

Department of Mechanical and Biomedical Engineering

Seminar Series

Investigation of nonequilibrium dynamics based on the free vibration of beam

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Date	April 24, 2018 (Tuesday)
Time	11:00am – 11:50am
Venue	Room B4-701, 4/F, Yeung Kin Man Academic Building

Abstract

This talk focuses on the use of the vibration frequency and loss rate of a free-free beam to probe the complicated dynamic properties of the material. It will start with the fundamental theory of viscoelastic beam vibration and then discuss several applications in materials research. We will show that the temperature and time dependence of the vibration frequency, which gives rise to Young's modulus, can be used to parameterize the classical phenomenological model of glass transition, that the loss rate can be used to determine the viscosity or the stretching exponent of stress relaxation in Borosilicate and chalcogenide glasses, and that the anomalous change of Young's modulus in a phase transformation process may indicate the two-step solid-liquid-solid nucleation process.

About the Speaker

Haihui Ruan received his Ph.D. in Mechanical Engineering from the Hong Kong University of Science and Technology in 2004 and is currently an Assistant Professor in the department of mechanical engineering of the HKPolyU. Prior to joining HKPolyU in 2014, he was a visiting assistant professor at HKUST, a research fellow in Hong Kong City University, the University of New South Wales and the Hong Kong Polytechnic University, and an R&D engineer in ASM assembly Automation Ltd. His research interests involve solid mechanics, impact dynamics, constitutive modeling of nano-structured and amorphous materials, and energy-absorption materials and structures.

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All are Welcome!