

# Strategy for a New Dimension (SAND) of CEDAR

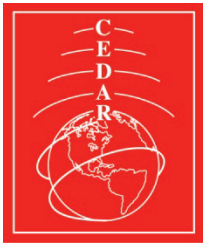
## ■ Overarching Problem Statement:

What are the geospace impacts on Earth's habitability and sustainability of technology-reliant societies?

*"Man must rise above the Earth – to the top of the atmosphere and beyond – for only thus will he fully understand the world in which he lives." Socrates*

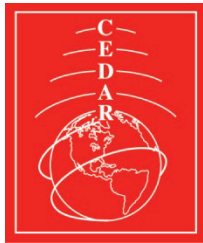
## ■ Themes

- Climate Change with the geospace system (mutual interaction)
  - Space climate
  - Geospace effects on climate
- Complexity in the geospace system
  - Nonlinear, complex system (e.g. space weather, extreme events)
- Follow the energy
  - Propagation, Transformation, Manifestation



# SAND Fundamental Processes

- Forcing, Response and Feedback
  - Processes responsible for the primary forcing, primary response on geospace and the subsequent feedback within geospace and to the atmosphere-space system
- Plasma-Neutral Interactions
  - Processes related to the exchange of energy, mass and momentum between the plasma and the neutral gas of geospace (i.e. plasma drag, plasma chemistry, charge distributions, electrodynamics, plasma instabilities, neutral acceleration, neutral energization)
- Cross-Scale Coupling
  - Processes of one spatial/temporal scale couple to other spatial / temporal scales (i.e., gravity wave – tidal wave interactions, wave-mean flow interactions, small scale Joule and particle heating to global thermal distribution, mean flow to instability processes)
- Preconditioning
  - Processes that modify the state of the system leading to a different response (QBO cycle, solar cycle, solar rotation, day/night cycle, geomagnetic cycles) or either processes only occur when certain conditions are met (ESF, strat warming...)



# 2009-2010 CEDAR Science Steering Committee (CSSC) Members

**Jeff Thayer (Chair)**

University of Colorado

[jeffrey.thayer@colorado.edu](mailto:jeffrey.thayer@colorado.edu)

**John Foster (Chair Elect)**

Millstone Hill / MIT

[jfoster@haystack.mit.edu](mailto:jfoster@haystack.mit.edu)

**Mark Conde**

University of Alaska, Fairbanks

[Mark.conde@gi.alaska.edu](mailto:Mark.conde@gi.alaska.edu)

**Larisa Goncharenko**

Millstone Hill / MIT

[lpg@haystack.mit.edu](mailto:lpg@haystack.mit.edu)

**Joseph Huba**

Naval Research Laboratory

[huba@ppd.nrl.navy.mil](mailto:huba@ppd.nrl.navy.mil)

**Tim Fuller-Rowell**

University of Colorado

[tim.fuller-rowell@noaa.gov](mailto:tim.fuller-rowell@noaa.gov)

**John Noto**

Scientific Solutions

[noto@sci-sol.com](mailto:noto@sci-sol.com)

**Meers Oppenheim**

Boston University

[meers@bu.edu](mailto:meers@bu.edu)

**Anthony van Eyken**

SRI International

[anthony.vaneyken@sri.com](mailto:anthony.vaneyken@sri.com)

**Lara Waldrop**

Univ. of Illinois Urbana-

Champaign

[lwaldrop@uiuc.edu](mailto:lwaldrop@uiuc.edu)

**Mike Ruohoniemi**

GEM Representative

Virginia Tech

[mikeruo@vt.edu](mailto:mikeruo@vt.edu)

**Susan Skone**

International Representative

University of Calgary

[shskone@ucalgary.ca](mailto:shskone@ucalgary.ca)

**Elizabeth Bass**

Student Representative

Boston University

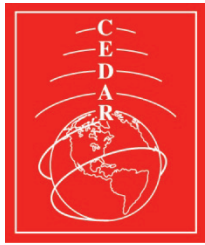
[enb@bu.edu](mailto:enb@bu.edu)

**Marco Milla**

Student Representative

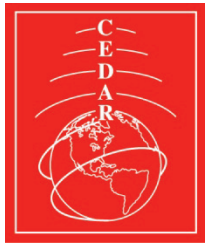
Univ. Illinois Urbana-Champaign

[mmilla@uiuc.edu](mailto:mmilla@uiuc.edu)



# THANK YOU!!

- Barbara Emery
- Julie Cross
- Ellen Martinez
- Susan Baltuch
- Sarah Melssen



# Next Year's Workshop

25<sup>th</sup> Annual CEDAR Workshop

University of Colorado

Boulder, Colorado

June 21-25, 2010

See you all there!

