

Curriculum Vitae

-short version-

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” 1992-
- Member of the Executive Committee of Physics Department 1995-1999
- Member of Academic Board of University of Rome “La Sapienza” for *macroarea 1* (Mathematics, Physics, Chemistry, Geology and Information Science) 2006-2009
- Member of Administration Board of University of Rome “La Sapienza” 2002-2006, 2009-2013-
- Member of Board of Faculty of PhD in Astronomia e Astrofisica (University of Rome “La Sapienza”) 2006-2013
- Member of Board of Faculty of the International PhD in Astronomy, Astrophysics and Space Science; PhD supervisor and tutoring 2011-
- Member of Direction Board of AURIS (Associazione Università, Ricerca, Innovazione e Società 2007-
- Frascati National Laboratories -INFN- associate 2015-

Scientific activity

- Author of more than 40 international publications
- Referee for the journals: ApJ, MNRAS, A&A, ApSS
- Member of Board of Referees of the Journal "Scienze e Ricerche" 2015-

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, Rome 2015 -chair-)
- 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
- Workshop “The Unquiet Universe”, chair, Cefalù 2014
- Conference “Modelling and Observing Dense Stellar System (MODEST 15-S)”, Kobe (Japan) 2015
- Conference “COSMIC-LAB: Star Clusters as Cosmic Laboratories for Astrophysics, Dynamics and Fundamental Physics (MODEST 16)”, Bologna 2016
- Workshop “Frontier Research in Astrophysics - II”, invited talk, Mondello 2016
- Workshop “Stellar aggregates over mass and spatial scales”, Bad Honnef (Germany) 2016

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-