

Workshop CIAS Meudon 2011

A Turning Point in the Research of Dark Matter

WARM DARK MATTER IN THE GALAXIES: THEORETICAL AND OBSERVATIONAL PROGRESSES

PURPOSE AND TOPICS

Recently, LambdaWDM (Warm Dark Matter) emerged impressively over LambdaCDM (Cold Dark Matter) whose small -galactic- scale (and even larger scale) problems are ever-increasing. LambdaWDM solves naturally the problems of LambdaCDM and agree with the observations at small as well as large and cosmological scales.

1: Conceptual context: Dark Matter in cosmology and astrophysics: perspective and prospective of the research in the subject: Theory and observations. The emergence of Warm (keV scale) Dark Matter from theory and observations.

2: Astronomical observations linked to the galaxy structural properties and especially to the universal and non universal properties of galaxies: high quality rotation curves, kinematics, density profiles, gravitational lensing, small and large structures.

3: Numerical simulations with Warm Dark Matter, large structures, structures and substructures. Special attention will be paid to the astrophysical understanding of the dark matter problems, the use of analytic and numerical methods which determine the properties, the distribution and the nature of Warm Dark Matter.

TOPICS

- Kinetic theory and the recent progress in solving the Boltzmann-Vlasov equation to obtain the observed universal properties of galaxies. N-body numerical simulations with Warm dark Matter.
- The dark matter surface density in galaxies.
- The phase-space density of dark matter.
- Particle model independent analysis of astrophysical dark matter.
- The impact of the mass of the dark matter particle on the small scale structure formation and the choice of the initial conditions.
- The radial profiles and the Dark Matter distribution. Cores versus Cusps.
- The ever increasing problems of LambdaCDM. The keV scale Dark Matter (Warm Dark Matter): Observational and theoretical progresses.
- Large and small scale structure formation in agreement with observations at large scales and small (galactic) scales.
- The new serious dark matter candidate: Sterile neutrinos at the keV scale.

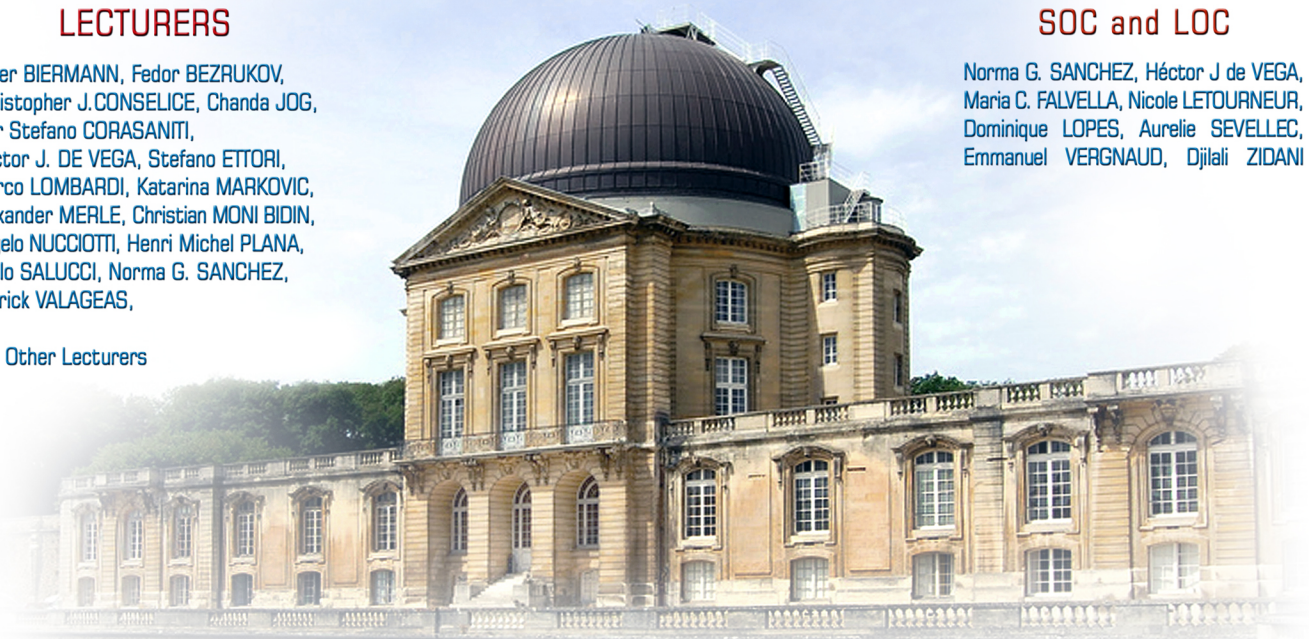
LECTURERS

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Paolo SALUCCI, Norma G. SANCHEZ,
Patrick VALAGEAS,

and Other Lecturers

SOC and LOC

Norma G. SANCHEZ, Héctor J de VEGA,
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Dominique LOPES, Aurelie SEVELLEC,
Emmanuel VERGNAUD, Djilali ZIDANI



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Château de Meudon, CIAS Observatoire de Paris, Meudon campus

