

# Austin Biaggne

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208.949.3019 (Cell)

## EDUCATION

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**PhD in Materials Science and Engineering** June 2018 – Summer 2023 (expected)

Boise State University, Boise, ID

*Dissertation title: "Optimization of Dye-DNA systems for Quantum Computing Applications"*

*Advisor: Lan Li, Ph.D.*

**BS in Physics, Minor in Mathematics** August 2014 – May 2018

Washington State University, Pullman, WA

## PROFESSIONAL EXPERIENCE

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**Internship** June 2019 – August 2019

Idaho National Laboratory, Idaho Falls, ID

*Project: Multiscale modeling of metal advanced manufacturing processes*

*Advisor: Michael McMurtrey, Ph.D.*

**Internship** June 2017 – August 2017

Naval Surface Warfare Center, Indian Head, MD

*Project: Characterization of shock-resistant materials for electronics protection*

*Advisor: Vasant Joshi, Ph.D.*

## RESEARCH EXPERIENCE

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**Graduate Research Assistant** June 2018 – Present

Boise State University, Boise, ID

Materials Theory and Modeling Group

- Multi-scale modeling of organic molecules on DNA scaffolding
- Density functional and time-dependent density functional theory calculations for single molecule ground and excited state properties
- Molecular dynamics simulations of large molecule-DNA structures to probe system dynamics and structure properties
- Customization and optimization of molecular aggregate properties for excitonic applications

## Undergraduate Research Assistant

Fall 2016 – Summer 2018

Washington State University, Pullman, WA

Institute for Shock Physics

- Characterization of high-energy density metal alloys
- Used spectral measurements and high-speed imaging to study metal-alloy combustion properties

## PUBLICATIONS

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1. Barcenas, G.; Biaggne, A.; Mass, O.; Wilson, C.K.; Obukhvoa, O.M.; Kolosova, O.S.; Tatarts, A.L.; Terpetschnig, E.; Pensack, R.D.; Lee, J.; Knowlton, W.B.; Yurke, B.; Li, L. First-principles studies of substituent effects on squaraine dyes. *RSC Advances* **2021**, *11*(31), doi: 10.1039/d1ra01377g.
2. Biaggne, A.; Noble, G.; Li, L. Adsorption and Surface Diffusion of Metals on  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> for Advanced Manufacturing Applications. *JOM* **2021**, *73*, doi: 10.1007/s11837-021-04589-y. (*Invited*)
3. Biaggne, A.; Knowlton, W.B.; Yurke, B.; Lee, J.; Li, L. Substituent Effects on the Solubility and Electronic Properties of the Cyanine Dye Cy5: Density Functional and Time-Dependent Density Functional Theory Calculations. *Molecules* **2021**, *26*, 524, doi: 10.3390/molecules26030524.
4. da Silva, H.; Butler, D.; Biaggne, A.; Kandadai, N.; Subbaraman, H.; Daw, J.; Li, L. First-Principles Studies of Dopant and Radiation Defect Effects on Optical Fiber Sensors," *Peer-reviewed proceedings for the 11th Nuclear Plant Instrumentation, Control and Human-Machine Interface Technologies (NPIC and HMIT) Conference, 2019.*

## PRESENTATIONS

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### Oral Presentations

1. Biaggne, A.; Li, L. "Computational Modeling of Dyes Attached to DNA Scaffolds" *TMS 2022 Annual Meeting & Exhibition, Anaheim, CA. 2022.*
2. Biaggne, A.; Noble, G.; Li, L. "Adsorption and Surface Diffusion of Metals for Advanced Manufacturing Applications" *TMS 2022 Annual Meeting & Exhibition, Anaheim, CA. 2022.*
3. Biaggne, A.; Knowlton, W.B.; Yurke, B.; Lee, J.; Li, L. "Substituent Effects on the Solubility and Electronic Properties of the Cyanine Dye Cy5" *MS&T21 Technical Meeting and Exhibition, Virtual On-Demand. 2021.*
4. Biaggne, A.; Li, L. "Adsorption and Surface Diffusion of Metals on  $\alpha$ -Al<sub>2</sub>O<sub>3</sub>" *MS&T21 Technical Meeting and Exhibition, Virtual On-Demand. 2021. (Invited)*
5. Biaggne, A. "Adsorption and Surface Diffusion of Metals on  $\alpha$ -Al<sub>2</sub>O<sub>3</sub>" Invited Seminar, Boise State University. **2021.**

6. Biaggne, A.; Knowlton, W.B.; Yurke, B.; Lee, J.; Li, L. "Substituent Effects on the Solubility and Electronic Properties of the Cyanine Dye Cy5: Density Functional and Time-Dependent Density Functional Theory Calculations" *TMS Annual Meeting, Virtual On-Demand*. **2021**.
7. Biaggne, A.; da Silva, H.; Butler, D.; Kandadai, N.; Subbaraman, H.; Daw, J.; Li, L. "First-Principles Studies of Dopant and Radiation Defect Effects on Optical Fiber Sensors" *ANS NPIC and HMIT, Orlando, FL*. **2019**.

### Poster Presentations

1. Biaggne, A.; Li, L.; "Computational Modeling of Dyes for Excitonic Applications" 2022 *MRS Spring Meeting and Exhibit, Honolulu, HI*. **2022**.
2. Barcenas, G.; Biaggne, A.; Ketteridge, M.; Li, L.; "First-principles Informed Screening of Dye Monomers for Excitonic Delocalization" *FNANO, Virtual On-Demand*. **2022**.
3. Biaggne, A.; Barcenas, G.; Lee, J.; Yurke, B.; Knowlton, B.; Li, L.; "Substituent Effects on the Solubility and Electronic Properties of Dyes: Density Functional and Time-Dependent Density Functional Theory Calculations" *FNANO, Virtual On-Demand*. **2021**.
4. Biaggne, A.; Fothergill, J.; Barcenas, G.; Knowlton, W.B.; Yurke, B.; Li, L.; "Ab-Initio Studies of Exciton Interactions of Cyanine Dyes" *FNANO, Virtual On-Demand*. **2020**.
5. Biaggne, A.; McMurtrey, M.; Bass, J.; Agesen, L. "Modeling Sintering Processes of Nanoparticle Inks" *INL Intern Poster Session, Idaho Falls, ID*. **2019**.

### CERTIFICATES

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#### Certificate in Teaching and Learning in Higher Education

May 18, 2022

*Description:* Completed 10 activities to develop abilities to apply backward course design principles, implement effective learning activities, assess student learning, develop inclusive and ethical learning environments, and reflect on my own growth and development around teaching and learning. Earning this certificate demonstrates my commitment to learning how to support students and teach more effectively in higher education.

### TECHNIQUE AND SOFTWARE PROFICIENCIES

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|------------------------------------|------------|
| • Density Functional Theory        | • VASP     |
| • Molecular Dynamics               | • Gaussian |
| • High Performance Computing (HPC) | • GROMACS  |
| • Phase-field Modeling             | • MOOSE    |

- Unix
- Bash
- Python
- C#
- Origin
- Microsoft Office Suite

## TEACHING AND LEADERSHIP EXPERIENCE

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**Teaching Assistant** Fall, 2021  
*Responsibilities:* Led office hours for classwork help. Graded homeworks and met with students who needed further assistance.

**CAES Remote Summer Boot Camp Presentation: VASP on INL HPC** August 11, 2020  
*Responsibilities:* Co-hosted a workshop that taught how to use ab-initio software on the Idaho National Laboratory computing cluster.

**Graduate Identity Formation through Teaching (GIFT) Mentor** Spring, 2020  
*Responsibilities:* Mentored a group of six undergraduate students majoring in elementary education about physics. Taught a lesson covering forces and motion and worked with the undergraduate students to develop a lesson plan for future elementary students.

**Teaching Assistant** Fall, 2019  
*Responsibilities:* Co-led recitation for homework and study help, proctored exams, developed and graded classwork, quizzes, and exams.

**Youth Soccer Coach for PAL** 2018 – 2019  
*Responsibilities:* Coached a team of 15 high schoolers in a recreational soccer league.

## HONORS / AWARDS

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**President's Honor Roll** 2015 – 2018  
 Washington State University, Pullman, WA

**Distinguished Glenn Terrell Presidential Scholarship** 2014 – 2018  
 Washington State University, Pullman, WA

**Cougar Academic Award Scholarship** 2014 – 2018  
 Washington State University, Pullman, WA