

W. Tyler McCleery

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| Education | John Innes Centre | Postdoctoral Fellow, Systems Biology | 2015-2017 |
| | Vanderbilt University | Ph.D., Physics | 2012-2016 |
| | <i>Dissertation:</i> Pulling Through: A Biomechanical Analysis of Normal and Aberrant Embryogenesis in <i>Drosophila</i> | | <i>Defense:</i> Sept. 2015 |
| | <i>Mentor:</i> Dr. M. Shane Hutson | | |
| | Vanderbilt University | M.A., Physics | 2010-2012 |
| | University of Southern Mississippi | B.S., Physics and Mathematics | 2006-2010 |
| | <i>Honors Thesis:</i> Analysis of the Motion of a Falling Maple Seed (<i>Acer species</i>) | | |
| | <i>Mentor:</i> Dr. Lawrence Mead | | |
| Career | Assistant Professor, Physics, University of South Alabama | | 2017-Present |
| Publication and Presentation Highlights | <i>Refereed Journal Articles</i> | | |
| | 1. S.M. Crews*, W.T. McCleery* , M.S. Hutson “Pathway to a phenocopy: Heat stress effects in early embryogenesis.” <i>Developmental Dynamics</i> , 245: 402-413, 2016. (*equal effort and authorship) | | |
| | 2. Yan, Y., Jiang, L., Aufderheide, K.J., Wright, G., Terekhov, A., Costa, L., Qin, K., McCleery, W.T. , Fellenstein, J.J., Ustione, A., Robertson, B., Johnson, C.H., Piston, D., Hutson, M.S., Wiksw, J.P., Hofmeister, W., Janetopoulos, C. “A Microfluidic-Enabled Mechanical Microcompressor for the Immobilization of Live Single- and Multi-Cellular Specimens.” <i>Microscopy and Microanalysis</i> , 20: 141–151, 2014. | | |
| | <i>Refereed Review Articles</i> | | |
| | 3. W.T. McCleery* , N.A. Mohd-Radzmann*, V.A. Grieneisen. “Root Branching Plasticity: Collective Decision-Making Results from Local and Global Signalling.” <i>Current Opinion in Cell Biology</i> , 44: 51–58, 2017. (*equal effort and authorship; invited for special issue) | | |
| | <i>Invited Presentations</i> | | |
| | 4. W.T. McCleery . “Collective Cellular Decision-Making: A Physical Analysis of Development in <i>Drosophila</i> and <i>Arabidopsis</i> .” <i>Department of Biology Colloquium</i> , U. South Alabama. March 2018. | | |
| | 5. W.T. McCleery , Pedagogical Lecture and Practical Demonstration, <i>EMBO Practical Course: Multi-level Modelling of Morphogenesis</i> . John Innes Centre, Norwich, UK, July 2017. | | |
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| Research Grants | “Development of a Low-Cost Micro-Environment Device for Root-Nutrient Interaction” OpenPlant Fund Principal Applicant: W. Tyler McCleery ; Co-applicants: Ziyi Yu and Zhijun Meng, University of Cambridge, Cambridge, UK; and Veronica A. Grieneisen, John Innes Centre, Norwich, UK Total Costs: £5000 (\$6350); Period of Award: Dec. 2016 – Dec. 2017 | | |
| Fellowships & Honors | <ul style="list-style-type: none"> • National Science Foundation Graduate Research Fellowship (\$92,000 + Tuition), 2010-2015 • Harold Stirling Vanderbilt Graduate Scholarship (\$6000), Vanderbilt University, 2010-2015 • <i>summa cum laude</i>, University of Southern Mississippi, 2010 • Society of Physics Student Leadership Scholarship (\$3000), 2009 • Barry Goldwater Scholarship, <i>Honorable Mention</i>, 2008 • Presidential Scholarship (Full Tuition, Room and Board), Univ. of Southern Mississippi, 2006-2010 • Eagle Scout, <i>Silver Palm</i>, Boy Scouts of America, 2005 | | |
| Memberships & Affiliations | Member, American Physical Society (APS-Physics) | | 2013-Present |
| | Division of Biological Physics (DBIO) | | |
| | Topical Group on Physics Education Research (GPER) | | |
| | Member, British Society of Developmental Biology | | 2017-Present |

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| Research Experience | Postdoctoral Scientist, John Innes Centre, Norwich, UK Grieneisen Computational and Systems Biology Lab <ul style="list-style-type: none"> Designing and fabricating <i>in vitro</i> chip platform to modulate root environment <ul style="list-style-type: none"> Experimental Skills: microfluidic xurography and soft lithography Modeling cellular communication via local and global signaling that drives branching decisions in <i>Arabidopsis</i> plant root <ul style="list-style-type: none"> Computational Skills: reaction-diffusion systems of equations; using models to design and interpret wet lab experiments; modeling analysis Initiated collaboration with biologist to interpret experimental data, design follow-up experiments, and hypothesize and predict results | 2015-2017 |
| | Research Assistant, Vanderbilt University Hutson Biomechanical and Biophotonics Lab <ul style="list-style-type: none"> Experimentally and computationally investigated the mechanics of morphogenesis in fruit fly embryos and larvae <ul style="list-style-type: none"> Experimental Skills: live cell imaging; confocal microscopy (scanning, spinning disk, multi-photon); laser ablation/microsurgery; fly husbandry and sample preparation for embryos, larvae, and pupa; heat shock; immunofluorescence staining; soft lithography for microfluidics Computational Skills: programming in Mathematica and Python; cell-level finite element models; cellular Potts models (CompuCell3D) Assisted in construction of Single Plane Imaging Microscope for 3D <i>in vivo</i> imaging <ul style="list-style-type: none"> Experimental Skills: optical system design, selection, and alignment; mechanical system design and fabrication; microscope automation | 2010-2015 |
| | Research Experience for Undergraduates, Cornell University Ralph Lab, Center for Nanoscale Science <ul style="list-style-type: none"> Constructed a diode laser control system that successfully stabilized for ultra-low temperature confocal imaging <ul style="list-style-type: none"> Experimental Skills: soldering; electronic diagrams; analog PID control circuit | 2009 |
| | Undergraduate Thesis and Research, University of Southern Mississippi Mead Theoretical Group & Winstead Optics Lab <ul style="list-style-type: none"> Inferred relationship of seed parameters necessary for auto-rotation during free fall <ul style="list-style-type: none"> Experimental Skills: dimensional analysis; data processing and correlation Assisted in development of an optical detector of radioactivity <ul style="list-style-type: none"> Computational Skills: LabVIEW, Excel; hardware communication | 2007-2010 |
| | Assistant Professor (Instructor of Record), Physics, University of South Alabama Taught PH 201 and 202: Introduction to Physics with Calculus I and II, and PH 114: Introduction to Physics with Alg/Trig I (12 contact hours/semester) | 2017-Present |
| Teaching Experience | Blended and Online Learning Design Fellow, Center for Teaching, Vanderbilt Univ. Designed and built a 2 week learning module to enhance lecture in Introductory Physics for the Life Sciences course, conducting research on the success of the module in teaching electrostatics | 2014-2015 |
| | Scientist in the Classroom, Litton Middle School, Nashville, TN Co-taught 6 th and 8 th grade science lab with certified teacher weekly | 2013-2014 |
| | Certificate in College Teaching, Center for Teaching, Vanderbilt Univ. | 2012 |
| | Teaching Assistant, Department of Physics and Astronomy, Vanderbilt Univ. Taught and assisted curriculum development for a general physics lab for non-science majors, using an interactive, collaborative teaching strategy to engage students and encourage peer-learning | 2011-2012 |

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| Mentoring Experience | Undergraduate Students | |
| | Koray Akozbek, Biology, Research Assistant at USA | 2017-2018 |
| | Jason Creedon, Physics, Research Experience for Undergraduates at Vanderbilt | 2014 |
| | Attiyya Houston, Biomedical Engineering, SyBBURE at Vanderbilt | 2013 |
| | High School Students | |
| | Liam P., Electronics and Programming, Nuffield Research Placement at JIC | 2016 |
| Publications and Presentations | <i>Manuscripts in Preparation</i> | |
| | 6. W.T. McCleery , J. Veldhuis, M.E. Lacy, G.W. Brodland, M.S. Hutson. “Highly elongated amnioserosa cells serve as a morphological memory to drive germband retraction.” Under revision, 2018. | |
| | 7. W.T. McCleery , Z. Yu, Z. Meng, V.A. Grieneisen. “Design and Protocol for a Low-Cost Micro-Fluidic Chamber for Live Imaging of Root-Nutrient Interaction.” In preparation, 2018. | |
| | 8. W.T. McCleery , V.A. Grieneisen. “A Parsimonious Model of Local and Global Signalling Uncovers Key to Root Branching Plasticity.” In preparation, 2018. | |
| | 9. N.A. Mohd-Radzmann, W.T. McCleery , V.A. Grieneisen. “Cells Coordinate to Pattern Lateral Root Branching in Dynamic Soil Conditions.” In preparation, 2018. | |
| | <i>Conference Presentations</i> | |
| | 10. W.T. McCleery , N.A. Mohd-Radzmann, V.A. Grieneisen. “Multi-cellular Modelling of Root Development.” <i>ANTS 2016: Tenth International Conference on Swarm Intelligence</i> , Brussels, Belgium. September 2016. | |
| | 11. W.T. McCleery , J. Veldhuis, G.W. Brodland, S.M. Crews, and M.S. Hutson “Modeling the Epithelial Morphogenesis of Germ Band Retraction in Three Dimensions.” <i>American Physical Society March Meeting</i> , San Antonio, TX, March 2015. | |
| | 12. W.T. McCleery , S.M. Crews, D.N. Mashburn, J. Veldhuis, G.W. Brodland, and M.S. Hutson “3D Forward Modeling of Epithelial Morphogenesis during Germ Band Retraction.” <i>World Congress of Biomechanics</i> , Boston, MA, July 2014. | |
| | 13. W.T. McCleery , S.M. Crews, D.N. Mashburn, J. Veldhuis, G.W. Brodland, and M.S. Hutson “Finite element modeling of heat shock-induced mechanical failure in <i>Drosophila</i> amnioserosa.” <i>Southeastern Section of the American Physical Society Meeting</i> , Bowling Green, KY, November 2013. | |
| | 14. W.T. McCleery , K. Peturis, L. Mead “What goes up must go round: Analysis of a falling maple seed.” <i>Journal of the Mississippi Academy of Sciences</i> , 54:95, January 2009. | |
| | <i>Conference Posters</i> | |
| | 15. W.T. McCleery , E.C. Rericha, C.J. Brame, M.S. Hutson “BOLD Learning Module: Electrostatics for Introductory Physics for the Life Sciences.” <i>CIRTL Forum</i> , College Station, TX, April 2015. | |
| | 16. W.T. McCleery , S.M. Crews, D.N. Mashburn, J. Veldhuis, G.W. Brodland, and M.S. Hutson “Modeling the Morphogenesis of Epidermal Tissues on the Surface of a 3D Last.” <i>American Physical Society March Meeting</i> , Denver, CO, March 2014. | |
| Training | ➤ ‘Signalling Networks: From Data to Modelling’, Training Workshop, The Genome Analysis Centre, Norwich, UK | |
| | ➤ ‘Multi-level Modelling of Morphogenesis’, EMBO Practical Course, JIC, Norwich, UK | |
| | ➤ ‘Developing Multi-Scale, Multi-Cell Biological Simulations with CompuCell3D and SBW’, Joint Training Workshop, Hamner Institute for Health Sciences, Research Triangle Park, NC | |
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| Science Outreach Leadership | SwarmOrgan Representative, Fundamentals of Collective Adaptive Systems | 2016 |
| | www.focas.eu/video-sprint | |
| | Vanderbilt Student Volunteers for Science | 2011-2012 |
| | Chair, Physics Outreach Fair, Society of Physics Students (USM) | 2010 |
| | President, Society of Physics Students, USM Chapter | 2008-2009 |
| Community Leadership | Waterfront Director & Lifeguard, Rap-A-Hope Children’s Oncology Summer Camp | 2007-2014 |
| | Merit Badge Counselor, Boy Scouts of America (Troop 28 Winter Camp) | 2012-2013 |
| | President, Stage Monkeys Improvisational Comedy Troupe | 2008-2009 |