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Lewis & Clark College  
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## PROFESSIONAL APPOINTMENTS

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- 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

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## EDUCATION

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- 2011 **Ph. D. in Physics**, Princeton University
- 2006 **B. S. with Honors in Physics**, California Institute of Technology

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## TEACHING EXPERIENCE

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### At Lewis & Clark College

- 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 *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

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### 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* 9 students 2022-23, 9 students 2021-22, 9 students 2020-21, 10 students 2019-20, 4 students 2018-19

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### PUBLICATIONS

**Peer reviewed** (\*undergraduate student authors) 470 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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. Julianne, and J. H. Thywissen  
Physical Review Research **3**, 033269 (2021), [doi:10.1103/PhysRevResearch.3.033269](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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)

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GRANTS, AWARDS, & PRESS

- 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 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](#))

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## 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 (24 total) Selected recent:

- 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