

NAME: **Steve Asztalos**

Email: asztalos1@llnl.gov

AFFILIATION : LLNL , California, USA

TITLE : Axion Cosmology and Detection

ABSTRACT:

Lecture I

Dark Matter overview including discussion of phase space, fine structure, caustics.
Constraints on the axion from cosmology & astrophysics.
Principle of the microwave cavity experiment.
Early history (RBF, UF experiments; there was also an early attempt at KEK using HEMTs)

Lecture II

ADMX experiment - description
Enabling technology - HFET amplifiers
Enabling technology - high-Q cavities, including concepts for higher frequency
ADMX data analysis & results

Lecture III

Discussion of the standard quantum limit, i.e. the phase-number uncertainty principle
Rydberg-atom single-quantum detection. Description of CARRACK-I and -II detectors;
results on measuring the blackbody spectrum.

Lecture IV

ADMX future - SQUID technology
What if the axion be found? (the counterpart of the "two-slit" experiment to measure the correlation length;
what is learned about the history of galactic formation, etc.)