Jamie J. Molaison

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EDUCATION

- M.S., Chemistry (Inorganic), University of Tennessee, Knoxville, TN, 2006
- B.S., Chemistry, Nicholls State University, Thibodaux, LA, 2002

EXPERIENCE

Scientific Associate, Spallation Neutron Source Science Support Group, Instrument and Source Division, Oak Ridge National Laboratory, Oak Ridge, TN
2006-Present

- Assisted in the oversight and coordination of the Spallation Neutrons And Pressure (SNAP) high-pressure neutron diffractometer construction, installation, and maintenance activities
- Performed high-pressure neutron-diffraction experiments, which included sample preparation, data collection, and data analysis.
- Held the role of lab space manager for the SNAP beamline
- Coordinated upgrade and repair efforts of instrument support groups with the goal of maintaining reliable beamline operations and minimizing downtime
- Performed user-related activities including sample environment setup/troubleshooting/ operation, sample preparation and disposition, instrument-specific training
- Maintained instrument documentation and chemical and sample inventories
- Participated in user-proposal feasibility reviews and scheduled approved experiments
- Co-organized SNAP Instrument Development Team meetings and the 2010 meeting of the IUCr Commission on High Pressure
- Designed numerous items using Creo 3D modeling software each having a varying degree of impact on the operational and scientific success of SNAP.
- Aided in the design, procurement, testing and implementation of several custom sample environments and components that significantly increased SNAP's capabilities and data quality. These include:
    - New diamond-anvil cells (DACs) and associated components used to collect refinable data at a sample pressure of 80 GPa, which supplanted the previous world record (for refinable neutron diffraction data) of 30 GPa
    - Multiple low- and high-temperature apparatuses that allow for simultaneous exploration of P-T space
    - Nested Kirkpatrick-Baez supermirrors designed to increase signal/background for small samples by focusing neutron beams down to >100 um.
    - Various collimation and shielding pieces required to reduce neutron background levels to those suitable for obtaining quality data from ~.03 mm^3 samples

Research Assistant, Professor John F. C. Turner, University of Tennessee, Knoxville, TN
2002–2006
Thesis title: *Structural and dynamical studies of superacids and superacidic solutions using neutron and high energy X-ray scattering*

- Manipulated air and moisture sensitive compounds using inert gas and high vacuum techniques
- Determined liquid structures through acquisition of neutron and high energy X-ray diffraction data followed by subsequent analysis using the ATLAS suite of programs
- Synthesized and purified molecular inorganic compounds to ultra-pure levels with respect to chemical and isotopic composition
- Characterized inorganic and organic compounds by NMR, IR, and Raman spectroscopy
- Determined the structure of inorganic and organic compounds using single crystal x-ray crystallography using a SMART 1000 diffractometer and the SHELXTL suite of programs
- Constructed custom glassware using standard freehand scientific glass-blowing techniques
- Wrote proposals for the acquisition of experiment time at neutron sources and synchrotron facilities
- Co-authored papers for publication in peer-reviewed journals

Graduate Teaching Assistant, General Chemistry, University of Tennessee,
2002–2005

- Instructed during labs and recitations, administered exams

PUBLICATIONS

1. Zheng, H. Y.; Wang, L. J.; Li, K.; Yang, Y. Y.; Wang, Y. J.; Wu, J. J.; Dong, X.; Wang, C. H.; Tulk, C. A.; Molaison, J. J.; Ivanov, I. N.; Feygenson, M.; Yang, W. G.; Guthrie, M.; Zhao, Y. S.; Mao, H. K.; Jin, C. Q., Pressure induced polymerization of acetylide anions in CaC2 and 10(7) fold enhancement of electrical conductivity. *Chem. Sci.* **2017,** *8* (1), 298-304.

2. Sun, J. M.; Dong, X.; Wang, Y. J.; Li, K.; Zheng, H. Y.; Wang, L. J.; Cody, G. D.; Tulk, C. A.; Molaison, J. J.; Lin, X. H.; Meng, Y. F.; Jin, C. Q.; Mao, H. K., Pressure-Induced Polymerization of Acetylene: Structure-Directed Stereoselectivity and a Possible Route to Graphane. *Angew. Chem.-Int. Edit.* **2017,** *56* (23), 6553-6557.

3. Song, G.; Lin, J.; Bilheux, J.; Xie, Q.; Santodonato, L.; Molaison, J.; Skorpenske, H.; M. Dos Santos, A.; Tulk, C.; An, K.; Stoica, A.; Kirka, M.; Dehoff, R.; Tremsin, A.; Bunn, J.; Sochalski-Kolbus, L.; Bilheux, H., Characterization of Crystallographic Structures Using Bragg-Edge Neutron Imaging at the Spallation Neutron Source †. *Journal of Imaging* **2017,** *3* (4), 65.

4. Li, X.; Baldini, M.; Wang, T.; Chen, B.; Xu, E. S.; Vermilyea, B.; Crespi, V. H.; Hoffmann, R.; Molaison, J. J.; Tulk, C. A.; Guthrie, M.; Sinogeikin, S.; Badding, J. V., Mechanochemical Synthesis of Carbon Nanothread Single Crystals. *J Am Chem Soc* **2017,** *139* (45), 16343-16349.

5. Hester, B. R.; Dos Santos, A. M.; Molaison, J. J.; Hancock, J. C.; Wilkinson, A. P., Synthesis of Defect Perovskites (He2-x squarex)(CaZr)F6 by Inserting Helium into the Negative Thermal Expansion Material CaZrF6. *J Am Chem Soc* **2017,** *139* (38), 13284-13287.

6. Haberl, B.; Dissanayake, S.; Ye, F.; Daemen, L. L.; Cheng, Y.; Li, C. W.; Ramirez-Cuesta, A. J.; Matsuda, M.; Molaison, J. J.; Boehler, R., Wide-angle diamond cell for neutron scattering. *High Pressure Res.* **2017,** *37* (4), 495-506.

7. Guthrie, M.; Pruteanu, C. G.; Donnelly, M. E.; Molaison, J. J.; dos Santos, A. M.; Loveday, J. S.; Boehler, R.; Tulk, C. A., Radiation attenuation by single-crystal diamond windows. *J. Appl. Crystallogr.* **2017,** *50*, 76-86.

8. Guguchia, Z.; Adachi, T.; Shermadini, Z.; Ohgi, T.; Chang, J.; Bozin, E. S.; von Rohr, F.; dos Santos, A. M.; Molaison, J. J.; Boehler, R.; Koike, Y.; Wieteska, A. R.; Frandsen, B. A.; Morenzoni, E.; Amato, A.; Billinge, S. J. L.; Uemura, Y. J.; Khasanov, R., Pressure tuning of structure, superconductivity, and novel magnetic order in the Ce-underdoped electron-doped cuprate T′−Pr1.3−xLa0.7CexCuO4 (x=0.1). *Phys. Rev. B* **2017,** *96* (9), 094515.

9. Cai, W. Z.; Dunuwille, M.; He, J. G.; Taylor, T. V.; Hinton, J. K.; MacLean, M. C.; Molaison, J. J.; dos Santos, A. M.; Sinogeikin, S.; Deemyad, S., Deuterium Isotope Effects in Polymerization of Benzene under Pressure. *J. Phys. Chem. Lett.* **2017,** *8* (8), 1856-1864.

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11. Zheng, H. Y.; Li, K.; Cody, G. D.; Tulk, C. A.; Dong, X.; Gao, G. Y.; Molaison, J. J.; Liu, Z. X.; Feygenson, M.; Yang, W. G.; Ivanov, I. N.; Basile, L.; Idrobo, J. C.; Guthrie, M.; Mao, H. K., Polymerization of Acetonitrile via a Hydrogen Transfer Reaction from CH3 to CN under Extreme Conditions. *Angew. Chem.-Int. Edit.* **2016,** *55* (39), 12040-12044.

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17. Li, K.; Zheng, H.; Hattori, T.; Sano-Furukawa, A.; Tulk, C. A.; Molaison, J.; Feygenson, M.; Ivanov, I. N.; Yang, W.; Mao, H.-k., Synthesis, Structure, and Pressure-Induced Polymerization of Li3Fe(CN)6 Accompanied with Enhanced Conductivity. *Inorganic Chemistry* **2015,** *54* (23),

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REFERENCES

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