

3.3. GCOE Sponsoring Events

The GCOE has sponsored /co-sponsored the 27 events which are including conferences, seminars, and lectures for young scientists (students) and/or civilian in 2011 fiscal year. These events are as follows.

No.	Date(s)	Event: Title Speaker(s)
1.	Jun. 09, 2011	Seminar: “Condensed Matter Colloquium; Information Thermodynamics in small nonequilibrium systems” Takahiro Sagawa (Assistant Prof., Yukawa Institute for Theoretical Physics, Kyoto University)
2.	Jun. 16, 2011	Seminar: “The optical Hall conductivity in the graphene quantum Hall system” Takahiro Morimoto (D3, The University of Tokyo)
3.	Jun. 29 – Jul. 06, 2011	Lecture in “Interdisciplinary Science beyond Particle-Matter Hierarchy” series: “Modern Particle Detectors” Patrick Achenbach (Dr. PD, Institute of Nuclear Physic, University of Mainz, Germany)
4.	Jul. 04, 2011	Seminar: “Study of the nucleon structure with the Mainz Microtron” Patrick Achenbach (Dr., Institute of Nuclear Physics, University of Mainz, Germany)
5.	Jul. 21, 2011	Seminar: “Spin nematics in spin-1/2 frustrated magnets” Tsutomu Momoi (Dr., RIKEN)
6.	Aug. 09, 2011	Seminar: “Present status of J-PARC accelerator” Michikazu Kinsho (Chief researcher, JAEA-JPARC and guest Prof. of Tohoku Univ.)
7.	Aug.11, 2011	Seminar: “Spin-Valley Phase Diagram of the Two Dimensional Electron Gas” Kei Takashina (Dr., University of Bath, UK)
8.	Sep. 27, 2011	Seminar: “The Latest Results of LHC focusing on Higgs and SUSY” Shoji Asai (Prof., University of Tokyo)
9.	Oct. 06, 2011	Seminar: “A Simple Model of Direct Gauge Mediation” Sibo Zheng (Dr., Chongqing University, China)

10.	Oct. 13, 2011	Seminar: "Gamma-ray probes of dark matter annihilation" Shin'ichiro Ando (Dr., GRAPPA/the University of Amsterdam, Holland)
11.	Oct. 24 - 28, 2011	Lectures in "Interdisciplinary Science beyond Particle-Matter Hierarchy" series: 1. "Large-time behavior of solutions to the model of semiconductor device simulations" / Masakazu Yamamoto (Assistant Prof. /Hirosaki Univ.) 2. "Geometry of networks" / Mamoru Tanaka (Assistant Prof. /Tohoku Univ.) 3. "Introduction to entropy" / Takahito Uehara (Assistant Prof. /Tohoku Univ.)
12.	Oct. 25, 2011	Seminar: "Physics on Nucleon structure by polarized proton collision and experiment of relativistic heavy ion collision" - Introduction, Satoshi Nakamura (Associate Prof., Tohoku Univ.) - Purpose and future plan of RHIC/PHENIX, I. Nakagawa (Dr., RIKEN) - Fundamental pQCD and nucleon structure, Y. Goto (Dr., RIKEN) - Physics on heavy ion, Y. Akiba (Dr., RIKEN) - Silicon vertex detector of PHENIX, Y. Akiba (Dr., RIKEN)
13.	Nov. 10, 2011	Seminar: "Interaction effect in topological insulators" X.C. Xie (Dr., International Center for Quantum Materials and School of Physics, Peking University, China)
14.	Nov. 15, 2011	Seminar: "Latest result on neutrino oscillation from Double Chooz experiment" Fumihiko Suekane (Associate Prof., Tohoku University)
15.	Nov. 22, 2011	Seminar: "Search for the signature of inflation universe" Osamu Tajima (Associate Prof., KEK)
16.	Dec. 08, 2011	Seminar: Testing the Reactor Antineutrino Anomaly with a 10g ¹⁴⁴Ce-¹⁴⁴Pr source deployed inside a Large Liquid Scintillator Detector" Thierry Lasserre (Dr., CEA-Saclay, France)
17.	Jan. 11-13, 2012	Lecture in "Interdisciplinary Science beyond Particle-Matter Hierarchy" series: "Flavor Physics at B-factory" Associate Prof. Karim Trabelsi (KEK)
18.	Jan. 16, 2012	Seminars: "Weak localization in graphene" Edward McCann (Dr., Lancaster University, UK)

19.	Jan. 17, 2012	Seminar: “Cross correlated responses of topological superconductors and superfluidsT” Kentaro Nomura (Associate Prof., IMR/Tohoku University)
20.	Jan. 24, 2012	Seminar: “Gamma-ray production in neutrion-oxygen reaction and O(p,p’gamma)experiment at RCNP” Makoto Sakuta (Prof., Okayama University)
21.	Feb.12-18, 2012	First International School for Strangeness Nuclear Physics (SNP School 2012)
22.	Feb. 15-17, 2012	Lecture in “Interdisciplinary Science beyond Particle-Matter Hierarchy” series: “Membrane, Quantum Geometry and Nambu-Poisson Sigma Models” P. Schupp (Prof., Jacobs University Bremen, Germany)
23.	Feb. 21, 2010	Seminar: “Regge-plus-resonance approach to strangeness production from the nucleon and deuteron” Pieter Vancraeyveld (Dr. FWO Research Fellow, Ghent Universit, Belgium)
24.	Feb. 21, 2012	Seminar: “The Achievement of R. J. Boscovich for the Development of Modern Particle Physics Picture of Nature” Tomislav Petković (Prof., University of Zagreb, Croatia)
25.	Feb. 23, 2010	Seminar: “Neutrino masses in a two Higgs doublet model” Alejandro Ibarra (Prof., Technische Universität München, Germany)
26.	Mar.29, 2012	Seminar: “Asymmetric Dark Matter from Spontaneous Cogenesis from MSSM Flat Directions” Kohei Kamata (Dr., DESY, Germany)
27.	Feb.20-22, 2012	The 4th GCOE International Symposium

Details of each event

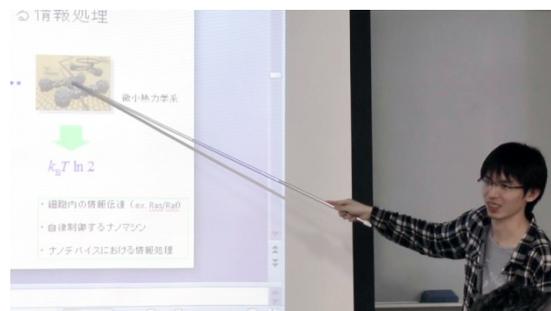
(1) Seminar: "Condensed Matter Colloquium; Information Thermodynamics in small nonequilibrium systems"

Date & Time: June 9 (Thu) 2011, 16:30 – 18:00

Place: Room 745 at 7F "Sogoto", Faculty of Science

Speaker: Takahiro Sagawa (Assistant Prof. /Yukawa Institute for Theoretical Physics, Kyoto University)

Title: "Information Thermodynamics in small nonequilibrium systems"



Takahiro Sagawa (Assistant Prof.)

Inquiries: Yoshio Kuramoto, Shinichiro Iwai, Hiroshi Matsui, Wataru Izumida (Department of Physics)

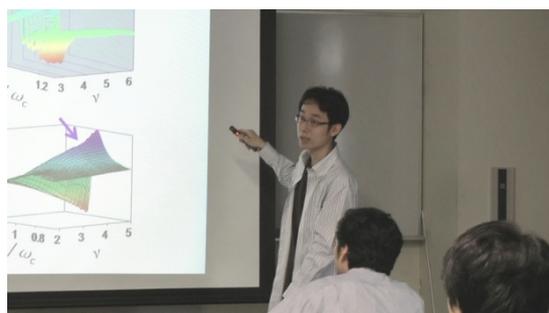
(2) Seminar: "The optical Hall conductivity in the graphene quantum Hall system"

Date & Time: June 16 (Thu) 2011, 14:40 – 16:10

Place: Room 745 at "Sogoto", Faculty of Science

Speaker: Takahiro Morimoto (D3 /University of Tokyo)

Title: "The optical Hall conductivity in the graphene quantum Hall system"



Takahiro Morimoto (D3)

Abstract: We theoretically study the optical Hall

conductivity in two-dimensional electron gas (2DEG) and in graphene in the quantum Hall regime. It was previously demonstrated that both conductivities retain their plateau structure at finite frequency, up to the optical frequency regime ^[1]. This effect has been experimentally observed with THz Faraday rotation spectroscopy for 2DEG ^[2]. Physically, the robustness of the plateau structure in the ac optical regime can be attributed to the localization of electrons in the QHE. To quantify this picture, a dynamical scaling analysis of the optical Hall conductivity is performed for the N=0 Landau level in graphene as well as for the conventional quantum Hall system. This analysis examines whether the system size dependence of the optical Hall conductivity can be captured with a universal scaling function that involves the localization exponent and the dynamic critical exponents. Based on exact diagonalization of these systems with potential disorder, it is shown that the optical Hall conductivity obeys a well-defined dynamical scaling behavior. For both systems, the static exponents are similar and the dynamical exponents are found to be close to 2 ^[3].

[1] T. Morimoto et al. PRL. 103, 116803 (2009).

[2] Y. Ikebe et al. PRL 104, 256802 (2010).

[3] T. Morimoto et al. PRB 82, 081404(R) (2010).

Inquiries: Mikito Koshino, Shinichiro Iwai, Hiroshi Matsui, Wataru Izumida (Department of Physics)

(3) Intensive Lecture: "Modern Particle Detectors"

Date & Time: June 29 (Wed) – July 6 (Wed), 2011

Place: Room 721 at "Sogoto", Faculty of Science

Speaker: **Patrick Achenbach** (Dr. /Institute of Nuclear Physics, University of Mainz)

Title: "Modern Particle Detectors"



Patrick Achenbach (Dr.)

This intensive lecture is one credit lecture of

"Interdisciplinary Science beyond Particle-Matter Hierarchy BVI" for master students and for doctor students.

Date	6/29(Wed)	6/30(Thu)	7/1(Fri)	7/4(Mon)	7/5(Tue)	7/6(Wed)
Time	14:40-16:10	14:40-16:10	14:40-16:10	4:40-16:10, 16:20-17:50	14:40-16:10, 16:20-17:50*	13:00-14:30

* Combining with GCOE Seminar

Abstract: The course will cover the functioning and operation of modern particle detectors. It will introduce the experimental techniques used in nuclear, hadronic, and particle physics and photon science, and describe the layout of modern experiments in these fields. The goal of lecture is to understand principle of modern particle detectors and to learn how they are used in modern nuclear and particle physics experiments. The lecture treats the interaction of particles with matter, scintillators, the principle of gaseous track detectors, solid-state ionization counters, calorimetry and detectors for particle identification. Large detector systems as used at accelerators like the LHC will also be discussed.

Inquiries: Satoshi Nakamura (Department of Physics)

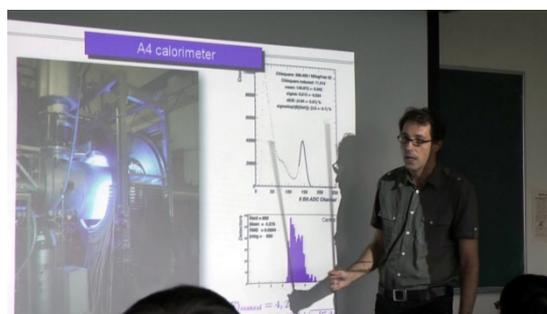
(4) Seminar: "Study of the nucleon structure with the Mainz Microtron"

Date & Time: July 4 (Mon) 2011, 16:20 – 17:50

Place: Room 721 at "Sogoto", Faculty of Science

Speaker: **Patrick Achenbach** (Dr. /Institute of Nuclear Physics, University of Mainz)

Title: "Study of the nucleon structure with the Mainz Microtron"



Patrick Achenbach (Dr.)

This GCOE seminar is a part of lectures

"Interdisciplinary Science beyond Particle-Matter Hierarchy BVI" for graduate students.

Abstract: Mainz University is operating the Mainz Microtron MAMI producing a high-quality continuous beam of electrons with an endpoint energy of 1.5-1.6 GeV for hadron and nuclear physics.

The spectrometer facility has been used to measure the proton elastic form factors with unprecedented sub-percent precision. Since 2008 the magnetic spectrometer Kaos is used in the facility for kaon electro-production.

The Crystal Ball and TAPS set-up is combined with a frozen-spin polarized target for high-precision, high-statistics measurements of neutral meson production and polarization observables on the nucleon.

At the A4 experimental set-up measurements of the parity violating asymmetry in elastic electron scattering are performed to determine the strange quark contributions to the proton.

I will show that the electron accelerator MAMI represents a unique research tool for precision measurements with the electroweak probe.

Inquiries: Satoshi Nakamura (Department of Physics)

(5) Seminar: "Spin nematics in spin-1/2 frustrated magnets"

Date & Time: July 21 (Thu) 2011, 16:20 – 17:50

Place: Room 745, 7F "Sogoto", Faculty of Science

Speaker: **Tsutomu Momoi** (Dr. /RIKEN)

Title: "Spin nematics in spin-1/2 frustrated magnets"



Tsutomu Momoi (Dr.)

Abstract: A spin nematic state is a sort of "quantum spin liquids" with hidden magnetic quadrupolar order. It has been revealed that, in spin-1/2 magnets, which cannot have any on-site quadrupolar moment, dynamical effects lead a spin nematic order formed on bonds without any magnetic dipolar order, when there are ferromagnetic and competing antiferromagnetic interactions. Numerical studies suggested that spin nematic phases do appear in frustrated Heisenberg models in between ferromagnetic and antiferromagnetic phases. Recently, we developed a mean-field theory of the spin nematic state using slave boson formulation, which demonstrated that the spin nematic state can be characterized as a spin-triplet resonating-valence-bond (RVB) state. Starting with this mean-field theory, we further performed a variational Monte Carlo study, which could give us a magnetic phase diagram of the square lattice $S=1/2$ J_1 - J_2 model.

[1] N. Shannon, T. Momoi, and P. Sindzingre, Phys. Rev. Lett. 96, 027213 (2006).

[2] R. Shindou and T. Momoi, Phys. Rev. B 80, 064410 (2009).

Inquiries: Sumio Ishihara, Shinichiro Iwai, Hiroshi Matsui, Nariya Uchida, Wataru Izumida
(Department of Physics)

(6) Seminar: "Present status of J-PARC accelerator"

Date: August 9 (Tue) 2011, 16:20 – 17:50

Place: Room 721, 7F "Sogoto", Faculty of Science

Speaker: **Michikazu Kinsho** (Chief researcher, JAEA-JPARC and guest Prof. of Tohoku Univ.)

Title: "Present status of J-PARC accelerator"



Michikazu Kinsho (Prof.)

Inquiries: Hirokazu Tamaura (Department of Physics)

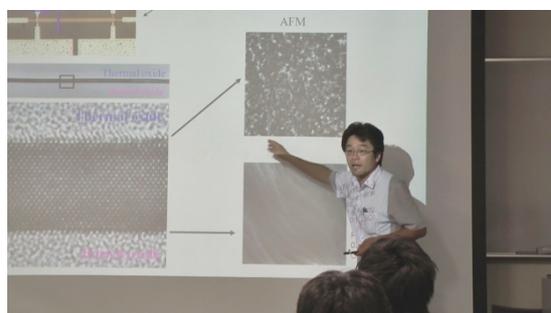
(7) Seminar: "Spin-Valley Phase Diagram of the Two Dimensional Electron Gas"

Date: August 11th (Thu) 2011, 16:00-17:00

Place: Room 745, 7F "Sogoto", Faculty of Science

Speaker: **Kei Takashina** (DR. /University of Bath, UK)

Title: "Spin-Valley Phase Diagram of the Two Dimensional Electron Gas"



Kei Takashina (Dr.)

*This GCOE seminar is partly supported by ERATO-JST.

Abstract: The two-dimensional electron gas generated in silicon quantum wells made using Separation-by-Implantation-of-Oxygen (SIMOX) substrates provides a unique capability to enlarge the valley splitting over an unprecedentedly large energy scale ^[1]. However, the exact mechanism by which this occurs remains unclear ^[2], as does the "quality" of the 2DEG under valley polarization, where mobility is found to be comparatively low.

Here, by making transport measurements under large in-plane magnetic field, we compare the effects of spin-polarization on resistivity to the effects of valley-polarization. We find that valley-polarization has remarkably similar effects on the resistivity as spin-polarization ^[3] suggesting that the low mobility observed under valley polarization in these structures is due primarily to the valley polarization itself, rather than differences in the scale of the underlying bare disorder.

We also examine effects of simultaneously polarizing valley and spin and discuss further analogies between the two degrees of freedom.

[1] Takashina et al, PRL, 96, 236801 (2006),

[2] Saraiva, Calderon, Hu, Das Sarma and Koiller, arXiv:1006.3338(2010), Saraiva, Koiller and Friesen, PRB 82, 245314 (2010),

[3] Takashina et al, PRL 106, 196403 (2011)

Inquiries: Yoshiro Hirayama (Department of Physics)

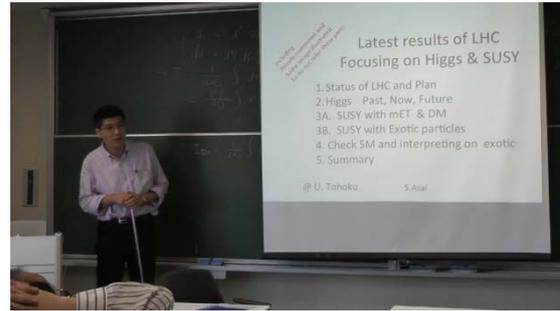
(8) Seminar: "The Latest Results of LHC focusing on Higgs and SUSY"

Date & Time: Sept. 27 (Tue) 2011, 15:30-16:30

Place: Room 1023, 10F "Sogoto", Faculty of Science

Speaker: **Shoji Asai** (Prof. /University of Tokyo)

Title: "The Latest Results of LHC focusing on Higgs and SUSY"



Shoji Asai (Prof.)

Inquiries: Fuminobu Takahashi (Department of Physics)

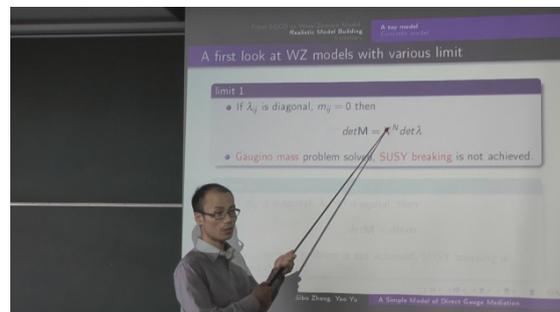
(9) Seminar: "A Simple Model of Direct Gauge Mediation"

Date & Time: October 6 (Thu) 2011, 15:30-16:30

Place: Room 1023, 10F "Sogoto", Faculty of Science

Speaker: **Sibo Zheng** (Dr. /Chongqing University, China)

Title: "A Simple Model of Direct Gauge Mediation"



Sibo Zheng (Dr.)

Inquiries: Fuminobu Takahashi (Department of Physics)

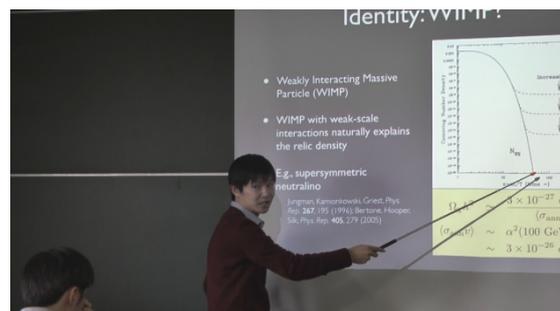
(10) Seminar: "Gamma-ray probes of dark matter annihilation"

Date & Time: October 13 (Thu.) 2011, 15:30-16:30

Place: Room 1023 at 10F "Sogoto", Faculty of Science

Speaker: **Shin'ichiro Ando** (Dr. /GRAPPA, the University of Amsterdam, Holland)

Title: "Gamma-ray probes of dark matter annihilation"



Shin'ichiro Ando (Dr.)

Inquiries: Fuminobu Takahashi (Department of Physics)

(11) Intensive Lectures: "Interdisciplinary Science beyond Particle-Matter Hierarchy BIII"

Date & Time: October 24 (Mon) – October 28(Fri), 2011

Place: Kawai Hall

This intensive lecture is one credit lecture of "Interdisciplinary Science beyond Particle-Matter Hierarchy BIII" for master students and for doctor students.

Time Date	24 Oct.(Mon)	25 Oct. (Thu)	26 Oct. (Wed)	27 Oct. (Thu)	28 Oct. (Fri)
15:00-17:00	1 st -Lecture(1)	1 st -Lecture(2)	2 nd -Lecture(1)		3 rd -Lecture(2)
15:00-16:00				2 nd -Lecture(2)	
16:10-17:10				3 rd -Lecture(1)	

1st Lecture

Date & Time: Oct. 24(Mon) and 25(Tue), 15:00-17:00

Speaker: **Masakazu Yamamoto** (Assistant Prof. /Hirosaki University)Title: **"Large-time behavior of solutions to the model of semiconductor device simulations"**

Abstract: We consider the drift-diffusion equation arising from the model of semiconductor device simulations. This model is provided by a system of the semi-linear dissipative equation and the Poisson equation. In this lecture, we study the large-time behavior of the solution to the drift-diffusion equation.



Masakazu Yamamoto (Assistant Prof.)

2nd Lecture

Date & Time: Oct. 26(Wed), 15:00-17:00 and Oct. 27(Thu), 15:00-16:00

Speaker: **Mamoru Tanaka** (Assistant Prof. /Tohoku Univ.)Title: **"Geometry of networks"**

Abstract: Networks (also said as graphs) have been studied actively in connection with computer networks, and it is also related to lattice models and the structure of fullerenes. I would like to talk about basics of geometry of networks, mentioning some of topics that relates to physics.



Mamoru Tanaka (Assistant Prof.)

3rd Lecture

Date & Time: Oct. 27(Thu), 16:10-17:10 and Oct. 28(Fri), 15:00-17:00

Speaker: **Takahito Uehara** (Assistant Prof. /Tohoku Univ.)

Title: **"Introduction to entropy"**

Abstract: Entropy is an index indicating the complexity of a state, and is used in various fields recently. In my lecture, I will comment on some properties about the entropy, and then give an outline of an application to dynamical systems on surfaces. I want to explain how several topics are linked through the entropy.



Takahiro Uehara (Assitant Prof.)

Inquiries: Reiko Miyaoka (Mathematical Institute)

(12) **Seminar: "Physics on Nucleon structure by polarized proton collision and experiment of relativistic heavy ion collision"**

Date & Time: October 25 (Tue) 2011, 15:00-17:50

Place: Room 721, 7F "Sogoto", Faculty of Science

Speakers: **I. Nakagawa** (Dr. /RIKEN), **Y. Goto** (DR. /RIKEN), **Y. Akiba** (Dr. /RIKEN)

Time	Program
15:00-15:10	Introduction, Satoshi Nakamura (Tohoku Univ.)
15:10-15:40	"Purpose and future plan of RHIC/PHENIX", I. Nakagawa (RIKEN)
15:50-16:20	"Fundamental pQCD and nucleon structure", Y. Goto (RIKEN)
16:30-16:50	Break
16:50-17:20	"Physics on heavy ion", Y. Akiba (RIKEN)
17:30-17:45	"Silicon vertex detector of PHENIX", Y. Akiba (RIKEN)



I. Nakagawa (Dr.)



Y. Goto (Dr.)



Y. Akiba (Dr.)

Inquiries: Satoshi Nakamura (Department of Physics)

(13) Seminar: "Condensed Matter Colloquium; Interaction effect in topological insulators"

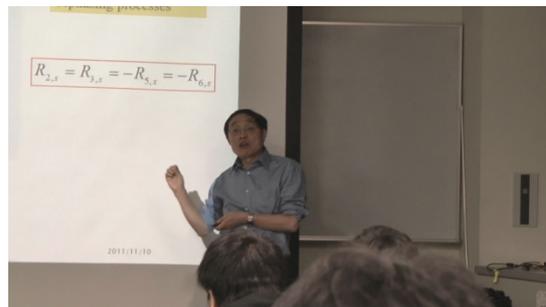
Date & Time: November 10 (Thu.) 2011,

16:30-18:00

Place: Room 745, 7F "Sogoto", Faculty of Science

Speaker: **X.C. Xie** (Dr. /International Center for
Quantum Materials and School of Physics,
Peking University, China)

Title: "Interaction effect in topological insulators"



X. C. Xie (Dr.)

Abstract: Recent numerical studies uncover that the topological insulating states could be broken down by the interaction effect without developing long range orders. However, due to the missing of a direct characterization of the interacting topological phases, the nature of these transitions remains to be a mystery. We study the effect of interactions in the time reversal invariant topological insulators. Their topological indices are expressed by the interacting Green's functions. Under the local self-energy approximation, we find that interaction could induce nontrivial frequency-domain winding numbers and change the topological classes of the system.

Inquiries: Teruya Ishihara, Shinichiro Iwai, Hiroshi Matsui, Nariya Uchida, Wataru Izumida
(Department of Physics)

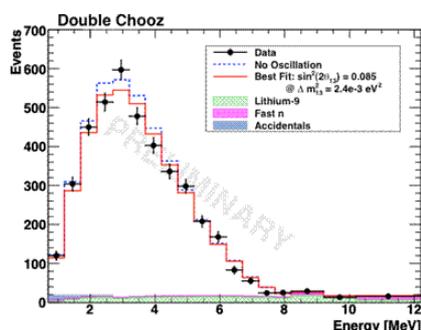
(14) Seminar: "Latest result on neutrino oscillation from Double Chooz experiment"

Date: November 15 (Tue) 2011, 17:00-18:00

Place: Meeting room, 2F Research Center for Neutrino Science

Speaker: **Fumihiko Suekane** (Associate Prof. /Tohoku University)

Title : "Latest result on neutrino oscillation from Double Chooz experiment"



Fumihiko Suekane (Associate Prof.)

Inquire: Fumihiko Suekane (Research Center for Neutrino Science)

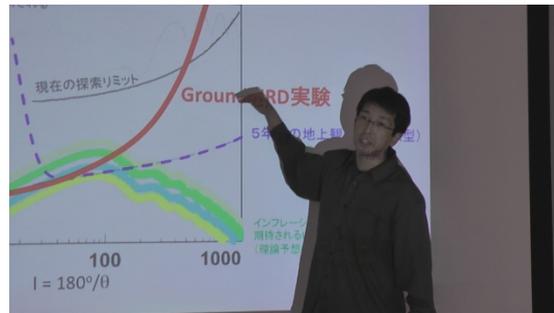
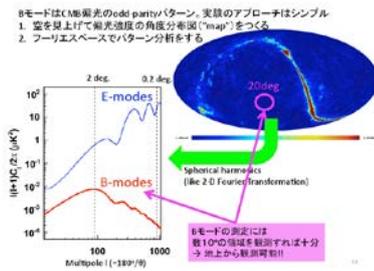
(15) Seminar: "Search for the signature of inflation universe"

Date & Time: November 22 (Tue), 16:00-18:00

Place: Meeting Room at 2F of Research Center for Neutrino Science

Speaker: **Osamu Tajima** (Associate Prof. /KEK)

Title: "Search for the signature of inflation universe – Preliminary results of QUIET experiment and Prospect of observation of CMB polarization"



Osamu Tajima (Associate Prof.)

Inquiries: Fumihiko Suekane (Research Center for Neutrino Science)

(16) Seminar: "Testing the Reactor Antineutrino Anomaly with a 10g ¹⁴⁴Ce-¹⁴⁴Pr source deployed inside a Large Liquid Scintillator Detector"

Date & Time: Dec. 8 (Thu) 2011, 13:00-14:30

Place: Meeting Room at 2F of Research Center for Neutrino Science

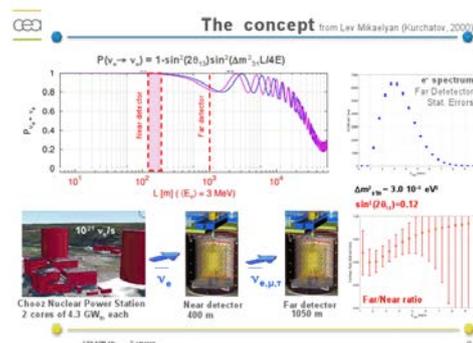
Speaker: **Thierry Lasserre** (Dr. /CEA-Saclay, France)

Title: "Testing the Reactor Antineutrino Anomaly with a 10g ¹⁴⁴Ce-¹⁴⁴Pr source deployed inside a Large Liquid Scintillator Detector"



Thierry Lasserre (Dr.)

Abstract: Recently new reactor antineutrino spectra have been provided for ²³⁵U, ²³⁹Pu, ²⁴¹Pu and ²³⁸U, increasing the mean flux by about 3 percent. With the new flux evaluation the synthesis of published experiments at reactor-detector distances <100 m leads to a ratio of 0.943(0.023), leading to a deviation from unity at 98.6% C.L. that we call the reactor antineutrino anomaly. The compatibility of our results with the existence of a fourth



non-standard neutrino state driving neutrino oscillations at short distances will be discussed. The combined analysis of reactor data, gallium solar neutrino calibration experiments disfavors the no-oscillation hypothesis at 99.8% C.L. The oscillation parameters are such that $\Delta m_{\text{new}}^2 > 1.5 \text{ eV}^2$ (99%) and $\sin^2(2\theta_{\text{new}}) = 0.14(0.1)$ (95%). I will show that this hypothesis can be tested with a PBq (ten kilocurie scale) ^{144}Ce or ^{106}Ru antineutrino beta-source deployed at the center of a large low background liquid scintillator detector. In particular, the compact size of such a source could yield an energy-dependent oscillating pattern in event spatial distribution that would unambiguously determine neutrino mass differences and mixing angles.

Inquiries: Fumihiko Suekane (Research Center for Neutrino Science)

(17) Intensive lecture: "Flavor Physics at B-factories" in "Interdisciplinary Science of Particle-Matter Hierarchy" series.

Date & Time: January 11(Wed)-13(Fri), 2012, 10:00-12:20, 13:30-16:50

Place: Room 225 at Physics Building A

Speaker: **Karim Trabelsi** (Associate Prof. /KEK)

Title: "Flavor Physics at B-factories"

This intensive lecture is one credit lecture of "Interdisciplinary Science of Particle-Matter Hierarchy BVI" for master students and for doctor students. A content of the lecture is the high energy physics – results from B factory experiment and future.

January 11(Wed)	January 12(Thu)	January 13(Fri)
10:00-10:45	10:00-10:45	10:00-10:45
10:50-12:20	10:50-12:20	10:50-12:20
13:30-15:00	13:30-15:00	
15:20-16:50		
	16:30-18:00 Seminar	

Inquiries: Hitoshi Yamamoto (Department of Physics)

(18) Seminar: "Condensed Matter Colloquium; Weak localisation in grapheme"

Date: January 16 (Mon) 2012, 16:30-18:00

Place: Room 745, 7F "Sogoto", Faculty of Science

Speaker: **Edward McCann** (Dr. /Lancaster University, UK)

Title: "Weak localisation in grapheme"

Abstract: The effective Hamiltonian of low-energy electrons in graphene is described, taking into



Edward McCann

account static disorder and spin-orbit coupling. We review different regimes of weak localisation that arise from an interplay between lattice, valley, and spin degrees of freedom and the relative strength of different types of symmetry-breaking scattering. We show that the influence of spin-orbit coupling on the weak localisation effect depends on the lack or presence of z/z symmetry in the system, and we describe the effect of applying an in-plane magnetic field.

Inquiries: Mikito Koshino, Shinichiro Iwai, Hiroshi Matsui, Nariya Uchida, Wataru Izumida
(Department of Physics)

(19) Seminar: "Condensed Matter Colloquium; Cross correlated responses of topological superconductors and superfluids"

Date & Time: January 17 (Tue) 2012, 16:30-18:00

Place: Room 721, 7F "Sogoto", Faculty of Science

Speaker: **Kentaro Nomura** (Associate Prof. /IMR, Tohoku University)

Title: "Cross correlated responses of topological superconductors and superfluids"



Kentaro Nomura (Associate Prof.)

Inquiries: Mikito Koshino, Shinichiro Iwai, Hiroshi Matsui, Nariya Uchida, Wataru Izumida
(Department of Physics)

(20) Seminar: "Gamma-ray production in neutron-oxygen reaction and $O(p, p'\gamma)$ experiment at RCNP"

Date & Time: January 24 (Tue) 2012, 16:00-17:30

Place: Meeting room, 2F, Research Center for Neutrino Science

Speaker: **Makoto Sakuta** (Prof., Okayama University)

Title: "Gamma-ray production in neutron-oxygen reaction and $O(p, p'\gamma)$ experiment at RCNP"



Makoto Sakuta (Prof.)

Inquiries: Kunio Inoue (Research Center for Neutrino Science)

(21) Workshop: "First International School for Strangeness Nuclear Physics (SNP School 2012)"

Date & Time: February 12 (Sun) – 18(Sat), 2012

Place: J-PARC, Tokai and Tohoku University, Sendai, JAPAN

Title: "First International School for Strangeness Nuclear Physics (SNP School 2012)"

URL: <http://lambda.phys.tohoku.ac.jp/snpsc2012/>

The GCOE has supported partly the SNP School 2012.

**(22) Intensive Lecture: "Membrane, Quantum Geometry and Nambu-Poisson Sigma Models"**

Date & Time: February 15 (Wed) – 17(Fri) 2012

Place: Room 745 at "Sogoto", Faculty of Science

Speaker: **P. Schupp** (Prof. /Jacobs University Bremen, Germany)

Title: "Membrane, Quantum Geometry and Nambu-Poisson Sigma Models"



P. Schupp (Prof.)

Feb. 15 (Wed)	Feb. 16(Thu)	Feb. 17 (Fri)
10:30-12:00	10:30-12:00	10:30-12:00
14:00-16:00	14:00-16:00	14:00-16:00

Intensive Lecture "Interdisciplinary Science beyond Particle-Matter Hierarchy BII" is 1 credit for Master / Doctor students.

Abstract: At scales where both quantum and gravitational effects are important, it is generally expected that our notion of smooth space-time will be replaced by some type of quantum geometry. String theory and the all-encompassing M-theory are prime candidates for quantum theories of gravity and not surprisingly, non-commutative geometry and higher geometric structures indeed feature prominently in these theories. One particularly interesting topic is membrane actions that govern the physics of multiple M2 and M5-branes. Nambu-structures appear to play an important role in this context. These are examples of higher quantum geometric structures that go beyond Lie algebras and Poisson structures. The main topic of this course of lectures is recent work on Nambu-Poisson sigma models and Dirac-Born-Infeld type membrane actions. We shall see that analogies to the string theory case are so restrictive that they essentially uniquely determine the desired effective actions. We shall systematically lift structures and methods of non-commutative gauge theory in the context of string theory to the higher geometric context of M-theory. Possible review topics include Kontsevich formality and star products, Seiberg-Witten maps, non-commutative line bundles and Morita equivalent star products.

Inquiries: Hirokazu Tamura (Department of Physics)

(23) Seminar: "Regge-plus-resonance approach to strangeness production from the nucleon and deuteron"

Date & Time: February 21 (Tue) 2012, 14:30-15:30

Place: Room 721 at 7F "Sogoto", Faculty of Science

Speaker: **Pieter Vancraeyveld** (Dr. /FWO Research Fellow, Ghent University, Belgium)



Pieter Vancraeyveld (Dr.)

Title: "Regge-plus-resonance approach to strangeness production from the nucleon and deuteron"

Abstract: Electromagnetic kaon production plays a key role in the ongoing efforts to resolve the "missing" resonance problem. A thorough understanding of open-strangeness production reactions could dramatically improve our understanding of the nucleon's structure. At Ghent university, photon- and electron-induced kaon production off nucleons and deuterium is studied using an efficient reaction model, coined Regge-plus-resonance, that successfully reconciles an isobaric approach in the resonance region with Regge phenomenology at higher energies. This yields a model that accounts for the available data from threshold up to invariant masses of several GeV. In spite of the dominance of data for production experiments from the proton, the complementary kaon production reaction on neutrons yields additional constraints to pin down the reaction dynamics. We show how the Regge-plus-resonance model, which is optimised to data obtained off proton targets, can be transformed to reliably describe all reactions with a kaon-hyperon pair in the final state. Subsequently, quasi-free kaon production from the deuteron is investigated using the Regge-plus-resonance elementary operator within the relativistic plane-wave impulse approximation. In addition, the effects of the hyperon-nucleon final-state interaction are analysed. We will present (semi-)inclusive and exclusive differential cross sections, comparing the model calculations with the latest $2H(\gamma, K)Y_s$ data.

Inquiries: Hiroki Kanda (Department of Physics)

(24) Seminar: "The Achievement of R. J. Boscovich for the Development of Modern Particle Physics Picture of Nature"

Date & Time: February 21 (The.), 2012 17:00-17:45

Place: Room 745 at 7F "Sogoto", Faculty of Science

Speaker: **Tomislav Petković** (Professor /University of Zagreb, Croatia)

Title: "The Achievement of R. J. Boscovich for the Development of Modern Particle Physics Picture of Nature"

Abstract: Ruđer Josip Bošković / Rogerius Joseph Boscovich (May 18, 1711, Dubrovnik, February 13, 1787, Brera-Milano): one of the greatest Croatian and World scientists and philosophers of all time, mathematician, natural philosopher, physicist, technician, poet, Jesuit, diplomat. He was universally occupied by the problems of astronomy, optics, mechanics, geodesy, and construction techniques, of his time. At the middle of 18th century, before the Maxwell-Einstein's epoch of physics, R. J. Boscovich synthesized for the first time a universal, natural-philosophical and mathematical Theory of Natural Philosophy (Vienna 1758 and Venice 1763, respectively), with the points atoms as the ultimate building blocks of matter, that has been based on the single law of forces that exists in nature. The Theory itself is fundamental for modern scientific picture and basic concepts of nature till today, due to structure and particles phenomenology included in it. Bošković explains phenomenology in various fields of physics through the mutual interaction of perfectly indivisible, non-extended, discrete building points (atoms) as the origin of forces. Depending on their distances in the space, forces between them can attract or repel (*curva Boscovichiana*), regardless of whether it is regarded as elementary particles or the entire universe in question.

A historico-epistemological significance of the Boscovich's achievement for the development of modern particle physics picture of Nature will be emphasized via the following issues:

- (i) Assessments of the Boskovic's Theory of Natural Philosophy in the light of modern experimental particle physics;
- (ii) Boskovic's first universal Theory for the single force in Nature and a modern dream of the unification of basic forces (theory of everything);
- (iii) Boskovic's ultimate building points (atoms) in nature and elementary quarks in the Standard Model;
- (iv) Boskovic's natural-philosophical apperceptions versus the new paradigm of the physics with objects and particles in the high energy physics experiments.

On the occasion of 300th anniversary of Boscovich's birth, in the light of proclaimed Boscovich's year of 2011 in Croatia and the World, we may say that Boscovich had apperception of points (atoms) with universal single force between them in nature.

(25) Seminar: "Neutrino masses in a two Higgs doublet model"

Date & Time: February 23 (Thu.) 2012,

13:30-14:30

Place: Room 1023, 10F "Sogoto", Faculty of Science

Speaker: **Alejandro Ibarra** (Prof. /Technische Universität München, Germany)

Title: "Neutrino masses in a two Higgs doublet model"



Alejandro Ibarra (Prof.)

Inquiries: Fuminobu Takahashi (Department of Physics)

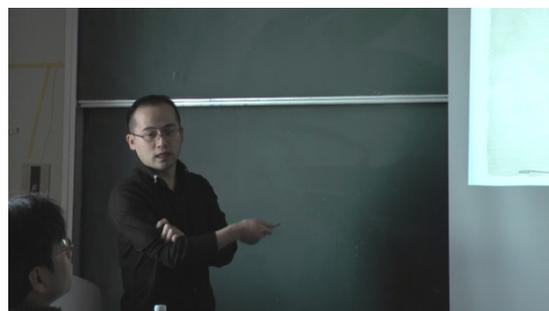
(26) Seminar: "Asymmetric Dark Matter from Spontaneous Cogenesis from MSSM Flat Directions"

Date & Time: March 29 (Thu) 2012, 15:30-16:30

Place: Room 1023 at 10F "Sogoto", Faculty of Science

Speaker: **Kohei Kamata** (Dr. /DESY, Germany)

Title "Asymmetric Dark Matter from Spontaneous Cogenesis from MSSM Flat Directions"



Kohei Kamata (Dr.)

Inquiries: Fuminobu Takahashi (Department of Physics)

(27) Symposium: The 4th GCOE International Symposium on "Weaving Science Web beyond Particle-Matter Hierarchy"

Date & Time: February 20 (Mon)-22 (Wed) 2012

Place: Faculty of Science, Aobayama Campus of Tohoku University

Banquet: February 20 (Mon) 2012, 18:30-20:00

Number of participants: 158 (non-Japanese 23)

Outline: The aim of this Symposium is to explore new science frontiers through "Weaving Science Web beyond Particle-Matter hierarchy" among physics - astrophysics - mathematics - philosophy.

Invited Speakers:

Plenary session:

Hayato Chiba (Mathematics / Assistant Prof., Institute of Mathematics for Industry, Kyushu University, Japan)

Yoshinori Imai (Condensed Matter Physics / Assistant Prof., University of Tokyo, Japan)

Masahiro Kawasaki (Particle Cosmology / Professor, Institute for Cosmic Ray Research, University of Tokyo, Japan)

Andreas Klumper (Condensed Matter Physics / Professor, University of Wuppertal, Germany)

Peter Kroes (Philosophy / Professor, Delft University of Technology, Holland)

Yasunori Maekawa (Mathematics / Associate Prof., Kobe University, Japan)

Hans-Josef Schulze (Nuclear Physics / Prof., INFN - University of Catania, Italy)

Peter Schupp (Particle Physics / Professor, School of Engineering & Science, Jacobs Univ., Germany)

Howard Smith (Astrophysics / Professor, Harvard-Smithsonian Center for Astrophysics - CfA, USA)

Kazuhiro Yamamoto (Astrophysics / Associate Prof., Hiroshima University, Japan)

Parallel session:

Patrick Achenbach (Nuclear Physics / Dr., Institute of Nuclear Physics, Joh. Gutenberg University, Germany)

Shigeyuki Aoki (Philosophy / Associate Prof., University of Aizu, Japan)

Mireya Etxaluze Azkonaga (Astrophysics / Dr., Centro de Astrobiologia, Instituto Nacional de Técnica Aeroespacial (CSIC/INTA), Spain)

Michael Brockmann (Condensed Matter Physics / Doctoral student, University of Wuppertal, Germany)

Luca del Frate (Philosophy / Doctoral student, Delft University of Technology, Holland)

Tomohiro Fukaya (Mathematics / Dr., Kyoto University, Japan)

Lauranne Lanz (Astrophysics / Doctoral student, Harvard-Smithsonian Center for Astrophysics - CfA, USA)

Sachiko Maki (Condensed Matter Physics / Doctoral student, Nagoya University, Japan)

Hiroaki Matsueda (Condensed Matter Physics / Associate Prof., Sendai National College of Technology, Japan)

Matsuo Sato (Particle Physics / Associate Prof., Hirosaki University, Japan)

Speakers of Tohoku University:

Kunio Inoue (Particle Physics-Neutrino / Prof., Research Center for Neutrino Science)

Hisataka Furuta (Particle Physics / Dr.)

Masatoshi Itoh (Nuclear Physics / Assistant Prof., CYRIC)

Tsuguhiko Asakawa (Particle Physics / Assistant Prof.)

Satoshi Heguri (Condensed Matter Physics / Assistant Prof.)

Takeshi Koike (Nuclear Physics, /Assistant Prof.)

Shumpei Masuda (Condensed Matter Physics / Assistant Prof.)

Joji Nasu (Condensed Matter Physics /Assistant Prof.)

Daisuke Nitta (Astrophysics, /Assistant Prof.)
Takahiro Okabe (Mathematics / Assistant Prof.)
Mamoru Tanaka (Mathematics / Assistant Prof.)
Mikito Tanaka (Astrophysics / Assistant Prof.)
Takato Uehara (Mathematics / Assistant Prof.)

Organizing Committee:

***(Chairman) Toshifumi Futamase, **(Program Leader) Kunio Inoue**

Organizing Committee (Extended steering committee of GCOE program):

Toshifumi Futamase (Astrophysics Tohoku Univ.)*
Osamu Hashimoto (Nuclear Physics, Tohoku Univ.)
Ken-ichi Hikasa (Particle Physics, Tohoku Univ.)
Yoshiro Hirayama (Condensed Matter Physics, Tohoku Univ.)
Kunio Inoue (Particle Physics, Tohoku Univ)**
Motoko Kotani (Mathematics, Tohoku Univ.)
Hideo Kozono (Mathematics, Tohoku Univ.)
Yoshio Kuramoto (Condensed Matter Physics, Tohoku Univ.)
Kiyotaka Naoe (Philosophy, Tohoku Univ.)
Takashi Takahashi (Condensed Matter Physics, Tohoku Univ.)
Hirokazu Tamura (Nuclear Physics, Tohoku Univ.)
Masahiro Yamaguchi (Particle Physics, Tohoku Univ.)

Local Committee:

Toshifumi Futamase (Astrophysics, Tohoku Univ.)*
Tsuguhiko Asakawa (Particle Physics, Tohoku Univ.)
Satoshi Heguri (Condensed Matter Physics, Tohoku Univ.)
Takeshi Koike (Nuclear Physics, Tohoku Univ.)
Shumpei Masuda (Condensed Matter Physics, Tohoku Univ.)
Joji Nasu (Condensed Matter Physics, Tohoku Univ.)
Mariko Nihei (Philosophy, Tohoku Univ.)
Daisuke Nitta (Astrophysics, Tohoku Univ.)
Takahiro Okabe (Mathematics, Tohoku Univ.)
Mamoru Tanaka (Mathematics, Tohoku Univ.)
Mikito Tanaka (Astrophysics, Tohoku Univ.)
Takato Uehara (Mathematics, Tohoku Univ.)



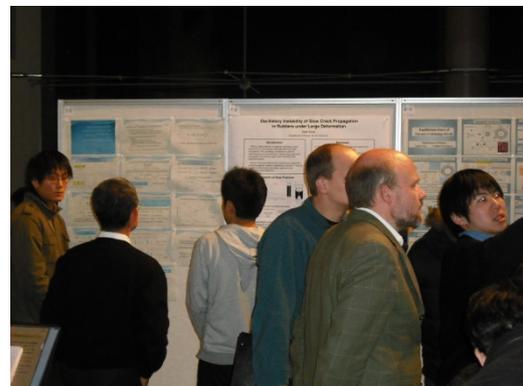
Prof. Kunio Inoue (GCOE program leader)



Prof. Peter Schupp



Plenary session



Poster session (Feb. 20-21)

Program:

February 20 Monday	
Plenary Session – Particle-, Condensed Matter-Physics, Astrophysics, Mathematics Main Lecture Hall	
	<i>(Chairman) T. Futamase</i>
09:00 – 09:10	Kunio INOUE (GCOE program leader) – “Opening address”
	<i>(Chairman) M. Yamaguchi</i>
09:10 – 09:55	Peter Schupp (Particle Physics / Professor., Jacobs University Bremen, Germany) “Space-time quantum geometry”
	<i>(Chairman) K. Tanigaki</i>
09:55 – 10:40	Yoshinori Imai (Condensed Matter Physics / Assistant Prof. University of Tokyo, Japan) “Dynamics of superfluids and quasiparticles in iron-based superconductors investigated by microwave to terahertz conductivity measurements”
10:40 – 11:00	<i>Coffee Break</i>
	<i>(Chairman) M. Hattori</i>
11:00 – 11:45	Howard Smith (Astrophysics / Professor., Harvard-Smithsonian Center for Astrophysics - CfA, USA) “Star Formation Near and Far: Recent Smithsonian Infrared-Submillimeter Research”
	<i>(Chairman) T. Shioya</i>
11:45 – 12:30	Hayato Chiba (Mathematics / Assistant Prof., Institute of Mathematics for Industry, Kyushu University, Japan) “Synchronization - A bifurcation theory of infinite dimensional dynamical systems –”
12:30 – 14:00	<i>Lunch</i>
Parallel Session A – Condensed Matter Physics Room203	
	<i>(Chairman) S. Masuda</i>
14:00 – 14:35	Michael Brockmann (Condensed Matter Physics / Doctoral student, University of Wuppertal, Germany) “Microwave Absorption by Anti-Ferromagnetic Spin Chains”
14:35 – 15:10	Joji Nasu (Condensed Matter Physics / Assistant Prof., Tohoku University, Japan) “Dynamical Jahn-Teller Effect in Spin-Orbital Coupled System”
15:10 – 15:30	<i>Coffee Break</i>

	<i>(Chairman) S. Heguri</i>
15:30 – 16:05	Sachiko Maki (Condensed Matter Physics / Doctoral student, Nagoya University, Japan) “Structural Study on Quasi One-dimensional Organic Conductor, (TMTTF) ₂ PF ₆ by Synchrotron X-ray Diffraction”
16:05 – 16:40	Shumpei Masuda (Condensed Matter Physics / Assistant Prof., Tohoku University, Japan) “Interference effects of helical current of two dimensional topological insulator”
Parallel Session B – Particle Physics	
Room204	
	<i>(Chairman) T. Asakawa</i>
14:00 – 14:35	Matsuo Sato (Particle Physics / Associate Prof., Hirosaki University, Japan) “3-algebra Model of M-theory”
14:35 – 15:10	Hisataka Furuta (Particle Physics / Dr., Tohoku University, Japan) “Double Chooz experiment – A search for neutrino mixing angle θ_{13} ”
15:10 – 15:30	<i>Coffee Break</i>
	<i>(Chairman) Mastuo Sato</i>
15:30 – 16:05	Tsuguhiko Asakawa (Particle Physics / Assistant Prof., Tohoku University, Japan) “Noncommutative Solitons of Gravity”
16:05 – 16:40	
Parallel Session C – Nuclear Physics	
Room303	
	<i>(Chairman) T. Koike</i>
14:00 – 14:35	Patrick Achenbach (Nuclear Physics / Dr., Institute of Nuclear Physics, Joh. Gutenberg University, Germany) “High-precision form factor measurements at MAMI”
14:35 – 15:10	Masatoshi Itoh (Nuclear Physics / Assistant Prof., CYRIC, Tohoku University, Japan) “The 2 ⁺ excitation of the Hoyle state in ¹² C”
15:10 – 15:30	<i>Coffee Break</i>
	<i>(Chairman) Hans-Josef Schulze</i>
15:30 – 16:05	Takeshi Koike (Nuclear Physics / Assistant Prof., Tohoku University, Japan) “ γ -ray spectroscopy of <i>sd</i> -shell hypernuclei at J-PARC”
16:05 – 16:40	

Poster Session

Entrance-hall 2F and Room205

16:40 – 18:00 Entrance-hall 2F: Exhibit = odd number of Poster no. 1~31
Room 205 : Exhibit = odd number of Poster no. 33~85

18:20 – 20:00 *Banquet at Campus Cafeteria*

February 21 Tuesday

Plenary Session – Nuclear -, Condensed Matter-Physics, Astrophysics, Mathematics,
Philosophy

Main Lecture Hall

09:00 -09:45	<i>Tamura</i> Hans-Josef Schulze (Nuclear Physics / Professor., INFN - University of Catania, Italy) “Neutron stars with hyperons and quarks”	(Chairman) <i>H.</i>
09:45 – 10:30	Andreas Kluemper (Condensed Matter Physics / Professor., University of Wuppertal, Germany) “Exact results for many body systems by use of the Yang-Baxter equation and related algebraic structures”	(Chairman) <i>Y. Kuramoto</i>
10:30 – 10:50	<i>Coffee Break</i>	
10:50 – 11:35	Kazuhiro Yamamoto (Astrophysics / Associate Prof., Hiroshima University, Japan) “Accelerating expansion of the universe and testing gravity on cosmological scale”	(Chairman) <i>T. Futamase</i>
11:35 – 12:20	Yasunori Maekawa (Mathematics / Associate Prof., Kobe University, Japan) “On vorticity formulation for viscous incompressible flows in the half plane and its application to the inviscid limit problem”	(Chairman) <i>H. Kozono</i>
12:20 – 13:05	Peter Kroes (Philosophy / Professor, Delft University of Technology, Holland) “The creation of physical phenomena and of technical artefacts”	(Chairman) <i>K. Naoe</i>
13:05 – 14:30	<i>Lunch</i>	

Parallel Session A – Condensed Matter Physics / Philosophy

Room203

		<i>(Chairman) J. Nasu</i>
14:30 – 15:05	Hiroaki Matsueda (Condensed Matter Physics / Associate Prof., Sendai National College of Technology, Japan) “AdS/CFT correspondence in statistical and information physics”	
15:05 – 15:40	Satoshi Heguri (Condensed Matter Physics / Assistant Prof., Tohoku University, Japan) “Vibrations of guest atoms induced anomalous physical properties in type-1 clathrate”	
15:40 – 15:50	<i>Coffee Break</i>	
		<i>(Chairman) M. Nihei</i>
15:50 – 16:25	Shigeyuki Aoki (Philosophy / Associate Prof., University of Aizu, Japan) “Philosophy of Science Useful for Scientists?”	
16:25 – 17:00	Luca del Frate (Philosophy / Doctoral student, Delft University of Technology, Holland) “Failure of engineering artefacts: a life cycle approach”	

Parallel Session B – Astrophysics

Room204

		<i>(Chairman) Mikito Tanaka</i>
14:30 – 15:05	Mireya Etxaluze Azkonaga (Astrophysics / Dr., Centro de Astrobiologia, Instituto Nacional de Técnica Aeroespacial (CSIC/INTA) Spain) “Herschel/SPIRE FTS observations of the Sagittarius B2 molecular cloud”	
15:05 – 15:40	Daisuke Nitta (Astrophysics / Assistant Prof., Tohoku University, Japan) “Shadows of multi-black holes in de Sitter space-time”	
15:40 – 15:50	<i>Coffee Break</i>	
		<i>(Chairman) D. Nitta</i>
15:50 – 16:25	Lauranne Lanz (Astrophysics / Doctoral student, Harvard-Smithsonian Center for Astrophysics - CfA, USA) “Investigating Galaxy Interactions from the Ultraviolet to the Far-Infrared”	
16:25 – 17:00	Mikito Tanaka (Astrophysics / Assistant Prof., Tohoku University, Japan) “Galactic Archaeology - Observational Studies of the Stellar Halo of the Andromeda Galaxy using Subaru telescope”	

Parallel Session C – Mathematics

Room303

		<i>(Chairman) Mamoru Tanaka</i>
14:30 – 15:05	Tomohiro Fukaya (Mathematics / Dr., Kyoto University, Japan) “Coarse Baum-Connes conjecture for relatively hyperbolic groups”	
15:05 – 15:40	Takato Uehara (Mathematics / Assistant Prof., Tohoku University, Japan) “Ergodic Theory of Painlevé VI”	
15:40 – 15:50	<i>Coffee Break</i>	

	<i>(Chairman) T. Uehara</i>
15:50 – 16:25	Takahiro Okabe (Mathematics / Assistant Prof., Tohoku University, Japan) “Initial profile for the slow decay of the Navier-Stokes flow in the half-space”
16:25 – 17:00	Mamoru Tanaka (Mathematics / Assistant Prof., Tohoku University, Japan) “Higher eigenvalues of the Laplacian on a graph and partitions of the graph”
Poster Session	
Entrance-hall 2F and Room205	
17:00 – 18:20	Entrance-hall 2F: Exhibit = even number of Poster no. 2~32 Room 205: Exhibit = even number of Poster no. 34~86

February 22 Wednesday

Plenary Session –Particle Cosmology, Particle Physics,

Main Lecture Hall

	<i>(Chairman) K. Hikasa</i>
09:00 -09:45	Masahiro Kawasaki (Particle Cosmology / Professor, Institute for Cosmic Ray Research - ICRR, University of Tokyo, Japan) “Axion Cosmology”
09:45 – 10:30	Kunio Inoue (Neutrino Physics / Professor, Research Center for Neutrino Science - RCNS, Tohoku University, Japan) “Can matter-particle and antimatter-particle be the same? -- Neutrino-less double beta decay search with KamLAND: KamLAND-Zen --”
10:30 – 10:40	Toshifumi Futamase (Chairman of Organizing Committee) – “Closing address”

Poster Presentations:

P- no.	Title / Name
1	"The spatial dispersion effect in stratified metal-dielectric metamaterial" Aunuddin Syabba Vioktalamo (Physics, D2)
2	"Resonance femtosecond stimulated Raman spectroscopy: development and application to vibration of excited state" Kenta Abe (Physics, D3)
3	"Electronic State and Superconducting of Heavy Fermion CeRhSi₃" Hiroki Iida (Physics, D1)
4	"Accurate Crystal Structure Analysis of YTiO₃ by Synchrotron X-ray Diffraction" Yoshihisa Ishikawa (Physics, D3)
5	"Terahertz Time Domain Spectroscopy of Dimer Mott Insulator" Keisuke Ito (Physics, D1)
6	"Investigating of the topological order in the quantum Hall effect" Toru Ito (Physics, D1)
7	"Structure of neutron-rich nucleus ³¹Ne deduced from nuclear reactions" Yasuko Urata (Physics, D1)
8	"Oscillatory Instability of Slow Crack Propagation in Rubbers under Large Deformation" Daiki Endo (Physics, D3)
9	"Properties of proton-rich unstable nuclei and two-proton radioactivity" Tomohiro Oishi (Physics, D2)
10	"Equilibrium states of polymer-containing micells" Yutaka Oya (Physics, D2)
11	"Shot noise measurements for a Kondo-correlated quantum dot in the unitary limit" Yuma Okazaki (Physics, D3)
12	"The analysis of Lambda hypernuclear spectroscopic experiment via (e,e'K⁺) reaction at JLab Hall-C" Daisuke Kawama (Physics, D3)
13	"Coherent double pion photoproduction on the deuteron" Chigusa Kimura (Physics, D2)
14	"Medium heavy Λ hyper nuclear spectroscopic experiment by (e, e' K) reaction" Toshiyuki Gogami (Physics, D2)
15	"Electron microscopy and spectroscopy studies of organic molecules inside SWCNT" Md. Mahbul Haque

16	“New geometric interpretation of D-branes and DBI action” Shuhei Sasa (Physics, D1)
17	“Study of $B^{\pm} \rightarrow DK^{\pm}$, $D \rightarrow K_S K^{\pm} \pi^{\mp}$ for the measurement of CP -violating angle ϕ_3, and $D^{*\pm} \rightarrow D\pi^{\pm}$, $D \rightarrow K_S K^{\pm} \pi^{\mp}$ for the modeling of $D \rightarrow K_S K^{\pm} \pi^{\mp}$ Dalitz plane” Zenmei Suzuki (Physics, D2)
18	“Description of single-Λ hypernuclei with a relativistic point coupling model” Yusuke Tanimura (Physics, D1)
19	“Boundary state analysis on the equivalence of T-duality and Nahm transformation in superstring theory” Yoshiro Teshima (Physics, D2)
20	“Statics and Dynamics of Wormlike Micellar Systems” Masatoshi Toda (Physics, D3)
21	“Study of light hypernuclei with the Stochastic Variational Method” Yoichi Nakagawa (Physics, D3)
22	“Study of $B^0 \rightarrow DK^{*0}$ (892) following by $D \rightarrow K^+ \pi^-$ at Belle” Kentarō Negishi (Physics, D1)
23	“DMRG study of the ground state phase diagram of interacting massless Dirac fermions in graphene under magnetic field” Tatsuya Higashi (Physics, D3)
24	“Cosmologically viable gauge mediation” Hiraku Fukushima (Physics, D1)
25	“Study of the Λ photoproduction with Neutral Kaon Spectrometer 2” Takao Fujii (Physics, D2)
26	“Statistical analysis of human written language” Sho Furuhashi (Physics, D3)
27	“Analysis of the hypernuclear γ -ray spectroscopy of $^{12}_{\Lambda}C$ and $^{11}_{\Lambda}B$ via the (π^+, K^+) reaction” Kenji Hosomi (Physics, D3)
28	“Electrostatic potential analysis of ferroelectric phase of hexagonal $YMnO_3$ using convergent-beam electron diffraction” Daisuke Morikawa (Physics, D3)
29	“X-ray exposure effect on charge-orbital order in Fe-doped layered manganites $La_{0.5}Sr_{1.5}Mn_{1-x}Fe_xO_4$” Yuuki Yamaki (Physics, D2)
30	“Theory of Superconductivity in fullerenes by the repulsive interaction model” Satoshi Yamazaki (Physics, D1)

31	“Improvement of the detector systems for Neutral Kaon Spectrometer 2” Fumiya Yamamoto (Physics, D1)
32	“Role of non-collective excitations in heavy-ion reaction around the Coulomb barrier” Shusaku Yusa (Physics, D2)
33	“Laser cooling of GaAs/AlGaAs cantilever by exciton-related optical absorption” Takayuki Watanabe (Physics, D2)
34	“Magnetic properties of lightly electron doped LaCoO₃” Masanori Watahiki (Physics, D2)
35	“On the development of resonant inelastic x-ray scattering for high-pressure experiments” Masahiro Yoshida (Physics, D3)
36	“Terahertz pulse shaping via difference frequency mixing of shaped optical pulses” Kouji Uematsu (Physics, D2)
37	“Spectral-Function Sum Rules in Supersymmetry Breaking Models” Mitsutoshi Nakamura (Physics, D2)
38	“Laser Raman spectroscopy and the D band of graphene” Nobuhiko Mitoma (Physics, D2)
39	“Theory of coherent phonon oscillations in carbon nanotubes and graphene nanoribbons” Ahmad Ridwan Tresna Nugraha (Physics, D1)
40	“High energy-resolution EELS and SXES studies on characteristic chemical shifts and charge transfer in Al-Si-Mn and Zn-Mg-Zr alloys” Shogo Koshiya (Physics, D3)
41	“Double Chooz: A search for the Neutrino Mixing angle θ_{13}” Thiago Junqueira De Castro Bezerra (Physics, D1)
42	“Evidence for Quantum Magnetotransport of Dirac Cone States in Ba(FeAs)₂” Huynh Kim Khuong (Physics, D1)
43	“Research of Transmission-line STJ Detector for Terahertz Band” Kenta Takahashi (Physics, D1)
44	“An investigation of the photo induced production of strangeness in the threshold energy range” Brian O'neil Beckford (Physics, D3)
45	“Simple model for rupture process of pressure-sensitive adhesives” Shinobu Sekine (Physics, D1)

46	“Crystal growth of new target systems for high-energy neutron-scattering measurements at J-PARC” Kenji Tsutsumi (Physics, D1)
47	“A living body system uses an amphipathic molecule etc. as a fundamental component” Shinsuke Fukaya (Physics, D1)
48	“A test for uniformity of BGO crystals to be used for an EM calorimeter” He Qinghua (Physics, D1)
49	“Magnetic properties of potassium doped polyacene: anthracene, tetracene, pentacene” Phan Thi Nhu Quynh (Physics, D1)
50	“Porting linux to MoGURA frontend electronics” Xu Benda (Physics, D1)
51	“Scanning tunneling microscopy of electronic properties of bulk and layered MoS₂” Amin Vakhshouri (Physics, D1)
52	“Quasinormal modes of charged anti-de Sitter black holes” Nami Uchikata (Astronomy, D2)
53	“The star formation in the SSA22 protocluster at $z=3.09$” Mariko Kubo (Astronomy, D1)
54	“Consistency Relation for multi-field inflation scenario” Naonori Sugiyama (Astronomy, D2)
55	“Path Integral Analysis of Bianchi I spacetime in Loop Quantum Cosmology” Kazuya Fujio (Astronomy, D2)
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