

# Physikalisches Kolloquium Universität Kiel Wintersemester 2018 / 2019

**Dienstag, 27. November 2018**

**Prof. Dr. Andreas Eckart**

I. Physikalisches Institut, University of Cologne  
and  
Max-Planck-Institute for Radio Astronomy, Bonn

## **The central light-year of the Milky Way: How stars and gas live in a relativistic environment of a super-massive black hole**

The central region of our Milky Way is an extremely active region. It is the closest galactic nucleus that is accessible to us allowing us to study it in fine detail. Here we present most recent results obtained with state of the art instruments providing sensitive measurements at their highest angular resolution. The central star cluster harbors a small cusp of high velocity mostly young and dusty stars that are in orbit around the 4 million solar mass super massive black hole (SMBH) Sagittarius A\* (SgrA\*). Molecular and atomic gas is streaming towards this region in the form of a spiral connecting it to the Circum Nuclear Ring. Using the Large Atacama Millimeter Array (ALMA) we investigated the kinematics and composition of this material in detail highlighting signatures of star formation and the interaction with a wind emerging from the direction of SgrA\*. Using results from the Very Large Telescope (VLT) we will highlight the dynamics of the ultra-fast stars and present theories on their origin. We demonstrate that one of the innermost stars shows clear signs of relativistic motion in the deep potential well of the SMBH. The interaction of plasma with SgrA\* reveals that matter is orbiting and is being accreted onto the SMBH to produce powerful flares. These are detectable all across the electromagnetic spectrum and help us to understand the region close to the event horizon of SgrA\* which is currently under investigation using the Event Horizon Telescope (EHT).

Der Vortrag beginnt um **16:15 Uhr** im **Hans-Geiger-Hörsaal (LS13-R.52)**  
des Physikzentrums.

Ab **16:00 Uhr** werden **Kaffee** und **Tee** angeboten.

W.J. Duschl  
für die Dozenten der Physik

Gastgeber: Prof. Duschl