

Fakultät 1  
Institut für Physik

## **Invitation to Physics Colloquium**

Lecturer:

**Dr. Giovanni Mirarchi**  
**University Würzburg**

Topic:

***" Strange-metal behavior of high- $T_c$  superconductors driven by dissipative charge collective modes"***

High-temperature superconducting cuprates, commonly known in the literature as cuprates, represent one of the most intricate and intriguing systems in condensed matter physics. Beyond their remarkable superconducting properties, these systems are characterized by a complex phenomenology which shows considerable deviations from the standard theory of metals and whose comprehensive understanding is still an open problem in condensed matter theory. In this talk, I will analyze some of the most remarkable physical phenomena observed in the so-called strange-metal phase of cuprates, for which there is still no unanimously shared theory that can explain them exhaustively. In particular, I will focus on the famous linear-in-temperature resistivity, as well as the anomalous behavior of specific heat and thermopower]. Within the scenario I'm going to discuss, a central role is played by appropriate short-ranged charge collective modes, recently observed throughout the strange metal phase thanks to RIXS experiments. Under suitable hypotheses regarding the Landau damping to which these collective modes are subject, we will show that they are capable of inducing a strange-metal behavior in the systems in which they are present. A brief discussion about the possible microscopic origin of this anomalous damping is also included.

**Date:** Thursday, 16.01.2025

**Time:** 03:30 p.m.

**Location:** ZHG, room SR1

*Im Auftrag von Prof. Flege - Stefanie Jannasch*

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