

# NATHANIEL W. CHAPMAN

## EDUCATION

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### Bachelor of Science

*Western Washington University (WWU)*

June 2019

*Bellingham, WA*

- Majors: Physics, Mathematics; Minor: Astronomy

## RESEARCH ACTIVITY

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### Effects of microscopic structure on molecular Bose-Einstein condensates

2017 - June 2019

*WWU Physics & Astronomy Department*

Research into the influence of microscopic structure of quadrupolar molecules on the many-body physics of a quasi-2D Bose-Einstein condensate of rigid rotor molecules via Bogoliubov mean-field theory. Computations were done using Mathematica.

This work is a collaboration with Dr. Brandon Peden (WWU) and Dr. Seth Rittenhouse (U.S. Naval Academy).

## GRANTS

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### Summer Student Research Stipend

June 2018

*WWU Physics & Astronomy Department*

- \$4800 grant to continue research into the theory of molecular Bose-Einstein condensates throughout the summer of 2018.
- Collaboration with Dr. Brandon Peden (WWU) and Dr. Seth Rittenhouse (U.S. Naval Academy).

## AWARDS

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### Best Poster - Undergraduate Division

May 2019

*APS Northwest Section*

- This award was based on the content and presentation of my work with Dr. Brandon Peden on the ground state phases of a quasi-2D BEC of rigid rotor molecules via Bogoliubov mean-field theory.

## TALKS

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### Ground state phases of a quasi-2D BEC of rigid rotor molecules via Bogoliubov mean-field theory

May 2019

*WWU Physics & Astronomy Undergraduate Research Conference*

[Link](#)

## POSTERS

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### Ground state phases of a quasi-2D BEC of rigid rotor molecules via Bogoliubov mean-field theory

May 2019

*Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (DAMOP)*

[Link](#)

### Ground state phases of a quasi-2D BEC of rigid rotor molecules via Bogoliubov mean-field theory

May 2019

*Annual Meeting of the APS Northwest Section*

[Link](#)

## WORK EXPERIENCE

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### **Credentialing Specialist**

February 2021 - Present

*Washington State Department of Health*

- Primary duties include:
  - Maintains, monitors and updates specialized health databases regarding client eligibility, vital statistics, enrollment, demographics and utilization.

### **Office Assistant 2**

June 2020 - October 2020

*Washington State Employment Security Department*

- Primary duties included:
  - Verifying documents and records for accuracy, and keying payment information into financial databases.
  - Reviewing documents for compliance with fiscal accountability rules and procedures.
  - Resolving tax and wage errors in Kofax Validation queue.
  - Processing the electronic records received from ESD units for archiving.
  - Processing electronic images of ESD Business Unit archive documents into appropriate ILINX archives.

### **Faculty Assistant**

January 2014 - June 2019

*WWU Physics & Astronomy*

- Primary duties included assisting faculty with grading, data entry, scanning, copying and other administrative tasks related to the logistics of courses.
- In addition to assisting the faculty, I provided administrative assistance to the office staff in the form of first-contact customer service, via both phone and in-person, to a wide variety of people, day-to-day administrative tasks associated with the P&A Department, and academic advising relevant to physics courses.

### **Research Assistant**

June 2018 - October 2018

*WWU Physics & Astronomy*

- Primary duties included:
  - Programming scientific simulations of ultra-cold molecules in Wolfram Mathematica
  - Attending scheduled collaboration and investigative meetings
  - Preparing highly technical documents for presentation to audiences both familiar and unfamiliar with the specific material

## VOLUNTEERING

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### **Founder, Writer**

December 2016 - Present

*Science for the Busy*

[Website](#)

- Created a website to make available my own original, introductory, learning materials on Wolfram *Mathematica*, L<sup>A</sup>T<sub>E</sub>X, and phasors from electronic circuit analysis.

## Blog Team Manager

February 2019 - June 2019

*Spark Science*

- In addition to the duties of Blogger, I also manage the blogging team and act as team liaison to Dr. Regina Barber DeGraaff.

## Blogger

June 2018 - February 2019

*Spark Science*

- Wrote articles about various highly scientific topics in an approachable manner in an effort to communicate science to non-scientists.

## Organizer, Host

May 2016

*WWU Physics & Astronomy Mathematica Workshop*

- Lead a workshop to interactively help physics students gain a rudimentary knowledge about the mathematical computing software *Mathematica*.

## SELF-PUBLISHED WORKS

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### Phasors for the Constantly Busy

May 2017

[Link](#)

- A guide to the basics of phasors, complex numbers and arithmetic, and their application to circuit analysis.

### Mathematica for the Constantly Busy

December 2016

[Link](#)

- A guide to the basics of *Mathematica*'s most important capabilities complete with exercises and solutions. This guide has been part of the curriculum in *Physics 326: Tools and Data Analysis* at WWU from winter 2018 to present.

### L<sup>A</sup>T<sub>E</sub>X for the Constantly Busy

December 2016

[Link](#)

- A guide to the basics of L<sup>A</sup>T<sub>E</sub>X relevant to science and mathematics.

## NOTABLE COURSEWORK

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### Physics & Astronomy

Mathematical Physics  
Physics of Solids & Materials  
Junior Lab  
Relativity  
Cosmology  
Science Communication  
Writing for Physicists  
Computational Physics  
Quantum Information and Computation

### Mathematics

Methods of Mathematical Analysis  
Complex Analysis  
Fourier Series & Partial Differential Equations  
Systems of Differential Equations  
Nonlinear Optimization  
Mathematical Computing  
Euclidean & Non-Euclidean Geometry