研究人員名稱	學術會議名稱	會議時間	出席任務
林耿慧	微流體與奈米流體進展 Advances in Microfluidics and Nanofluidics	2009-01-04~2009-01-07	Oral
陳彥龍	奈微米流體研討會 Conference on Advances in Microfluidics and Nanofluidics	2009-01-05~2009-01-07	Invited Speaker
鄭力兢	奈微米流體研討會 Conference on Advances in Microfluidics and Nanofluidics	2009-01-05~2009-01-07	Poster
蔣伯頡	奈微米流體研討會 Conference on Advances in Microfluidics and Nanofluidics	2009-01-05~2009-01-07	Poster
泰隆尼	奈微米流體研討會 Conference on Advances in Microfluidics and Nanofluidics	2009-01-05~2009-01-07	Poster
林伯耕	奈微米流體研討會 Conference on Advances in Microfluidics and Nanofluidics	2009-01-05~2009-01-07	Oral
廖國棠	奈微米流體研討會 Conference on Advances in Microfluidics and Nanofluidics	2009-01-05~2009-01-07	Poster
席瑞	奈微米流體研討會 Conference on Advances in Microfluidics and Nanofluidics	2009-01-05~2009-01-07	Poster
周家復	奈微米流體研討會 Conference on Advances in Microfluidics and Nanofluidics	2009-01-05~2009-01-07	Invited Speaker
李奧	奈微米流體研討會 Conference on Advances in Microfluidics and Nanofluidics	2009-01-05~2009-01-08	Participant
史利南	奈微米流體研討會 Conference on Advances in Microfluidics and Nanofluidics	2009-01-05~2009-01-08	Participant
陳信言	LHC School 2009	2009-01-05~2009-01-10	Invited Speaker

研究人員名稱	學術會議名稱	會議時間	出席任務
陳志強	6th Asian Biophysics Association Symposium	2009-01-11~2009-01-14	Invited Speaker
阮文滔	The 6th Asian Biophysical Association (ABA) Symposium	2009-01-11~2009-01-14	Invited Speaker
劉玉娟	6th Asina Biophysics Association Symposium	2009-01-11~2009-01-14	Oral
張欽賀	第六屆亞洲生物物理研討會 6th Asian Biophysics Association (ABA) symposium	2009-01-11~2009-01-15	Oral
林誠謙	Pre Grid Deployment Board、Grid Deployment Board	2009-01-13~2009-01-14	代表台灣參加工作委員會
余海禮	APCTP-NCTS國際重力與宇宙學學校會議 APCTP-NCTS International School/Workshop on Gravitation and Cosmology	2009-01-15~2009-01-21	Conference Chairman
李碩天	APCTP-NCTS 重力與宇宙論國際研討會 APCTP-NCTS International School/Workshop on Gravitation and Cosmology	2009-01-16~2009-01-20	Invited Speaker
施宏良	2008 Data-taking post-mortem	2009-01-20~2009-01-23	參與會議討論
沈介磐	2009奈米生物物理與化學國際研討會 Nanobiophysics & Chemistry Conference 2009	2009-01-21~2009-01-24	
周家復	2009奈米生物物理與化學國際研討會 Nanobiophysics & Chemistry Conference 2009	2009-01-21~2009-01-25	Invited Speaker
吳茂昆	International Workshop on Iron Related high-Tc Superconductors (IRiSes2009)	2009-01-25~2009-01-25	
黃珮華	EGEE III All Activity Meeting	2009-01-27~2009-01-28	參與會議討論
林誠謙	EGEE All Activity Meeting 與EGEE PMB meeting	2009-01-27~2009-01-28	參與會議討論

研究人員名稱	學術會議名稱	會議時間	出席任務
嚴漢偉	EGEE III All Activity Meeting	2009-01-27~2009-01-28	參與會議討論
吳茂昆	APCTP 2009 Winter Workshop on Frontiers in Electronic Quantum Matter: Pnictide and Cuprate High Temperature Superconductors through Graphenes	2009-02-08~2009-02-12	Invited Speaker
林誠謙	Pre Grid Deployment Board及Grid Deployment Board	2009-02-10~2009-02-11	代表台灣參加工作委員會
陳健群	「Coherent Internse X-rays in Physics and Biology」會議	2009-02-16~2009-02-19	Poster
胡宇光	第一屆國際強化自由電子雷射科學應用合作會議 The first international workshop emphasizing FEL science applications	2009-02-16~2009-02-19	Invited Speaker
盧建宏	「Coherent Internse X-rays in Physics and Biology」會議	2009-02-16~2009-02-19	Poster
李定國	1st Workshop on FEL Science: "Coherent Intense X-rays in Physics and Biology"	2009-02-16~2009-02-19	Invited Speaker
黃稔惠	日本奈米科技展覽會 nano tech 2009	2009-02-17~2009-02-20	奈米展相關系列活動
陳雯琪	日本奈米科技展覽會 nano tech 2009	2009-02-17~2009-02-20	奈米展相關系列活動
呂冠樺	日本奈米科技展覽會 nano tech 2009	2009-02-17~2009-02-20	奈米展相關系列活動
蘇宗粲	日本奈米科技展覽會 nano tech 2009	2009-02-18~2009-02-20	奈米展相關系列活動
胡恩德	日本奈米科技展覽會 nano tech 2009	2009-02-18~2009-02-20	參與台灣主題館展出
楊志文	日本奈米科技展覽會 nano tech 2009	2009-02-18~2009-02-20	參與台灣主題館展出

研究人員名稱	學術會議名稱	會議時間	出席任務
林志憲	日本奈米科技展覽會 nano tech 2009	2009-02-18~2009-02-20	參與台灣主題館展出
胡進錕	第一屆複雜科學國際會議 The First International Conference on Complex Sciences	2009-02-23~2009-02-25	Invited Speaker
李湘楠	APCTP2009年龍平天文粒子與共形物理研討會 YongPyong Astro-Particle and Conformal Topical Physics 2009	2009-02-23~2009-02-28	Oral
李定國	Recent trends in Strongly Correlated Systems	2009-03-01~2009-03-04	Invited Speaker
胡進錕	大量商業和經濟資料分析新方法國際會議 APFA7:Applications of Physics in Financial Analrsis	2009-03-01~2009-03-05	Invited Speaker,
張明強	德國原子分子物理年會 March Meeting of German Physical Society (2009 DPG Conference)	2009-03-01~2009-03-05	Oral
黃珮華	「4th EGEE User Forum」與「OGF 25 and OGF Europe`s 2nd International Event」會議	2009-03-02~2009-03-06	代表ASGC參與工作小組會議
許正欣	「4th EGEE User Forum」與「OGF 25 and OGF Europe`s 2nd International Event」會議	2009-03-02~2009-03-06	Invited Speaker
翁維瓏	「4th EGEE User Forum」與「OGF 25 and OGF Europe`s 2nd International Event」會議	2009-03-02~2009-03-06	Invited Speaker
林誠謙	Pre Grid Deployment Board及Grid Deployment Board	2009-03-10~2009-03-11	代表台灣參加工作委員會
林耿慧	美國物理年會 American Physical Society March Meeting	2009-03-15~2009-03-20	Oral
林伯耕	2009美國物理年會 2009 APS March Meeting	2009-03-16~2009-03-20	Oral
李尚凡	2009美國物理學會春季會議 2009APS March Meeting	2009-03-16~2009-03-20	Oral

研究人員名稱	學術會議名稱	會議時間	出席任務
張人方	2009 美國物理年會 2009 APS March Meeting	2009-03-16~2009-03-20	Oral
秦綱	CHEP 2009 and WLCG Collaboration Workshop	2009-03-21~2009-03-27	參與會議進行相關議題研討與規劃
熊舜哲	「PRAGMA 16」&「IDRiC workshop」	2009-03-23~2009-03-25	參加會議
黃珮華	CHEP 2009 and EGEE Meeting	2009-03-23~2009-03-27	討論下屆年會議程安排事宜
沈一慧	CHEP 2009 and EGEE Meeting	2009-03-23~2009-03-31	討論下屆年會議程安排事宜
胡宇光	物理D學報的編輯委員會 Editorial Board for Journal of Physics D	2009-03-26~2009-03-27	board member
高震峰	亞洲研究學會年會 AAS Annual Meeting	2009-03-26~2009-03-29	會場協助展覽內容解說
陳希慈	亞洲研究學會年會 AAS Annual Meeting	2009-03-26~2009-03-29	會場協助展覽內容解說
鄭喬倪	亞洲研究學會年會 AAS Annual Meeting	2009-03-26~2009-03-29	會場協助展覽內容解說
潘英海	亞洲研究學會年會 AAS Annual Meeting	2009-03-26~2009-03-29	會場協助展覽內容解說
楊杰倫	亞洲研究學會年會 AAS Annual Meeting	2009-03-26~2009-03-29	會場協助展覽內容解說
林誠謙	亞洲研究學會年會 AAS Annual Meeting	2009-03-26~2009-03-29	Invited Speaker
周淑玉	亞洲研究學會年會 AAS Annual Meeting	2009-03-26~2009-03-29	會場協助展覽內容解說

研究人員名稱	學術會議名稱	會議時間	出席任務
劉佩青	亞洲研究學會年會 AAS Annual Meeting	2009-03-26~2009-03-29	會場協助展覽內容解說
黃英碩	2nd International Workshop on Nanotechnology	2009-03-27~2009-03-29	Invited Speaker
金書正	2nd International Workshop on Nanotechnology	2009-03-27~2009-03-29	Oral
蘇維彬	2nd International Workshop on Nanotechnology	2009-03-27~2009-03-29	Invited Speaker
張淵智	2nd International Workshop on Nanotechnology	2009-03-27~2009-03-29	Oral
張嘉升	2nd International Workshop on Nanotechnology	2009-03-27~2009-03-29	Invited Speaker
呂欣明	2nd International Workshop on Nanotechnology	2009-03-27~2009-03-29	Oral
胡恩德	2009奈米科技洞察前瞻會議 Nanotech Insight 2009	2009-03-29~2009-04-02	Oral
周家復	2009海峽兩岸第一屆生物醫學光學國際研討會會	2009-03-29~2009-04-03	Invited Speaker
李湘楠	第11屆亞太理論物理中心評議會 The 11th APCTP General Council Meeting	2009-04-02~2009-04-04	Main Organizer
林誠謙	Pre Grid Deployment Board及Grid Deployment Board	2009-04-07~2009-04-08	代表台灣參加工作委員會
鄭海揚	BES第三屆物理會議 BESⅢPHYSICS WORKSHOP	2009-04-10~2009-04-15	Oral
黃英碩	6th Taiwan/U.S. Air Force Nanoscience Workshop	2009-04-20~2009-04-21	Invited Speaker

研究人員名稱	學術會議名稱	會議時間	出席任務
江政祥	6th U.S. Air Force/Taiwan Nanoscience and Nanotechnology workshop	2009-04-20~2009-04-21	出席會議
吳茂昆	6th Taiwan/U.S. Air Force Nanoscience Workshop	2009-04-20~2009-04-21	Invited
胡宇光	2009年韓國陶瓷材料協會春季會議 The 2009 Spring Meeting of the Korean Ceramic Society	2009-04-22~2009-04-25	Main Organizer
林誠謙	「Spring 2009 Internet 2 Member Meeting」及「CCIRN」	2009-04-26~2009-04-30	受邀代表台灣參加工作委員會
李定國	Science Collaboration Workshop	2009-04-27~2009-04-29	Invited Speaker
周家復	Nanotech Conference 2009	2009-05-03~2009-05-07	Oral
葉崇傑	極冷原子前瞻會議 Conference on Research Frontiers in Ultra-Cold Atoms	2009-05-04~2009-05-08	co-organizer
張明強	極冷原子前瞻會議 Conference on Research Frontiers in Ultra-Cold Atoms	2009-05-04~2009-05-08	Poster
胡進錕	EPL Editorial Board Meeting 2008	2009-05-08~2009-05-09	出席國際會議
嚴漢偉	EUGridPMA Meeting	2009-05-11~2009-05-13	Oral
林誠謙	Pre Grid Deployment Board、Grid Deployment Board	2009-05-12~2009-05-13	代表台灣參加工作委員會
吳茂昆	International Workshop on the Search for New Superconductors	2009-05-12~2009-05-15	Invited Speaker
嚴漢偉	Joint (EGEE & WLCG) Security Policy Group	2009-05-14~2009-05-15	Oral

研究人員名稱	學術會議名稱	會議時間	出席任務
吳茂昆	The Fifth INternation Nanotechnology Conference on Communications and Cooperation.	2009-05-17~2009-05-20	Invited Speaker
章文箴	第十屆粒子物理和核子物理交流會議 Tenth Conference on the Intersections of Particle and Nuclear Physics	2009-05-25~2009-05-31	Oral
李湘楠	第7屆味物理與CP破缺研討會 7th Conference on Flavor Physics and CP Violation (FPCP 2009)	2009-05-26~2009-06-01	Keynote Speaker
鄭海揚	第7屆味物理與CP破缺研討會 7th Conference on Flavor Physics and CP Violation (FPCP 2009)	2009-05-27~2009-06-01	Main Organizer
李定國	2009 Gordon Research Conference on Superconductivity	2009-06-07~2009-06-11	Invited Speaker
李定國	2009 Gordon Research Conference on Superconductivity	2009-06-07~2009-06-11	Invited Speaker
李湘楠	卡弗里理論物理研究所諮詢委員會會議 Advisory Board Meeting at Kavli Institute for	2009-06-08~2009-06-10	參加諮詢委員會會議
齊正中	台以奈米科技雙邊研討會 Israel-Taiwan Nanotechnonlogy Symposium	2009-06-13~2009-06-20	Invited Speaker
陳正弦	台以奈米科技雙邊研討會 Israel-Taiwan Nanotechnonlogy Symposium	2009-06-13~2009-06-20	Invited Speaker
胡宇光	台以奈米科技雙邊研討會 Israel-Taiwan Nanotechnonlogy Symposium	2009-06-13~2009-06-20	Invited Speaker
牟中原	台以奈米科技雙邊研討會 Israel-Taiwan Nanotechnonlogy Symposium	2009-06-13~2009-06-20	Invited Speaker
林麗瓊	台以奈米科技雙邊研討會 Israel-Taiwan Nanotechnonlogy Symposium	2009-06-13~2009-06-20	Invited Speaker
李定國	台以奈米科技雙邊研討會 Israel-Taiwan Nanotechnonlogy Symposium	2009-06-13~2009-06-20	Invited Speaker

研究人員名稱	學術會議名稱	會議時間	出席任務
彭旭明	台以奈米科技雙邊研討會 Israel-Taiwan Nanotechnonlogy Symposium	2009-06-13~2009-06-20	Invited Speaker
彭宗平	台以奈米科技雙邊研討會 Israel-Taiwan Nanotechnonlogy Symposium	2009-06-13~2009-06-20	Invited Speaker
張嘉升	台以奈米科技雙邊研討會 Israel-Taiwan Nanotechnonlogy Symposium	2009-06-13~2009-06-20	Invited Speaker
吳茂昆	台以奈米科技雙邊研討會 Israel-Taiwan Nanotechnonlogy Symposium	2009-06-13~2009-06-20	Invited Speaker
蔡日強	台法科學前峰論壇 Taiwan-France Frontier of Sciences, FT-FoS	2009-06-20~2009-06-25	受邀出席
黃榮鑑	第十九屆國際離岸海洋與極地工程研討會 19th International Offshore and Polar Engineering	2009-06-21~2009-06-26	Oral
吳建宏	IPMU國際會議-暗能量 IPMU International Conference – Dark Energy	2009-06-24~2009-06-26	Commentator
周家復	微流體物理與化學戈登研討會 Gordon Research Conference-Physics & Chemistry of Microfluidics	2009-06-26~2009-07-07	Poster
陳彥龍	Gordon Research Conference on Microfluidics, Physics & Chemistry Of	2009-06-28~2009-07-03	Poster
許華倚	Gordon Research Conference for Nonlinear Sciences	2009-06-28~2009-07-03	出席會議
鄧立詩	天文粒子物理與地下實驗室國際會議 The eleventh international conference on Topics in Astroparticle and Underground Physics (TAUP 2009)	2009-06-29~2009-07-06	Oral
王子敬	天文粒子物理與地下實驗室國際會議 The eleventh international conference on Topics in Astroparticle and Underground Physics (TAUP 2009)	2009-07-01~2009-07-05	Invited Speaker
陳洋元	第7屆國際半導體暨奈米電子技術研討會 7th INTERNATIONAL CONFERENCE ON SEMICONDUCTOR MICRO-&NANOELECTRONICS	2009-07-03~2009-07-05	Invited Speaker

研究人員名稱	學術會議名稱	會議時間	出席任務
李定國	8th Asia-Pacific Workshop on Novel Quantum Materials/2nd Workshop for A3 Foresight Program	2009-07-05~2009-07-07	Invited Speaker
王儷霖	第十八屆計算流體力學研討會 18th Discrete Simulation of Fluid Dynamics (DSFD2009)	2009-07-06~2009-07-10	Oral
林誠謙	Pre Grid Deployment Board、Grid Deployment Board	2009-07-07~2009-07-08	代表台灣參加工作委員會
余海禮	高士文MG12 會議 Marcel Grossmann Meeting MG12	2009-07-11~2009-07-21	Oral
林興德	第5屆Patras 工作坊於暗物質的候選粒子之討論 5th Patras Workshop on Axions, WIMPs and WISPs	2009-07-12~2009-07-17	Invited Speaker
蔡日強	顆粒及粉粒研究會議 Powder and Grains 2009, P&G2009	2009-07-13~2009-07-17	受邀出席
李浩斌	微中子技術研討會2009 Workshop Towards Neutrino Technologies 2009	2009-07-13~2009-07-17	Invited Speaker,Oral
林誠謙	28th APAN	2009-07-20~2009-07-22	Oral
林誠謙	EUAsiaGrid 計畫合作會議	2009-07-23~2009-07-24	進行討論協調
張嘉升	ASEPS kick-off meeting	2009-07-23~2009-07-24	Main Organizer
吳茂昆	第七屆海峽兩岸奈米研討會	2009-07-24~2009-08-02	Invited
胡宇光	第七屆海峽兩岸奈米科技學術研討會	2009-07-25~2009-07-29	Invited Speaker
蘇宗粲	第七屆海峽兩岸奈米科學與技術研討會 The 7th Cross-Strait Workshop on Nanoscience and Nanotechnology	2009-07-25~2009-08-01	Session Chairman

研究人員名稱	學術會議名稱	會議時間	出席任務
江政祥	第七屆海峽兩岸奈米科學與技術研討會 The 7th Cross-Strait Workshop on Nanoscience and Nanotechnology	2009-07-25~2009-08-01	出席會議
林思育	第七屆海峽兩岸奈米科學與技術研討會 The 7th Cross-Strait Workshop on Nanoscience and Nanotechnology	2009-07-25~2009-08-01	參與者
李定國	第七屆海峽兩岸奈米科學與技術研討會 The 7th Cross-Strait Workshop on Nanoscience and Nanotechnology	2009-07-25~2009-08-01	Session Chairman,Oral
張嘉升	第七屆海峽兩岸奈米科學與技術研討會 The 7th Cross-Strait Workshop on Nanoscience and Nanotechnology	2009-07-25~2009-08-01	Invited Speaker,
周家復	第七屆海峽兩岸奈米科學與技術研討會 The 7th Cross-Strait Workshop on Nanoscience and Nanotechnology	2009-07-25~2009-08-01	Invited Speaker
余海禮	北京師範大量子重力學夏季學校 BNU summer school on quantum gravity	2009-07-25~2009-08-01	Session Chairman
黃振維	EUAsiaGrid Summer School	2009-07-25~2009-08-08	Invited Speaker
陳啟東	第七屆海峽兩岸奈米科學與技術研討會 The 7th Cross-Strait Workshop on Nanoscience and Nanotechnology	2009-07-26~2009-07-28	Invited Speaker,Oral
陳正龍	第28屆熱電國際會議暨第7屆歐洲熱電會議 28th International Conference on Thermoelectrics and 7th European Conference on Thermoelectrics	2009-07-26~2009-07-30	Poster
藍天蔚	第28屆熱電國際會議暨第7屆歐洲熱電會議 28th International Conference on Thermoelectrics and 7th European Conference on Thermoelectrics	2009-07-26~2009-07-30	Poster
歐敏男	2009第九屆國際奈米技術會議 9th IEEE Conference on Nanotechnology 2009	2009-07-26~2009-07-30	Oral
吳茂昆	Quantum Criticality & Novel Phases 2009	2009-08-02~2009-08-05	Invited Speaker,
余海禮	環量子重力09國際會議 Loops 2009 international confernce on Quantum Gravity	2009-08-02~2009-08-07	Oral,

研究人員名稱	學術會議名稱	會議時間	出席任務
陳彥竹(高能物理實驗研究群專案人員)	第六屆全球華人物理大會 The 6th Joint Meeting of Chinese Physicists Worldwide (OCPA6)	2009-08-03~2009-08-07	Invited Speaker
鄭海揚	第6屆全球華人物理大會 Chinese physicists worldwide (OCPA6)	2009-08-03~2009-08-07	Oral
鄒忠毅	第六屆世界華人物理年會暨物理教育及前瞻物理國際會議 The 6th joint meeting of Chinese physicists worldwide (OCPA6) - International Conference on Physics Education and Frontier Physics	2009-08-03~2009-08-07	Oral
葉崇傑	第六屆世界華人物理年會暨物理教育及前瞻物理國際會議 The 6th joint meeting of Chinese physicists worldwide (OCPA6) - International Conference on Physics Education and Frontier Physics	2009-08-03~2009-08-07	Oral,co-chair
李定國	第六屆全球華人物理大會	2009-08-03~2009-08-07	Invited Speaker,
尤靖雅	EUAsiaGrid Summer School 2009	2009-08-03~2009-08-07	Invited Speaker
周家復	全球華人物理大會 OCPAS	2009-08-03~2009-08-07	Invited Speaker,
侯書雲	第六屆全球華人物理大會 OCPA6 The 6th Joint Meeting of Chinese Physicists Worldwide	2009-08-03~2009-08-07	Invited Speaker
吳建宏	2009年 SLAC夏季研究所地平線上的革命和十年新實驗 SLAC Summer Institute 2009 - Revolutions on the Horizon and	2009-08-03~2009-08-14	Oral
胡進錕	Frontiers in Non-equilibrium Physics	2009-08-05~2009-08-11	Invited Speaker
李湘楠	2009 粒子物理現象學暑期研究所 Summer Institute 2009 (Particle Physics Phenomenology)	2009-08-12~2009-08-21	Oral
杜其永	第五屆海峽兩岸統計物理學術會議	2009-08-13~2009-08-15	Invited Speaker
胡進錕	The 5th Cross Strait Conference on Statistical Physics	2009-08-13~2009-08-17	Invited Speaker,

研究人員名稱	學術會議名稱	會議時間	出席任務
鄒忠毅	第五屆海峽兩岸統計物理學術會議	2009-08-13~2009-08-18	Invited Speaker
蕭葆義	第十屆國際流體控制量測與視現研討會 The 10th International Conference on Fluid Control, Measurements, and Visualization	2009-08-16~2009-06-27	Oral
陳志強	10th International Conference on Fluid Control, Measurements, and Visualization (FLUCOM 2009)	2009-08-16~2009-08-20	Keynote Speaker,Invited Speaker
阮自強	第24屆高能量輕子光子交互作用國際研討會 XXIV INTERNATIONAL SYMPOSIUM ON LEPTON PHOTON INTERACTIONS AT HIGH ENERGIES	2009-08-17~2009-08-22	Invited Speaker
陸紀互	量子物理凝結會議 Quantum Condensation workshop in APCTP	2009-08-17~2009-08-28	Oral
張明強	量子物理凝結會議 Quantum Condensation workshop in APCTP	2009-08-17~2009-08-28	Session Chairman
周崇斌	The 2009 Workshop on Quantum Condensation (QC09)	2009-08-17~2009-08-28	Oral
李定國	The summer workshop at the headquarter of the Asia Pacific Center for Theoretical Physics	2009-08-19~2009-08-22	Oral
吳茂昆	ERICE INTERNATIONAL SEMINARS ON PLANETARY EMERGENCIES	2009-08-19~2009-08-24	參與者
蕭葆義	2009國際物理模擬流場與延散現象研討會 PHYSMOD 2009 International Workshop on Physical Modeling of Flow and Dispersion Phenomena	2009-08-22~2009-09-06	Oral,Poster
陳雪華	第75屆國際圖書館協會聯盟年會 World Library and Information Congress: 75th IFLA General Conference and Council	2009-08-23~2009-08-27	Poster
陳洋元	第四屆（2009年)海峽兩岸物理研討會	2009-08-23~2009-08-27	Invited Speaker
何亞真	第75屆國際圖書館協會聯盟年會 World Library and Information Congress: 75th IFLA General Conference and Council	2009-08-23~2009-08-27	Poster

研究人員名稱	學術會議名稱	會議時間	出席任務
張志義	第九屆亞洲量子資訊科學會議 9th Asian Conference on Quantum Information Science	2009-08-26~2009-08-29	Poster
侯書雲	STD7; 7th International "Hiroshima" Symposium on Development and Applications of Semiconductor Tracking Devices	2009-08-29~2009-09-01	Invited Speaker
李秉中	第30屆國際熱傳導會議及第18屆熱膨脹會議 30th International Thermal Conductivity Conference (ITCC) and 18th International Thermal Expansion Symposium (ITES)	2009-08-29~2009-09-02	Poster
曾詣涵	第 19 屆物理之數體問題國際會議 18th International IUPAP Conference on Few-Body Problems in Physics	2009-08-31~2009-09-05	Invited Speaker
胡進錕	第40屆波蘭物理學家及非正式物理學會交流會議	2009-09-06~2009-09-11	出席會議
胡進錕	第40屆波蘭物理學家及非正式物理學會交流會議	2009-09-06~2009-09-11	出席會議
許智佑	第十九屆離子束分析國際會議 19th International Conference on Ion Beam Analysis	2009-09-07~2009-09-11	Invited Speaker
余岳仲	第十九屆離子束分析國際會議 19th International Conference on Ion Beam Analysis	2009-09-07~2009-09-11	Invited Speaker
黃子文	第九屆國際超導體材料與機制研討會	2009-09-07~2009-09-12	Oral
黃信銘	9th International Conference on Materials and Mechanisms of Superconductivity (M2S-IX)	2009-09-07~2009-09-12	Poster
葉崇傑	第9屆國際超導材料與理論研討會 The 9th International Conference on Materials and Mechanisms of Superconductivity	2009-09-07~2009-09-12	Oral
李定國	9th International Conference on Materials and Mechanisms of Superconductivity (M2S-IX)	2009-09-07~2009-09-12	Session Chairman,Oral
周崇斌	9th International Conference on Materials and Mechanisms of Superconductivity (M2S-IX)	2009-09-07~2009-09-12	Poster

研究人員名稱	學術會議名稱	會議時間	出席任務
吳茂昆	第九屆國際超導材料及超導機制會議 9th International Conference on Materials and Mechanisms of Superconductivity	2009-09-07~2009-09-12	Invited Speaker
吳承恩	第九屆國際超導體材料與機制研討會	2009-09-07~2009-09-12	Oral
吳信霖	第九屆國際超導體材料與機制研討會	2009-09-07~2009-09-12	Oral
林誠謙	Pre Grid Deployment Board、Grid Deployment Board	2009-09-08~2009-09-09	代表台灣參加工作委員會
章文箴	第十屆超核與奇異粒子物理國際會議 10th International Conference on Hypernuclear and Strange Particle Physics	2009-09-14~2009-09-18	Invited Speaker
張淵智	The E-MRS Fall Meeting 2009	2009-09-14~2009-09-18	Oral
張定華	第七屆環太平洋高能自旋物理研討會 The 7th circum-pan-pacific Symposium on High Energy Spin Physics	2009-09-15~2009-09-18	Invited Speaker
林誠謙	EGEE ’09 Meeting	2009-09-21~2009-09-25	參與會議
黃郁婷	神經科學前瞻座談會 2009 ION-NHIM-NPAS-HKUST 10th Joint Retreat Symposium “Symposium on Frontiers in Neuroscience”	2009-09-24~2009-09-28	Poster
陳雪華	第13屆歐洲數位圖書館會議 13rd European Conference on Digital Libraries	2009-09-27~2009-10-02	參與(NKOS) 討論會
蘇雲良	第10屆同步輻射國際會議 The 10th International Conference on Synchrotron Radiation Instrumentation	2009-09-27~2009-10-02	Poster
李湘楠	味物理的進展與挑戰研討會 Workshop on Progress and Challenges in Flavour Physics (Primosten09)	2009-09-29~2009-10-03	Invited Speaker
吳茂昆	2009 Taiwan-America Science and Technology Conference	2009-10-02~2009-10-03	Invited

研究人員名稱	學術會議名稱	會議時間	出席任務
黃英碩	第216屆電化學學會國際會議 216th ECS Meeting	2009-10-04~2009-10-09	Invited Speaker
胡宇光	第一屆北海道大學中央研究院聯合研討會、第七屆未來藥劑探索與衛生保健研討會 "The 1st Hokkaido University Academia Sinica Joint Symposium", "The 7th Symposium fo Future Drug Discovery and medical Care"	2009-10-07~2009-10-08	Invited Speaker
林誠謙	WLCG T1 review、Pre Grid Deployment Board、Grid Deployment Board	2009-10-12~2009-10-14	代表台灣參加工作委員會
劉如熹	第5屆IUPAC新穎材料與綜合 (NMS-V)國際專題研討會 5th IUPAC International Symposium on Novel Materials and their Syntheis (NMS-V)	2009-10-18~2009-10-24	Keynote Speaker
王子敬	第五屆低能微中子物理國際研討會 5th International Workshop on Low energy neutrino physics	2009-10-19~2009-10-21	Invited Speaker
陳炳宏	第12屆北京第一原理亞洲研討會 The 12-th Asian Workshop on First-Principles Electronic Structure Calculations	2009-10-26~2009-10-28	Poster
張泰榕	第12屆北京第一原理亞洲研討會 The 12-th Asian Workshop on First-Principles Electronic Structure Calculations	2009-10-26~2009-10-28	Poster
許正欣	AsiaFlux Workshop 2009	2009-10-27~2009-10-29	參與會議
林誠謙	9th Annual Global LambdaGrid Workshop	2009-10-27~2009-10-29	Invited Speaker
葉佳唯	第13屆 化學與生命科學微型系統國際會議 μTAS 2009	2009-11-01~2009-11-05	Poster
周家復	第13屆化學與生命科學微型系統國際會議 μTAS 2009	2009-11-01~2009-11-05	Invited Speaker
陳彥龍	複雜系統材料的中尺度力學研討會 Workshop on Mesoscale Mechanics of Complex Materials	2009-11-02~2009-11-03	Invited Speaker,Main Organizer
陳俊杉	複雜系統材料的中尺度力學研討會 Workshop on Mesoscale Mechanics of Complex Materials	2009-11-02~2009-11-03	Invited Speaker

研究人員名稱	學術會議名稱	會議時間	出席任務
鄭友仁	複雜系統材料的中尺度力學研討會 Workshop on Mesoscale Mechanics of Complex Materials	2009-11-02~2009-11-03	Invited Speaker
張書瑋	複雜系統材料的中尺度力學研討會 Workshop on Mesoscale Mechanics of Complex Materials	2009-11-02~2009-11-03	參與者
周佳靚	複雜系統材料的中尺度力學研討會 Workshop on Mesoscale Mechanics of Complex Materials	2009-11-02~2009-11-03	參與者
吳茂昆	複雜系統材料的中尺度力學研討會 Workshop on Mesoscale Mechanics of Complex Materials	2009-11-02~2009-11-03	Main Organizer
胡宇光	第二屆影像技術與同步輻射國際研討會 2nd International workshop on imaging techniques with synchrotron radiation	2009-11-06~2009-11-10	Invited Speaker
陳彥龍	AIChE Annual Meeting	2009-11-08~2009-11-13	Oral
蔡幸真	MCN理監事會及博物館電腦網路協會2009 年會 Museum Computer Network 2009 Conference	2009-11-11~2009-11-15	統籌規劃該會議舉辦之推廣活動及海報展示
林國平	MCN理監事會及博物館電腦網路協會2009 年會 Museum Computer Network 2009 Conference	2009-11-11~2009-11-15	統籌規劃該會議舉辦之推廣活動及海報展示
陳彥龍	The 62nd Annual Neeting of the American Physical Society`s Division of Fluid Dynamics(APS DFD)	2009-11-21~2009-11-24	Oral,
鄭海揚	第十三屆強子質譜國際會議 13th International Conference on Hadron Spectroscopy	2009-11-29~2009-12-04	Invited Speaker
胡宇光	The 4th Aisa-Oceania Forum for Synchrotron Radiation Research	2009-11-30~2009-12-02	Invited Speaker
林誠謙	EUAsiaGrid Workshop on Natural Disaster Mitigation	2009-11-30~2009-12-02	Oral
吳建宏	「宇宙再離子化時期」國際會議 Focus Week on the Epoch of Reionization	2009-11-30~2009-12-02	Oral

研究人員名稱	學術會議名稱	會議時間	出席任務
何宜道	EUAsiaGrid Workshop on Natural Disaster Mitigation	2009-11-30~2009-12-02	Oral
吳茂昆	參加2009材料科學學會秋季會議	2009-11-30~2009-12-04	Keynote Speaker
林誠謙	Digital Repository Federation International Conference 2009	2009-12-03~2009-12-04	Oral,
林誠謙	SEE-GRID-SCI USER FORUM 2009	2009-12-09~2009-12-10	Keynote Speaker
黃英碩	第17屆掃描探針顯微術國際論壇 17th International Colloquium on Scanning probe Microscopy(ICSMP17)	2009-12-10~2009-12-12	Invited Speaker
黃英碩	觀察生物分子動作國際研討會 Symposium on Watching Biomolecules in Action	2009-12-15~2009-12-17	Oral,Poster,
楊志文	第二屆生物分子觀測暨原子力顯微術國際研討會 Watching Biomolecules in Action Symposium & 2nd Kanazawa Bio-AFM Workshop	2009-12-15~2009-12-17	Oral
陳彥龍	ASME 2009 2nd Micro/Nanoscale Heat & Mass Transfer International Conference	2009-12-18~2009-12-21	Invited Speaker

Institute Sponsored Meetings

本所協辦會議

研討會名稱	會議期間	地點	主辦人
International Workshop on Nonlinear Dynamics in Biological Systems 生物系統中的非線性動力學研討會	98.01.16 - 98.01.20	中央研究院物理所	陳志強
星空大使研習營	98.02.13 - 98.02.15	國立海洋生物博物館台灣大學墾丁天文台	李定國
2009年數位學習與典藏國際會議	98.02.23 - 98.02.27	中央研究院人文館	林誠謙
Mini Workshop on Multi-scale simulation	98.04.07	中央研究院物理所	吳茂昆 李定國
International Symposium on Grid Computing（ISGC）2009	98.04.16 - 98.04.23	中央研究院人文館	林誠謙
「博物館藏品登錄與系統建置」工作坊	98.05.22	國史館	林誠謙
「數位博物館之應用」工作坊	98.06.26	國立自然科學博物館立體劇場B1會議廳藍廳	林誠謙
「藏品管理系統建置與作業程序」工作坊	98.07.31	國立科學工藝博物館南館1樓S207教室	林誠謙
博物館與文化機構科技應用研討會	98.08.06	中研院資訊所106、107會議室	林誠謙

研討會名稱	會議期間	地點	主辦人
「博物館藏品登錄與系統建置經驗分享(II)」工作坊	98.08.07	國立故宮博物院正館B1多媒體室	林誠謙
「當藝術人文遇上科技 — 以故宮『未來博物館』為例」，	98.08.26	國立故宮博物院展覽館正館B1多媒體放映室	林誠謙
「博物館藏品登錄與系統建置經驗分享(III)」工作坊	98.09.18	國立故宮博物院正館B1 多媒體室	林誠謙
「編目與藏品管理作業程序」工作坊	98.09.25	國立海洋科技博物館籌備處	林誠謙
2009 NCTS September workshop on critical phenomena and complex system 2009 NCTS 九月 臨界現象與複雜系統研討會	98.09.25 - 98.09.28	台大物理系 中央研究院物理所	胡進錕
Taiwan - Israel Workshop on Nanoscience and Nanotechnology	98.10.05	中央研究院物理所	李定國
Asia Nano Forum – Summit Meeting 2009, ANFoS09 2009亞洲奈米論壇高峰會	98.10.09 - 98.10.09	中央研究院物理所	吳茂昆
「美國AAM MUSE Awards暨2009 AAM MUSE Awards Interactive Kiosks評選經驗」工作坊	98.10.19	國立故宮博物院展覽館正館B1多媒體放映室	林誠謙
「博物館藏品編目與管理系統實務暨個案研討」工作坊	98.11.20	國立故宮博物院	林誠謙
2009 Taiwan International Workshop on Biological Physics and Complex Systems 2009台灣生物物理與複雜系統國際研討會	98.12.10 - 98.12.15	中央研究院物理所	胡進錕

Seminars

中央研究院物理研究所九十八年度演講一覽表

(2009 January ~ December)

演講題目	演講者	所屬機構	日期
2D fulleride thin films	白偉武	台灣大學凝態科學中心	2009.01.06
Numerical analysis of binary black hole recoil	曹周鍵	Theoretical Institute for Advanced Research in Astrophysics	2009.01.09
Deformation, Restructuring, and Un-jamming of Concentrated Droplets in Large-Amplitude Oscillatory Shear Flows	黃仲仁	University of California, Los Angeles	2009.01.12
談音樂的剖析到歡唱卡拉ok	黃克寧	中央研究院原子與分子科學研究所	2009.01.13
Quantum mechanics and molecular mechanics: could they/should they play a key role in systems biology? What's possible? What's not?	Dennis R. Salahub	University of Calgary	2009.01.14
Explore gluon exchange in the non-perturbative regime by photoproduction on phi-mesons near threshold	章文箴	中研院物理所	2009.01.14
Dynamics of single DNA molecules confined in nanoslits	Chih-Chen Hsieh	National Taiwan University	2009.01.21
座談主題：Spintronics: Spin transfer, generation of microwave oscillations by spin transfer, synchronization of spin transfer oscillators.	2007諾貝爾物理獎 Dr. Albert Fert	法國巴黎第11大學	2009.01.22
Modeling directional influence in human brain using MEG and fMRI data	Fa-Hsuan Lin	National Taiwan University	2009.02.03

演講題目	演講者	所屬機構	日期
Application of QCD Sum Rules to Heavy Baryons	Altug Ozpineci	Middle East Technical University /TURKEY	2009.02.06
Molecular Dynamics Approach to Aggregation of Polymer Chains	Chin Kun Hu	中研院物理所	2009.02.09
Vaccination to protect a vulnerable subpopulation	Jonathan Dushoff	Department of Biology, McMaster University	2009.02.09
Nanooptics for photonics	Gilles Lerondel	CNRS 法國國家研究中心	2009.02.18
Geometrical Quantum Computation with Josephson Junctions	Mahn-Soo Choi	Korea University, Seoul, Korea	2009.02.19
Improving braid construction for topological quantum computation	萬歆	Asian Pacific center for theoretical physics	2009.02.19
baryonic B decays	王明儒	台灣大學物裡學系	2009.02.20
Discuss with us a recent paper by John J. Drozd and Colin Denniston. “Velocity fluctuations in dense granular flows”	杜其永	中研院物理所	2009.02.23
Analysis of heart rate variability: theory, approaches, perspectives	Alexey Dvornikov	Medical Academy of Nizhny Novgorod	2009.02.24
Higgs phases and zero-energy states in graphene	Igor Herbut	Simon Fraser University	2009.02.24
DNA Dynamics on Lipid Membranes	Joanna Lau	中研院物理所	2009.03.02

演講題目	演講者	所屬機構	日期
Spin Hall Effect in Metals: Theoretical Studies	Guang-Yu Guo	National Taiwan University	2009.03.03
Walking step by step in search of technicolour	林及仁	國立交通大學	2009.03.06
Introduction of Collective Behavior of Self-Propelled Swimmers	Lilin Wang	中研院物理所	2009.03.09
Phase Structure of Thermal QED/QCD through the HTL Improved Ladder Dyson-Schwinger Equation	中川壽夫	Nara University	2009.03.13
Violation of Lorentz invariance, nonmetricity, and metric-affine gravity(MAG)	Friedrich W. Hehl	University of Cologne	2009.03.20
Improved structural quality of multilayers and superlattices by ion-assisted magnetron sputter deposition	Jens Birch	Department of Physics, Chemistry, and Biology, Linkoping University, Sweden	2009.03.20
Hadronic Atoms in Effective Field Theory	Udit Raha	National Taiwan University	2009.03.20
Devour the Earth	周家復	中研院物理所	2009.03.20
微波量測介紹	洪東興	銘傳大學 電腦與通訊工程學系	2009.03.24
Leptophilic Dark Matter From ATIC and PAMELA	何小剛	台灣大學物理系	2009.03.27
Are water-repellent (anti-wetting) legs necessary to stand on water?	Heng Kwong Tsao	Department of Chemical Engineering, National Central University	2009.03.30

演講題目	演講者	所屬機構	日期
2009 NCTS March Workshop on Critical Phenomena and Complex Systems	胡進錕	中研院物理所	2009.03.30
Perpendicular magnetic anisotropy driven by ferromagnetic/antiferromagnetic exchange coupling	林敏聰	台灣大學物理系	2009.03.31
Non-equilibrium critical phenomena at the chiral phase transition.	Kazuaki Ohnishi	國立台灣大學	2009.04.10
Optically-induced dielectrophoresis and its biomedical applications	Gwo Bin Lee	Department of Engineering Science, National Cheng Kung University	2009.04.13
Cell Shape Determination in Bacteria	Kerwyn Casey Huang	Stanford University	2009.04.14
Cell Shape Determination in Bacteria.	KERWYN CASEY HUANG	Dept of Molecular Biology, Princeton University	2009.04.14
Newman-Penrose constants and Multipole structure of asymptotically flat stationary spacetime	Bai Shan	Institute of Apply Mathematics, Academia Sinica, Beijin	2009.04.17
Evolution of complex network co-authorship network: How the six degrees of freedom arises	Kim Doochul	Seoul National University	2009.04.21
Constraints on charged Higgs bosons from purely leptonic deacays of B, Bc and Ds mesons	Andrew Akeroyd	國立中央大學	2009.04.22
The physics of cell adhesion and cell migration	陳宣毅	中央大學物理系	2009.04.22
“RHIC Serves a Near-Perfect Fluid”--- a Paradigm Shift	陳俊瑋	國立台灣大學	2009.04.24

演講題目	演講者	所屬機構	日期
Studies of Block Copolypeptide Synthesis, Self-Assembly, and Structure-Directing Ability	詹正雄	Department of Chemical Engineering, National Cheng Kung University	2009.04.27
Dynamically generated baryon resonance and reaction dynamics	Atsushi Hosaka	大阪大學核子物理中心	2009.04.28
From Crystals to Quasicrystals Using Holographic Lithography	Wing Yim Tam	Department of Physics, Hong Kong University of Science and Technology	2009.04.28
Strong coupling theory for iron pnictide superconductivity	張富春	香港大學物理系	2009.04.29
The latest TEM development and its applications	近藤行人	JEOL Ltd.	2009.04.30
Ion Transport in Nanofluidic Channels	鄭力兢	中研院物理所	2009.05.04
Photoluminescence studies of single nanoparticles and laser-induced ultrafast structural dynamics of nanomaterials	湯朝暉	中研院應用科學研究中心	2009.05.05
Magnetic self-propelling microdevices and magnetotactic bacteria A.Cēbers	Andrejs Cebers	University of Latvia	2009.05.08
Poincare-Synder Relativity and Quantum Physics	江祖永	國立中央大學	2009.05.08
Bioinformatics Research in MicroRNA Regulation: Databases and Tools	Hsien-Da Huang	Institute of Bioinformatics, National Chiao Tung University	2009.05.11
X-ray tomography of a crumpled plastoelastic thin sheet	洪在明	清華大學物理系	2009.05.12

演講題目	演講者	所屬機構	日期
TWO-PHOTON AND TWO-GLUON DECAYS OF S AND P WAVE HEAVY QUARKONIA	Tri Nang Pham	Ecole Polytechnique	2009.05.15
Resolving the cell middle in E. coli	Yu-Ling Shih	Institute of Biochemistry, Academia Sinica	2009.05.18
Bell\\\\\\\\\\\\\\\\'s inequality, teleportation, and all that	Ady Mann	Israel Institute of Technology, Physics Department	2009.05.21
Time-reversed acoustics and Super-resolution.	Mathias Fink	Université Denis Diderot, France.(Université Paris 7)	2009.05.25
Bayesian Analysis of Folding and Unfolding Time Series of Single-Forced RNAs	Fei Liu	Center for Advanced School, Tsinghua University, Beijing	2009.05.26
Video-rate Fluorescence Lifetime Imaging Microscopy System-on-Chip with 0.13 mm CMOS Single-Photon Avalanche Diode Arrays	David Li	University of Edinburgh	2009.06.01
生命起源與生物進化之謎	胡進錕	中研院物理所	2009.06.02
Quantum Information Processing: A Dynamics Problem of Open Quantum Systems	張為民	成功大學物理學系	2009.06.05
Novel Spin Transport in two dimensional electron systems	張慶瑞	台灣大學物理系	2009.06.09
Design of new class of electronic materials for spintronics	Xiaolin Wang	Institute for Superconducting and Electronic Materials, University of Wollongong	2009.06.10
SUSY breaking by metastable states	張嘉泓	師範大學	2009.06.12

演講題目	演講者	所屬機構	日期
Symmetry or broken symmetry :that is the question	蔣正偉	中央大學物理系	2009.06.16
Future Prospects of Biological Electron Microscopy	Kuniaki Nagayama	National Institute for Physiological Sciences, Okazaki, Japan	2009.06.23
Novel physical properties of the smectic-C*_alpha phase in liquid crystals	C.C. Huang	Minnesota State University	2009.06.26
Weak Coupling Theory for High-Tc Cuprates	Wei-Cheng Lee	UT-Austin/UCSD	2009.07.22
Concept, measurement and application of the local work function	Klaus Wandelt	Institute of Physical and Theoretical Chemistry of the University Bonn, Germany	2009.07.29
Measurement of Inclusive Photon X-section at CDF	Shin-Shan Yu	Fermilab	2009.07.29
Glucose metabolism model in cancer cell	Da-lun Tseng	Centre for Mathematical Biology, University of Oxford	2009.08.03
Glucose metabolism model in cancer cell	Da-lun Tseng	Centre for Mathematical Biology, University of Oxford	2009.08.04
Metal Nanoparticles in TiO2 thin films for photocatalytic Applications	Alireza Z. Moshfegh	Department of Physics Sharif University of Technology	2009.08.13
Novel phases in geometrically frustrated magnets	Gia-Wei Chern	Department of Physics, University of Wisconsin – Madison	2009.08.27

演講題目	演講者	所屬機構	日期
A new phase of tau-charm physics ---- status of BESIII and its prospects	Yi-Fang Wang	Institute of High Energy Physics, Beijing	2009.09.11
THz nano-ultrasonics and THz phonon-polaritonics	林宮玄	Engineer, Industrial Technology Research Institute, Taiwan	2009.09.15
Fun and Profit with Soft Materials: Phospholipids, Nanoparticles,Macromolecules	Steve Granick	Materials Science & Engineering	2009.09.22
Double neutral Higgs production at the LHC	Rachid Benbrik	成功大學物理系	2009.09.25
The One-Dimenstional Dynamics and Transport of DNA Molecules in a Quasi-Two-Dimensional Nanoslit	林柏耕	中研院物理所	2009.09.28
Pion and kaon structure functions from the instanton vacuum	南昇日	中原大學	2009.10.02
Imaging the Nematic Electronic Structure of Underdoped Ferropnictides	Tien-Ming Chuang	Cornell University and National High Magnetic Field Lab	2009.10.06
Reflecting on the phase-diagram of the high temperature supecrconducotrs from proximity and interface effects	Oded Millo	the Hebrew University	2009.10.08
Leveraging Off-The-Shelf Technologies For Large Physics Experiments	Thierry Debelle	National Instruments, USA	2009.10.08
Entanglement Creation between Two Causally Disconnected Objects	林世昀	國立成功大學	2009.10.09
Discussion of "Internal Friction and Nonequilibrium Unfolding of Polymeric Globules"	Kiwing To	中研院物理所	2009.10.12

演講題目	演講者	所屬機構	日期
The supergravity dual of non-anticommutative supersymmetric gauge theories	Shou-Huang Dai	國立台灣師範大學	2009.10.16
Dark matter signals in cosmic-rays	Chuan-Ren Chen	Institute for the Physics and Mathematics of the Universe	2009.10.21
Shaken not Stirred: Using Brownian Motion for Biomagnetic Sensing	Dr. Hoffmann	美國Argonne實驗室	2009.10.22
The dual gravity models for condense matter	Chen-Pin Yeh	國立台灣大學	2009.10.23
Understanding of water interfaces at the molecular level	Yuen-Ron Shen	Department of Physics at the University of California, Berkeley	2009.10.26
Dynamics of soft particles in flow	陳彥龍	中研院物理所	2009.10.26
Hidden Symmetries of Higher Dimensional Rotating Black Holes	Tsuyoshi Houri	Osaka City University	2009.10.28
Phenomenology of Non-minimal SUSY Models	Jin-Min Yang	Inst. Theor. Phys, Beijing	2009.10.30
Phase statistics approach to human ventricular fibrillation	Ming-Chya Wu	中研院物理所	2009.11.02
Topobiologoy of feathers: a potential model for nanobiology and micro-sturcture	鍾正明	Keck School of Medicine, Dept. of Pathology, University of Southern California	2009.11.02
Superconductivity without phonons	Peter Fulde	Asia Pacific Center for Theoretical Physics	2009.11.05

演講題目	演講者	所屬機構	日期
Non-thermal gravitino production from the inflaton decay	Takahashi Fuminobu	Institute for the Physics and Mathematics of the Universe	2009.11.06
Single Molecule Studies of DNA Dynamics on Lipid Membranes	阮文滔	中研院物理所	2009.11.10
Holographic Methods for Strongly Coupled Systems	Feng-Li Lin	國立台灣師範大學	2009.11.13
熱力學應用在現代材料的挑戰	張永山	材料科學與工程學系 威斯康辛大學-麥迪遜校區	2009.11.13
宇宙的暗物質	王子敬	中研院物理所	2009.11.17
On the computation of black hole entropy in LQG	J. Fernando Barbero	CSIC, Madrid, Spain	2009.11.20
Possibility to observe sympatric speciation in bacteria under fast varying environments	李柏翰	The Affiliated Senior High School of National Taiwan Normal University	2009.11.23
Universality in biological and social systems	Chin-Kun Hu	中研院物理所	2009.11.24
Related Topics on Dark Energy and Bouncing Cosmology	邱濤濤	中原大學	2009.11.27
物理於醫學之應用-以游離輻射為例	洪志宏	長庚大學 醫學影像暨放射科學系	2009.12.01
iber-optic Multiphoton Fluorescence Spectroscopy for Biosensing and in vivo Flow Cytometry	張譽鐘	國立彰化師範大學 電機工程學系	2009.12.02

演講題目	演講者	所屬機構	日期
Holographic Model for Peak-Dip-Hump in High-Tc Superconductors	溫文鈺	國立台灣大學	2009.12.04
Cell Culture in Microfluidic Devices	Yi-Chung Tung	中研院應科中心	2009.12.07
What can first-principles calculations help to understand the physics in novel materials and nano-structures	鄭弘泰	中研院物理所	2009.12.07
可激發節點複雜網路的自持續震盪	胡崗	北京師範大學物理系	2009.12.08
Electromagnetic Leptogenesis	羅上智	中原大學	2009.12.11
Bio-Bio Interfaces: From Cell-Materials Interaction to Molecular Rectifiers	Ying-Chih Chang	GRC	2009.12.14
Quantum Information in condensed matter	Guifre Vidal	Department of Physics, University of Queensland Australia	2009.12.15
稀磁性氧化物中自旋電流及磁耦合機制的問題及可能原因	周雄	國立中山大學物理系	2009.12.15
Study of Pb thin films on Ge(111) substrate by ARPES and LEED	唐述中	清華大學物理系	2009.12.24

Visiting Scholars

中央研究院物理所九十八年度訪問學人表

(2009 年 1 月- 2009 年 12 月)

訪 問 學 人	所 屬 機 構	訪 問 期 間
Geghan Asryan	亞美尼亞 Yerevan Physics Institute	2008.05.08 - 2010.01.24
Nickolay Izmailian	亞美尼亞 Yerevan Physics Institute	2008.09.01 - 2009.03.31
Lakhwinder Singh	印度 拿勒斯印度教大學	2008.11.15 - 2010.06.30
Chuan-Ren Chen	日本 Univ. of Tokyo	2008.12.15 - 2009.01.05
尼斯瓦	印度 Indraprastha Univ.	2008.12.21 - 2009.01.04
高鐘	美國 Univ. of Oklahoma	2008.12.24 - 2009.01.02
Davit Sahakyan	亞美尼亞 Yerevan Physics Institute	2008.12.28 - 2009.02.20
李根浩	韓國 Pohang University	2009.01.01 - 2009.01.16
馬遠榮	東華大學應用物理研究所暨物理系	2009.01.01 - 2009.02.22
張經霖	淡江大學物理系	2009.01.01 - 2009.06.30
蔡麗珠	台北科技大學	2009.01.05 - 2009.02.20
Merideth Leigh Gattis	Cardigg University, School of Psychology	2009.01.10 - 2009.01.21
Vladimir S. Zykov	德國 Technical Universit Berlin, Institute for Theoretical Physics	2009.01.15 - 2009.01.28
鄒忠毅	文化大學物理系	2009.01.15 - 2009.02.15
Alex Semeyanov	日本 REIKEN	2009.01.16 - 2009.01.20
Kyoung Lee	韓國 Korean Univ.	2009.01.16 - 2009.01.20
Y. Kuramoto	日本 Kyoto Univ.	2009.01.16 - 2009.01.20
邱雅萍	中山大學物理系	2009.01.16 - 2009.02.15
林宏一	台南大學	2009.01.16 - 2009.03.01
Mathieu Caymax	Advanced Materials and Processing Steps Dept. at IMEC	2009.01.18 - 2009.01.22
蔡志申	國立台灣師範大學物理系	2009.01.20 - 2009.02.19
陳元宗	義守大學材料科學與工程學系	2009.02.01 - 2009.02.28
Alexey V. Dvornikov	俄羅斯 Central Research laboratory	2009.02.01 - 2009.04.30
Wolfram Schroers	德國 Wuppertal University	2009.02.01 - 2009.04.30
Altug Ozpineci	土耳其 Middle East Tech. Univ.	2009.02.02 - 2009.02.28

訪問學人	所屬機構	訪問期間
齊正中	清華大學物理系	2009.02.23 - 2009.08.22
Doochul Kim	韓國 Seoul National University	2009.03.01 - 2009.04.30
李根浩	韓國 Pohang Univ. of Science & Technology	2009.03.05 - 2009.03.06
方海平	中國 上海物理應用研究所	2009.03.06 - 2009.03.07
崔瑩鎮	韓國 Inha Univ.	2009.03.09 - 2009.03.12
Hisao Nakkagawa	日本 奈良大學	2009.03.09 - 2009.03.17
Friedrich W. Hehl	德國 University of Cologne	2009.03.12 - 2009.04.04
司徒國業	香港科技大學物理系	2009.03.21 - 2009.03.26
劉明輝	中國 中國科學技術大學近代物理系	2009.03.29 - 2009.04.18
Ulrich Sperhake	美國 California Institute of Technology	2009.03.30 - 2009.04.05
Selçuk Bilmiş	土耳其 Middle East Tech. Univ.	2009.04.04 - 2009.10.04
Tsung-Shung Harry Lee	美國 Argonne National Laboratory	2009.04.23 - 2009.04.29
Atsushi Hosaka	日本 Osaka University	2009.04.26 - 2009.04.29
盛偉德	印度 Banaras Hindu Univ.	2009.05.02 - 2009.06.30
Tung-Mow Yan	美國 Cornell University	2009.05.08 - 2009.05.30
Kuntal Chatterjee	越南 Vidyasagar University	2009.05.11 - 2009.06.26
Tri-Nang Pham	法國 Centre de Physique Theorique	2009.05.12 - 2009.05.24
Swee-Ping Chia	馬來西亞 Univ. of Malaya	2009.05.16 - 2009.05.18
何健民	美國 Wichita State University	2009.05.26 - 2009.06.28
Do Young No	Center for Extremem Light Applications	2009.05.27 - 2009.05.28
Patrick Soukiassian	法國 Universite de Paris-Sud	2009.06.01 - 2009.06.07
Narayan Mishra	印度 Indian Institute of Technology	2009.06.01 - 2009.07.25
Douglas H. Beck	美國 Univ. of Illinois at Urabana-Champaign	2009.06.02 - 2009.06.06
Nikolay V. Dokholyan	美國 University of North Carolina	2009.06.07 - 2009.06.16
童若軒	中國 上海大學	2009.06.09 - 2009.07.09
蔡麗珠	台北科技大學	2009.06.10 - 2009.09.15
徐 音	中國 南開大學物理學院	2009.06.12 - 2009.07.31

訪問學人	所屬機構	訪問期間
Hideki Kohri	日本 Research Center of Nuclear Physics, Osaka University	2009.06.17 - 2009.06.20
蔡志申	國立台灣師範大學物理系	2009.06.20 - 2009.09.19
Kuniaki Nagayama	日本 National Institute of Natural Sciences	2009.06.23 - 2009.06.27
馬遠榮	東華大學應用物理研究所暨物理系	2009.06.27 - 2009.09.22
Adam Martin	美國 Yale University	2009.06.30 - 2009.07.04
袁簡鵬	美國 Michigan State University	2009.06.30 - 2009.07.31
陳元宗	義守大學材料科學與工程學系	2009.07.01 - 2009.09.14
林宏一	台南大學	2009.07.01 - 2009.09.15
鄒忠毅	文化大學物理系	2009.07.01 - 2009.09.15
吳憲昌	彰化師範大學物理系	2009.07.01 - 2009.09.15
顧鴻壽	明新科技大學 光電系統工程系	2009.07.01 - 2009.12.31
Ihsan Ozan Yildirim	土耳其 Middle East Tech. Univ.	2009.07.01 - 2010.02.13
喻純旭	中國 南開大學	2009.07.10 - 2009.08.31
厚美瑛	中國 中國科學院 物理研究所	2009.07.12 - 2009.08.09
梁宗嶽	美國 University of Delaware	2009.07.14 - 2009.07.24
Jonathan Dushoff	加拿大 McMaster University	2009.07.23 - 2009.08.21
熊田雅之	日本 放射線醫學總合研究所	2009.08.01 - 2009.12.31
Cyril Petibois	法國 Universite de Bordeaux	2009.08.29 - 2009.09.04
Olga S. Rozanova	Moscow State University	2009.09.16 - 2009.10.14
Dmitry Klochkov	俄羅斯A.M. Prokhorov General Physics Institute RAS	2009.09.21 - 2009.10.20
王寬	美國 國家衛生研究院	2009.09.23 - 2009.09.27
Eric Issacs	美國 阿岡國家實驗研究院	2009.10.03 - 2009.10.09
Dan Porath	以色列奈米科技中心	2009.10.04 - 2009.10.10
Oded millo	以色列奈米科技中心	2009.10.04 - 2009.10.10
Oded Shoseyov	以色列奈米科技中心	2009.10.04 - 2009.10.10
Mukhles Suwan	以色列奈米科技中心	2009.10.04 - 2009.10.10
Roie Yerushalmi	以色列奈米科技中心	2009.10.04 - 2009.10.10

訪問學人	所屬機構	訪問期間
Ronen Rapaport	以色列奈米科技中心	2009.10.04 - 2009.10.10
Yosef Paltiel	以色列奈米科技中心	2009.10.04 - 2009.10.10
Peter H. Seeberger	德國 Max Planck Institute of colloids and Interfaces	2009.10.20 - 2009.10.23
Tsuyoshi Houri	日本 Osaka City University	2009.10.25 - 2009.11.07
劉艷芳	中國 南開大學	2009.10.29 - 2010.10.28
Mai Suan Li	波蘭 Polish Academy of Sciences	2009.11.01 - 2010.01.10
Fernando Barbero	西班牙 Instituto de Estructura de la Materia, CSIC	2009.11.18 - 2009.12.04
A. E. Allahverdyan	亞美尼亞 Yerevan Physics Institute	2009.11.18 - 2009.12.15
何健民	美國 Wichita State University	2009.11.26 - 2009.12.22
胡崗	中國 北京師範大學物理系	2009.12.01 - 2009.12.16
Sasun G. Gevorgyan	亞美尼亞 Yerevan Physics Institute	2009.12.02 - 2010.01.30
尼斯瓦	印度 Indraprastha Univ.	2009.12.06 - 2009.12.28
Ravindra E. Amritkar	Physical Research Laboratory	2009.12.08 - 2009.12.26
Yevgeni Mamasakhlisov	Department of Molecular Physics, Yerevan State University	2009.12.08 - 2010.01.08
C.C. Yang	新加坡 Nanyang Technological Univ	2009.12.09 - 2009.12.11
H. Eugene Stanley	美國 Physics Dept. Boston University	2009.12.12 - 2009.12.15
Hsin-Chia Cheng	美國 University of California	2009.12.14 - 2009.12.29
H. DANIEL OU-YANG	美國 Lehigh University	2009.12.21 - 2009.12.24
Chuan-Ren Chen	IPMU, Tokyo University	2009.12.21 - 2009.12.30