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Newsletter

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HPS Annual- Call for Volunteers

Ninni Jacob

We're looking for volunteers for the Local Arrangements Committee. If you're interested in helping to plan the 2006 HPS Annual Meeting, please contact:

Ninni Jacob at ninni_jacob@brown.edu or (401) 863-1738, OR

Bob Scott at bscott@4scotts.net or (401) 322-0576.

Science World Celebrates Centennial of Einstein Theory

Daily Princetonian.com- Albert Einstein was well known in Princeton for his generosity. But Jack Rosenberg remembers the time Einstein's colleagues asked him to turn the tables and help give the famous scientist a gift.

"The look of pleasure on his face was a sight I will never forget," said Rosenberg, then a young engineer, who installed a personal recording studio in Einstein's home for his 70th birthday in 1949.

"I have never witnessed a more authentic surprise," Rosenberg recalled in a recent newsletter of the Institute for Advanced Study.

Yet the gifts Einstein was known to give were not just personal; his remarkable contributions to Princeton and scientific progress are known throughout the world. One hundred years after one of Einstein's most important findings, the theory of special relativity, plans are now under way to remember the findings of the man who revolutionized physics in 1905 by redefining scientists' perception of space and time.

Einstein's 22 years in Princeton at the Institute for Advanced Study (IAS), until his death in 1955, created deep ties between the Nobel Prizewinning physicist and the University.

“He was one of several people who were very influential in highlighting Princeton as a place to do theoretical physics research," said physics professor Paul Steinhardt. "We still benefit from his legacy at Princeton."

Though President Tilghman's office has said that events are still in the beginning stages, the physics department has plans for special lectures starting this fall. According to Steinhardt, a concert might also be held in Einstein's honor.

"He was the quintessential science professor," said Daniel Marlow, the physics department chair. "I would say there's a public fascination with the theory of special relativity and I think a lot of that derives from Einstein himself."

"Einstein was a huge draw to the institute [for] other top scientists," he said, referring to Einstein's time at IAS adding, "People associate Einstein to Princeton."

Though not the theory that Einstein won the Nobel Prize for, and less practically applicable than his other theories, special relativity has profound intellectual implications.

"One of the great practical consequences . . . is E=mc2, which is the notion that you can convert mass to energy," said Marlow.

That famous equation is the principle behind nuclear energy and weapons. Einstein's equation states that energy can be converted to mass, and that mass can also be converted to energy. In a process called fusion, scientists join two nuclei of any light atoms to produce one larger nucleus and release massive amounts of energy. The scientific process — the way the sun creates energy — is expected to become essential in the future energy technologies.

"We know at some point that we're going to run out of fossil fuels. The great hope is that when we do, we'll be able to use fusion," Marlow said.

The effect special relativity has on space and time has captured not only the attention of scientists but also the public.

"I think that people continue to be intrigued by the idea that space and time are not what they appear to be. I get

questions everyday from the public about special relativity," Steinhardt said.

Only 26, Einstein tackled the major paradox of physics at the time with the theory of special relativity. The paradox arose after another physicist, James Clerk Maxwell, realized that light always travels at the same speed through his theory of electromagnetism.

According to Isaac Newton's laws of motion, if two masses are traveling at the same speed, then an observer on either mass would see the other mass as standing still. But this principle does not appear to apply to light, which travels at just less than 200,000 miles per second. No matter the speed of a mass, light is always traveling at the same speed, Maxwell theorized.

"Newton's concept of time and space really wasn't logically consistent," Marlow said.

But it was up to Einstein to offer the mathematical evidence behind Maxwell's hypothesis.

"The combination of special relativity and general relativity totally changed our view of space [and] time. That's an example of a total breakthrough in our view of the world," Steinhardt said.

A popular example illustrates the principle. Two people are sitting on a train on opposite ends and agree to stand up when they see a particular light bulb turn on. Someone standing on the platform will see the light hit the person at the back of train first because the train has a velocity that is carrying him toward the light while the person at the front the train seems to be moving away from it. But the two people on the train would see the light at the same time.

Einstein's theory illustrated that time is relative to motion and that as one's speed increases, time slows down. Though this difference is too small to detect at the slow speeds of everyday life, it has been well documented in observations of the universe and with very accurate atomic clocks flown at high speeds.

"Most people believe that eventually we'll want to explore the universe beyond our solar system. In order to understand when you'll get there and how old you'll be when you get there, you need special relativity," Marlow said.

It is impossible to predict where else Einstein's theory will be applicable in the future. But currently scientists are working on unifying relativity and quantum mechanics to create a what is referred to as a "grand unified theory" to resolve the conflicting laws of physics.

"In his later years, during his time at the institute, Einstein pursued the goal of a unified field theory. He did so at a time when the goal of unifying the four fundamental forces of nature — gravity, electromagnetism, the strong nuclear force and the weak nuclear force — had been set aside by the majority of working physicists," said IAS director Peter Goddard.

Einstein's contributions to the institute will be honored on May 20, the anniversary of the signing of the Institute's certificate of incorporation.

"Einstein was one of the institute's first faculty members . . . and played a significant part in our early development," Goddard said. "He was an iconic figure who had direct personal influence on the institute and the life and character of Princeton."

Abraham Flexner, the founding director of IAS, recruited Einstein. One of the institute's most widely recognized faculty members, his legacy stills looms there today, as IAS scientists continue to research unified field theory.

Einstein lived on 122 Mercer St. in Princeton and bequeathed his home to the institute after his death.

He came to the United States after renouncing his German citizenship when Adolf Hitler was appointed chancellor of Germany. Einstein lived with his wife at Princeton until his death and eventually became an American citizen.

[*If you'd like to contribute a piece, or even just an idea for an article, contact the editor at dlamay@mit.edu or by phone at (617) 253-4203.*]

JOB POSTING: RADIATION SAFETY TECHNICIAN
University of Massachusetts Lowell

Job Title: Radiation Safety Technician

Starting Salary: $42,000 to $46,000 anticipated hiring range

Location: Radiation Safety Office

Job Summary:

The Radiation Safety Technician (RST) assists the Director of Radiation Safety in operation of the university radiation safety program. The RST performs radiation surveys, calibrates instruments, maintains the campus dosimetry program, collects environmental samples, maintains radioactive material inventory and waste, trains individuals in radiation safety, and provides technical advice to users of radioactive materials or devices.

Qualifications:

The applicant must have a Bachelors degree in the radiological sciences or related fields, received on or before June 2005, and at least one year of health physics experience. The applicant must be familiar with proper radiation safety survey techniques, calibration of radiological instruments, radiation source inventory and waste storage procedures in addition to being able to prepare and analyze environmental samples and maintain the campus dosimetry program. The applicant must also possess basic computer skills and be familiar with Microsoft Word, Excel, Access, or their equivalents. Experience with radiation safety program development, reactor health physics, gamma spectroscopy, and electronic repairs are highly desirable.

Applications must be received by: February 28, 2005

Please send your application to the following address:

Search Committee – Radiation Safety Technician
C/O Human Resources
University of Massachusetts Lowell
883 Broadway St.
Lowell MA 01854

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