Jennifer K Briggs

Ph.D. Bioengineering Candidate University of Colorado Denver | Anschutz Medical Campus

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About Me

I am an NSF Graduate Research Fellow and 3rd year Ph.D. candidate at the University of Colorado Anschutz Medical Campus | Department of Bioengineering. My research interests is in applying novel computational tools from complexity science and non-linear dynamics and data assimilation to advance medical physiology. My physiological specialties are cerebral vascular blood flow for traumatic brain injury and stroke patients and islet pathophysiology in diabetes.

Education

University of Colorado Anschutz — *Aurora, Co*

Bioengineering Ph.D. Candidate — *2020-Present*

- Advised by Dr. David Albers (Ph.D Physcis) and Dr. Richard Benninger (Ph.D. Physics)
- **GPA:** 4.0
- **Relevant Classes:** Network Analysis and Modeling - Dr. Aaron Clauset; Data Science and Analysis of Time-Dependent Biomedcical Data - Dr. David Albers; Complex Systems Methods - Dr. Allison Goodwell; Numerical and Analytical Methods of Engineering - Dr(s). Vitaly Kheyfets and Melike Sirlanci; Random Processes for Engineers - Dr. Alireza Vahid

Sante Fe Institute — *Sante Fe, NM*

Complexity Systems Summer School — *2022*

- Month long intensitve education on state of the art Complexity Science
- **Projects:** Transmission dynamics under spatially clustered immunity, Chaos and Control Reading Group

Pepperdine University — *Malibu, CA*

Double Major: Bachelor of Science in Physics and Sports Medicine **minor**: Applied mathematics — *2016-2020*

- **GPA:** 3.9/4.0, *Suma Cum Laude*
- **Notable awards**: Natural Science Student of the Year, Physics Student of the Year, Edison Achievement Scholarship, Faculty and Staff Scholarship, Pepperdine Grant, Rosemarry Raitt Endowed Scholarship, Natural Science Award

Fellowships

2021-2025 **National Science Graduate Research Fellowship,** Physics of Living Systems

2022-2026 **Special Interest Group of High Power Computing Fellow,** Association of Computational Machinery

2020-2025 **Bioengineering Fellowship,** University of Colorado | Anschutz Medcial Campus

2020-2025 **Werner and Kitty Hirs Fellowship,** University of Colorado | Anschutz Medcial Campus

Research Experience (publications below)

Computational Methods and Complexity Science ot Aid in Clinical Decision Making and Advance Biomedicine — *University of Colorado Anschutz, Aurora, Co*

Departments of Bioengineering and Biomedical Informatics — *2020-Present*

- Additional Mentors: Tellen Bennet M.D., Jane Resuch M.D., Melike Sirlanci Ph.D., Soojin Park M.D.
- Research to improve clinical decision support for treatment of stroke and traumatic brain injury coupling a novel physiological informed cerebral hemodynamics model with data assimilation and time series analysis.
- Investigating mechanisms underlying cellular communication and blood flow in diabetes using network theory

Heliospheric Research Intern — *Greenbelt, Maryland*

NASA Goddard, Code 674 — *2019*

- Through Big data analysis techniques, discovered a never documented phenomenon in the dayside ionosphere and corresponding magnetospheric signatures.
- Manipulated, graphed, and analyzed data using IDl and Python

Publications

• **Briggs, J. K.,** Schonblum, A., Landsman, L., & Benninger, R. K. (2022). Going With the Flow: Pericyte-Regulated Islet Blood Flow Influences Glucose Homeostasis. Diabetes, 71(8), 1611-1613.

• **Briggs, J. K.,** Kravets, V., Dwulet, J. M., & Benninger, R. K. (2022). What do Functional Synchronization Networks Indicate About Underlying Structure and System Dynamics? A network theory study in the islet. bioRxiv.

• **Briggs, J. K.,** Stroh, J. N., Bennett, T. D., Park, S., & Albers, D. J. (2022). Integration of Clinical, Biological, and Computational Perspectives to Support Cerebral Autoregulatory Informed Clinical Decision Making Decomposing Cerebral Autoregulation using Mechanistic Timescales to Support Clinical Decision-Making. arXiv preprint arXiv:2202.03886.

• Adams, M. T., Dwulet, J. M., **Briggs, J. K.,** Reissaus, C. A., Jin, E., Szulczewski, J. M., ... & Blum, B. (2021). Reduced synchroneity of intra-islet Ca2+ oscillations in vivo in Robo-deficient β cells. Elife, 10, e61308.

• Dwulet, J. M., **Briggs, J. K.,** & Benninger, R. K. (2021). Small subpopulations of β-cells do not drive islet oscillatory [Ca2+] dynamics via gap junction communication. PLoS computational biology, 17(5), e1008948.

• **Briggs, J. K.,** Fasel, G. J., Silveira, M., Sibeck, D. G., Lin, Y., & Sigernes, F. (2020). Dayside auroral observation resulting from a rapid localized compression of the Earth's magnetic field. Geophysical Research Letters, 47(19), e2020GL088995.

Conferences

European Association for the Study of Diabetes Annual Meeting	**Briggs, K. J.**, Kravets, K., Dwulet, J.M., Albers, D.J., Benninger, R. K. (2022, September). Quantifying the relationship between emergent islet function, gap junctions, and beta cell dynamics: a network theory approach **Travel Grant Recipient**
Biophysical Society Annual Meeting	**Briggs, K. J.**, Kravets, K., Dwulet, J.M., Benninger, R. K. (2022, February). Probing the Relationship Between Functional And Structural Networks in the Pancreatic Islet.
Biophysical Society Annual Meeting	Dwulet, J.M., **Briggs, K. J.**, Benninger, R. K. (2022, February). The role of highly functional β-cell subpopulations in the multicellular islet.
American Geophysical Union Fall Conference	**Lau, J.**, et al. (2019, December). Ionospheric Response to a Transient Event at the Magnetopause.
American Geophysical Union Fall Conference	Fasel, G.J., **et al.** (2019, December). East-West Brightening in Poleward-Moving Auroral Forms and the Interplanetary Magnetic Field By -Component.
American Geophysical Union Fall Conference	Butler, K., **et al.** (2019, December). Dayside Auroral Oval Shifts Due to Enhanced Solar Wind Dynamic Pressure.
American Geophysical Union Fall Conference	Mann, J.C., **et al**. (2019, December). Dayside Auroral Oval Shifts Due to Enhanced Solar Wind Dynamic Pressure.
American Geophysical Union Fall Conference	Fasel,G.J., **et al.** (2017, December). What Solar Wind Conditions Produce Poleward Moving Auroral Forms?

Additional Experience

University of Colorado Anschutz — *Aurora, Co*
Teaching Assistant: Machine Learning and Analytical Methods — *2022-2023*

University of Colorado Anschutz — *Aurora, Co*
Member of Department of Biomedical Informatics Educational Committee — *2022-2023*

University of Colorado Denver Bioengineering Empowerment Program — *Aurora, Co*
Guest Lecturer — *2021-2022*

- Provided guest lectures on informatics and the scientific process to underprivaledged and underrepresented high school student

Clear Direction Mentoring — *Aurora, Co*
STEM Mentor for underrepresented, underprivileged high schoolers — *2021-2022*

Self Employed — *Malibu, Ca*
Physics, Mathematics, and Physiology Tutor — *2017-2020*

Pepperdine University — *Malibu, Ca*
Pepperdine Physics Club President — *2018-2020*

- Organized, planned and executed large events with emphasis on enhancing community and sharing science with public
- Applied for grants and apprehend funding to hold events

Mission at Natuvu Creek — *Vanua Levu, Fiji*
Medical and Educational Volunteer — *June 2018*

- Diagnosed and treated medical and dental needs for 100 citizens of Vanua Levu, Fiji
- Taught astronomy, math, and physics a class of high school students

Pepperdine University — *Malibu, Ca*
Spiritual Life Resident Advisor (On-Call) — *2017–2018*

Emily Shane Foundation in partnership with the boys and girls club — *Malibu, Ca*
Academic mentor for low income students — *2017*

Press

- 2022 ACM SIGHPC Computational and Data Science Fellowship Winners
- Briggs receives NSF Graduate Research Fellowship
- American Geophysical Union 'Postcards from the edge of space: New images, new phenomena, and new insights.' AGU Press Release

10 Dec. 2019 Forbes, Business Insider, NASA