Research Highlight

Modeling grain size evolution in the mantle with ASPECT

Grain size plays a key role in controlling the mechanical properties of the Earth’s mantle, affecting both long-term flow patterns and anelasticity on the timescales of seismic wave propagation. In turn, the deformation in the Earth’s mantle also affects grain size evolution. However, dynamic models of Earth’s convecting mantle usually implement flow laws with constant grain size, stress-independent viscosity, and a limited treatment of changes in mineral assemblage.

In “The importance of grain size to mantle dynamics and seismological observations”, Dannberg et al. (2017) use the community mantle convection code ASPECT to study grain size evolution in the Earth's mantle. The presented geodynamic models include the simultaneous and competing effects of grain growth, dynamic recrystallization resulting from dislocation creep (decreasing the grain size), and recrystallization at phase transitions. They show that grain size evolution drastically affects both rheology and the dynamics of mantle convection. Changes in grain size alone can lead to lateral viscosity variations of six orders of magnitude in the upper mantle, and control the shape of upwellings and downwellings. ... read full article J. Dannberg et al., 2017 doi: 10.1002/2017GC006944.

WEBINARS

November 16 - Max Rudolph
February 8 - Gabriele Morra
March 8 - Eri Mittelstaedt
April 23 - Sabine Stanley
May 10 -
More info
Connect to webinar

MEETINGS

Dec 11: CIG Business Meeting
Dec 11-15: AGU 2018
April 25-27: Coupling of Tectonic and Surface Processes
June 10-14: CGU joint wth CIG TBD: ASPECT Hackathon
TBD: PyLith Hackathon

NEW RELEASES

Calypso 1.2.0
PyLith 2.2.1

CONTACT US
Elections

2017 Elections are now open for positions on the Executive and Science Steering Committees. Candidates for the EC are Susanne Buiter and Carl Tape. Candidates for 3 positions on the SSC are Chris Harig or Gabriele Morra, David Ham or Moritz Heimpel, and Jessica Irving or Ying Zhou. Candidate statements are available online. Contact your member representative to vote. Many thanks to EC member Omar Ghattas and SSC members Jed Brown, David May, and Carl Tape for their contributions to the community and to the Nominations Committee, Clint Conrad, Wolfgang Bangerth, Ved Lekic and Sabine Stanley for presenting an excellent slate of candidates.

CIG @AGU

Looking for talks in geodynamics at AGU? Visit our website to see the latest research your CIG colleagues are presenting. Do not forget to email us your presentation information so your research can be highlighted on this list.

2017 CIG Business Meeting

CIG will hold its Annual Business Meeting on Monday, December 11 at the Hilton Garden Inn New Orleans Convention Center. The Hilton Garden Inn is just one block west of the convention center. The reception begins at 6pm followed by the business meeting at 7pm. Light hors d’oeuvres will be served. Results from the 2017 EC and SSC elections will be announced and join the lively discussion on HPC. See our website for more information and directions. [more info]

2017 CIG-LLNL Computational Seismology Workshop

CIG in collaboration with Lawrence Livermore National Laboratory (LLNL) held a workshop focusing on computational seismology at the Livermore Valley Open Campus September 18-22, 2017. The workshop combined keynote lectures and training on seismic waveform processing, visualization and HPC waveform simulation. Fifty-five predominantly early career participants from the US and 16 countries attended. This highly successful workshop was the first of its kind to feature full access to HPC resources for research grade example problems. [full article]

CIG in the News

Under the leadership of Jon Aurnou, the Geodynamo Work Group is entering the next phase of its successful INCITE project. The GWG has been using the CIG code Rayleigh to simulate solar and planetary dynamos at unprecedented detail on ALCF’s Mira supercomputer. Their work is highlighted in the ALCF magazine. [full article]

Congratulations to Julianne Dannberg for winning the KlarText Prize for Science Communication. The KlarText prize is awarded to scientists who have finished their dissertation and can explain their research to a non-scientific audience in German. Read her winning entry Up and down in the mantle.

Job Opportunities at NSF

NSF has openings for a Division Director in GEO/EAR and a Program Director for Geophysics. Consider making an impact on the national level and represent the geodynamics community in Alexandria, VA.