

**International Symposium
Nanoscience and Quantum Physics (nanoPHYS'12)
December 17-19, 2012**

- Program -

Monday, December 17, 2012

**- Morning Session -
(9:30-12:00)**

Opening

9:30- 9:40 *Opening*

Graphene and Related Materials (chair: Susumu Saito and Masaaki Nakamura)

- 9:40-10:20 Kazu Suenaga (AIST)
Low-Dimensional Materials with Interrupted Periodicities
- 10:20-11:00 Tsuneya Ando (Tokyo Institute of Technology)
Theory of Chiral Electrons in Graphene and Carbon Nanotubes
- 11:00-11:20 **Coffee break**
- 11:20-11:40 Ken-ichi Sasaki (NTT Basic Research Laboratories)
Mechanism of the doping dependence of Raman 2D band -Dirac-cone migration-
- 11:40-12:00 Maxim Ziatdinov (Tokyo Institute of Technology)
*Functionalization of graphitic edges and vacancies with hydrogen:
high-resolution scanning probe microscopy and density functional theory study*

**- Poster Session (Photo, Lunch) -
(12:00-14:00, odd-numbered posters, chair: Tetsuo Hyodo)**

**- Afternoon Session -
(14:00-18:30)**

Fundamental Quantum Physics and Quantum Information (chair: Hidekazu Tanaka and Hidetoshi Nishimori)

- 14:00-14:40 Masanao Ozawa (Nagoya University)
*Universally Valid Reformulation of the Heisenberg Uncertainty Principle
and Its Experimental Confirmations*
- 14:40-15:20 Akio Hosoya (Tokyo Institute of Technology)
Weak Value as a Fundamental Concept and Uncertainty Relation
- 15:20-15:35 **Coffee break**
- 15:35-16:15 Alejandro Perdomo-Ortiz (NASA)
Experimental realization of quantum annealing for lattice protein models
- 16:15-16:35 Masaaki Nakamura (Tokyo Institute of Technology)
Entanglement spectra of the fractional quantum Hall states
- 16:35-16:50 **Coffee break**

High-Energy Astronomy (chair: Nobuyuki Kawai)

- 16:50-17:30 William Craig (University of California, Berkeley)
First Results from NuSTAR
- 17:30-18:10 Shigeru Yoshida (Chiba University)
*The new messengers from the Universe :
"First Light" of the high energy neutrino astronomy*
- 18:10-18:30 Mikio Morii (Tokyo Institute of Technology)
Discovery of an extraordinary luminous and soft X-ray transient MAXI J0158-744

**- Poster Session -
(18:30-20:30, even-numbered posters, chair: Yoshitaka Fujimoto)**

Tuesday, December 18, 2012

- Morning Session -
(9:00-12:50)

Topological insulators (chair: Shuichi Murakami and Yuichi Okuda)

- 9:00- 9:40 Yoichi Ando (Osaka University)
Exploring Topological Insulator and Superconductor Materials
- 9:40-10:00 Motohiko Ezawa (University of Tokyo)
Silicene: Silicon-Based Topological Material
- 10:00-10:30 Shuichi Murakami (Tokyo Institute of Technology)
Topological chiral edge modes in magnonic crystals
- 10:30-10:50 Shigehiro Yasui (KEK, IPNS)
Non-Abelian vortices, Majorana fermions, and non-Abelian statistics
- 10:50-11:10 **Coffee break**

J-PARC I (chair: Makoto Oka)

- 11:10-11:50 Naohito Saito (KEK, J-PARC)
Fundamental Physics at J-PARC
- 11:50-12:20 Kenneth Hicks (Ohio University)
Exciting Prospects at the Hadron Hall at J-PARC
- 12:20-12:50 Daisuke Jido (Kyoto University)
Hadron physics at J-PARC ~ exotic hadrons and hadrons in nuclei ~

- G-COE Session (Lunch) -
(12:50-14:00)

- Afternoon Session -
(14:00-17:10)

J-PARC II (chair: Tetsuo Hyodo)

- 14:00-14:30 Emiko Hiyama (RIKEN)
Recent progress of hypernuclear physics
- 14:30-15:00 Hans-Josef Schulze (INFN Catania and Kyoto University)
Neutron Star Structure with Hyperons and Quarks
- 15:00-15:30 Wataru Higemoto (ASRC JAEA)
Ultra slow muon microscopy in the nanosciences at J-PARC MUSE
- 15:30-15:50 **Coffee break**

Nanoscience (chair: Junji Yoshino)

- 15:50-16:30 Kunio Takayanagi (Tokyo Institute of Technology)
Nano in Macro: Lithium ion imaging by a 50pm electron probe
- 16:30-17:10 Alex Zettl (University of California, Berkeley)
Atomic tailoring of graphene and BN: from valleytronics to bioimaging

- Panel Discussion -
(17:15-18:00)

"Nanoscience and Quantum Physics in the next decade and beyond"

chair: Marvin L. Cohen (University of California, Berkeley)

18:30 *Banquet*

Wednesday, December 19, 2012

- Morning Session -
(9:00-12:35)

Materials under high pressure and high temperature (chair: Susumu Saito)

- 9:00- 9:40 Kei Hirose (Tokyo Institute of Technology)
Post-Perovskite in the Earth's Lowermost Mantle
- 9:40-10:20 Renata M. Wentzcovitch (University of Minnesota)
Spin crossover systems in the deep mantle
- 10:20-10:45 Koichiro Umemoto (University of Minnesota)
First-principles predictions of phase transitions in minerals under ultrahigh pressure and temperature
- 10:45-11:05 Coffee break

Origin of mass and new frontier in particle physics (chair: Toshi-Aki Shibata)

- 11:05-11:45 Sachio Komamiya (University of Tokyo)
Particle Physics Now and in the Future
- 11:45-12:10 Masahiro Kuze (Tokyo Institute of Technology)
Measurements of neutrino oscillation angle θ_{13}
- 12:10-12:35 Osamu Jinnouchi (Tokyo Institute of Technology)
New particle is discovered at LHC, then what's next?

- Summary Session (Lunch) -
(12:35-13:30)

Closing

- 13:30-13:45 *Closing*

Poster Session
Monday, December 17, 2012

- P- 01 M. Tashima and N. Hatano
 (University of Tokyo)
Appearance of multiple Dirac Cones on Graphene with Periodic and Quasiperiodic Potentials
- P- 02 Shota Kizukuri, Takashi Koretsune and Susumu Saito
 (Tokyo Institute of Technology)
Graphene and graphene-nanoribbon complex: Gapped and gapless carbon nanostructures
- P- 03 Y. Kitamura and S. Murakami
 (Tokyo Institute of Technology)
Effective Model and Plasmonic Band Gap for One-dimensional Plasmonic Crystals
- P- 04 Tomoaki Kaneko and Takahisa Ohno
 (National Institute for Materials Science and University of Tokyo)
Electronic Transport through Graphene-Metal Electrode Junctions: DFT-NEGF Study
- P- 05 Masahiro Sakurai
 (Institute for Solid State Physics, University of Tokyo)
The energetics and electronic structures of MgB₂ nanotubes
- P- 06 Ken-Ichiro Imura and Yositate Takane
 (Hiroshima University)
Noninvasive Metallic State
- P- 07 K. Akiyama, M. Wasai, T. Nakao, R. Nomura and Y. Okuda
 (Tokyo Institute of Technology)
Effects of Magnetic Fields on Surface Andreev Bound States in Superfluid ³He B Phase
- P- 08 R. Takahashi, S. Murakami
 (Tokyo Institute of Technology)
Gapless interface states between two topological insulators with crystallographic rotational symmetry
- P- 09 Kazuhiro Tsutsui, Kazuhiro Hosono and Takehito Yokoyama
 (Tokyo Institute of Technology and MANA)
Absorption of Non-Local Pure Spin Currents at Interface
- P- 10 M. Noro, S. Murakami and T. Ando
 (Tokyo Institute of Technology)
Weak-field Hall Conductivity in Two-Dimensional Massless Dirac Fermions with Finite-ranged Scatterers
- P- 11 R. Matsumoto, R. Shindou and S. Murakami
 (Tokyo Institute of Technology)
Thermal Hall effect of spin wave described by BdG Hamiltonian
- P- 12 Yuta Aoki and Susumu Saito
 (Tokyo Institute of Technology)
Thermodynamic Effects on Energetic, Structural, and Elastic Properties of Titanium Dioxide Polymorphs
- P- 13 Nayuta Takemori and Akihisa Koga
 (Tokyo Institute of Technology)
Stabilities of superfluid and density wave states in fermionic mass imbalanced optical lattices
- P- 14 Z. Torbatian, S.J. Hashemifar and H. Akbarzadeh
 (Isfahan University of Technology)
First-principles investigation of CO, NO and HCN adsorption on Ag₈ nanocluster

- P- 15 Akihisa Koga
(Tokyo Institute of Technology)
Transport properties through a quantum dot coupled to normal and superconducting leads
- P- 16 Mitsuhiro Kondo and Susumu Saito
(Tokyo Institute of Technology)
Possibility of Homogeneous Boron Doping in Diamond for Higher Transition-Temperature Superconductor
- P- 17 K. Okamoto
(Tokyo Institute of Technology)
Randomness Effect on the Temperature Dependence of the Finite Field Magnetization of a One-Dimensional Spin Gapped System
- P- 18 Yuh Tomio and Hidekatsu Suzuura
(Hokkaido University)
Effects of Dynamic Screening on Excitons in Metallic Carbon Nanotubes
- P- 19 Y. Kawamura and S. Okuma
(Tokyo Institute of Technology)
Onset of Irreversibility and Dislocations in Periodically Sheared Vortex Matter
- P- 20 K. Nagatani S. Okuma, and N. Kokubo
(Tokyo Institute of Technology and The University of Electro-Communications)
Velocity-Induced Rearrangement and Instability of Abrikosov Lattice
- P- 21 S. Sharmin, T. Fujisawa and K. Muraki
(Tokyo Institute of Technology and NTT Research Laboratories)
Study of the stability of the feedback point in the spin blockade regime of a double quantum dot
- P- 22 S. Sharmin, H. Tanaka and T. Ono
(Tokyo Institute of Technology and Osaka Prefecture University)
Ion substitution effect on the distorted kagome lattice of $A_2Cu_3SnF_{12}$
- P- 23 R. Akashi and R. Arita
(University of Tokyo)
Ab initio calculation of superconducting transition temperatures of alkali-doped fullerenes by Density-functional theory for superconductors
- P- 24 Zheng-Yuan Wang and Masaaki Nakamura
(Tokyo Institute of Technology)
Exactly solvable 1D lattice model for the Laughlin states on torus geometries
- P- 25 Ryo Komakura, Shunsuke C. Furuya, Zheng-Yuan Wang, and Masaaki Nakamura
(Tokyo Institute of Technology and University of Geneva)
Phase transitions of bond-alternating quantum spin chains with three-body interactions
- P- 26 I. Nakamura, H. Inagawa, S. Fujiyoshi, and M. Matsushita
(Tokyo Institute of Technology)
Progress in low-temperature microspectroscopic study to detect single praseodymium ion
- P- 27 Martin Miranda, Akimasa Nakamoto, Yuki Okuyama, Atsushi Noguchi, Masahito Ueda, and Mikio Kozuma
(Tokyo Institute of Technology and University of Tokyo)
All optical formation of Ytterbium two-dimensional quasi-condensate near surface of solid immersion lens
- P- 28 Yuki Okuyama, Martin Miranda, Akimasa Nakamoto, Hitomi Ono, Masahito Ueda, and Mikio Kozuma
(Tokyo Institute of Technology and University of Tokyo)
Resolution assessment of a fluorescence microscope for observing single Ytterbium atoms trapped in two-dimensional optical lattice

- P- 29 Akimasa Nakamoto, Martin Miranda, Yuki Okuyama, Atsushi Noguchi, Masahito Ueda, and Mikio Kozuma
(Tokyo Institute of Technology and University of Tokyo)
One-way quantum computation with ultra-narrow optical transition of ^{171}Yb atoms
- P- 30 Y. Imamura and D. Yokoyama
(Tokyo Institute of Technology)
Orbifolded partition function
- P- 31 Yuya Seki and Hidetoshi Nishimori
(Tokyo Institute of Technology)
Quantum annealing with antiferromagnetic fluctuations
- P- 32 Y. Imamura, H. Matsuno and D. Yokoyama
(Tokyo Institute of Technology)
Phase problem of orbifolded partition function
- P- 33 Z. Dehghani Tafti, Sh. Ota, A. Mizoguchi and H. Kanamori
(Tokyo Institute of Technology)
A Study on possibility of observing "ortho-para" microwave transition in Disulfur Dichloride, S_2Cl_2
- P- 34 Y. Susa, A. Hosoya and Y. Shikano
(Tokyo Institute of Technology and Institute for Molecular Science)
Optimal probe wave function of weak-value amplification
- P- 35 K. Nakano, S. Miyasaka, K. Nagai and S. Obata
(Tokyo Institute of Technology)
Construction of Drift Chambers for Drell-Yan Measurement at FNAL SeaQuest
- P- 36 F. Sanftl
(Tokyo Institute of Technology)
The Di-Muon spectrometer for a Drell-Yan Experiment by SeaQuest at FNAL
- P- 37 A. Yokota, E. Hiyama, and M. Oka
(Tokyo Institute of Technology and RIKEN)
Charmonium-Nucleus Bound States
- P- 38 Y. Abe
(Tokyo Institute of Technology)
Calibration of the Double Chooz Neutrino Detector
- P- 39 Kei Suzuki, Philipp Gubler, Kenji Morita and Makoto Oka
(Tokyo Institute of Technology, RIKEN, Kyoto University, and KEK)
Thermal modification of bottomonium spectral functions from QCD sum rules with the maximum entropy method
- P- 40 Tetsuo Hyodo, M. Bayar, C. W. Xiao, A. Dote, M. Oka, and E. Oset
(Tokyo Institute of Technology, Centro Mixto Universidad, and KEK)
Energy and width of a narrow $I = 1/2$ DNN quasibound state
- P- 41 K. Ohtani, M. Oka and P. Gubler
(Tokyo Institute of Technology and RIKEN)
An analysis of the nucleon QCD sum rules
- P- 42 T. Uchino, T. Hyodo, M. Oka and D. Jido
(Tokyo Institute of Technology and Yukawa Institute for Theoretical Physics)
Analysis for the compositeness of hadronic resonances with effective field theory
- P- 43 H. Matsuda, A. Ochi, R. Isozaki, R. Nomura and Y. Okuda
(Tokyo Institute of Technology)
Crystal growth of ^4He in aerogel by temperature sweep

- P- 44 H. Iwata
Forward Obstacle Detection System by Stereo Vision
 (Tokyo Institute of Technology)
- P- 45 Kenji Aihara, Wataru Takeda, Yuji Sasaki and Kenji Erna
Calorimetric study of critical behavior at the SmC^ - SmC^*_a transition*
 (Tokyo Institute of Technology)
- P- 46 R. Usui, N. Kawai
Suzaku observations of a tidal disruption event Swift J1644+57
 (Tokyo Institute of Technology)
- P- 47 T. Fujinaga, K. Mori, A. Bamba, S. Kimura, T. Dotani, M. Ozaki, K. Matsuta, G. Puhlhofer, H. Uchiyama, J. S. Hiraga, H. Matsumoto and Y. Terada
 (Tokyo Institute of Technology, University of Miyazaki, Aoyama Gakuin University, Universitat Tubingen, University of Tokyo, Nagoya University, Saitama University, and JAXA)
An X-ray Study for Origin of Galactic Cosmic Rays: Discovery of an X-ray Counterpart of HESS J1427-608
- P- 48 Kotaro Oshida and Keiji Saneyoshi
Object Extraction from Stereo Vision using Continuity of Disparity Map
 (Tokyo Institute of Technology)
- P- 49 M. Ito and K. Saneyoshi
An attempt to make a large-scale stacked-type electrostatic actuator for artificial muscles of robots
 (Tokyo Institute of Technology)
- P- 50 Takuji Yamashita and H. Matsuhara
Molecular Gas Survey via $12CO(J=1-0)$ Emission Line from Local Luminous Infrared Galaxies
 (Tokyo Institute of Technology)
- P- 51 M. Wasai, K. Akiyama, T. Nakao, S. Murakawa, R. Nomura and Y. Okuda
Surface Andreev Bound States and Majorana Fermions in the Superfluid $3He$ B Phase
 (Tokyo Institute of Technology)
- P- 53 Yoshitaka Fujimoto and Susumu Saito
Energetics and Electronic Structures of Impurity Adsorption on Nitrogen-Doped Graphene: A Density-Functional Study
 (Tokyo Institute of Technology)