Montana State to host 1 of world's first celebrations for Einstein's theory, gravitational waves

EurekAlert!

BOZEMAN, Mont. – Montana State University will host one of the world's first events to celebrate the centennial of Einstein's theory of General Relativity, its final prediction and the impending detection of gravitational waves.

To celebrate Einstein's discovery of General Relativity and share in the excitement of the first gravitational wave detections, MSU, Princeton University, NASA, the National Science Foundation and the Montana Space Grant Consortium will hold a free public celebration and an international scientific workshop April 2 to 7 in Bozeman. Nicolas Yunes, 2010 recipient of NASA's Einstein Fellowship and assistant physics professor at MSU, is heading the planning committee.

The international scientific workshop is expected to draw 60 scientists from the United States, Europe and Japan who work on relativity and experimental tests of Einstein's theories.

The public celebration, titled "Celebrating Einstein," is designed to share with the general public the story of Einstein and his ideas, and the excitement of General Relativity, black holes and gravitational waves. The celebration brings together artists, musicians, composers, dancers, including one from Cirque du Soleil, filmmakers, architects, educators and physicists.

"Celebrating Einstein" begins with a public lecture series in February and March by world-renowned scientists, co-sponsored by the Southwest Montana Astronomical Society and MSU's Museum of the Rockies.

Speakers include Jim Gates, professor and director of the Center for String and Particle Theory at the University of Maryland, and David Kaiser, best-selling author and Germeshausen Professor of the History of Science and department head of the Program in Science, Technology and Society at MIT. Simultaneously, "Celebrating Einstein in the Schools," will visit area K-12 classrooms to lead related lessons and activities.

The main "Celebrating Einstein" celebration in April opens with the "Black (W)hole" art installation, which features visualizations and sounds of a small black hole spiraling violently into a supermassive one.

The week concludes with the "Shout Across Time" live multimedia theatre show, featuring a danced lecture on General Relativity, live MSU symphony orchestra playing an original composition inspired by gravitational wave astronomy, and an original film featuring numerical simulations of black hole collisions.

Physicists predict that they may be able to detect gravitational waves for the first time in the history of humankind by the end of this decade. They say this feat will test the accuracy of Einstein's final theory and lead to revolutionary discoveries about regions of the universe that are currently inaccessible with traditional electromagnetic astronomy.

Gravitational waves are produced by violent astrophysical events, such as when stars explode or two black holes collide, Yunes said.

"To make a simple analogy, these waves are like the soundtrack to the universe, and their detection will be like transitioning from mute pictures to modern cinema," he said.

"Celebrating Einstein" will be held two years before the centennial anniversary of the discovery of Einstein's General Relativity. One reason is to raise public awareness of the theory's significance, the last Einstein prediction that has not yet been observed, Yunes said. The other reason is to prepare materials that will be adapted for future Einstein celebrations elsewhere during the centennial celebration of General Relativity in 2015.

Joey Key, education specialist at the Montana Space Grant Consortium and member of the planning committee for "Celebrating Einstein," added, "It's also the excitement of where we are in this stage of discovery. This is going to be the next big thing in astronomy, the discovery of gravitational waves. Gravitational waves will tell us something totally new about our universe. It's going to answer lots of questions."

Yunes also pointed out that it is essential for scientists to explain themselves to the general public.

"All of our research, especially in this area, is funded by the federal government, either the NSF or NASA," he said. "So your taxes, my taxes, everyone's taxes are paying for this. If we scientists don't produce a return for that investment, then we run the risk that people will not want the government to continue investing in it; people will appreciate science less and less if we scientist don't bother to explain our discoveries in a language that everybody can understand."

In addition to heading the planning committee for the Einstein event and being an assistant professor at MSU, Yunes is a former Einstein Fellow at MIT and former research associate at Princeton. He researches Einstein's Theory of General Relativity and gravitation, specializing in black holes, neutrons stars and compact binary inspirals.

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