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II

Review of Research Projects

GENERAL INTRODUCTION

The Institute of Physics was founded in Shanghai in 1928 and was reestablished in Taiwan in 1962, with Dr. Ta-You Wu as its first Director. The succeeding Directors of the Institute were: Dr. W. N. Wang (1976-1977), Dr. E. K. Lin (1977-1989), Dr. L. T. Ho (acting, 1989-1990), Dr. T. T. Tsong (1990-1999), Dr. Y. D. Yao (acting, 1999-2002), Dr. Maw-Kuen Wu (2002-2004), 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 43 research staffs: 3 distinguished research fellows, 21 research fellows, 9 associate research fellows, 6 assistant research fellows, 2 senior research scientist, 1 associate research scientists and 1 assistant research scientist. 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.

Nanoscience Research Group

Nanoscience and nanotechnology have become one of the major research focuses in the Institute. During the 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.

Though the nature of condensed matter physics is quite diverse, in the past years we have been encouraged to largely place our efforts on collaborative research interests by separate funding resources. Indeed, several significant impacts in a larger scale have been made. The followings are summaries of the research activities involving various nanoscience research labs:

(1) Surface Physics and Nanoscale Microscopy

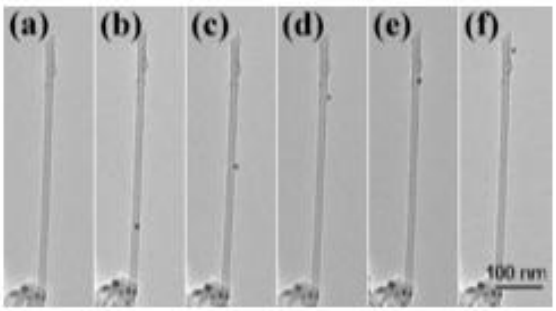
This research group includes four faculty members, one research scientist, and four joint appointment faculty members, and routinely maintains a size of around 40 researchers comprised of visiting scholars, post-doctors, assistants, and students. We have established several major research techniques 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 STM/AFM systems either in vacuum or in liquid; 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 strongly correlated phenomena at the atomic scale on exotic materials, such as graphene, topological

insulators, and iron-based superconductors, 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 last year's research accomplishments are summarized in the following:

1. We have written a review article on the quantum size effect associated with ultra-thin metallic films. This article summarizes our collected studies on this specific subject for the last few years. The quantum phenomena described include quantum well states, transmission resonance, and Gundlach oscillations. (J. Phys. D: Appl. Phys. **43**, 013001 (2010))

2. We demonstrate a high-resolution friction profiling technique using synchronous atomic/lateral force microscopy (AFM/LFM). The atomic resolution is achieved by our special carbon nanotube (CNT) probes made via *in situ* tailoring and manipulation inside an ultra-high vacuum transmission electron microscope (UHV TEM). This tip delivers the nanotribology study within two graphite layers by the LFM measurement on graphite and renders the possibility of discerning a spatial shift between the atomic points and local friction maxima. We believe this is the origin of atomic friction on the sub-nanonewton scale. (Nanotechnology **21**, 055702 (2010))

3. We have successfully positioned a single silver nanoparticle along the length of a carbon nanotube based resonator, and investigated the resonance frequency shift subject to the particle's position, as shown in the figure below. A curve derived from the classical continuum model can fit well to the experimental data, implying the applicability of the analytical formula even in the nanometer range. (Applied Phys. Lett. **97**, 133105 (2010))



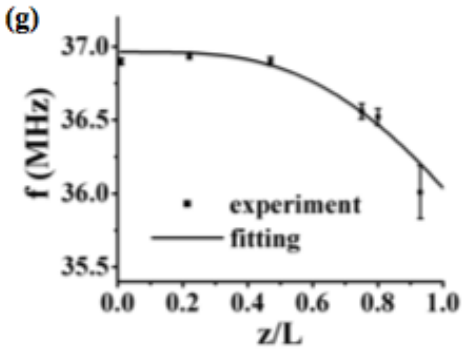


FIG. (a) The transmission electron micrograph of a CNT resonator. (b) – (f) The CNT with an attached Ag nanoparticle at 113 nm, 242 nm, 382 nm, 407 nm, and 474 nm away from the bottom fixed end. (g) Measured resonance frequency shift of the fundamental mode due to the attached nanoparticle position. Error bars indicate the ranges spanned by the resonance frequency during the measurements.

4. We have successfully used ultrahigh resolution full-field transmission x-ray microscopy to observe detailed phenomena during the potentiostatic copper electrodeposition on polycrystalline gold. We detected two coexisting cluster populations with different sizes. Their growth behaviors are different, with a shape transitions only occurring for large clusters. These differences influence the micromorphology and general properties of the overlayer. (Applied Phys. Lett. **97**, 033101 (2010))

5. We demonstrate that high-resolution imaging in water with a soft contact between the tip and the sample can be achieved with the frequency-modulation torsional resonance (FM-TR) mode atomic force microscopy (AFM). This mode is very sensitive to the contact of the tip with the sample surface. The tip applies very small normal and lateral forces on the surface. In addition, even a long and compliant AFM cantilever can achieve a high quality factor and a high resonant frequency for the torsional oscillation in water. This mode is very suitable for future development of high sensitivity, high resolution, high-speed AFM for study of dynamic biological processes in liquid. (Nanotechnology **21**, 065710 (2010))

6. We have successfully established a platform combining an AFM system with an optical microscope. As the picture showed below, the AFM head is combined with the objective lens of the Olympus BX51 optical microscope. The AFM lens module has a DVD optical pickup head (OPU) as the detection optical path of an AFM tip, and has a PZT plate as the excitation component for the AFM tip. The nano scale 3D topography of the sample surface can be measured by this AFM module.

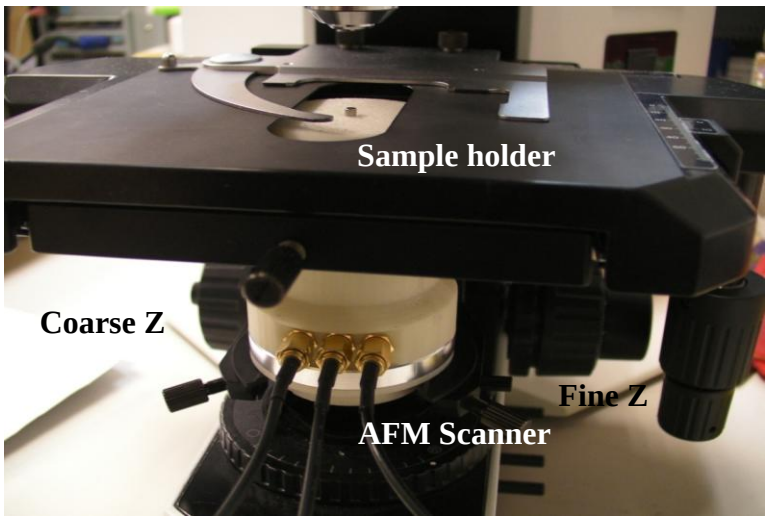


Photo of the AFM scanner module that combined with the optical microscope

(2) Nanomaterial and low temperature physics

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 including 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 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 sample fabrication facilities for thin film and single crystal materials. 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.
- We have studied the structural phase transitions and spin dynamics in Fe-based high Tc superconductors. Major research achievements：

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

We have developed a high-pressure thermal-relaxation microcalorimeter. It integrates our thermal-relaxation microcalorimeter with a pair of diamond anvils, covering the temperature range of 0.3-30 K and applied pressure up to 20 Kbar.

2. Measuring system for electrical and thermal transport properties of a single nanowire

A single nanowire is suspended in vacuum with its two ends in contact with the substrate for thermal insulation. By applying the 3ω method, the intrinsic thermal and transport properties of the nanowire can be studied. The results on a single Ni nanowire (√= 200 nm and L= 10 um) have been reported (Applied Physics Letter).

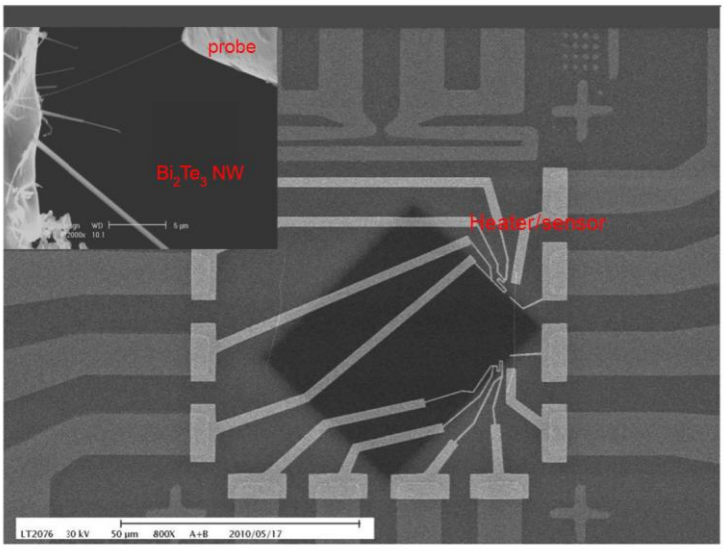


FIG. The scanning electron microscope (SEM) image of the Bi_2Te_3 NW with dimensions 100 nm×180 nm×20 μm, the Bi_2Te_3 NW was suspended above a groove on a Si/ Si_3N_4 substrate.

3. Fabrication and characterization of electrodeposited bismuth telluride films and nanowires (J. Phys. Chem. C **114**, 3385 (2010))

To elucidate low-dimensional effects on thermoelectric materials, bismuth telluride film and nanowires array were fabricated by potentiostatically electrodeposition. Both materials are slightly Te-rich, n-type Bi_2Te_3, exhibiting preferred orientation in rhombohedral strcture. Both Seebeck coefficient S ~ -70 ⌈V/K at 300 K decreases linearly with decreasing temperature, showing a diffusive nature of current flow. The

temperature dependence of resistivity (=1/) of nanowires obtained from the data of a nanowires array and a single-nanowire reveals a better electric conductivity than that of the bulk. By coupling temperature-dependent thermal diffusivity and heat capacity data with a modified effective medium theory, a thermal conductivity of 0.75 W/m K was obtained at 300 K. These parameters provide an estimated thermoelectric figure of merit ZT = $S^2T/$ of 0.45 at T = 300 K and likely to reach beyond 0.9 above 350 K for Bi_2Te_3 nanowires.

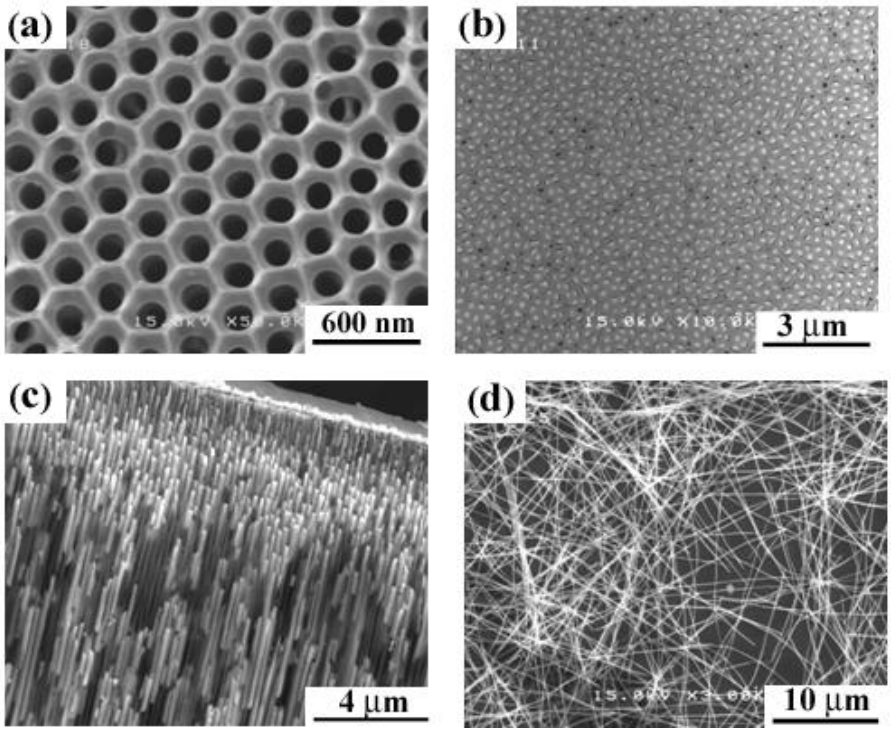


FIG. Scanning electron micrographs of AAM and Bi_2Te_3 nanowires array. (a) Highly ordered nanopores in AAM. (b) Top view of Bi_2Te_3 nanowires array. (c) Side view of Bi_2Te_3 nanowires array partially embedded in AAM. (d) Separated nanowires after AAM being dissolved.

4. Graphene electronics

The current density can be expressed as $J = \sigma E + \alpha(-\nabla T)$. In a finite 2-dimentional electron system under intense magnetic field, there exists edge currents within a distance of magnetic length to the system boundary. The calculations based on edge current model give quantized Hall conductivity σ_{xy} and a universal value for the transverse thermoelectric conductivity α_{xy} that has not been fully demonstrated in experiment. Taking advantage of the unusual chiral Fermionic property in graphene, the quantum Hall regime can extend to relatively high temperatures as shown in figure 1. We then performed detailed electric and thermal transport measurements to determine α_{xy} in bilayer graphene device shown in the inset of the figure 1. In high

magnetic field, α_{xy} reaches a peak value of $\alpha_{xy,p}$ whenever the chemical potential lies in the center of a Landau Level (LL). We uncovered that $\alpha_{xy,p}$ is practically linear in T at low T giving $\alpha_{xy,p}$ /T=0.19 nA/K^2 independent of field, temperature and LL index as shown in figure 2. At high T, it saturates to a value close to the predicted universal value of 4x(ln2)k_Be/h according to the edge current model. In addition, the lifting of spin-degeneracy in bilayer graphene under a moderate field makes it a likely system for the phase of counter-propagating edge channels with opposite spin that may be closely related to the observed anomaly near the charge neutral point. (Phys. Rev. B **82**, 121406(R), 2010)

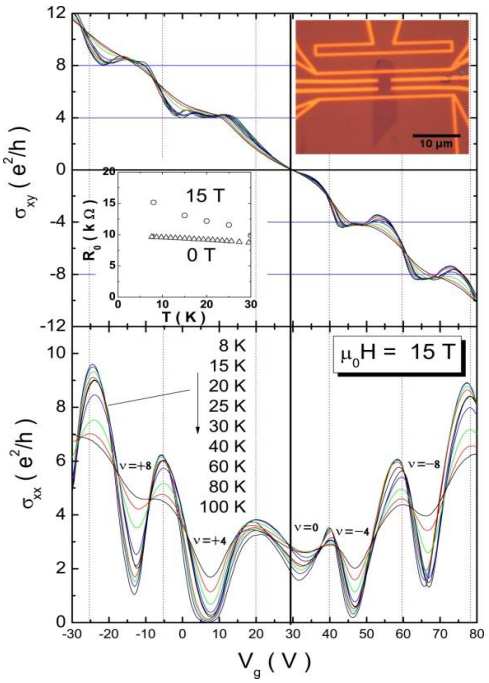


FIG. 1 V_g dependence of σ_{xy} and σ_{xx} at temperatures ranging from 8 to 100 K. An optical image of the device is shown in the upper-right inset. The middle inset plots the sheet resistance at CNP R_0 vs T at 15 T (circle) and 0 T (triangle).

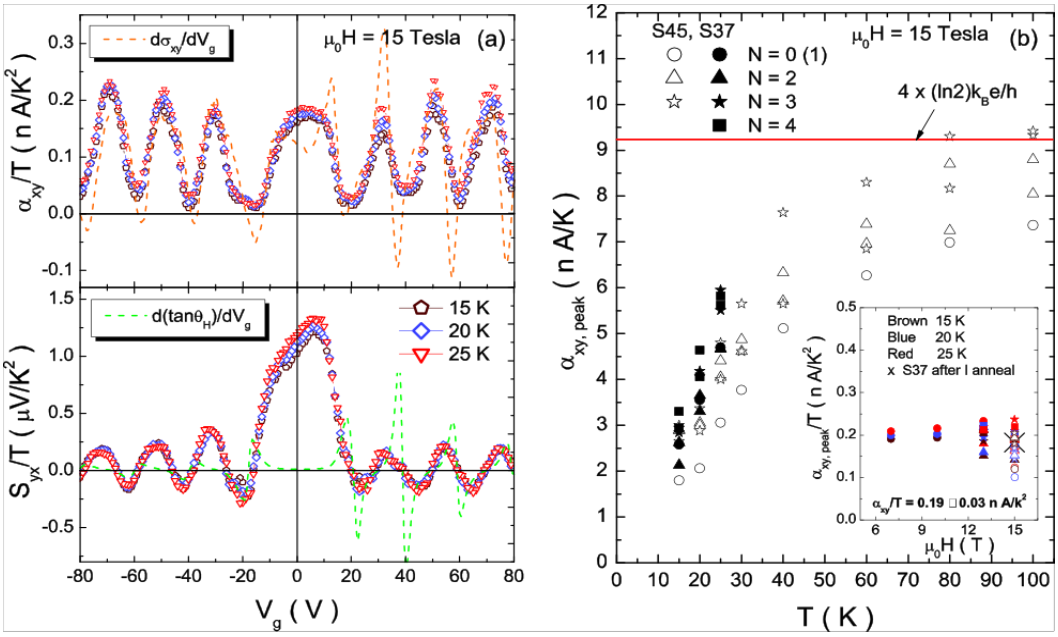


FIG. 2 V_g dependence of α_{xy}/T (upper panel) and S_{yx}/T at 15 T and three temperatures T =15 K (pentagon), 20 K (diamond), and 25 K (triangle). The orange (upper) and green (lower) dashed lines represent the Mott relation fits from $d\sigma_{xy}/dV_g$ and $d(\tan\theta_H)/dV_g$, respectively. (b) shows the T dependence of $\alpha_{xy,peak}$ at 15 T and different LLs N=0(1) (circle), 2 (triangle), 3 (star), and 4 (square). The lower-right inset plots the $\alpha_{xy,peak}/T$ vs $\mu_0 H$ with data points sharing the same symbols as (b).

5. In situ real-time investigation of cancer cell photothermolysis mediated by excited gold nanorod surface plasmons (Biomaterials **31**, 4104-4112, 2010)

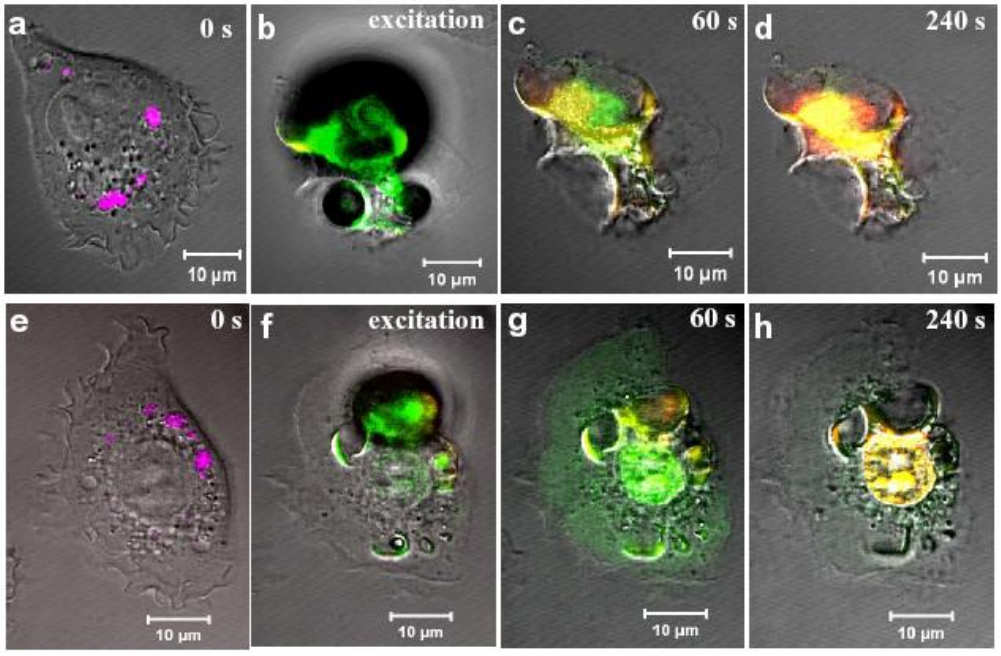


FIG. Photothermolysis of the EMT-6 tumor cell triggered by Au NRs under different

energy fluences. (a) to (d) 113 mJ/cm^2; (e) to (h) 93 mJ/cm^2.

The photothermolysis of living EMT-6 breast tumor cells triggered by gold nanorods with two-phonon irradiation was observed *in situ* real-time process. The morphological features and plasma membrane permeability of cells are the key indicators to exhibit the phenomena. The biocompatible gold nanorods with aspect ratio =3.92, having a longitudinal absorption peak at 800 nm, displayed excellent two-photon photoluminescence images. The in situ real-time results showed that the cavities inside cells were created by thermal explosion triggered by Au NRs localized photothermal effect. The cavitation dynamics was energy dependent and responsible for the perforation or sudden rupture on plasma membrane. The energy threshold for cell therapy was significantly depended on the number of nanorods taken up per cell. For uptake number of Au NRs clusters N~10-30 per cell, it is found that energy fluences I larger than 93 mJ/cm^2 led to an effective cell death in the crumble form in a very short period, however, for lower energy level I =18 mJ/cm^2 but with N~60-100 a non-instant but progressive dying process was explored.

6. Doping-driven structural phase transition and loss of superconductivity in M_xFe$_{1-x}$Se$_\delta$ (M = Mn, Cu)

We have reported the results of detailed studies on Mn and Cu substitution to Fe site of β-FeSe, namely, $Mn_xFe_{1-x}Se_{1-\delta}$ and $Cu_xFe_{1-x}Se_{1-\delta}$ (δ equals to 0.03–0.05 based on our neutron-diffraction refinements). The results show that with only 10 at. % Cu doping the compound becomes a Mott insulator. Detailed temperature-dependent structural analyses of these Mn- and Cu-substituted compounds show that the structural transition, which is associated with the changes in the building block $FeSe_4$ tetrahedron, is essential to the occurrence of superconductivity in β-FeSe.

7. Mossbauer spectroscopy of spin dynamics in $Mn_xFe_{1-x}Se_{0.85}$ superconductors: Evidence for an incommensurate-spin-density-wave state

In the tetragonal crystalline structure of $Mn_xFe_{1-x}Se_{0.85}$, the magnetic state contains low- and high-spin Fe2+, with high-spin numbers equal to that of the combined Mn substitute and Se deficiency atoms. The state is pinned by “spin-hopping” around substitution centers via high-spin ↔ low-spin conversions. During the structural distortion from tetragonal to orthorhombic, from 90 K to 70 K, the rate of spin conversions increases and the iterant character of the magnetic state is enhanced. In the orthorhombic structure, the spin dynamics evolve into an incommensurate spin-density wave (ISDW). Excitations of the ISDW decrease with temperature and

level out across the superconducting phase. The ISDW appears to have more than one oscillation mode and contributions from high-order harmonics.

(3) Spintronics, magnetic nanostructures and magnetotransport properties

1. 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 characteristic 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. In addition to the traditional magnetization reversal induced by external magnetic fields, the current density can be very high in nano-structures and the associated spin transfer torque and momentum transfer torque can also induce magnetization reversal by coherent rotation or by the formation of domain walls.

We systematically studied the relation between the critical current density of the spin transfer torque and the spin diffusion length in the current-perpendicular-to-plane magnetic trilayer nano pillars. In the current-in-plane geometry, as the interest in small width wires with higher areal density rises, the effects of edge roughness becomes more important. We studied on the scale we can control by electron-beam lithography, on the order of 10 to 80 nm, the magnetization reversal and domain wall speeds etc. and found a characteristic length below which no obvious effect on the domain wall speed and reversal behavior was observed. These results have been published in Applied Physics Letters. Other research directions involving the study of resonant dynamic behaviors and of domain wall movements are also on-going.

2. Magnetic semiconductor nanoparticles

This work was started by introducing magnetic impurities (Mn, Co etc.) into the semiconductor (Ge) by co-sputtering and co-evaporating. However we have found that pure Ge may still possess magnetism even without any magnetic impurities. By carefully checking with many related articles, it is believed that the magnetism in Ge might be due to the quantum size effect. Based on this assumption, two methods have been used to prepare Ge nanoparticles, nanosphere lithography and inert gas condensation. In the first method, Ge nanostructures were prepared by thermally evaporating pure Ge material to deposit different thick Ge layers (from 1 to 20 nm) on

top of polystyrene nanospheres with different sizes (from 20 to 500 nm). The size of Ge nanostructures was influenced by both the layer thickness and the size of nanospheres. The measured magnetization was dependent on both the size as well as the distance among Ge nanostructures. In the second method, Ge nanoparticles were prepared by collecting nanoparticles from a liquid nitrogen cooled metal plate in an inert gas atmosphere (He pressure from 0.001 to 1 Torr). Nano-sized amorphous Ge nanoparticles with sizes of about 2 – 20 nm have been prepared. By collecting Ge nanoparticles at different locations on the metal plate, the inter-particle distance was able to be varied. With the inter-particle distance less than the particle size, room-temperature magnetizations were measured. The magnetization was declined dramatically when the particle size or the inter-particle distance were increased. The distinct room-temperature ferromagnetism in Ge nanoparticles was attributed to the quantum size effect and the magnetic coupling among nanoparticles. The surface effect or the dopant effect on the magnetic properties has been investigated by capping a layer on top of the Ge nanostructures. The magnetization has been enhanced by capping different materials (Si, Al, Ag, Au, Cu). Partial results have been published recently in Applied Physics Letters (APL **90**, 182508, 2007 and APL **91**, 82505, 2007) and Advanced Materials. These results are interesting and should be important however many details are still needed to be discovered, such as the structure effect on the magnetism of nanoparticle, the magnetic coupling among nanoparticles, and the contribution of the capping materials. Recently we have tried to investigate the variations of the structure of the Ge nanoparticles by post-annealing. To do the heat-treatment, we have to deposit Ge layers on silica nanospheres because polystyrene nanospheres are afraid of heat. Indeed we have found that the magnetism in Ge nanosprticles was varied with the post-annealing temperatures. It seems that the nanostructure also has distinct effect on the magnetism in Ge nanoparticles. We are using transmission electron microscopy and other available tools to analyze the structure of Ge nanoparticles at different post-annealing temperatures. Hopefully we will clarify the effect of the size and the structure on the magnetism of Ge nanoparticles very soon. A similar result has also been revealed in Si nanoparticles with less pronounced magnetism. The effect of size and structure on the magnetism of Si nanoparticles is under investigated with even more precaution since it is even more difficult. Now we are trying to repeat every step over again to make sure of their consistency. During this period we have also tried to investigate other different nanoparticles, such as carbon, tin, lead, antimony, bismuth, cooper, silver, aluminum, with the same kind of processes. However the magnetism in these nanoparticles was either absent or too small to be detected. The topic of the magnetism in nanoparticles will be continued for some time until every detail has

been completely resolved.

3. FeCoGa/Si(100)

Continuation of last year's work: we made a series of FeCoGa films on Si(100) substrates, and studied their magnetic, electrical, and structural properties. Comparing with the corresponding data in the same series of FeCoGa films, but deposited on glass substrates, we found the following interesting results. First, we concluded that the magnetostriction behaviors, when using the Si(100) substrates, are in general better than when using the glass substrates. That means the saturation magnetostriction of the former should be larger than the latter. Second, the coercive force of the former is also larger. Third, the FeCoGa/Si(100) films are highly (110) textured. The major difference is that in these FeCoGa/Si(100) films, the (200) peak is lacking, or very weak. Finally, we still believe that the $Fe_{62}Co_{19}Ga_{19}$ alloy in the thin-film form should give the optimal magneto-elastic, electrical, and other mechanical properties.

4. Large area nanostructured thin films prepared by nanosphere lithography using monolayer polymer/nanosphere hybrid

We have developed an approach to prepare large array nanostructured thin films using monolayer of polymer/nanosphere hybrid as a template. By tuning the antidot

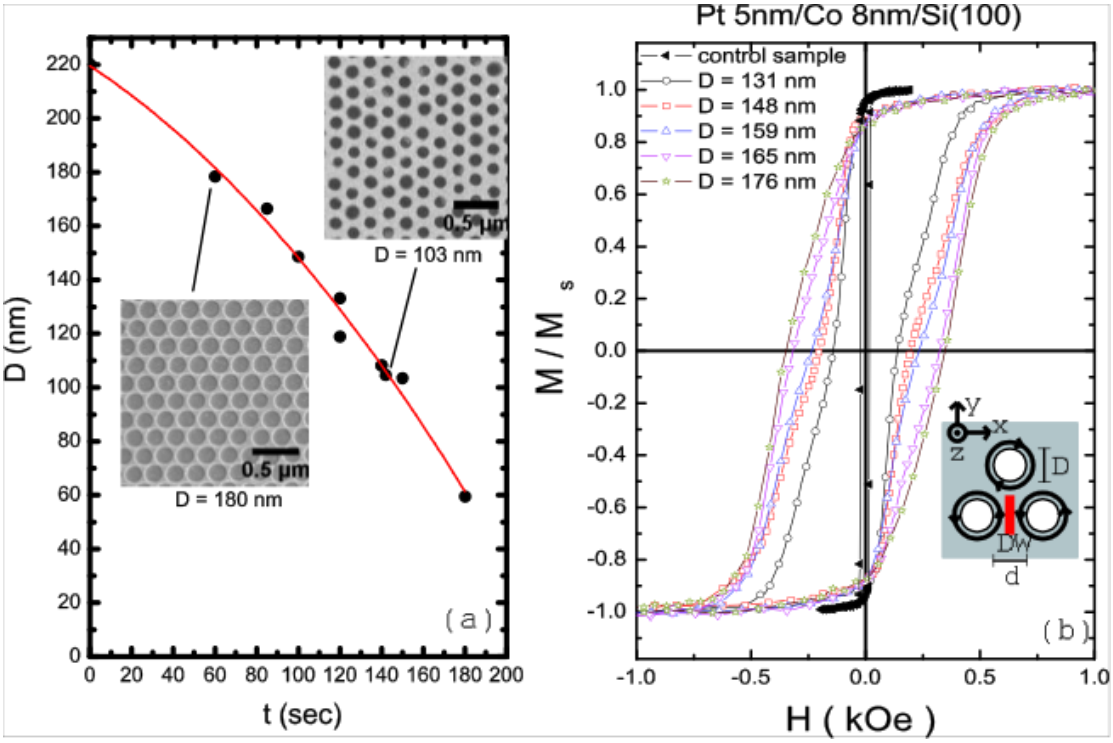


FIG. (a) Nanosphere diameter D as a function of oxygen ion etching time. The upper and lower inset shows the SEM images of cobalt antidot thin films with antidot diameter D equals 103 and 180 nm, respectively. (b) Normalized magnetization vs in-plane field H for a series of Pt(5nm)/Co(8 nm)/Si(100) antidot thin films with five different values of antidot diameter D and one control sample. The inset illustrates the vortex state configuration for D<160 nm.

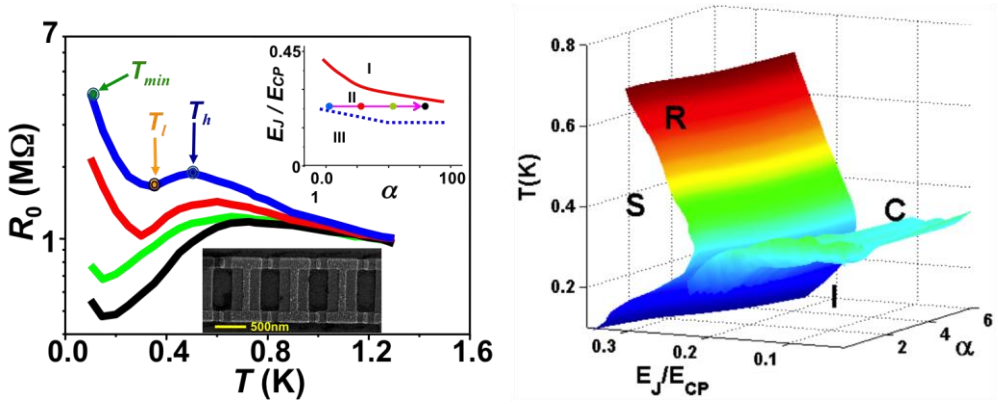
diameter D in the cobalt thin films, we found a crossover behavior in the magnetization reversal process shown in the figure 3 that may suggest the existence of the magnetic vortex state for D < 160 nm. In addition, the effective moment per cobalt atom turns out to drop with growing antidot diameter which effectively increases the surface to bulk volume fraction. Our results suggest a tendency of reduced saturation magnetization in a ferromagnet/normal metal interface, where the mixing of itinerant electrons with ferromagnetic d electrons can give rise to observable effect. (Appl. Phys. Lett. **96**, 122504 (2010))

(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. Effect of electromagnetic environment on the dynamics of charge and phase particles in one-dimensional arrays of small Josephson-junctions

The effect of electromagnetic environment on the dynamics of quasiparticles, Cooper-pairs and phase particles in one-dimensional arrays of small Josephson-junctions is investigated experimentally and theoretically. It is found that the

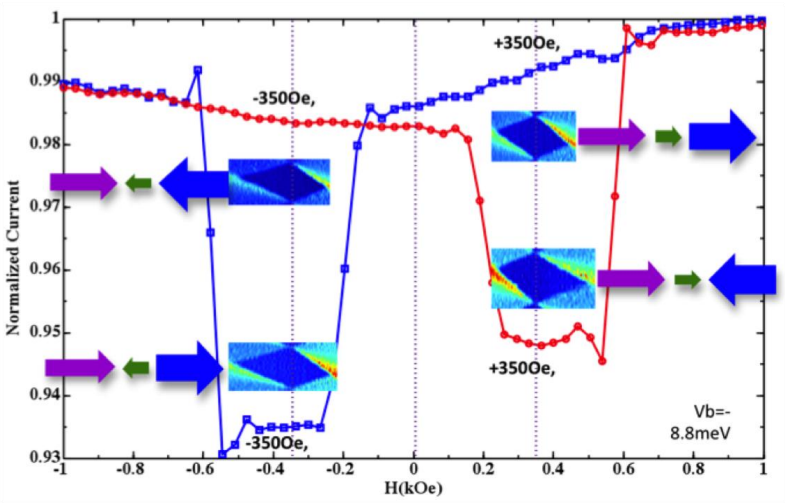


(left) Quasi-reentrant $R_0(T)$ traces at increasing ⟨ values for an array with E_J/E_{CP}=0.23. ⟨α1/Z_{env} is the inverse of the environment impedance. E_J and E_{CP} are Josephson coupling energy and Cooper pair charging energy, respectively. The arrows denote three temperature points, T_h, T_l and T_{min}, and the dashed curves mark ⟨-dependences of T_h (blue) and T_l (orange). The corresponding ⟨-values are indicated in the inset. Plotting T_h and T_l as a function of E_J/E_{CP} and ⟨ yields the 3D phase diagram

environment enhances the phase ordering and thus suppresses quasiparticle tunneling at high temperature and localization of Cooper pairs at low temperature. The dynamics is studied in the context of phase-charge duality, and the experimental results are quantitatively analyzed in both charge-ordered and phase-ordered regimes. Based on these analyses, a 2D low-temperature phase diagram as well as a 3D finite-temperature phase diagram are constructed and compared to the experimental diagrams.

2. Interfacial spin accumulation induced polarized Coulomb blockade diamonds

We observed an anisotropic tunneling magnetoresistance in Co/Al_2O_3/NiFe/Al_2O_3/Co all-ferromagnetic single electron transistors. The switching of magnetization occurs at a parallel magnetic field between 200Oe and 500Oe, allowing us to measure Coulomb blockade diamonds at ±350Oe in different magnetization configurations. It is found that depending on the configuration the Coulomb blockade diamonds are significantly asymmetric in respect to zero bias voltage. A plausible mechanism which takes into account spin accumulation is proposed.



Tunnel magneto-current observed on a device with 2.5nm thickness of alumina tunnel barrier at 4K. Since there is only one transition in a giving direction of magnetic field, it implies that only two electrodes make switching of magnetization orientation. The current is high in parallel alignment configuration and small in antiparallel alignment configuration. Small insets at each four stages display Coulomb diamond diagram (i.e. conductance intensity plot as a function of Vb and Vg.

(5) Theoretical condensed matter physics

This group consists of three faculty members and more than 15 postdoctors, visiting scholars and research assistants including graduate and undergraduate students. The major research topics are: strongly correlated electronic systems, including high temperature and unconventional superconductors; electronic structures of transitional-metal oxides such as multi-ferroics; properties of nano-materials, including graphene, carbon nano-ribbons, modeling of STM tips; surface science; general theory of quantum-many particle systems at low temperatures, in particular ultra-cold gases; development of numerical techniques: Quantum Monte Carlo method for correlated electron systems, numerical methods for image reconstruction from X-ray diffraction data, ab initial calculations of material properties.

1. Research in high temperature superconductors

Following our long term effort to understand the low energy phase of high temperature superconductors, recently we have studied the formation of stripe-like states in the t-J type models. In 2008 we found that these stripe states almost have the same energy as the uniform d-wave superconducting state. By using a variational Monte Carlo approach with this recently proposed stripe wave function, we showed that the strong correlation included in a *t*-*J*-type model has essentially all the necessary ingredients to form these stripes with modulations of charge density, spin

magnetization, and pair field. If a perturbative effect of electron-phonon coupling to renormalize the effective mass or the hopping rate of holes is considered with the model, we find the half-doped stripes, which has on the average one half of a hole in one period of charge modulation, to be most stable energetic wise in the underdoped region, with doping concentration between 1/12 and 1/8. This is in good agreement with the observation in the neutron-scattering experiments. We also find long-range Coulomb interaction to be less effective in the formation of half-doped stripes. (Phys. Rev. B **81**, 060503(R) (2010))

2. Research in thermopower of graphene

We systematically calculate thermopower of biased and unbiased multilayer graphene systems. The effect of screening to a bias field perpendicular to the graphene planes is taken into account self-consistently under the Hartree approximation. The model including nearest-neighbor hopping and the more general Slonczewski- Weiss-McClure model are both considered for a comparison. The effect of impurity scattering is studied for monolayer and unbiased/biased bilayer graphene and is treated in terms of the self-consistent Born approximation. For a monolayer graphene, only when the effect of impurity scattering is taken into account, could all the qualitative aspects of the experimental results be correctly reproduced. Besides bilayer graphene, only trilayer graphene opens a small gap and shows a slight enhancement of thermopower under an external bias. The biased bilayer graphene shows the largest thermopower among all the systems studied.

3. *Ab Initio* calculation studies

a. 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))

b. TbMnO3 and DyMnO3: This multiferroic material is a very hot topic in recent years. In cooperation with experimentalists in NSRRC and CCMS-NTU, we investigated the electronic structures of TbMnO3 and DyMnO3. We found the orbital ordering pattern similar to that of LaMnO3. The obtained orbital ordering is presumably responsible for the bonding anisotropy observed in x-ray spectroscopy. (Appl. Phys. Lett. **91**, 054108 (2007), Appl. Phys. Lett. **94**, 044105 (2009), PRB **81**,

201102(R) (2010), PRB **82**, 094442 (2010), J. Chemical Phys. 154510 (2010))

c. 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), J. Phys.: Cond. Matter **21**, 195602 (2009))

d. Be(1010) and Mg(1010) Pb/Ge(111): In cooperation with ARPES experiments we investigated the surface states (SS) and surface resonances of Be(1010) and Mg(1010) surfaces, and quantum well state of Pb/Ge(111). The SS of Be(1010) reside in the large projected bulk band gaps from A to G, while the SS of Mg(1010) 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. We also calculated the heavy hole, light hole, and split-off bands in Ge(111). They are related to the stronger spin-orbit interactions in Ge. The quantum well state of Pb thin films on Ge(111) are also analyzed in this workd. (Phys. Rev. B **77**, 045405 (2008), PRB **80**, 085419 (2009), Appl. Phys. Lett. **96**, 103106 (2010), PRB 81, (2010))

e. Armchair graphene nanoribbons: Using three different theoretical approaches including analytic analysis, dynamical mean field renormalization group method, and first-principles calculations, we found an 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 experiment. (Phys. Rev. B **79**, 035405 (2009))

f. C60/Cu(111): PES and ARPES experimentalists performed in NSRRC and STS measurements carried out in CCMS-NTU show the huge charge transfer and strong band shift in C60 monolayer over Cu(111) sustrate. These interesting behavoier has never been reported before. The mechanism is not clear. By building an interface reconstruction model that each C60 molecule digs 7 Cu atoms out of the surface layer over the 4x4 Cu supercell, we calculated the electronic structure of the reconstructed system. The calculated results shows huge charge transfer of ~3e/C60 and a strong band shift of ~0.3eV showing a nearly half-filled LUMO band consistent well with PES and STS results. The great success indicate that the

interesting behavior observed in experiments originated from the interface reconstruction which is called as structure-doping or self-doping. (Phys. Rev. Lett. **104**, 036103 (2010))

g. W(111) Single Atom Tip: Single-atom tips are not only important of scanning tunneling microscopy (STM) but are also of current interests for producing coherent bright electron beams in a Field electron emission mode. They can greatly improve the resolution of electron microscopy. Recently Prof. I. S. Hwang in Academia Sinica has successfully developed a new, simple, and easily reproducible method of preparing single-atom tips by electroplating Pd or Pt on singlecrystal W(111) tips followed by thermal annealing in a vacuum. They found this tip highly thermal stable with an extra peak at about 0.8 eV below the Fermi level, which is absent in traditional W tip. We have studied the electronic structures of the single atom tip from first principles. We found high stabilities of this single atom tip. The calculated results also show that the single atom tip exhibits an extra peak at about 0.7 eV below the Fermi level. The origin of the extra peak is the strongly reduced dimensions at the pyramid tip, while the peak position is related closely to the chare transfer from sublayers up to the tip atom. (Phys. Rev. B **81**, 155424 (2010))

4. Research in cold atomic gases

We studied quantum magnetism of spinor Bosons in optical lattice. Novel magnetic phases have been predicted. In particular, for spin-2 bosons in a one-dimensional lattice, we found three possible phases: ferromagnetic, dimerized, and trimerized phases. Besides plotting the general phase diagram, we identify the corresponding phases for realistic spin-2 elements. We also consider the behavior of Bose-Einstein condensate under artificial gauge fields. We showed that there are many possible ground states, depending on the details of the potentials and interparticle interactions. Bose-Einstein condensation can occur in finite wavevector states, or standing waves, depending on parameters. We also study multi-component Fermi gases of ^{171}Yb (spin-1/2) and ^{173}Yb (spin-5/2). Due to the interspecies attractive interaction, it is possible that this mixture can have interspecies Cooper pairing. The equilibrium order parameter is identified, and interesting Goldstone modes dispersion relations are calculated.

5. 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 vorticies, interfaces and Josephson junctions. Topological classification of superconductors has been

pointed out. Properties of the bound states at vortex cores, surface states, spin currents etc have been studied. Contributions to spin currents from topological surface bound states and non-topological continuum states are distinguished.

(6) Computational physics

1. 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. B **76**, 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)). Then a new alignment method is developed (Phys. Rev. B **79**, 052102 (2009)) which could be used for 3D reconstruction when there are only few projections available.

In 2010 together with our experimental partners we report quantitative 3D imaging of a whole, unstained cell at a resolution of 50–60 nm by X-ray diffraction microscopy (Fig. 1). We identified the 3D morphology and structure of cellular organelles including cell wall, vacuole, endoplasmic reticulum, mitochondria, granules, nucleus, and nucleolus inside a yeast spore cell. Furthermore, we observed a 3D structure protruding from the reconstructed yeast spore, suggesting the spore germination process. Our contribution in this work is that we provided two theoretical tools for image reconstruction: the GHIO method and the new alignment algorithm mentioned above. These methods help to achieve improved resolution with only 25 projections used. (*PNAS* **107**, 11234 (2010)).

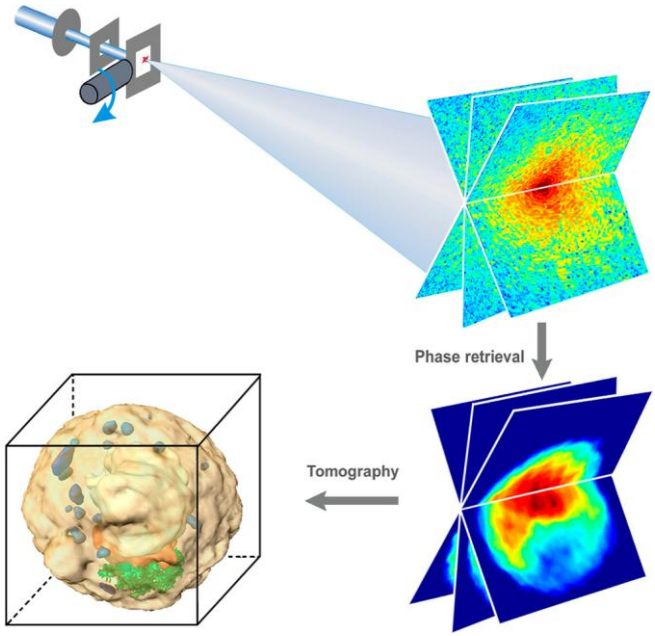


FIG.1. Schematic layout of the 3D X-ray diffraction microscope. A 20 μm pinhole and a guard slit were used to define a clean X-ray beam. Oversampled diffraction patterns, measured on a CCD camera, were directly phased to obtain 2D projectional images. The 3D image of a whole cell was reconstructed from the set of 2D projectional images by a tomographic method.

The same coherent diffraction image technique also can be used with electron source. This year we report a work using a three-dimensional electron CDI. We experimentally determine the morphology of a single MgO nanocrystal using the Bragg diffraction geometry. An iterative algorithm is applied to invert the 3D diffraction pattern about a _200_ reflection of the nanoparticle measured at an angular range of 1.8°. The results reveal a 3D image of the sample at _8 nm resolution, and agree with a simulation. Our work demonstrates an alternative approach to obtain the 3D structure of nanocrystals with an electron microscope. (Applied Phys. Lett. **96**, 221907 (2010)).

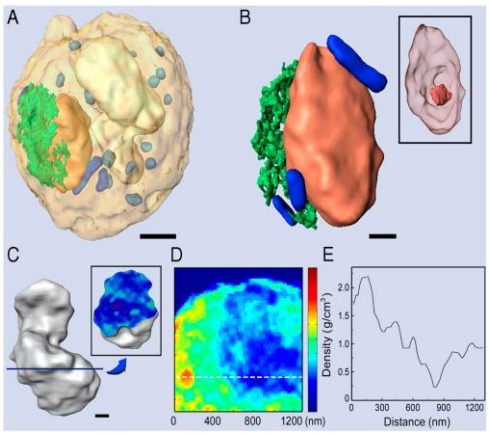


FIG. 2. Three-dimensional visualization of the cellular organelles inside the yeast spore cell. (A) A 3D volume rendering of the reconstructed yeast spore, showing nucleus (orange), ER (green), vacuole (white), mitochondria (blue), and granules (light blue). (Scale bar: 500 nm.) (B) Zoomed view of the 3D morphology and structure of the nucleus, ER, and mitochondria. Inset shows the nucleolus (orange). (Scale bar: 200 nm.) (C) A 3D morphology and structure of the vacuole. Inset shows a cross-sectional image of the vacuole. (Scale bar: 200 nm.) (D and E) A thin slice of the reconstructed yeast spore and a line scan along the dashed line, showing the density variation across a mitochondrion and the vacuole.

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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 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 and Solid Systems

Mixing of slurry in rotating drum

We study the effects of interstitial fluid viscosity on the rates of dynamical processes in a thin rotating drum half-filled with mono-disperse glass beads. The rotating speed is fixed at the rolling regime such that a continuously flowing layer of beads persists at the free surface. While the characteristic speed of a bead in the flowing layer decreases with the fluid viscosity η, the mixing rate of the beads is found to increase with η. These findings are consistent to a simple model related to the thickness of the flowing layer. In addition, our results indicate a possible transition from the inertial limit regime to the viscous limit regime (reported previously by S. Courrech du Pont et al. [Phys. Rev. Lett. 90, 044301, 2003]) when the Stokes number is reduced. (Kiwing To).

Traveling shock front in quasi-two-dimensional granular flow

While the density profile of a granular shock front can be obtained by the conventional treatment of supersonic fluids, its temperature profile is very different from that in ordinary shocks. We study the density and temperature profiles of a traveling granular shock generated by piling up metal spheres in a closed bottom quasi-two-dimensional channel. We successfully account for the temperature profile in the granular shock using a simple kinetic theory in terms of energy transfer from the mean flow direction to the transverse direction. Contrary to ordinary fluids and previous granular shock experiments, the granular shock width is found to increase with the inflow rate. (Kiwing To).

Granular gas, granular flow and granular chain

We have set up an experimental system to study the response of a chain subjected to a non-uniform vibration of its substrate. Depending on the state of vibration, the motion of a chain, typically consisting of eight loosely connected metallic beads, can exhibit either directional preference against or towards the increase of vibration, or sensitivity on the

modes of excitation which can flip from time to time. In many cases, the directional motion has a well-defined migration velocity determined by its local state of vibration, and can work against a finite tilting of the substrate. By the use of high-speed dual-imaging and computer-aided particle tracking, we are able to obtain the time-resolved 3D trajectories of individual beads at a wide range of frame rates, in order to assess the mechanism behind the directional migration. We plan to proceed with not only systematic experiments on this phenomenon over a range of control parameters, but also theoretical analyses, in order to further understand this gradient-induced directionality and its implication on other physical systems. (J.C. Tsai and W.T. Juan)

Jamming under shear

Mechanical properties of systems of closely packed granular materials are not only of practical importance but also of fundamental interests in the physics of jamming. Together with the IoP of Beijing, we have set up experiments to understand the scaling of yield points of such systems under a shear. We find that the yield stress of the closely packed granular systems increases with the layers of granular materials used to build up the system; until there are more than about 20 layers of granular beads. This nonlinear mechanical behavior might be related to the jamming properties of the system with different physical size. We are in the process of measuring the hysteresis of the yield stress to study the importance of friction in the jamming properties of such systems. (C. K. Chan)

Fracture by residual stresses in solid

Issues of pattern selection and the associated statistical properties were considered by means of a comprehensive theoretical analysis and simulations of a discrete spring-block model. The model describes the nucleation and propagation of cracks in a layer of solid material on a substrate. We characterized the events prior to cracking by a growth of correlation in the stress field, and those during cracking by progressive damages manifested in the number of broken bonds and energy releases. A host of scaling behaviors in measurable quantities were derived and verified, consistent with experiments. Our results explain why morphologically similar patterns may occur over a diverse length scale. (K.-t. Leung)

(2) Statistical and Computational Physics Approach to Complex Systems

Laboratory of Statistical and Computational Physics (LSCP, website: http://proj1.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: 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 used phase statistics to classify human ventricular fibrillation signals into three types and found that one of them is fatal. 10. We found that velocity distribution of monomers in the system of non-equilibrium polymer chains follows q-statistics and polymer chains tend to aggregate when the bending-angle and torsion-angle dependent potentials have
0 and very small interaction strength. 11. A lattice model has been used to find that the probability of a protein sequence appearing in an aggregated conformation can be used to determine the temperature at which the protein can aggregate most easily. (Chin-Kun Hu and Ming-Chya Wu)

(3) Biology-Inspired Physics

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. In the past years, we have been setting up multi-electrode array (MEA) systems to study these phenomena. With both spatial and temporal resolution of the MEA system, we find that the spontaneous firing in a neuronal network with glia can be changed from spikes synchronized to only burst synchronized when the

culture density is increased. This last finding indicates the importance (non-synchronized spikes) of extra-synaptic components of the excitation in systems with glia. Our result suggests that extra-synaptic glial release is important in high density neuronal cultures. (C. K. Chan).

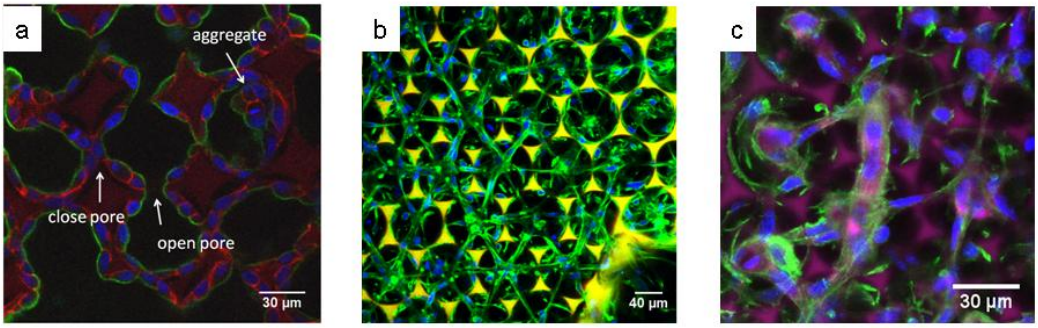
Actin-base locomotion manifested in *Listeria monocytogenes* and protein coated beads and disks were studied in a field-theoretic, coarse-grained model. The dynamical model describes the balance of forces and torques generated by actin polymerization and depolymerization at the peripheral of the disk-like object. Linear stability analyses identify a transition between stationary and linear moving states. Under certain conditions, the linear moving state was further shown to be unstable to lead to a host of curved trajectories that were seen in experiments. (K.-t. Leung).

(4) Morphology and Organization of Tissue Cells in 3D Ordered Cellular Solids

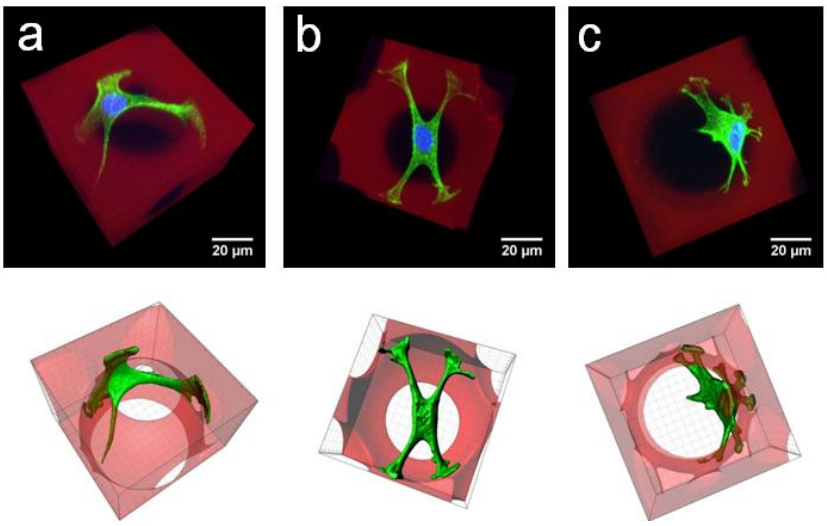
Creating a three-dimensional (3D) microenvironment for use as a scaffold that mimics the structure of the tissue source and directs cells to organize into a functional tissue has been a grand challenge for tissue engineers. Here, we invert the common paradigm and instead investigate how cells from different tissue types organize themselves in ordered cellular solids containing identical spherical pores. We demonstrate a new method to fabricate scaffolds of ordered cellular solids with tunable solid fraction and pore size. A monodisperse liquid foam containing scaffold material was first generated through a flow-focusing microfluidic device in which the bubble size and air fraction were controlled by varying the liquid flow rate and the air pressure. The collected liquid foam self-assembled in a crystalline order that congealed into solid foam with closed pores, which subsequently changed to the open-pore solid foam following degassing. Finally, the open-pore solid foam was used as a cell culture scaffold by seeding cells inside the pores.

We found that cells preserve their original characteristics, and some exhibit new morphologies not observed on 2D substrates. Three distinct cell types were cultured under these conditions and displayed appropriate physiological, morphological, and functional characteristics. Figure 1 shows that MDCK epithelial cells formed cyst-like structures and were polarized inside pores and C2C12 myoblasts adopted a tubular structure and fused into myotubes. 3T3 fibroblasts exhibited wide varieties of morphologies depending on their location inside the scaffolds (Figure 2). Our findings shed light on 3D cell organization and promote systematic study of mechanical factors

in tissue engineering and mechanobiology. (Keng-hui Lin)



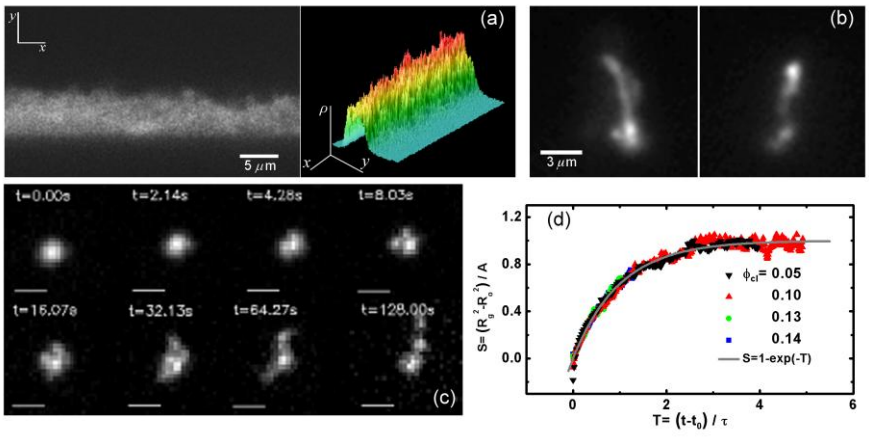
(a) MDCK epithelial cells form cyst-like confluent monolayers when grown in a scaffold with pores 70 m in diameter. Nuclei (blue) were stained with DAPI. Apical membranes (green) were labeled with an antibody against GP135, an apical antigen[17]. Basolateral domains (bright red) are marked with E-cadherin tagged with ds-Red proteins. The arrows indicate several possible topological scenarios besides confluent monolayer on the wall for MDCK cells – closed and open "cysts" at the pores as well as aggregates. C2C12 cells cultured in scaffolds with uniform pores adopted distinct morphologies before (b) and after (c) exposure to differentiation medium. Multiple nuclei (blue) were visible within the thick tube, evidence of myotube fusion.



3D-rendered (top) and reconstructed (bottom) images of the diverse morphologies exhibited by fibroblasts grown on a scaffold with 65- m pores. Nuclei were stained with DAPI (blue), actin was stained with phalloidin (green), and the scaffold was labeled with fluorescein (shown as red). The rendered images (top) were created by maximum intensity projection and the reconstructed images (below) were created by extracting the isosurfaces of the cell bodies and scaffolds from the intensities of the green and red channels, respectively. (a) Most of the cell body is attached to the wall of the spherical pore (sticker). (b) The cell straddles the pore with "legs" of similar size (stretcher). (c) The cell body is supported away from the wall by many small pseudopods (squatter).

(5) Single Molecule Studies of Highly Confined Biological Macromolecules

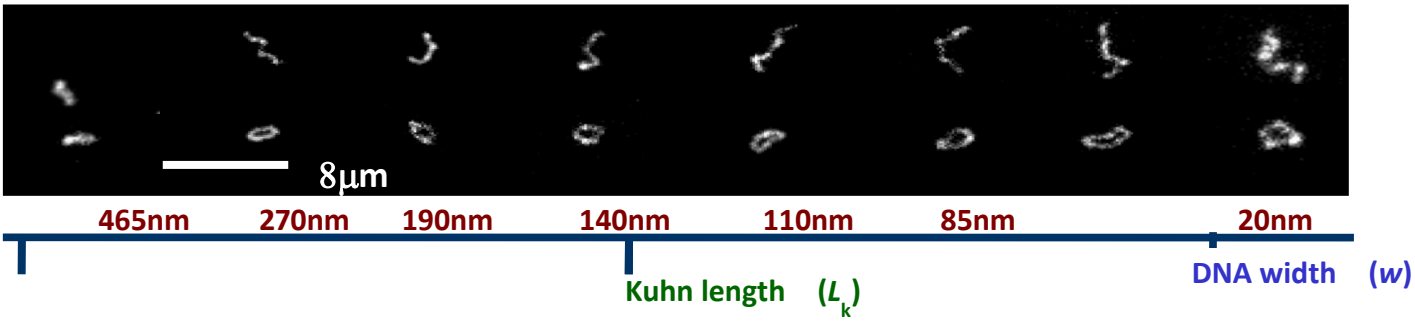
The idea of confining long-chain macromolecules to surfaces has always intrigued polymer scientists. Although lots of efforts have been made in the studies of bulk characters of confined polymer chains, our knowledge on these molecules at microscopic level is still very limited. Our research interests 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. However, the ensemble averaged spreading of the adsorbed polymer coils can be rescaled into a simple master curve regardless of the detailed polymer-membrane interactions. 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).

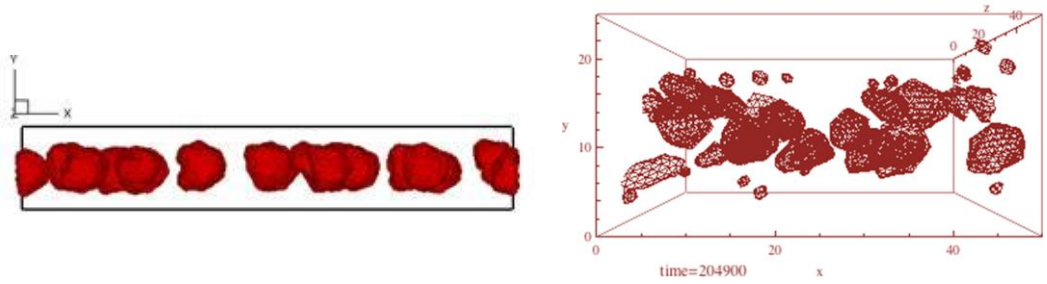


(a) Dye labeled DNA brushes and the corresponding monomer density distribution. (b) Typical conformation of individual molecules inside the brush layer. (c) The swelling process of the DNA molecule after the adsorption. The scale bar is 2 μm. (d) Ensemble averaged swelling curves of adsorbed DNA on membranes with different cationic lipid concentrations ϕ_{cl}.

(6) Dynamics of Biological Macromolecules and Complex Fluids

We are interested in the dynamics and conformation of soft particles such as DNA, proteins, and cells in solution. Such systems are applicable to the study of cardiovascular diseases, the development of high throughput and high sensitivity biomedical diagnostics, and nano-material processing. Our focuses are on the development of theoretical and computational methods to investigate (i) dynamics of large, micron-sized, DNA in microchannel flow, (ii) the flow of soft deformable cells in microcirculation, (iii) the thermodynamics and dynamics of semi-flexible DNA molecules in nanochannels. Our studies have revealed hydrodynamic, entropic, and electrostatic mechanisms to manipulate DNA/protein/cell particles in small systems. (Yeng-Long Chen)





Size and shape dependence of lambda-phage DNA confined in nanoslits of different heights, relative to the DNA radius of gyration, Kuhn length, and width (top). Soft particle solution driven by flow through a small channel (bottom left). Binary soft particle mixture separated by pressure-driven microfluidic flow in a large channel (bottom right).

(7) Hydrodynamics and Atmospheric Physics

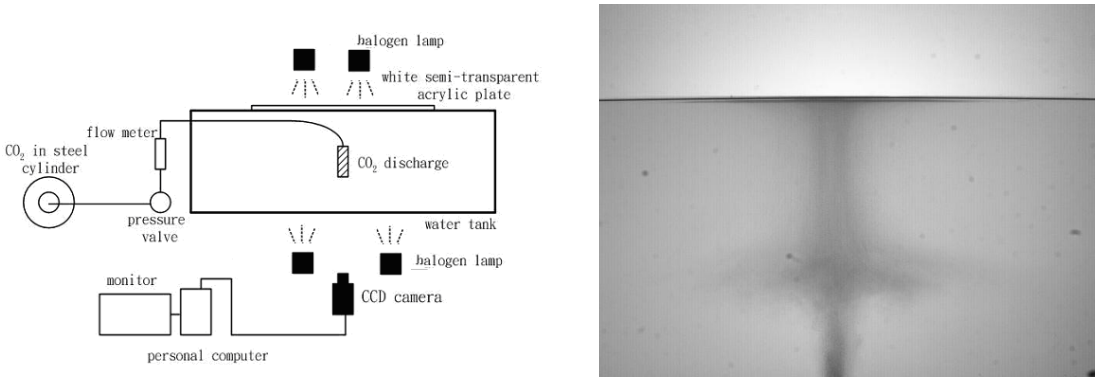
The green house effect of the earth is mainly caused by the increase of carbon dioxide.

To slow down the global warming, it is necessary to decrease discharging carbon dioxide into the atmosphere. Since our country, Taiwan, all of the fossil power plants are located beside the coastal region. It is a feasible way to collect the discharged carbon dioxide, and sequestrate it in the ocean water column. Study results of the behaviors of carbon dioxide discharge into the ocean will be helpful for conducting the carbon dioxide sequestration in the ocean.

After discharging CO_2 gas into the water, the carbon dioxide bubble plume is formed. We conducted experimental observations on the CO_2 bubble plume behaviors in the homogeneous and two-layer density stratified waters in the water tank. The CCD (Charged-Coupled Detector) digital camera was used to grab the images. The digitized images of CO_2 bubble plume were processed with the MPIV (Matlab Particle Image Velocimetry) software to yield the results of CO_2 bubble plume velocity.

For CO_2 bubble plume in homogeneous sea water column, the observed results reveal that the bubble plume upward velocity increases as increasing the source discharging strength. When the density of ambient sea water decreases, the bubble plume upward velocity increases. The bubble plume width becomes wider as the source discharging strengths increases. As the ambient sea water density increasing, the bubble plume width becomes wider.

For two layer density stratified sea water column, the CO_2 bubble plume intrusion occurs and is observed around the interface region between two different density layers of sea water column. Results of analysis reveal that the averaged bubble plume intrusion length is longer when the discharged source strength increases. As the density difference of two layers of sea water column increases, the averaged intrusion length of the bubble plume is shown to be longer. (Bao-Shi Shiau).



Plane view of schematic diagram of experimental set-up (left). Averaged image of carbon dioxide bubble plume in two-layer density stratification sea water column (right).

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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 and Others

(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

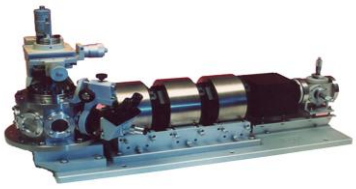
C. Theoretical Nuclear Physics

(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

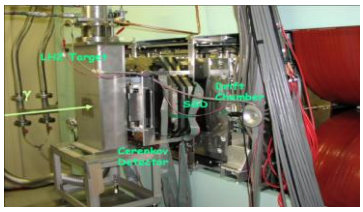
We have an on-site facility of 3 MV (NEC 9SDH-2) tandem accelerator which was installed in 1989. Since then the accelerator became an important facility for experimental research in accelerator based atomic and applied physics. The accelerator system has two negative ion sources, SNICS for solid source 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.

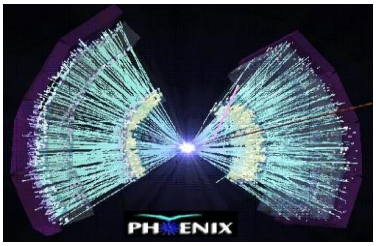
As for the high energy nuclear experiment, we participate at two international projects: SPring-8 LEPS experiment (Fig. 2) and BNL PHENIX experiment (Fig. 3). Photon beam with maximum energy up to 2.5 GeV can be generated from the backward Compton-scattering of incident eV laser photons with 8 GeV electrons 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



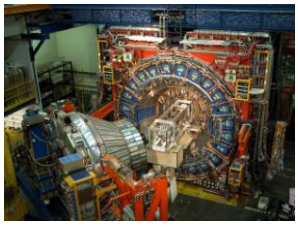


BNL PHENIX experiment

(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.

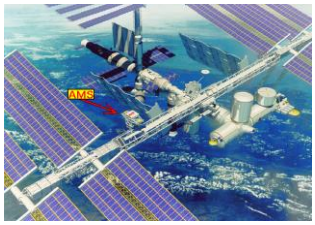


1: Insertion of the silicon track into the CDF II detector.

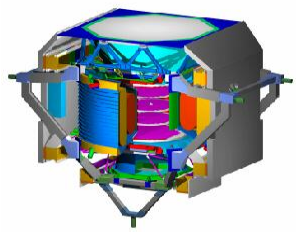
2: Silicon tracker read out Port Card mounted with the "Dense Optical Interface Modules" (black chips with optical filbers)

(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.

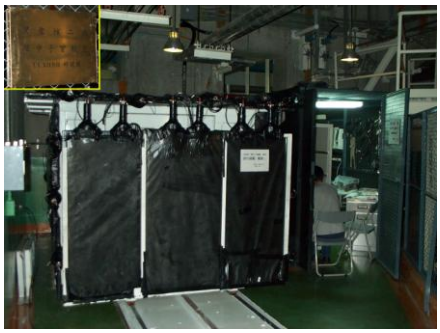
Wong said. The results of international collaborations such as the Super-Kamiokande in Japan and Sudbury Neutrino Observatory in Canada gave the Taiwan project what Wong described as a "positive impact."

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 experiement. 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.

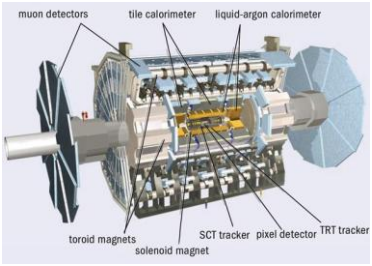


3. The shielding and control room at the Kuo Sheng Neutrino Laboratory.

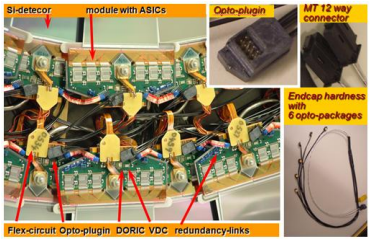
(D) The CERN LHC ATLAS experiment

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.

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III

List of Ongoing Research Projects

List of Ongoing Research Projects

中央研究院物理研究所98-100年度計劃清單一覽表

(2009 年 8 月 ~ 2011 年 7 月)

主持人	計　劃　名　稱	執 行 期 間	計 劃 編 號
黃英碩	奈米級像散式量測系統之開發	2006.12.01 - 2009.11.30	NSC95-3114-P-001-008-MY3
李世昌	AMS-02熱控系統研製、測試及運作計畫	2007.01.01 - 2009.11.30	NSC96-2745-P-001-001-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 - 2010.07.31	NSC96-2911-M-001-001-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
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 - 2010.07.31	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
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
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
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

主持人	計　劃　名　稱	執行期間	計劃編號
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
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
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
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
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
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
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
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
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
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
鄭海揚	重味物理之探討	2008.08.01 - 2011.07.31	NSC97-2112-M-001-004-MY3
余海禮	量子重力研究	2008.08.01 - 2011.07.31	NSC97-2112-M-001-005-MY3

主持人	計　劃　名　稱	執行期間	計劃編號
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
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
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
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
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
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	行政院衛生署
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 - 2010.07.31	NSC98-2631-H-001-016
陳洋元	透明導電薄膜(ITO)物性量測分析	2009.04.01 - 2010.03.31	卓韋光電股份有限公司
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
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 - 2010.10.31	NSC98-2119-M-001-025

主持人	計　劃　名　稱	執行期間	計劃編號
陳志強	A study of the Dynamics of slime mould	2009.07.01 - 2010.02.28	98-2815-C-001-003-M
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
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
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
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

主持人	計　劃　名　稱	執行期間	計劃編號
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
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
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
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 - 2011.04.30	NSC98-2120-M-001-007-CC2
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 - 2011.04.30	NSC98-2120-M-001-007-CC2(嘉原科技)
李湘楠	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
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
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

主持人	計　劃　名　稱	執行期間	計劃編號
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
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
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
蔡日強	顆粒流的相變行為	2009.12.01 - 2012.07.31	NSC98-2112-M-001-026-MY3
吳茂昆	奈米國家型科技計畫—衛生署99年度相關研究計畫管考及100年度計畫徵求、審查	2010.01.01 - 2010.12.31	行政院衛生署
吳茂昆	奈米國家型科技計畫辦公室運作計畫(Ⅱ)	2010.01.01 - 2011.03.31	NSC99-3113-P-001-002-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—數位典藏與學習之海外推展暨國際合作計畫-總計畫	2010.01.01 - 2011.04.30	NSC99-2631-H-001-025
胡宇光	台法國合計畫-發展X光螢光顯微應用於腫瘤血管新生之研究	2010.01.01 - 2012.12.31	NSC99-2112-M-001-001-MY3
陳洋元	透明導電薄膜(ITO)物性量測分析	2010.04.01 - 2011.03.31	卓韋光電股份有限公司
林誠謙	參與全球網格永續發展EGI-InSPIRE計畫(1/4)	2010.05.01 - 2011.07.31	NSC99-2923-I-001-001
林誠謙	參與歐盟European Middleware Initiative研發計畫	2010.05.01 - 2011.07.31	NSC99-2923-I-001-003
林誠謙	參與歐盟Desktop Grids全球科學合作計畫(1/2)	2010.06.01 - 2011.08.31	NSC99-2923-I-001-002

主持人	計　劃　名　稱	執行期間	計劃編號
李世昌	參與全球e-Science合作架構、建立所需國際網路連線與e-Science亞洲中心維運	2010.06.301 - 2011.12.31	NSC99-2119-M-001-001
鄭弘泰	過渡金屬氧化物之電荷軌域有序化與多鐵電性研究及奈米系統之電子結構研究	2010.08.01 - 2011.07.31	NSC99-2112-M-001-030
李世昌	參與ATLAS實驗搜尋新物理現象-10暨以精密磁譜儀探測宇宙中之反物質及暗物質-10	2010.08.01 - 2011.07.31	NSC99-2119-M-001-015
侯書雲	強子對撞之雙玻子生成與新物理現象搜尋暨高速光纖電子系統之開發與Super LHC實驗升級之應用	2010.08.01 - 2011.07.31	NSC99-2119-M-001-017
王嵩銘	CDF實驗Higgs boson搜尋與準備LHC研究分析所需要的工具	2010.08.01 - 2011.07.31	NSC99-2119-M-001-018
林誠謙	高能物理網格計算與分析核心平台之建置與研發	2010.08.01 - 2011.07.31	NSC99-2119-M-001-019
章文箴	核子中奇異夸克含量和反夸克分佈不對稱性之測定	2010.08.01 - 2011.07.31	NSC99-2119-M-001-020
黃榮鑑	波與流環境對射流場之影響研究	2010.08.01 - 2011.07.31	NSC99-2221-E-001-022
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)(3/3)	2010.08.01 - 2011.07.31	NSC99-2627-M-001-001
黃英碩	以原子力顯微術探討水與固體界面計畫設備	2010.08.01 - 2011.07.31	NSC99-2738-M-001-003
陳洋元	以奈米科技研發高ZT熱電材料以為能源之應用(3/3)	2010.08.01 - 2011.07.31	NSC99-2120-M-001-001
張嘉升	北台灣奈米科技核心設施服務計畫-中央研究院(2/3)	2010.08.01 - 2011.07.31	NSC99-2120-M-001-003
胡宇光	從人類到細胞中的奈米等級生醫影像：發展下一世代的技術和應用(1/3)	2010.08.01 - 2011.07.31	NSC99-2120-M-001-006
胡進錕	統計與非線性物理之學術研究與會議(2/3)	2010.08.01 - 2011.07.31	NSC99-2911-I-001-006

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(2/3)	2010.08.01 - 2011.07.31	NSC99-2911-I-001-008
張嘉升	建立自然科學學門/學域研究績效評估機制Ⅱ(總計畫暨子計畫一)	2010.08.01 - 2011.07.31	NSC99-2114-M-001-002
王子敬	台灣微中子實驗-以超低能探測器研究低能區微中子物理與找尋暗物質	2010.08.01 - 2013.07.31	NSC99-2112-M-001-017-MY3
林耿慧	三維有序多孔性材料的力學性質及在生物上應用	2010.08.01 - 2013.07.31	NSC99-2112-M-001-022-MY3
陳志強	神經網路結構與動力行為之動態反饋研究	2010.08.01 - 2013.07.31	NSC99-2112-M-001-026-MY3
周家復	Dynamics and detection of polyelectrolytes in micro/nano confine ment with external electric fields—聚電解質於微奈米流道內交	2010.08.01 - 2013.07.31	NSC99-2112-M-001-027-MY3
黃英碩	以原子力顯微術探討水與固體界面	2010.08.01 - 2013.07.31	NSC99-2112-M-001-029-MY3
李尚凡	自旋極化電流的產生與偵測-鐵磁共振與自旋轉移力矩的研究	2010.08.01 - 2013.07.31	NSC99-2112-M-001-031-MY3
李偉立	薄石墨片元件的傳輸特性研究	2010.08.01 - 2013.07.31	NSC99-2112-M-001-032-MY3
陳啟亮	運用x-光光譜研究分析強相關聯系統材料之電子與原子結構與磁性特性	2010.08.01 - 2013.07.31	NSC99-2112-M-001-036-MY3
吳茂昆	新穎超導體及超導機制研究-總計畫及子計畫一：鐵晒超導物理機制研究與新鐵基超導探索	2010.08.01 - 2013.07.31	NSC99-2112-M-001-028-MY3
吳茂昆	奈米國家型科技計畫研發成果第二年度產學橋接計畫	2010.12.01 - 2011.11.30	NSC99-2120-M-001-007
陳洋元	「2010臺北國際花卉博覽會」紅火蟻偵測犬防治計畫	2011.01.01 - 2011.04.30	臺北市政府產業發展局
吳茂昆	台以國合計畫—奈米尺度探索新鐵基超導體奈米材料(台以合作)	2011.01.01 - 2012.12.31	NSC100-2923-M-001-002-MY2

主持人	計　劃　名　稱	執行期間	計劃編號
胡進錕	台斯國合計畫—以計算方法研究生物聚合物的結構、摺疊與交互作用	2011.01.01 - 2013.12.31	NSC100-2923-M-001-003-MY3

IV

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V

Academic Activities

Attendance in International Conference
中研院物理所九十九年度出席國際會議表
(2010年1月 ~ 2010年12月)

研究人員名稱	學術會議名稱	會議時間	出席任務
林烜慶	IEEE 2010國際奈米電子學會議 IEEE 2010 International NanoElectronic Conference (INEC)	2010-01-03 ~ 2010-01-08	Oral
林誠謙	Grid Deployment Board	2010-01-13 ~ 2010-01-13	受邀參加工作委員會
張良君	第11屆磁性及磁性材料年會 11th Joint Magnetism and Magnetic Materials–Intermag	2010-01-18 ~ 2010-01-22	Poster
呂德輝	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
廖國棠	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
張哲維	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
張弘志	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
林勃劭	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
林孟賢	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
林政明	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
林銘洲	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster

研究人員名稱	學術會議名稱	會議時間	出席任務
江政祥	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Main Organizer
洪敏玲	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Main Organizer
海耳倫	The First International Workshop on Computational Biophysics(IWCBP-1)	2010-02-01 ~ 2010-02-05	參加會議
藍彥文	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
許哲瑋	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
賴威廷	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
陳柏端	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
陳虹穎	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
黃建勝	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
黃立維	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-05	Poster
林興德	第五屆「超越標準模型之粒子物理、宇宙學暨天文物理」國際研討會 Fifth International Conference on Beyond the Standard Models of Particle Physics, Cosmology and Astrophysics	2010-02-01 ~ 2010-02-06	Invited Speaker
王立群	2010 International Winter School: Beyond Moore`s Law	2010-02-01 ~ 2010-02-06	Poster

研究人員名稱	學術會議名稱	會議時間	出席任務
胡進錕	The First International Workshop on Computational Biophysics(IWCBP-1)	2010-02-03 ~ 2010-02-06	Invited Speaker
林誠謙	APAN29 – Sydney	2010-02-07 ~ 2010-02-11	參與APAN會員會議
廖先順	日本奈米科技展覽會 Nano Tech 2010 International Nanotechnology Exhibition&Conference	2010-02-17 ~ 2010-02-19	參展
胡恩德	日本奈米科技展覽會 Nano Tech 2010 International Nanotechnology Exhibition&Conference	2010-02-17 ~ 2010-02-19	參展
李湘楠	量子力學新前沿–奇異強子系統與密物質 New Frontiers in QCD 2010-Exotic Hadron Systems and Dense Matter	2010-02-10 ~ 2010-02-22	Invited Speaker
林耿慧	美國生物物理年會 Biophysical Society Meeting	2010-02-20 ~ 2010-02-24	Poster
陳彥龍	Gordon Research Conference on Colloidal, Macromolecular & Polyelectrolyte Solutions	2010-02-21 ~ 2010-02-26	Poster
侯書雲	Astro-Particle and Conformal Topical Physics 2010	2010-02-23 ~ 2010-02-27	Invited Speaker
安良煥	YongPyong Astro-Particle and Conformal Topical Physics 2010	2010-02-23 ~ 2010-02-27	Poster
蕭佑國	YongPyong Astro-Particle and Conformal Topical Physics 2010	2010-02-23 ~ 2010-02-27	Invited Speaker
王嵩銘	Rencontres de Physique de la Vallee d`Aoste	2010-03-04 ~ 2010-03-05	Invited Speaker
李定國	本院100年度新增主題研究計畫數理組及生命組複審會議	2010-03-12 ~ 2010-03-13	代表中研院學諮會參與會議

研究人員名稱	學術會議名稱	會議時間	出席任務
鄭弘泰	10th Japan-Korea-Taiwan Symposium	2010-03-11 ~ 2010-03-13	Invited Speaker
陳啟亮	the 10th Japan-Korea-Taiwan Symposium	2010-03-11 ~ 2010-03-14	Poster
劉鏞	地球與太空會議(第12屆國際會議) EARTH & SPACE CONFERENCE	2010-03-14 ~ 2010-03-17	Invited Speaker
吳茂昆	2010 March Meeting of the American Physical Society	2010-03-14 ~ 2010-03-17	Invited Speaker
周家復	2010美國物理年會 March Meeting,2010	2010-03-15 ~ 2010-03-19	Oral
張人方	2010 美國物理年會 2010 APS March Meeting	2010-03-15 ~ 2010-03-19	Oral
張嘉升	美國物理年會 2010March Meeting ,APS	2010-03-15 ~ 2010-03-19	Oral
李偉立	美國物理學會2010年三月會議 American Physical Society 2010 March Meeting	2010-03-15 ~ 2010-03-19	Oral
李定國	美國物理年會 APS March Meeting	2010-03-15 ~ 2010-03-19	Session Chairman
林伯耕	2010 美國物理年會 2010 APS March Meeting	2010-03-15 ~ 2010-03-19	Oral
金書正	美國物理年會 APS March Meeting 2010	2010-03-15 ~ 2010-03-19	Oral
陳彥龍	2010 美國物理年會 Annual March Meeting of the American Physical Society 2010	2010-03-15 ~ 2010-03-19	Oral

研究人員名稱	學術會議名稱	會議時間	出席任務
黃斯衍	2010美國物理年會 The 2010 March Meeting of the American Physical Society	2010-03-14 ~ 2010-03-19	Oral
吳茂昆	The Aymposium for Research Award Winners of Alexander von Humboldt	2010-03-18 ~ 2010-03-21	參與者
胡進錕	Japan – Taipei –Poland Heart Rhythm Symposium	2010-03-27 ~ 2010-03-27	Oral
李定國	1st ANR-NSC meeting on X-Ray nano-tomography of angiogenesis	2010-03-29 ~ 2010-03-31	Oral
楊重熙..等3人	第1屆台法X光奈米血管斷成攝影成相會議 1st ANR-NSC meeting on X-Ray nano-tomography of angiogenesis	2010-03-26 ~ 2010-03-31	Invited Speaker
胡宇光	第1屆台法X光奈米血管斷成攝影成相會議 1st ANR-NSC meeting on X-Ray nano-tomography of angiogenesis	2010-03-29 ~ 2010-03-31	Invited Speaker
鄭嘉良	第1屆台法X光奈米血管斷成攝影成相會議 1st ANR-NSC meeting on X-Ray nano-tomography of angiogenesis	2010-03-26 ~ 2010-03-31	Invited Speaker
顏家瑞	第1屆台法X光奈米血管斷成攝影成相會議 1st ANR-NSC meeting on X-Ray nano-tomography of angiogenesis	2010-03-28 ~ 2010-03-31	Invited Speaker
何宜道	5th EGEE User Forum	2010-04-12 ~ 2010-04-15	參加會議展示模擬程式
林誠謙	5th EGEE User Forum	2010-04-12 ~ 2010-04-15	參加會議
林誠謙	LHC Resources Review Boards	2010-04-19 ~ 2010-04-21	參加會議
吳茂昆	Inauguration of the Work of Art Galileo Galilei Divine Man	2010-04-28 ~ 2010-04-28	Invited Speaker

研究人員名稱	學術會議名稱	會議時間	出席任務
張忠傑	2010國際冶金與鍍膜會議 The International Conference On Metallurgical Coatings And Thin Films	2010-04-26 ~ 2010-04-30	Oral
陳大坤	2010國際冶金與鍍膜會議 The International Conference On Metallurgical Coatings And Thin Films	2010-04-26 ~ 2010-04-30	Oral
孫允斌	European Geosciences Union General Assembly 2010	2010-05-02 ~ 2010-05-07	Poster
林誠謙	2010 CloudAsia	2010-05-03 ~ 2010-05-07	Keynote Speaker
胡進錕	Editorial Board of EPL meeting	2010-05-07 ~ 2010-05-08	出席會議
林誠謙	Grid Deployment Board	2010-05-12 ~ 2010-05-12	參加會議
楊志文	第12屆掃針顯微術國際研討會 The 12th International Scanning Probe Microscopy Conference	2010-05-10 ~ 2010-05-12	Oral
胡恩德	第12屆掃針顯微術國際研討會 The 12th International Scanning Probe Microscopy Conference	2010-05-10 ~ 2010-05-12	Oral
李碩天	Cosmology and Fundamental Physics	2010-05-17 ~ 2010-05-19	Commentator
胡宇光	INC conference	2010-05-17 ~ 2010-05-20	Invited Speaker
林唯芳	The 10th International meeting of ISO/TC229 Nanotechnologies-Maastricht 2010	2010-05-17 ~ 2010-05-21	參與制訂會議
楊重熙	The 10th International meeting of ISO/TC229 Nanotechnologies-Maastricht 2010	2010-05-17 ~ 2010-05-21	參與制訂會議

研究人員名稱	學術會議名稱	會議時間	出席任務
葉崇傑	2010杭州量子物質研討會 2010 Hangzhou Workshop On Quantum Matter	2010-05-18 ~ 2010-05-21	Invited Speaker
蔡幸真	人文學+數位視覺化呈現研討會2010 Humanities + Digital Visual Interpretations Conference 2010	2010-05-20 ~ 2010-05-22	協助會議進行
林國平	美國博物館協會2010年會暨博物館博覽會 AAM 2010 Annual Meeting & MuseumExpo	2010-05-23 ~ 2010-05-26	評審團主席暨頒獎人
黃榮鑑	第五屆國際風工程計算學術研討會	2010-05-24 ~ 2010-05-27	Oral
李定國	the 9th International Conference on Spectroscopies in Novel Superconductors (SNS2010)	2010-05-23 ~ 2010-05-28	Oral
莫文皓	the 9th International Conference on Spectroscopies in Novel Superconductors (SNS2010)	2010-05-23 ~ 2010-05-28	Poster
趙偉祥	the 9th International Conference on Spectroscopies in Novel Superconductors (SNS2010)	2010-05-23 ~ 2010-05-28	Poster
郭景桓	HIMSS AsiaPac 2010	2010-05-26 ~ 2010-05-28	參加會議及參訪
吳茂昆	the 9th International Conference on Spectroscopies in Novel Superconductors (SNS2010)	2010-05-23 ~ 2010-05-29	Invited Speaker, Poster
周家復	International Symposium on Microchemistry and Microsystems (ISMM) 2010	2010-05-28 ~ 2010-05-30	Invited Speaker
李秉中	第29屆國際熱電會議 The 29th International Conference on Thermoelectrics	2010-05-30 ~ 2010-06-03	Poster
歐敏男	第29屆國際熱電會議 The 29th International Conference on Thermoelectrics	2010-05-30 ~ 2010-06-03	Oral

研究人員名稱	學術會議名稱	會議時間	出席任務
熊德智	第29屆國際熱電會議 The 29th International Conference on Thermoelectrics	2010-05-30 ~ 2010-06-03	Oral
陳正龍	第29屆國際熱電會議 The 29th International Conference on Thermoelectrics	2010-05-30 ~ 2010-06-03	Poster
陳洋元	第29屆國際熱電會議 The 29th International Conference on Thermoelectrics	2010-05-30 ~ 2010-06-03	Invited Speaker
章文箴	第十二屆介子核子物理和核子結構國際會議 12th International Conference on Meson-Nucleon Physics and the Structure of the Nucleon	2010-05-31 ~ 2010-06-04	Invited Speaker
吳茂昆	8th Beijing Forum on High-Temperature Superconductivity	2010-06-03 ~ 2010-06-07	Invited Speaker, Poster
阮自強	GoranFest : the joy of making physics	2010-06-09 ~ 2010-06-12	Invited Speaker
葉崇傑	WORKSHOPS - SUMMER 2010 (Aspen Center for Physic`s 49th Summer Season)	2010-06-01 ~ 2010-06-13	參與者
章文箴	第四屆山田先進光束和科學應用演進會議 The 4th Yamada Symposium on Advanced Photons and Science Evolution	2010-06-13 ~ 2010-06-18	Invited Speaker
黃振維	Jamboree on Evolution of WLCG Data & Storage	2010-06-16 ~ 2010-06-18	參加會議
李湘楠	2010物理學前沿工作月 Frontier Physics Working Month	2010-06-13 ~ 2010-06-19	Invited Speaker
王子敬	微中子物理與天文物理國際會議 XXIV International Conference on Neutrino Physics and Astrophysics	2010-06-14 ~ 2010-06-19	Invited Speaker
鄧立詩	微中子物理與天文物理國際會議 XXIV International Conference on Neutrino Physics and Astrophysics	2010-06-14 ~ 2010-06-19	Invited Speaker

研究人員名稱	學術會議名稱	會議時間	出席任務
張嘉升	NANO CENTER Annual Conference 2010	2010-06-21 ~ 2010-06-22	Invited Speaker
林誠謙	High Performance Computing, Grids and Clouds	2010-06-21 ~ 2010-06-25	Invited Speaker
鄧雅文	亞洲數位圖書館國際會議2010年會 The International Conference on Asian Digital Libraries	2010-06-21 ~ 2010-06-25	參加會議
陳雪華	亞洲數位圖書館國際會議2010年會 The International Conference on Asian Digital Libraries	2010-06-21 ~ 2010-06-25	擔任議程委員及指導委員
黃榮鑑	第二十屆國際海洋工程會議	2010-06-20 ~ 2010-06-26	Oral
黃振維	Tape Storage Experts Workshop	2010-06-28 ~ 2010-06-29	參加會議
吳建宏	第八屆國際LISA研討會 8th International LISA Symposium	2010-06-28 ~ 2010-07-02	Oral
周家復	Gordon research Conference	2010-06-27 ~ 2010-07-02	Poster
林宜欣	International Conference on Strongly Correlated Electron Systems	2010-06-27 ~ 2010-07-02	Poster
陳洋元	International Conference on Strongly Correlated Electron Systems	2010-06-27 ~ 2010-07-02	Poster
林誠謙	Karlsruhe Institute of Technology	2010-07-02 ~ 2010-07-03	參加會議
鄭海揚	第十五屆國際量子色動力學會議 15th International QCD Conference	2010-06-28 ~ 2010-07-03	Invited Speaker

研究人員名稱	學術會議名稱	會議時間	出席任務
黃振維	WLCG Daily Operation Meeting, Tape Storage Experts Workshop, Castor Internal Meeting and WLCG Tier1 Service Coordination Meeting.	2010-06-19 ~ 2010-07-06	參加會議
廖先順	IEEE/ASME 先進智慧電機國際會議	2010-07-05 ~ 2010-07-09	Oral
曾詣涵	國際原子核物理會議 2010 International Nuclear Physics Conference 2010	2010-07-04 ~ 2010-07-09	Invited Speaker
莊博景	2010國際電子電機/機械先進智慧型機電研討會 2010 IEEE/ASME International Conference on Advanced Intelligent Mechatronics	2010-07-05 ~ 2010-07-09	Oral
葉崇傑	Workshop on Emergence of New States of Matter in Magnetic Systems and Beyond	2010-07-05 ~ 2010-07-09	Oral
林誠謙	Digital Humanities 2010	2010-07-05 ~ 2010-07-10	參加會議
胡進錕	第6屆亞太動力學日國際會議(DDAP6)	2010-07-12 ~ 2010-07-14	出席會議
吳建宏	第二屆伽利略-徐光啟會議 2nd Galileo-XuGuangqi Meeting	2010-07-12 ~ 2010-07-16	Invited Speaker
杜其永	StatPhysHK: Complexity, Computation, and Information	2010-07-13 ~ 2010-07-16	出席會議
涂筱雯	StatPhysHK: Complexity, Computation, and Information	2010-07-13 ~ 2010-07-16	Poster
陳志強	StatPhysHK: Complexity, Computation, and Information	2010-07-13 ~ 2010-07-16	Oral
黃英碩	第8屆帶電粒子光學國際會議 8th International Conference in Charged Particles Optics	2010-07-12 ~ 2010-07-16	Oral

研究人員名稱	學術會議名稱	會議時間	出席任務
王嵩銘	22nd Rencontres de Blois, Particle Physics and Cosmology	2010-07-15 ~ 2010-07-20	Invited Speaker
周家復	XXIV IUPAP International Conference on Statistical Physics	2010-07-19 ~ 2010-07-23	Oral
胡進錕	第24 屆IUPAP統計物理國際會議(StatPhys 24)	2010-07-19 ~ 2010-07-23	出席會議
胡宇光	11th Epioptics School	2010-07-19 ~ 2010-07-25	Invited Speaker, Oral
吳茂昆	Long-term Impacts and Future Opportunities for Nanotechnology” US-Japan-Korea-Taiwan Workshop	2010-07-26 ~ 2010-07-27	Keynote Speaker
林唯芳	"Long-term Impacts and Future Opportunities for Nanotechnology" US-Japan-Korea-Taiwan Workshop	2010-07-26 ~ 2010-07-27	Invited Speaker
牟中原	"Long-term Impacts and Future Opportunities for Nanotechnology" US-Japan-Korea-Taiwan Workshop	2010-07-26 ~ 2010-07-27	Invited Speaker
魏金明等9名	"Long-term Impacts and Future Opportunities for Nanotechnology" US-Japan-Korea-Taiwan Workshop	2010-07-26 ~ 2010-07-27	Main Organizer
李浩斌	國際高能物理會議 2010 ICHEP 2010	2010-07-22 ~ 2010-07-28	Invited Speaker
林興德	國際高能物理會議 2010 ICHEP 2010	2010-07-22 ~ 2010-07-28	Invited Speaker
王紀科	國際高能物理會議 2010 ICHEP 2010	2010-07-22 ~ 2010-07-28	Oral
陳志強	The Conference Nonlinear Science Perspectives(PNLD2010)	2010-07-26 ~ 2010-07-29	Invited Speaker

研究人員名稱	學術會議名稱	會議時間	出席任務
李浩斌	國際黑暗物質物理會議 2010 IDM 2010	2010-07-26 ~ 2010-07-30	Invited Speaker
林興德	國際黑暗物質物理會議 2010 IDM 2010	2010-07-26 ~ 2010-07-30	Invited Speaker
吳茂昆	臺美奈米科技研討會：奈米科技與應用-臺美經驗交流	2010-07-29 ~ 2010-08-04	Invited Speaker
金艾文	2010中國同步輻射用戶年會 The 2010 Users Meeting of National Synchrotron Radiation Laboratory	2010-08-01 ~ 2010-08-05	guest
陳福榮	Microscopy &Microanalysis 2010	2010-08-01 ~ 2010-08-05	Oral
黃英碩	第13屆非接觸式原子力顯微術國際會議 13th International Conference on Non-Contact Atomic Force Microscopy	2010-07-31 ~ 2010-08-05	Oral
曾繁根	2010海峽兩岸微奈米科技研討會	2010-08-01 ~ 2010-08-07	Oral
余岳仲	第二十一屆加速器在研究與工業應用國際會議 The 21st International Conference on the Application of Accelerators in Research and Industry (CAARI 2010)	2010-08-08 ~ 2010-08-13	Oral
林誠謙	APAN30 - Asia-Pacific Advanced Network 30th Meeting	2010-08-09 ~ 2010-08-13	參與APAN會員會議
胡進錕	第四屆中-歐複雜性科學暑期研討會 The 4th Chinese-European Summer Workshop on Complex Systems	2010-08-11 ~ 2010-08-14	Oral
翁怡錚	第76屆國際圖書館協會聯盟年會 World Library and Information Congress 76th Annual Conference	2010-08-10 ~ 2010-08-15	Poster
陳雪華	第76屆國際圖書館協會聯盟年會 World Library and Information Congress 76th Annual Conference	2010-08-10 ~ 2010-08-15	Poster

研究人員名稱	學術會議名稱	會議時間	出席任務
蔡小青	中國顆粒學會第七屆（2010年）學術年會暨海峽兩岸顆粒技術研討會 Introduction of Chinese Society of PARTICUOLOGY	2010-08-15 ~ 2010-08-18	Oral
張嘉升	18th International Vacuum Congress (IVC-18)	2010-08-23 ~ 2010-08-27	Oral
林誠謙	EUAsiaGrid Review	2010-08-25 ~ 2010-08-27	參與會議
胡宇光	18th Intl. Vacuum Congress (IVC-18) joined with the 2010 Intl. Conference on Nanoscience and Technology (ICN+T 2010), the 14th Intl. Conference on Sol	2010-08-23 ~ 2010-08-27	Invited Speaker
葉崇傑	Quantum Solids, Liquids and Gases	2010-07-19 ~ 2010-08-27	Invited Speaker, Oral
周家復	The Workshop on Chemi-Thermo-EM Phoresis in Complex Fluids	2010-08-25 ~ 2010-08-28	Oral
廖國棠	The Workshop on Chemi-Thermo-EM Phoresis in Complex Fluids	2010-08-24 ~ 2010-08-28	Poster
阮自強	18th International Conference on Supersymmetry and Unification of Fundamental Interactions (SUSY 10)	2010-08-19 ~ 2010-08-28	學術交流研究討論
陳志強	Workshop on Chemi-Thermo-EM Phoresis in Complex Fluids	2010-08-25 ~ 2010-08-28	Invited Speaker
胡進錕	生物分子群集和網絡自然浮現的行為 Emergent behavior of biomolecular ensembles and networks	2010-08-15 ~ 2010-09-01	Oral,
吳茂昆	2010材料應用科技及奈米元件國際研討會	2010-09-08 ~ 2010-09-10	Invited Speaker
陳彥龍	Gordon Research Conference, Biointerface Science	2010-09-05 ~ 2010-09-10	Poster

研究人員名稱	學術會議名稱	會議時間	出席任務
黃文樺	第14屆歐洲數位圖書館會議 14th European Conference on Digital Libraries	2010-09-06 ~ 2010-09-10	參加會議
吳茂昆	奈米醫學暨永續能源科技研討會- 挑戰與機會	2010-09-11 ~ 2010-09-12	Invited Speaker,
廖國棠	亞洲奈米科技研習營 Asia Nanotech Camp 2010 (ANC 2010)	2010-10-03 ~ 2010-09-15	
郭霽慶	亞洲奈米科技研習營 Asia Nanotech Camp 2010 (ANC 2010)	2010-10-03 ~ 2010-09-15	Oral
錢家琪	2010年x奈米結構材料研討會 2010 X International Conference Nanostructured Materials	2010-09-12 ~ 2010-09-15	Oral
陳翔欣	2010年x奈米結構材料研討會 2010 X International Conference Nanostructured Materials	2010-09-12 ~ 2010-09-15	Oral
陳彥龍	IAP Conference of Young Scientists	2010-09-13 ~ 2010-09-16	Invited Young Scientist
余岳仲	第十屆歐洲加速器在研究與工業應用國際會議 The 10th European Conference on Accelerators in Applied Research and Technology	2010-09-13 ~ 2010-09-17	Invited Speaker
林誠謙	EGI Technical Forum	2010-09-14 ~ 2010-09-17	代表台灣參加會議
王錚亮	2010年X奈米結構材料研討會 2010 X International Conference Nanostructured Materials	2010-09-12 ~ 2010-09-17	Oral
伍焜玉	微血管先進影像方法研討會 Advanced Imaging Methods for Microangiogenesis	2010-09-16 ~ 2010-09-22	Invited Speaker
胡宇光	微血管先進影像方法研討會 Advanced Imaging Methods for Microangiogenesis	2010-09-16 ~ 2010-09-22	Oral, Main Organizer

研究人員名稱	學術會議名稱	會議時間	出席任務
錢家琪	微血管先進影像方法研討會 Advanced Imaging Methods for Microangiogenesis	2010-09-16 ~ 2010-09-22	Main Organizer,
陳翔欣	微血管先進影像方法研討會 Advanced Imaging Methods for Microangiogenesis	2010-09-16 ~ 2010-09-22	Main Organizer,
蕭葆義	第九屆英國風工程研討會 9th UK Conference on Wind Engineering	2010-09-09 ~ 2010-09-23	Oral,Poster
陳大坤	第十七屆國際顯微鏡會議 17th International Microscopy Congress (IMC17)	2010-09-19 ~ 2010-09-24	Poster
蘇宗粲	IUMRS ICA 2010材料國際會議	2010-09-25 ~ 2010-09-28	Oral
吳茂昆	US/ China workshop on Novel Superconductors	2010-09-27 ~ 2010-09-29	Invited Speaker
楊重熙	Final Nano2 Workshop	2010-09-30 ~ 2010-09-30	Oral
蘇宗粲	Final Nano2 Workshop	2010-09-30 ~ 2010-09-30	Oral
吳建宏	宇宙/宇宙粒子天文物理 2010 COSMO/CosPA 2010	2010-09-27 ~ 2010-10-01	Invited Speaker
周家復	HET Instrument 2010.	2010-09-30 ~ 2010-10-01	參展
吳嫻	多娜西亞腦神經雙語工作坊 Donostia Workshop on Neurobilingualism	2010-09-28 ~ 2010-10-02	Participant
郭文瑞	多娜西亞腦神經雙語工作坊 Donostia Workshop on Neurobilingualism	2010-09-28 ~ 2010-10-02	Participant

研究人員名稱	學術會議名稱	會議時間	出席任務
胡進錕	2nd Symposium on Systems and Synthetic Biology (TriSys)	2010-10-04 ~ 2010-10-06	Invited Speaker
周家復	Micro-TAS conference 2010	2010-10-04 ~ 2010-10-07	Oral, Poster
李定國	3rd WS on FEL Science	2010-10-04 ~ 2010-10-07	guest
蔡介立	第十屆德國認知科學雙年會 KogWis 2010 – The 10th Biannual Meeting of the German Society for Cognitive Science	2010-10-03 ~ 2010-10-07	Oral
呂欣明	第15屆固體薄膜和表面國際學術研討會 15th International Conference on Solid Films and Surfaces	2010-10-05 ~ 2010-10-10	Oral
蘇維彬	第15屆固體薄膜和表面國際學術研討會 15th International Conference on Solid Films and Surfaces	2010-10-05 ~ 2010-10-10	Oral
陳志強	New Horizons in Calcium Signaling	2010-10-10 ~ 2010-10-13	Poster
黃郁婷	鈣訊號前沿性國際研討會 Conference on New Horizons in Calcium Signaling	2010-10-10 ~ 2010-10-13	Poster
陳怡云	第八屆海峽兩岸電子顯微學研討會 The 8th Chinese-Taiwan Electron Microscopy Society	2010-10-08 ~ 2010-10-14	協助會議進行
王錚亮	第八屆海峽兩岸電子顯微學研討會 The 8th Chinese-Taiwan Electron Microscopy Society	2010-10-08 ~ 2010-10-15	Oral
胡宇光	第八屆海峽兩岸電子顯微學研討會 The 8th Chinese-Taiwan Electron Microscopy Society	2010-10-08 ~ 2010-10-15	Invited Speaker
金艾文	第八屆海峽兩岸電子顯微學研討會 The 8th Chinese-Taiwan Electron Microscopy Society	2010-10-08 ~ 2010-10-15	Oral

研究人員名稱	學術會議名稱	會議時間	出席任務
黃榮鑑	第九屆國際水動力學研討會 9th International Conference on Hydrodynamics	2010-10-11 ~ 2010-10-15	Invited Speaker
任盛源	美國真空學會第57屆國際年會 AVS57th International Symposium & Exhibition	2010-10-17 ~ 2010-10-22	Oral
何亞真	2010年都柏林核心集與後設資料應用國際會議 International Conference on Dublin Core and Metadata Applications	2010-10-20 ~ 2010-10-22	參與會議
彭惠萱	2010年都柏林核心集與後設資料應用國際會議 International Conference on Dublin Core and Metadata Applications	2010-10-20 ~ 2010-10-22	參與會議
李奧	AVS57th International Symposium & Exhibition	2010-10-17 ~ 2010-10-22	Poster
杜其永	第七屆全國液體和軟物質物理學術會議	2010-10-20 ~ 2010-10-23	出席會議
陳志強	第七屆全國液體和軟物質物理學術會議	2010-10-20 ~ 2010-10-23	Invited Speaker
林誠謙	GRDI 2020	2010-10-23 ~ 2010-10-24	參加會議
鄭海揚	第四屆魅物理國際研討會 The 4th International Workshop on Charm Physics	2010-10-21 ~ 2010-10-24	Invited Speaker
林誠謙	Scientific Data and Sustainable Development - International CODATA Conference	2010-10-24 ~ 2010-10-27	Oral,
徐明景	博物館電腦網路協會2010年會 Museum Computer Network 2010 Conference	2010-10-26 ~ 2010-10-30	邀請講者
林國平	博物館電腦網路協會2010年會 Museum Computer Network 2010 Conference	2010-10-26 ~ 2010-10-30	率領台灣代表團

研究人員名稱	學術會議名稱	會議時間	出席任務
張泰榕	第十三屆亞洲第一原理會議	2010-11-01 ~ 2010-11-03	Oral,
李定國	CCAST學術顧問委員會	2010-11-03 ~ 2010-11-03	Commentator
林保安	第十三屆亞洲第一原理會議	2010-11-01 ~ 2010-11-03	Oral,
李定國	「大亞灣時代的中微子物理」研討會	2010-11-04 ~ 2010-11-05	Commentator
李尚凡	亞洲磁性協會聯盟國際會議(ICAUMS2010) International Conference of AUMS2010	2010-11-05 ~ 2010-11-08	參與者
胡宇光	2010年第三屆國際同步輻射影像科技研討會 The 3rd International Workshop on Imaging Techniques with Synchrotron Radiation(ITSR 2010)	2010-11-06 ~ 2010-11-10	Invited Speaker
何宜道	gLite and SPECFEM Training	2010-11-10 ~ 2010-11-11	參加Workshop
張嘉升	2010 亞洲奈米科技論壇 Asia Nano Forum Summit 2010	2010-11-09 ~ 2010-11-12	Oral
徐峻賢	語言之神經生物學研討會 Neurobiology of Language Conference	2010-11-11 ~ 2010-11-12	與會者
李湘楠	大型強子對撞機紀元的味物理國際研討會 International Conference on Flavor Physics in the LHC Era	2010-11-08 ~ 2010-11-12	Invited Speaker
葉崇傑	Beyond standard Optical Lattices	2010-10-25 ~ 2010-11-12	參與者
薛富盛	2010 亞洲奈米科技論壇 Asia Nano Forum Summit 2010	2010-11-09 ~ 2010-11-12	Oral

研究人員名稱	學術會議名稱	會議時間	出席任務
蘇宗粲	2010 亞洲奈米科技論壇 Asia Nano Forum Summit 2010	2010-11-09 ~ 2010-11-12	Oral
鄭海揚	「LHC時代的味物理」國際會議 International Conference on Flavor Physics in the LHC Era	2010-11-08 ~ 2010-11-12	Invited Speaker
陳彥龍	American Institute of Chemical Engineering Annual Meeting 2010	2010-11-07 ~ 2010-11-12	Oral
吳茂昆	KUSTAR Education Forum ”Innovation and Future Trends in Education"	2010-11-13 ~ 2010-11-13	Invited Speaker
任盛源	第55屆磁學及磁性材料年會 The 55th MMM Conference	2010-11-14 ~ 2010-11-18	Poster
吳茂昆	The 11th Asia Pacific Physics Conference	2010-11-15 ~ 2010-11-18	Invited Speaker
林呂圭	第55屆美國磁性暨磁性材料年會 55th Annual Conference on Magnetism & Magnetic Materials	2010-11-14 ~ 2010-11-18	Poster
王子敬	第十一屆亞太物理學會議 The 11th Asia Pacific Physics Conference (APPC11)	2010-11-14 ~ 2010-11-18	Invited Speaker
胡宇光	第十一屆亞太物理學會議 The 11th Asia Pacific Physics Conference (APPC11)	2010-11-14 ~ 2010-11-18	Commentator,member of TPC
蔡宗霖	第55屆磁學及磁性材料年會 The 55th MMM Conference	2010-11-14 ~ 2010-11-18	Poster
阮自強	第十一屆亞太物理學會議 The 11th Asia Pacific Physics Conference (APPC11)	2010-11-14 ~ 2010-11-18	Invited Speaker
陳洋元	第十一屆亞太物理學會議 The 11th Asia Pacific Physics Conference (APPC11)	2010-11-15 ~ 2010-11-18	Oral

研究人員名稱	學術會議名稱	會議時間	出席任務
鄭海揚	第一屆LHC時代物理 First International Workshop on LHC Era Physics in 2010	2010-11-15 ~ 2010-11-19	Invited Speaker
周家復	IAS Seminar Series	2010-11-18 ~ 2010-11-20	Invited Speaker
阮自強	Workshop on Particle astrophysics and Cosmology: Beyond the Standard Models and the Dark Side of Our Universe	2010-11-18 ~ 2010-11-20	Invited Speaker,
陳啟東	第八屆海峽兩岸“納米科學與技術”研討會 The 8th Cross-Strait Workshop on "Nano Science and Technology	2010-11-19 ~ 2010-11-22	Oral
陳彥龍	American Physical Society Division of Fluid Dynamics Meeting 2010	2010-11-21 ~ 2010-11-23	Session Chairman, Oral,
李定國	Asia Pacific Center for Theoretical Physics-Junior Research Groups會議	2010-11-24 ~ 2010-11-24	Commentator
胡宇光	海峽兩岸奈米材料高峰論壇 Chinese-Taiwan nanomaterials Society	2010-11-30 ~ 2010-12-04	Invited Speaker
申峻瑋	2nd DEGISCO Project Meeting	2010-12-07 ~ 2010-12-09	參與會議
林唯芳	meeting of ISO/TC229 and its working groups	2010-12-06 ~ 2010-12-10	Oral
林誠謙	Grid Deployment Board	2010-12-08 ~ 2010-12-10	參加會議
楊重熙	meeting of ISO/TC229 and its working groups	2010-12-06 ~ 2010-12-10	Oral
胡宇光	中子和X-射線驅散奈米刻度材料結構與動力學研討會 Workshop on Neutron and X-ray Scattering for the Structures and Dynamics of Nanoscale Materials	2010-12-09 ~ 2010-12-10	Invited Speaker

研究人員名稱	學術會議名稱	會議時間	出席任務
呂欣明	18th International Colloquium on Scanning Probe Microscopy(ICSPM)	2010-12-09 ~ 2010-12-11	Oral
胡進錕	量子操作國際會議 International Conference on Quantum Manipulation	2010-12-10 ~ 2010-12-12	Invited Speaker
林誠謙	「CHAIN kick-off Launch Event」會議	2010-12-13 ~ 2010-12-14	Oral
吳建宏	星系外磁場的理論和觀測 Theory and observations of extragalactic magnetic fields	2010-12-13 ~ 2010-12-15	Oral
李定國	the 9th Asia Pacific Workshop on Materials Physics	2010-12-12 ~ 2010-12-15	Invited Speaker
林耿慧	美國細胞生物年會 American Society for Cell Biology Meeting	2010-12-11 ~ 2010-12-15	Poster
周崇斌	the 9th Asia Pacific Workshop on Materials Physics	2010-12-12 ~ 2010-12-16	Oral
王子敬	偵測低能罕見事件國際研討會 Symposium on Low Energy Rare Event Detection	2010-12-12 ~ 2010-12-18	Invited Speaker
李湘楠	第八屆重味物理與CP對稱破缺研討會 The 8th Workshop on Heavy Flavor Physics and CP Violation	2010-12-15 ~ 2010-12-20	Invited Speaker
金艾文	2010年第六屆太平洋地區化學協會國際際大會 2010 The International Chemical Congress of Pacific Basin Societies	2010-12-15 ~ 2010-12-20	Poster
吳茂昆	第八屆海峽兩岸"納米科學與技術"研討會 The 8th Cross-Strait Workshop on “Nano Science and Technology”	2010-12-19 ~ 2010-12-21	Session Chairman
呂冠樺	第八屆海峽兩岸”納米科學與技術”研討會 The 8th Cross-Strait Workshop on “Nano Science and Technology”	2010-12-19 ~ 2010-12-22	Oral

研究人員名稱	學術會議名稱	會議時間	出席任務
張守進	第八屆海峽兩岸"納米科學與技術"研討會 The 8th Cross-Strait Workshop on "Nano Science and Technology"	2010-12-19 ~ 2010-12-22	Invited Speaker
牟中原等8位	第八屆海峽兩岸"納米科學與技術"研討會 The 8th Cross-Strait Workshop on "Nano Science and Technology"	2010-12-19 ~ 2010-12-22	Invited Speaker
鄭嘉良	第八屆海峽兩岸"納米科學與技術"研討會 The 8th Cross-Strait Workshop on "Nano Science and Technology"	2010-12-19 ~ 2010-12-22	Invited Speaker
陳引幹	第八屆海峽兩岸"納米科學與技術"研討會 The 8th Cross-Strait Workshop on "Nano Science and Technology"	2010-12-19 ~ 2010-12-22	Invited Speaker
陳洋元	第八屆海峽兩岸"納米科學與技術"研討會 The 8th Cross-Strait Workshop on "Nano Science and Technology"	2010-12-19 ~ 2010-12-22	參與者

Institute Sponsored Meetings

本所協辦會議

研討會名稱	會議期間	地點	主辦人
數位典藏與數位學習教育應用推廣中小學篇：『教育資源整合』研討會暨『學習資源編輯分享平台及學習服務入口網』諮詢會	2010.01.22	國立自然科學博物館立體劇場會議廳	林誠謙
生物物理與軟物質研討會	2010.01.24 - 2010.01.26	宜蘭羅東久屋麗緻客棧	陳志強
2010 NCTS January Workshop on Critical Phenomena and Complex Systems	2010.01.28 - 2010.01.29	清華大學	胡進錕
台東國際重力學校/研討會 2010Taitung International School/Workshop on Gravitation	2010.02.26 - 2010.02.28	台東大學	余海禮
2010數位典藏與數位學習國際研討會	2010.03.02 - 2010.03.04	中央研究院人文館	林誠謙
Mini-workshop on Hydrodynamics of Interacting Fluids/Particles	2010.03.05	國立中央大學	陳志強
International Symposium on Grid Computing 2010	2010.03.05 - 2010.03.12	中央研究院人文館	吳茂昆
美國博物館學會繆思獎台灣評審團第一次評審會	2010.03.18	國立故宮博物院	林誠謙
2010博物館藏品登錄與管理實務系列工作坊(I)－考古學與民族學篇	2010.03.27 - 2010.03.28	國立自然科學博物館	林誠謙

研討會名稱	會議期間	地點	主辦人
2010博物館藏品登錄與管理實務系列工作坊(II)－中小型博物館篇	2010.03.30 2010.03.31	鴻禧美術館 國立故宮博物院	林誠謙
Mini-workshop on Nonlinear Biophysics in Excitable Systems	2010.04.12	中研院物理所	陳志強
2010數位藏品標準規範工作坊（I）－ 數位影像的基礎管理與文物編目實務	2010.04.12	中央研究院歷史語言研究所研究大樓704會議室	林誠謙
1st Mini-workshop of LHC Focus Group	2010.04.24	中研院物理所	阮自強
複雜系統學術會議 Complex systems symposium	2010.05.21 - 2010.05.23	日月潭教師會館(5/21-5/22) 中興大學物理系(5/23)	陳志強
Taipei International Workshop for Soft Matter and Biophysics	2010.05.24 - 2010.05.28	台灣大學	林耿慧
中央研究院物理研究所與國立台灣師範大學物理學系雙邊會議 AS-NTNU Bilaterial Meeting	2010.05.29	中央研究院物理所	李湘楠
The 7th Biennial Conference on Classical and Quantum Relativistic Dynamics of Particles and Fields	2010.05.30 - 2010.06.01	國立東華大學	余海禮
「數位圖書館與語意網路」學術演講	2010.06.07	中央研究院資訊科學研究所會議室	林誠謙
博物館數位典藏數位影像品質工作坊	2010.06.11	中央研究院資訊科學研究所會議室	林誠謙

研討會名稱	會議期間	地點	主辦人
歐盟計畫EUAsiaGrid國際研討會	2010.06.21 - 2010.06.23	中央研究院 學術活動中心	林誠謙
2010數位藏品標準規範工作坊(II)－文化物件儲存包裝	2010.06.24	中央研究院 歷史語言研究所	林誠謙
2010北區博物館觀摩活動『數位媒體科技應用融入博物館教育推廣』	2010.06.30	國立故宮博物院	林誠謙
「2010數位內容加值應用」工作坊	2010.07.16	國立成功大學	林誠謙
第十屆台灣統計物理國際會議 The 10th Taiwan International Symposium in on Statistical Physics	2010.07.27 - 2010.07.31	中央研究院物理所	胡進錕
「2010建築數位化技術」工作坊	2010.08.19	中國文化大學	林誠謙
「中央研究院奈米科技研究計畫」年度會議	2010.09.02 - 2010.09.03	三峽大板根森林溫泉渡假村	李定國
「美國博物館協會(AAM) 繆思獎(MUSE Awards)作品欣賞暨校園交流」工作坊	2010.09.13	輔仁大學	林誠謙
2010數位化流程教育訓練工作坊 II	2010.09.23 - 2010.09.24 2010.09.28 - 2010.09.29	中央研究院歷史語言研究所 國立成功大學	林誠謙
「美國博物館協會(AAM) 繆思獎(Muse Awards)作品欣賞暨南區博物館交流」工作坊	2010.09.30	成功大學	林誠謙

研討會名稱	會議期間	地點	主辦人
美國博物館協會(AAM) 繆思獎(MUSE Awards)作品欣賞暨校園交流工作坊Ⅱ	2010.10.07	台灣大學	林誠謙
「2010博物館藏品登錄與管理實務系列工作坊(III)－典藏管理系統功能需求評估與整合篇」工作坊	2010.10.12 - 2010.10.14	國立故宮博物院 國立科學工藝博物館	林誠謙
Computing in High Energy and Nuclear Physics 2010 (CHEP 2010)	2010.10.18 - 2010.10.22	中央研究院人文館及學術活動中心	李世昌
2010年國際經濟物理學年會 Econophysics Colloquium 2010	2010.11.04 - 2010.11.06	中央研究院物理所	李世炳
石墨烯、碳管的最近發展與奈米材料的超快現象 Symposium on General Aspects of Graphene, CNT & Ultrafast Phenomena of Nanomaterials	2010.11.15 - 2010.11.16	中央研究院人文館國際會議廳	吳茂昆
2010數位藏品標準規範工作坊（III）－ 在地vs全球：歐美博物館進行藏品資訊交換的標準與實務	2010.11.16	中央研究院 歷史語言研究所	林誠謙
2010 臨界現象與複雜系統會議	2010.11.25 - 2010.11.26	中央研究院物理所	胡進錕
「門陣來按『讚』－社交網站行銷在博物館領域之運用」工作坊	2010.12.16	國立故宮博物院	林誠謙
2010中南區博物館觀摩活動－台灣博物館界教育應用推廣與國際資訊分享	2010.12.17	國立台灣文學館	林誠謙

Seminars

中央研究院物理研究所九十九年度演講一覽表

(2010 January ~ December)

演講題目	演講者	所屬機構	日期
On the wings of a butterfly	梁鈞泰	Institute of Physic, Academia Sinica	2010/1/4
Superconductivity in presence of a flow, magnetic field and impurities	魏子傑	the Department of Physics and Astronomy, University of British Columbia.	2010/1/4
野性的呼喚--嗓音的產生與感知	蔡振家	臺灣大學音樂學研究所	2010/1/5
Hidden Charged Dark Matter	Tu Huitzu	NTU/LeCosPA	2010/1/8
Nanoparticle interfaces to biology: enabling new capabilities in drug delivery and protein synthesis	Kimberly Hamad-Schifferli	Dept. of Mechanical Engineering & Dept. of Biological Engineering Massachusetts Institute of Technology	2010/1/11
The planned X-ray Photon correlation Spectroscopy facility at SRRC.	牟中原	台大化學系	2010/1/11
Collagen Fibril Stabilizes and Anomalous Hydrates under Heating	Sasun Gevorkian	Yerevan Physics Institute, Armenia	2010/1/12
Mori theory revisited --'mechanical' random force and self-consistent structure	宗像豊哲	京都大學	2010/1/12
Constructive Role of Stochasticity in Biochemical Networks	洪耀正	物理所	2010/1/18

演講題目	演講者	所屬機構	日期
A disturbing understanding of Cooper pairs	Monique Combescot	University Pierre and Marie Curie	2010/1/19
Flavor testing in warp space	John N. Ng	TRIMF&UBC	2010/1/22
Understanding Friction: from a Stimulus Responsive Hydrogel to Joint Lubrication	Debby F. S. Chang	Department of Mechanical Engineering,Duke University	2010/1/28
Phase Change Materials: a Theory as to How They Work	Dennis M Newns	IBM T.J. Watson Research Center	2010/2/5
LATTICE BOLTZMANN SIMULATIONS OF SOFT MATTER SYSTEMS	皮佳倫	Institute of Physic, Academia Sinica	2010/2/8
Mapping Quantitative Mechanical Properties at Nanometer Scale	Lin Huang	Veeco Instruments Inc	2010/2/9
The executing and signaling networks of cell migration	Artur Baumgaertner	Forschungszentrum Jülich	2010/3/1
單層石墨的物理與相對論電子學的可行性	牟中瑜	清華大學物理系	2010/3/2
Lorentz Violation: Theory and Phenomenology	Bo-Qiang Ma	Physics School of Peking University	2010/3/5
Correlated surface fluctuations near a repulsive boundary	Artur Baumgaertner	Forschungszentrum Jülich	2010/3/8
Test the gravity origin as an entropy force	Yao Cheng	北京清華大學	2010/3/10

演講題目	演講者	所屬機構	日期
Generalized Uncertainty Principle on a Planckian Lattice, and micro black hole mass-temperature relation	Fabio Scardigli	國立台灣大學	2010/3/12
MAOS Reconstruction of the SM Higgs boson at the LHC	Jae-Sik Lee	NCTS	2010/3/19
Dynamic Force Probing and Mechanical Property Mapping of Living Cells	Chia-Hsiang Menq	Dept. of Mechanical Engineering The Ohio State University	2010/3/23
塑膠與玻璃微流體晶片的研發與生物應用	鄭郅言	中央研究院應用科學中心	2010/3/23
Nano-ultrasonics and THz polaritonics	林宮玄	Industrial Technology Research Institute	2010/3/25
Determining Properties of Dark Matter Particles on the AMIDAS Website	Chung-Lin Shan	國立成功大學	2010/3/26
Active soft matter and active signaling	Hsuan-Yi Chen	中央大學	2010/3/29
Selected Topics in Neutrino Physics	Boris Kayser	Fermilab, USA	2010/3/30
Biomimetic platforms for cellular diagnostics & 3D Microtissues	許聿翔	University of California, Irvine	2010/3/30
Climate Change and Molten Salt Reactors	徐遐生	中央研究院天文及天文物理研究所籌備處	2010/4/6
Quark and lepton mass and mixing angle patterns: flavour symmetry or extra-dimensional explanation?	Raymond Volkas	Univ. of Melbourne	2010/4/7

演講題目	演講者	所屬機構	日期
DARK MATTER AND DARK ENERGY : 21st Century Conundra	Lee,Seokcheon	Institute of Physic, Academia Sinica	2010/4/8
癌症系統生物學	阮雪芬	國立台灣大學生命科學系	2010/4/13
Coherent Control of Photons and Atoms	Chih-Sung Chuu	Stanford University	2010/4/15
RN/CFT Correspondence	Jia-Rui Sun	中央大學	2010/4/16
Fabricating Scaffolds By Microfluidics	林耿慧	Institute of Physic, Academia Sinica	2010/4/19
Deterministic control of domain switching in multiferroic films	陳宜君	成功大學物理系	2010/4/20
Nematic Electronic Structure in the Parent State of Iron-Based Superconductor Ca(Fe1-xCox)2As2	Tien-Ming Chuang	Cornell University	2010/4/21
Directed cell migration during vascular morphogenesis and angiogenesis	莊永仁	清華大學生命科學學系	2010/4/26
Instrumentation for spintronics	盧志權	師大物理系	2010/4/26
Color superconductivity and radius of dense star - NJL model with dimensional vs. cut-off regularization	Tomohiro Inagaki	Hiroshima University, Japan	2010/4/30
Application of immersed boundary method to fluid-structure interaction -simulation of a falling leave	陳明志	台灣科技大學機械工程系	2010/5/3

演講題目	演講者	所屬機構	日期
Electrical properties of a nanocontact-constrained electron system, semiconductor nanowires, and colloidal quantum-dot arrays	簡紋濱	國立交通大學電子物理系	2010/5/4
2 and 3 flavor Nambu-Jona-Lasinio models with dimensional regularization	Daiji Kimura	Shudo University	2010/5/5
Is the Statistical Physics of Complex Systems Still Exotic Physics?	Zbigniew Romuald Struzik	Graduate School of Education The University of Tokyo	2010/5/6
Quantum Teleportation, Accelerated Observer, and Black Hole Information	Tom Shiokawa	國立成功大學	2010/5/7
Diffusions on Supported Lipid Membrances	阮文滔	Institute of Physic, Academia Sinica	2010/5/10
Spontaneous Symmetry Breaking	李靈峰	國家理論科學研究中心	2010/5/11
Dynamic domain walls and some cosmological implications	Debaprasad maity	國立台灣大學	2010/5/12
Glueballs and Tight Knots	Thomas W. Kephart	Vanderbilt University, Nashville	2010/5/14
Application of Wind Tunnel Simulation on Flow and Dispersion in Complex Terrain	蕭葆義	IOP. Academia Sinica	2010/5/17
Influence of Asymmetry on Bias Behavior of Spin Torque in Magnetic Tunnel Junction	唐毓慧	中央研究院應用科學中心	2010/5/18
發明技巧與高價值專利	羅吉進	臺灣積體電路有限公司	2010/5/18

演講題目	演講者	所屬機構	日期
Measurement of Neutrino-Electron Scattering and Electroweak Parameters at the Kuo-Sheng Reactor Neutrino Laboratory	Muhammed Deniz	Institute of Physic, Academia Sinica	2010/5/21
Quadrupolar order in the bilinear-biquadratic model	Kenji Harada	Kyoto University	2010/5/25
How does the non-perturbative string landscape look like?	Irie Hirotaka	國立台湾大学	2010/5/26
Micromechanics of Solid Foams with Open Cells	Andrew M. Kraynik	Sandia National Laboratories, Albuquerque,	2010/5/28
Self-propelled colloidal particles	H. R. Jiang	Dept of Physics, University of Tokyo	2010/5/28
Self-propelled Colloidal Particles	Hong-Ren Jiang	Department of Physics , the University of Tokyo	2010/5/28
New Physics with Jets at the LHC	Kao Chung	University of Oklahoma	2010/5/28
Implications on Higgs decay in light of CDM	Kingman Cheung	國立清華大學	2010/6/2
Hadronic Decays of Charmed Mesons	Cheng-Wei Chiang	中央大學	2010/6/4
Characteristic Statistics in Ecosystems and Simple Models	Takashi Shimada	The University of Tokyo	2010/6/7
武士刀與柳葉刀	劉士永	中研院台灣史研究所	2010/6/8

演講題目	演講者	所屬機構	日期
he Universal Extra Dimensional Model on Six-dimensions with two- sphere orbifold extra space	Takaaki Nomura	中央大學	2010/6/11
Condensation behavior of Multivalent ions and Structure and Dynamics of Water Surrounding the Poly(methacrylic acid) (PMAA):A Molecular Dynamics Study	Ching-I Huang	National Taiwan University	2010/6/14
Beyond natural materials – new properties of metamaterials	張之威	台灣大學凝態科學研究中心	2010/6/15
Black Hole like Space-time in Classical and Quantum Fluids	Tapas Kumar Das	Harish Chandra Research Institute, India	2010/6/18
Studying sub-microsecond protein folding kinetics using a photolabile caging strategy and time-resolved photoacoustic calorimetry	Hsin-Liang Chen	Institute of Biochemistry, Academia Sinica	2010/6/21
Measurement of hierarchy demonstrates that	Michael W. Deem	Rice University	2010/6/21
Using Single-Molecule Manipulation to Probe Dynamic States of Proteins and DNA	Ching-Hwa Kiang	Department of Physics & Astronomy, Rice University, USA	2010/6/22
Observational consequence of the bubble nucleation	葉振斌	國立台灣大學	2010/6/25
Finite size effects in superconducting nanograins: from theory to experiments	Antonio Miguel Garcia	University of Lisbon	2010/6/28
Electrokinetic Transport at Nanoscales	Hsueh-Chia Chang	University of Notre Dame	2010/6/29

演講題目	演講者	所屬機構	日期
Measurement Uncertainty in Nanometrology --- leveraging attributes of TEM and CD AFM	劉浩志	成功大學	2010/6/29
Dispersion corrections to parity-violating electron scattering	Mikhail Gorshteyn	Nuclear Theory Center, Indiana University, USA	2010/7/2
中國象棋棋話	伍法岳	美國東北大學	2010/7/6
Study of Top Quark Properties	Yen-Chu Chen	Academia Sinica	2010/7/7
Surface Engineering and Immunotargeting of Functional Nanoparticles	Benjamin Thierry	Ian Wark Research Institute	2010/7/8
Sıngle molecule spatıaltemporal dynamıcs ı n lıvıng cells	Gene-Wei Li	X. Sunney Xie Group, Harvard University	2010/7/16
Determination of the viscosity utilizing the vibrating cantilever beam submerged in fluid	Ivo Stachiv	Czech Academy of Sciences	2010/7/19
Drawing: Unknowable Future	Rosalyne Shieh	University of Michigan	2010/7/22
The Big Bang and Inflation United by an Analytic Solution	Shih-Hung Chen	University of Southern California, USA	2010/7/22
The Variant Axion Models at the LHC	Chuan-Ren Chen	Institute for the Physics and Mathematics of the Universe	2010/7/23
Self-Assembly of DNA-Linked Nanoparticle	Chia Wei Hsu	Wesleyan University	2010/7/26

演講題目	演講者	所屬機構	日期
Transport in cells and tissues	Heiko Rieger	University Saarland, Germany	2010/8/3
Writing a research paper in English - a proofreader's perspective	Mandy Engelsma	Translation and proofreading agency and University of Bristol, Faculty of Arts	2010/8/3
Metadynamics and its applications	Chai-Yu Lin	Department of Physics, National Chung Cheng University	2010/8/5
Precision Electroweak Physics and Global Analysis of PDFs	Gaber Faisel	Thamar University, Yemen	2010/8/6
Speculative attempts to solve the cosmological constant paradox	Anthony Zee	University of California, Santa Barbara	2010/8/13
Probing Majorana Neutrinos	C. S. Kim	Yonsei Univ., Korea	2010/8/20
Various forms of de Sitter and anti de Sitter metrics: a pedagogical overview	Anthony Zee	University of California, Santa Barbara	2010/8/27
Investigations on undoped and doped Zno nanorids and thin film:Prepared by sol-gel and Hydrothermal Method	Rajalingam Thangavel,	Research Centre for Applied Science,Academia Sinica	2010/9/3
音樂講座	陳漢金	東吳大學	2010/9/7
Topological concepts in field theory: a brief review	Anthony Zee	University of California, Santa Barbara	2010/9/10
Effect of f electron excitations in heavy fermion and unconventional superconductors	Peter Thalmeier	Max Planck Institute for Chemical Physics of Solids, Dresden	2010/9/14

演講題目	演講者	所屬機構	日期
Some personal views on quantum field theory: past, present, and future	Anthony Zee	University of California, Santa Barbara	2010/9/14
Ferro-Orbital Order and Rich Magnetic Structures of Iron-Based Superconductors	Wei Ku	CMPMSD, Brookhaven National Laboratory	2010/9/16
Understanding dense granular systems	高國傑	Dept. of Mechanical Engineering Yale University	2010/9/20
Simple and complex dynamics of DNA, polymers, and blood cells in micro and nano flow	陳彥龍	Institute of Physic, Academia Sinica	2010/9/21
Magnetic and Photoconductive Properties of Ni-NiO Core-shell Nano-Arrays.	曾院介	國立交通大學材料科學工程系	2010/9/23
The SuperB project -- a super flavor factory	Chih-hsiang Cheng	California Institute of Technology	2010/9/24
The Astrophysics of Stellar Mass Compact Objects	Ronald E. Taam	Institute of Astronomy and Astrophysics, Academia Sinica	2010/9/28
The Higgs Boson Sector of the Next-to-MSSM with CP Violation	侯鐵君	國立清華大學	2010/10/1
Exploring life from a physical perspective	紀凱容	中興大學物理學系	2010/10/5
Gravitational radiation and angular momentum flux from a spinning dynamical black hole	吳育慧	中央大學	2010/10/8
綠色化學與生活	梁偉明	靜宜大學應用化學系	2010/10/12

演講題目	演講者	所屬機構	日期
Automation and information technologies for infrastructure project management	Miroslaw Skibniewski	School of Engineering, Khalifa University of Science, Technology and Research	2010/10/13
Conventional and Unconventional Applications of FPGA	吳進遠	美國費米加速器國家實驗室	2010/10/14
Strongly coupled fourth family and electroweak phase transition	Masaya Kohda	國立台灣大學	2010/10/15
QSE growth and super-diffusive liquid-like motion at low temperature	Michael C. Tringides	Department of Physics Iowa State University	2010/10/15
Nucleation of Polymer Crystals	An-Chung Su	Dept. of Chem. Engr. NTHU.	2010/10/18
Cosmological Constant Problem and its Poss	陳丕燊	國立臺灣大學物理系及天文物理所	2010/10/19
From Micro/Nano Devices, Systems to Control of Complex Systems	Chih-Ming Ho	University of California	2010/10/22
Anomalous Macrolattices of Diblock Copolymers	Hsin-Lung Chen	Department of Chemical Engineering, National Tsing Hua University	2010/10/25
Testing the Landscape of Oncology through a Physical Sciences Perspective	Larry Akio Nagahara	National Cancer Institute (NCI)/National Institutes of Health (NIH)	2010/10/26
Geometry of 2D Foams: Spaces of Foams an	Shou-hua Zhu	Dept. of Physics, University of Pennsylvania, USA	2010/10/27
Double Parton Scattering at the LHC -- Dynamic and Kinematic Characteristics	Edmond Berger	Argonne National Laboratory	2010/11/5

演講題目	演講者	所屬機構	日期
Inkjet Devices and Digital Printing Applications	廖英志	台大化工	2010/11/8
Modulation of Mechanical Strain-induced Nu	林奇宏	國立陽明大學微生物暨免疫學研究所	2010/11/9
AdS/CFT correspondence and BPS Geometry	Yoshihiro Mitsuka	NCTU	2010/11/12
Integrating Actin Dynamics and Adhesion in Cell Migration	Clare M. Waterman	National, Heart, Lung and Blood Institute National Institutes of Health	2010/11/15
消防安全講習	許志敏	台北市消防局	2010/11/17
Transient Response of Sap Flows	朱佳仁	中央大學土木工程系	2010/11/22
Heavy hadron chiral lagrangian and b decays on the lattice	David Lin	交通大學	2010/11/25
Fate of False Vacuum Revisited	Shigeki Matsumoto	IPMU, The univ. of Tokyo	2010/11/26
Biological Applications of Frequency Modulation Atomic Force Microscopy	Takeshi Fukuma	Kanazawa University	2010/11/26
Non-universal tunneling resistance at the quantum critical point of mesoscopic SQUIDs array	Dr. Sujit Sarkar	PoornaPrajna Institute of Scientific Research, India	2010/11/29
Some molecular dynamics simulations of Lennard-Jones fluid	Prof: Hisashi OKUMURA	Institute of Molecular Sciences, Okazaki,Japan	2010/11/30

演講題目	演講者	所屬機構	日期
Dark Energy and EoS in Modified Gravity Theories	耿朝強	國立清華大學	2010/12/3
Integrated microfluidic devices for biological analyses	王翔郁	成功大學化工系	2010/12/6
蔡志忠閉關十年物理研究發表會：「東方宇宙」	蔡志忠	台灣漫畫家	2010/12/7
PEGylated cationic lipid-DNA complexes for gene delivery	Chialing Chan	中央大學	2010/12/9
Renormalization group study of random quantum magnets	Prof. Ferenc IGL'OI	Research Institute for Solid State Physics and Optics Hungarian Academy of Sciences,	2010/12/14
台法幽蘭互訪計畫	Damien Baigl	University Pierre and Marie Curie	2010/12/17
A unique alternative non-negative gravitational energy tensor to the Bel-Robinson tensor in the quasilocal small sphere limit	Dr. Lau Loi So	中央大學	2010/12/17
Phase Transition in Mesoscopic Biochemical Systems: From Stochastic to Nonlinear Dynamics and Beyond	Prof. Hong Qia	Dept. of Applied Math, U. Washin	2010/12/20
Graphene electronics—from classical to quantum Hall regime	Dr. Hsin-ying Chiu	IBM Thomas J. Watson Research Center	2010/12/22

Visiting Scholars

中央研究院物理所九十九年度訪問學人表

(2010 年 1 月- 2010 年 12 月)

受邀人	國名　學校機構	訪問期間
Geghan Asryan	亞美尼亞 Yerevan Physics Institute	2008-05-08 ~ 2010-01-24
Lakhwinder Singh盛樂文	印度 拿勒斯印度教大學	2008-11-15 ~ 2010-04-10
Ihsan Ozan Yildirim	土耳其 Middle East Tech. Univ.	2009-06-27 ~ 2010-02-13
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
Sasun G. Gevorgyan	亞美尼亞 Yerevan Physics Institute	2009-12-01 ~ 2010-01-31
Yevgeni Mamasakhlisov	亞美尼亞 Department of Molecular Physics, Yerevan State University	2009-12-07 ~ 2010-01-08
洪東興	銘傳大學電腦資訊工程系	2010-01-01 ~ 2010-02-28
劉國欽	淡江大學物理系	2010-01-01 ~ 2010-02-28
熊田雅之	日本 放射線醫學總合研究所	2010-01-01 ~ 2010-06-30
Manoj Kumar Singh(盛滿諾)	印度 貝拿勒斯印度教大學	2010-01-01 ~ 2011-06-30
蔡麗珠	台北科技大學	2010-01-02 ~ 2010-03-01
彭仁傑	美國 伊利諾大學香檳分校	2010-01-09 ~ 2010-01-14
Richard Wagner	美國 Florida State University	2010-01-15 ~ 2010-01-23
Prakash Padakannaya	印度 University of Mysore	2010-01-15 ~ 2010-01-23
鄒忠毅	文化大學物理系	2010-01-15 ~ 2010-02-15
曹慶堂	淡江大學物理系	2010-01-15 ~ 2010-02-28
顧鴻壽	明新科技大學	2010-01-15 ~ 2010-02-28
王士元 院士	香港城市大學	2010-01-16 ~ 2010-01-23
Mark Seidenberg	美國 University of Wisconsin-Madison	2010-01-16 ~ 2010-01-24
林宏一	台南大學材料科學系	2010-01-16 ~ 2010-03-01
馬遠榮	東華大學應用物理研究所暨物理系	2010-01-16 ~ 2010-09-20
梁宗嶽	美國 University of Delaware	2010-01-18 ~ 2010-01-30
蔡志申	國立台灣師範大學物理系	2010-01-20 ~ 2010-02-19
鄭志剛	中國 北京師範大學	2010-01-25 ~ 2010-02-23

受邀人	國名　學校機構	訪問期間
陳元宗	義守大學材料工程系	2010-01-28 ~ 2010-02-22
AlessandroTaloni	義大利 Tel-Aviv University	2010-01-29 ~ 2010-02-14
崔瑩鎮	韓國 Inha University	2010-02-05 ~ 2010-02-08
沙阿金（David B. Saakian）	亞美尼亞 Yerevan Physics Institute	2010-03-01 ~ 2010-03-31
吳昱城	北京清華大學工程物理系	2010-03-01 ~ 2010-06-30
Graciela Beatriz Gelmini	美國 Dept. of Physics and Astronomy UCLA	2010-03-30 ~ 2010-04-03
Xuan Zhan	中國 Huazhong Normal University	2010-04-06 ~ 2010-04-28
Kyoung Lee	韓國 Korea University	2010-04-11 ~ 2010-04-13
Vladimir S. Zykov	俄羅斯 Technical University Berlin	2010-04-11 ~ 2010-04-15
Chih-Sung Chuu	美國　Stanford University	2010-04-13 ~ 2010-04-18
Namik K. Pak	土耳其 Middle East Tech. Univ.	2010-04-18 ~ 2010-04-24
Daiji Kimura	日本 Hiroshima Shudo University	2010-04-30 ~ 2010-05-06
Zbigniew Romuald Struzik	日本 The University of Tokyo	2010-05-04 ~ 2010-05-07
Chia-Yuech CHU	紐西蘭 National Institute of Health (NIH)	2010-05-09 ~ 2010-05-30
童若軒	中國　Shanghai Normal University	2010-05-10 ~ 2010-05-24
Lawrence H. Ford	美國 Tufts University	2010-05-14 ~ 2010-06-03
Andrew M. Kraynik	美國 Sandia National Laboratories	2010-05-21 ~ 2010-06-05
徐音	中國　南開大學物理學院	2010-05-21 ~ 2010-07-16
崔瑩鎮	韓國 Inha University	2010-05-23 ~ 2010-05-28
Klaus-Dieter Rainer Kroy	德國萊比錫大學理論物理所	2010-05-23 ~ 2010-05-29
何健民	美國 Wichita State University	2010-05-23 ~ 2010-06-22
高鐘	美國 Univ. of Oklahoma	2010-05-26 ~ 2010-06-08
尼斯瓦	印度Indraprastha University	2010-06-01 ~ 2010-07-07
Ray River	英國 Senior Research Investigator and Emeritus Professor in Theoretical Physics	2010-06-15 ~ 2010-06-21
Cyril Petibois	法國 UNIVERSITY OF BORDEAUX 2	2010-06-17 ~ 2010-06-25
Hsueh-Chia Chang	美國 University of Notre Dame	2010-06-20 ~ 2010-07-20
魏大華	台北科技大學機械工程系	2010-06-20 ~ 2010-09-15

受邀人	國名　學校機構	訪問期間
蔡麗珠	台北科技大學	2010-06-20 ~ 2010-09-15
蔡志申	國立台灣師範大學物理系	2010-06-20 ~ 2010-09-19
Shlyapnikov Georgy	法國 University of Amsterdam	2010-06-21 ~ 2010-06-25
Man Chiu Ho	美國Vanderbilt University	2010-06-22 ~ 2010-06-26
Antonio M. García	葡萄牙 University of Lisbon	2010-06-27 ~ 2010-06-29
Mikhail Gorshteyn	IUCF, Nuclear Theory Center Indiana University	2010-06-28 ~ 2010-07-09
Arun Kumar Soma (蘇雅仁)	印度 貝拿勒斯印度教大學	2010-06-29 ~ 2011-06-30
伍法岳	美國東北大學	2010-07-01 ~ 2010-07-15
劉國欽	淡江大學物理系	2010-07-01 ~ 2010-08-31
邱雅萍	中山大學物理系	2010-07-01 ~ 2010-09-15
鄒忠毅	文化大學物理系	2010-07-01 ~ 2010-09-15
曹慶堂	淡江大學物理系	2010-07-01 ~ 2010-09-15
林宏一	台南大學材料科學系	2010-07-01 ~ 2010-09-15
顧鴻壽	明新科技大學	2010-07-01 ~ 2010-09-15
陳元宗	義守大學材料工程系	2010-07-01 ~ 2010-09-19
Steven Louie	美國 University of California at Berkeley	2010-07-02 ~ 2010-07-09
藍志成	加拿大University of British Columbia, Department of Physics and Astronomy	2010-07-02 ~ 2010-07-12
SRASHTI GUPTA	印度GGS Indraprasth University	2010-07-02 ~ 2010-08-07
喻純旭	中國　南開大學物理學院	2010-07-02 ~ 2010-08-30
錢嘉陵	美國 Johns Hopkins University	2010-07-05 ~ 2010-07-13
Benjamin Thierry	澳洲 Ian Wark Research Institute	2010-07-06 ~ 2010-07-10
Patrick GUENOUN	法國 Laboratoire sur l'Organisation Nanométrique et Supramoléculaire	2010-07-07 ~ 2010-07-17
彭仁傑	美國 Dept. of Physics Univ. of Illinois at Urbana-Champaign	2010-07-08 ~ 2010-07-15
Zhan-Jun Zhang 張戰軍	中國 Anhui University	2010-07-09 ~ 2010-10-08
沈元壤	美國University of California	2010-07-10 ~ 2010-07-11
崔章琪	美國萬國商業計算機公司華生研究中心	2010-07-10 ~ 2010-07-13
朱經武	美國 Texas Center for Superconductivity, University of Houston	2010-07-10 ~ 2010-07-14

受邀人	國名　學校機構	訪問期間
Olga S.Rozanova	俄羅斯 Scienti¯c research career and publications	2010-07-13 ~ 2010-08-18
Chien-Peng Yuan	美國 Michigan State University	2010-07-14 ~ 2010-08-16
Gene-Wei Li	美國 Harvard University	2010-07-16 ~ 2010-07-25
陳傳仁	日本 University of Tokyo	2010-07-20 ~ 2010-07-27
Jonathan Dushoff	加拿大 McMaster University	2010-07-20 ~ 2010-08-20
Sasun G. Gevorgyan	亞美尼亞 Yerevan Physics Institute	2010-07-22 ~ 2010-09-30
AMALENDU SAU	韓國 Gyeongsang National University	2010-07-25 ~ 2010-08-09
ZBIGNIEW R. STRUZIK	日本 Graduate School of Education The University of Tokyo	2010-07-26 ~ 2010-08-11
厚美瑛	中國 北京中國科學院物理研究所	2010-07-27 ~ 2010-08-20
Imre Derényi	匈牙利 Eötvös University	2010-08-01 ~ 2010-08-12
Kim, Choong Sun	韓國 Yonsei University	2010-08-01 ~ 2010-08-31
Peter Fulde	德國 Max Planck Institute for the Physics of Complex Systems	2010-08-19 ~ 2010-09-09
Yan Chen	中國 Fudan University物理系	2010-08-21 ~ 2010-08-24
Alvin Teo	新加坡 School of Applied Science	2010-08-30 ~ 2010-09-22
Kimihiro Nakamura	法國Cognitive Neuroimaging Unit (INSERM-CEA, Gif/Yvette, France)	2010-08-31 ~ 2010-09-02
Danny Porath	以色列 希伯來大學	2010-09-01 ~ 2010-09-06
黃海超	以色列 希伯來大學	2010-09-01 ~ 2010-09-15
Wenting Zhao	Hong Kong University of Science and Technology	2010-09-03 ~ 2010-09-06
Peter Thalmeier	德國 Max-Planck-Institute for the Chemical Physics	2010-09-05 ~ 2010-09-26
Wei Ku	美國 Brookhaven National Laboratory	2010-09-13 ~ 2010-09-29
高國傑	美國 Yale University	2010-09-17 ~ 2010-09-20
Zhao Li	美國 Michigan Univ.	2010-10-01 ~ 2010-12-14
Michael C. Tringides	美國 Iowa State University Ames	2010-10-14 ~ 2010-10-16
Cyril Petibois	法國 UNIVERSITY OF BORDEAUX 2	2010-10-18 ~ 2010-10-24
劉明輝	中國科學技術大學近代理學院及近代物理系	2010-10-26 ~ 2010-10-31
Gordon L. Kane	美國 University of Michigan	2010-10-26 ~ 2010-10-31
韓良	中國科學技術大學近代理學院及近代物理系	2010-10-26 ~ 2010-11-01

受邀人	國名　學校機構	訪問期間
安琪	中國科學技術大學近代理學院及近代物理系	2010-10-26 ~ 2010-11-01
金革	中國科學技術大學近代理學院及近代物理系	2010-10-26 ~ 2010-11-01
馬文淦	中國科學技術大學近代理學院及近代物理系	2010-10-26 ~ 2010-11-01
張仁友	中國科學技術大學近代理學院及近代物理系	2010-10-26 ~ 2010-11-01
陳向軍	中國科學技術大學近代理學院及近代物理系	2010-10-26 ~ 2010-11-01
陰澤杰	中國科學技術大學近代理學院及近代物理系	2010-10-26 ~ 2010-11-01
Michael Gordon Endres	日本 Theoretical Physics Laboratory, RIKEN	2010-11-07 ~ 2010-11-14
司徒國業	香港科技大學物理系	2010-11-11 ~ 2010-11-14
Zbigniew R. Struzi	日本 The University of Tokyo	2010-11-21 ~ 2010-12-10
R.C.Verma	印度 Punjabi University,Patiala	2010-11-22 ~ 2011-02-21
Shruti Aggarwal/Pooja Vadhan	印度 University School of Basic and Applied Sciences	2010-11-28 ~ 2010-12-30
Andreas Erbe	德國　Max Planck Institute for Iron Research	2010-11-29 ~ 2010-12-07
Brian C. Tiburzi	美國 Center for Theoretical Physics, Massachusetts Institute of Technology	2010-12-05 ~ 2010-12-19
Ferenc IGL'OI	匈牙利 University of Szeged	2010-12-08 ~ 2010-12-19
Hyoung Jin Choi (崔瑩鎮)	韓國 Inha University	2010-12-18 ~ 2010-12-21
王清海	新加坡 National University of Singapore	2010-12-20 ~ 2010-12-23