The Wolfgang Paul Lecture is held bi-annually at the Physikalisches Institut of the University of Bonn. This lecture series is made possible by the Wolfgang Paul Foundation, which he endowed with his Nobel Prize award. Internationally outstanding physicists are honored and invited to Bonn, to give the Wolfgang Paul Lecture.

Wolfgang Paul was born in Lorenzkirch, a small village in Saxony, on August 10th, 1913. After finishing high school in Munich, he decided to become a physicist. The renowned theoretical physicist Arnold Sommerfeld advised him to first finish an apprenticeship as a precision mechanic. In 1932, he started his studies at the Technical University Munich and in 1934 continued in Berlin where he obtained his Diploma and in 1939 his Ph.D. He then went to Kiel and, in 1942, became an assistant at Göttingen University working with Hans Kopfermann. There, he also completed his Habilitation in 1944. In 1952, he became full professor at the University of Bonn and director of the Physikalisches Institut.

His research interests were in atomic and molecular physics, mass spectroscopy, and elementary particle physics. During his directorate, the first electron synchrotron in Europe with strong focusing was constructed in Bonn. A significantly larger synchrotron followed in the mid-60s and in the 80s the ELSA electron stretcher ring was constructed. Wolfgang Paul became professor emeritus in 1981. He deceased on December 7th, 1993.

During his time in Bonn, Wolfgang Paul was director at the research centers in Jülich and DESY. He was also a regular advisor for the German federal government. From 1979, he was president of the Humboldt Foundation for ten years.

In 1989, Wolfgang Paul was awarded the Nobel Prize for the development of the ion trap technique.

Hitoshi Murayama
UC Berkeley and Kavli IPMU, UTokyo

The Quantum Universe
Where do we come from? Science is making progress on this age-old question of humankind. The Universe was once much smaller than the size of an atom. Small things mattered in the small Universe, where quantum physics dominated the scene. To understand the way the Universe is today, we have to solve remaining major puzzles. The Higgs boson that was discovered recently is holding our body together from evaporating in a nanosecond. But we still do not know what exactly it is. The mysterious dark matter is holding the galaxy together, and we would not have been born without it. But nobody has seen it directly. And what is the very beginning of the Universe?

Wolfgang-Paul-Lecture 2016
• May 3rd, 2016, 10:15h
• Wolfgang-Paul-Hörsaal, Kreuzbergweg 28, 53115 Bonn
Hitoshi Murayama

Hitoshi Murayama was born in Tokyo in 1964. After four years in Germany, he studied physics at the University of Tokyo, where he graduated in 1986 and obtained his Ph.D. in theoretical physics in 1991. Then he was in a research position at Tohoku University and Lawrence Berkeley Laboratory. Since 1995, he has been at the University of California Berkeley where he is currently the MacAdams Professor of Physics.

He is also the founding director of the Kavli Institute for the Physics and Mathematics of the Universe (Kavli IPMU) at the University of Tokyo since 2007. The institute’s goal is to use the synergistic perspectives of mathematics, astronomy, and theoretical and experimental physics to reveal how the cosmos was formed, which fundamental laws control the Universe, and why we exist.

Research Interests

Hitoshi Murayama is a theoretical physicist working on a wide range of topics: particle physics beyond the standard model, quantum field theory, collider physics, dark matter, dark energy, inflation, grand unification and neutrino physics.

Why are there so many “elementary” particles classified in three generations, which have identical properties except their masses? Why are there three forces acting on elementary particles in a seemingly random manner? Why does the Higgs boson exist and play such a special role? Why is the Universe so long-lived and has more matter than anti-matter? Why have neutrinos masses, though they are supposed to be completely massless in the Standard Model? Why does the Universe appear to be accelerating its expansion? These are only some of the questions his research is dealing with.

Hitoshi Murayama is the Principal Investigator of the SuMIRE (Subaru Measurement of Images and Redshift) Project, started in 2009. Subaru is a 8.2-meter optical-infrared telescope at the summit of Mauna Kea, Hawai‘i, operated by the National Astronomical Observatory of Japan (NAOJ). Using data from the Subaru Telescope, the SuMIRE Project is trying to reveal the origin and fate of the Universe by elucidating the nature of dark matter and dark energy via imaging and spectroscopy.

Furthermore he is Deputy Director of the Linear Collider Collaboration, working towards the realization of the future project.

Awards and Honors

• 2002, Nishinomiya Yukawa Commemoration Prize in Theoretical Physics
• 2003, Fellow of American Physical Society
• Aug 2003 - Jun 2004, Member, School of Natural Sciences, Institute for Advanced Study, Princeton
• 2004, MacAdams Professor
• 2005, Miller Professor
• 2008, Member of Science Council of Japan
• 2012 “Passion without borders“ designation by Japanese Cabinet Office
• 2013, Member of American Academy of Arts and Sciences

As a multi-cultural global citizen, Hitoshi Murayama served on advisory committees around the world. In October 2014, he was invited to give a speech at the United Nations headquarters in New York about how science unites people and brings peace.