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Noted professor speaks for World Year of Physics

Kip Thorne will address Albert Einstein's legacy on the centennial of five famous physics papers

BY EVA SYLWESTER
NEWS REPORTER

The University will celebrate World Year of Physics with a lecture by Kip Thorne, the Feynman Professor of Theoretical Physics at the California Institute of Technology, in 100 Willamette Hall on Thursday, March 24 at 7 p.m.

Thorne said he plans to speak about Albert Einstein's legacy in the modern world. The United Nations declared 2005 the World Year of Physics in honor of the 100th anniversary of Einstein's "miraculous year."

In 1905, Einstein was an unknown 26-year-old patent clerk in Switzerland. By the end of the year, he had published five papers relating to three important problems in physics: special relativity, or a concept of how the universe would function without gravity; the photoelectric effect, the idea that light beams are more like particles than waves; and Brownian motion, the study of how molecules in a given volume of liquid move around.

"He wrote these papers, and he suddenly became a widely known guy," University mathematics professor Jim Isenberg explained. "Two of these papers became the basis of how we understand the universe works."

Ten years later, in 1915, Einstein developed the theory of general relativity, which integrated gravity into his previous theory of special relativity. This theory explains how time and space fit together and emphasizes that the shortest path between two objects — for example, a mountain climber and the top of a mountain — may be curved rather than linear. The theory became well known in 1919 after a publicized experiment demonstrated that the path of light from stars to Earth bends in different ways based on the earth's varying positions in relation to the sun.

"You never prove a theory, ... but what you show is, at this time, this is the best way to understand it," Isenberg said.

Isenberg said since the 1960s, physicists have made progress toward understanding things Einstein predicted, such as black holes and gravitational radiation. Einstein predicted black holes in 1916, Isenberg said, and now scientists know every galaxy has black holes. A black hole is a massive stellar object concentrated in a very small space, which creates a gravitational pull that not even light can escape, in theory.

"Albert Einstein gave us a number of very surprising insights into the laws that govern the nature of the universe," Thorne said. "Those insights never came to fruition until decades later."

Thorne researches black holes. While black holes do not emit light or x-rays, he said, they emit gravitational waves. Thorne is one of the founders of the Laser Interferometer Gravitational Wave Observatory, which is a series of instruments set up in Hanford, Wash., and Livingston, La., to investigate gravitational waves.

Thorne also plans to speak about quantum mechanics, the laws that govern atoms and molecules. He said future directions of the field may include quantum cryptography, unbreakable methods of encoding information, and quantum teleportation, the teleportation of quantum information over great distances.

Isenberg and Thorne have collaborated since 1985 on the Pacific Coast Gravity Meeting, an annual conference about gravitational relativity. Isenberg said the conference usually meets at the California Institute of Technology in Santa Barbara, but this year, it will meet in Eugene on March 25 and 26. While the conference is open to all, Isenberg said the speeches are often very specialized, but he asked Thorne to give a speech that would be understandable to "anybody who knows a little bit about science."

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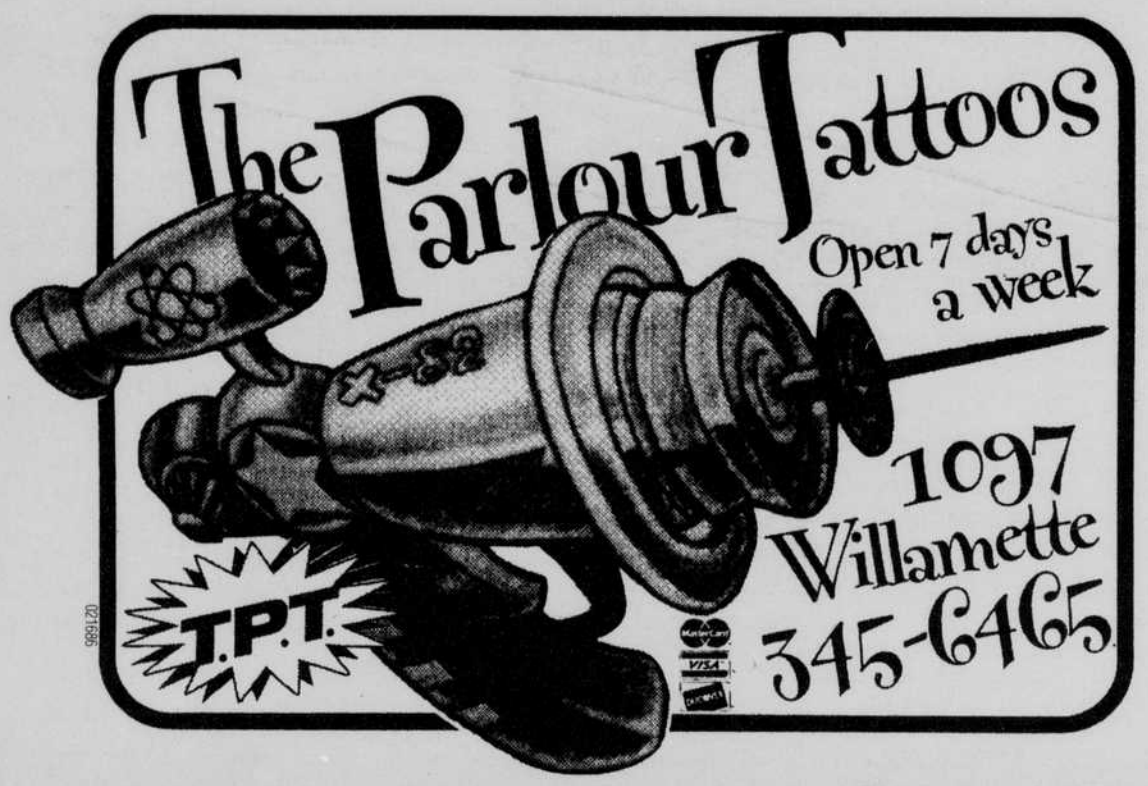

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