

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE
2A&B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Seminar Notice

Organized by
Theoretical Physics Department

Title:	Quantum catastrophes
Speaker:	Duncan O'Dell, McMaster University, Canada
Date:	August 9, 2017 (Wednesday)
Time:	4:00 p.m.
Venue:	Theoretical Physics Seminar Room (R/No.-C406), 3rd Floor, Centenary Building, IACS
Abstract:	Catastrophe theory provides a unified description of a broad range of singularities and defects in fields. A key idea is that of scale: at large scales, the singularity appears singular but at smaller scales, it is smoothed, e.g. by wave interference. In 2004 Michael Berry and Mark Dennis suggested that waves might themselves display singularities which are only smoothed by the fundamental discreteness of quantum field excitations (e.g. photons). In this talk, I will give examples of such "quantum catastrophes" appearing in the dynamics of cold atom systems following a quench. Quantum catastrophes resemble classical wave catastrophes at large quantum numbers, but the quantization of excitations leads to an intrinsic granularity. This alters the morphology of the classic catastrophes, particularly the network of dislocations that underlie them. I will emphasize that owing to the structural stability of catastrophes and their scaling properties, quantum catastrophes represent a universal aspect of many-body quantum dynamics.

All are cordially invited to attend the seminar