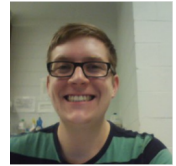




# Brett Tregoning

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## Education

- 2016 – . . . .  **Georgia Institute of Technology** School of Physics.  
**Ph.D. (expected December 2021)**, President's Fellow
- 2012 – 2016  **Vanderbilt University**  
**Bachelor of Arts-Physics** with Highest Honors  
Thesis title: *Ps<sub>2</sub>- in a magnetic field : structure and stability in the M=0 state.*  
**Bachelor of Arts-Mathematics**

## Research Publications

### Publications

- 1 **Tregoning, B.**, & Stewart, S. G. (2014). Predicting navigational error of visual binary stars. *Naval Engineering Journal*, 126.4, 169–172.  
[https://my.vanderbilt.edu/susanstewart/files/2015/05/Stewart\\_DEC2014.pdf](https://my.vanderbilt.edu/susanstewart/files/2015/05/Stewart_DEC2014.pdf)

### Theses

- 1 **Tregoning, B.** (2016). *Ps<sub>2</sub>- in a magnetic field : Structure and stability in the m=0 state.*  
<http://hdl.handle.net/1803/7562>

### Conference Proceedings and Talks

- 1 Schatz, M., **Tregoning, B.**, Barnett, J., Yoda, M., & Grigoriev, R. (2019). Experimental Study of Roll-Hydrothermal Wave Coexistence in Convection Driven by Buoyancy and Thermocapillarity, In *72nd Annual Meeting of the APS Division of Fluid Dynamics (APS DFD 2019)*, Seattle, Washington, USA.  
<https://meetings.aps.org/Meeting/DFD19/Session/S08.3>
- 2 **Tregoning, B.**, Mukherjee, S., Levanger, R., Cyranka, J., Mischaikow, K., Paul, M., & Schatz, M. (2019). Characterizing Spatiotemporal Dynamics in Fluid Flows using Persistent Homology, In *Invited Seminar at Los Alamos National Labs*, Los Alamos, New Mexico, USA.
- 3 **Tregoning, B.**, Mukherjee, S., Levanger, R., Xu, M., Cyranka, J., Mischaikow, K., Paul, M., & Schatz, M. (2019). Using Persistent Homology to Compare Chaotic Dynamics Between Experiments on and Simulations of Rayleigh-Bénard Convection, In *72nd Annual Meeting of the APS Division of Fluid Dynamics (APS DFD 2019)*, Seattle, Washington, USA.  
<https://meetings.aps.org/Meeting/DFD19/Session/G14.4>
- 4 **Tregoning, B.**, Levanger, R., Cyranka, J., Mukherjee, S., Paul, M., Mischaikow, K., & Schatz, M. (2018). Using topology to identify large Lyapunov vector magnitude in Rayleigh-Bénard convection, In *71st Annual Meeting of the APS Division of Fluid Dynamics (APS DFD 2018)*, Atlanta, Georgia, USA.  
<http://meetings.aps.org/Meeting/DFD18/Session/G33.5>

## Research Experience

Schatz Lab, Georgia Institute of Technology, School of Physics, Center for Non-linear Science

*Advisors: Michael Schatz and Roman Grigoriev, 2016 – . . . .*

- Uses topological data analysis to study spatio-temporally chaotic fluid flows.
- Predicts the evolution of dynamical systems using machine learning.
- Detects exact coherent structures in dynamical systems using persistent homology.

#### **Varga Group, Vanderbilt University, Physics Department**

*Advisor: Kalman Varga, 2015*

- Studied quantum few-body problems.
- Calculated stability of positron-electron systems using a variational method.

#### **United States Naval Observatory**

*Advisor: Susan G. Stewart, 2014*

- Studied navigational astronomy.
- Quantified visual navigational error of binary star systems.
- Studied weather effects on sky visibility.

#### **Bolotin Group, Vanderbilt University, Physics Department**

*Advisor: Kirill Bolotin, 2013 – 2014*

- Studied experimental condensed matter physics.
- Gained experience exfoliating graphene.
- Gained clean-room training and experience.

## **Employment History**

2016 – . . . .	■ <b>Graduate Student Researcher</b> , Georgia Institute of Technology, School of Physics, Center for Non-linear Science.
2014 – 2016	■ <b>Tutor</b> , Vanderbilt Physics Department.
2015 Summer	■ <b>Undergraduate Research Assistant</b> , National Science Foundation International Research Experiences for Students, McGill University.
2014 Summer	■ <b>Undergraduate Research Assistant</b> , United States Naval Observatory.

## **Skills**

Languages	■ English (fluent), Spanish (comprehension)
Coding	■ Python, MATLAB, Latex, R, C, C++
Scientific	■ Fluid Mechanics, Dynamical Systems, Topological Data Analysis, Machine Learning, Network Science, Data Science, Numerical Methods
Misc.	■ Teaching, tutoring, academic research, academic mentoring

## **Leadership Experience**

2020 – . . . .	■ <b>Diversity, Equity, and Inclusion Task Force</b> , Georgia Tech School of Physics
2015 – 2016	■ <b>Music Director</b> , WRVU Vanderbilt College Radio
2014 – 2016	■ <b>President</b> , Vanderbilt Quiz Bowl
2013 – 2015	■ <b>Secretary</b> , Vanderbilt Society of Physics Students

## Awards and Honors

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|----------------|---|
| 2016           | ■ <b>President's Fellow</b> , Georgia Institute of Technology.                            |
|                | ■ <b>Highest Honors</b> , Vanderbilt University Physics Department.                       |
| 2012,2014,2016 | ■ <b>Dean's List</b> , Vanderbilt University.   |
| 2014           | ■ <b>Sigma Pi Sigma Physics Honor Society</b> , Vanderbilt University Physics Department. |

## References

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Available on Request