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Opening the Infrared Treasure Chest with JWST

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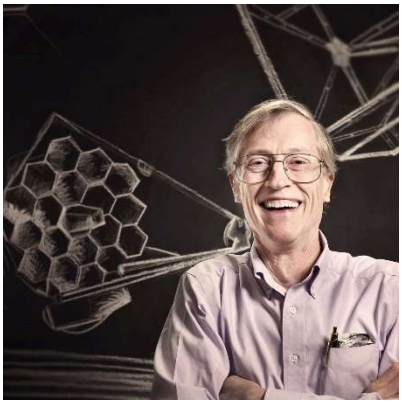
Abstract: The James Webb Space Telescope (JWST) was launched on December 25, 2021. With its 6.5 m golden eye, and cameras and spectrometers covering 0.6 to 28 μm, Webb will observe the first objects that formed after the Big Bang, the first black holes (primordial or formed in galaxies), the growth of galaxies, the formation of stars and planetary systems, individual exoplanets through coronography and transit spectroscopy, and all objects in the Solar System from Mars on out. It could observe a 1 cm2 bumblebee at the Earth-Moon distance, in reflected sunlight and thermal emission. I will show how we built the Webb and discuss the most recent discoveries. Webb is a joint project of NASA with the European and Canadian space agencies.



Biography: Dr. John Mather is Senior Project Scientist for the James Webb Space Telescope (JWST) at NASA's Goddard Space Flight Center, leading the science teams since 1995. As a postdoc at NASA's GISS in 1974, he led the proposal efforts for the Cosmic Background Explorer (COBE), coming to GSFC to be the COBE Project Scientist and Principal Investigator for the Far IR Absolute Spectrophotometer (FIRAS) on COBE. With the team, he showed that the cosmic microwave background radiation has a blackbody spectrum within 50 parts per million, confirming the expanding universe model to extraordinary accuracy. The team also made the first map of the hot and cold spots in the background radiation (anisotropy).

Dr. Mather received the Nobel Prize in Physics (2006) with George Smoot.