

# Condensed Matter Physics Seminar Series

## Pressure-induced phenomena and physics in superconductors with 3d transition metals

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The exploration of emerging phenomena and physics in high-temperature ( $T_c$ ) superconducting materials has been a frontier topic in condensed matter physics. Particularly, the development of various experimental techniques has opened new opportunities to unravel key issues in this field. Given the strong electron correlation and diverse degrees of freedom inherent in high- $T_c$  superconducting materials, the application of pressure consistently unveils new insights. In this talk, I will report novel phenomena observed from our high-pressure investigations on high- $T_c$  superconducting materials. These include bi-critical point between antiferromagnetic and superconducting phases and breakdown of both strange metal and superconducting states at a pressure-induced quantum critical point in FeAs-based superconductors [1,2]; Reemergence of superconductivity and quantum phase transition in FeSe-based superconductors [3,4]; the pressure-induced crossover from two-dimensional to three-dimensional superconducting states and quantum phase transitions [5,6] in bismuth-based cuprate superconductors; and some key issues of the pressure-induced superconductivity in  $\text{La}_3\text{Ni}_2\text{O}_7$  [7,8].

Liling Sun, a condensed matter physicist, specializes in strongly correlated electron systems, with a particular emphasis on elucidating the mechanisms of unconventional superconductivity using high-pressure methods. She served as a full professor at the Institute of Physics, Chinese Academy of Sciences, starting from 2005. In 2024, she joined the Center for High Pressure Science and Technology Advanced Research (HPSTAR). She has published over 180 papers in scientific journals, including Nature, Nature Physics, Nature communications, PNAS, Reports on Progress in Physics, Physics Review Letters and Advanced Materials etc, and delivered over 70 invited talks. Professor Sun is a Fellow of the American Physical Society.

**Tuesday, March 25th at 3:00 PM  
4-330 PAB**