# Benjamin W. McInroe

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| CONTACT INFORMATION | Email: bmcinroe at berkeley dot edu  Web: benmcinroe.com |
| RESEARCH INTERESTS | biophysics, biomechanics, robotics, nonlinear dynamics, soft matter |

EDUCATION

**University of California, Berkeley**, Berkeley, CA

Ph.D. Biophysics, *expected*
- Advisors: Robert J. Full, Ph.D. and Ronald Fearing, Ph.D.

**Georgia Institute of Technology**, Atlanta, GA

B.S. Physics, Highest Honors, *May 2015*
- Minor - Mathematics
- GPA - 3.95/4.00
- Thesis: *Physical and Robotic Modeling of the Evolution of Legged Locomotion on Land*
- Advisor: Daniel I. Goldman, Ph.D.

RESEARCH EXPERIENCE

**Graduate Research Assistant**  Sep 2015 to present
Biophysics Graduate Group, UC Berkeley
PolyPEDAL and Biomimetic Millisystems Labs

**Undergraduate Research Assistant**  Mar 2014
School of Physics, Georgia Institute of Technology
Advisor: Predrag Cvitanovic, Ph.D
Periodic orbit theory formulation of linear response

**Undergraduate Research Assistant**  Dec 2012 to Aug 2015
School of Physics, Georgia Institute of Technology
Advisor: Daniel I. Goldman, Ph.D
Physical principles behind evolution of terrestrial locomotion

**Undergraduate Research Assistant**  May 2012 to Aug 2012
School of Physics, Georgia Institute of Technology
Advisor: Harold Kim, Ph.D
Autofocus for fluorescence microscopy of yeast

PUBLICATIONS

1. **McInroe, B.**, Cvitanovic, P. "Periodic orbit theory of linear response." 2016. (in prep)

2. **McInroe, B.** "Consider the cockroach: synthesis of biological and robotic studies elucidate the mechanisms of robust terrestrial locomotion." The Tower (GT Undergraduate Research Journal), 2016.

3. **McInroe, B.**, Astley, H., Gong, C., Kawano, S., Schiebel, P., Rieser, J., Choset, H., Blob, R., and Goldman, D. "Tail use improves soft substrate performance in models of early land locomotors.", Science, 2016

4. Aguilar, J., Jin, D., Gong, C., Kingsbury, M., Li, C., Maladen, R., Mazouchova, N., **McInroe, B.**, Qian, F., Zhang, T., Choset, H., Umbanhowar, P., and Goldman, D.I. "Robophysics: the science of moving systems at the intersection of dynamical systems, soft matter, and robots.", Reports on Progress in Physics, 2015.

5. **McInroe, B.**, Goldman, D.I. "Biological and robotic modeling of the evolution of legged locomotion." (Undergraduate Thesis)

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| Awards/<br>Honors | **NDSEG Fellowship (Physics) - Awarded**<br>• $102,000 support for 3 years | Apr 2016 |
| | John and Fannie Hertz Foundation Fellowship - Finalist | Apr 2016 |
| | NSF Graduate Research Fellowship (Physics) - Honorable Mention | Apr 2016 |
| | Georgia Tech H. Fukuyo Outstanding Physics Undergraduate Award<br>• Given to the most outstanding academic undergraduate student<br>in the school of physics | Mar 2015 |
| | Roger M. Wartell and Stephen E. Brossette Award for Multidisciplinary<br>Studies in Biology, Physics, and Mathematics | Mar 2015 |
| | Georgia Tech PURA Travel Award<br>• $1000 travel grant to present research poster at iPOLS 2014<br>meeting in Munich, Germany | July 2014 |
| | Georgia Tech UROP MS&T Research Grant<br>• $800 materials grant for thesis project | May 2014 |
| | Georgia Tech UROP Spring Symposium Competition<br>• First Place Oral Presentation, College of Sciences<br>• Presentation on Thesis Project | Apr 2014 |
| | Hope/Zell Miller Scholarship<br>• Full Tuition Scholarship | Aug 2011-May 2014 |
| | Georgia Tech Honors Program<br>• Student in Georgia Tech Honors Program | Aug 2011 |
| | University of West Georgia Freshman of the Year<br>• Earned as dual-enrolled high school student | May 2011 |
| | University of West Georgia Presidential Scholarship<br>• Earned as dual-enrolled high school student | Aug 2010 |
| Presentations | SICB Annual Meeting, San Francisco, CA<br>• Poster Presentation, Division of Biomechanics | Jan 2018 |
| | Bay Area Robotics Symposium, Berkeley, CA<br>• Spotlight talk and Poster | Oct 2017 |
| | APS March Meeting, Baltimore, MD<br>• Oral presentation, Robophysics session | Mar 2016 |
| | SICB Annual Meeting, Portland, OR<br>• Oral presentation | Jan 2016 |
| | Bay Area Robotics Symposium, Berkeley, CA<br>• Spotlight talk and Poster | Oct 2015 |
| | Berkeley Biophysics Group Symposium, Tomales Bay, CA<br>• Oral Presentation | Oct 2015 |
| | APS March Meeting, San Antonio, TX<br>• Oral Presentation, Physics of Behavior Session | Mar 2015 |
| | SICB Annual Meeting, West Palm Beach, FL<br>• Oral Presentation, Division of Biomechanics | Jan 2015 |

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| | NSF iPoLS Student Network Meeting, Munich, Germany | Jul 2014 |
| | • Poster Presentation | |
| | GT UROP Spring Symposium, Atlanta, GA | Apr 2014 |
| | • First place oral presentation, College of Sciences | |
| | APS March Meeting, Denver, CO | Mar 2014 |
| | • Oral Presentation, Physics of Behavior I Session | |
| | GT PoLS Lunch& Learn Internal Colloquium, Atlanta, GA | Feb 2014 |
| | • Oral Presentation | |
| | SICB Annual Meeting, Austin, TX | Jan 2014 |
| | • Poster Presentation, Division of Biomechanics | |
| | Regional SICB Meeting, Atlanta, GA | Sep 2013 |
| | • Oral Presentation | |
| TEACHING EXPERIENCE | Bioinspired Design (IB 32, UC Berkeley) | Spring 2017 |
| | • Graduate Student Instructor | |
| | Seminar in Biomechanics (IB 232, UC Berkeley) | Fall 2015-present |
| | • Guest Speaker | |
| | Introduction to Robotics (EE 106/206A, UC Berkeley) | Fall 2017 |
| | • Guest Lecturer | |
| | • Lecture Title: 'Sensing and Actuation in Soft Robots' | |
| OUTREACH | Berkeley Language Exchange Program | 2015-present |
| | • English and Chinese (Mandarin) | |
| | Bay Area Scientists in Schools | 2015-2016 |
| | • Development of lesson plan for elementary school students | |
| ACADEMIC SERVICE | Biophysics Graduate Group Executive Committee | |
| | • Junior Student Member | 2016-2017 |
| | • Senior Student Member | 2017-present |
| | UC Berkeley Graduate Student Assembly | 2017-present |
| | • Biophysics Alternate Delegate | |
| REVIEWER SERVICE | Advanced Robotics | 2017-present |
| | IEEE International Conference on Soft Robotics | 2017-present |
| PROFESSIONAL MEMBERSHIPS | Member, American Physical Society | 2013-present |
| | Member, Society of Integrative and Comparative Biology | 2013-present |
| | • Divisions of Biomechanics, Neurobiology, and Vertebrate Morphology | |
| | Graduate Student Member, IEEE | 2017-present |
| SKILLS | Software/Programming Skills | |
| | • Python (including NumPy, SciPy), MATLAB, C, C++, LabView (including NI Vision), SolidWorks, Embedded Programming (Arduino, mbed), OpenCV, GNU Make, Git | |

Hardware Skills
- Robotics, experimental physics, control systems, machine design, electronics, digital fabrication, computer vision, pneumatics
- Some experience with fluorescence, STM microscopy

Languages
- English - Native
- Chinese (Mandarin) - Professional Working Proficiency

Other
- Sketching, Painting (watercolor, gouache)
- Classical Guitar (10+ years, 3 years formal training)