

DEAN SMITH

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PROFESSIONAL EXPERIENCE

- Dec. 2019 – Present **Argonne National Laboratory** (Lemont, IL, USA)
Assistant Physicist, [HPCAT](#), X-ray Science Division
- May 2016 – Jun. 2019 **University of Nevada, Las Vegas** (Las Vegas, NV, USA)
Postdoctoral scholar, [High Pressure Science & Engineering Center](#) Advisor: [Ashkan Salamat](#)

EDUCATION

- 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

- Jan. – Feb. 2018 **Deutsches Elektronen-Synchrotron** (Hamburg, Germany)

PEER-REVIEWED PUBLICATIONS

- 18 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,* *Phys. Rev. B* **103**, 094104 (2021)
- 17 J. Louis-Jean,* S. M. Balasekaran, K. V. Lawler, A. Sanchis-Perucho, J. Martínez-Lillo, **D. Smith**, P. M. Forster, A. Salamat, & F. Poineau,* *RSC Adv.* **11**, 6353 (2021)
- 16 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)
- 15 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 $\text{Na}_3(\text{N}_2)_4$ and NaN_2 , *Inorganic Chemistry* **59**, 14819 (2020)
- 14 **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)
- 13 Z. M. Grande, C. Huang, **D. Smith**, J. S. Smith, J. H. Boisvert, O. Tschauner, J. H. Steffen,* & A. Salamat,* Bond strengthening in dense H_2O and implications to planetary composition (under review, [arXiv:1906.11990](#))
- 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 MnS_2 , *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 CO_2 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)

ACADEMIC SERVICE & OUTREACH

- 2022 Chair; [Gordon Research Seminar on Research at High Pressure](#) (originally 2020).
- 2020 [22nd National School on Neutron and X-ray Scattering](#) remote interaction with participants.
- 2016–2019 Co-supervised 12 [PhD, MSc and BSc students](#); University of Nevada, Las Vegas, Las Vegas, NV, USA.
- 2018 Co-chair; [Shining Light on Matter at Extremes](#); University of Nevada, Las Vegas, Las Vegas, NV, USA.
- 2017 [Rebel STEM Academy](#), involving lab activities for Las Vegas high school students.

PEER REVIEW SERVICE

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

MEDIA & PRESS FEATURES

- 2 Jul. 2019 [Earth could have more water than we thought while exoplanets have less](#), Leah Crane, New Scientist.
- 1 May 2018 [Liquid mysteries](#), John E. Proctor, Physics World.

COMMUNICATIONS

INVITED ORAL PRESENTATIONS

CDAC, University of Illinois at Chicago	Chicago, IL, USA	Apr. 2020
Gordon Research Seminar: <i>Research at High Pressures</i>	Holderness, NH, USA	July 2018
DESY Photon Sciences User Meeting	Hamburg, Germany	Jan. 2018
University of North Florida	Jacksonville, FL, USA	Sept. 2016
14 th International Symposium on Metal Hydrogen Systems	Salford, UK	July 2014

CONTRIBUTED ORAL PRESENTATIONS

APS March Meeting 2018	Los Angeles, CA, USA	Mar. 2018
AIRAPT-26 (joint with ACHRP-8 & CHPC19)	Beijing, PRC	Aug. 2017
Joint AIRAPT-25 & EHPRG-53	Madrid, Spain	Sept. 2015
IOP Shockwaves & Extreme Conditions Group Meeting: <i>PETER</i> 2014	London, UK	Apr. 2014

SESSION CHAIR

21 st Biennial Meeting of APS GSCCM 2019: <i>Early Career & Student Symposium</i>	Portland, OR, USA	June 2019
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