CSEDI Science Plan Workshop

January 21-22, 2015
Scripps Seaside Forum

WEDNESDAY JANUARY 21

8:30am Registration, Coffee, Juice, Rolls available at Meeting

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9:00am Welcome - Scripps Director, Margaret Leinen
- Logistics/Goals and Overview, Cathy Constable, Guy Masters

THEME 1: Evolution of Earth and Planets: Path to the Present
Moderators - James Day, Guy Masters, Bruce Buffett

9:15am Keynote 1: *David Stevenson* The Initial Condition for Mantle and Core
10:15am Break
10:30am Keynote 2: *Richard Carlson* Early Earth differentiation: Consequences for deep Earth structure and dynamics
11:30-12:30

Shorter Presentations (no more than 10 mins) and discussions: *Bruce Buffett* (Inner core evolution), *Mark Harrison* (Conditions for early life), *Rich Walker* (Tungsten isotopes and early Earth), *Steve Mackwell* (planetary), *John Tarduno* (the oldest geodynamo), and others, including (but not limited to):
Initial Conditions; Planetary Formation; Early Life; Early Tectonic Regimes, Thermal evolution....

Identification of Further Topics for Breakout Discussions

12:30pm Lunch - and ongoing discussions - please address the attached questions

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THEME 2: Deep Earth Engine: Present state and dynamics
Moderators - Wendy Mao, Maureen Long, Cathy Constable

1:30pm Keynote 1: *Ved Lekic* Seismological constraints on large and meso-scale structure of the lower mantle.
2:30pm Break
2:45pm Keynote 2: *Quentin Williams* The dynamical interplay between mineral physics and seismology in deep Earth studies
3:45-4:00pm *Peter van Keken - geodynamical consideration*
4:00- 5:30

Short presentations (no more than 10 minutes) and discussions:
Jennifer Jackson (The core-mantle boundary and next-generation mineral physics); *Leah Ziegler* (Boundary conditions and impact on geomagnetic field); *Steve Constable* (Electrical conductivity in deep mantle); *Shijie Zhong*, and others including (but not limited to):
Structure and Origin of Major interfaces, Geodynamo, Pattern of large scale flow in the Mantle, Core structure (stratification and IC anisotropy);

Identification of Further Topics for Breakout Discussions

5:30-7:30pm Reception and ongoing discussions - please address the attached questions

THURSDAY JANUARY 22
8:30am Coffee, Juice, Rolls available at Meeting

THEME 3: Deep Impacts on Climate/Hydrosphere/ Biosphere and the Future
Moderators - Shun-Ichiro Karato, Marc Hirschmann

9:00am Keynote 1: *Sujoy Mukhopadhyay* Early and long-term volatile exchange between interior and surface reservoirs
10:00am Discussion
10:15am Break
10:30am Keynote 2: *David Bercovici* Coupling of mantle dynamics, tectonics, volatile cycling and climate.
11:30-12:30
Short presentations and discussions on role of volatiles, melt, mass and heat fluxes, including
Gary Egbert (Constraints on volatiles in the upper mantle from EM induction: Progress and Challenges)
Craig Manning (What's so super about supercritical fluids?)

Identification of Further Topics for Breakout Discussions

12:30pm Lunch - and ongoing discussions - please address the attached questions

THEME 4: Should there be a completely new theme?

1:30pm Any Other Short Verbal Contributions
Jon Aurnou (Geodynamo),
Dan Lathrop (Collaboration across CSEDI with geodynamo experiments, theoretical and computational teams)
Mike Gurnis (Emerging opportunities to link deep earth dynamics with surface evolution)
plus other matters arising.
2:30pm Break
2:45pm Breakout Sessions - content and questions to be based on earlier workshop discussion
For example:
What else should go in the science plan?
What is the most important topic CSEDI should address?
What are the barriers to interdisciplinary cooperation?
What does the C mean in CSEDI (multidisciplinary or multi-institutional)?
What kind of infrastructure and educational resources are needed? (relation to other initiatives like CIDER, SEDI, CIG, IRIS, COMPRESS, EARTHCUBE, etc.)
How should we define and shape broader impact from CSEDI?

3:45pm Reports from Breakout Groups
4:30pm Wrap up discussion: the future of CSEDI, and structure of the science plan.

CSEDI Science Planning Workshop
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Workshop Goals:

1. Discuss major discoveries in past decade since 2004 science plan (http://csedi.ucsd.edu/CSEDI_plan_2004.pdf)
2. Identify science drivers for the next decade to provide input to 2015 research plan
3. Determine what community resources/infrastructure are needed

How can you help?

1. Identify one or two major discoveries from the past decade
2. Tell us where you think the science is going over the next few years
3. Itemize necessary resources and infrastructure
4. Provide accessible figures/cartoons that illustrate your points for potential inclusion in the final report
5. Contribute to discussion sessions at the meeting
6. Identify additional topics for Thursday afternoon verbal contributions and breakout sessions

http://csedi.ucsd.edu/csedi_2015_program.pdf

No Free Lunch!

- During lunch and reception please identify key topics from this morning's discussions and send written input to steering committee
- What impressed you as major discoveries from the past decade?
- What are the current science drivers?
- What resources/ infrastructure are needed for the next decade?