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TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS Seminar

Title : Topological Photonics: From Exciton-Polariton Devices to On-chip Photonic Terahertz Communications

Speaker : Rimi Banerjee (Nanyang Technological University, Singapore)

Date : Wednesday, 05 November 2025

Time : 3:30 PM (IST)

Abstract : Electrons and photons are fundamental particles driving the information age. Electrons interact strongly and form the basis of computational architectures, but these interactions lead to heating and information loss. Photons, by contrast, interact weakly with their surroundings, making them excellent carriers for communication; however, their weak mutual interactions make it difficult to realize all-optical information-processing elements. Combining these complementary strengths and leveraging the robustness of topological design principles opens new opportunities for next-generation photonic technologies. A promising route toward this goal lies in exciton-polaritons, hybrid light-matter quasiparticles that offer great potential for future optoelectronic devices. Recently, topological concepts have been extended to the terahertz regime, proving beneficial for designing compact terahertz devices for future 6G communication. In this talk, I will present some of my work on topological exciton-polaritons and silicon-based THz photonic platforms, highlighting the role of topology in shaping future photonic devices

Venue : Online

Zoom Link: <https://icts-res-in.zoom.us/j/96365576122?pwd=VEfmOwmGtWlpwsm1YWB0tQPLNjJ8t.1>

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