

## TG Quantum Sensors for Geodetical Observation and Relativistic Geodesy Overview

<b>TG Leader</b>	Waldemar Herr
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### TG Activities

- Develop and test transportable optical clocks to an uncertainty of few  $10^{-18}$
- Chronometric levelling with cm resolution using transportable optical clocks
- Improve height networks with this novel method
- Develop and test transportable quantum gravimeter
- Measure gravity with unprecedented uncertainty of few  $\text{nm/s}^2$
- Contribute accurate gravity data to geodetic observation campaigns

### TG Competences/Services

- Schmidt, Lisdat: Transportable optical lattice clocks for chronometric levelling campaigns
- Rasel, Herr: Transportable Quantum Gravimeter for absolute gravity surveys
- Müller, Denker, Timmen, Weigelt: Geoid and height determination; expertise in satellite and terrestrial gravimetry, modelling and analysis of gravity field data, and gravimetric monitoring of mass change processes

### Involved QF Members

Members	Institution	Relevant Expertise
Waldemar Herr, Leader	DLR-SI / LUH	Atom-Chip Based Gravimeters and Inertial Sensors
Ernst Rasel	LUH	Quantum Gravimeters; Atom-Chip Based Gravimeters and Inertial Sensors
Jürgen Müller	LUH	Relativistic Geodesy; LLR Relativity Test; Application of Quantum Gravimetry
Ludger Timmen	LUH	Geodesy with Gravimeters
Christian Lisdat	PTB	Sr Optical Lattice Clock
Piet Schmidt	PTB / LUH	Quantum Logic Spectroscopy of Highly Charged Ions; Transportable $\text{Al}^+$ Uhr
Heiner Denker	LUH	Gravity field modelling, geoid, height systems, chronometric levelling
Matthias Weigelt	LUH	Satellite Gravimetry, Loading, deformation, gravity field, local modeling
Christian Schubert	DLR-SI / LUH	Atom-Chip Based Gravimeters and Inertial Sensors
Nina Heine	LUH	Quantum Gravimetry
Sven Abend	LUH	Atom-chip based interferometry and inertial sensors for navigation
Hendrik Heine	LUH	Atom Chip and Grating MOTs



Marat Musakaev	LUH	
Tobias Leopold	DLR-SI	