Jed Brown

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Education

Ph.D. Glaciology, ETH Zürich, 2011.

M.S. Mathematics, University of Alaska Fairbanks, 2006.

B.S. Mathematics, *magna cum laude*, University of Alaska Fairbanks, 2004.

B.S. Physics, *magna cum laude*, University of Alaska Fairbanks, 2004.

Employment

Postdoctoral Fellow, Mathematics and Computer Science Division, Argonne National Laboratory, 2011–present

Research Assistant, ETH Zürich, 2007–2011

Research Technician, University of Alaska Fairbanks, 2006–2007

Research Assistant, University of Alaska Fairbanks, 2003–2006

Research

Scalable solvers for implicit multiphysics, high order PDE discretization in complex geometry, compatible discretizations for heterogeneous flows, PDE-constrained optimization.

Selected publications

R.J. Biezuner, J. Brown, G. Ercole, and E. M. Martins, *Computing the first eigenpair of the p-Laplacian via inverse iteration of sublinear supersolutions*, accepted by J. Scientific Computing, 2011.

J. Brown, B. Smith, and A. Ahmadia, *Achieving textbook multigrid efficiency for hydrostatic ice sheet flow*, submitted to SIAM J. Sci. Comput., 2011.

J. Brown, *Efficient nonlinear solvers for nodal high-order finite elements in 3D*, Journal of Scientific Computing, 45(1) 48–63, 2010.

J. M. Amundson, M. Fahnestock, M. Truffer, J. Brown, M. P. Lüthi, and R. J. Motyka, *Ice mélange dynamics and implications for terminus stability, Jakobshavn Isbræ, Greenland*, Journal of Geophysical Research, Earth Surface, 115, F01005, 2010.

K. Burckhardt, D. Szczerba, J. Brown and K. Muralidhar, and G. Szkely. *Fast implicit simulation of oscillatory flow in human abdominal bifurcation using a Schur complement preconditioner*, Euro-Par Parallel Processing, 747-759, 2009.

E. Bueler and J. Brown, *The shallow shelf approximation as a 'sliding law' in a thermomechanically coupled ice sheet model*, Journal of Geophysical Research, Earth Surface. 114, F03008, 2009.

E. Bueler, J. Brown, and C. Lingle, *Exact solutions to the thermocoupled shallow ice approximation: effective tools for verification*, Journal of Glaciology. 53(182), 499-516, 2007.

E. Bueler, C. S. Lingle, J. Brown. *Fast computation of a viscoelastic deformable earth model for ice flow simulations*, Annals of Glaciology. 46, 97-106, 2007.

E. Bueler, C. S. Lingle, J. A. Kallen-Brown, D. N. Covey, and L. N. Bowman, *Exact solutions and the verification of numerical models for isothermal ice sheets*, Journal of Glaciology, 51(173), 2005.

Selected conference presentations

Jed Brown, Dave May, and Barry Smith, *Strongly coupled solvers with loosely coupled software*, 7th International Congress on Industrial and Applied Mathematics - ICIAM 2011, Vancouver, Canada, 2011-07-21.

Jed Brown, Iulian Grindeanu, Dmitry Karpeev, Barry F. Smith, and Timothy J. Tautges, *Scalable implicit methods for free surface flows in glaciology*, 7th International Congress on Industrial and Applied Mathematics - ICIAM, Vancouver, Canada, 2011-07-20.

J. Brown, *Implicit solution of free surface flows in glaciology*, SIAM Conference on Computational Science and Engineering, Reno, NV, 2011-03-01.

J. Brown, *Computational methods for several models of ice stream flow*, International Conferenece on the Diversity of Research on Geophysical Environmental Sciences, ETH Zürich, 2011-02-18.

J. Brown, *Solving free surface flows for steady state without time stepping*, American Geophysical University Fall Meeting, 2010-12-14.

J. Brown, *Implicit discretizations for grounding line dynamics*, CCSM Annual Meeting, Breckenridge, CO, 2010-06-30.

J. Brown, *PETSc: new developments, memory performance, and algorithmic experimentation*, NOTUR, Bergen, Norway, 2010-05-21.

J. Brown, *Implicit integration of 3D ice sheet flow using hybrid factorization/relaxation block preconditioning*, invited, Copper Mountain Conference on Iterative Methods, CO, 2010-04-08.

Software

Principal author of the Parallel Ice Sheet Model (PISM) 2004–2007, `http://pism-docs.org`.

Developer of the PETSc solvers package since 2008, `http://mcs.anl.gov/petsc`.

Author of the Dohp finite element library, `https://github.com/jedbrown/dohp`.

Other

Tutorials

J. Brown, *PETSc* tutorial at the 2011 ACTS workshop, NERSC, Berkeley, CA, 2011-08-17.

J. Brown, *PETSc*, 3-day tutorial at the Arctic Region Supercomputing Center, Fairbanks, AK, 2010-08-03 to 05.

J. Brown, *PETSc*, 2-day tutorial at the Swiss National Supercomputing Center, Manno, Switzerland, 2010-05-10 to 11.

J. Brown, *Scalable solvers for nonlinear equations: mini-course on Newton-Krylov methods*, 3-week mini-course at the University of Alaska Fairbanks, 2009-01-22 to 02-05, `59A2.org/newton-krylov`.

Last updated: 2011-09-15