

News

Takaaki Kajita Receives Japan's Order of Culture

The University of Tokyo's Institute for Cosmic Ray Research Director and Kavli IPMU Principal Investigator Takaaki Kajita was selected as a 2015 recipient of the Order of Culture. At a ceremony at the Imperial Palace in Tokyo on November 3, Emperor Akihito awarded the medal to Kajita for his significant contribution to the development of Japan's culture.



Takaaki Kajita

Yoichiro Suzuki and Takaaki Kajita Awarded 2016 Breakthrough Prize in Fundamental Physics

On November 9, 2015, the Breakthrough Prize Foundation awarded this year's Breakthrough Prize in Fundamental Physics to the leading scientists and team members involved in five neutrino experiments (Japan's Super-Kamiokande, KamLAND, K2K and T2K, Canada's SNO, and China's Daya Bay). The prize is an international award recognizing scientists who have contributed to human knowledge of the mysteries of the Universe.



Yoichiro Suzuki

From the Super-Kamiokande experiment, leaders Takaaki Kajita and

Yoichiro Suzuki, and all the collaboration members who are coauthors of the papers representing the Super-Kamiokande's main achievements were selected as laureates.

Yuji Tachikawa Receives the 2016 New Horizons in Physics Prize

On November 9, 2015, the Breakthrough Prize Foundation also announced Yuji Tachikawa as one of the recipients of the 2016 New Horizons in Physics Prize. Tachikawa is an Associate Professor at the University of Tokyo's School of Science, and a Scientist at the Kavli IPMU. The prize recognizes junior researchers who have made significant contributions to the field of fundamental physics.



Yuji Tachikawa

Tachikawa was recognized for penetrating and incisive studies of supersymmetric quantum field theories. For example, his outstanding contribution to the discovery of the Alday-Gaiotto-Tachikawa correspondence led to spectacular advances in quantum field theory and string theory.

Open Campus Kashiwa 2015

"Bright Science, from Kashiwa" was the theme of this year's open campus (October 23 - 24, 2015).

Highlights at the Kavli IPMU included special seminars on both days, "The Dark Side of the Universe through the Eyes of the Subaru Hyper Suprime-Cam" by Professor Masahiro Takada on the first day, and "Capturing Dark Matter: Closing in on the Mystery of the Universe from Underground" by Yoichiro Suzuki on the second day.

Kavli IPMU Postdoctoral Fellow Ryo Namba and contemporary artist and Artist in Residence participant Yasuo Nomura took part in a talk event

about the link between science and art.

Special exhibitions on display during the two-day event included an Artist in Residence art exhibition showcasing Nomura's work, mathematics puzzles, Kavli IPMU tours, and a screening of the science documentary *Particle Fever*, with Japanese subtitles advised by UC Berkeley Professor and Kavli IPMU Visiting Senior Scientist Yasunori Nomura, and by Kavli IPMU staff.

With most of the country still in celebration over Takaaki Kajita receiving the Nobel Prize, the open campus attracted a record number of visitors: more than 10,000 came by Kashiwa campus over the event, 3,700 to the Kavli IPMU alone.



Masahiro Takada's talk



Yoichiro Suzuki's talk

Kavli Prize Laureate Lectures in Tokyo

On October 31, 2015, up to 400 visitors came to Kokuyo Hall in Shinagawa, Tokyo, to hear renowned scientists speak at the "2015 Kavli Prize Laureate Lectures," supported by the Kavli Foundation, the Norwegian Academy of Science and Letters, the Norwegian Embassy, and the Kavli IPMU.

The event started with a welcoming from Kavli Foundation President Robert Conn. With Kavli IPMU Director Hitoshi Murayama as host, physical chemist and 2014 Kavli Prize in Nanoscience

laureate Thomas Ebbesen talked about his work in nano-optics, and theoretical physicist and 2014 Kavli Prize in Astrophysics laureate Alan Guth talked about cosmic inflation and whether our universe is really part of a multiverse.



(From left) President Conn, Professor Guth, Director Murayama, and Professor Ebbesen

Kavli IPMU and ICRR Joint Public Lecture: See the Unseen Universe

On November 22, 2015, the Kavli IPMU and University of Tokyo Institute for Cosmic Ray Research (ICRR) hosted their 13th joint event at the University of Tokyo's Hongo campus. More than 170 people, from young junior high school students to senior citizens filled up the Koshiba Hall.

Kavli IPMU Associate Professor Kai Martens started the event, with a talk titled "Dark Matter: Mystery, Imagination, and Challenge." In it, he talked about how scientists first found evidence concluding that dark matter exists in the Universe, and about his own work on the XMASS project. In the next talk, ICRR Project Assistant Professor Masaaki Hayashida gave a talk titled "Look into Our Dynamic Universe Using High-Energy Gamma Rays," and explained how scientists study the Universe using gamma rays, and shared stories about the Cherenkov Telescope Array currently being built.

Following on from the talks, both speakers took part in a discussion titled "Making the World's Only Handmade Machine." There, they shared stories about what got them interested in their current projects, what other projects they had worked on, and

characteristics about the equipment that both of them currently work on. The teatime at the end of the event gave participants a chance to ask their own questions to the speakers. The room was buzzing with conversations for a long time, providing an uplifting end to the event.



Kai Martens (left) and Masaaki Hayashida on stage

The 5th Annual WPI Joint Symposium

On December 26, 2015, the Kavli IPMU took part in the 5th Annual WPI Joint Symposium "Seeing, Touching, and Feeling Science" at Kyoto University. This year's event was hosted by the Institute for Integrated Cell-Material Sciences (iCeMS).

Every year, the symposium has invited local high school students to hear and ask about the latest cutting edge developments in science.

This year's event included talks from three scientists, and a special talk by Kyoto University President and gorilla expert Juichi Yamagiwa. A special highlight of the day was a panel discussion where scientists shared stories about their research notebooks, and how it shapes their work. The other WPI institutes including the Kavli IPMU set up booths upstairs, and enjoyed the time answering questions from curious students and participants.



High school students crowd around WPI booths

Santa Claus Visits the Donguri Day Nursery

The Kashiwa Campus Donguri Day Nursery threw its annual Christmas party on December 18, 2015. This year, Kavli IPMU Assistant Professor Kevin Bundy transformed into Santa Claus, and joined in the celebration with the Donguri children.



Kevin Bundy as Santa Claus

Kavli IPMU Seminars

1. "Cosmic Reionization on Computers
2. How to build a virtual universe"
Speaker: Nick Gnedin (Fermilab / U Chicago)
Date: Oct 01, 2015
2. "On the proof of the S-duality modularity conjecture for the quintic threefold"
Speaker: Artan Sheshmani (Ohio State U / Kavli IPMU)
Date: Oct 01, 2015
3. "6d SCFTs and their compactifications"
Speaker: Kazuya Yonekura (Kavli IPMU)
Date: Oct 06, 2015
4. "Expansion Opacity in Supernova Models: Line Lists and the Shape of Type Ia Supernova Light Curves"
Speaker: Elena Sorokina (Sternberg Astronomical Inst)
Date: Oct 07, 2015
5. "The Growth of Today's Most Massive Galaxies over the Last 12.8 Gyr of Cosmic History"
Speaker: Danilo Marchesini (Tufts U)
Date: Oct 08, 2015
6. "In the Alphabet of Bsm Curiosities, A is for Axion"
Speaker: Sacha Davidson (Inst Nuclear Physics of Lyon / CNRS)

- Date: Oct 09, 2015
7. "K. Saito structures and string theory"
Speaker: Yakov Kononov (HSE, Moscow)
Date: Oct 13, 2015
 8. "The Stellar IMF of Early-type Galaxies from Strong Gravitational Lensing"
Speaker: Alessandro Sonnenfeld (Kavli IPMU)
Date: Oct 13, 2015
 9. "Sheaves on Lorentzian manifolds"
Speaker: Pierre Schapira (U Paris VI)
Date: Oct 13, 2015
 10. "Introduction to BV quantization"
Speaker: Nicolai Reshetikhin (UC Berkeley)
Date: Oct 13, 2015
 11. "Localization of 4d N=1 super-Yang-Mills on elliptic fibrations"
Speaker: Itamar Yaakov (Kavli IPMU)
Date: Oct 14, 2015
 12. "Introduction to BV quantization"
Speaker: Nicolai Reshetikhin (UC Berkeley)
Date: Oct 14, 2015
 13. "Introduction to BV quantization"
Speaker: Nicolai Reshetikhin (UC Berkeley)
Date: Oct 15, 2015
 14. "Flops and spherical functors"
Speaker: Alexey Bondal (Kavli IPMU)
Date: Oct 15, 2015
 15. "Introduction to BV quantization"
Speaker: Nicolai Reshetikhin (UC Berkeley)
Date: Oct 16, 2015
 16. "IceCube Events from Dark Matter through Right-handed Neutrino Portal"
Speaker: Yong Tang (KIAS)
Date: Oct 21, 2015
 17. "Close binary progenitors of gamma-ray bursts and hypernovae"
Speaker: Maxim Barkov (RIKEN)
Date: Oct 22, 2015
 18. "Scalar dark matter with coloured partner"
Speaker: Laura Lopez Honorez (Vrije Universiteit Brussel)
Date: Oct 23, 2015
 19. "Matrix factorizations and the Landau-Ginzburg/conformal field theory correspondence"
Speaker: Ana Ros Camacho (Institut de Mathématiques de Jussieu-Paris Rive Gauche)
Date: Oct 27, 2015
 20. "Cartan eigenvectors, Toda masses, and their q-deformations"
Speaker: Vadim Schechtman (Toulouse Mathematics Inst)
Date: Oct 27, 2015
 21. "Searching for 5-dimensional Nontrivial UV Fixed Point"
Speaker: Jin-beom Bae (Seoul National U)
Date: Oct 28, 2015
 22. "Probing properties of cosmic strings through Pulsar Timing Arrays"
Speaker: Sachiko Kuroyanagi (Nagoya U)
Date: Oct 28, 2015
 23. "Infinite Phase Space and the Two-Headed Arrow of Time"
Speaker: Alan Guth (MIT)
Date: Oct 30, 2015
 24. "Modeling cosmic-ray propagation in the Galaxy"
Speaker: Carmelo Evoli (DESY)
Date: Nov 02, 2015
 25. "Indirect searches for WIMP dark matter: Some signal candidates and many"
Speaker: Christoph Weniger (U Amsterdam)
Date: Nov 04, 2015
 26. "Quantum Hydrodynamics from Large-n Supersymmetric Gauge Theories"
Speaker: Peter Koroteev (Perimeter Inst for Theoretical Physics)
Date: Nov 04, 2015
 27. "Running Non-Minimal Inflation with Stabilized Inflaton Potential"
Speaker: Nobuchika Okada (U Alabama)
Date: Nov 05, 2015
 28. "The origin of the elements: direct nucleosynthesis constraints from supernovae"
Speaker: Anders Jerkstrand (Queens U Belfast)
Date: Nov 05, 2015
 29. "A formula for the double ramification cycle"
Speaker: Felix Janda (IMJ-PRG)
Date: Nov 05, 2015
 30. "Lepton Flavor Violating Processes in Mirror Fermion Model"
Speaker: Tzu-Chiang Yuan (Academia Sinica)
Date: Nov 06, 2015
 31. "Calabi-Yau structures on dg categories and shifted symplectic structures on moduli"
Speaker: Christopher Brav (HSE Moscow)
Date: Nov 11, 2015
 32. "Search for Muon to Electron Conversion at J-PARC — the COMET Experiment"
Speaker: Yasushi Kuno (Osaka U)
Date: Nov 11, 2015
 33. "Magnetar powered superluminous supernovae"
Speaker: Mariana Orellana (National U Rio Negro, Argentina)
Date: Nov 11, 2015
 34. "The Cosmic Dawn : Physics of the First Luminous Objects"
Speaker: Ken Chen (NAOJ)
Date: Nov 12, 2015
 35. "Construction of Compact Special Lagrangian T2-conifolds"
Speaker: Yohsuke Imagi (Kavli IPMU)
Date: Nov 12, 2015
 36. "Localization on twisted spheres and supersymmetric GLSM in 2d"
Speaker: Cyril Closset (Simons Center for Geometry and Physics)
Date: Nov 13, 2015
 37. "Stability in the Landscape"
Speaker: Michael Dine (SCIPP)
Date: Nov 16, 2015
 38. "Star/Galaxy Separation and Mapping the Milky Way Halo in HSC"
Speaker: Jose Garmilla (Princeton U)
Date: Nov 16, 2015
 39. "Integrable Bootstrap for Structure

- Constants in N=4 SYM”
Speaker: Shota Komatsu (Perimeter Inst)
Date: Nov 18, 2015
40. “A Zm graded generalization of the Witt algebra and its representations”
Speaker: Kenji Iohara (U Lyon1)
Date: Nov 18, 2015
41. “Detecting dark matter substructure using dusty galaxies”
Speaker: Neal Dalal (Illinois U)
Date: Nov 19, 2015
42. “Categorical approach to deformation theory”
Speaker: Agnieszka Bodzenta (U Edinburgh)
Date: Nov 24, 2015
43. “Preamble to CDM cosmogony: Theoretical overview”
Speaker: Simon White (Max-Planck-Inst für Astrophysik)
Date: Nov 24, 2015
44. “On Holomorphic Chern-Simons Theory in Twistor Space”
Speaker: Alexei Rosly (ITEP / HSE, Moscow)
Date: Nov 24, 2015
45. “Higher Derivative Terms in M-Theory Reductions”
Speaker: Matthias Weissenbacher (Kavli IPMU)
Date: Nov 25, 2015
46. “An elementary Goldstone Higgs”
Speaker: Aurora Meroni (U Southern Denmark)
Date: Nov 25, 2015
47. “The formation and evolution of the galaxy population”
Speaker: Simon White (Max-Planck-Inst für Astrophysik)
Date: Nov 25, 2015
48. “Searching for Strong Lenses to Probe Dark Matter Substructures”
Speaker: James Chan (ASIAA)
Date: Nov 26, 2015
49. “Non-linear structure formation: LCDM challenges and successes”
Speaker: Simon White (Max-Planck-Inst für Astrophysik)
Date: Nov 26, 2015
50. “Characterising the baryon content of galaxy halos through stacking analyses”
Speaker: Simon White (Max-Planck-Inst für Astrophysik)
Date: Nov 26, 2015
51. “Discussion meeting on cosmogony in the Λ CDM universe”
Speaker: Kavli IPMU astro group
Date: Nov 27, 2015
52. “Resurgence and Non-perturbative Physics: Decoding the Path Integral”
Speaker: Gerald Dunne (U Connecticut)
Date: Nov 30, 2015
53. “5d/6d SCFTs and 5-brane (Tao) web diagrams”
Speaker: Sung-Soo Kim (KIAS)
Date: Dec 01, 2015
54. “The Batalin-Vilkovisky formalism of the spinning particle”
Speaker: Ezra Getzler (Northwestern U)
Date: Dec 01, 2015
55. “Gluino Coannihilation”
Speaker: Feng Luo (Kavli IPMU)
Date: Dec 02, 2015
56. “Galaxy Formation in Dark Matter Halos from $z=15$ to $z=0$ ”
Speaker: Peter Behroozi (Space Telescope Science Inst)
Date: Dec 03, 2015
57. “The top off shell effects on new physics search”
Speaker: Chengcheng Han (Kavli IPMU)
Date: Dec 03, 2015
58. “Local and Large-Scale Environmental Influences on Galaxy Gas Content”
Speaker: David Stark (Kavli IPMU)
Date: Dec 08, 2015
59. “Accidental symmetries and the conformal bootstrap”
Speaker: Silviu Pufu (Princeton U)
Date: Dec 08, 2015
60. “Quasiphantom categories in derived categories of surfaces isogenous to a higher product”
Speaker: Kyoung-Seog Lee (KIAS)
Date: Dec 08, 2015
61. “Little string theories via F-theory”
Speaker: David Morrison (UCSB)
Date: Dec 10, 2015
62. “2D and 3D Mass mapping from weak lensing data”
Speaker: Jean-Luc Starck (CEA Saclay)
Date: Dec 10, 2015
63. “Weighted Compactifications of Configuration Spaces”
Speaker: Evangelos Routis (Kavli IPMU)
Date: Dec 10, 2015
64. “Gauge Theory in 2 and 3 dimensions and categorical representations”
Speaker: Constantin Teleman (UC Berkeley)
Date: Dec 14, 2015

Personnel Changes

Promotion

Kavli IPMU Assistant Professor Tomoyuki Abe became an Associate Professor on January 1, 2016



Tomoyuki Abe

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 Tanmay Deshpande [November 1, 2012 – November 30, 2015] moved to the Tata Fundamental Research Institute as a Leader of Mathematics.

Kavli IPMU Postdoctoral Fellow Kai Schmiz [November 1, 2012 – October 31, 2015] moved to the Max Planck Institute for Nuclear Physics in Heidelberg as a Postdoctoral Fellow.

Kavli IPMU Postdoctoral Fellow Benedetta Vulcani [October 16, 2012 – November 30, 2015] moved to Melbourne University Physics Department as a Postdoctoral Fellow.