ICTS | INTERNATIONAL CENTRE for THEORETICAL SCIENCES

TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS Condensed Matter Seminar

Title : Triplet pairing mechanisms from Hund's-Kondo models - applications to heavy fermion superconductors

Speaker : Tamaghna Hazra (Rutgers University)

Date : Tuesday, 06 December 2022

Time : 03:00 pm (IST)

Abstract : The family of heavy fermion materials, with active f-electrons, hosts several candidate-triplet superconductors, with upper critical fields often exceeding the Pauli limit by an order of magnitude. Notably, almost every triplet heavy fermion superconductor shares a common structural motif – two or more f-shell atoms in the primitive unit cell related to each other by inversion, with only two exceptions UAu2 and YbRh2Si2. I will present a triplet pairing mechanism driven by Hund's and Kondo coupling and enabled by this structural motif. In essence, Hund's coupling leads to pre-formed triplet pairs between the electrons trapped inside local moments, which delocalize via Kondo hybridization. This pairing mechanism unifies the triplet superconductivity and the local moment physics in a coherent framework, and we discuss existing experimental support and predictions for future experiments. The near-universal correlation with the structural motif suggests a common origin of heavy fermion triplet superconductivity in Hund's-coupled local moments.

Venue : **Hybrid Mode**

Offline: Madhava Lecture Hall

Online: Please click on the below link to join the meeting

https://icts-res-in.zoom.us/j/84530227460?pwd=Y000U0R5UVpTZUc5Q2d1eDJwcmx2UT09

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Passcode: 060602

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