

News

On the Passing of Fred Kavli, Founder and Chairman of The Kavli Foundation

On November 21, 2013, Fred Kavli, Founder and Chairman of The Kavli Foundation passed away at the age of 86.

In 2012, the IPMU joined the Kavli family as the first Kavli Institute in Japan and the 16th in the world, and renamed as the Kavli IPMU, following an endowment from The Kavli Foundation. We wish to thank Mr. Fred Kavli again for his generous support and wish to express our condolences.

We also refer to the Obituary on pp. 28 – 29 in this issue of the Kavli IPMU News, by Kavli IPMU Principal Investigator Hiroshi Ooguri.

Public Lecture by Fabiola Gianotti “Higgs Boson and Our Life”

Dr. Fabiola Gianotti, former spokesperson of the ATLAS experiment that discovered the Higgs boson at CERN, gave a public lecture entitled “Higgs Boson and Our Life” at the Hama-Rikyu Asahi Hall on November 20, 2013. It was hosted by the Kavli IPMU and co-hosted by the Asahi Shimbun Company.

This public lecture received much interest because of the announcement of the 2013 Nobel Prize in Physics to be awarded to theorists who

predicted the Higgs boson in the preceding month, and the Hall was filled to capacity. The lecture was also broadcast live, with an audience of nearly 1,000. Dr. Gianotti’s talk on the experiment at CERN, the Higgs boson, and the like, was interpreted by Kavli IPMU Director Hitoshi Murayama in Japanese at short intervals. In the latter half of the lecture, Mariko Takahashi, Senior Staff Writer of the Asahi Shimbun Company, acted as moderator. She asked Dr. Gianotti frank questions, which highlighted her personality, and along with Murayama’s nice interpretation, pleased the audience very much.

Those who are further interested in this topic, please read Director Murayama’s interview with Fabiola Gianotti on pp. 12 – 19 in this issue of the Kavli IPMU News.



From left to right: Hitoshi Murayama, Fabiola Gianotti, and Mariko Takahashi

Minister of State for S&T Policy Ichita Yamamoto Visited Kavli IPMU

On November 20, 2013, Minister of State for Science and Technology Policy Ichita Yamamoto visited the Kavli IPMU at the University of Tokyo’s Kashiwa campus. Mr. Yamamoto heard an overview from Kavli IPMU Director Murayama and other researchers about the SuMIRe (Subaru Measurement of Images and Redshifts) Project. This project has been supported by the Funding Program for World-Leading Innovative R&D on Science and Technology (FIRST) and led by Director Murayama as the core researcher. Mr. Yamamoto then heard progress reports from

SuMIRe collaborators at Princeton University and NASA’s Jet Propulsion Laboratory via videoconference. Mr. Yamamoto also observed activities at the Kavli IPMU, such as Fabiola Gianotti’s seminar, which was held on that day, laboratory work for an experimental apparatus, and joining tea time for researchers.



(Center) Mr. Yamamoto, Minister of State for S&T Policy, having a pleasant chat with Kavli IPMU foreign researchers at tea time

Kavli IPMU Director Murayama Gave a Presentation at CSTP

Kavli IPMU Director Murayama was invited to the 116th session of the Council for Science and Technology Policy (CSTP) held at the Prime Minister’s official residence on December 17, 2013 to give a presentation in the latter half of the session where “The Trend of Science & Technology” was discussed. In his presentation, he explained the Kavli IPMU’s research to look into the origin and fate of the Universe.



Kavli IPMU Director Murayama, giving presentation at CSTP



Chairperson (Prime Minister Abe) and Members of the CSTP hearing Director Murayama’s presentation

Kavli IPMU and RIKEN's iTHES Signed Collaboration Agreement

On December 2013, Kavli IPMU signed a collaboration agreement with iTHES (Interdisciplinary Theoretical Science team) of RIKEN (the Institute of Physical and Chemical Research). The signing ceremony was held at RIKEN's Wako campus. iTHES is a new group launched in 2013 at RIKEN with Chief Scientist Tetsuo Hatsuda designated as Director, aiming at interdisciplinary collaborations of theoretical sciences in different fields such as physics, material science, and biology. This is the beginning of collaboration between the Kavli IPMU and iTHES for the development of theoretical sciences. We note that Dr. Hatsuda is also Visiting Senior Scientist at Kavli IPMU since October 2010.



From left to right, Tetsuo Hatsuda, Maki Kawai (Executive Director of RIKEN), Hitoshi Murayama, and Shigeki Sugimoto (Kavli IPMU Professor)

Subaru's FMOS Reveals the Growth of Massive Galaxies in the Early Universe

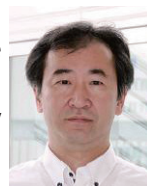
An international team of astronomers participating in the Cosmological Evolution Survey (COSMOS), including Kavli IPMU Assistant Professor John Silverman, Professor at Nagoya University and Kavli IPMU Principal Investigator Naoshi Sugiyama, and a graduate student at Nagoya University Daichi Kashino, has found the birth of new stars at remarkable rates in galaxies over nine billion years ago, using the Fiber-Multi-Object Spectrograph (FMOS) mounted on the Subaru Telescope. Also, it has been confirmed

that the gases surrounding massive galaxies were relatively dusty and enriched by heavier elements. This means that even at these early times, massive galaxies showed signs of maturation. These results provide us with a clue to address an important question, "What was the Universe like when it was young."

Part of the results from this research has been published on November 1, 2013 in *Astrophysical Journal Letters* 777 (2013) L8.

Julius Wess Award Goes to Takaaki Kajita

Takaaki Kajita, Director of the Institute for Cosmic Ray Research, the University of Tokyo, and Principal Investigator at the Kavli IPMU received the 2013 Juius Wess Award.



The Julius Wess award was created in 2008 to commemorate the outstanding work of Professor Julius Wess in theoretical physics, and it is granted to elementary particle or astroparticle physicists for outstanding achievements by the Karlsruhe Institute of Technology (KIT). Professor Kajita received this award for his "significant role in the discovery of atmospheric neutrino oscillations with the Super-Kamiokande Experiment." The award ceremony took place on December 19, 2013 at the KIT Elementary Particle and Astroparticle Physics Center (KCETA).

2013 President's Award for Operational Improvement to Kavli IPMU Working Group

A working group made up of twelve Kavli IPMU Administrative Division staff members has received the 2013 President's Award for

Operational Improvement. (The group has actually received the highest award with ¥1M support for overseas study tour as a supplementary prize.) The award has been given in recognition of the group's creation of a safety training video in English and construction of an online system to test for the training contents, which resulted in comprehensive safety training for newly arriving foreign researchers with no exception and no delay and reduction of administrative burden for such training, and which are expected to be adopted university-wide and thus to contribute for further developing globalization of the University of Tokyo. The award was presented by President of the University of Tokyo Junichi Hamada at an awards ceremony held on December 19, 2013 at the Ito Hall on the University of Tokyo's Hongo campus. Representing the working group, Rieko Tamura received a testimonial.

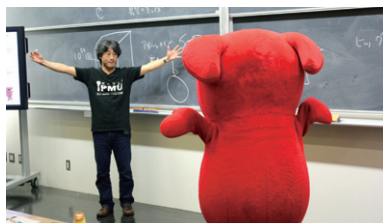


Working group of the Kavli IPMU Administrative Division receiving a testimonial from President Hamada

2013 Open House at UT Kashiwa Campus

An open house on the Kashiwa campus of the University of Tokyo was held on Friday, October 25, 2013. Though a two-day open house was planned as usual, the second day was cancelled because of an approaching typhoon. Even so, the Kavli IPMU's attractive program was very popular. Director Murayama presented "Ask a Scientist Live! Special," where a

mascot character of Chiba Prefecture, *Chiba-kun*, had a surprise appearance. Also, Kavli IPMU Professor Shigeki Sugimoto presented another “Ask a Scientist Live!” In addition, Digital Space Theater program, Japanese *Kyogen* performance by Kavli IPMU foreign researchers, guided building tours, and an experiential program of making a spectrograph by hand were presented.

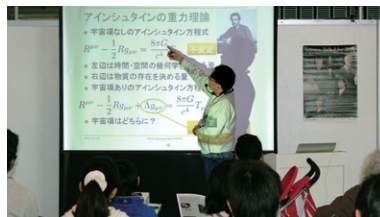


Unable to speak, *Chiba-kun* made questions to Director Murayama by showing questionnaire posters.

WPI Centers Jointly Participated in SCIENCE AGORA 2013, and Received a SCIENCE AGORA Award

Science Agora 2013 was held on November 9 and 10 at the National Museum of Emerging Science and Innovation (*Miraikan*) in the Tokyo waterfront region of Odaiba, and all the nine WPI (World Premier International Research Center Initiative) centers participated jointly. Science Agora is an event hosted by the Cabinet Office, Government of Japan and other bodies, aiming at deepening interests in science and technology of the public, especially of the young generations, and consisting of presentations and exhibitions about the forefront researches and their outcomes. During the two-day event, more than 6,000 people visited. At the “WPI Science Live!” booth where all the WPI centers presented their scientific activities in rotation, the Kavli IPMU presented a lecture by Associate Director Nobuhiko Katayama and a talk session by two Assistant Professors in mathematics, Satoshi

Kondo and Tomoyuki Abe. This “WPI Science Live!” booth presentation was selected as one of 11 programs that received the Science Agora Award. The award ceremony was held on December 26 at *Miraikan*.



Kavli IPMU Associate Director Nobuhiko Katayama giving a lecture on the cosmology forefront and accelerator experiments



Kavli IPMU Assistant Professors Kondo (right) and Abe (left) explaining mathematics researches, using a blackboard

“The 9th Workshop to Aim at Spreading Astronomy” Held at Kavli IPMU

“The 9th Workshop to Aim at Spreading Astronomy” was held at the Kavli IPMU lecture hall for three days, November 17 - 19, 2013, co-hosted by the Kavli IPMU and the Astronomy Data Center of the NAOJ (National Astronomical Observatory of Japan). This Workshop has been annually held by NAOJ and others for those who are involved in spreading astronomy at science museums, planetariums, and educational institutions. This time, three-day intensive course was given to them aiming at conveying the latest knowledge of cosmology research to many people through them. The following researchers from the Kavli IPMU contributed to the Workshop. Professor Masahiro Takada served as a coordinator and also

gave a lecture. In addition, lectures were given by Principal Investigators Naoshi Sugiyama (also Professor at Nagoya University) and Mihoko Nojiri (also Professor at KEK), Associate Professor Shinji Mukohyama, affiliate members Eiichiro Komatsu (Director at the Max Planck Institute), Naoki Yoshida (Professor at the University of Tokyo), and Keiichi Maeda (Associate Professor at Kyoto University). Participants expressed comments such as “I wish to create a planetarium program that will convey the contents of the lectures,” and “I want to talk to students about how the Universe is attractive.”



A scene of the Workshop

The Ninth Joint Kavli IPMU-ICRR Public Lecture

On December 1, 2013, the Ninth Kavli IPMU-ICRR (Institute for Cosmic Ray Research) joint public lecture entitled, “Decoding the Universe,” was held at the Koshiba Hall on the University of Tokyo’s Hongo campus. The first lecture was given by Masahiro Ibe, an ICRR Associate Professor as well as a Kavli IPMU Scientist, on “The Standard Model of Elementary Particles and the Higgs Boson,” and the second lecture by Ken’ichi Nomoto, Principal Investigator at the Kavli IPMU, on “Evolution of the Universe Probed by Means of Supernovae.” After the lectures, there was a science-café style discussion time. The lecturers nicely responded to the questions from many people surrounding them.



Ken'ichi Nomoto explaining the supernova explosion

The Third WPI Joint Symposium Held in Sendai

On December 14, 2013, the Third Joint Symposium of the WPI (World Premier International Research Center Initiative) centers entitled, "Science Talk Live!" was held at the Sendai International Center with participation of all the nine WPI centers. About 600 high-school students were invited from Miyagi Prefecture as well as various places in the Tohoku region. As this Joint Symposium was the first one held after the number of WPI centers had increased to nine, lectures were given by researchers at Tohoku University's AIMR (The Advanced Institute for Materials Research) and Directors of three new WPI centers launched in 2012, and, in addition, all the nine WPI centers respectively ran a booth. At the Kavli IPMU booth, Director Murayama's video presentation about the Higgs Boson was shown and also it was demonstrated how spectroscopic observations are useful in astronomy by observing an actual light source with a small hand-made model of spectroscope. This way, we conveyed

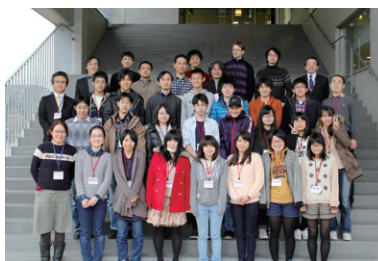


High-school students gathering at the Kavli IPMU booth

to many high-school students how the Kavli IPMU's research of the Universe is attractive.

Science Camp for High School Students "Open the Door to the Universe"

A winter science camp for high school students, "Open the Door to the Universe" was held at the Kavli IPMU for three days, December 25 - 27, 2013, and twenty 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 third science camp held at the Kavli IPMU. The participating high school students heard lectures from Kavli IPMU Professor Shigeki Sugimoto and other researchers on forefront topics in theoretical physics and mathematics, and, in addition, experimental physics. They also attended Kavli IPMU researchers' teatime at 3 p.m., where they actively asked questions of foreign researchers in English. A closing ceremony was held on the last day, with Kavli IPMU Director Murayama and other researchers in attendance.



Students, lecturers, and Kavli IPMU staff

Kavli IPMU Seminars

1. "Noncommutative Deformations of curves and spherical twists"
Speaker: Michael Wemyss (U Edinburgh)
Date: Sep 30, 2013
2. "Holographic Quantum Effective Actions"
Speaker: Francesco Nitti (APC, Paris 7)
Date: Oct 01, 2013
3. "Large Scale Structure – Cosmic Flows"
Speaker: Marc Davis (Berkeley)
Date: Oct 02, 2013
4. "Introductory course on functional renormalization group I"
Speaker: Roberto Percacci (SISSA)
Date: Oct 04, 2013
5. "Science with CMB spectral distortions: a new window to the early Universe"
Speaker: Jens Chluba (Johns Hopkins U)
Date: Oct 04, 2013
6. "Photons from a QCD phase transition in neutron star mergers"
Speaker: Lance Labun (LeCosPa)
Date: Oct 04, 2013
7. "Theories of Natural Supersymmetry"
Speaker: Nathaniel Craig (Rutgers U)
Date: Oct 07, 2013
8. "Tilting theory on Geigle-Lensing weighted projective spaces"
Speaker: Osamu Iyama (Nagoya U)
Date: Oct 07, 2013
9. "Vector Beta Function"
Speaker: Yu Nakayama (IPMU/ Caltech)
Date: Oct 08, 2013
10. "Introductory course on functional renormalization group II"
Speaker: Roberto Percacci (SISSA)
Date: Oct 09, 2013
11. "An implication of 126 GeV Higgs boson for Planck scale physics –

- naturalness and the stability of the vacuum –”
Speaker: Satoshi Iso (KEK)
Date: Oct 09, 2013
12. “Introductory course on functional renormalization group III”
Speaker: Roberto Percacci (SISSA)
Date: Oct 10, 2013
13. “Gravitational Lensing of the CMB: Mass Maps, Power Spectra, and B-modes with the South Pole Telescope”
Speaker: Gil Holder (McGill U)
Date: Oct 10, 2013
14. “Index Theory in Algebraic K-Theory and Algebraic Geometry”
Speaker: Jesse Wolfson (Northwestern U)
Date: Oct 10, 2013
15. “Asymptotic safety: motivations and results”
Speaker: Roberto Percacci (SISSA)
Date: Oct 11, 2013
16. “CDMSlite: A Search for Light WIMPs”
Speaker: Ritoban Thakur (U of Illinois Urbana Champaign)
Date: Oct 11, 2013
17. “Correlation Functions in N=4 SYM from Integrability”
Speaker: Yunfeng Jiang (Saclay)
Date: Oct 15, 2013
18. “How we can learn and use languages freely? —study of human faculty of languages and mathematics—”
Speaker: Gyo Takeda (Tohoku U)
Date: Oct 16, 2013
19. “Signatures of a companion star in type Ia supernovae”
Speaker: Keiichi Maeda (Kyoto U)
Date: Oct 17, 2013
20. “Heavy modes and the oscillatory features in the curvature power spectrum”
Speaker: Xian Gao (Titech)
Date: Oct 18, 2013
21. “Lecture 1: Progress Towards the Core-Collapse Supernova Mechanism”
Speaker: Adam Burrows (Princeton U)
Date: Oct 22, 2013
22. “Lecture 2: Core-Collapse Supernovae and Diagnostics: Some Observables and Diagnostics”
Speaker: Adam Burrows (Princeton U)
Date: Oct 22, 2013
23. “Spectra and Photometry: Windows into Exoplanet Atmospheres”
Speaker: Adam Burrows (Princeton U)
Date: Oct 23, 2013
24. “Lecture 3: Brown Dwarfs: 20 Years Later”
Speaker: Adam Burrows (Princeton U)
Date: Oct 24, 2013
25. “Galaxy Clusters from Inside to Out: Thermal Instability and Non-thermal Pressure Support”
Speaker: Ian Parrish (CITA)
Date: Oct 24, 2013
26. “Stable homotopy type of Seiberg-Witten monopole Floer homology”
Speaker: Tirasan Khandhawit (Kavli IPMU)
Date: Oct 24, 2013
27. “Orbifold Quasimap Theory”
Speaker: Bumsig Kim (KIAS)
Date: Oct 28, 2013
28. “Instanton Effects in ABJM Theory”
Speaker: Sanefumi Moriyama (KMI, Nagoya U)
Date: Oct 29, 2013
29. “Equiangular Lines in Real Euclidean Spaces and Seidel Matrices with Three Distinct Eigenvalues”
Speaker: Ferenc Szollosi (Tohoku U)
Date: Oct 29, 2013
30. “Derivative interactions in dRGT massive gravity”
Speaker: Rampei Kimura (RESCEU)
Date: Oct 29, 2013
31. “Gamma-ray bursts as the sources of the ultra-high energy cosmic rays?”
Speaker: Walter Winter (U Wuerzburg)
Date: Oct 30, 2013
32. “Why do super-massive black holes accrete?”
Speaker: Knud Jahnke (MPIA)
Date: Oct 30, 2013
33. “MSSM Neutralino signature”
Speaker: Yue-Lin Sming Tsai (Kavli IPMU)
Date: Nov 01, 2013
34. “Minicourse on the Madsen-Weiss Theorem [Part 1]”
Speaker: Charles Siegel (Kavli IPMU)
Date: Nov 05, 2013
35. “A physical introduction to conformal blocks”
Speaker: Jonathan Maltz (Kavli IPMU)
Date: Nov 05, 2013
36. “Evolution of electron capture supernova progenitors: new models, improved nuclear physics and hydrodynamic mixing uncertainties”
Speaker: Samuel Jones (Keele U)
Date: Nov 05, 2013
37. “Minicourse on the Madsen-Weiss Theorem [Part 2]”
Speaker: Charles Siegel (Kavli IPMU)
Date: Nov 06, 2013

Personnel Changes

Moving Out

Kavli IPMU Postdoctoral Fellow Yi Wang moved to Cambridge University as a Postdoctoral Fellow. He was at the Kavli IPMU from September 1, 2012 to October 31, 2013.

Simon Wood moved to the Australian National University as a Postdoctoral Fellow. He stayed at the IPMU as a Swiss National Science Foundation Postdoctoral Fellow from December 1, 2010 to November 30, 2011, and then he stayed at the Kavli IPMU supported by the JSPS Postdoctoral Fellowship Program for Foreign Researchers from November 30, 2011 to November 29, 2013.