THE UNIVERSITY OF HONG KONG

DEPARTMENT OF MECHANICAL ENGINEERING

SEMINAR

Online

Title: Phononic Frequency Combs

Speaker: Dr. Adarsh Ganesan
National Institute of Standards and Technology
USA

Date: 28 February, 2022 (Monday)

Time: 4:00 p.m. (Hong Kong Time)

Zoom meeting:

1) Link to join the meeting:

https://hku.zoom.us/j/95144187931?pwd=QkFWanNnZCtOenFjTmlFb0NISmlzZz09

2) Meeting ID: 951 4418 7931

3) Password: 717066

Abstract:
Phononic frequency combs (PFC) are the mechanical analogs of celebrated photonic frequency combs. These represent a newly documented physical phenomenon in the well researched physical domain of mechanical resonators [1]. The emergence of PFC is mediated by nonlinear modal coupling. Through a series of experiments with mechanical devices, various features of PFC have now been identified. These include drive parameters for comb operation, hysteresis for comb spectrum tailoring and growth, saturation and attenuation mechanisms of combs, and nonlinear sensitivity to physical perturbations. My talk will describe the physics of phononic frequency combs and will emphasize how these combs could be foundational to the fields of materials science, molecular science

and quantum information science. In that respect, I will also present our first conceptual demonstrations of material combs, molecular combs and active-cavity optomechanics respectively. The future work will be focused on the fundamental contributions leading to the convergence of phononic frequency combs and these disparate fields.

1. **Ganesan, A., Do, C. and Seshia, A., 2017. Phononic frequency comb via intrinsic three-wave mixing. Physical review letters, 118(3), p.033903.**

Biography:

Adarsh Ganesan is currently a postdoctoral researcher at the US National Institute of Standards and Technology. He holds his Ph.D. in Engineering from Cambridge University and BE (Hons) in Electrical and Electronics Engineering from Birla Institute of Technology and Science, Pilani. Adarsh has been recognized for his doctoral work on phononic frequency combs by the 2017 John Winbolt prize (Cambridge University), 2017 UK doctoral researcher award, 2018 APS GSNP Student Speaker Award, 2018 IET Hudswell International Research Scholarship and 2019 BITS Alumni Association Global 30 Under 30 Award.

ALL INTERESTED ARE WELCOME

For further information, please contact Dr. Y. Chen at 3917 7095.

Research area: Advanced Material