TcSUH Special Seminar

Texas Center for Superconductivity at the University of Houston

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The Sonic Crystal and its Novel Effects

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Room 102, University of Houston Science Center
11:00 a.m. – 12:00 noon

Abstract

The sonic crystal, analogous to the photonic crystal, has been studied for over two decades. Some of its important effects, such as band-gap and dispersion relation, have been well established. Very recently, abnormal phenomena, such as negative refraction, enhanced transmission of acoustic waves in sub-wavelength, negative bulk modulus, negative mass density, etc., were found. The much lower velocity of acoustic waves as compared to light makes it easier to directly measure the sonic crystal's amplitude and phase of propagation, providing evidence for establishing the basic effects shared by both photonic and sonic crystals. On the large scale, sonic crystals with complicated artificial structures could be easily introduced not only to give rise to some novel effects for which the physics is unclear in photonic crystals, but also to revolutionize acoustic device applications.

Bio

Prof. Yanfeng Chen is currently the department chair and the endowed Changjiang Professor of the Department of Materials Science at Nanjing University in China. He received his B.S., M.S., and Ph.D. degrees from Northwest Polytech University at Xi'an, China, in 1984, 1987, and 1990, respectively. He was a postdoctoral researcher in the Solid State Microstructure Lab at Nanjing University between 1990 and 1993, and then became a faculty member there, beginning as an associate professor in 1993 and being appointed as a professor in 1997. He has been the chair of the department since 1995. Prof. Chen's research has spanned over very broad areas from the ferroelectric thin films to piezoelectric and acoustic multilayered structures and superlattices, with more than 110 refereed articles in journals such as Phys. Rev. Lett., Appl. Phys. Lett., Nano Letters, etc. He has also delivered a number of invited talks at international and national conferences and has received a number of awards.

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