

# Benjamin D. Smith

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Citizenship: USA/Canada (dual)

## Research interests

Warm-atomic vapors, optical magnetometry, spin-orbit coupled Bose-Einstein condensates, physics education and outreach.

## Education

2016 – Present     **University of Alberta** – Edmonton, Alberta, Canada  
Ph.D. in Physics  
Supervisor: Professor Lindsay J. LeBlanc  
*GPA: 3.64.*

2009 – 2015     **Brigham Young University** – Provo, Utah, USA  
B.Sc. in Physics, *cum laude*  
Advisors: Professors R. Steven Turley & David Allred  
*GPA: 3.87.*

## Honors and scholarships

- 2018     The Queen Elizabeth II Graduate Scholarship - Doctoral level (The Government of Alberta)  
*Value: \$7,500 CAD.*
- 2016     Doctoral Recruitment Scholarship (University of Alberta Faculty of Graduate Studies and Research)  
*Value: \$20,000 CAD.*
- 2016     Dean's Excellence Recruitment Scholarship Award (University of Alberta Faculty of Science)  
*Value: \$5,000 CAD.*

## Publications

- 3     **GPU-accelerated solutions of the nonlinear Schrödinger equation for simulating 2D spinor BECs**  
Benjamin D. Smith, Logan W. Cooke, Lindsay J. LeBlanc. *Computer Physics Communications* 275 (2022): 108314.

- 2 **Storing short single-photon-level optical pulses in Bose–Einstein condensates for high-performance quantum memory**  
Erhan Saglamyurek, Taras Hrushevskyi, Anindya Rastogi, Logan W Cooke, Benjamin D Smith, Lindsay J LeBlanc. *New Journal of Physics* 23.4 (2021): 043028.
- 1 **Y<sub>2</sub>O<sub>3</sub> optical constants between 5 nm and 50 nm** Joseph B. Muhlestein, Benjamin D. Smith, Margaret Miles, Stephanie M. Thomas, Anthony Willey, David D. Allred, R. Steven Turley.  
*Optics Express* 27.3 (2019): 3324-3336.

## Research experience

September 2016 – Present	<b>Ultracold Quantum Gas Lab</b> Mentor: Professor Lindsay J. LeBlanc (University of Alberta).
April 2014 – August 2015	<b>Thin Films and EUV Optics Lab</b> Mentors: Professors R. Steven Turley & David D. Allred (Brigham Young University).
October 2013 – April 2014	<b>XRD and Crystallography Lab</b> Mentors: Professor Branton J. Campbell (Brigham Young University).

## Teaching experience

Spring 2016	<b>Adjunct Instructor, PHYS 121: Principles of Physics 1 (Brigham Young University - Idaho)</b> The first course in the calculus-based sequence of introductory physics for science majors. The course focused on Newtonian laws of motion and the concept of energy. In this course, I applied principles of peer-instruction active learning. <i>Average student rating: X/5.</i>
Winter 2016	<b>Adjunct Instructor, PHYS 220: Principles of Physics 3 (Brigham Young University - Idaho)</b> The third calculus-based introductory physics course teaching principles of electricity and magnetism and how they relate to Maxwell's equations. <i>Average student rating: X/5.</i>

Winter-Spring 2016      **Adjunct Instructor, PHYS 150: Beginning Physics Lab (Brigham Young University - Idaho)**  
 This hands-on laboratory course introduced first-year students to the basics of experimental physics, with emphasis in experimental uncertainty, statistical analysis, regressions, and simple numerical modeling.  
*Average student rating: X/5.*

## Industry experience

Summer 2020      **Name of company (Title of job or internship) – City, State**  
 Description of your responsibilities. Integer pretium semper justo. Proin risus. Nul-  
 lam id quam. Nam neque. Phasellus at purus et lib ero lacinia dictum.

Summer 2019      **Name of company (Title of job or internship) – City, State**  
 Description of your responsibilities. Integer pretium semper justo. Proin risus. Nul-  
 lam id quam. Nam neque. Phasellus at purus et lib ero lacinia dictum.

Summer 2018      **Name of company (Title of job or internship) – City, State**  
 Description of your responsibilities. Integer pretium semper justo. Proin risus. Nul-  
 lam id quam. Nam neque. Phasellus at purus et lib ero lacinia dictum.

## Contributed Conference and Poster Presentations

June 2019      Synthetic electromagnetic forces in ultracold atoms. [Conference presentation]  
*APS Division of Atomic Molecular and Optical Physics (DAMOP) Meeting.* (Milwaukee, WI)

June 2019      AC synthetic gauge potentials in ultracold atoms. [Poster presentation]  
*APS DAMOP Meeting.* (Milwaukee, WI)

July 2018      How to engineer a BEC's kinetic energy: Techniques in quantum simulation [Con-  
 ference presentation]  
*Quanta CREATE Student Symposium.* (Calgary, AB)

July 2018      Quantum Simulation via a Raman-coupled BEC of 87-Rb. [Poster presentation]  
*Quanta CREATE Student Symposium.* (Calgary, AB)

June 2018      Spin-orbit coupling and superfluidity in ultracold quantum gases. [Poster Presenta-  
 tion]  
*APS DAMOP Meeting.* (Ft. Lauderdale, FL)

October 2016	Making physics possible: The case for systematic assessment of learning and active learning practices in the university physics classroom. [Conference Presentation] <i>University of Alberta GPSA Annual Symposium for Graduate Physics Research.</i> (Edmonton, AB)
March 2015	Plasma light source for extreme ultraviolet reflectance. [Conference presentation] <i>BYU College of Physical and Mathematical Sciences Student Research Conference.</i> (Provo, UT)
March 2014	Representational analysis of thermal vibrations in crystals. [Conference presentation] <i>BYU College of Physical and Mathematical Sciences Student Research Conference.</i> (Provo, UT)

## Mentorship and service

Month Year – Present	<b>Title of organization you are in (Name of your role)</b> Description of your responsibilities. Integer pretium semper justo. Proin risus. Nul- lam id quam. Nam neque. Phasellus at purus et lib ero lacinia dictum.
Month Year – Month Year	<b>Title of organization you were in (Name of your role)</b> Description of your responsibilities. Integer pretium semper justo. Proin risus. Nul- lam id quam. Nam neque. Phasellus at purus et lib ero lacinia dictum.

## Professional memberships

Year – Present	Name of professional society <i>Short description or conferences you attended.</i>
Year – Present	Name of professional society <i>Short description or conferences you attended.</i>

## Technical skills

### Programming languages

Proficient in: language 1, language 2, language 3

Familiar with: language 4, language 5

### Software

LaTeX, Git, another piece of software

**Languages**

English (fluent), Another language (advanced)

**Other interests**

Some of your hobbies, etc.