Politecnico di Torino | DiSAT | DISAT Dipartimento Scienza Applicata e Tecnologia

Seminar Announcement

June 4th, 2026, Aula Denina, ore 12.00

Exascale computing to accelerate discoveries in astrophysics and space plasma physics

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Abstract. From early particle calculations to today's models, numerical simulations have reshaped the way physicists investigate the Universe. This overview examines how the next generation of high-performance computing systems - characterized by unprecedented scale and substantial technical complexity - will create opportunities for astronomical discovery, from plasma physics to cosmological structure formation.

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Andrea Mignone is a **Full Professor in the Department of Physics at the University of Turin** and a computational astrophysicist specializing in **plasma physics, relativistic magnetohydrodynamics, and high-performance numerical simulations of astrophysical flows**. His key research areas include **relativistic jets, accretion disks, magnetic reconnection, plasma instabilities, and particle-fluid hybrid models**, with applications to **AGN jets, pulsar wind nebulae, protoplanetary disks, and stellar outflows**.

Prof. Mignone has coordinated and led several national and international projects in computational astrophysics and exascale computing. These include the **EUROHPC project SPACE** and **PRIN MIUR projects** focused on high-energy astrophysical plasmas. He also serves as the **scientific coordinator for the University of Turin** within the **National Centre for HPC, Big Data and Quantum Computing under the PNRR**.