Abstract:

My 60 Year Romance with the Warped Side of the Universe - And What It Has Taught Me about Physics Education

Already in the 1950s and 60s, when I was a student, Einstein's general relativity theory suggested that there might be a "warped side" of our universe: objects and phenomena made *not* from matter, but from warped spacetime. These include, among others, black holes, wormholes, backward time travel, gravitational waves, and the big-bang birth of the universe. I have devoted most of my career to exploring this warped side through theory and computer simulations, and to developing plans and technology for exploring the warped side observationally, via gravitational waves. Most of my classroom teaching, mentoring, writing, and outreach to nonscientists, has revolved around the warped side; and from this I have developed some strong views about physics education. In this talk I will discuss those views, in the context of personal anecdotes about my warped-side research, teaching, mentoring, writing, and outreach.

Bio:

Kip Thorne was born in 1940 in Logan, Utah, USA, and is currently the Feynman Professor of Theoretical Physics, Emeritus at the California Institute of Technology (Caltech). From 1967 to 2009, he led a Caltech research group working in relativistic astrophysics and gravitational physics, with emphasis on relativistic stars, black holes, and especially gravitational waves. Fifty three students received their PhD's under his mentorship, and he mentored roughly sixty postdoctoral students. He co-authored the textbooks *Gravitation* (1973, with Charles Misner and John Archibald Wheeler) and *Modern Classical Physics* (2017, with Roger Blandford), and was sole author of *Black Holes and Time Warps: Einstein's Outrageous Legacy*.

Thorne was cofounder (with Rainer Weiss and Ronald Drever) of the LIGO (Laser Interferometer Gravitational Wave Observatory) Project. LIGO - largely in the hands of a younger generation of physicists - made the breakthrough discovery of gravitational waves arriving at Earth from the distant universe on September 14, 2015. For his contributions to LIGO and to gravitational wave research, Thorne has shared the 2017 Nobel Prize in Physics, and other major awards.
In 2009 Thorne stepped down from his Caltech professorship to ramp up a new career at the interface between art and science, including the movie *Interstellar* (which sprang from a Treatment he co-authored, and for which he was Executive Producer and Science Advisor).