Departmental Colloquia

Department of Mathematics
香港城市大學
City University of Hong Kong

DEPARTMENT OF MATHEMATICS

City University of Hong Kong

Periodic Solutions of the Compressible Euler Equations and the Nonlinear Theory of Sound

by

Prof. Blake Temple

University of California, Davis, USA

Date: 13 April. 2023 (Thursday)
Time: 4:00 – 5:00 pm
Venue: 1312 (Li Dak Sum Yip Yio Chin Academic Building)

ABSTRACT

We prove the existence of a large class of nonlinear sound waves, by which we mean space and time periodic oscillatory solutions of the 3 X 3 compressible Euler equations, in one space dimension. Being perturbations of solutions of a linear wave equation, these solutions provide a rigorous justification for the centuries old theory of Acoustics. In particular, Riemann's celebrated 1860 proof that compressions always form shocks, holds for isentropic flows, but this existence theory establishes that shock-free periodic solutions containing nontrivial compressions and rarefactions always exist under arbitrarily small perturbation of the entropy profile.

This is joint work with Robin Young.

~ALL ARE WELCOME~