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UNIVERSITY OF MICHIGAN

Short Course on: Ultrafast Spectroscopy of Phonons and Spin Excitations in Solids

TENTATIVE SYLLABUS

1. Introduction: Basic Ideas, Experimental Aspects and Data Analysis
2. Mechanisms of Generation and Detection of Coherent Fields
 - 2.1 Excitation Mediated by Electronic States
 - 2.1.1 Phenomenological Theory: Transparent Media
 - 2.1.2 Microscopic Theory: Two Raman Tensors
 - 2.1.3 Displacive Excitation of Coherent Phonons
 - 2.2 Stimulated Ionic Raman Scattering and Anharmonicity
- 3 Case Studies
 - 3.1 Coherent Phonons, Longitudinal-Optical Modes and Plasmons
 - 3.2 Squeezed Phonons and Magnons
 - 3.3 Two-Dimensional Electron Gas: Charge- and Spin-Density Excitations
- 4 Mechanisms for Generation of Low-Frequency Modes
 - 4.1 Picosecond Ultrasonics (Acoustic Phonons)
 - 4.2 Acoustic Magnons and Electron Paramagnetic Resonance
 - 4.3 Folded Phonons and Cavity Modes in Semiconductor Superlattices

Lecture I	-	14 May 2018, 11:00 am, CFEL, SR I, II
Lecture II	-	17 May 2018, 02:00 pm, CFEL, SR I, II
Lecture III	-	29 May 2018, 02:30 pm, CFEL, SR I, II
Lecture IV	-	31 May 2018, 02:00 pm, CFEL, SR I, II
Lecture V	-	04 June 2018, 11:00 am, CFEL, SR IV
Lecture VI	-	06 June 2018, 11:00 am, CFEL, SR IV

Host: Andrea Cavalleri

