10:00am - Advanced Computing & Nuclear Astrophysics  
   Frank Timmes

10:15am - Core Collapse Supernovae  
   Christian Cardall

10:30am - Thermonuclear driven events  
   Mike Zingale

10:45am - Nucleosynthesis  
   Raph Hix

11:00am - 1 slide, 1 minute presentations : Everyone

11:15am - Merge with Astro & Nuclear Theory Working Group

11:20am - Discussion : Everyone
We are interested in the intersection of the foregoing topics (and many others!) with the entire computing and networking ecosystem:

- High-Performance Computing
- High-Throughput Computing
- High-Memory Computing
- Next Generation Internet Capabilities
- Big Data Initiatives
- Hadoop Map-Reduce Computing
- Social Computing
to help our community address the questions

1. What will advanced computing and networking be able to do for nuclear astrophysics in the coming decade?

2. What do we need to do to maximize the impact of new capabilities on nuclear astrophysics?

We invite you to put on your blue-sky, no limits, visionary hats. We need your leadership!
Multi-dimensional codes of all kinds are a traditional application.

1D radiation transport codes can be another.

Large systems of linear equations, matrix algebra, can be another.

Others?

Raskin et al 2011
High-Throughput Computing

Large surveys with 1D codes:
mass-metallicity grids with stellar evolution codes.
Monte Carlo stellar evolution with Monte Carlo reaction rates.
Post-processing trajectories with reaction networks.

Others?

![Diagram showing variation factor for $^{22}\text{Ne}(\alpha,\gamma)^{26}\text{Mg}$]
High-Memory Computing

Analysis of large observational surveys. Deep tabulations of thousands of reaction rates. 2D models with 100’s of isotopes in reaction network.

Others?
100 Gb/s Ethernet will be transformational across all fields.
The phrase "Big Data" refers to large, diverse, complex, longitudinal, and/or distributed data sets generated from instruments, sensors, computational models, video, audio and/or all other digital sources.

Big Data aims to advance scientific and technological means of managing, analyzing, visualizing, and extracting useful information from large, diverse, distributed and heterogeneous data sets.

Near Field Cosmology - Correlating Monte Carlo surveys of reaction rates and Monte Carlo stellar evolution model grids with the forthcoming massive data sets from the, say, GAIA mission.

Others?
Hadoop and Friends Map-Reduce Computing

MapReduce is to jobs as MPI is to tasks.

Verification of multi-D code output.

Querying data bases from massive post-processing databases such as NuGrid.

Others?
Social Computing

SETI@home - mothership of social computing, astrobiology

Einstein@home - LIGO gravitational wave search

How does nuclear astrophysics play?