

Black Hole Astrophysics

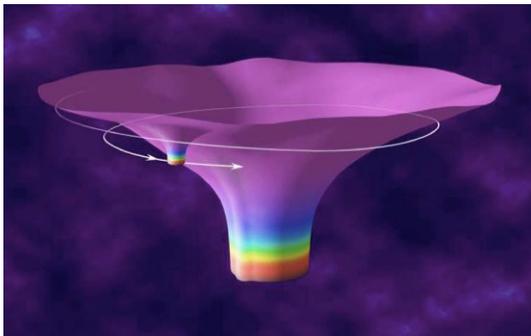
- Gravitational Wave Emission from Black Hole Binaries

- <http://gravity.phy.umassd.edu/>
- Numerical modeling of the process of capture of a solar mass star by a supermassive black hole (relevant to the worldwide network of gravitational wave detectors).

- GPUs are attractive ..

- Numerical hyperbolic PDE solver
- Massive finegrain parallelism
- Some parts compute intensive
- Others bandwidth intensive
- Both accelerated well by GPUs
- OpenCL & CUDA implementation

- Capture of star by super massive black hole (NASA)



- Performance results

- Over ***order-of-magnitude performance gains*** over multi-core CPUs
- Khanna et. al, *Computer Physics Communications*, 181, 1605 (2010)