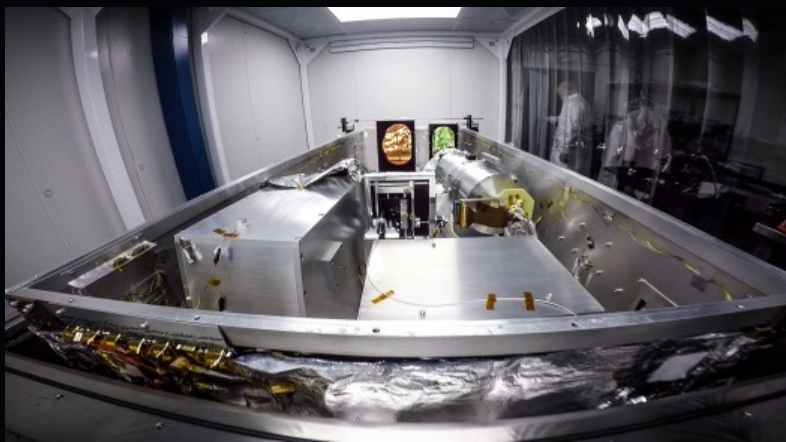


The Precision Tools of Exoplanet Discovery & Characterization: Peeking under the Hood of the Instruments

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Suvrath Mahadevan is the Verne M. Willaman Professor of Astronomy & Astrophysics at the Pennsylvania State University, USA. His interests include exoplanet discovery and characterization, astronomical instrumentation, precision measurements, large scale surveys, and astrophotonics. He is the Principal Investigator of the Habitable Zone Planet Finder and the NEID precision Doppler radial velocity spectrometers. He and the NEID Team were awarded a NASA Group achievement award for the design and construction of that instrument. He has also led the development of new techniques for precision ground-based photometric measurements and been heavily involved in the development of frequency stabilized laser combs for astronomical applications. Suvrath completed a B.Tech in Engineering Physics from IIT Bombay, and a PhD from the University of Florida, before moving to his current position at Penn State.

Modern astronomical instruments are approaching the exquisite sensitivity to detect the signature of an Earth-mass planet around a Sun-like star. The speaker will discuss the challenges involved in making these measurements, the evolution of the design of these instruments as they seek ever-tighter control of environmental parameters, higher resolution and efficiency. A suite of new technologies like frequency stabilized laser combs, low drift etalons, and deeper understanding of the detectors is enabling a new level of precision in Doppler radial velocity measurements - as well as illustrating new challenges. He will also describe how beam-shaping diffusers are now enabling space-quality photometry from the ground to aid in photometric follow-up and confirmation of transiting exoplanets, as well as chart a path from JWST to future facilities illustrating the challenges and opportunities of atmospheric characterization and direct detection and spectroscopy of exoplanet atmospheres, in the search for atmospheric biosignatures and Life.

February 23 2024 at 3.30 p.m.

(Hybrid) Lecture Theatre AG-66, TIFR Mumbai

YouTube Live:

<http://tinyurl.com/ASETonFeb23>

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Please note: This Colloquium will start at 3:30pm

