Sufian M. **Alnemrat**

Assistant Professor of Physics, the Hashemite University, Zarqa, Jordan.

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``Ethics are Exclusively Human with No Superhuman Authority$_{Einstein}$"

Education

New Mexico State University — *Las Cruces, NM 88001, US.*

Ph.D in Physics — *Jul. 2012*

- Thesis: Ab-Initio Study of the Physics and Chemistry of Metals in Planetary Core Materials and Nanomaterials at Relevant Thermodynamic Conditions.

New Mexico State University — *Las Cruces, NM 88001, US.*

M.S. in Physics — *May. 2009*

- Comprehensive Exam

Jordan University of Science and Technology — *Irbid 221110, Jordan*

M.S. in Applied Physics — *Oct. 2004*

- Thesis: D.C Conductivity and Dielectric Response Function of Homometallic and Heterometallic Conducting Organic Polymers.

Jordan University of Science and Technology — *Irbid 221110, Jordan*

B.S. in Applied Physics — *Sep. 2001*

- Specialization: Nuclear and Radiation Techniques

Experience

Department of Physics, Hashemite University — *Zarqa, Jordan*

Assistant Professor of Physics — *Sep. 2016 - present*

Department of Physics, Naval Postgraduate School — *Monterey, CA 93940, U.S.*

Faculty Research Associate — *May. 2018 - present*

Department of Physics, Naval Postgraduate School — *Monterey, CA 93940, U.S.*

National Research Council Research Associate — *Aug. 2012 - Aug. 2016*

Department of Physics, New Mexico State University — *Las Cruces, NM 88001, U.S.*

Teaching and Research Graduate Assistant — *Aug. 2007 - Jul. 2012*

Department of Physics, Jordan University of Science and Technology — *Irbid, Jordan*

Teaching Assistant — *Oct. 2004 - Jul. 2007*

Publications

- Al–Sugheir M, Edmairi M, Ghassib H, and **Sufian Alnemrat** A microscopic study of spin-polarized asymmetric hot nuclear matter within the static fluctuation approximation (SFA), *Nuclear Physics A* (2019).

- Liangying Li, Lidong Guo, Siyu Pu, Jiawei Wang, Qiwei Yang, Zhiguo Zhang, Yiwen Yang, Qilong Ren, **Sufian Alnemrat**, Zongbi Bao. A Calcium-based Microporous Metal–Organic Framework for Efficient Adsorption Separation of Light Hydrocarbons, *Chemical Engineering Journal* (2019).

- Xin Tang, Jeffery B. DeLisio, **Sufian Alnemrat**, Zachary Hicks, Lauren Stevens, Chad A. Stoltz, Joseph P. Hooper, Bryan W. Eichhorn, Michael R. Zachariah, Kit H. Bowen, and Dennis H. Mayo. Mechanistic Studies of $[AlCp^*]_4$ Combustion, *Inorganic Chemistry* (2018).

- **Sufian Alnemrat** and Joseph P. Hooper. The role of reducing agents in the nucleation and growth of Al metalloid clusters: Ab initio molecular dynamics study, *AIP Conference Proceedings* (2018).

- **Sufian Alnemrat** and Joseph P. Hooper. Modeling the stability and growth of metalloid clusters for energetic materials, *AIP Conference Proceedings* (2017).

- Aldo Ponce, Lynn B. Brostoff, Sarah K. Gibbons, Peter Zavalij, Carol Viragh, Joseph Hooper, **Sufian Alnemrat**, Karen J. Gaskell, Bryan Eichhorn. Elucidation of the Fe(III) gallate structure in historical iron gall ink, *Analytical Chemistry* (2016).

- Brian Mason, Madelynn Whittaker, James Hemmer, Simran Arora, Antron Harper, **Sufian Alnemrat**, Alanna McEachen, Sam Helmy, Javier Read de Alaniz, and Joseph Hooper. A temperature-mapping molecular sensor for polyurethane-based elastomers, *Applied Physics Letter* (2016).

- **Sufian Alnemrat**, Dennis Mayo, Samantha DeCarlo, Bryan Eichhorn, Joseph P. Hooper. Growth of metalloid aluminum clusters on graphene vacancies, *The Journal of Chemical Physics* (2016).

- **Sufian Alnemrat** and Joseph P. Hooper. Ab initio metadynamics simulations of oxygen/ligand interactions in organoaluminum clusters, *The Journal of Chemical Physics* (2014)

- J. P. Hooper, J. R. Hemmer, B. P. Mason, **Sufian Alnemrat**, M. Whittaker, S. Arora, S. Helmy, and J. Read de Alaniz. Thermochromic polymers as in–situ sensors for hot spots in explosive composites, *Proc. 15th Intl. Detonation Symposium.* 2015.

- **Sufian Alnemrat** and Joseph P. Hooper. Quantum molecular dynamics simulations of the oxidation of aluminum-cyclopentadienyl clusters, *Journal of Physics: Conference Series* (2014).

- James R. Hemmer, Patrick D. Smith, Matt van Horn, **Sufian Alnemrat**, Brian P. Mason, Javier Read de Alaniz, Sebastian Osswald, Joseph P. Hooper. High strain-rate response of spiropyran mechanophores in PMMA, *Journal of Polymer Science Part B: Polymer Physics* (2014).

- Andrew Pollack, **Sufian Alnemrat**, Thomas Chamberlain, Andrei Khlobystov, Joseph P. Hooper, and Sebastian Osswald. Electronic property modification of single–wall carbon nanotubes by encapsulation of sulfur-terminated graphene nanoribbons, *Small: Nano, Micro* (2014).

- **Sufian Alnemrat** and Joseph P. Hooper. Oxidation of ligand-protected aluminum clusters: an ab-initio molecular dynamics study, *The Journal of Chemical Physics* (2014).

- **Sufian Alnemrat**, Joseph P Hooper, Igor Vasiliev, and Boris Kiefer. The role of equilibrium volume and magnetism on the stability of iron phases at high pressures, *Journal of Physics: Condensed Matter* (2014).

- **Sufian Alnemrat** and Joseph P. Hooper. Predicting solubility of military, homemade, and green explosives in pure and saline water using COSMO-RS, *Propellants, Explosives, Pyrotechnics* (2014).

- **Sufian Alnemrat**, Young Ho Park, and Igor Vasiliev. Ab initio study of ZnSe and CdTe semiconductor quantum dots. *Physica E* (2014).

- **Sufian Alnemrat**, Gary T. Brett, and Joseph P. Hooper. Adsorption of 2,4,6-trinitrotoluene on the ZnO $(2\bar{1}\bar{1}0)$ surface: A DFT study of the detection mechanism of ZnO nanowire chemiresistors, *Applied Physics Letter* (2013).

- **Sufian Alnemrat** and Joseph P. Hooper. Predicting temperature-dependent solid vapor pressures of explosives and related compounds using a quantum mechanical continuum solvation model. *Journal of Physical Chemistry* (2013).

- Zongbi Bao,**Sufian Alnemrat**, Liang Yu, Igor Vasiliev, Qilong Ren, Xiuyang Lu, and Shuguang Deng. Adsorption of ethane, ethylene, propane, and propylene on a magnesium-based metal organic framework, *Langmuir* (2011).

- Zongbi Bao, **Sufian Alnemrat**, Liang Yu, Igor Vasiliev, Qilong Ren, Xiuyang Lu, and Shuguang Deng. Kinetic separation of carbon dioxide and methane on a copper metal–organic framework, *Journal of Colloid and Interface Science* (2011).

- Isam Arafa, Hassan El-Ghanem, and **Sufian Alnemrat**. Electrical and magnetic behavior of homometallic and heterometallic of polyethylenediaminecarbosilazane-based metallopolymers, *Recent Developments in Polymer Research, Nova Science Publishers Inc.* ISBN: 1-60021-346-4, Chapter 1,PP1-28. (2007).

Selected Presentations

- Invited, world science forum, Jordan 2017. Science for peace. Dead Sea, Jordan.

- Metalloid clusters as novel energetic materials: Progress and challenges. Oral presentation at the APS March meeting 2016, focus topic "materials in extremes", Volume 61, Number 2.

- Nucleation of aluminum nanoclusters on graphene: an ab-initio molecular dynamics study. Oral presentation at the 19th Biennial Intl. conference of the APS topical group on shock compression of condensed matter. 2015, Volume 60, Number 8.

- Adsorption of monovalent aluminum halides on graphene defects. Oral presentation at the APS March meeting. 2015, Volume 60, Number 1.

- Adsorption of 2,4,6-trinitrotoluene on the ZnO $(2\bar{1}\bar{1}0)$ surface: A DFT study of the detection mechanism of ZnO nanowire chemiresistors. Oral presentation at the APS March meeting. 2014, Volume 59, Number 1.

- Quantum molecular dynamics simulations of the stability and reactivity of aluminum cyclopentadienyl clusters. Oral presentation at the 18th Biennial Intl. conference of the APS topical group on shock compression of condensed matter. 2013, Volume 58, Number 7.

- First principles study of core-shell semiconductor nanocrystals. Oral presentation at New Mexico State University graduate research & arts symposium. 2012.

- Magnetic and thermal fluctuations in Fe and (Fe,Ni) alloys at Earth core conditions. Oral presentation at the APS March meeting. 2012, Volume 57, Number 1.

- First-principles simulations of magnetism in Fe and (Fe,Ni) alloys at core Earth conditions. Poster presentation at the American Geophysics Meeting (AGU), 2011.

- Crystal orbital overlap population analysis and electronic density of states of elemental iron up to 400GPa. Poster presentation at the consortium for materials properties research in Earth sciences(COMPRES) Meeting, 2011.

Committees

Editorial board member, The Splendid Journals *2017*
Editorial board member, International Journal of Solid State Materials *2018*
Scientific research and graduate study committee, Department of physics, Hashemite university *2019*
Physics department curriculum committee, Department of physics, Hashemite university *2019*
Physics department secretary, Department of physics, Hashemite university *2019*

Honors and Awards

National research council fellowship, Monterey, CA 93940, U.S. *2012--2016*
Graduate school honor certificate, Las Cruces, NM 88001, U.S. *2009 and 2012*
BRAVO award for outstanding research and teaching performance, Las Cruces, NM 88001, U.S. *2010*
Physics department merit--based enhancement fellowship, Las Cruces, NM 88001, U.S. *2009*
Research and teaching assistant graduate school award, Las Cruces, NM 88001, U.S. *2007--2012*

Theses Advised

2018 **Haleemah Shamiah**, M.S. Thesis: Adsorption of CO2, CH4, and H2 on Calcium-based Microporous Metal-Organic Framework. *Hashemite university*

2018 **Amneh Salameh**, M.S. Thesis: Magnetic Properties of 2D-Transition Metal Dihalide structures: First Principles Study. *Hashemite university*

2017 **Amani Twal**, M.S. Thesis: Structure and Electron Localization of Reduced Ceria (CeO2) Surfaces: First Principles Study. *Hashemite university*

2014 **Gary T. Brett**, M.S. Thesis: Ab-initio simulations of TNT adsorption on the ZnO $(2\bar{1}\bar{1}0)$ surface. *Naval Postgraduate school*

2013 **Christopher Jumonville**, Summer Intern: Static equation of state of aluminum cyclopentadienyl clusters: DFT study. *Naval Postgraduate school*

Skills

Computer and Software Skills

- Platforms: UNIX/Linux (gcc/gdb, make, shell, git), Windows, Mac OS X.
- Data analysis: Origin, SigmaPlot, Matlab, SciDAVis, Grace...
- Quantum Chemistry Modeling packages: CPMD, SIESTA, VASP, QUANTUM ESPRESSO, GAUSSIAN, PARSEC, OCTOPUS, COSMO-RS, and MATERIALS STUDIO
- Familiar with common scientific programming languages (C++ , Python, FORTRAN).
- Experienced in multithreaded/distributed computing: CUDA, pthreads, OpenMP, and MPI.

Hardware and Instrumentation Skills

- Split Hopkinson pressure bar systems.
- InVia confocal Raman microspectrometer, renishaw Inc.
- UV-VIS-NIR spectrophotometer, cary 5000.

References

available upon request,