

## Kavli Foundation Established an Endowment for IPMU

On February 8, 2012, a press conference was held at the University of Tokyo, with the establishment of an endowment of \$7.5 million by the Kavli Foundation for the Institute for the Physics and Mathematics of the Universe (IPMU). The income from the endowment will help sustain the research program at the IPMU. At the conference, President Junichi Hamada, Managing Director Masako Egawa, IPMU Director Hitoshi Murayama and others from the University of Tokyo, Vice President Miyoung Chun from the Kavli Foundation, and a guest from MEXT (the Ministry of Education, Culture, Sports, Science and Technology), Deputy Director-General of the Research Promotion Bureau, Koichi Morimoto participated. Also, from the Kavli Foundation, Founder and Chairman Fred Kavli and President Robert W. Conn joined the conference through a video conference system.

The IPMU will be named as the Kavli IPMU on April 1, 2012 in honor of Fred Kavli for his generous gift. This is the first time a National University in Japan is hosting a named research institute with an endowment donated from a foreign foundation.

The Kavli Foundation sponsors research in astrophysics, nanoscience, neuroscience and theoretical physics. Up to now, it has donated fifteen

Kavli institutes that exist only at the most prestigious universities in the world, such as Harvard, MIT, Cambridge, and the like. The IPMU will become the 16th Kavli institute. As Director Murayama expresses in Director's Corner (page 3) of this issue of *IPMU NEWS*, joining the family of Kavli Institutes implies that the IPMU joins the prestigious institutes in the world, and, therefore, it helps IPMU to develop further to a world premier institute.

The University of Tokyo has set a long-term goal of "200 billion yen by 2020" in accordance with President Hamada's action scenario "FOREST 2015," with the aim of attaining a new form of the national university by strengthening global competitiveness. The fact that the IPMU is supported by the endowment donated from a foreign foundation has implications for the University of Tokyo that it successfully secured a resource from overseas with a new scheme, and that it has stepped forward to a new vision of the national university. For the IPMU, supported by the WPI program for the specified duration, introducing a scheme to receive annual returns in perpetuity from an endowment is also a big step forward to make the IPMU a permanent research center.

The Kavli IPMU naming ceremony and public lecture will be held on May 10, with Mr. Fred Kavli in attendance.



From left to right: K. Morimoto (Duputy Director-General of the Research Promotion Bureau, MEXT), H. Murayama (IPMU Director), J. Hamada (President, the University of Tokyo), M. Chun (Vice President, Kavli Foundation), and M. Egawa (Managing Director, The University of Tokyo).



From the Kavli Foundation, Founder and Chairman Fred Kavli and President Robert Conn joined the press conference through a video conference system.

## Missing Dark Matter Located: Inter-Galactic Space Is Filled with Dark Matter

Masataka Fukugita, Professor at the Institute for Cosmic Ray Research (ICRR), the University of Tokyo, and IPMU Principal Investigator and Naoki Yoshida, IPMU Associate Professor, together with Shogo Masaki, a graduate student at Nagoya University, used very large computer simulations of cosmic structure formation to unfold various contributions to the projected matter distribution. They showed that galaxies have extended

the outskirts of dark matter, well beyond the region where stars exist. The dark matter distribution is well organized but extended to intergalactic space, whereas luminous components such as stars are bounded within a finite region. There is no empty space in the universe. The inter-galactic space is filled with dark matter.

More interestingly, the estimated total amount of dark matter in the outskirts of the galaxies explains the gap between the global cosmic mass density and that derived from galaxy number counting weighted by their masses. A long-standing mystery on the location of the missing dark matter is now solved by the research.

This article was published in *the Astrophysical Journal*, vol. 746, on February 10, 2012.

#### Precise Measurement of Dark Matter Distribution with Strong and Weak Gravitational Lensing

Gravitational lensing provides an important means of studying the spatial distribution of mysterious dark matter, which is a dominant component of the mass in the universe but which cannot be directly seen by the usual observations. An international research group led by Masamune Oguri, Assistant Professor at IPMU, has made a precise measurement of dark matter distribution in galaxy clusters by analyzing both 'strong' and 'weak' gravitational lensing

phenomena observed in images of 28 galaxy clusters taken at the Subaru telescope. The result settles a long-standing controversy about the central concentration of dark matter distribution.

This result appeared in *the Monthly Notices of the Royal Astronomical Society* as an online version in January, 2012, and was published in its vol. 420 in March, 2012.

#### Masataka Fukugita & Tsutomu Yanagida Awarded the Third Yoji Totsuka Prize

The Third Yoji Totsuka Prize has been awarded to Masataka Fukugita, Professor at the ICRR and Principal Investigator at IPMU, and Tsutomu Yanagida, IPMU Professor and Principal Investigator, for the "Proposal of a Mechanism to Generate the Cosmological Baryon Number Asymmetry via Leptogenesis." This prize is awarded annually aiming at recognizing outstanding achievements in neutrino physics experiments, non-accelerator particle physics experiments, or related theoretical studies.

Fukugita and Yanagida proposed a model in which the decays of right-handed neutrinos may produce the lepton number asymmetry if CP invariance is violated in the decay processes, and this lepton number asymmetry is converted into the baryon number asymmetry of the

universe via non-perturbative effects of electroweak theory. Though this model has not yet been tested experimentally, at present it is the simplest and most promising model to explain the baryon number asymmetry of the present universe. This mechanism to account for the origin of the cosmological baryon number asymmetry via the lepton number asymmetry is called *leptogenesis*. Prof. Fukugita and Prof. Yanagida have been highly evaluated for their work which opened a new horizon in the investigations of cosmological baryon number asymmetry.

The award ceremony was held at the Koshiba Hall at the University of Tokyo's Hongo campus on March 18, 2012.

#### 2012 Japan Academy Prize to Takaaki Kajita

The Japan Academy announced at its 1057th General Meeting on March 12, 2012 that Takaaki Kajita, ICRR Director and IPMU Principal Investigator, had won the 2012 (102nd) Japan Academy Prize for the "Discovery of Atmospheric Neutrino Oscillations." The award ceremony will be held in June, 2012.

Prof. Kajita and his collaborators discovered neutrino oscillations through observations of atmospheric neutrinos, which are produced by the interactions of cosmic rays with the atmosphere surrounding the

Earth, by the Kamiokande and Super-Kamiokande detectors located in the Kamioka mine in Gifu Prefecture. Neutrino oscillations give the conclusive evidence for finite neutrino mass. A detailed story of this discovery was written by Prof. Kajita in *IPMU NEWS* No. 15, see pp. 28-33.

**Masahiro Ibe Co-Winner of the 2011 Young Scientist Award in Theoretical Particle Physics**

The 2011 Young Scientist Award in Theoretical Particle Physics was awarded to Masahiro Ibe, Associate Professor at ICRR and IPMU Scientist, and Ryuichiro Kitano, Associate Professor at Tohoku University. Their article “Sweet Spot Supersymmetry,” published in *the Journal of High Energy Physics* 0708 (2007) 016, was recognized by the Japanese particle theorists community which selects recipients of this award from its young members to encourage them.

**Science Camp for High School Students “Learn Math and Physics to Challenge Particles and the Universe”**

A winter science camp for high school students, “Learn Math and Physics to Challenge Particles and the Universe” was held at IPMU for three days, December 26 – 28, 2011, and nineteen students selected among applicants from all over Japan took part. The science camp is one of the

projects supported by JST (Japan S&T Agency), providing hands-on experience to high school students. JST selects programs for subsidization from applications, and three-day camps on approved topics are held at universities or research institutes, which include discussions with frontier scientists and among the participating high school students.

This was the second science camp held at IPMU. The participating high school students who like mathematics and physics stayed together for three days, hearing lectures in mathematics and relativity. They also attended IPMU researchers’ tea time. After the camp, they made comments such as, “I am very happy because I made friends with whom I can share a keen interest



in science, which is impossible with my school friends,” or “After the camp, I will stay in contact with friends I met here through e-mail or Skype.”

**IPMU in WPI Exhibit Booth at AAAS Annual Meeting**

The six WPI centers jointly participated for the first time in an overseas event, the AAAS (American Association for the Advancement of Science) 2012 Annual Meeting, which was held from February 16 through 20, 2012 in Vancouver, Canada.

The WPI booth was open from February 17 through 19 within the Japan Pavilion in the Vancouver Convention Center, and the purpose



WPI booth at the Japan Pavilion.



WPI booth staff members included a MEXT officer Mitsu Ueda (Director, WPI/Basic Research Promotion Division, Research Promotion Bureau), 2nd from the right in the front row, in addition to those from the six WPI centers.

of the WPI program, which aims to establish globally visible research centers in Japan, as well as the recent research activities of each WPI center was exhibited through video presentations and posters. About 2,700 people visited the JAPAN Pavilion over the three days. A total of 11,000 people visited throughout the AAAS 2012 Meeting, many more than in the usual year. About 6,000 people came on the “Family Science Day,” and about 700 people were those engaged in media or public-relations.

#### IPMU Seminars

1. “What are higher-dimensional analogues of  $D_n$ ,  $E_6$ ,  $E_7$  and  $E_8$  singularities?”  
Speaker: Ivan Cheltsov (Edinburgh)  
Date: Nov 08, 2011
2. “Stellar dynamics lecture - 1: Kozai-Lidov resonance”  
Speaker: Scott Tremaine (Institute for Advanced Study, Princeton)  
Date: Nov 08, 2011
3. “Spinoptics in a stationary spacetime”  
Speaker: Valeri Frolov (Alberta)  
Date: Nov 08, 2011
4. “On tetragonal construction of R. Donagi”  
Speaker: Constantin Shramov (Steklov Math Institute and Laboratory of Algebraic Geometry, HSE)  
Date: Nov 08, 2011
5. “Stellar dynamics lecture - 2: integration algorithms”  
Speaker: Scott Tremaine (Institute for Advanced Study, Princeton)  
Date: Nov 09, 2011
6. “Gravitational Lensing III”  
Speaker: Marcus Werner (IPMU)  
Date: Nov 10, 2011
7. “Testing the equivalence principle: the link between constants, gravitation and cosmology”  
Speaker: Jean-Philippe Uzan (IAP)  
Date: Nov 10, 2011
8. “Fermionic structure in lattice, conformal and massive integrable field theory”  
Speaker: Fedor Smirnov (Paris 6)  
Date: Nov 14, 2011
9. “Derived Reid’s recipe for threefold singularities (Part I)”  
Speaker: Timothy Logvinenko (Warwick)  
Date: Nov 14, 2011
10. “Derived Reid’s recipe for threefold singularities (Part II)”  
Speaker: Timothy Logvinenko (Warwick)  
Date: Nov 15, 2011
11. “Universal behavior in the scattering of heavy, weakly interacting dark matter on nuclear targets”  
Speaker: Richard Hill (Chicago)  
Date: Nov 15, 2011
12. “Hidden fermionic structure of the XXZ model”  
Speaker: Fedor Smirnov (Paris 6)  
Date: Nov 15, 2011
13. “Quantum cohomology of flag varieties”  
Speaker: Changzheng Li (IPMU)  
Date: Nov 16, 2011
14. “Conquering Systematic Errors in Weak Lensing Measurements”  
Speaker: Jun Zhang (Texas)  
Date: Nov 16, 2011
15. “Signals from the cosmological recombination era and spectral distortions of the CMB”  
Speaker: Jens Chluba (Toronto)  
Date: Nov 17, 2011
16. “Introduction to AdS/CFT Correspondence”  
Speaker: Tadashi Takayanagi (IPMU)  
Date: Nov 17, 2011
17. “Hyperbolic geometry and symplectic Calabi-Yau varieties”  
Speaker: Dmitri Panov (King’s College London)  
Date: Nov 18, 2011
18. “Fukaya category of the punctured torus”  
Speaker: Yanki Lekili (Cambridge university)  
Date: Nov 19, 2011
19. “The Stokes geometry of a quantum non-integrable map”  
Speaker: Akira Shudo (Tokyo Metropolitan University)  
Date: Nov 22, 2011
20. “Gravitational Lensing as the Source of Enhanced Strong MgII Absorption Towards Gamma-Ray Bursts”  
Speaker: Sharon Rapoport (Mt. Stromlo Observatory, Australian National University)  
Date: Nov 24, 2011
21. “Discrete R-Symmetries and Generalized Gaugino

- Condensation (and Three Generations)”  
Speaker: John Kehayias (IPMU)  
Date: Nov 24, 2011
22. “Generation of Magnetic Field in Cosmic Structure”  
Speaker: Francesco Miniati (ETH Zurich)  
Date: Nov 28, 2011
23. “Lectures on photometry and detectors (Part 1)”  
Speaker: Jim Gunn (Princeton)  
Date: Nov 28, 2011
24. “Lectures on photometry and detectors (Part 2)”  
Speaker: Jim Gunn (Princeton)  
Date: Nov 29, 2011
25. “Summing up All Genus Free Energy of ABJM Matrix Model”  
Speaker: Shinji Hirano (Nagoya U.)  
Date: Nov 29, 2011
26. “Challenges of neutrino oscillation physics”  
Speaker: Alexei Smirnov (ICTP)  
Date: Nov. 30, 2011
27. “Signals of Quark-Gluon Plasma Formation in Astrophysical Environments”  
Speaker: Omar Benvenuto (Universidad Nacional de La Plata)  
Date: Dec 01, 2011
28. “Lectures on photometry and detectors (Continued)”  
Speaker: Jim Gunn (Princeton)  
Date: Dec 01, 2011
29. “The Novikov homology and complex hyperplane arrangements”  
Speaker: Andrei Pajitnov (The University of Nantes)  
Date: Dec 01, 2011
30. “Lectures on optics and the atmosphere (Part 1)”  
Speaker: Jim Gunn (Princeton)  
Date: Dec 05, 2011
31. “Lectures on optics and the atmosphere (Part 2)”  
Speaker: Jim Gunn (Princeton)  
Date: Dec 05, 2011
32. “Higher spin AdS<sub>3</sub> supergravity and its dual CFT”  
Speaker: Yasuaki Hikida (Keio U.)  
Date: Dec 06, 2011
33. “Gravitational lensing in a dark matter free braneworld model”  
Speaker: Fanky Wong (U. Hong Kong)  
Date: Dec 06, 2011
34. “Subaru fiber multi-object spectroscopy: current & future instruments for large census in astronomy”  
Speaker: Naoyuki Tamura (SUBARU (NAOJ))  
Date: Dec 07, 2011
35. “Studying the Evolution of Galaxies with the Subaru Telescope”  
Speaker: Jim Gunn (Princeton)  
Date: Dec 07, 2011
36. “Understanding the cosmic recombination epoch”  
Speaker: Chris Hirata (Caltech)  
Date: Dec 08, 2011
37. “Exotic branes, double bubbles, and superstrata”  
Speaker: Masaki Shigemori (KMI, Nagoya U.)  
Date: Dec 12, 2011
38. “Lectures on image processing, spectroscopy and spectrophotometry (Part 1)”  
Speaker: Jim Gunn (Princeton)  
Date: Dec 12, 2011
39. “Lectures on image processing, spectroscopy and spectrophotometry (Part 2)”  
Speaker: Jim Gunn (Princeton)  
Date: Dec 12, 2011
40. “Confluent A-hypergeometric functions and rapid decay homology cycles”  
Speaker: Kiyoshi Takeuchi (U. Tsukuba)  
Date: Dec 13, 2011
41. “Global Geometry and Analysis on Locally Homogeneous Spaces”  
Speaker: Toshiyuki Kobayashi (Graduate School of Mathematical Sciences, The University of Tokyo)  
Date: Dec 14, 2011
42. “Spinning the Top”  
Speaker: Adam Falkowski (Laboratoire de Physique Theorique d’Orsay)  
Date: Dec 15, 2011
43. “Probing neutrino masses in the baryon triality cMSSM at  $\sqrt{s}=7$  TeV”  
Speaker: Marja Hanussek (U. Bonn)  
Date: Dec 15, 2011
44. “Precision constraints on UED models and implications for the LHC”  
Speaker: Thomas Flacke (Michigan U., MCTP & Wurzburg U.)  
Date: Dec 16, 2011
45. “McKay Type Correspondence for

- Quantum Projective Spaces (Part 1)"  
Speaker: Izuru Mori (Shizuoka U.)  
Date: Dec 19, 2011
46. "McKay Type Correspondence for Quantum Projective Spaces (Part 2)"  
Speaker: Izuru Mori (Shizuoka U.)  
Date: Dec 19, 2011
47. "Fluid gravity at finite  $r$ "  
Speaker: Daniel Brattan (Durham University)  
Date: Dec 20, 2011
48. "Model Discrimination at the LHC"  
Speaker: Satoshi Shirai (UC Berkeley)  
Date: Dec 22, 2011
49. "Quantum Mechanics, Gravity, and the Multiverse"  
Speaker: Yasunori Nomura (UC Berkeley)  
Date: Jan 04, 2012
50. "Parton distribution functions and CDF dijet anomaly"  
Speaker: Hiroyuki Kawamura (KEK)  
Date: Jan 18, 2012
51. "Gravitational Lensing VI: Magnification invariants and Lefschetz fixed point theory"  
Speaker: Marcus Werner (IPMU)  
Date: Jan 19, 2012
52. "Observational constraints on disk galaxy formation from Tully-Fisher relation and weak gravitational lensing"  
Speaker: Reina Reyes (Chicago: KICP)  
Date: Jan 19, 2012
53. "Trisymplectic manifolds"  
Speaker: Misha Verbitsky (IPMU)  
Date: Jan 19, 2012
54. "Global Torelli theorem for hyperkaehler manifolds"  
Speaker: Misha Verbitsky (IPMU)  
Date: Jan 20, 2012
55. "Twistor correspondence for hyperkaehler manifolds and the space of instantons"  
Speaker: Misha Verbitsky (HSE, National Research University)  
Date: Jan 23, 2012
56. "Dissipative force on an external quark in heavy quark cloud"  
Speaker: Shankadeep Chakraborty (Institute of Physics, Bhubaneswar)  
Date: Jan 24, 2012
57. "Trihyperkaehler reduction"  
Speaker: Misha Verbitsky (HSE, National Research University)  
Date: Jan 24, 2012
58. "A Global Model for Galaxy Evolution: Simplicity and its Consequences"  
Speaker: Yingjie Peng (ETH Zurich)  
Date: Jan 25, 2012
59. "Gravitational lensing VII: Magnification invariants and orbifolds"  
Speaker: Amir Aazami (Duke University)  
Date: Jan 26, 2012
60. "Long-distance properties of baryons in the Sakai-Sugimoto model"  
Speaker: Aleksey Cherman (DAMTP, Cambridge)  
Date: Jan 30, 2012
61. "Motivic Donaldson Thomas invariants and the Kontsevich Soibelman integration map (Part I)"  
Speaker: Ben Davison (Oxford)  
Date: Jan 30, 2012
62. "Motivic Donaldson Thomas invariants and the Kontsevich Soibelman integration map (Part II)"  
Speaker: Ben Davison (Oxford)  
Date: Jan 30, 2012
63. "Instantons on  $R^3 \times S^1$  and a semi-classical realization of IR renormalons"  
Speaker: Philip Argyres (U. Cincinnati)  
Date: Jan 31, 2012
64. "Tensor structure on module category of  $W_p$  Vertex Operator Algebras"  
Speaker: Akihiro Tsuchiya (IPMU)  
Date: Jan 31, 2012
65. "Black holes in Einstein-aether and Horava-Lifshitz gravity"  
Speaker: Thomas Sotiriou (SISSA)  
Date: Feb 01, 2012
66. "The Galaxy-Dark Matter Connection across Mass and Time"  
Speaker: Risa Wechsler (KIPAC/Stanford University)  
Date: Feb 02, 2012
67. "SCFTs, OPEs, and susy breaking mediation"  
Speaker: Ken Intriligator (University of California, San Diego)  
Date: Feb 03, 2012
68. "BPS State Wallcrossing and ADHM Sheaf Theory (Part I)"

- Speaker: Wu-yen Chuang (National Taiwan University)  
Date: Feb 06, 2012
69. "BPS State Wallcrossing and ADHM Sheaf Theory (Part II)"  
Speaker: Wu-yen Chuang (National Taiwan University)  
Date: Feb 06, 2012
70. "Subgroups of Cremona groups I"  
Speaker: Yuri Prokhorov (Moscow State University)  
Date: Feb 08, 2012
71. "Towards a quantum treatment of leptogenesis"  
Speaker: Mathias Garry (DESY)  
Date: Feb 08, 2012
72. "Supernova shocks in circumstellar medium: from puzzles to cosmological tools"  
Speaker: Sergei Blinnikov (ITEP)  
Date: Feb 08, 2012
73. "Subgroups of Cremona groups II"  
Speaker: Yuri Prokhorov (Moscow State University)  
Date: Feb 09, 2012
74. "SN explosions inside extended non-hydrogen circumstellar shells"  
Speaker: Elena Sorokina (Sternberg Astronomical Institute)  
Date: Feb 09, 2012
75. "Electric and magnetic screening in plasma with charged Bose-Einstein condensate"  
Speaker: Alexander Dolgov (Ferrara)  
Date: Feb 09, 2012
76. "Axion Monodromy Inflation and Related Phenomenology"  
Speaker: Raphael Flauger (IAS / NYU)  
Date: Feb 15, 2012
77. "Evolution of the most massive galaxies: a statistical study of SDSS LRGs"  
Speaker: Tomer Tal (Yale)  
Date: Feb 16, 2012
78. "Atiyah-Hirzebruch spectral sequences for real varieties"  
Speaker: Jeremiah Heller (Bergische Universität Wuppertal)  
Date: Feb 17, 2012
79. "McKay correspondence via G-Hilbert schemes"  
Speaker: Yukari Ito (Nagoya U.)  
Date: Feb 20, 2012
80. "Spontaneous R-symmetry breaking with Multiple Pseudomoduli"  
Speaker: David Curtin (Stony Brook)  
Date: Feb 22, 2012
81. "Asymptotic analysis of the function  $Ei(x)$ "  
Speaker: Alexander Getmanenko (IPMU)  
Date: Feb 23, 2012
82. "SL(2,R) duality on AdS/BCFT"  
Speaker: Mitsutoshi Fujita (University of Washington, Seattle)  
Date: Feb 24, 2012
83. "The Upcoming Grand Challenge by the Super B-Factor Experiment"  
Speaker: Takeo Higuchi (KEK)  
Date: Feb 27, 2012
84. "Mahler measures and pencils of Calabi-Yau varieties"  
Speaker: Evgeny Shinder (MPIM)  
Date: Feb 28, 2012
85. "Derived fusion tensor product"  
Speaker: Alexander A. Voronov (Minnesota)  
Date: Mar 01, 2012
86. "Mirror symmetry and mixed Hodge structures"  
Speaker: Tony Pantev (Pennsylvania)  
Date: Mar 05, 2012
87. "The Riemann-Hilbert correspondences and sheaves on subanalytic sites"  
Speaker: Giovanni Morando (University of Padova/RIMS)  
Date: Mar 07, 2012
88. "Introduction to Inflationary Universe"  
Speaker: Shinji Mukohyama (IPMU)  
Date: Mar 07, 2012
89. "Hydrogen-deficient explosions and their environments"  
Speaker: Giorgos Leloudas (Copenhagen Univ.)  
Date: Mar 08, 2012
90. "Soliton Theories and Quasideterminants"  
Speaker: Masashi Hamanaka (Nagoya U.)  
Date: Mar 08, 2012
91. "Ramification Points of Seiberg-Witten Curves"  
Speakers: Chan-Y. Park (Caltech)  
Date: Mar 13, 2012
92. "Holonomic D-modules on abelian varieties"  
Speaker: Christian Schnell (IPMU)  
Date: Mar 15, 2012
93. "Landau-Ginzburg/Calabi-Yau correspondence of all genera for elliptic orbifold  $P^1$ "

- Speaker: Yefeng Shen (Michigan)  
Date: Mar 19, 2012
94. "Towards q-deformations of the Mirror TBA"  
Speaker: Gleb Arutyunov (Utrecht)  
Date: Mar 21, 2012
95. "Spontaneous Cogenesis from the MSSM Flat Direction as the Origin of Matter and Dark Matter"  
Speaker: Kohei Kamada (DESY)  
Date: Mar 21, 2012
96. "Core-collapse supernovae as tracers of massive star formation within nearby galaxies"  
Speaker: Joseph Anderson (U. Chile)  
Date: Mar 22, 2012
97. "Integer Partitions, 3d Mirror Symmetry and 3d Gauge Theories"  
Speaker: Noppadol Mekareeya (MPI Munich)  
Date: Mar 27, 2012
98. "Cosmology at Sub-mm Wavelengths: From Herschel to CCAT and Beyond"  
Speaker: Asantha Cooray (UC Irvine)  
Date: Mar 27, 2012
99. "Strong field QFT in condensed matter – photo-induced topological phase transition and many-body Schwinger mechanism"  
Speaker: Takashi Oka (U. Tokyo)  
Date: Mar 28, 2012
100. "Filtrations of the singular homology of real varieties"  
Speaker: Mircea Voineagu (IPMU)

- Date: Mar 29, 2012
101. "Search for new physics using underground detectors"  
Speaker: Alexandre Kozlov (IPMU)  
Date: Mar 30, 2012

#### IPMU Komaba Seminars

1. "Enumerative meaning of mirror maps for toric Calabi-Yau manifolds"  
Speaker: Siu-Cheong Lau (IPMU)  
Date: Nov 21, 2011
2. "Refined holomorphic anomaly equations"  
Speaker: Albrecht Klemm (The University of Bonn)  
Date: Jan 23, 2012

#### Personnel Changes

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

IPMU Associate Professor Tadashi Takayanagi [September 1, 2008 to March 31, 2012] moved to the Yukawa Institute for Theoretical Physics as a Professor.

IPMU Associate Professor Naoki Yoshida [September 1, 2008 to March 31, 2012] moved to the Department of Physics, the University of Tokyo as a Professor.

IPMU Assistant Professor Yuji Tachikawa [November 1, 2010 to April 9, 2011 and August 8, 2011 to March 31, 2012] moved to the Department of

Physics, the University of Tokyo as an Associate Professor.

IPMU Postdoctoral Fellow Yutaka Ookouchi [August 16, 2010 to March 31, 2012] moved to Kyoto University as a Hakubi Project Associate Professor.

IPMU Postdoctoral Fellow Ikko Shimizu [January 1, 2009 to March 31, 2012] moved to the Physics Group, College of General Education, Osaka Sangyo University as a postdoctoral fellow.

JSPS Postdoctoral Fellow Mitsutoshi Fujita [April 1, 2011 to February 28, 2012] moved to the University of Washington as a Research Associate.

JSPS Postdoctoral Fellow Noriaki Ogawa [April 1, 2011 to March 31, 2012] moved to Riken Nishina Center for Accelerator-Based Science as a Special Postdoctoral Researcher.

Also, IPMU Professor Akihiro Tsuchiya resigned IPMU on March 31, 2012. He has been working full time at IPMU since February 1, 2008, but he served as IPMU Principal Investigator from the launch of IPMU (October 1, 2007) through March 31, 2009.

#### From the Editor

Starting with the next issue, the name of this magazine will be *Kavli IPMU News*. A FEATURE article by Toshiyuki Kobayashi will appear in this next issue.