

Curriculum Vitae

Marco Merafina

- Born in Rome (Italy) on May 29, 1959
- Graduated in Physics at University of Rome "La Sapienza" on January 30, 1986
- Researcher at Physics Department - University of Rome "La Sapienza" since 1992
- Member of the Executive Committee of Physics Department 1995-1999
- Member of Academic Board of University of Rome "La Sapienza" for *macroarea I* (Mathematics, Physics, Chemistry, Geology and Information Science) 2006-2009
- Member of Administration Board of University of Rome "La Sapienza" 2002-2006, 2009-

Scientific activity

- Author of more than 40 international publications
- Referee for The Astrophysical Journal and for the Kluwer Academic Publishers (Astrophysics and Space Science)

Research Topics

I. Equilibrium and dynamical stability of selfgravitating systems

Study of compact objects like relativistic stellar clusters, as possible progenitors of supermassive black holes observed at the inner regions of active galactic nuclei. Study of the equilibrium configurations and analysis of dynamical and thermodynamical stability for models of stellar clusters with anisotropy in velocity distribution of stars.

II. Galactic halos and dark matter

Study of semidegenerate particles systems (Fermions) in gravitational equilibrium as a possible description for galactic halos, considerable in cosmological problem of dark matter. Generalization to semidegenerate distributions with cutoff energy in phase space in presence of visible mass. Study of selfgravitating equilibrium configurations in presence of anisotropy in velocity distribution of particles. Research development on the effects of the presence of dark energy on large scale selfgravitating structures.

III. Thermodynamic treatment of astrophysical systems

Study of thermodynamical instabilities connected to the evolution of selfgravitating systems strongly influenced by relaxation processes like globular clusters. Development of a model

describing the evolution of a globular cluster to the onset of gravothermal catastrophe, starting from a new statistical approach which defines a different formalism of the various thermodynamical ensembles, out of the framework of Boltzmannian theory, by using techniques based on effective potentials applied to distribution function.

Main International Meetings

- Marcel Grossmann Meeting on General Relativity (Roma 1985, Perth 1988, Kyoto 1991, Stanford 1994, Jerusalem 1997, Rio de Janeiro 2003, Paris 2009, Stockholm 2012)
- International Symposium on Cosmology and Relativistic Astrophysics, Tartu (Estonia) 1988
- Workshop on Dynamics of Globular Clusters, Berkeley (USA) 1992
- XI S.Cruz Summer Workshop on Globular Clusters, S.Cruz (USA) 1992
- Workshop “The Universe of Gamow: Original Ideas in Astrophysics and Cosmology”, Invited Talk, Odessa (Ucraina) 1999
- Workshop “4-th Gamow International Conference”, Invited Talk, Odessa (Ucraina) 2009
- Workshop “The astrophysics with the ongoing and future experiment: space-based experiments, ground-based experiments”, Invited Talk, Palermo 2013

Teaching Activity at Physics Department – University of Rome "La Sapienza"

- Laboratory of Physics (CL Chemistry) 1999-2004
- Laboratory of Mechanics 2002-2007 (CL Physics) 2002-2007
- Laboratory of Advanced Calculus (CL Astronomy and Astrophysics) 2007-2009
- Selfgravitating Systems (CL Astronomy and Astrophysics) 2005-
- Dynamics of Stellar Systems (CL Astronomy and Astrophysics) 2005-2006, 2011-