



## PHYSIKALISCHES KOLLOQUIUM

*Referentin:*

**Dr. Aline Ramires**

- Max Planck Institute for the Physics of Complex Systems,  
Dresden, Germany  
- International Centre for Theoretical Physics  
South American Institute for Fundamental Research,  
São Paulo, Brazil  
- Instituto de Física Teórica  
Universidade Estadual Paulista, São Paulo, Brazil



*Thema:*

**How unconventional can a superconductor be?**

*Zeit und Ort:*

Dienstag, 19.11.2019, 16:40 Uhr  
Recknagel-Bau, Hörsaal REC/C213, Haeckelstr. 3

*Leiter:*

Prof. Dr. Carsten Timm

*Kurzfassung:*

The superconducting state of electronic matter is one interesting example of macroscopic quantum phenomena and has promising technological applications. Superconductors based on elemental materials and alloys are usually referred to as conventional, following the phenomenology predicted by the standard BCS theory, and associated with the breaking of U(1) gauge symmetry. Many families of superconducting materials were discovered, with most of these being classified as "unconventional superconductors", in which case additional symmetries are broken in the superconducting state. The breaking of point group symmetry, spin rotational symmetry or time-reversal symmetry lead to unique signatures in experiments which gives us hints about the nature of the superconducting state. Simple extensions of BCS theory have given us theoretical guidelines to understand these signatures. Nevertheless, today we find materials that challenge this understanding by displaying signatures which seem contracting. In this colloquium, we come closer to contemporary issues in unconventional superconductivity highlighting complex materials hosting unconventional superconducting states with unexpected phenomenology, and discussing how these can be more robust than their conventional counterparts.

[The colloquium will be followed by a Get-Together with Aline Ramires in room B202 \(~6 pm.\). Female students and staff are invited to talk to her in person and discuss female perspectives on challenges in studies and professional life over drinks and snacks.](#)

*Biographie:*

Bachelor degree in Physics from the Federal University of Sao Carlos (2009), Master's degree from the Fluminense Federal University (2010), and PhD degree from Rutgers University (2015). For three years she was a Junior Fellow at the Institute for Theoretical Studies at ETH-Zurich (2015-2018), and now holds a Distinguished Postdoctoral Fellow position at the Max Planck Institute for the Physics of Complex Systems in Dresden, as well as a Simons-FAPESP junior group leader position at the ICTP-SAIFR in Sao Paulo, Brazil.

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