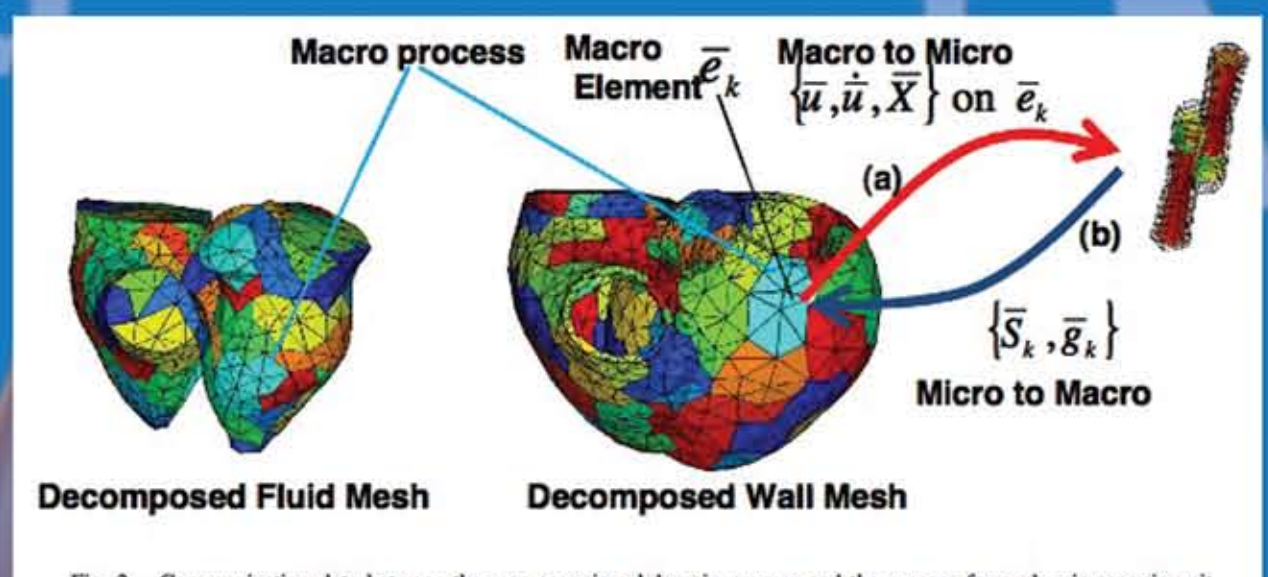
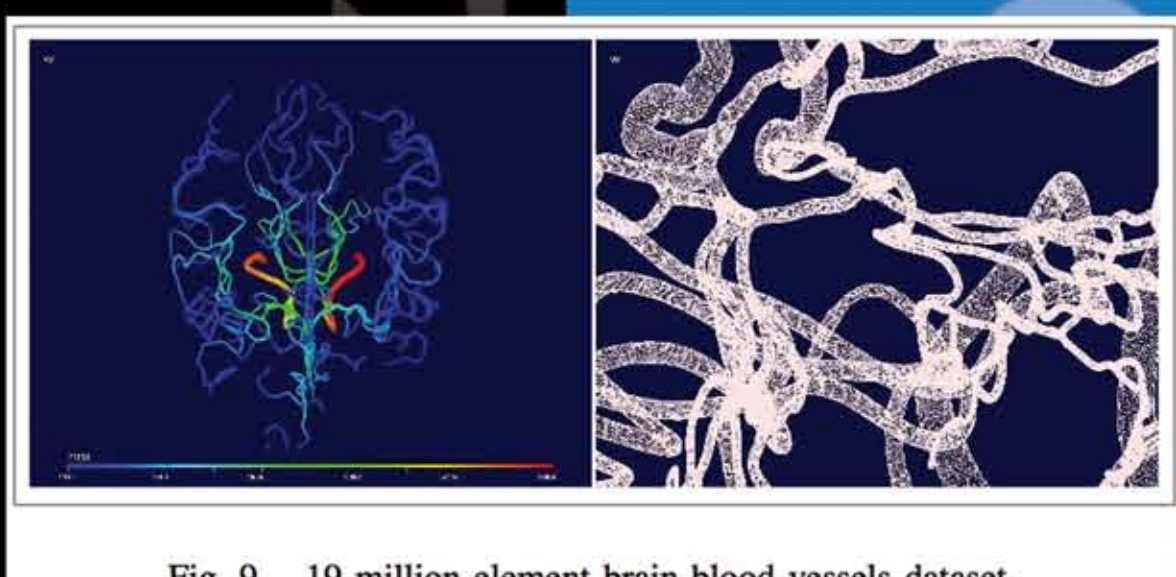
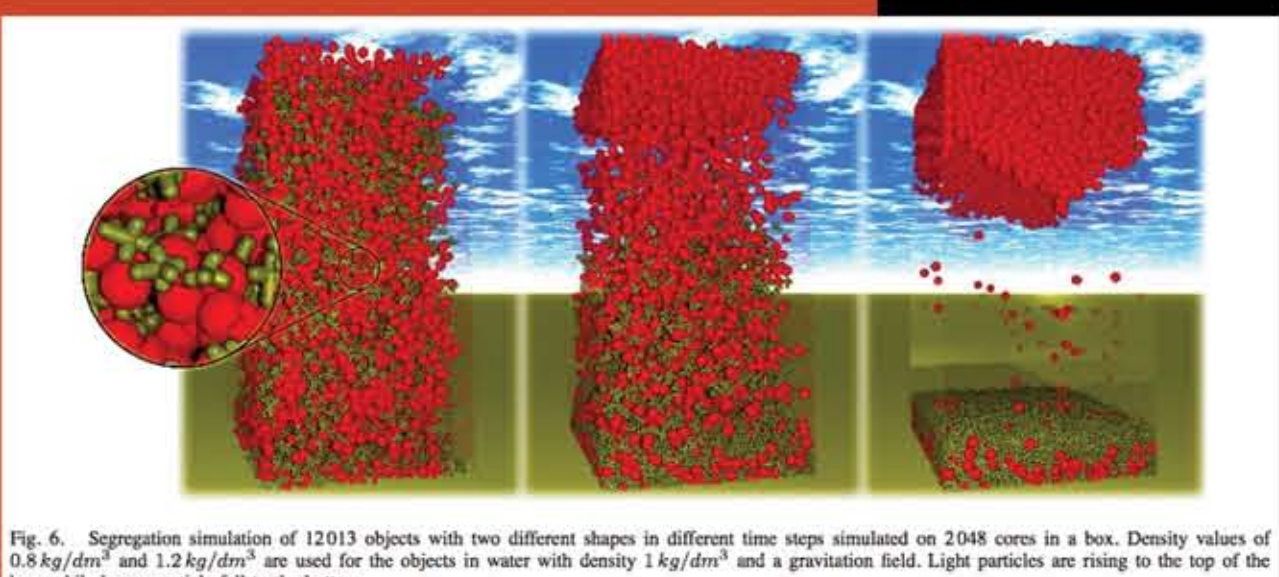
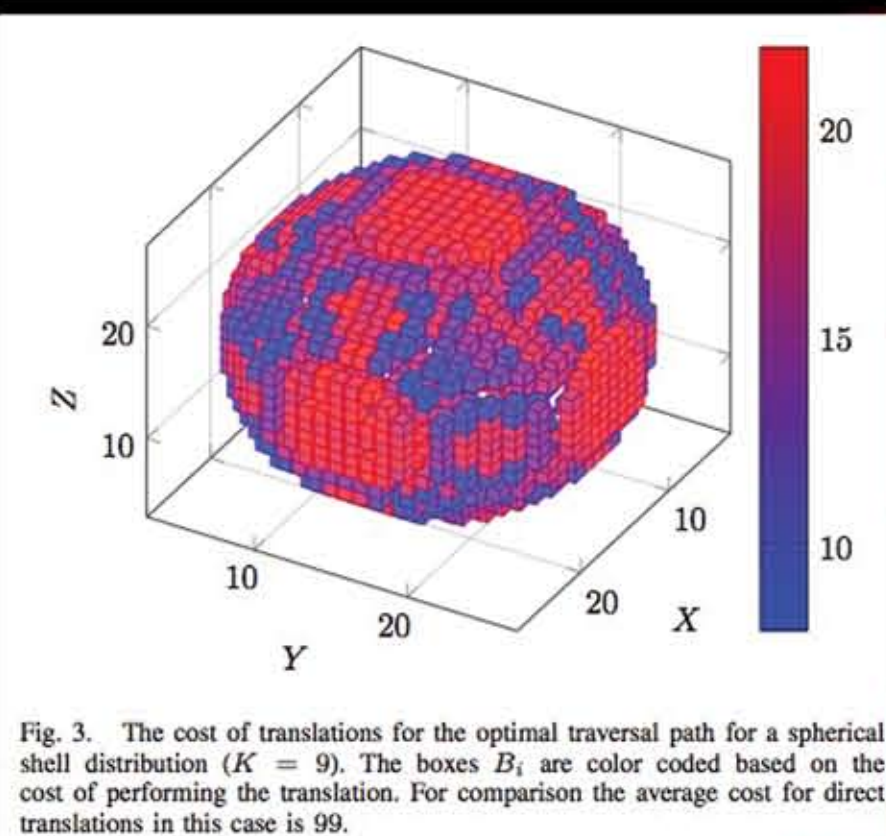
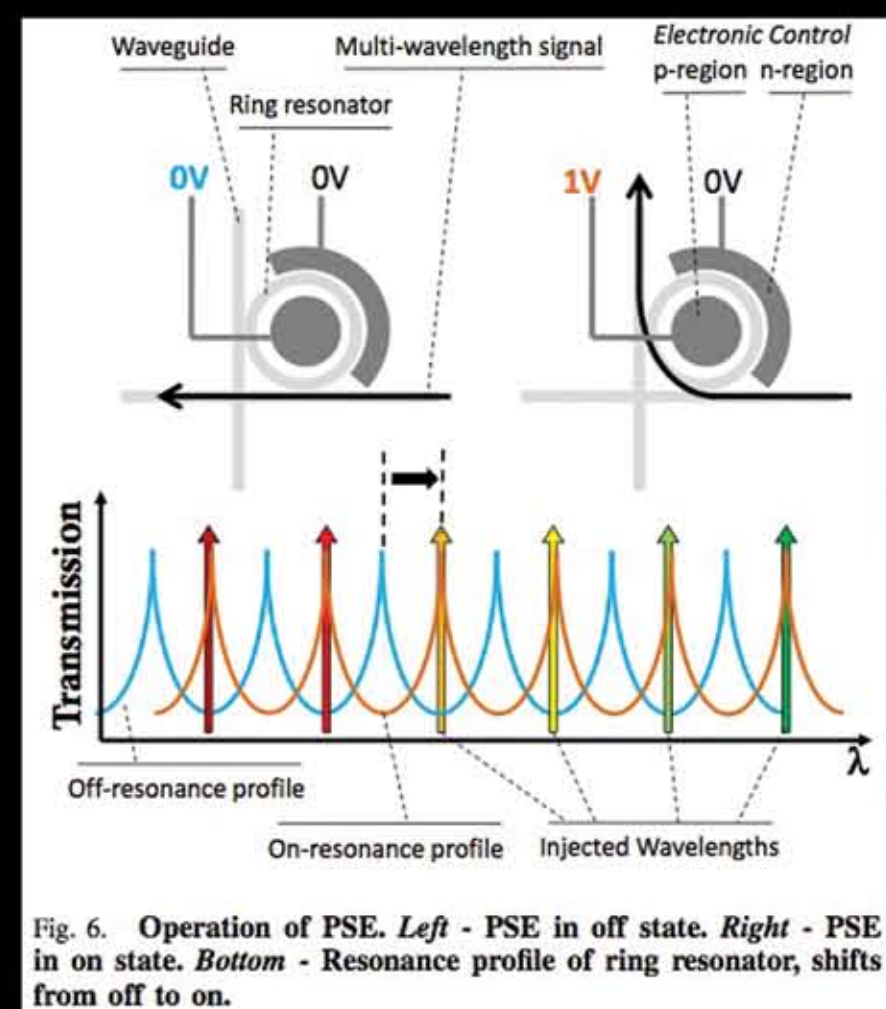
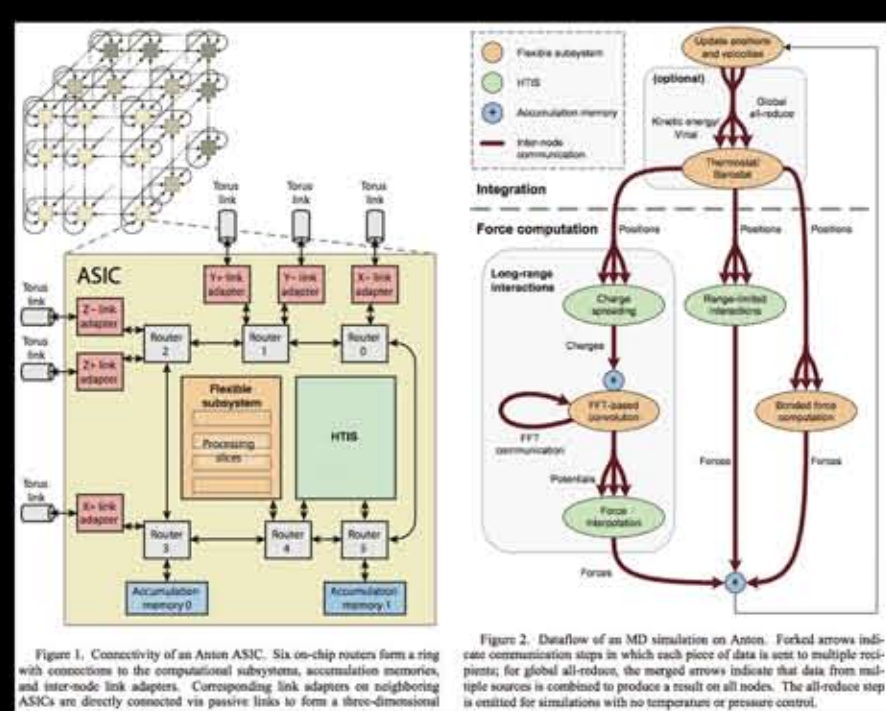


The Future of Discovery

2010

2010 Chair
Barry Hess
New Orleans, LA



2010

Notable Systems first mentioned this year in the proceedings:

- Cray XT5
- Jaguar
- T2K Open Supercomputer (Tokyo)
- Roadrunner
- NCSA Lincoln GPU cluster
- Amazon EC2
- Ranger

Application/Problem Studies:

- Communication optimization in asymmetric interconnects
- Optical memory access networks
- Heart simulation
- High resolution weather prediction
- Molecular Dynamics Discrete Particle Simulation
- Effects of System Noise on Application

Noteworthy Architecture Topics:

- All-to-All Communications
- Evaluating networks
- Multi-domain dynamic power and clock frequency management for chip MPUs
- GPU acceleration of memory-intensive application
- Adding new levels/devices to memory hierarchies
- GPGPUs and expanded programming models for them
- Formal verification of MPI programs

Other Topics:

- Scalable checkpointing

Fig. 6. Segregation simulation of 12013 objects with two different shapes in different time steps simulated on 2048 cores in a box. Density values of 0.8 kg/dm³ and 1.2 kg/dm³ are used for the objects in water with density 1 kg/dm³ and a gravitation field. Light particles are rising to the top of the box, while heavy particles fall to the bottom.

Fig. 9. 19 million element brain blood vessels dataset.

Fig. 2. Communication data between the macroscopic subdomain process and the process for each microscopic unit.