

AIDAA Educational Series and Academy Space Instrumentation: challenges, legacies and innovations

31st October 2024

Space instrumentation encounters challenges due to the hostile space environment, resource constraints, communication delays, and the demand for precision. Navigating extreme temperatures, radiation, and vacuum conditions necessitates robust designs. Additionally, stringent limitations on power, weight, and budget pose further hurdles, demanding optimal instrument performance within constrained parameters. Moreover, technological aspects and the need for precision and accuracy in measurements present ongoing challenges. Miniaturization enables the development of small, yet powerful instruments, while advanced imaging technologies enhance the resolution of captured data. For example, the development of the MarsTEM temperature sensor for Mars, the JANUS COVer Mechanism (COM) for JUICE mission and the new VENOM astrobiology experiment will be described and challenges presented.

Learning objectives: designing a space instrument: functionality, efficiency, testing and normative aspects.

Target audience: doctoral students, non-academic professionals, and undergraduate students.

Dates and time: 31 October – from 10:30 to 12:30

Speaker

Giacomo Colombatti - Ph.D., CISAS G. Colombo, University of Padova - is an expert in space sensor development (from designing to realization to testing) and in planetary atmospheric data analysis. He was the Lead CoI for the MarsTem temperature sensor for the Exomars2016 mission and was involved in testing campaigns conducted in a Mars-like environment, both in a laboratory (Aarhus wind tunnel facility) and on-site (Ibn Battuta Space Center in the Moroccan desert).

He works on data analysis for planetary probe trajectory reconstruction using different techniques; he is also an expert in space tether modeling and in the analysis of the dynamics of the system (particularly on two EU projects: Bets and ETPack, still undergoing).

He also studies the dynamics of lighter-than-air vehicles, both for earth and space applications. He is involved in developing control algorithms and techniques for different types of airships. He is also interested in probes' dynamics in the framework of SLAM (Simultaneous Localisation and Mapping) research.

Recently he is involved in several projects aiming at earth environment analysis using UAV (quad and esacopters) for the analysis of pollution due to different sources (artificial light, air, and soil pollution).

Course platform: Webex, a link will be sent via email as the registration is complete.

