

# Space Physics Seminar

## Thursday, January 28, 2016

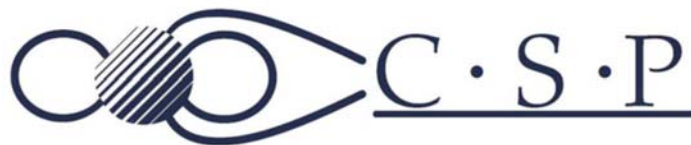
### Langmuir Turbulence and the Underlying Source of Free Energy in the Auroral Ionosphere

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#### Abstract:

Langmuir turbulence, arguably one of the most discussed regimes of nonlinear plasma turbulence, is known to occur in a vast range of plasmas; from laboratory to a variety of space and astrophysical plasmas including pulsar magnetospheres, the solar wind, and planetary foreshocks. Over the past few years, Langmuir turbulence has been detected in the high-latitude ionosphere in the form of anomalous incoherent scatter radar (ISR) echoes. The echoes that are characterized by specific spectral morphologies are also considered the most conclusive evidence for the generation of naturally produced Langmuir cavitons. While Langmuir turbulence alone is a subject of active research, its generation in the ionosphere can be further discussed from another point of view, that is the underlying source of free energy. In this talk I will discuss how a combination of ISR measurements, high speed optical measurements, simulations, and in-situ measurements of waves and particles with instruments on board of rockets leads us towards the conclusion that the most plausible source of energy for the turbulence is the electron beams produced by inertial Alfvén waves. Other sources of energy that will be discussed are the secondary electrons and the 'inverted V' electron beams produced by quasi-static parallel electric fields.



725 Commonwealth Avenue  
Boston, MA 02215

**3:00 pm**

Refreshments  
CAS Room 500

**3:45 pm**

Seminar  
CAS Room 502

#### Next Week

- Ralph Kraft  
CfA
- What can X-rays tell us about the Jovian Magnetosphere? Results from a recent Hisaki/Chandra campaign to study the Jovian Aurora and Io Plasma Torus



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