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Lewis & Clark College
615 S Palatine Hill Rd, MSC 15
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Professional Appointments

2023– **Assistant professor** Lewis & Clark College, Department of Physics

2017–2024 **Director of curriculum and instruction** Tapia Say STEM Camps, Rice University

2018–2023 **Assistant professor** Yale-NUS College, Division of Science (Physics)

2016–2018 **Postdoctoral research fellow** University of Toronto, Department of Physics

2015–2016 **Physicist** AOSense, Inc., Inertial Sensors Divison, Sunnyvale, CA

2011–2015 **Postdoctoral research associate** Rice University
Department of Physics & Astronomy and Rice Quantum Institute

Education

2011 **Ph. D. in Physics,** Princeton University

2006 **B. S. with Honors in Physics,** California Institute of Technology

Teaching Experience

At Lewis & Clark College

2025 *Phys 490: Independent Research*

2025 *Phys 300: Advanced Lab*

2024 *Phys 331: Advanced Electricity & Magnetism*

2024, 2025 *Phys 201: Experimental Methods in Physical Sciences*

2023, 2024 *Phys 151: Motion, Phys 151L*
Introductory Physics with Lab

2023 *Phys 380: Physics In Curved Spacetime*

At Yale-NUS College

2022 *YSC3221: Introduction to Electrodynamics*

2019, 2022 *YSC4223: Physics in Curved Spacetime*

2018–2022 *YCC2137: Scientific Inquiry 2* (9 total sections)
Deep Inquiry 1 (Experimentation) Track Lead in 2019, 2020

2020, 2021 *YSC2246: Experimental Methods in Physical Sciences*
Co-Taught with S. Presolski in 2020

2021 *YSC2251: Science Skills Workshop*

2020 *YSC3224: Statistical Thermodynamics*

2019 *YSC2214: Introduction to Optics & Imaging*

Elsewhere

2018-2024 Director of curriculum and instruction, *Say STEM Camps, Tapia Center*, Rice University

2017 Instructor, *Phy 326: Advanced Physics Laboratory*, University of Toronto

2016–2017 Lead physics instructor, curriculum development, *Say STEM Camp, Tapia Center*, Rice University

2015 Guest lecturer, *Physics 202: Modern Physics*, Rice University

2013–2015 Guest lecturer, *Physics 311/312: Introduction To Quantum Physics I/II*, Rice University

2010–2011 Assistant for instruction, *ISC 231: An Integrated, Quantitative Introduction to the Natural Sciences, Laboratory Section*, Princeton University

2009–2010 Instructor, *Physics & Science Reasoning*, Princeton University Preparatory Program

2005 Teaching assistant, *Ph 6: Physics Laboratory*, California Institute of Technology

2005 Teaching assistant, *Ph 5: Analog Electronics*, California Institute of Technology

Students Mentored

At Lewis & Clark College

Experimental physics research 4 undergraduate students, 1 secondary school student

Physics major/minor advising 6 undergraduate students

Pre-major advising 4 undergraduate students 2024-25

Elsewhere

Experimental physics research 1 graduate, 21 undergraduate (6 capstone), 3 secondary school students

Physics major advising 7 students (5 at Yale-NUS College, 2 at University of Toronto)

Pre-major advising Yale-NUS College
9 students 2022-23, 9 students 2021–22, 9 students 2020–21, 10 students 2019–20, 4 students 2018–19

Publications

Peer reviewed (*undergraduate student authors) 466 total citations, h-index 9, Google Scholar Profile

16. *Local-time formula for dissipation in solid ionic electrolytes*
A. Rodin, **B. A. Olsen**, A. Ustyuzhanin, A. Maevskiy, and K. Noori
Physical Review Research **6**, 033244 (2024) doi:10.1103/PhysRevResearch.6.033244

15. *Activation in solid ionic electrolytes*
K. Noori, **B. A. Olsen**, A. Rodin
Physical Review Research **6**, 023322 (2024) doi:10.1103/PhysRevResearch.6.023322

14. *Dissipation and diffusion in one-dimensional solids*
H. Mahalingam, **B. A. Olsen**, A. Rodin
Physical Review Research **5**, 033044 (2023) doi:10.1103/PhysRevResearch.5.033044

13. *Emergent s-wave interactions between identical fermions in quasi-one-dimensional geometries*
K. G. Jackson, C. J. Dale, J. Maki, K. G. S. Xie, **B. A. Olsen**, D. J. M. Ahmed-Braun, S. Zhang, and J. H. Thywissen
Physical Review X **13**, 021013 (2023) doi:10.1103/PhysRevX.13.021013

12. *Minimal model of drag in one-dimensional crystals*
H. Mahalingam, Z. W. Yap*, **B. A. Olsen**, A. Rodin
Physical Review Research **5**, 013053 (2023) doi:10.1103/PhysRevResearch.5.013053

11. *Microscopic theory of thermalization in one dimension with nonlinear bath coupling*
A. Rodin, **B. A. Olsen**, M. Choi*, and A. Tan*
Physical Review Research **4**, 033057 (2022) doi:10.1103/PhysRevResearch.4.033057

10. *Probing open- and closed-channel p-wave resonances*
D. J. M. Ahmed-Braun, K. G. Jackson, S. Smale, C. J. Dale, **B. A. Olsen**, S. J. J. M. F. Kokkelmans, P. S. Julienne, and J. H. Thywissen
Physical Review Research **3**, 033269 (2021), doi:10.1103/PhysRevResearch.3.033269

9. *Observation of a Transition Between Dynamical Phases in a Quantum Degenerate Fermi Gas*
S. Smale, P. He, **B. A. Olsen**, K. G. Jackson, H. Sharum, S. Trotzky, J. Marino, A. M. Rey, and J. H. Thywissen
Science Advances **5**, eaax1568, (2019) doi:10.1126/sciadv.aax1568

8. *Observation of Quantum-Limited Spin Transport in Strongly Interacting Two-Dimensional Fermi Gases*
C. Luciuk, S. Smale, F. Böttcher, H. Sharum, **B. A. Olsen**, S. Trotzky, T. Enss, and J. H. Thywissen
Physical Review Letters **118**, 130405 (2017) doi:10.1103/PhysRevLett.118.130405

7. *1D to 3D Crossover of a Spin-Imbalanced Fermi Gas*
M. C. Revelle, J. A. Fry, **B. A. Olsen**, and R. G. Hulet
Physical Review Letters **117**, 235301 (2016) doi:10.1103/PhysRevLett.117.235301

6. *Phase diagram of a strongly interacting spin-imbalanced Fermi gas*
B. A. Olsen, M. C. Revelle, J. A. Fry, D. E. Sheehy, and R. G. Hulet
Physical Review A **92**, 063616 (2015) doi:10.1103/PhysRevA.92.063616

5. *Spin-velocity correlations of optically pumped atoms*
R. Marsland III*, B. H. McGuyer, **B. A. Olsen**, and W. Happer
Physical Review A **86**, 023404 (2012) doi:10.1103/PhysRevA.86.023404

4. *Cusp kernels for velocity-changing collisions*
B. H. McGuyer, R. Marsland III*, **B. A. Olsen**, and W. Happer
Physical Review Letters **108**, 183202 (2012) doi:10.1103/PhysRevLett.108.183202

3. *Optical pumping and spectroscopy of Cs vapor at high magnetic field*
B. A. Olsen, B. Patton, Y.-Y. Jau, and W. Happer
Physical Review A **84**, 063410 (2011) doi:10.1103/PhysRevA.84.063410

2. *Transfer of spin angular momentum from Cs vapor to nearby Cs salts through laser-induced spin currents*
K. Ishikawa, B. Patton, **B. A. Olsen**, Y.-Y. Jau, and W. Happer
Physical Review A **83**, 063410 (2011) doi:10.1103/PhysRevA.83.063410

1. *Temperature-insensitive laser frequency locking near absorption lines*
N. Kostinski, **B. A. Olsen**, R. Marsland III*, B. H. McGuyer, and W. Happer
Review of Scientific Instruments **82**, 033114 (2011) doi:10.1063/1.3574221

2024–2026 **Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences** National Science Foundation
Ultracold Atoms for Quantum Science
PI: $249,684

2022 **Finalist: Yale-NUS College Junior Faculty Teaching Award**

2022–2025 **Academic Research Fund Tier 2** Ministry of Education, Singapore
Photoswitchable DTE Ligands for Spatiotemporal Catalytic Control
Co-PI: SGD$465,000 (of total SGD$1,273,543)

2022–2023 **Teaching Engagement Grant** Yale-NUS College
Experiential learning aids in advanced physics electives using tangible elements
PI: SGD$3,660

2021–2023 **Quantum Engineering Programme** National Research Foundation of Singapore, DSO National Laboratories, Singapore
Quantum Assisted Navigation and Magnetic Sensing
Co-PI: SGD$300,000 (of total SGD$7,802,627)

2021–2024 **Internal Seed Grant** Yale-NUS College
Many-body quantum spin dynamics of Fermi and Bose gases of lithium
PI: SGD$179,232

2021–2022 **Shared Equipment Grant** Yale-NUS College
High-power laser sources for experimental sciences at Yale-NUS
PI: SGD$96,594

2020–2022 **Student Research Special Pocket Research Grant (x3)** Yale-NUS College
Direct-current electromagnet field simulations/design, Automated image acquisition and compositing system, Automated laboratory monitoring system
PI: SGD$4,500

2019 **Eleanor P. Eells Award for Program Excellence**
American Camp Association, for Say STEM Camp at Rice University (Citation Link)

2019 **Inspiring Programs in STEM Award**
INSIGHT Into Diversity, for Say STEM Camp at Rice University (Citation link)

2019–2020 **Shared Equipment Grant** Yale-NUS College
Optical frequency reference for experimental sciences at Yale-NUS
PI: SGD$96,000

2017 **Article: STEM Camps Showcase PBL**
National Science Teachers Association Reports, September, 2017 (Article link)

PRESENTATIONS

Seminars & Colloquia (19 total) Selected recent:

Oct 2024 Lewis & Clark College Chemistry Department, Portland, OR

Apr 2024 Society of Physics Students Chapter 17 Meeting, Portland, OR

Feb 2024	Reed College, Portland, OR
Apr 2023	Lewis & Clark College, Portland, OR
Nov 2022	Hamilton College, Clinton, NY
Nov 2022	Wellesley College, Wellesley, MA
Apr 2022	Rose-Hulman Institute of Technology, Terre Haute, IN

Contributed Conference Presentations (22 total) Selected recent:

Jun 2024	APS DAMOP, Fort Worth, TX
Jun 2023	APS DAMOP, Spokane, WA
Sep 2022	Institute of Physics Singapore, NTU, Singapore (with 4 undergraduate student poster presenters)
Jun 2022	APS DAMOP, Orlando, FL
Jun 2020	APS Virtual DAMOP, Portland, OR
Sep 2019	Workshop on dynamics and interactions in quantum gases, Institut Menorquí d'Estudis, Menorca, Spain
Mar 2019	Fundamental Physics Using Atoms Workshop, OIST, Okinawa, Japan