

Microphysics in Computational Relativistic Astrophysics: MICRA2009

Monday 24 August 2009 - Friday 28 August 2009

Niels Bohr International Academy

Scientific Programme and Rationale

The workshop will consist of a mixture of scheduled talks sessions, group discussion sessions, and free time for interaction, collaboration and individual work. All participants will have a desk and internet access. The talks and discussion sessions will be arranged with "focus sessions" around particular topics (e.g., equation of state, neutrino interactions, radiation transport, etc.).

The number of talks per day will be limited to approximately 2 long (30 min net talk time) overviews plus a limited number of shorter (15 min net talk time) contributions.

The focus of the workshop is on finding ways to bring more modern and more realistic physics to simulations of relativistic astrophysical systems. Its intention is to further scientific progress in the whole community and its emphasis will be on identifying problems and finding ways to their solution.

Key topics include, but are not limited to:

Numerical modeling of relativistic astrophysical systems: key paradigms, future directions

Numerical relativity in non-vacuum spacetimes with and without black holes.

General relativistic MHD.

Neutrino/Photon transport and Interactions: Basics and Efficient Approximations

The equation of state (EOS) of matter at finite temperature and high density. Efficient general EOS implementations applicable to systems with large density/temperature contrasts.

Thermonuclear Processes: rates, reaction networks, efficient implementations.

Treating turbulence, magnetic fields, and microscopic magnetic processes in compact stars and accretion disks