

Exploring Condensed Matter Physics at Extreme Pressure

Prof. Jung-Fu Lin 林俊孚教授

Department of Geological Sciences and Texas Materials Institute

The University of Texas at Austin 德州大學奧斯汀分校

2021/3/11(Thursday), 13:20

SC001, Science Building III

Host : Prof. Jung-Jung Su

Abstract: Materials in our daily lives occur at ambient conditions. However, most materials in the universe exist in extreme pressure up to hundreds of gigapascals via self compression induced by naturally-occurring gravitational force. Physics and chemistry of matter at extreme pressures can be drastically different from those at ambient conditions. In this presentation, I will use three „most abundant elements“ as examples to highlight new perspectives of condensed matter physics at high pressure:

- (1). Hydrogen, the most abundant and perhaps simple element of the universe: molecular hydrogen transitioning to near-room temperature superconducting hydrides;
- (2). Nitrogen, the most abundant element in the atmosphere: triple bonded nitrogen ($N\equiv N$) transforming to single-bonded hexazine (N-N in N_6 ring);
- (3). Iron, the most abundant transition metal of the planet: heat conduction of iron generating thermal energy to power the planet's magnetic field.