

IQSE AMO QO Seminar Series

Tuesday, April 11th, 11:30 am ZOOM & IQSE
seminar room (MPHY 578)

Pizza will be served for IQSE members at 11:00 am. The talk will start around 11:30 am

Dr. David J. Hilton

(Baylor University)

THz Time-domain Spectroscopy: Unlocking New Materials Physics in Novel Condensed Matter Systems

EVENT DETAILS: Terahertz time-domain spectroscopy is a powerful optical technique that can measure low energy excitations and condensed matter materials on the sub-picosecond time scale. In this talk, I will discuss two recent experiments using terahertz time-domain spectroscopy to demonstrate. In the first part of my talk, I will discuss recent experiments to develop near and middle infrared electronic materials for next generation communications platforms. In current wireless technology, silicon and silicon-germanium are commonly-used semiconductors as emitters in wireless communications. As bandwidth requirements continue to increase from gigahertz into the lower terahertz band, novel electronic materials will be required as next generation materials. Our experiments examine one such material, bismuth doped gallium arsenide, and its suitability for future electronics applications. In the second part of my talk, I will discuss our recent experiments using strain to suppress superconductivity in a simple class of iron-based superconductors. FeSe is the prototype “11” iron-based superconductor with the transition temperature in the bulk of 8 to 10 Kelvin. We demonstrate in strained FeSe samples via growth on a lattice mismatched substrate, the suppression of the superconducting dome with a $T_c < 2$ K. In the final part of my talk, I will discuss our future plans for experiments with this material system to study the ground state in $\text{Fe}_{1-x}\text{Cu}_x\text{Se}$ near its quantum critical point ($x_c = 1.5\%$), which should permit us to dynamically characterize this Quantum phase transition.

ZOOM information:

<https://tamu.zoom.us/j/98156251523?pwd=QVdSdGxtL1UyY0g1L083SU5QR0QrUT09>

Meeting ID: 981 5625 1523

Passcode: 297578

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