

TATA INSTITUTE OF FUNDAMENTAL RESEARCH

Homi Bhabha Road, Mumbai-400 005

December 5, 2017

ASET Colloquium

Title : In search of Exo-earths: Development of next generation extreme precision radial velocity spectrographs

Date & Time : Tuesday 19 December 2017 at 16:00 hrs.

Venue : Lecture Theater (AG-66.)

Abstract :

Search for earth-like exo-planets in habitable zone (exo-earths) has been the holy grail in exo-planet astronomy research. Beginning with the instruments like HARPS, the extreme precision radial velocity (EPRV) community have made incredible progress in building ultra-stable spectrographs for bringing down the measurable radial velocity (rv) precision to sub-m/sec. However, to detect earth-like planets around sun-like stars in earth-like orbits, we need to be able to measure radial velocities at a few cm/sec level. For comparison, our Earth has ~ 9 cm/sec rv effect on our Sun.

After a brief introduction on the exciting field of exo-planets, I shall present our R&D work on the interesting subtleties one has to deal with in cm/s regime. We are developing two spectrographs; Habitable Planet Finder (HPF) in near-infrared wavelength (< 3 m/sec in NIR), and the next generation NEID spectrograph in optical wavelength (< 29 cm/sec). NEID was the winning proposal of NASA-NSF Exoplanet Observational Research (NN-EXPLORE) partnership's call for an Extreme Precision Doppler Spectrometer based on recommendations of the Astro2010 Decadal Survey. With HPF already on sky and under commissioning at 10-m Hobby Eberly Telescope, USA, and NEID under construction for completion by the end of 2018 for 3.8-m WIYN telescope, we are at the beginning of the next generation cm/sec radial velocity era!.



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(Coordinator, ASET Forum)