

News

Katsuhiko Sato Named a Person of Cultural Merit in 2014

President of the National Institutes of Natural Sciences and a Visiting Senior Scientist of the Kavli IPMU, Katsuhiko Sato, who had served as a Principal Investigator of the IPMU from its launch to the end of March, 2010, has been selected as a Person of Cultural Merit (*Bunkakorosha*) in 2014 for his outstanding contributions to astrophysics and cosmology research, and for promotion of science.



Katsuhiko Sato

Yuji Tachikawa Receives the 29th Nishinomiya-Yukawa Memorial Prize

Yuji Tachikawa, an Associate Professor of the School of Science, the University of Tokyo and a Scientist at the Kavli IPMU, has won the 29th Nishinomiya-Yukawa Memorial Prize for “the discovery of the correspondence relation between quantum field theories in different dimensions.”



Yuji Tachikawa

Tsuyoshi Nakaya Receives 2014 Nishina Memorial Prize

Tsuyoshi Nakaya, a Professor of the Graduate School of Science, Kyoto University and a Kavli IPMU Visiting Senior Scientist, has been awarded the 2014 Nishina Memorial Prize, together with Takashi Kobayashi, a Professor of KEK, for “the discovery of electron neutrino appearance in a muon neutrino beam,” in the T2K long-baseline neutrino experiment.



Tsuyoshi Nakaya

Yukinobu Toda Receives the 11th JSPS Prize

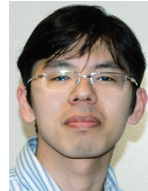
Yukinobu Toda, an Associate Professor at the Kavli IPMU, has won the 11th JSPS (Japan Society for the Promotion of Science) Prize for his work on “the derived category of coherent sheaves and curve counting invariants.”



Yukinobu Toda

Tadashi Takayanagi Receives 2015 New Horizons in Physics Prize

Tadashi Takayanagi, a Professor at the Yukawa Institute for Theoretical Physics, Kyoto University, and a Visiting Senior Scientist at the Kavli IPMU, has been awarded the 2015 New Horizons in Physics Prize, together with Ryu Shinsei, an Associate Professor at the University of Illinois at Urbana-Champaign, for “fundamental ideas about entropy in quantum field theory and quantum gravity.”



Tadashi Takayanagi

Robert Quimby among the Recipients of 2015 Breakthrough Prize in Fundamental Physics

The Fundamental Physics Prize Foundation has announced that the recipients of the 2015 Breakthrough Prize in Fundamental Physics are: Saul Perlmutter and members of the Supernova Cosmology Project; Brian P. Schmidt, Adam Riess, and members of the High-Z Supernova Team. Their discovery of the accelerating expansion of the universe is recognized. Robert Quimby, now an Associate Professor at San Diego State University, Director of Mount Lagna Observatory, and a Visiting Scientist at the Kavli IPMU, is among the recipients, as he is a member the Supernova Cosmology Project.



Robert Quimby

Roger Wendell Receives the 2015 Young Scientist Award of the Physical Society of Japan

Roger Wendell, an Assistant Professor at the Institute for Cosmic Ray Research, the University of Tokyo and an Associate Scientist at the Kavli IPMU, has won the 2015 Young Scientist Award of the Physical Society of Japan for his outstanding contributions to “Evidence for the Appearance of Atmospheric Tau Neutrinos in Super-Kamiokande,” a paper published by the Super-Kamiokande Collaboration in *Physical Review Letters* **110** (2013) 181802.



Roger Wendell

NSF Director France Córdoba Visited the Kavli IPMU

On October 3, 2014, Dr. France

Córdoba, Director of the National Science Foundation (NSF) visited the Kavli IPMU in the company of Dr. Graham Harrison, Program Manager, Office of International and Integrative Activities, NSF, and Dr. Kellina Craig-Henderson, Director, NSF Tokyo Regional Office. They heard Kavli IPMU Director Hitoshi Murayama's presentation of the research activities at the Kavli IPMU including past experience of accepting researchers supported by NSF grants, and exchanged frank opinions with Director Murayama regarding the support to basic science.

Subsequently, the guests joined the tea time held in Piazza Fujiwara and enjoyed the interactions with young researchers from many countries. In particular, Dr. Córdoba, talked with female astronomers to share her own scientific contributions in the areas of observational and experimental astrophysics.



From left to right: Dr. France Córdoba, Kavli IPMU postdoctoral fellows, Claire Lackner and Edmond Cheung, and Hitoshi Murayama, discussing at tea time

Director Murayama Delivered a Speech at the UN Headquarters

CERN was established in 1954. In 2014, it has been celebrating its 60th anniversary with a series of events, and the celebrations have been brought to a close with a special high-level event at the United Nations Headquarters in New York, on October 20: "CERN: Sixty Years of Science for Peace and Development," organized by CERN and the United

Nations Economic and Social Council (ECOSOC). In this event, Kavli IPMU Director Hitoshi Murayama has delivered a keynote speech entitled, "Science for peace and development today and tomorrow." The program also included the speeches of UN Secretary-General Ban Ki-moon and CERN Director-General Rolf Heuer, and the keynote speeches of Nobel Physics Prize Laureate and former CERN Director-General Carlo Rubbia, Nobel Peace Prize Laureate and former UN Secretary-General Kofi Annan.

For Murayama's key note speech, see the cover photo and pp. 4-6 in this issue of the Kavli IPMU News.

Kashiwa Campus Open House 2014

An open house on the Kashiwa campus of the University of Tokyo was held on October 24 (Friday) and 25 (Saturday), 2014. In two days, the entire Kashiwa campus was visited by about 8,000 people, and the Kavli IPMU attracted about 2,000 people.

The Kavli IPMU's program included two public lectures by Professor Masashi Hazumi and by Director Hitoshi Murayama, introductory poster presentations of the research conducted at the Institute, math puzzles, 3D movie program "Story of the Origin of the Universe," guided building tours, and Science *Onsen* (Spa). (For Science *Onsen*, see the next news item.)



At a seminar room, graduate students explained poster presentations of the research conducted at the Kavli IPMU as well as math puzzles



Prof. M. Hazumi talked on "Probing the Origin of the Universe — Towards the LiteBIRD Satellite"



Director Murayama gave a lecture entitled, "Together with Chiba-kun (a mascot character of Chiba prefecture), Listen to Professor Murayama about the Story of the Universe"

Kavli IPMU Held "Science *Onsen* (Spa)" in Science Agora 2014

"Science Agora" is an annual event, aimed at building good relations between Science and the future Society. Its program includes science experiments for children, talking with top scientists, science discussion with public participation — they are open to anyone who wants to participate. On November 7-9, 2014, Science Agora 2014 was held in the Tokyo waterfront region of Odaiba, and the Kavli IPMU participated on November 9 by holding "Science *Onsen* (Spa)—Science and Art, Do They Actually Share Things Similar?!" at the Miraikan Hall, on the 7th floor of the National Museum of Engaging Science and Innovation (*Miraikan*).

What is Science *Onsen*? Adapting from Science Café, which is believed to have started in England, Science *Onsen* aims at discussion between scientists and people in a relaxing mood in an *onsen* (spa), which is

very popular in Japan. Actually, such a relaxing mood may be created by participants wearing towels around their necks, and in particular, speakers and facilitators wearing yukata (an informal cotton kimono for summer wear), as if they were bathing in a real *onsen*.

At this Kavli IPMU's Science *Onsen*, a contemporary artist (painter) Mr. Yusuke Asai and an Assistant Professor of the Kavli IPMU Masahito Yamazaki, both wearing yukata, had a sincere talk on a serious subject, "The Method to Approach the Object." An audience of about 30 listened to their talk in a relaxing mood, wearing Kavli IPMU original *onsen* towel around their necks. The audience looked impressed by having witnessed how they approach certain aspects of their complex worlds, and the similarities of their methods. After the talk, there were a lot of questions from the audience until the time ran out.



A scene of Science *Onsen* in Science Agora 2014

The 11th Kavli IPMU-ICRR Joint Public Lecture — Look into the Universe

On November 15, 2014, the Eleventh Kavli IPMU-ICRR (Institute for Cosmic Ray Research) joint public lecture, "Look into the Universe— Approaching the Nature of Dark Matter—," was held at the West Lecture Hall of the 21 Komaba Center for Educational Excellence (KOMCEE) on the University of Tokyo's Komaba campus with audience of about 200

people. The first lecture entitled, "On the Nature of Dark Matter," was a review of the present investigations of dark matter, given by a theoretical physicist Shigeki Matsumoto, a Kavli IPMU Associate Professor. The second lecture, "Underground Search for Dark Matter," was given by an experimental physicist Masaki Yamashita, an ICRR Associate Professor and a Kavli IPMU Scientist. He is a member of XMASS, an underground experiment in search for dark-matter. After the lectures, the two lecturers presented their frank conversation about "How Interesting Is Dark Matter?" The audience also enjoyed teatime surrounding the lecturers.



Professor Yamashita (left) and Professor Matsumoto (right)

The Fourth Annual WPI Joint Symposium Held in Tokyo

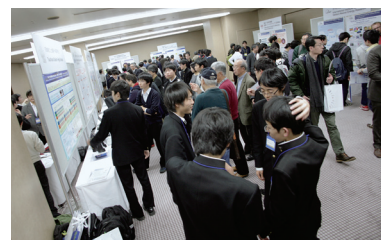
The Fourth Annual WPI Joint Symposium has been held on December 13, 2014 at the Yurakucho Asahi Hall in Tokyo, hosted by Kavli IPMU and co-hosted by the other eight WPI centers. The main purpose of this series of joint symposia is to attract, in particular, high school students to leading-edge scientific research.

The Symposium was opened by speeches by Junichi Hamada, President of the University of Tokyo, and Yutaka Tokiwa, Director-General of Research Promotion Bureau, MEXT. Subsequently, there was a presentation of video recording in which a young researcher from each

of the nine WPI centers features his/her research. Lectures were then given by three top-level researchers from WPI centers. Kavli IPMU Director Hitoshi Murayama was among them, giving a talk on "Is There an End to the Universe?" Some high school students also presented their research results. In addition, there were poster presentations of researches at the WPI centers and those of high school students on their daily research activities.



Lecture by Kavli IPMU Director Hitoshi Murayama



Exhibition room for poster presentations

Santa Claus Is Coming to Donguri from the Kavli IPMU

Every year, near Christmas, Kavli IPMU Professor Mark Vagins visits Donguri Nursery School on the Kashiwa campus, dressed up as Santa Claus. This year, Professor Vagins has visited Donguri with his wife and his son, and they had a joyful time with children in Donguri.



Professor Mark Vagins and his family with staff of Donguri

Kavli IPMU Seminars

1. "The Great Inflationary Debate: Inflation in a Post-Planck World"
Speaker: Joseph M. Fedrow (Palomar College / UCSD)
Date: Jul 16, 2014
2. "Large-scale structure formation with massive neutrinos and dynamical dark energy"
Speaker: Amol Upadhye (IEU)
Date: Jul 17, 2014
3. "Two proofs of modularity of Gromov-Witten correlation functions for elliptic orbifold curves"
Speaker: Yefeng Shen (Kavli IPMU)
Date: Jul 22, 2014
4. "The Direct Collapse Black Holes during the Early EoR and the Neutral Islands during the Late EoR"
Speaker: Yidong Xu (Chinese Academy of Sciences)
Date: Jul 24, 2014
5. "Beyond ADE integrable hierarchies"
Speaker: Yongbin Ruan (U Michigan)
Date: Jul 24, 2014
6. "Kac-Wakimoto hierarchies and W-symmetries"
Speaker: Bojko Bakalov (North Carolina State U)
Date: Aug 05, 2014
7. "Axion Monodromy Inflation"
Speaker: Timm Wrase (Stanford U)
Date: Aug 06, 2014
8. "Anisotropic inflation reexamined"
Speaker: Atsushi Naruko (Titech)
Date: Aug 06, 2014
9. "Moonshine and String Theory"
Speaker: Timm Wrase (Stanford U)
Date: Aug 07, 2014
10. "Millisecond pulsar interpretation of the Galactic center gamma-ray excess"
Speaker: Yuan Qiang (IHEP)
Date: Aug 08, 2014
11. "Skeletons in tropical and non-Archimedean geometry"
Speaker: Andrew MacPherson (IHES)
Date: Aug 12, 2014
12. "Hypercommutative operad as a homotopy quotient of BV"
Speaker: Anton Khoroshkin (HSE)
Date: Aug 13, 2014
13. "Quantum Dimension as Entanglement Entropy in 2D RCFTs"
Speaker: Song He (YITP)
Date: Aug 19, 2014
14. "Causal Structures in Gauss-Bonnet gravity"
Speaker: Keisuke Izumi (LeCosPA)
Date: Aug 19, 2014
15. "Type Ia supernovae: Explosions and Progenitors"
Speaker: Wolfgang Kerzendorf (U Toronto)
Date: Aug 20, 2014
16. "Deconfinement transition as black hole formation by the condensation of QCD strings"
Speaker: Jonathan Maltz (Kavli IPMU)
Date: Aug 26, 2014
17. "Nerves and Group Completion for Categories and Operads: A beginner's guide"
Speaker: Jesse Wolfson (Northwestern U)
Date: Aug 29, 2014
18. "Nerves and Group Completion for Categories and Operads: A beginner's guide Part 2"
Speaker: Jesse Wolfson (Northwestern U)
Date: Sep 01, 2014
19. "Solitons on intersecting 3-branes"
Speaker: Akikazu Hashimoto (U Wisconsin)
Date: Sep 01, 2014
20. "Supersymmetric theories on manifold with boundary and localization"
Speaker: Yutaka Yoshida (KIAS)
Date: Sep 02, 2014
21. "Nerves and Group Completion for Categories and Operads: A beginner's guide Part 3"
Speaker: Jesse Wolfson (Northwestern U)
Date: Sep 02, 2014
22. "When is a top quark a parton?"
Speaker: Ahmed Ismail (ANL)
Date: Sep 10, 2014

(For further list of seminars, see the next issue.)

Personnel changes

Promotion

Todor Milanov, previously a Kavli IPMU Assistant Professor, was appointed as a Kavli IPMU Associate Professor on December 1, 2014.



Todor Milanov

Moving Out

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

Kavli IPMU postdoctoral fellow Marcus Werner [October 1, 2011 – December 31, 2014] will be appointed as an Assistant Professor at the Yukawa Institute for Theoretical Physics, Kyoto University on April 1, 2015, after staying at CTC/DAMTP, the University of Cambridge, as a visiting researcher.

JSPS postdoctoral fellow Norimi Yokozaki [April 1, 2012 – October 31, 2014] moved to Università degli Studi di Roma "La Sapienza" as a postdoctoral fellow.