The Department of Civil and Environmental Engineering at the University of Houston presents...

CIVE 6111 Graduate Seminar

Topology in condensed matter and mechanical systems

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Friday, August 30, 2019
2:30pm-3:45pm
Classroom Business Building (CBB) – Room 118

Abstract
The last 15 years have seen an explosion of activity on topological states of matter in condensed matter physics. More recently, analogs of topological matter have been predicted and created in mechanical systems as well. In this talk, I will introduce the idea of topological matter, review the essential physics and present some examples of realizations in mechanical systems such as mass-spring systems and coupled motors. Along the way, the similarity in the mathematics governing the relevant ideas in condensed matter physics and mechanical systems will be highlighted to pave the way for creating more topological states of the latter type.

Bio
Dr. Hosur received his undergraduate degree in Engineering Physics in 2007 at IIT Bombay in India and his Ph.D. in Physics from UC Berkeley in 2012. After spending 4 years as a postdoc in physics at Stanford University, he joined the physics department at UH as an Assistant Professor, which is the position he currently holds.

Dr. Hosur's research interests are in theoretical condensed matter physics and quantum statistical mechanics. Within condensed matter theory, he is currently excited about topological phases of matter, especially gapless ones such as Dirac and Weyl semimetals. Other interest include exploring unusual broken symmetry phases and devising ways to detect them in experiments. Questions in quantum statistical mechanics that he is thinking about, revolve around quantum ergodicity, quantum chaos, and generally, how ideas from classical statistical mechanics apply to quantum systems. These questions have received a surge of interest lately via work on Eigenstate Thermalization and Many-Body Localization, but many aspects remain unclear. His hope is to understand and contribute toward resolving them in the coming years.