Frontiers in Computational Astrophysics: Particles and Flames in Radiative and Magnetic Flows

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Computational astrophysics has rapidly evolved in recent years. Multi-scale, multi-physics simulations of entire stars, planets, galaxies come within reach today. While promising new and decisive insights, this progress also challenges the computational astrophysics community. The workshop wants to support this development by bringing together researchers from different fields within and outside astrophysics. The goal of the workshop is to discuss computational approaches and strategies to efficiently tackle the above challenges in the age of massive parallelism.

Topics Covered

Astrophysics

interstellar medium turbulence and star formation, multi-dimensional stellar structure models, atmospheres of stars and planets, accretion flows, type Ia supernovae and novae.

Physical Processes

turbulence, combustion and explosive physics, particle acceleration and propagation, interplay between hydrodynamical and kinetic models in high energy objects, dynamos and magnetism, radiative transfer.

Computational Methods

multi-scale algorithms, efficient solvers of large linear systems, stiff equations, adaptive meshes, interface tracking, subgrid-scale modeling, massive parallelism and GPUs, visualization and data-analysis.

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