

Mads Fonager Hansen, PhD

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Employment History

- 2018 – 2019 📌 **Student assistant**, Aarhus University.
- 2023 – ... 📌 **Post doctoral fellow**, Carnegie Institution for Science.

Education

- 2019 – 2022 📌 **Ph.D. student Physics, Institute Néel, Université Grenoble Alpes.**
Thesis title: *Search for and study of new Fe-Si-based superconductors*
- 2017 – 2019 📌 **M.Sc. Nano science, Aarhus university.**
Thesis title: *High-pressure studies, -devices and crystal growth of iron-based superconductors*
- 2014 – 2017 📌 **B.S. Nano science, Aarhus university.**

Research Publications

Journal Articles

- 1 Hansen, M. F., Vaney, J.-B., Lepoittevin, C., Bernardini, F., Gaudin, E., Nassif, V., ... Toulemonde, P. (2022). Superconductivity in the crystallogenic LaFeSiO_{1-δ} with squeezed FeSi layers. *npj Quantum Materials*, 7(1), 86. [doi:10.1038/s41535-022-00493-z](https://doi.org/10.1038/s41535-022-00493-z)
- 2 Hansen, M. F., Layek, S., Vaney, J.-B., Toulemonde, P., Tencé, S., Boullay, P., ... Méasson, M.-A. (2023). Lattice dynamics in the intermetallic LaFeSi and the derived superconducting compounds LaFeSiH and LaFeSiO. arXiv: 2307.12610 [cond-mat.supr-con]
- 3 Hansen, M. F., Vaney, J.-B., De Rango, P., Salaün, M., Tencé, S., Nassif, V., & Toulemonde, P. (2023). In-situ deuteration study of LaFeSi into superconducting LaFeSi(H,D). *Journal of Alloys and Compounds*, 169281. [doi:https://doi.org/10.1016/j.jallcom.2023.169281](https://doi.org/10.1016/j.jallcom.2023.169281)
- 4 Ehrenreich-Petersen, E., Hansen, M. F., Jeanneau, J., Ceresoli, D., Menescardi, F., Ottesen, M., ... Bremholm, M. (2023). Seven-coordinated high-pressure phase of CrSb₂ and experimental equation of state of MSb₂ (M = Cr, Fe, Ru, Os). *Inorganic Chemistry*. [doi:10.1021/acs.inorgchem.3c00227](https://doi.org/10.1021/acs.inorgchem.3c00227)
- 5 Kronbo, C. H., Ottesen, M., Hansen, M. F., Ehrenreich-Petersen, E., Meng, Y., & Bremholm, M. (2020). Discovery of Rhombohedral NaIrO₃ Polymorph by In Situ High-Pressure Synthesis of High-Oxidation-State Materials Using Laser Heating in Diamond Anvil Cells. *Inorganic Chemistry*, 59(21), 15780–15787. [doi:10.1021/acs.inorgchem.0c02233](https://doi.org/10.1021/acs.inorgchem.0c02233)





Skills

General

- Languages 📌 English (Fluent), Danish (Fluent), French (A2.1), German (A1)
- Coding 📌 Python, L^AT_EX, LabVIEW




Skills (continued)

Experimental science




- Structure  X-ray powder diffraction - DAC and Paris-Edinburgh press, Neutron diffraction
- Physical properties  Resistivity, high pressure resistivity, specific heat, SQUID and VSM magnetometry
- Characterization  Raman spectroscopy, SEM/EDX
- Synthesis  High-pressure/high-temperature synthesis (large volume press), Solid state reactions in quartz, Chemical vapor transport, Laser heating in DAC.

Miscellaneous Experience

Schools

- 2022  **Les Houches-WE Heraeus school "Fermi surface, novel quantum phases, and superconductivity in strongly correlated electrons systems"** , France, (<https://fermi-sces2022.grenoble.cnrs.fr/>).
- 2020  **HERCULES**, Grenoble (<https://hercules-school.eu/>).
- 2018  **DANSCATT and MAX4ESSFUN Summer School**, Denmark.

Conference appearances

- 2023  **AIRAPT and EHPRG - Superconductivity in carbon-boron clathrates - Contributed talk**, Edinburgh.
- 2022  **SCES - : LaFeSiO_{1-δ}: a novel superconducting member of the Fe silicide family - Contributed talk**, Amsterdam.
- 2021  **CSEC - Orthorhombic distrotron by hydrogenation at high pressures - Contributed talk**, Edinburgh (Online).