Eastbay Astronomical Society Presents

When: Saturday, September 14th, 7:30 – 9:30PM
Where: Chabot Space and Science Center; Room: Hauben Room

Join us for our free monthly presentation on the latest in Astronomy! Along with our featured speaker, we will be opening up our library, and giving away door prizes to a lucky few. There will be snacks and drinks to taste. Of course, weather permitting, there will be free telescope viewing on the decks.

Installation, testing and results of the Khayyam Instrument at Lick Observatory

Sona Hosseini

Hi all! It's back to school time, and we bring you a more technical but fascinating look at the real world school work of PhD candidate Sona Hosseini and her project at the Lick Observatory.

Khayyam: A Tunable Spatial Heterodyne Spectrometer for Broadband Observation of Diffuse Emission Line Targets

Sona Hosseini would report on progress toward development of a tunable spatial heterodyne spectrometer (TSHS) at the fixed focus of the Coudé Auxiliary Telescope (CAT) in the Shane Telescope at Lick Observatory (Khayyam). SHS instruments are a class of interferometric sensor capable of providing a combination of large étendue, high resolving power ($R=\lambda/d\lambda \sim 105$) and wide field of view (FOV~0.5 degree) at Optical and NUV wavelengths in a compact format.

The TSHS implementation addresses the bandpass limitation of the basic SHS through controlled rotation of pilot mirrors in the interferometer. The use of a single grating as both a dispersing and beam-splitting element in the all reflective SHS greatly relaxes the precision required in the alignment of the other optical elements relative to a more typical scanning Fourier Transform Spectrometer and allows the TSHS implementation to be accomplished with low cost commercial rotation stages. The new design builds on a previous design originally tested in 2007, and will address several issues identified with the input beam, output imaging, and grating efficiency. Here she will discuss the design considerations going into this new system and the initial results of the installation and testing of the TSHS and the future plans.

Following completion of the ground based TSHS version (Khayyam), the longer term goals of the TSHS project are to provide in flight testing on a sounding rocket platform that Sona's research group is developing and then ultimately a translation to satellite applications.

About Sona

Sona is a PhD student at University of California Davis, Department of Engineering Applied Science. She has been working on SHS technique for four years with her adviser Dr. Walter Harris. During this course, her responsibilities on this project include all aspects of a top-level instrumentation design and development from optical design to environmental stability to control to data pipelining. To this date, she has finished the optical design for the instrument, the coupling system to the telescope, the alignment and the environmental testing. As well as the first light was achieved during February 2012. Since then she has been working on a data reduction pipeline to improve her data and calibrate her instrument, as well as start obtaining scientific data.

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