

# Chandler C. Benjamin

Texas A&M University  
School of Engineering Medicine  
1020 Holcombe Blvd, Houston, TX 77030

## EDUCATION

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2017-August	<b>Ph.D Engineering Mechanics</b> , University of Wisconsin-Madison <i>Advisor:</i> Prof. Wendy C. Crone <i>Co-Advisor:</i> Prof. Roderic S. Lakes <i>Ph.D Thesis Title:</i> Adhesion Characteristics and Swelling Response of Stimuli-Responsive Hydrogels. <i>Field:</i> Solid Mechanics
2013-Dec	<b>M.S. in Engineering Mechanics</b> , University of Wisconsin-Madison <i>Advisor:</i> Prof. Wendy C. Crone <i>Masters Thesis Title:</i> Experimental and Analytical Methods of Responsive Hydrogel Characterization. <i>Field:</i> Solid Mechanics
2011-July	<b>B.S. in Optical Physics</b> , Saginaw Valley State University <i>Advisor:</i> Prof. Alan D. Freed <i>Undergraduate Research Project:</i> Equi-biaxial characterization of animal skin.

## EMPLOYMENT

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2024-Current	<b>Assistant Professor</b> School of Engineering Medicine Texas A&M University
2018-2024	<b>Assistant Professor</b> Department of Mechanical Engineering Texas A&M University
2017-2018	<b>Assistant Research Professor</b> Department of Mechanical Engineering Texas A&M University
2011-2017	<b>Research Assistant</b> Department of Engineering Mechanics University of Wisconsin-Madison
2014-2016	<b>Adjunct Physics Instructor</b> Madison Area Technical College
2010-Summer	<b>Research Experience for Undergraduates</b> University of Wisconsin-Madison

## HONORS & AWARDS

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2015	Delta Teaching Certification: Project ( <i>Active Learning in the Physics Classroom</i> )
2012	National Science Foundation, Graduate Research Fellowship Program, (GRFP)
2011	Graduate Engineering Research Fellow, University of Wisconsin-Madison
2011	Sigma-Pi-Sigma, Society of Physics Students (SPS)
2010	Multi-Cultural Engineering Scholarship
2009	Multi-Cultural Engineering Scholarship
2008	SMART Grant, Saginaw Valley State University

## RESEARCH

	Peer-Reviewed Articles
2024	[19] Gueldner, P.H., Darvish, C.J., Chickanosky, I.K., Ahlgren, E.E., Fortunato, R., Chung, T.K., Rajagopal, K., <b>Benjamin, C.C.</b> , Maiti, S., Rajagopal, K.R. and Vorp, D.A., 2024. "Aortic tissue stiffness and tensile strength are correlated with density changes following proteolytic treatment." <i>Journal of Biomechanics</i> , 172, p.112226.
2024	[18] Yanamundra, Krishna Kaushik, <b>Chandler C. Benjamin</b> , and Kumbakonam Ramamani Rajagopal. "Flow of a colloidal solution in an orthogonal rheometer." <i>Physics of Fluids</i> 36.4 (2024).
2023	[17] Willis, J. A., Trevino, A., Nguyen, C., <b>Benjamin, C. C.</b> , & Yakovlev, V. V. (2023). Photodynamic Therapy Minimally Affects HEMA-DMAEMA Hydrogel Viscoelasticity. <i>Macromolecular Bioscience</i> , 2300124.
2023	[16] Willis, J. A., Trevino, A., Nguyen, C., <b>Benjamin, C. C.</b> , Yakovlev, V. V. Photodynamic therapy effects on hydrogel viscoelastic properties. In <i>Photonics in Dermatology and Plastic Surgery 2023</i> (Vol. 12352, pp. 91-99). SPIE.
2023	[15] Rajagopal, K. R., Myneni, M., Trevino, A., <b>Benjamin, C. C.</b> , Muthupillai, R., Rajagopal, K., Developing improved mathematical models of aortic mechanics. <i>The Journal of Thoracic and Cardiovascular Surgery</i> .
2023	[14] Kar, P., Myneni, M., Tuma, K., Rajagopal, K. R., <b>Benjamin, C. C.</b> 'Axial pulling of a neo-Hookean fiber embedded in a generalized neo-Hookean matrix.' <i>International Journal of Non-Linear Mechanics</i> , 148, 104292 .
2022	[13] Capriani, C.E., Shu, Y, Pentzer, E.B., <b>Benjamin, C.C.</b> , "Viscoelastic and Thixotropic Characterization of Paraffin/Photopolymer, Composites for Extrusion-Based Printing", <i>Accepted Aug 2022, Physics of Fluids</i>
2022	[12] Karimineghlani, P., Youssef, A. A., & <b>Benjamin, C. C.</b> , Energy dissipation in phase change salogels under shear stress. <i>Polymer</i> , 124977 (2022).
2022	[11] Darnal, A., Fisseler, M., <b>Benjamin, C. C.</b> , & Srinivasa, A. R. "An Excel-based approach for designing stepped driveshafts for mobility devices and a study of its use in a design of machine elements course." <i>Computer Applications in Engineering Education</i> (2022).
2022	[10] M. Myneni, R. L. Sridhar, K. R. Rajagopal, <b>C. C. Benjamin</b> , "Experimental Investigation of the Anisotropic Mechanical Response of the Porcine Thoracic Aorta". <i>Annals of Biomedical Engineering</i> , 1-15 (2022).
2021	[9] M. Myneni, <b>C.C. Benjamin</b> , K.R.Rajagopal, "Stress concentration factors around a circular hole in two fiber reinforced materials under large deformations." <i>Mechanics of Materials</i> (2021).
2021	[8] C.E. Cipriani, T. Ha, O.B. Martinez Defilló, M. Myneni, Y. Wang, <b>C.C. Benjamin</b> , J. Wang, E.B. Pentzer, P. Wei "Structure-Processing-Property Relationships of 3D Printed Porous Polymeric Materials" <i>A.C. Materials</i> , 2021
2021	[7] S.Paul, A.D. Freed, <b>C.C. Benjamin</b> , "Application of a Gram-Schmidt factorization of the deformation gradient to a cone and plate rheometer" <i>Physics of Fluids</i> , 2021
2020	[6] M. Myneni, A. Rao, M. Jiang, M.R. Moreno, K.R. Rajagopal, <b>C.C. Benjamin</b> , "Segmental Variations in the Peel Characteristics of the Porcine Thoracic Aorta", <i>Annals of Biomedical Engineering</i> , 2020
2020	[5] P.Prabhakaran, <b>C.C. Benjamin</b> , "Energy dissipation in pH-sensitive hydrogels subjected to large amplitude oscillatory shear", <i>Mechanics of Materials</i> , 2020.
2019	[4] M Arjmand, <b>C.C. Benjamin</b> , I Szlufarska, "Analytical elastoplastic analysis of heteroepitaxial core-shell nanowires" <i>AIP Advances</i> , 2019
2019	[3] <b>C.C. Benjamin</b> , M.Myneni, A.Muliana, K.R. Rajagopal, "Motion of a finite composite cylindrical annulus comprised of nonlinear elastic solids subject to periodic shear." <i>International Journal of Non-linear Mechanics</i> , 2019
2018	[2] <b>C.C. Benjamin</b> , R. J. Craven, W. C. Crone, and R. S. Lakes. "Viscoelastic

2018	<p>characterization of pH-sensitive 2-hydroxyethyl methacrylate (2-dimethylamino) ethyl methacrylate HEMA-DMAEMA hydrogels." <i>Polymer Testing</i> (2018).</p> <p>[1] <b>C.C. Benjamin</b>, R.S. Lakes, W.C. Crone, "Measurement the stiffening parameter for 2-hydroxyethyl methacrylate (2-dimethylamino) ethyl methacrylate (HEMA-DMAEMA) stimuli-responsive hydrogels, <i>Acta Mechanica</i>, 2018</p>
<b>Conference Proceedings/Presentations</b>	
2023	[7] W. Norton, C. McNellis, C. Mysliweic, <b>C.C. Benjamin</b> , "Effects of Work Hardening on 314 Stainless Steel Alloy", <i>Proceedings of the 2022 SEM Annual Conference and Exposition on Experimental and Applied Mechanics</i> .
2022	[6] L. Nguyen, M. Myneni, A.A. Youssef, <b>C.C. Benjamin</b> , "Effect of Normal Stress on the Torsional Shear Response of the Porcine Descending Aorta", <i>Proceedings of the 2022 SEM Annual Conference and Exposition on Experimental and Applied Mechanics</i> .
2019	[5] A. Rao, M. Myneni, <b>C.C. Benjamin</b> , K.R. Rajagopal, "High Amplitude Torsional Shear of Porcine Thoracic Aorta", <i>Proceedings of the 2019 SEM Annual Conference and Exposition on Experimental and Applied Mechanics</i> .
2017	[4] <b>C.C. Benjamin</b> , W.C. Crone, R.S. Lakes, "Viscoelastic Relaxation of HEMA-DMAEMA Responsive Hydrogels." <i>Proceedings of the 2016 SEM Annual Conference and Exposition on Experimental and Applied Mechanics</i> .
2013	[3] <b>C.C. Benjamin</b> , J.C. Springmann, S.A. Chindhy, and W.C. Crone, "Experimental Tools for Responsive Hydrogel Characterization." In <i>Fracture and Fatigue</i> , Volume 7, pp. 7-11. <i>Proceedings of the 2013 Annual Conference on Experimental and Applied Mechanics</i> , Springer International Publishing.
2012	[2] W.C. Crone, S.A. Chindhy, J.C. Springmann, and <b>C.C. Benjamin</b> , "Experiments on Hydrogels of Varying Shape," <i>Proceedings of the 2012 SEM Annual Conference and Exposition on Experimental and Applied Mechanics</i> .
2012	[1] <b>C.C. Benjamin</b> , J.C. Springmann, S.A. Chindhy, and W.C. Crone, "Characterization of the Interfacial Adhesion for Responsive Hydrogels on Substrates," 2012 APS Meeting.
<b>Oral Presentations/Poster Presentations</b>	
2024	[23] <b>Flow of a colloidal solution in an Orthogonal Rheometer</b> Society of Rheology Annual Conference
2024	[22] <b>Characterization of the upper descending thoracic aorta</b> Biomedical Engineering and Instrumentation conference.
2023	[21] <b>Application of the Gram-Schmidt Factorization of the Deformation Gradient to a Cone and Plate Rheometer</b> U.S. National Congress on Theoretical and Applied Mechanics
2023	[20] <b>Viscoelastic and Thixotropic Characterization of 3D printable paraffin/photoelastic solids</b> , The Society of Rheology 93rd Annual Meeting, October 2022
2023	[19] <b>Flow of a colloidal solution in an orthogonal rheometer</b> The Society of Rheology 93rd Annual Meeting, October 2022.
2022	[18] <b>QR Decomposition</b> , Congress on Theoretical and Applied Mechanics.
2021	[17] <b>Research in Soft Condensed Matter</b> , TAMU MEEN graduate symposium.
2020	[16] <b>Mechanics of Soft Solids</b> Invited talk, TAMU-LANL Soft Materials Symposium.
2019	[15] <b>Energy dissipation in pH-sensitive hydrogels subjected to large amplitude oscillatory shear</b> , <i>Student presentation (P.Prabhakaran)</i> Society of Experimental Mechanics International Symposium.
2019	[14] <b>Stretch measurement during peel tests in porcine thoracic aorta</b> , ( <i>Student Presentation, M. Myneni</i> ) Society of Experimental Mechanics International Symposium.
2018	[13] <b>From Graduate School to a Professorship</b> Invited talk, UW-Madison SURE-REU.
2018	[12] <b>Analysis and Experiment on HEMA-DMAEMA Stimuli Responsive Hydrogels</b> Invited talk, Saginaw Valley State University

2017	[11] <b>Experimental and Analytical Techniques for Soft Solids</b> , annual Engineering and Industrial Liaison committee (Texas A&M University)
2016	[10] <b>Viscoelastic Relaxation of HEMA-DMAEMA Responsive Hydrogels</b> , 2016 Annual Conference on Experimental and Applied Mechanics, Society of Experimental Mechanics (SEM)
2014	[9] <b>Viscoelastic Properties of Responsive Hydrogels used in Device Applications</b> , 2014 Midwest Experimental Mechanics Graduate Student Symposium, Society of Experimental Mechanics (SEM).
2013	[8] <b>Analytical Modeling of Stimuli-Responsive Hydrogels</b> , Graduate Engineering Research Scholars (GERS) annual meeting
2013	[7] <b>Experimental Tools for Responsive Hydrogel Characterization</b> , 2013 Annual Conference on Experimental and Applied Mechanics, Society of Experimental Mechanics (SEM).
2012	[6] <b>Experimental Characterization of Stimuli-Responsive Hydrogels</b> , Graduate Engineering Research Scholars (GERS) annual meeting.
2012	[5] <b>Characterization of the Interfacial Adhesion for Responsive Hydrogels on Substrates</b> , 2012 American Physics Society (APS) conference.
2010	[4] <b>Spectroscopy of Extraterrestrial Materials</b> , 2010 Users Meeting, Synchrotron Radiation Center (SRC), Madison WI.
2010	[3] <b>Spectroscopy of Extraterrestrial Materials</b> , CIC Summer Conference, Ohio State University.
2010	[2] <b>Spectroscopy of Extraterrestrial Materials</b> , MIAAPT Meeting, UMICH-Dearborne.
2010	[1] <b>Spectroscopy of Extraterrestrial Materials</b> , Synchrotron Radiation Center (SRC) Research Experience for Undergraduates (REU) final presentation, Madison WI.
	<b>In pre-preparation</b>
2024	[1] A. Yalamanchili, K.K. Yanamundra, A.A. Youssef, <b>C.C. Benjamin</b> "Stress concentration in solid Blatz-Ko sheets with elliptical holes or rigid inclusions under uni-axial and equi bi-axial loading".
2024	[2] L. Nguyen, A. Youssef, C. Nguyen, K. Patel, J. Luce, B. Tijerina, <b>C.C. Benjamin</b> , "The Stress Relaxation Response of the Porcine Descending Aorta under Combined Normal and Torsional Loadings"

## ADVISING

<b>Ph.D Students</b>	
2021-Current	Krisna Kaushik Yanamundra <b>MEEN</b> co-advised with Dr. Rajagopal
2021-Current	Luc Nguyen <b>MEEN</b>
2017-2021	Manoj Myneni <b>MEEN</b> co-advised with Dr. Rajagopal ( <i>graduated</i> )
<b>MS Students</b>	
2019-2021	Pratyusa Kar <b>MEEN</b> <i>graduated</i>
2017-2018	Pranitha Prabhakaran <b>MEEN</b> <i>graduated</i>
2017-2018	Akshay Rao <b>MEEN</b> <i>graduated</i>

## PROFESSIONAL SOCIETIES

2019-Current	Society of Rheology
2012-Current	Society of Experimental Mechanics (SEM)
2011-Current	American Physics Society (APS)
2009-2011	Saginaw Valley State University Physics Club, President

## TEACHING

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	<b>Texas A&amp;M University</b>
2024-Fall	Guest Lecturer: ITDE 611 (Engineering Innovation in Medicine I)
2024-Fall	ITDE 641 (Innovation Immersion Engineering Design II)
2024-Summer	MEEN 602 (Modeling and Analysis of Mechanical Systems)
2024-Spring	MEEN 455 (Engineering with Plastics)
2023-Fall	MEEN 368 (Solid Mechanics in Design)
2023-Summer	MEEN 602 (Modeling and Analysis of Mechanical Systems)
2023-Spring	MEEN 368 (Solid Mechanics in Design)
2022-Fall	MEEN 368 (Solid Mechanics in Design)
2022-Spring	MEEN 608 (Continuum Mechanics) ( <i>graduate</i> )
2021-Spring	MEEN 368 (Solid Mechanics in Design)
2020-Fall	MEEN 368 (Solid Mechanics in Design)
2020-Fall	MEEN 485/685 (Introduction to Rheometry)
2020-Spring	MEEN 368 (Solid Mechanics in Design)
2019-Fall	MEEN 368 (Solid Mechanics in Design)
2019-Fall	MEEN 685 (Perturbation theory in Solid Mechanics)
2019-Spring	CVEN 305 (Mechanics of Materials)
2018-Fall	CVEN 305 (Mechanics of Materials)
2017-Fall	Guest Lecturer: MEEN 445 (Mechanics of Continuous Media) Topic: Polar Decomposition.
	<b>Madison College</b>
2016-Fall	Instructor: Physics-363 (Science I)
2015-Fall	Instructor: Physics-221 (University Physics I)
2014-Fall	Instructor: Physics-139 (Survey of Physics)
	<b>University of Wisconsin-Madison</b>
2016-Spring	Guest Lecturer: EP-468 (Introduction to Engineering Research and Mentoring) Topic: Publication and Authorship.
2014-Spring	Guest Lecturer: EP-468 (Introduction to Engineering Research and Mentoring) Topic: Developing a Professional Network.
2013-Fall	Guest Lecturer: EP-468 (Introduction to Engineering Research and Mentoring) Topic: Working with a Diverse Team.

## SERVICE & OUTREACH

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2023-Mar	[14] Proposal Reviewer, NSF-CBET
2021-Nov	[13] Proposal Reviewer, NSF-CBET
2021-Sep	[12] Proposal Reviewer, NSF-BMMB
2019-Dec	[11] Application reviewer, NSF-GRFP 2019.
2019-Feb	[10] Packet reviewer SB3C Undergraduate Student Competition 2019
2019-Feb	[9] Nomination packet reviewer for the 2018 Diversity Fellowship-TAMU
2018-Feb	[8] Packet reviewer SB3C Undergraduate Student Competition 2018
2018-Feb	[7] Nomination packet reviewer for the 2017 Diversity Fellowship-TAMU
2015-Feb	[6] Represented the University of Wisconsin-Madison GERS program at the Emerging Researchers Network (ERN) Conference.
2014-Fall	[5] Served as moderator for the University of Wisconsin - Madison Undergraduate Symposium.

2014-Feb	[4] Represented the University of Wisconsin-Madison GERS program at the National Society of Black Engineers (NSBE).
2013-Fall	[3] Presented at Opportunities in Engineering (OPPS) program at the University of Wisconsin-Madison.
2012-Fall	[2] Presented at Opportunities in Engineering (OPPS) program at the University of Wisconsin-Madison.
2012-Summer	[1] Mentored undergraduate student for Summer Undergraduate Research Experience (SURE) program at the University of Wisconsin - Madison.

## TRAINING IN TEACHING AND PEDAGOGY

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2015-Spring	<b>Delta Certificate in Research, Teaching and Learning</b>
2013-Spring	<b>EPD 690: Effective Teaching with Technology</b>
2013-Spring	<b>Teaching Portfolio Workshop</b>
2013-Fall	<b>EPD 654: The College Classroom</b>
2012-Fall	<b>Teaching with Writing in SBE and STEM Courses Workshop</b>
2012-Summer	<b>CBE 562: Research Mentorship Training</b>

## RESEARCH STATEMENT

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My main interest lies in the experimental characterization of soft condensed matter. It is through the study of the mechanics and physics of these materials that many uncommon phenomena have been discovered. Phenomena such as rod climbing, die swell, and elastic recoil to name a few. Polymers, gels, and biological materials fall under the broad classification of viscoelastic solids and viscoelastic fluids and the characterization of these materials is of the utmost importance to many new and emerging industries. The focus of my research is in the following areas:

- Thoracic aorta studies:
  - Peeling characterization of the medial layer of the descending thoracic aorta.
  - Investigation of the anisotropic mechanical response of the porcine thoracic aorta.
  - Improving mathematical modeling of the aorta.
- Polymers and Suspensions.
  - Viscoelastic characterization of stimuli-responsive hydrogels.
  - Energy dissipation in stimuli-responsive hydrogels.
  - Thixotropic characterization of polymeric suspensions.