TG Tests of Fundamental Physics (Gravity) Overview

TG Leader	Eva Hackmann

TG Activities

- Sophisticated tests of Einsteins's theory of relativity, e.g. possible temporal variation of the gravitational constant, test of the weak and strong equivalence principle, Yukawa-test for the Earth-Moon distance, estimation of metric parameters gamma and alpha
- Measuring gravity at short distances with micro-machined optomechanical force sensors
- Relativistic effects in matter wave interferometers, quantum tests of the equivalence principle, dark energy search in the Einstein Elevator
- Clock tests in gravitational fields

TG Competences/Services

- **….**

Involved QF Members

Members	Institution	Relevant Expertise
Eva Hackmann (leader)	ZARM	Tests of GR and of alternative/modified theories of gravity
Claus Lämmerzahl	ZARM	Quantum Sensors in Free Fall; Relativistic Geodesy; Quantum Objects in Gravity
Florian Seemann	ZARM	Quantum Sensors in Free Fall
Roy Barzel	ZARM	Quantum Objects in Gravity
Jürgen Müller	LUH	Relativistic Geodesy; LLR Relativity Test; Application of Quantum Gravimetry
Liliane Biskupek	LUH	LLR Relativity Test
Ernst Rasel	LUH	Quantum Gravimeters; Atom-Chip Based Gravimeters and Inertial Sensors
Uwe Brand	PTB	Experimental investigation of the Gravitational 1/r2 Law at separations down to sub-µm
Gerhard Heinzel	AEI	Experimental investigation of the Gravitational 1/r2 Law at separations down to sub-µm
Christian Pfeifer	ZARM	General relativity, Quantum Gravity Phenomenology
Sven Herrman	ZARM	microgravity experiments
Christian Vogt	ZARM	microgravity experiments