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

Seminar Notice

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School of Physical Sciences

Title:	**Dynamical localization in one-dimensional polar lattice gases**
Speaker:	**Arya Dhar, Institut für Theoretische Physik, Leibniz Universität, Hannover, Germany.**
Date:	**December 10, 2018 (Monday)**
Time:	**4:15 p.m.**
Venue:	**Physics Seminar Room (C406),3rd Floor, Centenary Building, IACS**
Abstract:	The dynamics of polar lattice gases is radically affected, even at very low fillings and moderate dipole strengths, by the interplay between dipolar interactions, energy conservation, and finite band-width. The initial presence of dynamically-bound nearest-neighbor dimers leads to an anomalously slow dynamics that may reveal the $1/r^3$ dipolar tail at large distances even for relatively weak dipole moments, as those currently available in lanthanides. Moreover, we show that an initial gas formed by single particles (singlons) and dimers results in an intriguing dynamics characterized by Brownian-like dimer motion for weak dipole strengths, and by a surprisingly strong slowing-down of the whole dynamics for larger dipoles that results in an effective quasi-many-body localization. Furthermore, the expansion dynamics of an initially confined polar lattice gas may be dynamically arrested, even in the presence of a large hole dopping. These self-bound quantum droplets of finite density present an intriguing internal dynamics characterized by holon trapping and evaporation, and the establishment of an equilibrium with an external singlon bath.

All are cordially invited to attend the seminar