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NEWS RELEASE

Contact: Jim Ormond
212-626-0505
ormond@hq.acm.org

Trailblazing Approach to Modeling Earth's Geological Processes Wins Gordon Bell Prize

Team Employs a Number of New Advances to Make Extreme Scalability Possible

Austin, Texas, November 20, 2015 – ACM, the world's leading professional computing society (www.acm.org), announced at SC15 that a 10-member team led by Johann Rudi of the University of Texas at Austin are the recipients of the 2015 ACM Gordon Bell Prize for their entry entitled *An Extreme-Scale Implicit Solver for Complex PDEs: Highly Heterogeneous Flow in Earth's Mantle.* The winning team includes representatives from the University of Texas at Austin, IBM Corporation, California Institute of Technology and the Courant Institute of Mathematical Sciences at New York University. The ACM Gordon Bell Prize (awards.acm.org/bell) tracks the progress of parallel computing and rewards innovation in applying high performance computing to challenges in science, engineering, and large-scale data analytics. The award was bestowed during SC15 (sc15.supercomputing.org/) in Austin, Texas.

The group's submission demonstrates that, contrary to conventional wisdom, implicit solvers can be designed that enable efficient global convection modeling of the earth's interior, allowing researchers to gain new insights into the geological evolution of the planet.

The team presented a solver which can process difficult partial differential equations (PDEs) at an extreme scale to predict activity in the earth's mantle and that scales up to half a million cores. By effectively modeling these processes, scientists can better understand the dynamics that produce earthquakes and related natural disasters. Mantle convection is just one application in the physical sciences wherein processing difficult PDEs at an extreme scale would be useful.

Team members include Costas Bekas (IBM), Alessandro Curioni (IBM), Omar Ghattas (University of Texas at Austin), Michael Gurnis (California Institute of Technology), Yves Ineichen (IBM), Tobin Isaac

(University of Texas at Austin), Cristiano Malossi (IBM), Johann Rudi (University of Texas at Austin), Georg Stadler (Courant Institute of Mathematical Sciences), and Peter W.J. Staar (IBM).

Innovations from advanced scientific computing have far-reaching impact in many areas of science and society, from accurately predicting storms and other weather phenomena, to economic forecasts and developing new pharmaceuticals. The annual SC conference brings together scientists, engineers and researchers from around the world for an outstanding week of technical papers, timely research posters, tutorials and Birds-of-a-Feather (BOF) sessions.

About ACM

ACM, the Association for Computing Machinery (www.acm.org) is the world's largest educational and scientific computing society, uniting computing educators, researchers and professionals to inspire dialogue, share resources and address the field's challenges. ACM strengthens the computing profession's collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the professional growth of its members by providing opportunities for life-long learning, career development, and professional networking.

About the ACM Gordon Bell Prize

The ACM Gordon Bell Prize (awards.acm.org/bell) is awarded each year to recognize outstanding achievement in high-performance computing. The purpose of this recognition is to track the progress over time of parallel computing, with particular emphasis on rewarding innovation in applying high-performance computing to applications in science, engineering, and large-scale data analytics. The prize is awarded for peak performance as well as special achievements in scalability and time-to-solution on important science and engineering problems. Financial support for the $10,000 award is provided by Gordon Bell, a pioneer in high-performance and parallel computing.

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