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## CSO SPECIAL SCIENCE SEMINAR

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**TIME: 04:00 PM, Friday 10th June 2011**

**PLACE: CSO Conference Room**

**TITLE: ZEUS-2: A Grating Spectrometer Optimized For Observations of High-Z Galaxies and Warm Molecular Gas In Nearby Galaxies**

**SPEAKER: Dr. Thomas Nikola (*Cornell University*)**

### **ABSTRACT:**

Observation of far-infrared line emission that is redshifted into the submillimeter regime provides a unique glimpse at the star-formation and nuclear activity of high-z galaxies. For example, the [CII] 158 micron and [OI] emission probe the properties of gas heated by recent star formation, while the [OIII] 88 micron and [NII] lines trace ionized gas that is excited either by star formation or nuclear activity. These observations require the most sensitive and state-of-the-art instruments.

Warm molecular gas is intimately linked to kinematic and radiative processes in galaxies, like shock excitation in cloud-cloud collisions, star formation, or nuclear activity. These processes also drive galaxy evolution. Since each of the mechanisms (e.g. PDR, XDR, shocks) that heat the molecular gas imprints a distinct signature on the mid- and high-J CO transitions these lines are excellent tools to study the interplay between global and local galactic properties, hence the evolution of galaxies.

ZEUS-2 is a submillimeter grating spectrometer optimized for these observations. It can observe multiple lines simultaneously and also provides spatial information in extended objects. In this presentation I will give an overview of the instrument, its current status, and the science cases that drive the requirements of ZEUS-2.

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Caltech Submillimeter Observatory (CSO) Hilo office is located in the University Park, at the corner of Komohana – Nowelo Street.

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