

Inauguration Ceremony of IPMU's Research Building on February 23rd

To mark the completion of the IPMU's Research Building, a ceremony and reception were held on February 23, 2010, with about 150 people (guests, University of Tokyo researchers, and administrative staff) in attendance. The formal ceremony began with a performance by the Todai (University of Tokyo) Philharmonic Orchestra Quartet at the Piazza Fujiwara, on the third floor in the center of the new building. IPMU Director Hitoshi Murayama delivered a speech in which he expressed his joy and gratitude. Then, University of Tokyo President Junichi Hamada spoke about the strong hopes he had concerning IPMU's achievements, and expressed his determination to make IPMU one of the University of Tokyo's "Institutes for Advanced Studies," the creation of which is being discussed by the University's Board, and thus to make IPMU a permanent University entity and to give tenure to a subset of the IPMU faculty. (For the speeches of Director



Murayama and President Hamada, please refer to <http://www.ipmu.jp/ja/node/643>). Following the speeches, distinguished guests, Mr. Shigeo Okaya (Director of the Strategic Programs Division, S&T Policy Bureau, MEXT) and Prof. Toshio Kuroki (WPI Program Director and Deputy Director of the Research Center for Scientific Systems, JSPS) offered words of congratulation. Then, Prof. Hidetoshi Ohno of the University of Tokyo Graduate School of Frontier Sciences, the architect who designed the building, explained the concept he used to design the new building, as "a place having the capability" to create communication among researchers.

At the reception, the IPMU Chamber Orchestra, consisting of IPMU's researchers, administrative staff, and other related people, performed "Jupiter" from Gustav Holst's The Planets suite with members of the Todai Philharmonic Orchestra. The reception was most convivial, wonderfully complementing the formal ceremony.



2010 Japan Academy Prize to Katsuhiko Sato

The Japan Academy announced on March 12, 2010 that Katsuhiko Sato, IPMU Principal Investigator and IPMU Professor, had won the 2010 Japan Academy Prize. Prof. Sato is one of the pioneers who proposed the inflationary universe theory based on the unified theory of forces. This theory predicts that the early universe experienced an extremely rapid exponential expansion

(inflation) just after its birth, and then turned into a very hot fireball.

Keiichi Maeda Received Young Astronomer Award

On January 23, 2010, the Astronomical Society of Japan (ASJ) announced that Keiichi Maeda, an assistant professor at IPMU, had been selected as a recipient of the ASJ Young Astronomer Award for his contribution to the "theoretical and observational study on the structure of supernova explosions." Prof. Maeda developed a new method to theoretically calculate emissions from supernovae, and he also discovered new aspects of supernova explosions through observations by the Subaru and other telescopes. The award ceremony took place on March 25, 2010 at the annual meeting of the ASJ.

Takaaki Kajita Awarded the First Yoji Totsuka Prize

On February 14, 2010, Heisei Foundation for Basic Science announced that Takaaki Kajita, Director of the Institute for Cosmic Ray Research, the University of Tokyo and IPMU Principal Investigator, had won the first Yoji Totsuka Prize. This Prize has been created in honor of the late Professor Yoji Totsuka, one of the most respected physicists in neutrino physics, and is aimed at recognizing outstanding scientific achievements in neutrino physics experiments, non-accelerator physics experiments, or related theoretical studies. Prof. Kajita has been awarded the Prize for "Discovery of Atmospheric Neutrino Oscillations." Together with Yoji Totsuka, he played a leading role at Super-Kamiokande in this discovery, the first evidence for finite neutrino mass and the existence of lepton mixing in weak interactions. The awards ceremony was held on March 21, 2010.

Masaomi Tanaka Won the 2009 UT President's Award

The University of Tokyo announced that Masaomi Tanaka, postdoctoral fellow at IPMU, is a recipient of the 2009 President's Award for his contribution on "Observational and Theoretical Studies on Supernova Explosions." Dr. Tanaka has studied the nature of supernova explosions by means of both observations with the Subaru telescope, and theoretical simulations, and clarified that supernova explosions have a complex three-dimensional structure. This result constitutes a new step in understanding the mechanism of supernova explosions. The awards ceremony was held on March 24, 2010.

Memorial Lecture by Prof. Leggett, Recipient of UT Honorary Doctoral Degree

The University of Tokyo conferred an honorary doctoral degree to Sir Anthony J. Leggett while he was staying at the University of Tokyo at the invitation of IPMU. Prof. Leggett is a professor at the University of Illinois and winner of the 2003 Nobel Prize in Physics for his pioneering work on the theoretical understanding of superfluid helium 3 liquid. Prof. Leggett was awarded the honorary doctoral degree for his distinguished contribution to science and culture, particularly to progress and education in physics, not only for UT (he once taught at UT as a visiting professor) but for all of Japan. The awards ceremony and memorial lecture from Prof. Leggett were held on March 12, 2010, at Koshiba Hall on the University's Hongo Campus. Following his lecture, students and young researchers were invited to a tea-time discussion with Prof. Leggett. This event was co-hosted by the School of Science and IPMU.

2nd "Science Café: The Universe" at Tamarokuto Science Center

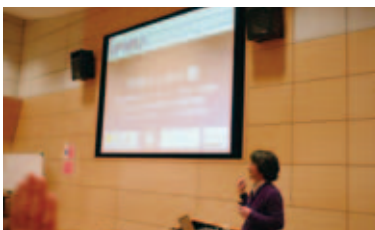
Following last year's successful event at Tamarokuto Science Center, the second "Science Café: The Universe" was held there, jointly sponsored by IPMU and the Tamarokuto Science Center. Three IPMU researchers gave lectures on Saturdays: IPMU Professor Shigeki Sugimoto on the "Miracles of Superstring Theory: About the Ultimate Picture of Matter" on January 30, IPMU Associate Professor Masahiro Takada on "Dark Matter Controls the Universe from Behind the Scenes: Search for It!" on February 20, and finally, IPMU Director Hitoshi Murayama on "Wrinkles and Seeds of the Universe" on March 6. Science Café emphasizes interaction between audience and lecturers. As with last year's event, this time attendees enjoyed it in a relaxed atmosphere.



Prof. Shigeki Sugimoto gave a lecture on January 30



Prof. Masahiro Takada gave a lecture on February 20



IPMU Director Hitoshi Murayama gave a lecture on March 6

Science Camp for High School Students "Encounters of Modern Mathematics and Modern Physics"

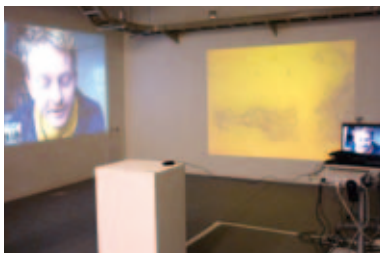
The spring science camp for high school students, "Encounters of Modern Mathematics and Modern Physics," was held at IPMU for three days, March 23 – 25, 2010. The science camp is one of the projects supported by JST (Japan S&T Agency) to foster next-generation leaders in science and technology. JST selects programs for subsidization from applications, and three-day camps on approved topics are held at universities and science centers, which include hands-on sessions and discussions with scientists and among the participating high school students. IPMU Prof. Akihiro Tsuchiya, a mathematician, took the lead in planning the approved program. Twenty students, selected from among applicants, took part. They lived together for three days, hearing lectures in mathematics. They also attended the IPMU researchers' tea time. In the exit questionnaire, the students made comments such as, "It was very exciting and enjoyable to have seen a mathematical world which is different from what we are learning at school," or "I am very happy because I made a lot of new friends."



"Searching for the Other Physics" – An Art Exhibition at IPMU

The IPMU Art Society is a group of IPMU people and associated members who love contemporary art. The society organized an art exhibition titled

“Searching for the Other Physics” at IPMU from February 3 to 27, 2010. This exhibition was primarily aimed at an audience on the University of Tokyo’s Kashiwa Campus, but was also open to the public on February 25 and 27, and about 50 people visited from outside the campus. Artists inspired by research at IPMU, which explores the mysteries of the universe through cooperation among mathematics, physics, and astronomy, exhibited works on paper, video, and other media. On the first day, an opening reception was held and artists spoke about their work. One of the artists who contributed to this art exhibition is living in England. He explained his work via the Internet as seen below.



IPMU Workshop: Elliptic Fibration and F-theory

IPMU hosted the Elliptic Fibration and F-theory workshop during the period of January 4-8, 2010. F-theory is one of the formulations of superstring theory, which draws heavily on the mathematics of elliptic fibered Calabi-Yau geometry in its application to low-energy physics. We therefore brought together experts in physics and mathematics from around the world to exchange ideas and make



further progress in this interdisciplinary field.

Focus Week: Condensed Matter Physics Meets High Energy Physics

This Focus Week workshop was held at IPMU for five days, February 8 - 12, 2010. For details, see pp. 16 - 17.

Workshop: Geometry of Lattices and Infinite Dimensional Lie Algebras

This workshop was held at IPMU for three days, March 17 – 19, 2010.

Future Workshop: Workshop on Recent Advances in Mathematics at IPMU. 2

“Workshop on Recent Advances in Mathematics at IPMU, 2” will be held at IPMU on April 5 and 6, 2010.

Future Workshop: CL J2010: from Massive Galaxies Formation to Dark Energy

The workshop CL J2010: from Massive Galaxy Formation to Dark Energy will be held over five days, June 28 – July 2, 2010. While galaxy clusters are the most massive self-gravitating systems in the universe, we will discuss a wide range of topics at the conference, from how massive central galaxies in a cluster have formed in structure formation to methods of exploring the nature of dark energy with cluster based cosmological experiments.

IPMU Seminars

Information on IPMU seminars is posted on IPMU website (http://db.ipmu.jp/seminar/?mode=seminar_recent). You will find detailed information and request form (when needed) there.

1. “Dark Matter and the First Stars”
Speaker: Doug Spolyar (Fermilab)
Date: Jan 08, 2010
2. “Dilaton cosmologies and their gauge theory duals”
Speaker: Sumit Das (Kentucky University)
Date: Jan 12, 2010
3. “Exploring Hadron Physics in Black Hole Formations: a New Promising Target of Neutrino Astronomy”
Speaker: Ken’ichiro Nakazato (Kyoto University)
Date: Jan 14, 2010
4. “Mirror symmetries of P^2 enumerated by Markov triplets”
Speaker: Sergey Galkin (IPMU)
Date: Jan 19, 2010
5. “Aspects of orientifolds in topological string theory”
Speaker: Daniel Krefl (IPMU)
Date: Jan 26, 2010
6. “The environmental dependence of galaxy properties at $0 < z < 2$ ”
Speaker: Masayuki Tanaka (IPMU)
Date: Jan 28, 2010
7. “Neutron Stars and the Dense Matter Equation of State”
Speaker: James M. Lattimer (SUNY)
Date: Jan 28, 2010
8. “Solving Complex Projective Superspace”
Speaker: Volker Schomerus (DESY)
Date: Feb 02, 2010
9. “Implications of CDMS II result on Higgs sector in the MSSM”
Speaker: Masato Yamanaka (ICRR)
Date: Feb 04, 2010
10. “Neutrino Constraints on Inelastic Dark Matter after CDMS II”
Speaker: Jing Shu (IPMU)
Date: Feb 04, 2010
11. “Ten-fold classification of topological insulators and superconductor”
Speaker: Shinsei Ryu (UC Berkeley)
Date: Feb 05, 2010
12. “The Next Generation X-Ray Satellite: ASTRO-H”

- Speaker: Aya Bamba (Dublin/JAXA)
Date: Feb 09, 2010
13. "Holography from the $AdS_3 \times S^5$ Pure Spinor Formalism"
Speaker: Nathan Berkovits (The University of São Paulo)
Date: Feb 11, 2010
 14. "T-duality, field theory, and Courant brackets"
Speaker: Barton Zwiebach (MIT)
Date: Feb 11, 2010
 15. "Cosmic structure formation and weak gravitational lensing"
Speaker: Masahiro Takada (IPMU)
Date: Feb 17, 2010
 16. "Non-gaussianities and the Inflationary Initial State"
Speaker: Andrew Tolley (Perimeter Institute)
Date: Feb 22, 2010
 17. "Improved flux limits for neutrinos with energies above 10^{22} eV from NuMoon observations"
Speaker: Olaf Scholten (KVI/ Groningen)
Date: Feb 22, 2010
 18. "Nearly Frobenius Structures and Quantum Field Theory"
Speaker: Ernesto Lupercio (CINVESTAV)
Date: Feb 23, 2010
 19. "Primordial density perturbations from inflation"
Speaker: David Wands (University of Portsmouth)
Date: Feb 25, 2010
 20. "Finite type invariants and the Ptolemy groupoid"
Speaker: Robert Penner (Aarhus University/USC/Caltech)
Date: Mar 02, 2010
 21. "New cosmological constraints on primordial black holes"
Speaker: Bernard Carr (Queen Mary University of London/RESCEU)
Date: Mar 04, 2010
 22. "Thermodynamic Bethe Ansatz for Konishi-like states in $AdS_5 \times S^5$ "

- Speaker: Ryo Suzuki (Trinity Colledge, Dublin)
Date: Mar 09, 2010
23. "Fate of young radio-loud AGN: Dead or alive?"
Speaker: Nozomu Kawakatu (University of Tsukuba)
Date: Mar 11, 2010
 24. "Introduction to High Energy Low Temperature Physics"
Speaker: Anthony J. Leggett (University of Illinois, Urbana-Champaign)
Date: Mar 15, 2010
 25. "D0-D6 states counting and Gromov-Witten invariants"
Speaker: Jacopo Stoppa (Cambridge)
Date: Mar 16, 2010
 26. "New particle mass spectrometry at the LHC"
Speaker: Won-Sang Cho (IPMU)
Date: Mar 18, 2010
 27. "Calculating multi-leg one loop amplitudes with unitarity cut method"
Speaker: Zoltan Kunszt (ETH Zurich)
Date: Mar 25, 2010



A scene of a seminar in the new IPMU building

IPMU Komaba Seminar

Mathematics seminars are also held at the University of Tokyo Komaba Campus (<http://info.ms.u-tokyo.ac.jp/seminar/ipmusem/>).

1. "Bases in the solution space of the Mellin system"
Speaker: Timur Sadykov (Siberian Federal University)
Date: Feb 01, 2010

Personnel Change

IPMU Principal Investigator (PI) Katsuhiko Sato (he has also been IPMU Project Professor since retiring from the Science School, the University of Tokyo on March 31, 2009) will be appointed President of the National Institutes of Natural Sciences on April 1, 2010. As a result, he will step down as IPMU PI and Project Professor on March 31, 2010. However, he will remain a visiting member of IPMU as Visiting Senior Scientist and join research projects.

Also, the following three IPMU postdoctoral fellows have left IPMU to work at other institutes. Their time at IPMU is shown in parentheses.

Jan Schuemann moved to Massachusetts General Hospital in Boston as a postdoctoral researcher (September 19, 2008 – February 28, 2010).

Dongfeng Gao has taken a position as Associate Researcher at Wuhan Institute of Physics and Mathematics, the Chinese Academy of Sciences (May 1, 2009 – March 31, 2010).

Hajime Takami moved to the Max Planck Institute for Physics as a Project Researcher (April 1, 2009 – March 31, 2010).