

News

IPMU Suffered No Physical Damages by the Tohoku-Pacific Ocean Earthquake: Research Activities Face Inconvenience at Present

"The 2011 off the Pacific coast of Tohoku Earthquake" occurred on March 11, 2011, at 14:46 JST, and caused devastating damage to the coast region of the Tohoku and Kanto districts. We would like to express our deepest condolences and sympathies to the families of those who lost their lives, and to those who were affected by this earthquake and tsunami.

We also would like to report that the safety of all the IPMU members, including temporary visitors, was confirmed. Further, the IPMU building suffered no serious damage. We wish to thank those who expressed their concerns to us. However, at present research activities at IPMU have been influenced by various issues caused by the earthquake, such as rolling blackouts and difficulties in the public transportation systems, and seminars as well as workshops have been cancelled or postponed. We sincerely hope the recovery from this tumultuous situation can be executed as rapidly as possible.

Today Institutes for Advanced Study (TODIAS) Launched and Decided to Bring IPMU under its Umbrella

As President Junichi Hamada remarks (see page 10), the University of Tokyo

marked ensuring academic diversity and pursuit of excellence as one of the priority areas, with the objectives of promoting world-class scientific research, strengthening international public relations efforts to boost the University of Tokyo's global presence as a comprehensive research university, and becoming a world leader in inter-university collaboration and scholarship. As part of the measures that the university is taking to achieve these goals, the Todai Institutes for Advanced Study (TODIAS) was established on January 1st, 2011 as a university-wide organization, and at the first meeting held on January 11th the TODIAS Steering Committee decided to approve the Institute for the Physics and Mathematics of the Universe (IPMU) as the first entity within TODIAS. This provided IPMU a "citizenship" within Todai, and this is a critical step for IPMU to become a permanent member of the Todai community.

Public Lecture to Inaugurate the Todai Institutes for Advanced Study "Unravelling the Secrets of the Universe"

On March 9, 2011, a public lecture to inaugurate the Todai Institutes for Advanced Study "Unravelling the Secrets of the Universe" was held at the Yasude Auditorium on the Hongo Campus of the University of Tokyo, with a bidirectional simultaneous interpretation service between Japanese and English provided.

After the opening remarks given by Junichi Hamada, President of the University of Tokyo and Sadanori Okamura, Director of TODIAS, and a congratulatory address given by Etsuya Kanamori, Deputy Minister of Ministry of Education, Culture, Sports, Science and Technology, IPMU Director Hitoshi Murayama spoke on "What

is the Universe made of?" and 2004 Nobel Laureate in Physics David J. Gross, Director in Theoretical Physics at the Kavli Institute for Theoretical Physics of the University of California, Santa Barbara gave a lecture on "The Frontiers of Fundamental Physics." Although it was a weekday afternoon, the lecture was well attended, with nearly 1,000 participants.



Univ. of Tokyo President Hamada, giving an opening remark



TODIAS Director Okamura, introducing the TODIAS's logo.



IPMU Director Murayama, giving a lecture



2004 Nobel Laureate Prof. Gross, giving a lecture

Yoichiro Suzuki and Serguey T. Petcov won the 2010 Bruno Pontecorvo Prize

The prestigious 2010 Bruno Pontecorvo Prize has been awarded to Yoichiro Suzuki, Director of the Kamioka Observatory, ICRR, the

University of Tokyo and Deputy Director of IPMU, for his outstanding contribution to the discovery of atmospheric and solar neutrino oscillations in the Super-Kamiokande experiment, and to Serguey T. Petcov, Professor at SISSA (Scuola Internazionale Superiore di Studi Avanzati) at Trieste in Italy and Visiting Senior Scientist at IPMU, for his fundamental contribution to the investigation of neutrino propagation in matter, $\mu \rightarrow e + \gamma$ and $\mu \rightarrow 3e$ processes, and Majorana properties of neutrinos.

This Prize was established in 1995 by the Joint Institute for Nuclear Research (JINR) in Dubna, Moscow in commemoration of Bruno Pontecorvo who produced numerous pioneering achievements in neutrino physics.

The award ceremony was held on February 18th, 2011 at JINR.

Seon Chan Park Co-Winner of the 2010 Young Scientist Award in Theoretical Particle Physics

Seong Chan Park, an IPMU postdoctoral fellow and Kin-ya Oda, Assistant Professor of Osaka University received the 2010 Young Scientist Award in Theoretical Particle Physics. Their article "Rotating black holes at future colliders: Greybody factors for brane fields" was recognized by the Japanese particle theorist community which selects recipients of this award from its young members (one of the co-authors of the awarded article, Daisuke Ida, is a non-member).

IPMU Director Murayama Won the 2011 Best Paperback Book Grand Prix

IPMU Director Hitoshi Murayama won the 2011 Best Paperback Book Grand Prix awarded by a Japanese publishing company Chuokoron-Shinsha, Inc. His book "What Is the

Universe Made Of? –Solving the Mystery of the Universe with Particle Physics" (in Japanese, Gentosha, Inc., Tokyo) was recognized. It is an easy and enjoyable introduction to particle cosmology, published at the end of September, 2010, with contents ranging from the investigations of fundamental constituents of matter to the attempts to solve mystery of the birth of the Universe (see IPMU NEWS No.12, page 23). The award ceremony was held on March 8th, 2011, and a commemorative lecture was given.



Astronomers Release the Largest Color Image of the Sky Ever Made

At the 217th American Astronomical Society meeting in Seattle, the Sloan Digital Sky Survey-III (SDSS-III) Collaboration, including some IPMU scientists, is releasing the largest digital color image of the sky ever made, and it is free to all. SDSS is a survey program to create a 3-dimensional map of the nearby universe and study the structure and evolution of the universe. This data release will open all imaging data taken over the last decade to the public. SDSS will continue spectroscopic observation to determine distances to individual galaxies over the next four years.

Workshop: Geometry and Analysis of Discriminants

This workshop was held at IPMU on February 7 and 8, 2011. The discriminant of a deformation of some mathematical structure is often a free divisor and contains plenty of

substantial information of the original family (Gauss-Manin system and its Fourier transform, the fundamental group of the complement and its monodromy representation, etc). It was impressive that several talks in the workshop suggested the important role of the large circle in the fundamental group, which corresponds to the Coxeter element in the classical theory.

IPMU Workshop on Black Holes

The "IPMU Workshop on Black Holes" was held at IPMU from February 21 to 25, 2011. The topic of the meeting was black holes, but very broadly defined, from their astronomical observations to their quantum properties in string theory and loop quantum gravity. The number of participants was limited to 40, in order to have a relatively small number of talks per day and encourage free discussions on possible links between different research fields.

Workshop: Log Hodge Theory and Elliptic Flat Invariants

This workshop was held at IPMU on February 24, 2011.

Future Workshop: Death of Massive stars: Supernovae & Gamma-Ray Burst

The symposium was originally scheduled to be held in Nikko, Japan, from 18 to 22 April, 2011. It was postponed, however, because of the 2011 off the Pacific coast of Tohoku Earthquake, which occurred on March 11. Further details, including the alternative date, will be announced later.

In this symposium, some 30 speakers will be invited from all over the world, and there will be as many contributed talks and many more

poster presentations. The primary goal of this symposium is to bring together theoretical and observational experts in order to discuss the connection between supernovae and gamma-ray bursts. (This symposium is supported by IAU and JSPS.)

IPMU Seminars

1. "Global Gauge Anomalies in Two Dimensions"
Speaker: Krzysztof Gawedzki (ENS-Lyon)
Date: Dec 01, 2010
2. "Khrono-metric model: the low-energy limit of Horava-Lifshitz gravity"
Speaker: Sergey Sibiryakov (Moscow INR)
Date: Dec 02, 2010
3. "Charting the Transient Sky: The Palomar Transient Factory"
Speaker: Robert Quimby (Caltech)
Date: Dec 03, 2010
4. "The Next Generation Transient Facility"
Speaker: Shri Kulkarni (Caltech)
Date: Dec 03, 2010
5. "Quasar Eclipses"
Speaker: Martin Elvis (CfA)
Date: Dec 06, 2010
6. "Toric degeneration and tropical curves"
Speaker: Takeo Nishinou (Tohoku University)
Date: Dec 06, 2010
7. "Clustering of AGNs from the ROSAT All-Sky Survey and Halo Occupation Distribution"
Speaker: Takamitsu Miyaji (UNAM)
Date: Dec 07, 2010
8. "G-structures and calibrations in supergravity and steps towards SUSY breaking on the conifold"
Speaker: Johannes Schmude (IPMU)
Date: Dec 07, 2010
9. "Degeneration of minuscule varieties, quiver toric varieties and mirror symmetry"
Speaker: Alexey Bondal (IPMU/Aberdeen)
Date: Dec 08, 2010
10. "How are Massive Galaxies Built Over Cosmic Time?"
Speaker: Kevin Bundy (UC Berkeley)
Date: Dec 08, 2010
11. "Analysis on Minimal Representations"
Speaker: Toshiyuki Kobayashi (The University of Tokyo)
Date: Dec 09, 2010
12. "Open mirror symmetry for Pfaffian Calabi-Yau manifold"
Speaker: Masahide Shimizu (Hokkaido University)
Date: Dec 09, 2010
13. "Lie group actions on linear categories"
Speaker: Constantin Teleman (UC Berkeley)
Date: Dec 13, 2010
14. "Wave operators and a topological version of Levinson's theorem"
Speaker: Serge Richard (University Lyon, Tsukuba University)
Date: Dec 14, 2010
15. "The structure of 2D semi-simple field theories"
Speaker: Constantin Teleman (UC Berkeley)
Date: Dec 14, 2010
16. "Levitating Dark Matter"
Speaker: Nemanja Kaloper (UC Davis)
Date: Dec 15, 2010
17. "Fate of the False Vacuum Revisited"
Speaker: Shigeki Matsumoto (IPMU)
Date: Dec 16, 2010
18. "Higher spin gauge theory and vector models"
Speaker: Xi Yin (Harvard)
Date: Dec 16, 2010
19. "Distance Precision with Type Ia Supernovae"
Speaker: Gaston Folatelli (IPMU)
Date: Jan 06, 2011
20. "Wall-crossing holomorphic anomaly and mock modularity of multiple M5-branes"
Speaker: Albrecht Klemm (Bonn)
Date: Jan 11, 2011
21. "Another dark component of the Universe"
Speaker: Fuminobu Takahashi (IPMU)
Date: Jan 13, 2011
22. "First Stars and their Local Relics"
Speaker: Andrea Ferrara (Scuola Normale Superiore, Pisa)
Date: Jan 21, 2011
23. "Quantum Hall Effects, $SL(2, \mathbb{Z})$ Symmetry, and Holography"
Speaker: Norihiro Iizuka (CERN)
Date: Jan 21, 2011
24. "Consistent truncations from wrapped branes, and a Lifshitz solution"
Speaker: Oscar Varela (MPG)
Date: Jan 24, 2011
25. "New nonspherical black holes and charged black rings"
Speaker: Maria J Rodriguez (MPI)
Date: Jan 24, 2011
26. "Supermassive Black Holes in Nearby Galaxies: Insights into Accretion and Jet Physics"
Speaker: Luis Ho (Carnegie Observatories)
Date: Jan 24, 2011
27. "Phase Transitions in the $U(1)$ Charged Sector of ABJM Theory"
Speaker: Dongsu Bak (Seoul University)
Date: Jan 25, 2011
28. "Coevolution of Black Holes and Galaxies: Recent Developments"
Speaker: Luis Ho (Carnegie Observatories)
Date: Jan 26, 2011
29. "Witt vectors as a polynomial functor"
Speaker: Dmitry Kaledin (Steklov)
Date: Jan 31, 2011
30. "Comparing Hydrodynamic Models"

- with Observations of Type II Plateau Supraevae”
Speaker: Melina Bersten (IPMU)
Date: Feb 01, 2011
31. “D-branes Wrapped on Fuzzy del Pezzo Surfaces”
Speaker: Kazuyuki Furuuchi (NCTS Hsinchu)
Date: Feb 01, 2011
32. “Quantum Gravity phenomenology: achievements and challenges”
Speaker: Stefano Liberati (SISSA, Trieste)
Date: Feb 03, 2011
33. “The SYZ picture of mirror symmetry”
Speaker: Kwokwai Chan (IPMU)
Date: Feb 04, 2011
34. “Fluxes and BPS Vortices in ABJM model”
Speaker: Yoonbai Kim (Sungkyunkwan University)
Date: Feb 08, 2011
35. “Core-collapse supernovae: Cosmological probes and astrophysical laboratories for stellar evolution and explosion”
Speaker: Luc Dessart (Laboratoire d’Astrophysique de Marseille)
Date: Feb 09, 2011
36. “Supernova Explosions inside Carbon-Oxygen Circumstellar Shells”
Speaker: Elena Sorokina (Sternberg Astronomical Institute)
Date: Feb 10, 2011
37. “Closing in on Dark Matter”
Speaker: Carsten Rott (The Ohio State University)
Date: Feb 15, 2011
38. “Precise Duals in Cosmology”
Speaker: Daniel Harlow (Stanford University)
Date: Feb 15, 2011
39. “Search for Walking Technicolor theory using Lattice”
Speaker: Norikazu Yamada (KEK)
Date: Feb 17, 2011
40. “The Limits of Reductionism”

- Speaker: Ed Turner (Princeton University)
Date: Feb 18, 2011
41. “Ruan’s conjecture and integral structures in quantum cohomology”
Speaker: Hiroshi Iritani (Kyoto University)
Date: Feb 21, 2011
42. “Long and Longer Baseline Neutrino Oscillations: Searching for Symmetry Violation”
Speaker: Roger Wendell (Duke University)
Date: Feb 22, 2011
43. “The Dark Sector vs. Modified Gravity”
Speaker: Scott Dodelson (Fermilab/University of Chicago)
Date: Feb 23, 2011
44. “Panoramic mapping of star formation in and around distant clusters of galaxies”
Speaker: Yusei Koyama (University of Tokyo)
Date: Feb 24, 2011
45. “Linear free divisors and quivers”
Speaker: Michel Granger (l’Université d’Angers, France)
Date: Feb 28, 2011
46. “ $6 = 4+2$ ”
Speaker: Yuji Tachikawa (IPMU)
Date: Mar 01, 2011
47. “Active galaxies observed with integral field spectroscopy”
Speaker: Hajime Sugai (Kyoto University)
Date: Mar 03, 2011
48. “Super-massive Black Holes Across the Cosmic History”
Speaker: Ezequiel Treister (University of Hawaii)
Date: Mar 04, 2011
49. “Exact results for ’t Hooft loops in supersymmetric gauge theories”
Speaker: Takuya Okuda (University of Tokyo)
Date: Mar 08, 2011
50. “Mirror symmetry and projective

- geometry of Reye congruences”
Speaker: Shinobu Hosono (University of Tokyo)
Date: Mar 10, 2011
51. “Motivation and Application of Recent Development in Supersymmetric Gauge Theories”
Speaker: Kentaro Hori (IPMU)
Date: Mar 10, 2011

IPMU Komaba Seminar

1. “Mirror symmetry for toric Calabi-Yau manifolds from the SYZ viewpoint”
Speaker: Kwokwai Chan (IPMU)
Date: Jan 31, 2011

Personnel Changes

The following people left IPMU to work at other institutes. Their time at IPMU is shown in square brackets:

IPMU Assistant Professor Fuminobu Takahashi [December 1, 2007 – January 31, 2011] moved to the Graduate School of Science, Tohoku University as an Associate Professor.

IPMU postdoctoral fellow Seong Chan Park [November 1, 2008 – February 21, 2011] moved to Chonnam National University in Korea as an Assistant Professor.

IPMU postdoctoral fellow Keisuke Izumi [April 1, 2009 – March 31, 2011] moved to the Yukawa Institute for Theoretical Physics, Kyoto University as a Researcher.

JSPS postdoctoral fellow Issha Kayo [April 1, 2008– March 31, 2011] moved to the Faculty of Science, Toho University as a Researcher.

Swiss National Science Foundation postdoctoral fellow Cornelius Schmidt-Colinet stayed at IPMU from November 2, 2009 and January 20, 2011. After a temporary return to Switzerland, he will be hired by IPMU as a postdoctoral fellow.