ICTS | INTERNATIONAL CENTRE for THEORETICAL SCIENCES

TATA INSTITUTE OF FUNDAMENTAL RESEARCH

# ICTS Statistical Physics Journal Club Seminar

Title : The Taylor-von Neumann-Sedov blast-wave solution: comparisons with microscopic simulations of a one dimensional gas.

Speaker : Santhosh Ganapa and Subhadip Chakraborti (ICTS-TIFR)

Date : Thursday, 22nd October 2020

Time : 03:00 pm (IST)

Abstract : We consider the evolution of an initial profile of density, momentum and energy, corresponding to a localized part of a gas in a long tube being at a much higher temperature than the remaining gas, as happens during a blast. For the case with an ideal gas equation of state, we make a detailed comparison of the evolution of the profiles, as given by the hydrodynamic euler equations, with those from microscopic molecular dynamics simulations of the alternate mass hard particle gas. At long times the profiles of the three conserved variables evolve to a self-similar form, with a scaling exponent as predicted by the Taylor-von Neumann-Sedov blast-wave solution. However, we find that the scaling functions are different for the microscopic dynamics and, in particular, do not develop shocks. Attempts to understand this will be discussed.

Online Seminar : Please click on the below link to join the seminar

https://zoom.us/j/99074479657?pwd=RVBNeThremlyK3R2Z3dIS0oxNitLUT09

Meeting ID: 990 7447 9657

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