

## Dr. Yang Ding

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### Research Interest

My research mainly concerns high-pressure condensed matter physics, with a focus on studying emergent electrodynamics phenomena, such as insulator-metal transitions, superconductivity, magnetic phase transitions, in electron strongly correlated materials at high pressure. The major techniques we are using are advanced synchrotron probes, including resonant inelastic x-ray scattering, resonant x-ray emission, inelastic x-ray scattering, magnetic x-ray circular dichroism, x-ray absorption, nano-imaging, as well as optical wprobes, transport measurements and theoretical modeling.

### Professional Preparation

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|----------------------------|-----------------------------|-----------------|
| • Nanjing University       | Earth Science               | B.S., 1991      |
| • Johns Hopkins University | Earth and Planetary Science | M.S., 1999      |
| • Johns Hopkins University | Earth and Planetary Science | Ph.D., 2002     |
| • Geophysical Laboratory   | High-Pressure Physics       | Postdoc 3 years |

### Appointments

- 2019-present HPSTAR Beijing Branch Director, HPSTAR, China
- 2019-present Executive Director, HPSynC-JP, HPSTAR, China
- 2015-present Staff Scientist, HPSTAR, China
- 2015-2018 Visiting scientist at Argonne National Laboratory, USA
- 2011-2015 Physicist, Argonne National Laboratory, USA
- 2007-2011 Beamline Scientist, HPSynC- Geophysical Laboratory, USA
- 2003-2007 Research Scientist, Geophysical Laboratory, USA

### Selected Publications (\* corresponding author)

- Zhang, J., Yan, D., Sorb, Y. A., Deng, H., Xiao, H., Chen, B., Sereika, R., Yin, X., Yi, C., Shi, Y., Liu, Z., Pärschke, E. M., Chen, C.-C., Chang, J., **Ding, Y\***, & Mao, H.-k. Lattice frustration in spin-orbit Mott insulator Sr<sub>3</sub>Ir<sub>2</sub>O<sub>7</sub> at high pressure. *npj Quantum Materials*, **4**, 23 (2019).
- Zhang, J., **Ding, Y.\***, Chen, C. C., Cai, Z., Chang, J., Chen, B., Hong, X., Fluerasu, A., Zhang, Y., Ku, C. S., Brews, D., Heald, S., Ishii, H., Hiraoka, N., Tsuei, K. D., Liu, W., Zhang, Z., Cai, Y. Q., Gu, G., Irifune, T. & Mao, H. K. Evolution of a Novel Ribbon Phase

in Optimally Doped  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$  at High Pressure and Its Implication to High- $T_c$  Superconductivity. *Journal of Physical Chemistry Letters* **9**, 4182-4188, (2018).

- Mao, H.-K., Chen, X.-J., **Ding, Y.**, Li, B. & Wang, L. Solids, liquids, and gases under high pressure. *Reviews of Modern Physics* **90**, (2018).
- **Ding, Y.\***, Yang, L., Chen, C. C., Kim, H. S., Han, M. J., Luo, W., Feng, Z., Upton, M., Casa, D., Kim, J., Gog, T., Zeng, Z., Cao, G., Mao, H. K. & van Veenendaal, M. Pressure-Induced Confined Metal from the Mott Insulator  $\text{Sr}_3\text{Ir}_2\text{O}_7$ . *Physical Review Letters* **116**, 216402, (2016).
- **Ding, Y.\***, Chen, C.-C., Zeng, Q., Kim, H.-S., Han, M. J., Balasubramanian, M., Gordon, R., Li, F., Bai, L., Popov, D., Heald, S. M., Gog, T., Mao, H.-k. & Veenendaal, M. v. Novel high-pressure monoclinic metallic phase of  $\text{V}_2\text{O}_3$ . *Physical Review Letters* **112**, 056401, (2014).
- **Ding, Y.\***, Haskel, D., Tseng, Y.-C., Kaneshita, E., van Veenendaal, M., Mitchell, J. F., Sinogeikin, S. V., Prakapenka, V. & Mao, H.-k. Pressure-induced magnetic transition in manganite ( $\text{La}_{0.75}\text{Ca}_{0.25}\text{MnO}_3$ ). *Physical Review Letters* **102**, 237201, (2009).
- **Ding, Y.\***, Haskel, D., Ovchinnikov, S. G., Tseng, Y.-C., Orlov, Y. S., Lang, J. C. & Mao, H.-k. Novel Pressure-Induced Magnetic Transition in Magnetite ( $\text{Fe}_3\text{O}_4$ ). *Physical Review Letters* **100**, 45508, (2008).

### **Funding**

- PI: The National Key Research and Development Program- 2018YFA0305703 “Novel Magnetism of Electron Correlated Systems at High Pressure”, 3980 K; 2018/05-2023/04.
- PI: National Natural Science Foundation of China (NSFC) - 11874075, “ Study the 4f Electron State at High Pressure”, 640 K; 2019/01-2022/12.
- PI: Challenging Project-TZ2016001, “Spectroscopic study of 4f electrons at High Pressure”, 1200 K; 2016-2020.
- Co-PI: National Natural Science Foundation of China (NSFC) - U1930401, “Frontier of the Equation of State at ultrahigh Pressure”, 26,000 K; 2020/01-2022/12.

### **Synergistic Activities**

- Review Editor for Frontiers in Materials of Editorial Board of Quantum Materials.
- International Program Committee member of the 11th International Conference on Inelastic X-ray Scattering, IXS 2017-2019.
- Proposal Review for National Synchrotron Radiation Research Center (NSSRC).