



Contribution ID: 604

Type: **Plenary talk**

Unleashing the scientific potential of LISA

LISA is considered by a growing part of the relevant scientific community to be one of the most exciting and impacting observatories from space in the next 30 years. The scientific case it carries with it is enormous, ranging from the supermassive black holes to the Galactic binaries' astrophysics via cosmology and fundamental physics. Not to mention its invaluable discovery potential. Added to this, is the complexity of the almost unprecedented technological challenge. To fulfill its promises, the observatory will have to measure to picometer level the distance between free-falling test masses (TMs) on a baseline of 2.5 million kilometers, by using laser interferometry. Furthermore, it must be able to maintain TMs as inertial references at the sub-femto-g level in terms of the relative acceleration between them. Those performances will depend on the design of the Optical Metrology System (OMS) and Gravity Reference System (GRS), this last one being for a large part a legacy of LISA Pathfinder (LPF), but also on a complex interaction between the LISA subsystems and the entire satellite surrounding them, and on crucial in-orbit operations, calibrations, and instrument noise characterizations, some of them only possible downstream of the Time Delay Interferometry observable calculations. In this talk, we will describe the LISA mission, its design and performances, and the critical in-orbit operations needed to achieve them. We will also give an update of the project status and what's ahead of us in the next few years.

Presenter: VETRUGNO, Daniele

Session Classification: Friday plenary session