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Lewis & Clark College
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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 Division, 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 321: Quantum Mechanics*
2025 *Phys 490: Independent Research*
2025 *CS 499: Independent Research*
Co-Advised with Alain Kägi
2025 *Phys 300: Advanced Lab*
2024 *Phys 331: Advanced Electricity & Magnetism*
2024, 2025 *Phys 201: Experimental Methods in Physical Sciences*
2023, 2024, 2025 *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 YSC2137: *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 5 undergraduate students, 1 secondary school student

Physics major/minor advising 9 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 9 students 2022–23, 9 students 2021–22, 9 students 2020–21, 10 students 2019–20, 4 students 2018–19

Peer reviewed (*undergraduate student authors) 508 total citations, h-index 9, [Google Scholar Profile](#)

17. *Time-local stochastic equation of motion for solid ionic electrolytes*
A. Rodin, **B. A. Olsen**, A. Ustyuzhanin, and A. Maevskiy
Accepted for publication in Physical Review Research, [arXiv:2504.06595](#)
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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1063/1.3574221)

GRANTS, AWARDS, & PRESS

- 2025 **Article: A Quantum Leap for Physics Students**
 Lewis & Clark Newsroom ([Article Link](#))
- 2024 **Murdock Poster Prize for Physics and Engineering** M. J. Murdock Charitable Trust
Custom Electromagnets: Design, Simulation, Construction, Testing
 Awarded to undergraduate research mentee Emma Falk
- 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 com-
 positing 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 (25 total) Selected recent:

- Jun 2025 *APS DAMOP (4 undergraduate student presenters), Portland, OR
- Nov 2024 *MCSR Conference (2 undergraduate student presenters; *Physics and Engineering* Murdock Poster Prize), Vancouver, WA
- Jun 2024 APS DAMOP, Fort Worth, TX
- Jun 2023 APS DAMOP, Spokane, WA

Sep 2022 *Institute of Physics Singapore (4 undergraduate student poster presenters), NTU, Singapore

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

SERVICE

Outreach:

Apr 2025 Skype a Scientist with 5 HS classes from Elmira, OR

Apr 2025 Skype a Scientist with middle-school class from Sartell, MN

Apr 2025 LC Admitted Student Program: 5 Lab tours

Nov 2024 Led student volunteers to manage interactive physics demos for OMSI Teen night

May 2024 Skype a Scientist with HS class from Salinas, CA

Apr 2024 LC Admitted Student Program: Panel Discussion and 3 Lab tours

Oct 2023 APS Physicist to Go with HS class from Montebello, CA

Oct 2023 Co-organized Annular Eclipse Viewing Event with LC Physics Club

Feb 2020 Organized Singapore Science and Engineering Fair special award judging

Jun 2019 QCamp at NUS Centre for Quantum Technologies: Laser cooling

May 2019 Co-organized Event Horizon Telescope results viewing party

Referee & Panels:

Jul 2025 NSF review panel

Mar 2025 NSF ad hoc review

Feb 2025 *Physical Review A* referee

Jan 2025 NSF review panel

Mar 2024 NSF ad hoc review

Aug 2021 *Nature Physics* referee

Apr 2020 *Physical Review Letters* referee

Aug 2019 *Physical Review Research* referee

Dec 2016 *Physical Review Letters* referee