

Einladung zum Physikalischen Kolloquium

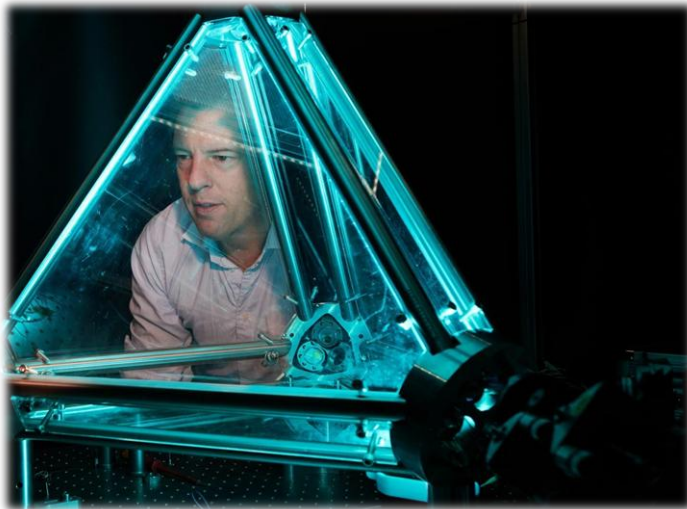
22.05.2026 Simon Stellmer, Universität Bonn

»Ring lasers for rotation sensing in the geosciences«

Einführung: Th. Forbriger

Abstract: Ring laser gyroscopes are highly sensitive inertial optical interferometers, exploiting the Sagnac effect on two counter-propagating laser beams in a ring cavity. Meter-sized and highly stable interferometers have been developed in the past 30 years and reach a resolution of 0.3 prad/s after a few hours of integration time. The rotation of Earth, including its variations, is a commonly available signal used to benchmark the performance of large ring lasers, which succeed to quantify variations in the length-of-day (LoD) and to resolve the precession and nutation of Earth's axis.

Similarly, ring laser gyroscopes can also be employed in the field of seismology to reconstruct rotational motions in seismic wavefields. Building on the technology of optical clocks and gravitational wave detection, new developments are underway to realize so-called passive ring laser gyroscopes. This approach relies on an external laser referenced to the counterpropagating modes of a ring resonator and might allow for miniaturization of sensors with large bandwidth.



In my presentation, I will trace the development of ring interferometers over the past 100 years, and I will highlight future developments specifically in the recently established DFG research unit RING.

A three-dimensional array of ring laser gyroscopes allows to reconstruct the full rotation vector with high resolution.

Der Vortrag findet **am Freitag, den 22. Mai 2026 um 15:45 Uhr im Otto-Lehmann-Hörsaal**, Physik-Flachbau (Geb. 30.22), KIT-Campus Süd statt.