

PHYSICAL COLLOQUIUM
INVITATION

Monday, 31.10.2016, 4.15 p.m., W2-1-148

speaks

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about

**Laser measurement science and an overview of its groundbreaking
applications**

Coherent light enables length measurements of exquisite sensitivity that lie at the core of fascinating observations in fundamental and quantum physics, astrophysics, geodesy and measurement science.

In particular, observations from the Laser Interferometer Gravitational-Wave Observatory (LIGO) over the past year not only confirmed crucial gravitational physics effects, but have now also officially launched the era of Gravitational Wave Astronomy and Multi-Messenger observations. Similar laser-interferometric measurements have been demonstrated and are now flying on LISA Pathfinder, exceeding expectations and paving the way for a spaceborne Gravitational Wave Observatory that will allow us to survey the gravitational universe otherwise inaccessible to us from ground.

Moreover, GRACE follow-on will continue to provide valuable information about fluctuations of the Earth's gravitational field to the geophysical and climatology science community starting early 2018, whose observations will be greatly enhanced by interspacecraft laser gradiometric measurements.

In the area of cavity optomechanics and novel compact and integrated photonics, the combination of low-loss devices and optomechanically coupled coherent light field is enabling us to reach unprecedented measurement accuracies at the quantum sensing limit, which is revolutionizing the state-of-the-art in several areas of measurement science.

I will discuss the advances in coherent light measurements and some of its recent results and upcoming groundbreaking applications to the science community.

All interested persons are cordially invited.

Sgd. Prof. Claus Lämmerzahl