

DEAN SMITH

Bigelow Physics Building (MS 4002)
University of Nevada, Las Vegas
Las Vegas, NV 89154, USA

dean.smith@unlv.edu
(702) 894-9505
dean-smith.me



PROFESSIONAL APPOINTMENTS

- Dec. 2021 – Present **University of Nevada, Las Vegas** (Las Vegas, NV, USA)
Assistant Research Professor, [Nevada Extreme Conditions Laboratory](#)
- Dec. 2019 – Nov. 2021 **Argonne National Laboratory** (Lemont, IL, USA)
Assistant Physicist, [HPCAT](#), X-ray Science Division

EDUCATION

- May 2016 – Jun. 2019 **University of Nevada, Las Vegas** (Las Vegas, NV, USA)
Postdoctoral Scholar, [High Pressure Science & Engineering Center](#) Advisor: [Ashkan Salamat](#)
- Sep. 2012 – Mar. 2016 **University of Salford** (Manchester, UK)
PhD Physics, “Hydrogenation of monolayer graphene in the diamond anvil cell and supercritical phenomena in methane” Advisor: [John E. Proctor](#)
- Sep. 2008 – July 2012 **The University of Hull** (Hull, UK)
MPhys Physics with Nanotechnology Advisors: [Tommy S. Horozov](#) & [D. Martin A. Buzza](#)

VISITING POSITIONS

- June 2023 – Present **University of California, Berkeley** (Berkeley, CA)
Visiting Professor Host: [Michael W. Zuerch](#)
- Jan. – Feb. 2018 **Deutsches Elektronen-Synchrotron** (Hamburg, DE)
Assisting with development of CO₂ laser heating instrument at [Extreme Conditions Beamline](#).

SYNERGISTIC ACTIVITIES

- 2023 – Advisory board for [Spectra](#), [UNLV Undergraduate Research Journal](#)
- 2023 Co-chair: [Shining Light on Matter at Extremes](#); University of Nevada, Las Vegas, Las Vegas, NV, USA
- 2022 Chair: [Gordon Research Seminar: Research at High Pressure](#); Holderness, NH, USA
- 2020 [22nd National School on Neutron and X-ray Scattering](#)
- 2018 Co-chair: [Shining Light on Matter at Extremes](#); University of Nevada, Las Vegas, Las Vegas, NV, USA
- 2017 [Rebel STEM Academy](#)

PEER REVIEW *American Mineralogist*, *Journal of Applied Physics*, *Journal of Chemical Physics*, *Journal of Geophysical Research: Solid Earth*, *Materials* (MDPI), *Nature Communications*, *Review of Scientific Instruments*

MEMBERSHIPS American Chemical Society, American Physical Society, Institute of Physics (UK), National Postdoctoral Association (USA)

GRADUATE COMMITTEES

- | | | |
|-------------------|--|----------------|
| Logan Magad-Weiss | PhD, University of Nevada, Las Vegas, Dept. of Geosciences | 2022 – Present |
| Joshua Van Cleave | MSc, University of Nevada, Las Vegas, Dept. of Physics & Astronomy | 2023 |
| Zachary Grande | PhD, University of Nevada, Las Vegas, Dept. of Physics & Astronomy | 2023 |

PEER-REVIEWED PUBLICATIONS

- 34 M. White, D. Schacher, G. A. Smith, **D. Smith**, C. Park, K. V. Lawler,* & A. Salamat,* Pressure-induced loss of metallicity in RuO₂, *Physical Review Materials* **8**, 013603 (2024)
- 33 D. T. Sneed, G. A. Smith, J. Kearney, C. Childs, C. Park, K. V. Lawler, A. Salamat,* & **D. Smith**, Stable and metastable structures of tin (IV) oxide at high pressure, *Philosophical Transactions of the Royal Society A* **381**, 20220346 (2023)

- 32 M. Frost,* **D. Smith**, E. E. McBride, J. S. Smith, & S. H. Glenzer, The equations of state of statically compressed palladium and rhodium, *Journal of Applied Physics* **134**, 035901 (2023)
- 31 R. J. Husband,* C. Strohm, and 64 others including **D. Smith**, A MHz X-ray diffraction set-up for dynamic compression experiments in the diamond anvil cell, *Journal of Synchrotron Radiation* **30** (2023)
- 30 M. Frost,* E. E. McBride, **D. Smith**, J. S. Smith, & S. Glenzer,* Pressure Driven Alkane Dehydrogenation by Palladium Metal, *Advanced Materials Interfaces* **2023**, 2202081 (2023)
- 29 A. Bommannavar, P. Chow, R. Ferry, R. Hrubciak, F. Humble, C. Kenney-Benson, M. Lyu, Y. Meng, C. Park, D. Popov, E. Rod, M. Somayazulu, G. Shen, **D. Smith**, J. S. Smith, Y. Xiao, & N. Velisavljevic,* Overview of HPCAT and capabilities for studying minerals and various other materials at high-pressure conditions, *Physics and Chemistry of Minerals* **49**, 36 (2022)
- 28 C. Childs,* **D. Smith**,* G. A. Smith, P. Ellison, D. Sneed, J. Hinton, E. Siska, J. S. Pigott, E. Rod, W. O'Donnell, R. Salem, B. Sturtevant, R. J. Scharff, N. Velisavljevic, C. Park, & A. Salamat,* CO₂ laser heating system for *in situ* radial x-ray absorption at 16-BM-D at the Advanced Photon Source, *Review of Scientific Instruments* **93**, 083901 (2022)
- 27 G. A. Smith, I. Collings, E. Snider, **D. Smith**, S. Petitgirard, J. S. Smith, M. White, E. Jones, P. B. Ellison, K. V. Lawler, R. P. Dias, & A. Salamat,* Carbon content drives high temperature superconductivity in a carbonaceous sulfur hydride below 100 GPa, *Chemical Communications* **58**, 9064 (2022), retraction notice [online](#)
- 26 D. Sneed, P. Söderlind, E. F. O'Bannon III, H. Cynn, **D. Smith**, J. Smith, C. Park, & Zs. Jenei, High-pressure structural systematics of Dy metal compressed in a Ne pressure medium to 182 GPa, *Physical Review B* **105**, 214110 (2022)
- 25 Z. M. Grande, C. Huy Pham, **D. Smith**, J. H. Boisvert, C. Huang, J. S. Smith, N. Goldman, J. L. Belof, O. Tschauner, J. H. Steffen,* & A. Salamat,* Pressure-driven symmetry transitions in H₂O ice, *Physical Review B* **105**, 104109 (2022)
- 24 R. Dutta,* S. J. Tracy, R. E. Cohen, F. Miozza, K. Luo, J. Yang, P. C. Burnley, **D. Smith**, Y. Meng, S. Chariton, V. B. Prakapenka, & T. S. Duffy, Ultrahigh-pressure disordered eight-coordinated phase of Mg₂GeO₄: Analogue for super-Earth mantles, *Proceedings of the National Academy of Sciences* **119** e2114424119 (2022)
- 23 P. V. Marshall, Z. Alptekin, S. D. Thiel, **D. Smith**, Y. Meng, & J. P. S. Walsh,* High-Pressure Synthesis of Bulk Cobalt Cementite, Co₃C, *Chemistry of Materials* **33**, 9601 (2021) **127**
- 22 D. Durkee, N. Dasenbrock-Gammon, G. A. Smith, E. Snider, **D. Smith**, C. Childs, S. A. J. Kimber, K. V. Lawler,* R. P. Dias,* & A. Salamat,* Colossal Density-Driven Resistance Response in the Negative Charge Transfer Insulator MnS₂, *Physical Review Letters* **127**, 016401 (2021), retraction notice *Physical Review Letters* **131**, 079902 (2023)
- 21 E. Siska, **D. Smith**, A. Salamat,* K. V. Lawler, B. Lavina, F. Poineau, & P. M. Forster, Synthesis and chemical stability of technetium nitrides, *Chemical Communications* **57**, 8079 (2021)
- 20 E. Siska, **D. Smith**, C. Childs, D. Koury, P. M. Forster, K. V. Lawler,* & A. Salamat,* β-Technetium: An allotrope with a nonstandard volume-pressure relationship, *Physical Review Materials* **5**, 063603 (2021)
- 19 K. V. Lawler,* **D. Smith**, S. R. Evans, A. M. dos Santos, J. J. Molaison, J.-W. G. Bos, H. Mutka, P. F. Henry, D. N. Agryriou, A. Salamat,* & S. A. J. Kimber,* Decoupling Lattice and Magnetic Instabilities in Frustrated CuMnO₂, *Inorganic Chemistry* **60**, 6004 (2021)
- 18 C. Huang,* D. R. Rice, Z. M. Grande, **D. Smith**, J. S. Smith, J. H. Boisvert, O. Tschauner, A. Salamat, J. H. Steffen, Implications for an improved water equation of state for water-rich planets, *Monthly Notices of the Royal Astronomical Society* **503**, 2825 (2021)
- 17 X. Zhang, X. Luo, M. Bykov, E. Bykova, I. Chuvashova, D. Butenko, S. Chariton, V. Prakapenka, **D. Smith**, H. Wang, Y. Wang, Jian Lv,* & Alexander F. Goncharov,* Stability of the peroxide group in BaO₂ under high pressure, *Physical Review B* **103**, 094104 (2021)
- 16 J. Louis-Jean,* S. M. Balasekaran, K. V. Lawler, A. Sanchis-Perucho, J. Martínez-Lillo, **D. Smith**, P. M. Forster, A. Salamat, & F. Poineau,* Coexistence of metamagnetism and slow relaxation of magnetization in ammonium hexafluoridorhenate, *RSC Advances* **11**, 6353 (2021)
- 15 J. K. Hinton, C. Childs, **D. Smith**, P. B. Ellison, K. V. Lawler, & A. Salamat,* Response of the mode Grüneisen parameters with anisotropic compression: A pressure and temperature dependent Raman study of β-Sn, *Physical Review B* **102**, 184112 (2020)
- 14 M. Bykov,* K. R. Tasca, I. G. Batyrev, **D. Smith**, K. Glazyrin, S. Chariton, M. Mahmood, A. F. Goncharov, Dinitrogen as a Universal Electron Acceptor in Solid-State Chemistry: An Example of Uncommon Metallic Compounds Na₃(N₂)₄ and NaN₂, *Inorganic Chemistry* **59**, 14819 (2020)

- 13 **D. Smith**, D. Sneed, N. Dasenbrock-Gammon, E. Snider, G. A. Smith, C. Childs, J. S. Pigott, N. Velisavljevic, C. Park, K. V. Lawler,* R. P. Dias,* & A. Salamat,* Anomalous Conductivity in the Rutile Structure Driven by Local Disorder, *The Journal of Physical Chemistry Letters* **10**, 5351 (2019)
- 12 H. E. Weekes, D. Dye,* J. E. Proctor, **D. Smith**, C. Simionescu, T. J. Prior, & M. R. Wenman, The effect of pressure on hydrogen solubility in Zircaloy-4, *Journal of Nuclear Materials* **524**, 256 (2019)
- 11 D. Sneed, J. S. C. Kearney, **D. Smith**, J. S. Smith, C. Park, & A. Salamat*, Probing disorder in high-pressure cubic tin (IV) oxide: a combined x-ray diffraction and absorption study, *Journal of Synchrotron Radiation* **26**, 1245 (2019)
- 10 D. Durkee, **D. Smith**, R. Torchio, S. Petitgirard, R. Briggs, I. Kantor, S. R. Evans, T. Chatterji, T. Irifune, S. Pascarelli, K. V. Lawler,* A. Salamat,* & S. A. J. Kimber.* Electronic origins of the giant volume collapse in the pyrite mineral MnS₂, *Journal of Solid State Chemistry* **269**, 540 (2019)
- 9 **D. Smith**,* D. P. Shelton, P. B. Ellison, & A. Salamat,* Simple imaging for the diamond anvil cell: Applications to hard-to-reach places, *Review of Scientific Instruments* **89**, 103902 (2018)
- 8 **D. Smith**,* J. S. Smith,* C. Childs, E. Rod, R. Hrubiak, G. Shen, & A. Salamat,* A CO₂ laser heating system for *in situ* high pressure-temperature experiments at HPCAT, *Review of Scientific Instruments* **89**, 083901 (2018)
- 7 J. S. C. Kearney, M. Grauzinytė, **D. Smith**,* D. Sneed, C. Childs, J. Hinton, C. Park, J. S. Smith, E. Kim, S. D. S. Fitch, A. H. Hector, C. J. Pickard, J. A. Flores-Livas,* & A. Salamat,* Pressure tuneable visible-range band gap in the ionic spinel tin nitride, *Angewandte Chemie (Int. Ed.)* **57**, 11623 (2018) and *Angewandte Chemie* **130**, 11797 (2018)
- 6 J. Louis-Jean, S. Mariappan Balasekaran,* **D. Smith**, A. Salamat, C. T. Pham, & F. Poineau, Syntheses, Raman spectroscopy & crystal structures of alkali hexafluoridorhenates(IV) revisited, *Acta Crystallographica E* **74**, 646 (2018)
- 5 **D. Smith**, K. Lawler, M. Martinez-Canales, A. Daykin, Z. Fussell, G. A. Smith, C. Childs, J. S. Smith, C. J. Pickard, & A. Salamat,* Postaragonite phases of CaCO₃ at lower mantle pressures, *Physical Review Materials* **2**, 013605 (2018)
- 4 **D. Smith**, M. A. Hakeem, P. Parisiades, H. E. Maynard-Casely, D. Foster, D. J. Bull, A. R. L. Marshall, A. M. Adawi, R. T. Howie, A. Sapelkin, V. V. Brazhkin, & J. E. Proctor,* Crossover between liquidlike and gaslike behaviour in CH₄ at 400 K, *Physical Review E* **96**, 052113 (2017)
- 3 **D. Smith**, O. Joris, A. Sankaran, H. Weekes, D. Bull, T. Prior, D. Dye, D. Errandonea, & J. E. Proctor,* On the high-pressure phase stability and elastic properties of β-Ti alloys, *Journal of Physics: Condensed Matter* **29**, 155401 (2017)
- 2 **D. Smith**,* R. T. Howie, I. F. Crowe, C. L. Simionescu, C. M. Muryn, V. Vishnyakov, K. S. Novoselov, Y.-J. Kim, M. P. Halsall, E. Gregoryanz, & J. E. Proctor,* Hydrogenation of graphene by reaction at high pressure and high temperature, *ACS Nano* **9**, 8279 (2015)
- 1 A. D. Law, M. Auriol, **D. Smith**, T. S. Horozov,* & D. M. A. Buzza,* Self-assembly of two-dimensional colloidal clusters by tuning the hydrophobicity, composition, and packing geometry, *Physical Review Letters* **110**, 138301 (2013)

COMMUNICATIONS

INVITED ORAL PRESENTATIONS

- 5 Uni. of Illinois at Chicago, Chicago, IL, USA, Apr. 2020. “High Pressure Experimentation at the HPCAT Beamlines”
- 4 Gordon Research Seminar: *Research at High Pressures*, Holderness, NH, USA, Jul. 2018. “*In situ* diagnostics in the CO₂ laser heated diamond anvil cell: Applications to lower mantle minerals”
- 3 *DESY Photon Sciences User Meeting*, Hamburg, DE, Jan. 2018. “*In situ* CO₂ laser heating at an X-ray diffraction beamline”
- 2 Uni. of North Florida, Jacksonville, FL, USA, Sep. 2016. “High pressure science: How and why do we squeeze things?”
- 1 14th *International Symposium on Metal Hydrogen Systems*, Salford, UK, Jul. 2014. “High pressure and temperature formation of graphene hydride”

CONFERENCE CONTRIBUTIONS

23 contributed conference abstracts in 6 countries, including 3 contributed oral presentations.
 Session chair at one national (US) conference.

FULL CURRICULUM VITAE AVAILABLE ON REQUEST.