



UNIVERSITÀ  
DI TRENTO

Dipartimento di  
Fisica



# PhD Program in Space Science and Technology - SST

## Overview of Earth Gravity Missions: GOCE and MAGIC/NGGM

### Specific Seminar – Curriculum 8

June 8, 2026, 3:00 p.m.

#### Speaker:

Dr. Luca Massotti – European Space Agency & Politecnico di Torino

#### Abstract:

This seminar will give an overview on **space mission design** devoted to **Earth Observation gravity missions**, spanning from the **fundamental scientific observables** to the **challenges of the drag compensation and AOCS design**. This talk will emphasize the technology design of the instruments, optimized for the Earth gravity field measurement, and on general qualification aspects, till missions' architecture and implementation. Topics addressed:

1. Objectives and criticalities; 2. Observables and related science products; 3. Brief overview of the gravity missions (EU and US missions); 4. Measurement principles; 5. The GOCE mission: a close look at the satellite, mission profile and achievements; 6. NGGM: mission and satellite design, mission profile, technology status and the MAGIC international cooperation scenario.

The seminar will end with the latest updates on the NGGM project implementation.

#### Short Bio:

Luca Massotti graduated in Aerospace Engineering from the Politecnico di Torino (IT), and in 2004 received his Ph.D. in Aerospace Engineering from the Aeronautical and Space Department of the Politecnico di Torino. He was visiting researcher at West Virginia University (WVU, US) to study aircraft modelling and Neural Network controllers.

He joined Thales Alenia Space in Turin (IT) as an engineering consultant for metrology and AOCS. From 2005 to 2007 he was a Post Doctoral Researcher at the Earth Observation Programmes Department of ESA at ESTEC facility (NL), later consultant and then ESA staff at the Future Missions & Instruments division. He has been working on European projects of Earth Explorers satellites (in particular on Biomass, EE7, and FLEX, EE8), GEO High Resolution and GOCE follow-on missions. L. Massotti became acquainted with Embedded Model Control and laser interferometry since the early post-doc years, during test and calibration of the Nanobalance thrust stand, an interferometry-based instrument for micro-thruster qualification in view of space gravity missions, like the planned European NGGM. NGGM studies and simulation, design, technology tests and qualifications (accelerometer, laser ranging instrument, electric propulsion) have been the core of his activity at the ESTEC Research Centre of the European Space Agency (ESA) since the mission dawn. The current implementation phase takes advantage of his experience as Lead E2E System Performance Engineer. He was also active on pursuing gravity mission synergies with NASA/JPL, USA, and the Zhuhai campus of the SYSU University, Guangdong, China.

Dr. Massotti is adjunct professor at Politecnico di Torino, Member of the AIAA GNC Technical Committee, AIAA Associate Fellow, and lecturer at several universities and research centers

(e.g. Giessen University, FOTEC, SYSU and HUST University (China)). He is author and co-author of more than 100 publications.

#### Online attendance:

Information on remote participation can be requested by sending an e-mail to [dn\\_sst@unitn.it](mailto:dn_sst@unitn.it)

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