

# PHYSIKALISCHES KOLLOQUIUM

## Wintersemester 2019/2020



FRIEDRICH-SCHILLER-  
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JENA

Ort: Hörsaal 1, Abbeaum, Fröbelstieg 1  
Zeit: 03.02.2020, 16:15 Uhr  
Sprache: Englisch

**Vortragender:** Prof. Dr. Andrea Santangelo (Eberhard Karls Universität Tübingen)

Fundamental physics studies with high energy missions

Spectral, timing, and polarimetric observations at high energies allow us to address scientific questions in fundamental physics. In this seminar I will address three specific topics:

1. Which is the state of baryonic matter at extreme densities, larger than several times the ones in the atomic nuclei, and expected in the cores of neutron stars?
2. How can we constrain the properties of the dark matter particle candidate through high energy observations?
3. Which is the behavior of light in the presence of ultra-strong magnetic fields, almost a billion of times stronger than what achievable on earth (i.e., in magnetars)? The matter inside neutron stars, the extremely magnetized vacuum close to magnetars, the objects in which dark matter clusters, are among the uncharted territories of fundamental physics.

In this talk, after having discussed the science case at the base of these three questions, I will review briefly future missions that could help us to answer those questions, such as the enhanced X-ray Timing and Polarimetry, an innovative space mission that will observationally address those fundamental questions.

