



**POLITECNICO**  
MILANO 1863

# Federica Migliaccio – POLIMI



**Academic background:** *M.Sc. in Civil Engineering (Politecnico di Milano, 1986)*  
*Ph.D. in Geodesy and Topography (Politecnico di Milano 1992)*  
**Present position:** *Full Professor of Topography and Cartography (Geomatics)*  
*Politecnico di Milano - Department of Civil and Environmental Engineering (DICA) - Geodesy and Geomatics Section*

**Fields of research:**

- **Satellite Geodesy (gravity field modelling)**
- **Geospatial data analysis, geostatistics**

<b>The Physical Geodesy group at POLIMI</b>	
<i>Federica Migliaccio Mirko Reguzzoni</i>	<i>Satellite physical geodesy: data analysis of satellite missions (GOCE); computation of global gravity models from satellite data; studies of quantum gravimetry missions.</i>
<i>Riccardo Barzaghi</i>	<i>Ground and airborne gravity measurements. Regional gravity models at high resolution. Gravity inversion applications.</i>
<i>Alberta Albertella</i>	<i>Ocean circulation models.</i>



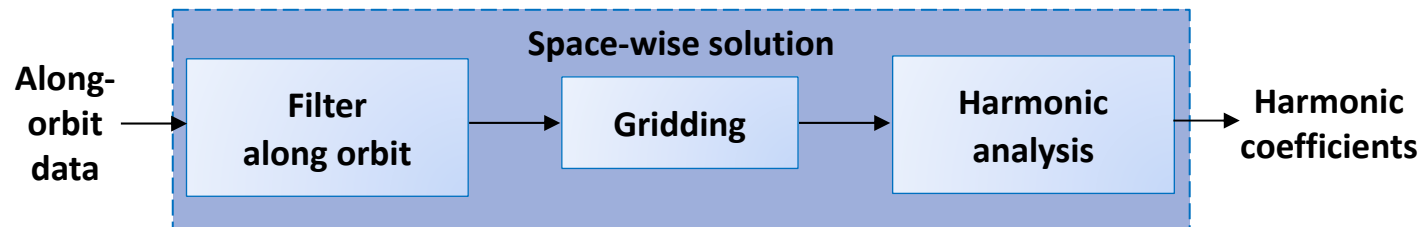
# Research activities in satellite geodesy

## ✓ GOCE mission data analysis (ESA, GOCE HPF)

- Framework: the ESA GOCE EGG-C High-level Processing Facility HPF (2004 – 2020).
- Computation of global gravity models from GOCE data (GOCE\_SPW models) by the «space-wise» approach developed at Politecnico di Milano.
- Computation of gravity gradient grids at satellite altitude and gravity anomaly grids at ground level from GOCE data.

## ✓ Participation to the «Laser Doppler Interferometry» study (ESA – Thales Alenia Space)

- 2004 - 2005: the first study starting a series of activities leading to a «New Generation Gravity Mission» (NGGM) concept.



# Research activities in satellite geodesy: quantum technology

- ✓ **Participation to the «Cold Atom Interferometry» study (ESA – Thales Alenia Space)**
  - 2018 - 2019: study of a mission based on quantum gravimetry.
  
- ✓ **Studies and proposals of quantum gravimetry missions**  
(collaboration POLIMI, UNITS, AtomSensors, Thales Alenia Space)
  - MOCASS (ASI: 2017 – 2018): proposal of a GOCE-like quantum gravimetry mission; payload: Cold Atom Interferometer (CAI) on board a satellite on low Earth orbit; observables: second derivatives of the geo-potential (gradients).
  - MOCAS+ (ASI: 2020 – on-going): proposal of a GRACE-like quantum gravimetry mission; payload: CAI + atomic clock on board two satellites on low Earth orbit; observables: second derivatives of the geo-potential (radial and cross-track direction) + potential differences between the two satellites.