Acoustic metamaterials, phononic crystals, and applications

Prof. Andrew Norris

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Abstract: The idea of a metamaterial is to somehow defy nature and make physical effects occur that would not be seen otherwise. This talk focuses on acoustic waves, and how by careful design we can make acoustic waves do things that seem unnatural, such as "cloaking" and "negative index of refraction". The talk will combine a basic introduction where there is no need for prior knowledge, with description of recent advances and discussion of future possibilities. One of the goals of the talk is to show how thinking outside the box can be the most important contribution of future engineers.

About the Speaker: Andrew Norris is an internationally recognized expert in modeling of acoustic and elastic wave phenomena. In his 35 year research career he has worked on topics ranging from ultrasonic nondestructive evaluation for detecting cracks, modeling of underground sound for geophysical prospecting, structural acoustics for naval applications, and consulting to industry on acoustics and structural dynamics. He enjoys tackling problems that combine physics, engineering science, applied mathematics and numerical simulation. His current interests are in developing fundamental models for mechanical metamaterials that exhibit extraordinary wave bearing properties. Dr. Norris joined Rutgers University in 1985 after post-doc positions at Northwestern University and at Exxon Research and Engineering Corporate Laboratories, NJ, and is currently Distinguished Professor of Mechanical and Aerospace Engineering in the School of Engineering. He has authored or co-authored more than 160 papers in refereed journals, is editor in chief of the journal Wave Motion, and a member of the board of Editors of several journals including the Journal of the Acoustical Society of America, Mathematics and Mechanics of Solids, and the Journal of Elasticity. In his spare time Dr. Norris enjoys reading, running and roaming.

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