Research Highlight

Using Matrix-free, Multigrid Methods in ASPECT for Large Scale Computations

Solving discrete finite element systems rely heavily on the computation of matrix-vector products with sparse matrices. These matrix-vector products tend to dominate the total amount of work required for the average finite element program, and, as these matrices can be quite large and do not fit into the cache of a modern machine, accessing the data from RAM has become a major bottleneck in finite element computations. Instead of computing the entries of and storing a system matrix, matrix-free methods define an operation on a vector as a loop over the cells in the domain, applying small, dense matrices defined locally on the cell, and summing the results over the entire domain. In this way, one replicates the action of a matrix while never actually storing a matrix. These methods show significant gains in the time of a matrix-vector product as compared to traditional matrix-based methods when using degree 2 and higher finite elements ...

[full article]

Contributed by Thomas Clevenger

CIG @ 2019 Fall 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 to increase the visibility of your research.

[2019 talks in geodynamics at AGU]

2019 CIG Business Meeting

CIG will hold its Annual Business Meeting on Wednesday, December 11. The meeting will begin at 12:45p. Lunch will be available beginning at 12:15p. Come discuss the findings from this summer's community survey. Results from the 2019 EC and SSC elections and the schedule for the 2020 CIG events will be announced. Check back at our website for location details.

[business meeting]

Governance

Elections

2019 Elections are now open for positions on the Executive and Science Steering Committees. Candidates for 2 seats on the EC are Bruce Buffet, Claire Currie, and Peter van Keken. Candidates for 2 positions on the SSC are Clint Conrad, Juliane Dannberg, and Scott King. Candidate statements are available online. Contact your member representative to vote. Many thanks to EC members Claire Currie and Frederik Simons and SSC members Brad Aagaard and John Rudge for their contributions to the community and to the Nominations Committee - Carolina Lithgow-Bertelloni, Frederik Simons, and Jolante van Wijk for presenting an excellent slate of candidates.

[view candidate statements here]

CIG Postdoctoral Researchers

Applications are invited for two Postdoctoral Researchers who are interested in joining the CIG team at UC Davis. The positions are expected to contribute to the development and support of numerical modeling codes in geodynamics and towards conducting independent research. We seek proposals for innovative, original, and feasible software engineering and/or software development projects that complement and/or improve our current practices. CIG supports communities in computational science, dynamo, education, long-term tectonics, mantle convection, multiphysics,

seismology, and short-term crustal dynamics. For more information contact Lorraine Hwang: ljhwang@ucdavis.edu.

<div align="center">[job listing]</div>

Events

Joint Canadian Geophysical Union and CIG Meeting

The 2020 annual meeting of the Canadian Geophysical Union (CGU) will be held in Banff, AB, May 3-6. CIG will be partnering again with CGU for this event. The theme of the Meeting, which reflects the full range of the CGU's scientific interests is Addressing Challenges in Earth and Environmental Sciences, and scientific sessions are being invited for all areas of interest encompassed. These areas include biogeosciences, earth surface processes, geodesy, hydrology, and the solid earth. Proposals for scientific sessions must be submitted by November 22. Travel support will be available for U.S. based researchers.

<div align="center">[More Information]</div>

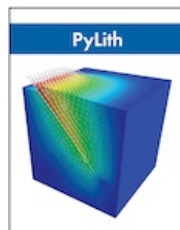*Find all past events by navigating to: Outreach > Calendar.*

Webinars

Webinars begin @ 2P PT

November 14   Richard Styron, GEM Foundation & Earth Analysis, LLC

December   AGU

January   Winter break

February 13   Christy Till, Arizona State University

March 12   Nicole Gasparini, Tulane University
                   and Jane Willenbring, Scripps Institution of Oceanography

April 9   Ved Lekic, University of Maryland

May 7   Brandon Schmandt, University of New Mexico

New Release

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