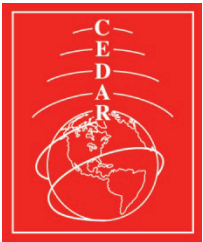
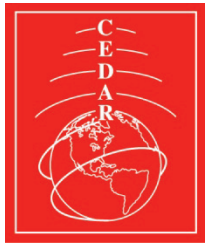

CEDAR Strategic Planning for the Next Decade

Jeff Thayer, CSSC Chair
Aerospace Engineering Sciences
University of Colorado



CEDAR 2009, June 29- July 3, Santa Fe, NM

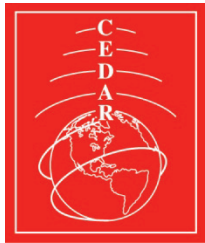




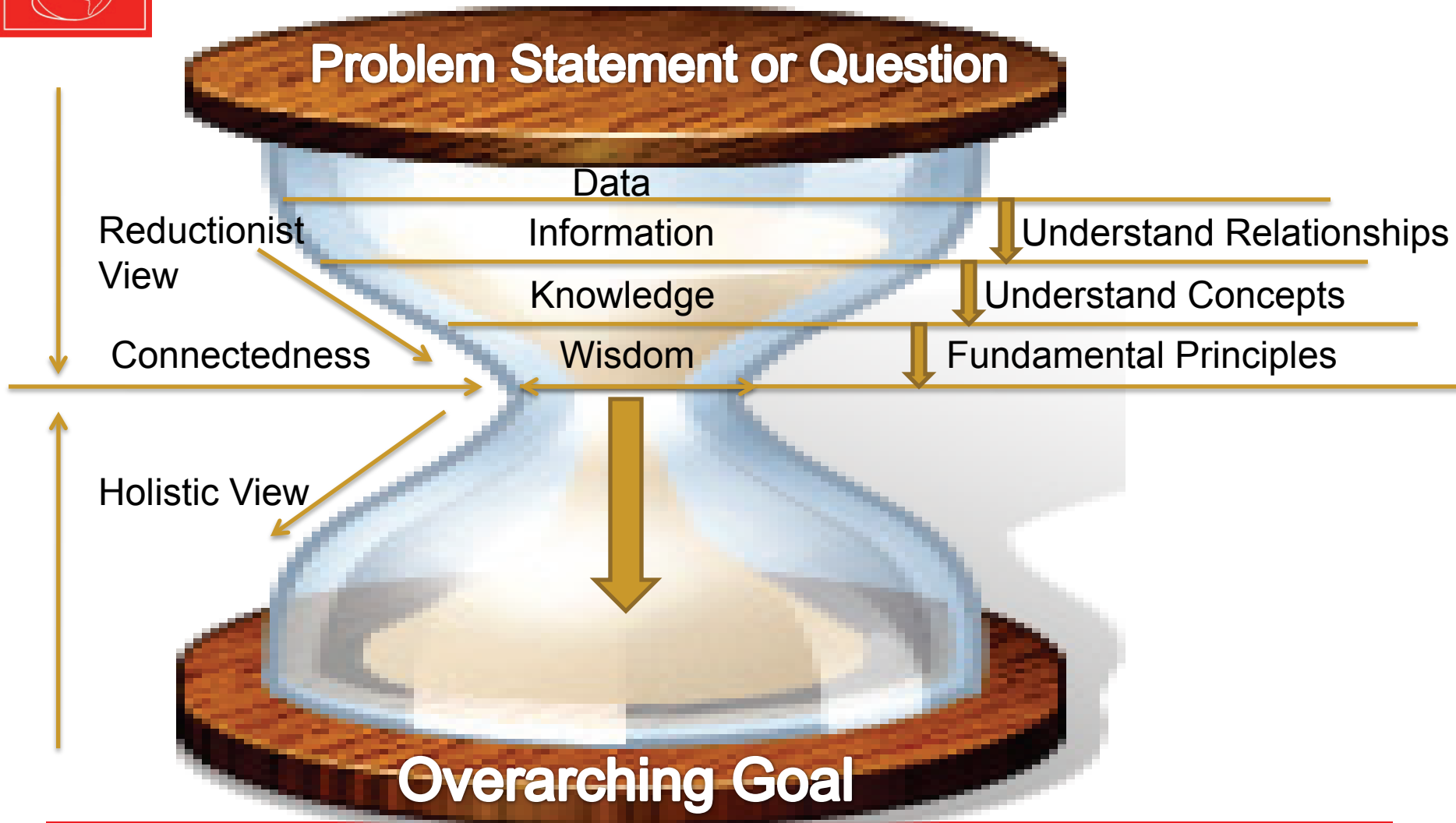
Motivation for a CEDAR Strategic Plan

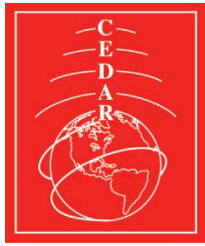
CEDAR program has maintained its prominence and longevity by planning, implementing, reviewing, self-assessing, and phasing with a grass-roots community spirit.

- CEDAR Phase III document is 12 years old
- Research landscape is rapidly evolving
- Initiatives are pushing the research and resource envelope of CEDAR
- CEDAR needs to be better poised to contribute to high-priority, agency-wide research programs
- CEDAR has icon status as the preeminent aeronomic body and is the right group to push concept forward

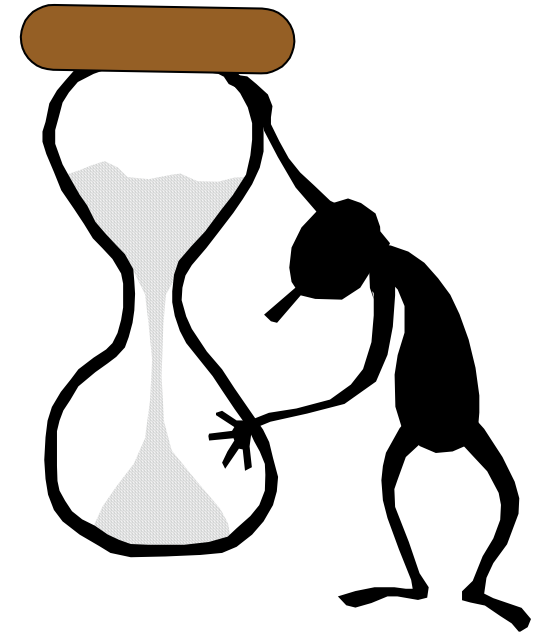
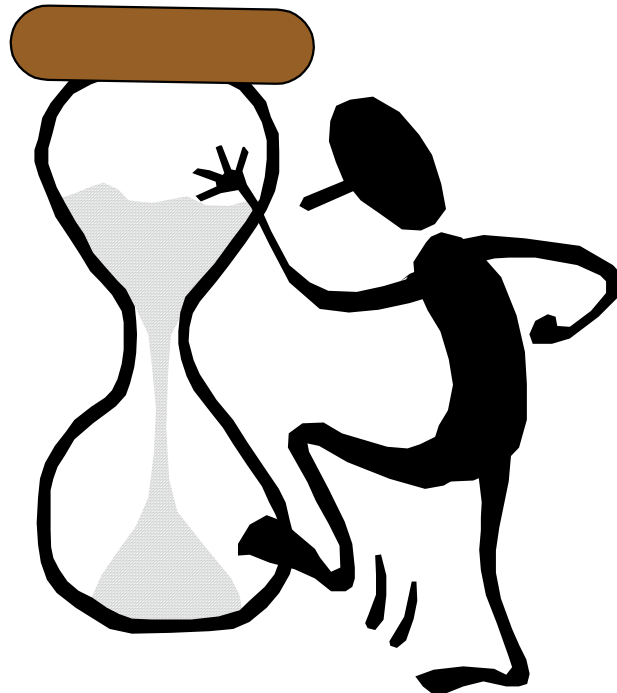
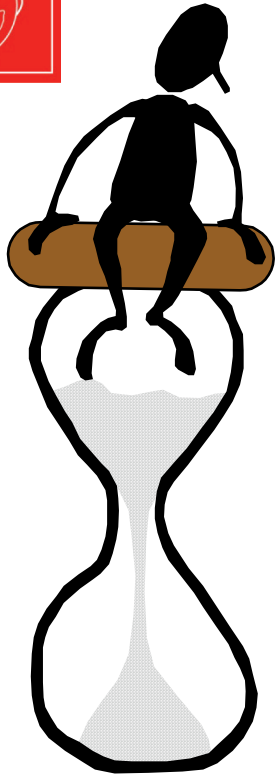


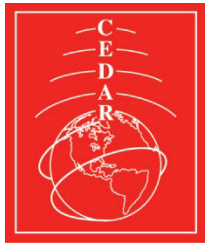
Hour Glass Concept





Limited amount of SAND

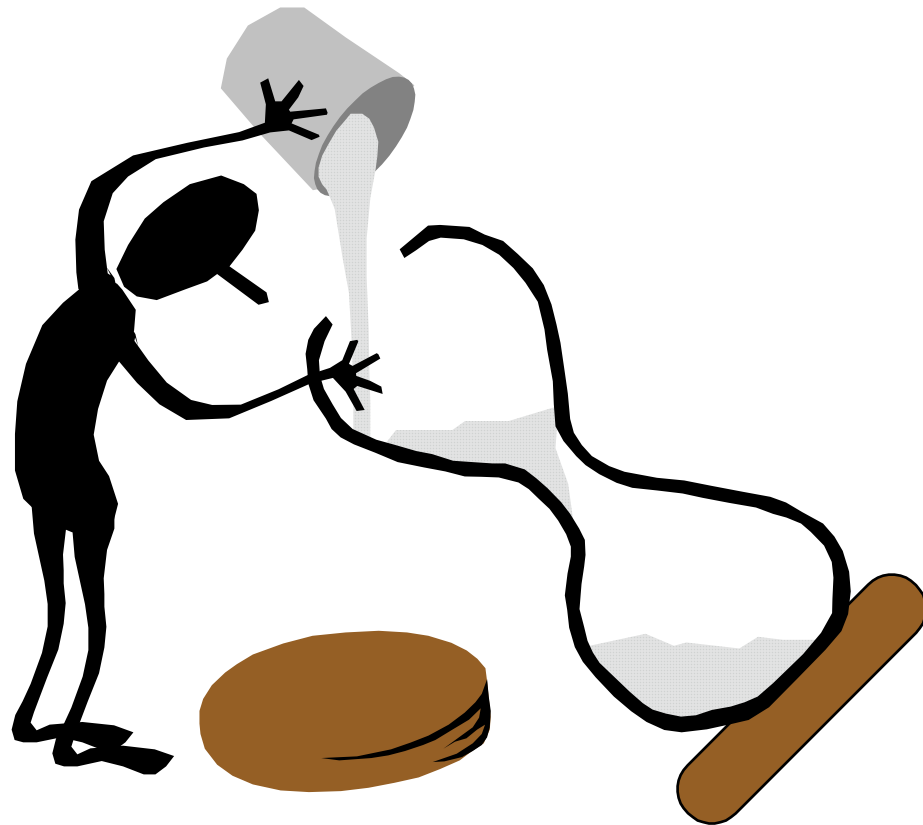


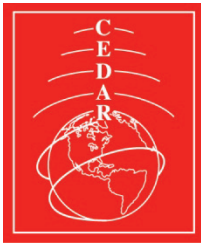


Reformulate Problem Statement and Approach

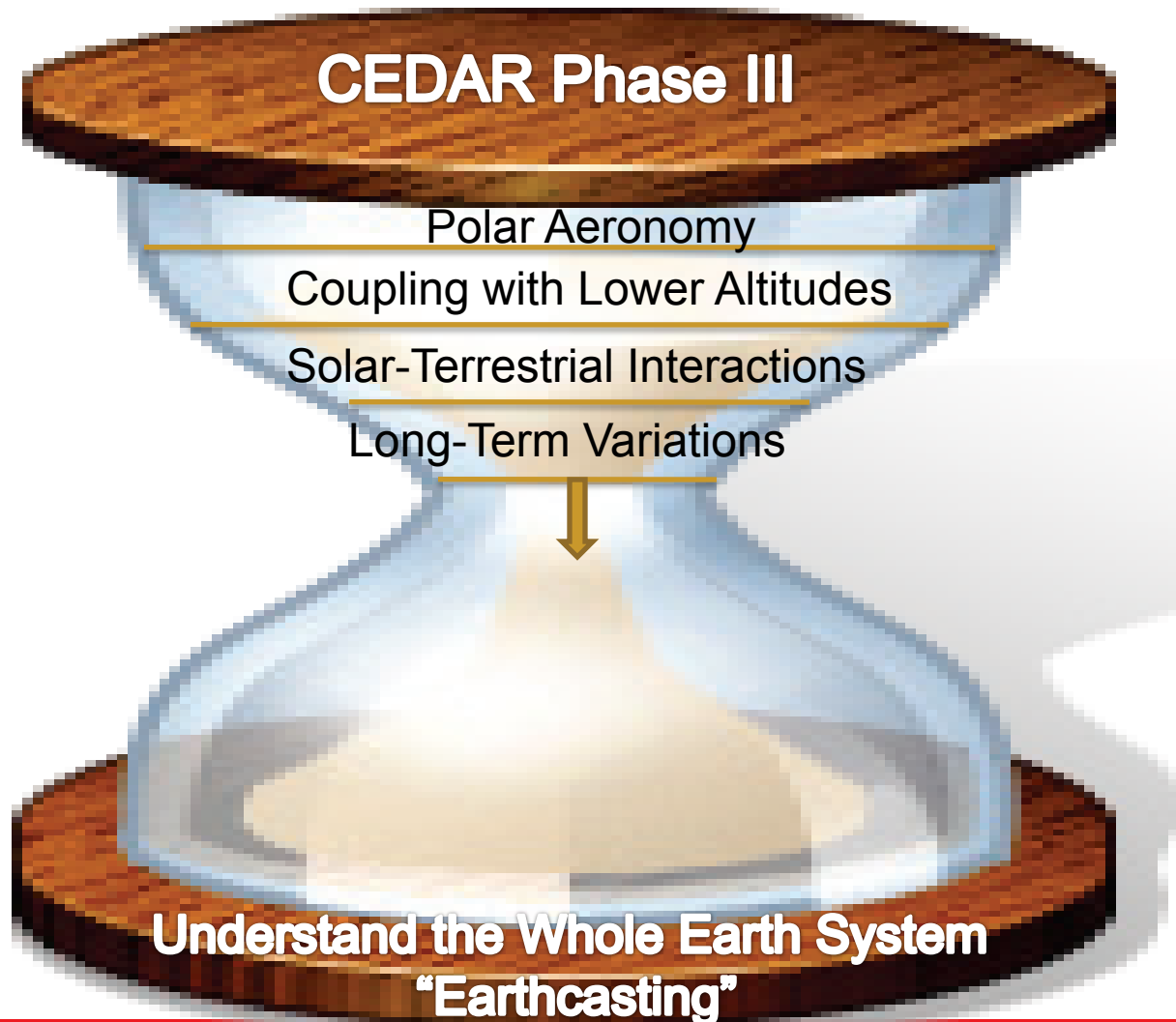
Add more SAND

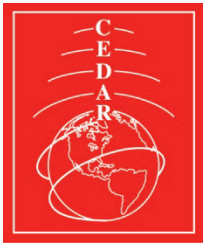
SAND = Ideas





CEDAR Program



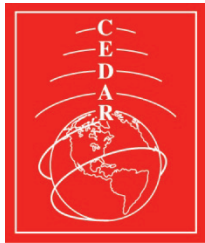


CEDAR: The SAND Phase

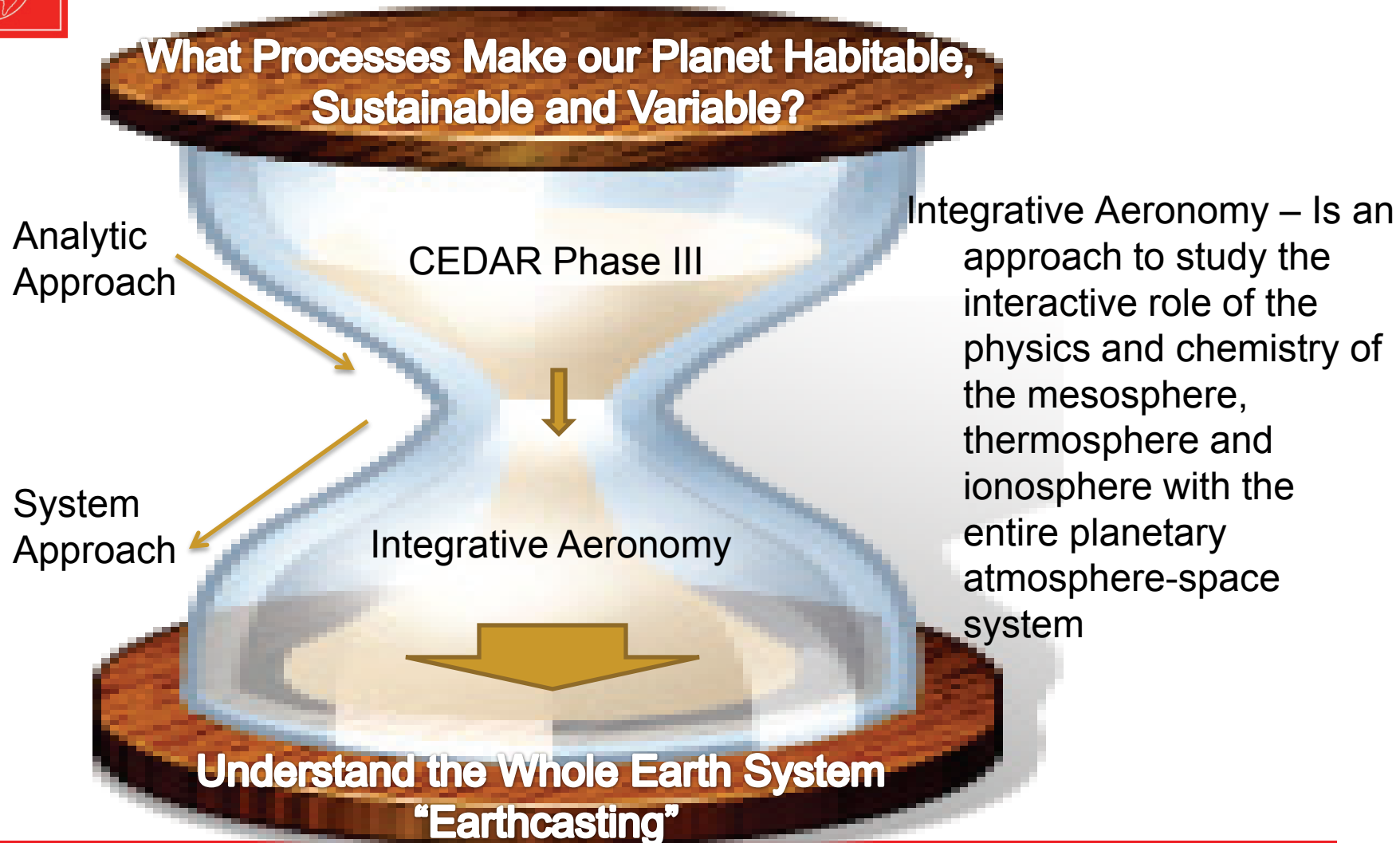
Strategy for
A
New
Dimension of CEDAR

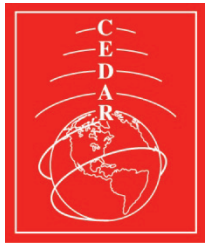
This strategy applies a whole atmosphere-space system approach to ITM research building from the wisdom gained through the concerted effort of the CEDAR community.

“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



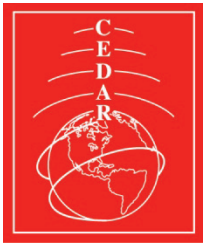
A Way Forward





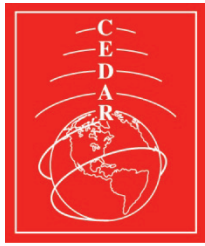
It Takes a Village to Develop the Strategic Plan

- The proposed approach is to create a new dimension of CEDAR by establishing community subcommittees tasked to develop themes and concepts centered around fundamental processes
 - Forcing, Response and Feedback
 - Plasma-Neutral Interactions
 - Cross-Scale Coupling
 - Preconditioning
- Subcommittee members and their themes would serve as focused efforts within subsequent CEDAR meetings



Benefits of the Strategic Plan

- **Unifies** the Aeronomic field
- **Demands** stronger collaboration with other research areas, such as lower atmosphere and magnetosphere
- **Explores** transformational research
- **Defines** resource needs
- **Responds** to the new research landscape
- **Provides** a platform from which new initiatives can build



CEDAR and ITM Strategic Planning Workshop

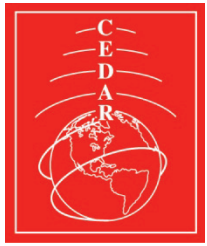
1:00-3:00pm Monday

Anasazi South

Convenors: Thayer and Paxton

The ionosphere / thermosphere / mesosphere community is at a cross roads in how this discipline will evolve over the coming years. There are many changes taking place in the agencies and in the scientific approach to geoscience and geospace research. It is imperative that action be taken to ensure the CEDAR community is properly involved in this new evolution of science and to lead the direction for the CEDAR program. This workshop will invigorate discussion regarding the CEDAR strategic plan and include participation and discussion by a broader ITM group that is

spearheading action in other programs.



Strategy for a New Dimension (SAND) of CEDAR

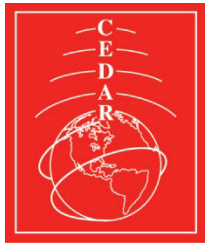
■ Overarching Problem Statement:

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

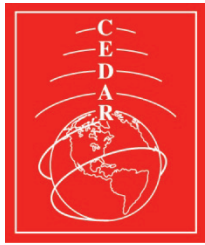
- Processes related to the exchange of energy, mass and momentum between the plasma and the neutral gas of geospace (i.e. plasma drag, plasma chemistry, charge distributions, electrodynamics, plasma instabilities, neutral acceleration, neutral energization)

■ 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)

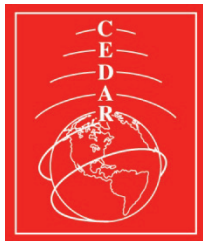
■ Preconditioning

- 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...)



Approach

- Identify Leads for each fundamental process topic
 - To lead and represent that effort, to meet with other leads to address overlap, to organize activities for next year's meeting, and to begin the process of generating CEDAR report
- Common items to address by leads
 - Establish focus groups and schedule
 - Determine how the specific processes fit within the themes and main question
 - How might this new dimension broaden the scientific method
 - How would this effort be put forward to other science communities and public
- All leads will meet regularly (telecon) to make overall progress
 - Work with the CSSC chair and committee on next year's meeting and in the production of a CEDAR report
- Must not digress
 - Note the approach does not digress to a particular instrument, location or altitude – must keep eye on themes and fundamental processes which will dictate resources such as instrumentation development and their distribution



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