Nathan S. Nichols

Contact Information

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Education

The University of Vermont, Burlington, VT, USA

Ph.D., Materials Science, August 2014 to Present

- Advisor: Dr. Adrian Del Maestro
- Area of Study: Computational Condensed Matter Physics

Certificate of Graduate Study in Complex Systems, Vermont Complex Systems Center, August 2014 to Present

Hartwick College, Oneonta, NY, USA

B.S., Physics, Chemistry, and Mathematics, May 2014

- With Honors in Physics, Chemistry, and Mathematics

Refereed Journal Publications (total: 4, h-index: 3, citations: 78)

[1] Nichols, N. S., Prisk, T. R., Warren, G., Sokol, P., Del Maestro, A. Dimensional reduction of helium-4 inside argon-plated MCM-41 nanopores *Physical Review B*, 102, 144505, 6 October 2020. doi:10.1103/PhysRevB.102.144505

[2] Sengupta, S., Nichols, N. S., Del Maestro, A., and Kotov, V. N. Theory of Liquid Film Growth and Wetting Instabilities on Graphene. *Physical Review Letters*, 120, 236802, 8 June 2018. doi:10.1103/PhysRevLett.120.236802

[3] Nichols, N. S., Del Maestro, A., Wexler, C., and Kotov, V. N. Adsorption by design: tuning atom-graphene van der Waals interactions via mechanical strain. *Physical Review B*, 93, 205412, 6 May 2016. doi:0.1103/PhysRevB.93.205412

[4] Cannon, J. et al. The Alfalfa “Almost Darks” Campaign: Pilot VLA HI Observations of Five High Mass-To-Light Ratio Systems. *The Astronomical Journal*, 149(2):72, January 2015. doi:10.1088/0004-6256/149/2/72

Preprint Publications

[5] Yu, J. et al. Two-Dimensional Bose–Hubbard Model for Helium on Graphene *arXiv preprint arXiv:2102.11288*, 22 February 2021. arXiv:2102.11288

Conference Talks

[1] Nichols, N., Prisk, T., Warren, G. T., Sokol, P. E., Vanegas, J. M., and Del Maestro, A.. Confinement Potential Inside Rare Gas Plated MCM-41 Nanopores In: *American Physical Society (APS) March Meeting 2020*, Virtual, March 15–19, 2021 (virtual).

[2] Nichols, N., Del Maestro, A., Prisk, T., Warren, G. T., and Sokol, P. E.. A Parameter Free Genetic Algorithm for Estimating the Dynamic Structure Factor at Zero and Finite Temperature In: *American Physical Society (APS) March Meeting 2020*, Denver, CO, March 2–6, 2020 (virtual).

[3] Nichols, N., Del Maestro, A., Prisk, T., Warren, G. T., and Sokol, P. E.. Quantum Monte Carlo simulation of superfluid helium confined inside pre-plated nanoporous materials In: *American Physical Society (APS) March Meeting 2019*, March 4–8, 2019; Boston, Massachusetts

[4] Nichols, N., Kotov, V., and Del Maestro, A.. Superfluid ^{4}He phases on strained graphene. In: *American Physical Society (APS) March Meeting 2017*, New Orleans, LA, March 13–17, 2017.

[5] Nichols, N., Kotov, V., and Del Maestro, A.. Helium adsorption potential near mechanically deformed graphene. In: *American Physical Society (APS) March Meeting 2016*, Baltimore, MD, March 14–18, 2016.

Conference Posters

[1] Nichols, N., Grezkowiak, S., Murray, K., and Troischt, P.. L-Band Wide Follow-up Survey: Interesting Candidates and IDL Routines. In: *American Astronomical Society, AAS Meeting #223*, Washington, DC, January 5–9, 2014.

[2] Nichols, N. and Troischt, P.. ALFALFA L-band Wide Followup Observations and IDL Routines In: *American Astronomical Society, AAS Meeting #221*, Long Beach, CA, January 6–10, 2013.

[3] Nichols, N., Patterson, J., Weigel, C, and Troischt, P.. Group Membership and Dynamical Mass Estimates of Galaxy Group AWM3 In: *American Astronomical Society, AAS Meeting #219*, Austin, TX, January 8–12, 2012.

Research Experience

Del Maestro Group Member
University of Vermont (Burlington, VT, USA) **2015–Present**

Research Assistant
University of Vermont (Burlington, VT, USA) **2017–Present**

Undergraduate Researcher
Hartwick College (Oneonta, NY, USA) **2010–2014**

Teaching Experience

Teaching Assistant
University of Vermont (Burlington, VT, USA) **2014–2017**

Professional Memberships

American Physical Society (APS), Member, 2015–Present

Materials Research Society (MRS), Member, 2014–2015

Society of Physics Students (SPS), Member, 2012–Present

Kappa Mu Epsilon Mathematics Honor Society (KME), Member, 2012–Present
- President of local chapter (2013–2014)

Public Service

NanoDays at ECHO Lake Aquarium and Science Center **March 2014**
- Public outreach effort in nanoscale informal science education

STEM Fair Judge at Missisquoi Valley Union High School **January 2018**

Programming, Scripting Languages, and High Performance Computing Experience

- C++, C, Julia, Python, UNIX shell scripting, cmake and GNU make scripts, SQL, IDL and others
- Parallel Computing and GPU: HIP, CUDA-C++, OpenCL, Julia (multi-threading), Python (multiprocessing), and OpenMP
- Machine Learning Frameworks: TensorFlow, Torch
- Quantum Computing Frameworks: Qiskit, cirq
- HPC Experience: PSC Bridges-2, PSC Bridges, SDSC Comet, OSG, VACC Bluemoon, VACC BlackDiamond, VACC DeepGreen, Big Red
- HPC Schedulers: Slurm, Moab/Torque, and HTCondor

Awards

- President’s Scholarship, 2010–2014
- Dean’s List, 2010–2014
- Freedman Prize in Natural Science, 2011 and 2013
- Otto Steinbach Memorial Scholarship in Chemistry, 2013
- David A. Diener Mathematics Achievement Award, 2012 and 2013
- Richard J. Kohlmeyer Award in Mathematics, 2012
- Outstanding Freshman Physics Award, 2011
- CRC Press Chemistry Achievement Award, 2011
- Marine Gunnery Sergeant John David Fry Scholarship, 2010–2014