

MICHAEL C. HOLCOMB

Texas Tech University
Dept. of Physics and Astronomy – MS 1051
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EDUCATION

May 2019 (expected)	Ph.D. in Physics (ABD) – Texas Tech University Proposed Dissertation: Coordination of the Early Morphogenetic Movements of Drosophila Gastrulation through Mechanical Feedback Advisor: Dr. Jerzy Blawdziewicz	Lubbock, Texas
Dec. 2013	M.S. in Physics – Texas Tech University	Lubbock, Texas
May 2012	B.A. Double Major: Mathematics, Physics – Austin College	Sherman, Texas

SPECIALIZATION

Theoretical Soft Condensed Matter (Biophysics)

TEACHING EXPERIENCE

2014 – present	Graduate Part-Time Instructor – Texas Tech University Teach lecture session(s) as the instructor of record. Assignments vary dependent on need as decided upon by the chair of the department. Physics, Traditional Lecture Sections: Algebra Based, 1st Semester: Summer I 2018 Algebra Based, 2nd Semester: Summer II 2016, Fall 2016, Spring 2018 Calculus Based, 1st Semester: Fall 2014, Spring 2015, Summer II 2015 Calculus Based, 2nd Semester: Spring 2014, Summer II 2014 Physics, Inquiry-Based Lecture Sections: Algebra Based, 1st Semester: Spring 2017, Fall 2017 Algebra Based, 2nd Semester: Spring 2016 Freshman Seminar: Fall 2017	Lubbock, Texas
2012 – 2017	Graduate Teaching Assistant – Texas Tech University Teach laboratory and recitation sessions in conjunction with lecture sessions as assigned by the Undergraduate Laboratory Coordinator. Physics, Traditional Laboratory Sections: Calculus Based, 1st Semester: Summer II 2012, Summer II 2013 Optics, Junior Level Course: Fall 2015 Physics, Traditional Discussion Sections: Calculus Based, 1st Semester: Summer II 2012 Physics, Inquiry Laboratory Sections: Algebra Based, 1st Semester: Fall 2012, Summer II 2017	Lubbock, Texas

Astronomy:

Solar System: Spring 2013, Fall 2013

Stellar: Fall 2013

2010 – 2013 Owner/Tutor – ELE Tutoring Sherman, TX; Lubbock, Texas
 Tutor primary, secondary, and higher education students in mathematics, physics, clarinet performance, and other subjects.

CURRICULUM DEVELOPMENT

2017 Graduate Part-Time Instructor – Texas Tech University Lubbock, Texas
 Update, revise, and expand existing algebra-based physics manuals used in the inquiry-based lecture sections. Work collaboratively with other lecturers and PER faculty to develop training techniques for both graduate and undergraduate teaching assistants.

2013 TEACH Program Fellow – Texas Tech University Lubbock, Texas
 The Teaching Effectiveness And Career enHancement (TEACH) Program is a competitive year-long fellowship through the Teaching, Learning, & Professional Development Center. The program assists fellows in developing teaching skills through one-on-one meetings with pedagogical development consultants, instructor videotaping, comprehensive class feedback, peer observations, project work, and workshop attendance.

RESEARCH EXPERIENCE

2013 – present Graduate Student Research Assistant – Texas Tech University Lubbock, Texas
 Dr. Jerzy Blawdziewicz, Department of Mechanical Engineering (Joint Appointment, Department of Physics and Astronomy); Soft Matter and Complex Fluids Group
 Model the gastrulation of a *Drosophila melanogaster* embryo through implementation of mechanical feedback loops in a computer simulation written in Fortran90.

2011 Undergraduate Student Research Assistant – Austin College Sherman, Texas
 Dr. David Baker, Department of Physics; Advanced Physics Research Experience
 Evaluate the performance of the Austin College weather station's CS616 Water Content Reflectometer and discern a solution which alleviates the known issue of unreliable data.

2010 Undergraduate Student Research Assistant – Austin College Sherman, Texas
 Dr. Andra Troncalli, Department of Physics; Physics Research Experience
 Study the high temperature Type II superconductor Yttrium Barium Copper Oxide ($\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$) while gaining exposure to basic laboratory techniques and practices.

2009 Undergraduate Student Research Assistant – Austin College Sherman, Texas
 Dr. Karla McCain, Department of Chemistry; JanTerm Chemistry Research Experience
 Study the relationship between concentration and diffusion rate of Organogels composed of C_6C_{12} networks.

PROFESSIONAL SERVICE

2017	RaiderReady Mentor – Texas Tech University Serve as a faculty mentor for first-generation and high-risk first-semester students.	Lubbock, Texas
2016 – present	Sigma Pi Sigma Chapter President – Texas Tech University Coordinate volunteer efforts for outreach events, such as the South Plains Regional Science and Engineering Fair. Work with departmental advisors to review undergraduate and graduate students for induction eligibility. Plan and coordinate annual induction ceremony. Developed, planned, and supervised TTU Department of Physics and Astronomy's First Annual Graduate Student Poster Competition.	Lubbock, Texas
2016	Grade Appeal Committee Member – Texas Tech University Serve with other faculty members to review, investigate, and suggest response to student initiated grade appeals filed with the Dean of the College of Arts and Sciences.	Lubbock, Texas
2014 – present	Discussion Coordinator and TA Trainer – Texas Tech University Traditional Laboratory and Discussion Sections: Meet with graduate teaching assistants (TAs) once a week to prepare them for the upcoming week. Develop mini-lectures, assignments, and exercises (to be implemented by graduate TAs) for discussion sections that cover material relevant across multiple lecture sections. Inquiry-Based Sections: Meet with graduate and undergraduate TAs once a week to prepare them for the upcoming week. Work with them to reinforce content knowledge and develop their pedagogical content knowledge.	Lubbock, Texas

VOLUNTEER SERVICE

2017 – present	Judge, Setup Volunteer – South Plains Regional Science & Engineering Fair Coordinated the volunteer efforts from Sigma Pi Sigma, volunteered time to help set up the science fair, and judged elementary and 5th grade science fair projects.	Lubbock, Texas
2018	Judge – Legacy Elementary School Science Fair Coordinated the volunteer efforts from Sigma Pi Sigma and judged 4th and 5th grade science fair projects.	Lubbock, Texas
2018	Judge – Roscoe Wilson Elementary School Science Fair Coordinated the volunteer efforts from Sigma Pi Sigma. Judged 3rd and 2nd grade science fair projects, and Judged as a tie-breaker for 4th grade projects.	Lubbock, Texas
2018	Judge – 17th Annual Graduate Research Poster Competition Judged graduate student posters in the category of Visual and Performing Arts.	Lubbock, Texas

PUBLICATIONS

G.-J.J. Gao, **M.C. Holcomb**, J.H. Thomas, and J. Blawdziewicz. Embryo as an active granular fluid: stress-coordinated cellular constriction chains. *J. Phys. Condens. Matter*, 28(41), 2016

INVITED PRESENTATIONS

“Cellular harmonization during embryonic development: how do cells coordinate mechanical activity?” Trinity University Physics Department Seminar, San Antonio, Texas, November 28, 2017

CONFERENCE PRESENTATIONS

M.C. Holcomb, G.-J.J. Gao, M. Servati, J.H. Thomas, and J. Blawdziewicz. Mechanical Feedback during Ventral Furrow Formation in *Drosophila*: Intercellular Coordination and Robustness. Control ID 2883723. APS March Meeting 2018, Los Angeles, California, March 5-9, 2018

M.C. Holcomb, G.-J.J. Gao, J.H. Thomas, and J. Blawdziewicz. Mechanical Feedback in the *Drosophila melanogaster* Embryo: Robustness and Intercellular Coordination. Abstract no. K4.00004. Joint Fall 2017 Meeting of the Texas Section of the APS, Texas Section of the AAPT, and Zone 13 of the Society of Physics Students, Richardson, Texas, October 20-21, 2017

M.C. Holcomb, G.-J.J. Gao, J.H. Thomas, and J. Blawdziewicz. Embryo as an active granular fluid: stress-coordinated cellular constriction chains. Abstract no. D30.00002. 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, Oregon, November 20-22, 2016

M.C. Holcomb, G.-J.J. Gao, J.H. Thomas, and J. Blawdziewicz. *Drosophila melanogaster* Embryo as an Active Granular Fluid: Intercellular Coordination via Mechanical Feedback during Morphogenesis. Abstract no. 230ao. AIChE Annual Meeting, San Francisco, California, November 13-18, 2016

RESEARCH COMPETITION PRESENTATIONS

M.C. Holcomb, G.-J.J. Gao, J.H. Thomas, and J. Blawdziewicz. Mechanical Feedback in the *Drosophila melanogaster* Embryo: Robustness and Intercellular Coordination. Department of Physics and Astronomy Graduate Student Poster Competition, Texas Tech University, Lubbock, Texas, October 16, 2017

M.C. Holcomb, G.-J.J. Gao, J.H. Thomas, and J. Blawdziewicz. Mechanical Feedback in the *Drosophila melanogaster* Embryo: Robustness and Intercellular Coordination. MEGA 3 Minute Presentation Competition, Texas Tech University, Lubbock, Texas, April 20, 2017

M.C. Holcomb, G.-J.J. Gao, J.H. Thomas, and J. Blawdziewicz. Mechanical Feedback in the *Drosophila melanogaster* Embryo: Robustness and Intercellular Coordination. Graduate Student Research Poster Competition, Texas Tech University, Lubbock, Texas, March 24, 2017

M.C. Holcomb, G.-J.J. Gao, J.H. Thomas, and J. Blawdziewicz. Intercellular Coordination via Mechanical Feedback during Ventral Furrow Formation in the *Drosophila melanogaster* Embryo. MEGA Poster Competition, Texas Tech University, Lubbock, Texas, April 28, 2016

AWARDS & HONORS

- 2018 Doctoral Dissertation Completion Fellowship, Texas Tech University Graduate School
- 2018 Summer Thesis/Dissertation Research Award, Texas Tech University Office of the Vice Provost
- 2018 Bucy Graduate Scholarship in Applied Physics, Texas Tech University Department of Physics and Astronomy
- 2017 2nd Place – Department of Physics and Astronomy Graduate Student Poster Competition, Texas Tech University

- 2017 2nd Place – Mechanical Engineering Graduate Student Association (MEGA) 3 Minute Presentation Competition, Texas Tech University
- 2017 Bucy Graduate Scholarship in Physics, Texas Tech University Department of Physics
- 2017 2nd Place – TTU Graduate Student Research Poster Competition, Mathematics & Physics division
- 2016 American Physical Society Division of Fluid Dynamics Travel Grant
- 2016 Bucy Graduate Scholarship in Physics, Texas Tech University Department of Physics
- 2016 2nd Place – Mechanical Engineering Graduate Student Association (MEGA) Poster Competition, Texas Tech University
- 2015 Bucy Graduate Scholarship in Physics, Texas Tech University Department of Physics
- 2014 Hazelwood Memorial Graduate Fellowship, Texas Tech University Graduate School
- 2014 Bucy Graduate Scholarship in Applied Physics, Texas Tech University Department of Physics
- 2013 TEACH Program Fellow, Texas Tech University TLPDC
- 2013 David Howe Graduate Fellowship in Physics, Texas Tech University Department of Physics
- 2012 Sigma Pi Sigma, Physics National Honor Society

ADDITIONAL SKILLS & EXPERIENCE

Academic & Teaching

Academic event planning
Instructor of record for 24-60 student sections (inquiry-based)
Instructor of record for 20-200 student sections (traditional)
Lab TA for 6-60 student sections
Mentoring first-year graduate students and junior lab-mates
One-on-one and small group tutoring
Proposal writing for federal (NSF, NIH) and private (KECK Foundation) funding sources
Research advisor for non-STEM undergraduate students
Undergraduate student mentoring

Programming & Computers

Bash shell scripts
Fortran90 based computer programming
Gnuplot scripts
Image editing and figure generation software: GIMP, Inkscape, and Fresh Paint
Java based computer programming
NI LabVIEW programming
Office productivity software: Microsoft Office, OpenOffice
Operating systems: Microsoft Windows, Scientific Linux, Debian

Equipment

National Instruments interface, and related data acquisition equipment
Pasco introductory physics lab equipment
Power, air, and hand tool proficiency
Thor Labs optical tables, lenses, filters, sources, and related interfacing equipment
Vernier LabPro and LabQuest interfaces, Logger Pro, and related data acquisition equipment

Medical

Medical terminology proficiency
Medical Response Emergency System (MRES) Computer Aided Dispatch (CAD)
Previous completion of GEMS, PEPP, and AHA healthcare provider (CPR and AED) education
Previous completion of EMT-Basic education including Weapons of Mass Destruction response safety
Sterile technique and body substance isolation precautions