



The Keck Institute for Space Studies
presents the following lecture:

Revolutionizing Astrophysics: How Space and Ground Telescopes Can Work Together

John C. Mather

Nobel Laureate
former Senior Project Scientist
James Webb Space Telescope

Wednesday, March 11, 2026

5:00 PM Refreshments

5:30 PM Lecture

Ramo Auditorium
California Institute of Technology

Hybrid observatories, combining space assets and ground-based telescopes, can enable extraordinary advances in capabilities and startling scientific discoveries. Orbiting laser guide stars in high Earth orbit can remain passively within arcseconds of a target area for hours at a time, enabling diffraction-limited adaptive optics imaging at visible wavelengths where the sky is darkest. A test at Keck with the orbiting LCRD satellite has recently demonstrated this capability. With a 30 m telescope, angular resolution of a few milliarcsec is feasible. With point source observing speed scaling as D^4 , it would be 20,000x faster than Hubble and 1000 x faster than HWO. Such a guide star working with the DKIST could obtain the first sharp images of the solar corona, with a resolution of 25 km. An orbiting standard light source could improve absolute and color photometric accuracy to better than 1%, with impact on high redshift photometric distance scales, dark energy measurements, and on exoplanet models. An orbiting mm wave antenna working with the Event Horizon Telescope could measure the details of photon rings and hence the spins of black holes. Most extreme, a 30 m class telescope with an orbiting 100 m diameter starshade could image exoplanets directly, if it could be built, with 5x the angular resolution of HWO and 1000 x the observing speed. Except for the starshade, all of these could be built as CubeSat or Explorer-class missions.

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Registration is required for this lecture.