

## Hang (Jerry) Qi

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Prof. Qi's research is in the broad field of nonlinear mechanics of active polymers with a focus on developing fundamental understanding of multi-field properties of active polymers and advancing their processing methods. He has made significant contributions at the intersection of nonlinear mechanics of polymers, additive manufacturing, and recycling to develop multifunctional active composites and structures and sustainable manufacturing.

He is a world-leading researcher in the nonlinear mechanics of active polymers. His 2013 paper titled "Active materials by four-dimension printing"[1] is the first journal paper in the emerging field of 4D printing. His fundamental research has led to many industrial applications. For example, his research on polymer with dynamic bonds[2,3] has led to a startup company Mallinda (Mallinda, Inc; <https://mallinda.com/>), founded in 2014 by a student involved in this research [2,3], which focuses on developing recyclable thermoset composites. His research on stretch-induced crystallization[4] has led to the establishment of PolyMaker (<https://us.polymaker.com/>), which uses stretch-induced crystallization to enhance the stiffness of the 3D printing filament to avoid clogging. Today, Polymaker is one of the premium brands in 3D printing filaments, and its 2024 sales have reached \$100M. The constitutive models he developed for thermoplastic polyurethanes (TPU)[5], shape memory polymers[6,7], and photocuring mechanics[8] are widely used by academic researchers as well as industry, such as Apple, Inc. and Boeing, Inc. As the site director of the NSF Industry/University Collaborative Research Center (IUCRC) on Science of Heterogeneous Additive Printing of 3D Materials (SHAP3D), which is the only NSF center focusing on additive manufacturing, he also promotes the connections between university research and industrial needs.

Prof. Qi published more than 240 papers in peer-reviewed journals. He was listed as one of the highly cited researchers by Clarivate in 2024. His research has been funded by federal agencies, such as NSF, AFOSR, ONR, and DARPA, as well as industry, including Cornerstone Research Group, Sandia, Boston Scientific, Northrop Grumman, Boeing, HP, Toyota North America, etc. He is a recipient of Sigma Xi Best Faculty Paper Award (2018), Gerhard Kanig Lecture by the Berlin-Brandenburg Association for Polymer Research (2019), the James R. Rice Medal from Society of Engineering Science (2023), the T. H. H. Pian Award from International Conference on Computational & Experimental Engineering and Sciences (SES) (2024), and the American Society of Mechanical Engineers (ASME) Warner T. Koiter Medal (2024).

### Summary of Major Works

Active polymers, such as shape memory polymers (SMPs), liquid crystal elastomers, hydrogels, light-activated polymers (LAP), and dynamic covalent network polymers (or vitrimers), are at the forefront of materials research for multifunctional applications. They can generate large shape changes in response to

environmental stimuli, such as heat, light, etc. The shape change of active polymers has inspired novel concepts for a plethora of applications, including morphing structures, actuators, and sensors. Their integration with 3D printing (or additive manufacturing) also leads to the birth of 4D printing. Dr. Qi has established an internationally recognized leading group in four areas 1) 4D printing; 2) multimaterial 3D printing techniques; 3) multiphysics modeling of active polymers; 4) polymer recycling.

**4D printing** Recent developments in 3D printing enable the precise placement of multiple materials to create complex 3D configurations. This unprecedented design freedom has motivated a myriad of studies and applications to create heterogeneous engineered structures. Dr. Qi pioneered the concept of 4D printing, where the printed material/structure can change its shape after 3D printing, and time becomes the 4th dimension of the shape formation. In the 4D printing paper[1], which is the first journal paper in 4D printing field, he demonstrated this concept through printed active composites, in which the fiber material is an SMP. Since 2013, he has published about 100 papers in the 3D/4D printing area. His works on 4D printing were widely reported by public media (more than 100 reports), such as Design News, Physics News, Composites Today, and GizMag, NPR, and ABC, etc. A figure in his 2017 work [9] was included by Soft Matter in its promotional brochure in 2019. Today, 4D Printing has been identified as an emerging technology in the Gartner Technology Hype Cycle and has exploded worldwide as a new research and technology field with major funding initiatives by governments and industry in the US, Europe, and Asia. Recently, the 4D Printing Society was founded to bring together 4D Printing researchers from across the world. Because of his leadership in this field, the first in-person 4D printing conference was held at Georgia Tech in September 2023.

**Multimaterial 3D printing techniques** One highly demanded area in 3D printing is to fabricate parts with different properties, or multimaterial 3D printing. This is very challenging due to the drastic difference in processing conditions for materials of different properties. Dr. Qi group is the leading group in developing multimaterial 3D printing techniques for polymers. They developed a multi-material multi-method ( $m^4$ ) 3D printer[10], which is the first one in the world. They also combined two different printing techniques, direct ink writing (DIW) and digit light processing (DLP) into one platform [11], by which they fabricated functional structures [12,13]. Recently, they developed a novel single vat grayscale DLP (g-DLP) printing to create “multimaterial-like” parts [14, 15]. This new technology represents a breakthrough as DLP printing is traditionally regarded as a single material printing approach. Currently, they are working on licensing the g-DLP technique to a small start-up company. In addition, the grayscale 3D printing is intensively pursued by researchers at different institutions, such as UT Austin, Sandia, etc.

**Multiphysics modeling and applications of active polymers** Dr. Qi’s work in this area mainly focuses on SMPs and LAPs. For SMPs, he and his collaborators identified two fundamental mechanisms that can lead to shape memory effects: a dramatic change in relaxation time in amorphous polymers and phase evolution in semi-crystalline polymers. They developed two constitutive models based on these two mechanisms, respectively. These models are among the first two 3D constitutive models for SMPs ([6,7]. His study of two-way shape memory effects due to stretch-induced crystallization[4] has led to the establishment of PolyMaker, (<https://us.polymaker.com/>), which uses stretch-induced crystallization to enhance the stiffness of the 3D printing filament to avoid clogging during printing, Today, PolyMaker is one of the premium brands in 3D printing filaments, and its 2024 sales have reached \$100M. LAPs are a novel group of active polymers that can deform upon light irradiation. They developed the first 3D constitutive model for LAPs[16] by considering multi-physical processes, including light propagation, light-induced chemical reactions, material structure changes, and stress relaxation. They also used the model to guide the design of photo origami. This work[17] was selected for APL’s 50th Anniversary Collection. He has published about 50 papers related to SMPs and LAPs. He also developed the first constitutive

model that captures the change of mechanical properties during the photopolymerization process. This model is used by researchers in Apple, Inc. The polymer curing model is also used by Boeing to investigate the curing process of sealant materials.

**Polymer recycling** Polymer recycling has become an increasingly important topic in the past 5-10 years. Dr. Qi's work started with the modeling of vitrimers, which are network polymers containing dynamic bonds with bond exchange reactions (BERs). BERs can rearrange the network connections, leading to reshaping, welding, reprocessing, and recycling. He started to work on vitrimers in 2013. Their initial work on developing polyimine-based vitrimer and composites[2,3] has led to a start-up company by Taynton (Mallinda, Inc; <https://mallinda.com/>). They demonstrated the powder-based reprocessing of vitrimers[18]. They further developed the recycling method by using small molecules to decompose vitrimers[19]. Several papers were published on this new approach, including one on the recycling of carbon fiber reinforced thermosetting composite [20] and two issued patents [21, 22]. More recently, his group developed a network polymer that can be depolymerized into monomers at low temperatures [23, 24]. This new polymer has properties that are close to the very popular but not recyclable PDMS and can be 3D printed, offering a potential solution of sustainable additive manufacturing.

**NSF IUCRC SHAP3D SHAP3D** (Science of Heterogeneous Additive Printing of 3D Materials) is an NSF Industry/University Collaborative Research Center (IUCRC) and was established in 2018 by three universities (U Mass Lowell (lead), U Conn, and GT). It is the only NSF IUCRC on additive manufacturing. It conducts pre-competitive research and fills the gap between typical NSF fundamental research and higher TRL centers such as American Make. The industrial members (including past members) include Stratasys, HP, Markforged, Desktop Metal, Raytheon, Boeing, AFRL, Army Soldier Center, Army Armaments Center, Sandia, Akita, etc. It has funded more than 50 projects. It helped to increase the connections between university faculty and industry. SHAP3D has also trained graduate students. The center just finished Phase I and is in Phase II.

Prof. Jerry Qi was the founding chair of the Mechanics of Soft Materials Technical Committee of AMD of ASME (2009), which is one of the most active technical committees in AMD. He was also the vice chair (2007-2009) and chair (2009-2011) of the Mechanics of Time-Dependent Material Technical Division of the Society of Experimental Mechanics. Currently, he serves on editorial board of seven international journals. He is a member of Board of Directors for the Society of Engineering Science (SES). He is organizing the 2025 SES Annual Technical Conference, which will be held on 10/12/25-10/15/25 in Atlanta, GA. The 2025 SES conference is expected to have more than 1000 attendees. He is the co-chair of the 2026 Gordon Research Conference on Multifunctional Materials and Structures, which will be held 1/25/26-1/30/26.

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- [5] Qi, H.J., Boyce, M.C., Stress-strain behavior of thermoplastic polyurethanes, Mechanics of Materials, 2005, 37 (8), 817-839. <https://doi.org/10.1016/j.mechmat.2004.08.001>

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- [7] Nguyen, T.D., Qi, H.J., Castro, F., Long, K.N., A thermoviscoelastic model for amorphous shape memory polymers: incorporating structural and stress relaxation, *Journal of the Mechanics and Physics of Solids*, 2008, 56 (9), 2792-2814. <https://doi.org/10.1016/j.jmps.2008.04.007>
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- [9] Yuan, C., Roach, D.J., Dunn, C.K., Mu, Q., Kuang, X., Yakacki, C.M., Wang, T.J, Yu, K., Qi, H.J., 3D printed reversible shape changing soft actuators assisted by liquid crystal elastomers, *Soft Matter*, 2017, 13 (33), 5558-5568. <https://doi.org/10.1039/C7SM00759K>
- [10] Roach, D., Hamel, C.M., Dunn, C.K., Johnson, M.V., Kuang, K., Qi, H.J., The m4 3D printer: A multi-material multi-method additive manufacturing platform for future 3D printed structures, *Additive Manufacturing*, 2019, 29, 100819. <https://doi.org/10.1016/j.addma.2019.100819>
- [11] Peng, X., Kuang, X., Roach, D.J., Wang, Y., Hamel, C.M., Lu, C., Qi, H.J., Integrating digital light processing with direct ink writing for hybrid 3D printing of functional structures and devices, *Additive Manufacturing*, 2021, 40, 101911. <https://doi.org/10.1016/j.addma.2021.101911>
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- [14] Kuang, X., Wu, J., Chen, K., Zhao, Z., Ding, Z., Hu, F., Fang, D., Qi, H.J., Grayscale digital light processing 3D printing for highly functionally graded materials, *Science Advances*, 2019, 5 (5), eaav5790. <https://doi.org/10.1126/sciadv.aav5790>
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- [16] Long, K.N., Scott, T.F., Qi, H.J., Bowman, C.N., Dunn, M.L., Photomechanics of light-activated polymers, *Journal of the Mechanics and Physics of Solids*, 2009, 57 (7), 1103-1121. <https://doi.org/10.1016/j.jmps.2009.03.003>
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- [18] Yu, K., Taynton, P., Zhang, W., Dunn, M.L., Qi, H.J., Reprocessing and recycling of thermosetting polymers based on bond exchange reactions, *RSC Advances*, 2014, 4 (20), 10108-10117. <https://doi.org/10.1039/C3RA47438K>
- [19] Kuang, X., Zhou, Y., Shi, Q., Wang, T., Qi, H.J., Recycling of epoxy thermoset and composites via good solvent assisted and small molecules participated exchange reactions, *ACS Sustainable Chemistry & Engineering*, 2018, 6 (7), 9189-9197. <https://doi.org/10.1021/acssuschemeng.8b01538>
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- [22] Qi, H., Yu, K., Shi, Q., Kuang, X., Methods of Recycling and Reshaping Thermosetting Polymers and Composites Thereof, *US 11,421,095 B2* (08/2022).
- [23] Yue, L., Su, Y.L., Li, M., Yu, L., Montgomery, S.M., Sun, X., Finn, M.G., Gutekunst, W.R., Ramprasad, R., Qi, H.J., One-Pot Synthesis of Depolymerizable  $\delta$ -Lactone Based Vitrimers, *Advanced Materials*, 2023, 35 (29), 2300954. <https://doi.org/10.1002/adma.202300954>
- [24] Yue, L., Su, Y.L., Li, M., Yu, L., Sun, X., Cho, J., Brettmann, B., Gutekunst, W.R., Ramprasad, R., Qi, H.J., Chemical circularity in 3D printing with biobased  $\Delta$ -valerolactone, *Advanced Materials*, 2024, 36 (34), 2310040. <https://doi.org/10.1002/adma.202310040>

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### I. EARNED DEGREES

**Massachusetts Institute of Technology** Cambridge, MA  
Sc.D. in Mechanics of Materials (08/99~08/03)

Advisor: Professor Mary C. Boyce, Mechanical Engineering Department  
Thesis: Mechanics of Abrasive Wear of Elastomeric Materials

**Tsinghua University** Beijing, China  
Ph.D. in Computational Mechanics (09/94~06/99)

Advisors: Professor Zhenhan Yao, Engineering Mechanics Department  
Professor Daining Fang, Engineering Mechanics Department  
Thesis: Geometrically Nonlinear FEM Analysis of Shell and Three Dimensional Elasto-Dynamic Time Domain Direct Integral BEM

**Tsinghua University** Beijing, China  
M.Sc. in Solid Mechanics (09/94~06/99)

Advisors: Professor Zhenhan Yao, Engineering Mechanics Department  
Professor Daining Fang, Engineering Mechanics Department  
Thesis: Geometrically Nonlinear Analysis of Laminate Composite Shell and Electromechanical Analysis of Smart Materials

**Kyoto University** Kyoto, Japan  
International Visiting Student (03/97~04/98)

Advisors: Professor Shaoyichi Kobayashi, Civil Engineering Department  
Professor Naoshi Nishimura, Civil Engineering Department

**Tsinghua University** Beijing, China  
B.Eng. with honors in Engineering Mechanics (09/89~06/94)  
B.Eng. in Machine Design

### II. EMPLOYMENT HISTORY

**Georgia Institute of Technology** Atlanta, GA  
Professor, School of Mechanical Engineering (03/16-present)

**Nanyang Technological University** Singapore  
Visiting Professor (06/23-07/23)

	(07/24-08/24)
<b>University of Technology of Belfort-Montbéliard</b> Visiting Professor	Sevenans, France (11/22-12/22)
<b>Xi'an Jiaotong University</b> Yangtze River Scholar Professor (Type B, visiting), School of Aerospace Engineering	Xi'an, China (01/18-12/20)
<b>Xi'an Jiaotong University</b> Tengfei Scholar Professor (Type B, visiting), School of Aerospace Engineering	Xi'an, China (01/14-12/17)
<b>Georgia Institute of Technology</b> Associate Professor, School of Mechanical Engineering	Atlanta, GA (01/14-02/16)
<b>University of Colorado</b> Associate Professor, Department of Mechanical Engineering	Boulder, CO (08/10~12/13)
<b>University of Colorado</b> Assistant Professor, Department of Mechanical Engineering	Boulder, CO (08/04~08/10)
<b>Massachusetts Institute of Technology</b> Post-doctoral Associate, MIT Army Institute of Soldier Nanotechnology Advisors: Professor Christine Ortiz, Professor Mary C. Boyce	Cambridge, MA (09/03~08/04)

### III. HONORS AND AWARDS

#### A. International or National Awards

- The ASME Warner T. Koiter Medal (2024)  
The ASME Warner T. Koiter is one of the most prestigious senior award (after Timoshenko Award) in Solid Mechanics. Established in 1996, It is bestowed in recognition of distinguished contributions to the field of solid mechanics with special emphasis on the effective blending of theoretical and applied elements of the discipline, and on a high degree of leadership in the international solid mechanics community.  
The 2024 Koiter Medal cited "Prof. Qi has made significant contributions to fundamental nonlinear mechanics and multiphysics behaviors of active polymers through experimentation and theoretical modeling and in applying the fundamental understanding to the emerging field of 4D printing".
- Highly Cited Researcher by Clarivate (2024)
- The T. H. H. Pian Award from International Conference on Computational & Experimental Engineering and Sciences (ICCES) (2024)  
The ICCES T.H.H. PIAN AWARD is given to a researcher, from anywhere in the world, in recognition of her/his contributions to any area germane to the ICCES conferences, and in recognition of her/his services to ICCES. This award honors Professor THH Pian, who for nearly 50 years at MIT, played a significant role in educating several generations of students in the areas of structural and computational mechanics.

The 2024 award cites Prof. Qi “for his pioneering contributions to the constitutive modeling of mechanical and multiphysical behaviors of active polymers and 4D printing”.

- James R. Rice Medal, Society of Engineering Science (2023)  
The prize is awarded to a mid-career researcher in the field of engineering sciences who has had a substantial impact in his/her field. At the time of the nomination, eligible candidates must be within 10-20 years of earning their PhD or equivalent degree.  
The 2023 James R. Rice Medal cites Prof. Qi “for his pioneering work in understanding the mechanical and multiphysical behavior of soft active materials, and for developing novel applications of these materials in recycling and 4D printing”
- Gerhard Kanig Lecture by the Berlin-Brandenburg Association for Polymer Research (2019)  
The Gerhard Kanig Lecture is named after Gerhard Kanig, a renowned polymer scientist, and typically features distinguished speakers who have made significant contributions to polymer science and engineering. The 2019 Gerhard Kanig Lecture was given by Prof. Qi during PolyDays Conference (2019) because of “his pioneering scientific research in 4D printing”.
- Sigma Xi Best Faculty Paper Award (2018)  
Prof. Qi shared this award with Prof. Glaucio Paulino for their work “K Liu, J Wu, GH Paulino, HJ Qi, Programmable deployment of tensegrity structures by stimulus-responsive polymers, Scientific reports 7 (1), 3511”.
- ASME Fellow (2015)
- J. T. Oden Faculty Fellowship, UT Austin, (2012)
- AFRL Summer Faculty Fellowship (2010-2012)
- NSF Career Award (2007)

#### **B. Institute of School Awards**

- Woodruff Faculty Fellow (2015-2019)
- Woodruff School Teaching Fellow (2015)
- Mechanical Engineering Outstanding Research Award (2009)
- Mechanical Engineering Chair Faculty Fellow (2008)
- Woodward Outstanding Mechanical Engineering Faculty (2006-2007)
- University of Colorado Graduate School Junior Faculty Development Award (2005)

### **IV. RESEARCH, SCHOLARSHIP, AND CREATIVE ACTIVITIES**

#### **A. PUBLISHED BOOKS, BOOK CHAPTERS, AND EDITED VOLUMES**

##### **A1. Books**

None.

##### **A2. Refereed Book Chapters**

1. Kuang, X., Yue, L., Qi, H.J., 2023. Introduction to 4D Printing: Concepts and Material Systems, in Additive Manufacturing Technology: Design, Optimization, and Modeling, Ed. K. Zhou, Wiley - VCH GmbH.
2. Yue, L., Kuang, X., Sun, X., Qi, H.J., 2022. Recyclable thermoset polymers: beyond self-

- healing. In Woodhead Publishing Series in Composites Science and Engineering, Recent Advances in Smart Self-Healing Polymers and Composites (Second Edition), Ed. Li, G., Feng, X., Woodhead Publishing.
3. Roach, D.J., Kuang, X., H.M., Craig, Dunn, M.L., Qi, H.J., 2021. "Chapter 7, 4D Printing Based on Multi-Material Design", in "Manufacturing in the Era of 4<sup>th</sup> Industrial Revolution", Ed. H. Burck, Y. Chen, and S.K. Gupta, World Scientific Series in Advanced Manufacturing. March 2021, 163-194.
  4. Yu, K., Qi, H.J., 2016. "Chapter 7. Viscoelasticity Based Models for Thermally Activated Systems", in "Shape Memory Polymers for Aerospace Applications: Novel Activation, Modeling, Characterization and Design", Ed. G.P. Tandon, A.J.Q. McClung, J.W. Baur, DEStech Publications.
  5. Dunn, M., Qi, H.J., 2016. "Chapter 18. Active Origami", in "Shape Memory Polymers for Aerospace Applications: Novel Activation, Modeling, Characterization and Design", Ed. G.P. Tandon, A.J.Q. McClung, J.W. Baur, DEStech Publications.
  6. Qi, H.J., Dunn, M.L., 2010. "Chapter 3. Thermomechanical Behavior and Modeling Approaches" in "*Shape-Memory Polymers and Multifunctional Composites*", Ed. JS Leng, SY Du, CRC Press, pp65-90.
  7. Qi, H.J., Bruet, B.J.F., Palmer, J.S., Ortiz, C., Boyce, M.C., 2006. Micromechanics and macromechanics of the tensile deformation of nacre, in *Mechanics of Biological Tissue*, Springer, Berlin Heidelberg, pp189-203.

### A3. Edited Volumes

None.

### A4. Other Parts of Books

None.

## B. REFEREED PUBLICATIONS AND SUBMITTED ARTICLES

### B1. Published and Accepted Journal Articles (241 total)

#### 2025

1. \*Sahu, H., Li, M., Mukherjee, M., Yue, L., Qi, H.J., Ramprasad, R., 2025. Elucidating Photochemical Conversion Mechanism of PDMS to Silica under Deep UV Light and Ozone. *The Journal of Physical Chemistry Letters* 16, 747-753.
2. Chen, M., An, R., Demoly, F., Qi, H.J., Zhou, K., 2025. Hybrid 4D printing of flexible multifunctional composites by multi jet fusion and direct ink writing, *Materials Science and Engineering: R: Reports* 163, 100890.
3. Moughames, J., Martínez, J.A.I., Ulliac, G., Sylvestre, T., Barbot, A., André, J., Qi, H.J., Demoly, F., Kadic, M., 2025. Topology-optimized multimaterial 4D-printed Fabry–Perot filter with enhanced thermal stability using two-photon polymerization, *Thin-Walled Structures*, 209, 112900.

#### 2024



4. \***Gholami, F., Yue, L., Li, M.**, Jain, A., Mahmood, A., **Fratarcangeli, M.**, Ramprasad, R., Qi, H.J., 2024. Fast and Efficient Fabrication of Functional Electronic Devices through Grayscale Digital Light Processing 3D Printing, *Advanced Materials* 36 (46), 2408774.
5. Chen, M., Hou, Y., An, R., Qi, H.J., Zhou, K., 2024. 4D printing of reprogrammable liquid crystal elastomers with synergistic photochromism and photoactuation. *Advanced Materials* 36 (34), 2303969.
6. \*Kobayashi, H., **Gholami, F., Montgomery, S.M.**, Tanaka, M., **Yue, L.**, Yuhn, C., Sato, Y., Kawamoto, A., Qi, H.J., Nomura, T., 2024. Computational synthesis of locomotive soft robots by topology optimization. *Science Advances* 10 (30), eadn6129.
7. \***Sun, X., Yue, L., Yu, L., Forte, C.T., Armstrong, C.D.**, Zhou, K., Demoly, F., Zhao, R.R., Qi, H.J., 2024. Machine learning-enabled forward prediction and inverse design of 4D-printed active plates, *Nature Communications* 15 (1), 5509.
8. \*Su, Y.L., Xiong, W., **Yue, L.**, Paul, M.K., Otte, K.S., Bacsa, J., Qi, H.J., Gutekunst, W.R., 2024. Michael Addition–Elimination Ring-Opening Polymerization, *Journal of the American Chemical Society*, 146, 26, 18074–18082.
9. \***Yue, L.**, Su, Y.L., **Li, M., Yu, L., Sun, X.**, Cho, J., Brettmann, B., Gutekunst, W.R., Ramprasad, R., H Jerry Qi, H.J., 2024. Chemical Circularity in 3D Printing with Biobased  $\Delta$  - Valerolactone, *Advanced Materials*, 36(34), 2310040.
10. \***Li, M., Gholami, F., Yue, L., Fratarcangeli, M.R., Black, E.**, Shimokawa, S., Nomura, T., Tanaka, M., Kobayashi, H., Song, Y., Qi, H.J., 2024. Coaxial - Spun Hollow Liquid Crystal Elastomer Fiber as a Versatile Platform for Functional Composites, *Advanced Functional Materials*, 34, 2406847.
11. Leanza, S., Wu, S., Sun, X., Qi, H.J., Zhao, R.R., 2024. Active Materials for Functional Origami, *Advanced Materials*, 36(9), 2302066.
12. Wan, X., Xiao, A., Tian, Y., Chen, M., Liu, F., Wang, D., Liu, Y., Bartolo, P.J.D.S., Yan, C., Shi, Y., Zhao, R.R., Qi, H.J., Zhou, K., 2024. Recent Advances in 4D Printing of Advanced Materials and Structures for Functional Applications, *Advanced Materials*, 36(34), 2312263.
13. Li, H., CB Chng, C.B., Zheng, H., Wu, M.S., Bartolo, P.J.D.S., Qi, H.J., Tan, Y.J., Zhou, K., 2024. Self - Healable and 4D Printable Hydrogel for Stretchable Electronics, *Advanced Science* 11 (13), 2305702.
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238. Yao, Z., Qi, H., Fu, M., Yao, J., 1997. A kind of super-parametric finite element for

geometric nonlinear analysis of plates and shells, *Tsinghua Sci. Tech.*, 2:707-712.

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240. Fang, D., Qi, H., Tu, S., 1996. Elastic and plastic properties of metal-matrix composites: geometrical effects of particles, *Comput Mater. Sci.*, 6:303-309.
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## **B2. Conference Presentation with Proceedings (Refereed)**

1. **Ge, Q., Mao, Y., Yu, K.,** Dunn, M.L., Qi, H.J., Active Composites and 4D Printing, 20<sup>th</sup> International Conference on Composite Materials (ICCM-20), Copenhagen, Denmark, July 19-24, 2015.
2. CD Saintsing, C.D., Yu, K., Qi, H.J., Tentzeris, M., Planar monopole antennas on substrates fabricated through an additive manufacturing process, Radio and Wireless Symposium (RWS), 2015 IEEE, 159-161.
3. **Yu, K.,** Baur, J.W., Philips, D.M., Qi, H.J., Simulations of Thermomechanical Performance of SMP-Based Microvascular Systems, 19<sup>th</sup> International Conference on Composite Materials (ICCM-19), Montreal, Canada, July 28-August 2, 2013.
4. **Kao, P., Westbrook, K.K.,** Qi, H.J., Design Considerations for Shape Memory Polymer Composites with Magneto-sensitive Particles, 18<sup>th</sup> International Conference on Composite Materials (ICCM-18), Jeju Island, S. Korea, August, 2011.
5. **Westbrook, K.K., Castro, F.,** Qi, H.J., Temperature dependent recovery of shape memory polymers, SAMPE Conference, Salt Lake City, Oct 11-14, 2010.
6. **Long, K.N.,** Dunn, M., Qi, H.J, 2009. "Constitutive model for photo-mechanical behaviors of photo-induced shape memory polymers", in Proceedings of SAMPE'09, Baltimore, MD, May 18-21, 2009.
7. Qi, H.J., **Castro, F.,** 2009. "Time dependent thermo-mechanical behavior of thermally induced shape memory polymers", in Proceedings of SAMPE'09, Baltimore, MD, May 18-21, 2009.
8. Hermiller, J.M., Cable, K.M., Hemmelgarn, C.D., Qi, H.J., and **Castro, F.,** 2009. "Thermal Design Methodology for Attaching Morphing Components", in *Industrial and Commercial Applications of Smart Structures Technologies*, San Diego, CA, March 8, 2009, Proc. of SPIE. 7290. doi:10.1117/12.815869.
9. **Castro, F.,** Qi, H.J., Hermiller, J.M., Havens, E., 2009, "Time Dependent Thermo-Mechanical Behavior of Thermally Induced Shape Memory Polymers", in *Industrial and Commercial Applications of Smart Structures Technologies*, San Diego, CA, March 8, 2009, Proc. of SPIE, 7290. doi:10.1117/12.817609.
10. **Long, K. N.,** Scott, T. F., Qi, H. J., Bowman, C. N., and Dunn, M. L., 2008, "Photomechanics of Light-Activated Shape Memory Polymers," in *Proceedings of the ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems*.
11. **Francis, W.H.,** Lake, M.S., Schultz, M.R., Campbell, D., Dunn, M, and Qi, H.J., Elastic

Memory Composite Microbuckling Mechanics: Closed-Form Model with Empirical Correlation. 48th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, 23 - 26 April 2007, Honolulu, Hawaii, AIAA 2007-2164.

12. Qi, H.L., Dunn, M.L., **Long, K.N., Castro, F.**, Shandas, R., 2007. Thermomechanical Indentation of Shape Memory Polymers, in Behavior and Mechanics of Multifunctional and Composite Materials 2007, edited by M.J. Dapino, San Diego, CA, March 18, 2007, Proc. of SPIE v.6526, 652615.
13. Qi, H.J., Ortiz, C., Boyce, M.C., 2005. Protein forced unfolding and its effects on the finite deformation stress-strain behavior of biomacromolecular solids. Mater. Res. Soc. Symp. Proc. Vol. 874. L4.3.1
14. Qi, H., Nishimura, N., Yao, Z., Kobayashi, S., Application of 3D time domain direct integral BEM to crack and inverse problem, In: *Theory and Application of Boundary Element Methods, Proc. of the 8th Chinese-Japan Symposium on Boundary Element Methods*, Beijing, China, May, 1998, International Academic Publishers, p105-112.
15. Qi, H., Fang, D., Yao, Z., Nishimura, N., Kobayashi, S., FEM analysis of crack problem with different crack surface electric boundary conditions in piezoelectric materials. In: *Mechanical Properties of Advanced Engineering Materials, Proc. of the Third International Symposium on Microstructures and Mechanical Properties of New Engineering Materials*, Tsu, Japan, August 1997, Mie University Press, p315-322.
16. Fang, D., Qi. H., An investigation of 3-D simulations for predicting elastic and plastic properties of particulate-reinforced metal-matrix composites. Wang T.C., Chou T. W. eds., *Progress in advanced materials and mechanics, ICAM'96*, 1996, 2 , p96-101.

### **B3. Other refereed material**

None.

## **C. OTHER PUBLICATIONS AND CREATIVE PRODUCTS**

### **C1. Non-referred Conference Presentations with Proceedings**

1. Qi, H.J., **Westbrook, K.K., Kao, P.H., Castro, F.**, Ding, Y., A 3D Finite Deformation Thermomechanical Constitutive Model for Amorphous Shape Memory Polymers, NSF CMMI Grantee Conference, Atlanta, GA, Jan. 4-7, 2011.
2. Qi, J.H., Roy, S, **Miao, F.**, A Computational Modeling Approach for Cell-Substrate Interaction and Cell Crawling. NSF CMMI Grantee Conference, Atlanta, GA, Jan. 4-7, 2011.
3. Qi, H.J., **Xiao, L.**, 2008, Micromechanical Modeling of Large Deformation Behavior of Red Blood Cell Membranes, in Proceedings of NSF CMMI Grantee Conference, Knoxville, TN, January, 2008.
4. Qi, H.J., Castro, F., **Long, K. N.**, Finite Element Simulations of Thermally Induced Shape Memory Polymers Based Applications, in Proceedings of NSF CMMI Grantee Conference, Knoxville, TN, January, 2008.

### **C2. Software**

None

### **C3. Patents**

#### **C3.a. Patents Granted**

1. H. Qi, Yu, K., Shi, Q., Methods of Recycling and Reshaping Thermosetting Polymers and Composites Thereof, US 10,829,612 B2 (11/2020)
2. H. Qi, Yu, K., Shi, Q., Kuang, X., Methods of Recycling and Reshaping Thermosetting Polymers and Composites Thereof, US 11,421,095 B2 (08/2022)

#### **C3.b. Provisional Patents, Applications, and Invention Disclosures**

1. Song, Y., Tanaka, M., Yue, L., Qi, H.J., Resins for digital light processing 3D printing, 06/06/2022, 17/833,144. Patent.
2. Song, Y., Tanaka, M., Yue, L., Qi, H.J., Digital light processing 3D printed monolithic substrates with integrated and embedded sensors, 17/977,314, patent.
3. Song, Y., Tanaka, M., Yue, L., Qi, H.J., Resins for adhesive bonding of fabrics, 17/951,312, patent.
4. Zhao, R., Ze., Q., Qi, H.J., Kuang, X., Magnetic Shape memory Polymers with Integrated Multifunctional Shape Manipulations, 09/27/2019, 62/907,230.
5. Xiao Kuang, H. Jerry Qi, Epoxy Composite 3D Printing, provisional patent, 03/14/2018, 62/643,002
6. Xiao Kuang, H. Jerry Qi, Jiangtao Wu, Gray Scale 3D Printing, provisional patent, 03/14/2018, 62/643,901

### **C4. Other**

None

## **D. PRESENTATIONS**

### **D1. Keynote Address and Plenary Lectures**

1. (Plenary) Koiter Lecture: Light, Chemo-physics, and Mechanics in 3D and 4D Printing, International Mechanical Engineering Congress & Exposition (IMECE), Portland, OR, November 17-21, 2024.
2. (Keynote) Mechanics in 3D/4D Printing, Rice Medal Talk, Society of Engineering Science Annual Technical Meeting (SES 2023), Minneapolis, MN, October 8 - 11, 2023.
3. (Plenary lecture) Additive Manufacturing of Active Polymer Composites for 4D Printing, Polydays 2019, Erwin Schrodinger Center, Humboldt University at Berlin, Berlin, Germany, September 11-13, 2019.
4. (Keynote) Multi-material Additive Manufacturing for 4D Printing, MacroBio Summer Symposium, Institute of Biomaterial Science, Helmholtz-Zentrum Geesthacht Teltow, Germany, September 10, 2019.
5. (Keynote) Multimaterial and Hybrid Additive Manufacturing for 4D Printing, International Workshop 4D Printing and Additive Manufacturing, UTBM Sevenans, June 13, 2019.
6. (Keynote) \*4D Printing: Making Additive Manufacturing Alive. Construct3D, Atlanta, GA, October 6, 2018.

7. (Keynote) \*4D Printing Enabled by Active Polymers and Composites. SPE/ANTEC New Technology Forum: 4D Printing and Stimuli-Responsive Materials, ANTEC conference, Orlando, FL, May 7-10, 2018.
8. (Plenary) \*4D Printing: Making 3D Printing Alive. The International Symposium of Photopolymer Science 2018, Jiangnan University, Wuxi, China, April 23, 2018.
9. (Keynote) \*Multi-material 3D Printing for Shape Changing Devices and 4D Printing. ACS 2018 Spring National Conference and Exposition, New Orleans, LA, March 18-22, 2018.
10. (Keynote) \*Direct 4D Printing by Using Multimaterial Additive Manufacturing. American Society of Physics March Meeting 2018, Los Angeles, CA, March 5-9, 2018.
11. (Keynote) \*4D Printing Enabled by Active Polymers and Composites. AIAA SciTech Forum and Exposition, Kissimmee, FL, Jan 8-12, 2018.
12. (Plenary) \*4D Printing: 3D Printing and Mechanics Design. The Chinese Congress of Theoretical and Applied Mechanics (CCTAM-2017), Beijing, China, Aug. 13-16, 2017.
13. (Plenary) \*Design of Active Composites for 4D printing, 19<sup>th</sup> National Conference on Composite Materials, Xian, China, Oct. 16, 2016.
14. (Keynote) \*Model Description of Shape Memory Effect in Amorphous Polymers, the 2014 Conference of Solid Mechanics, Chengdu, China, October 11-12, 2014.
15. (Keynote) Philip Kao, H. Jerry Qi, Michael Sacks, Anisotropic Mechanical Behaviors and Growth of Pulmonary Artery Tissues, 13<sup>th</sup> International Conference on Fracture, Beijing, China, June 16-21, 2013.

**D2. Invited Conference and Workshop Presentations (\* Based on GT work):**

**2024**

16. Machine Learning Based Design for Multimaterial 4D Printing, International Mechanical Engineering Congress & Exposition (IMECE), Portland, OR, November 17-21, 2024.
17. Multimaterial Functional Structures by Grayscale Digital Light Processing 3D Printing, International Mechanical Engineering Congress & Exposition (IMECE), Portland, OR, November 17-21, 2024.
18. Machine Learning Based Design for Multimaterial 4D Printing, International Conference on Additive Manufacturing (ICAM), Atlanta, GA, October 28- November 1, 2024.
19. 3D/4D Printing for Multifunctional Composites, Shaping the Future of Multifunctional Materials and Structures, A Symposium in Honor of Dr. Les Lee, Johns Hopkins University, September 19-20, 2024
20. Multimaterial Additive Manufacturing for Shape Morphing Structures, SMASIS Conference on Smart Materials, Adaptive Structures and Intelligent Systems 2024, Atlanta, GA, September 9-11, 2024.
21. Multiphysics modeling of grayscale digital light processing printing for pixel-level property manipulations, The 26<sup>th</sup> International Congress of Theoretical and Applied Mechanics (ICTAM 2024), Daegu, Korea, August 25-30, 2024.
22. Machine Learning Based Design for Multimaterial 4D Printing of Active Structures, The 30th International Conference on Computational & Experimental Engineering and Sciences (ICES), Singapore, August 3-6, 2024.
23. Depolymerizable  $\delta$ -lactone based polymers for recyclable vitrimers and 3D printing, ACS Spring Conference, New Orleans, LA, March 17-21, 2024

**2023**

24. Multimaterial 3D/4D Printing for Bioinspired Design, International Mechanical Engineering Conference & Exposition (IMECE 2023), New Orleans, LA, October 29- November 2, 2023.
25. Multiphysics modeling of grayscale digital light processing printing for pixel-level property manipulations, in Symposium Mechanics of Materials and Structures: Honoring Prof. Zhigang Suo on the Occasion of his 60th Birthday. Society of Engineering Science Annual Technical Meeting (SES 2023), Minneapolis, MN, October 8 - 11, 2023.
26. Multimaterial Additive Manufacturing by Integrating Digital Light Processing and Direct Ink Writing, 3rd International Conference on Mechanics of Advanced Materials and Structures (ICMAMS 2023), College Station, TX, August, 9-10, 2023.
27. Multimaterial 3D Printing of Active Mechanical Metamaterials with Tunable Properties, Complex Mechanical Metamaterials Workshop, Ann Arbor, MI, July 10-14, 2023.

## **2022**

28. Multimaterial 3D/4D Printing for Functional Composites, Society of Engineering Science Annual Technical Meeting, College Station, TX, October 16 - 19, 2022.
29. Grayscale Digital Light Processing Multimaterial 3D Printing toward Biomimetic Applications, 2<sup>nd</sup> International Conference on Materials for Humanity, National University of Singapore, September 19-21, 2022.
30. Multimaterial Material Additive Manufacturing by Integrating Digital Light Processing and Direct Ink Writing. The 16th International Symposium on Functionally Graded Materials, Hartford, CT, August 7-10, 2022.
31. Multimaterial Functional Structures by Grayscale Digital Light Processing 3D Printing. The 16th International Symposium on Functionally Graded Materials, Hartford, CT, August 7-10, 2022.
32. Multimaterial Functional Structures by Grayscale Digital Light Processing (g-DLP) 3D Printing. 19th U.S. National Congress on Theoretical and Applied Mechanics, Austin, Texas, June 19-24, 2022
33. Design and 3D Printing of Active Mechanical Metamaterials. Workshop on Architected Metamaterials for Civil Infrastructure, U Mass Amherst, May 23-25, 2022
34. Multimaterial 3D/4D printing for Functional Composites, 2022 MRS Spring Meeting & Exhibit, Honolulu, Hawaii, May 8-13, 2022.
35. Good solvent assisted recycling of thermosetting polymers with dynamic bonds, 2022 MRS Spring Meeting & Exhibit, Honolulu, Hawaii, May 8-13, 2022.
36. Multimaterial Additive Manufacturing and 4D Printing, 2022, 2022 Boulder Workshop on Soft & Active Matter Mechanics, April 28-29, 2022

## **2021**

37. Desolvation Induced Shape Change for 4D Printing, 2021 MRS Fall Meeting & Exhibit, Boston, MA (virtual), Dec. 7, 2021.
38. Grayscale Digital Light Processing 3D/4D Printing: a Novel Method to Create Functional Parts, 2021 MRS Fall Meeting & Exhibit, Boston, MA (virtual), Nov. 30, 2021.
39. Multimaterial Additive Manufacturing for Printed Active Composites, virtual, KAUST Workshop, Shaping the future with Composite Materials, May 24-27, 2021.

## 2020

40. 3D Printing of Active Materials for Shape Changing Applications, Techtexil North America & Texprocess Americas Virtual Symposium, online virtual, Oct. 19, 2020.
41. 3D Photocuring and Photomechanics in Digital Light Processing Additive Manufacturing for Soft Functional Composites and 4D Printings, Advanced Photopolymer Concepts Webinar Series, RADTECH, Oct. 15, 2020.
42. Multimaterial 3D printing for functional applications. 3D Lab Tech Forum at HP Labs, online virtual, June 21, 2020.

## 2019

43. \*Multimaterial and Hybrid 3D Printing of Soft Robotic Applications, Robot Design and Customization: Opportunities at the Intersection of Computation and Digital Fabrication Workshop, 2019 International Conference on Robotics and Automation, Montreal, Canada, May 23, 2019.
44. \*Digital Light Processing 3D Additive Manufacturing for Soft Functional Composites and 4D Printing, ASME IMECE (International Mechanical Engineering Congress & Exposition), Salt Lake City, UT, Nov. 11-14, 2019.
45. \*Design and Fabrication of Active Mechanical Metamaterials Using Shape Memory Polymers, ASME IMECE, Salt Lake City, UT, Nov. 11-14, 2019.

## 2018

46. \*Multimaterial Additive Manufacturing for Shape Changing Devices and 4D Printing, 2018 Tsinghua Mechanics Workshop, Beijing, China, July 2-3, 2018.
47. \*4D Printing Enabled by Printed Active Composites, 2018 CAMS Workshop, Center for Additive Manufacturing Systems, Huazhong University of Science and Technology, Wuhan, China, June 11-12, 2018.
48. \*Additive Manufacturing of Polymers and 4D Printing, 2018 Southeast Polymer Forum, Atlanta, GA, June 3-5, 2018.
49. \*Multimaterial 3D Printing for Architected Material Application. Workshop - Meta-structures: Dynamics, Topology and Related Opportunities, Atlanta, GA, May 16-18, 2018.

## 2017

50. \*Material Design by Mechanics: The opportunities and Challenges by 3D Printing. 2017 Workshop on Solid Mechanics: Challenges and Future Directions. Oct. 20-22, Hangzhou, China.
51. \*Soft Active Materials for 3D Printing to Enable Multifunctional Structures and Devices. KCLI Workshop on Advanced Materials for Additive Manufacturing (3D Printing): State-of-the-Art, Challenges and Opportunities. Sept. 28, 2017, Georgia Tech, Atlanta, GA.
52. \*4D Printing Enabled by Active Polymers and Composites. SME Seminar: The Changing Landscape of Additive Manufacturing Materials, August 9, 2017, Youngstown, OH.
53. \*Hybrid 3D Printing with Active Materials for Morphing Structures and Soft Robots, Workshop on Advanced Fabrication and Morphological Computation for Soft Robotics, IEEE International Conference on Robotics and Automation (ICRA), MAY 29, 2017, Singapore.
54. \*Recycling Thermosetting Polymers and Composites Using Exchange Reactions. Plastics Recycling 2017, March 6-8, 2017. New Orleans, LA.

## 2016

55. \*Design and Printing of Active Composites and Structures, 6<sup>th</sup> Annual Karles Invitational Conference in Additive Manufacturing, Naval Research Lab, Washington DC, Aug. 10, 2016.
56. 4D/5D Printed Composites for Topology Transforming Devices, US-Korea Symposium on Programmable Materials and Manufacturing Science, Seoul, South Korea, July 15, 2016.
57. Design of Active Composites for 4D Printing Applications, 2016 International Symposium on 3D/4D Printing, Seoul, South Korea, July 14, 2016.
58. \*Mechanics of Surface Welding in Vitrimers. International Workshop on Cutting-edge Problems on Chemomechanics, Xian, China, Jun 26-28, 2016.
59. \* Design of Reversible Shape Changing Components for 3D/4D Printing Applications, Xi'an, China, June 24-26, 2016.
60. \*4D/5D Printed Composites for Topology Transforming Devices, The 2016 Gordon Research Conference on Multifunctional Materials and Structures: Science of Autonomic, Adaptive and Self-Sustaining Systems, Ventura, CA, Jan. 31 - Feb 5, 2016.

## 2015 Before

61. \*Digital Manufacturing Enabled Active Composites and 4D Printing, Annual Technical Workshop of State Key Laboratory of Nonlinear Mechanics, Institute of Mechanics, Beijing, China, Dec. 14, 2015.
62. \*Design of Active Structures Enabled by 3D Printing, Designer Matter Workshop, FOM Institute AMOLF, Amsterdam, the Netherlands, June 22-June 24, 2015.
63. \*Design of Active Composites for 4D Printing, The Chinese Congress of Theoretical and Applied Mechanics (CCTAM), Shanghai, China, Aug. 15-18, 2015.
64. \*Mechanics of Soft Active Materials with Bond Exchange Reactions, Workshop on Chemomechanical Coupling, Xi'an, China, August 24-25, 2014.
65. Qi Ge, Martin L. Dunn, H. Jerry Qi, Active Composites by 4D Printing, IUTAM Symposium on Mechanics of Soft Active Materials, Haifa, Israel, 5/12/2014-5/15/2014.
66. Photo-mechanics of Polymer Structural Alteration Due to Light Irradiation, NSF-NIST Workshop on Service-Life Prediction of Polymeric Materials: Vision for the Future, Monterey, CA, March 3-8, 2013.
67. Shape Memory Behaviors in Soft Materials, Workshop on Mechanics of Soft Materials, Lhasa, China, July 29-August 4, 2012
68. Shape memory polymers: Physics and Mechanics, TAPS symposium, Boulder, CO, August, 2009.

## **D3. Presentations in Conferences (GT student/postdoc presenter, bold fonts)**

### 2024

1. **Teerapong Poltue**, Qi, H.J., Machine Learning-Based Optimization of Pixel Intensities for Vat Photopolymerization 3D Printing, International Mechanical Engineering Congress & Exposition (IMECE), Portland, OR, November 17-21, 2024.
2. **Farzad Gholami**, Qi, H.J., Fast and Efficient Fabrication of Functional Electronics Through Grayscale Digital Light Processing 3d Printing, International Mechanical Engineering Congress & Exposition (IMECE), Portland, OR, November 17-21, 2024.
3. **Farzad Gholami**, Qi, H.J., A sustainable approach for recycling of plastic waste through digital light processing 3D printing, International Mechanical Engineering Congress &



- Exposition (IMECE), Portland, OR, November 17-21, 2024.
4. **Mingzhe Li**, Qi, H.J., Additive manufacturing of glass microstructures at mild conditions, International Mechanical Engineering Congress & Exposition (IMECE), Portland, OR, November 17-21, 2024.
  5. **Farzad Gholami**, Qi, H.J., Fast and Efficient Fabrication of Functional Electronics Through Grayscale Digital Light Processing 3d Printing, International Conference on Additive Manufacturing (ICAM), Atlanta, GA, October 28- November 1, 2024.
  6. **Teerapong Poltue**, Qi, H.J., Machine Learning-Based Optimization of Pixel Intensities for Vat Photopolymerization 3D Printing, International Conference on Additive Manufacturing (ICAM), Atlanta, GA, October 28- November 1, 2024.

## 2023

7. S. Macrae Montgomery, Multiphysics modeling of grayscale digital light processing printing for creating multifunctional composites, International Mechanical Engineering Conference & Exposition (IMECE 2023), New Orleans, LA, 10/29-11/2, 2023
8. Yue, L., Qi, H.J., Recyclable 3D Printing Enabled By Depolymerizable Resin Design. Society of Engineering Science Annual Technical Meeting (SES 2023), Minneapolis, MN, October 8 - 11, 2023.
9. **Farzad Gholami**, Yue, L., Qi, H.J., Tailoring Conductivity in 3D-Printed Polymers Using Single-Vat Digital Light Processing. Society of Engineering Science Annual Technical Meeting (SES 2023), Minneapolis, MN, October 8 - 11, 2023.
10. **Liang Yue**, Sun, X., Qi, H.J., Cold programmed shape morphing structures based on grayscaled digital light processing 4D printing, Society of Engineering Science Annual Technical Meeting (SES 2023), Minneapolis, MN, October 8 - 11, 2023.
11. **Xiaohao Sun**, Yue, L., Qi, H.J., Machine learning-enabled forward prediction and inverse design for 4D-printed active plates, Society of Engineering Science Annual Technical Meeting (SES 2023), Minneapolis, MN, October 8 - 11, 2023.
12. **Mingzhe Li**, Yue, L., Qi, H.J., Additive Manufacturing of Glass Microstructures at Mild Conditions, Society of Engineering Science Annual Technical Meeting (SES 2023), Minneapolis, MN, October 8 - 11, 2023.
13. **Connor Armstrong**, Montgomery, S.M., Yue, L., Demoly, F., Zhou, K., Qi, H.J., Multi-Axis Conformal Direct Ink Write 3D Printing for Appending Structures on Unstructured Surfaces, Society of Engineering Science Annual Technical Meeting (SES 2023), Minneapolis, MN, October 8 - 11, 2023.
14. **Mingzhe Li**, Yue, L., Qi, H.J., Additive Manufacturing of Glass Microstructures at Mild Conditions, 3rd International Conference on Mechanics of Advanced Materials and Structures (ICMAMS 2023), 9-10 August 2023, College Station, TX.
15. **Liang Yue**, Sun, X., Qi, H.J., Cold programmed shape morphing structures based on g-DLP 4D printing, 3rd International Conference on Mechanics of Advanced Materials and Structures (ICMAMS 2023), 9-10 August 2023, College Station, TX.
16. **Xiaohao Sun**, Yue, L., Qi, H.J., Machine learning-enabled forward prediction and inverse design for 4D-printed active plates, 3rd International Conference on Mechanics of Advanced Materials and Structures (ICMAMS 2023), 9-10 August 2023, College Station, TX.

## 2022

17. **Liang Yue**, S. Macrae Montgomery, Xiaohao Sun, Luxia Yu, Yuyang Song, Tsuyoshi Nomura, Masato Tanaka, H. Jerry Qi, Single Vat g-DLP 3D Printing of Materials with Robust

- Multi-Properties and High Stretchability, Society of Engineering Science Annual Technical Meeting, College Station, TX, October 16 - 19, 2022.
18. **Xiaohao Sun**, Liang Yue, H. Jerry Qi, Machine learning-evolutionary algorithm enabled design for 4D-printed active composite structure, Society of Engineering Science Annual Technical Meeting, College Station, TX, October 16 - 19, 2022.
  19. **Xiaohao Sun**, Liang Yue, H. Jerry Qi, Shuai Wu, Sophie Leanza, R. Renee Zhao, Phase diagram and mechanics of snap-folding of ring origami by twisting, Society of Engineering Science Annual Technical Meeting, College Station, TX, October 16 - 19, 2022.
  20. **S. Macrae Montgomery**, H. Jerry Qi, Pixel-level manipulation to improve accuracy in grayscale digital light processing printing, Society of Engineering Science Annual Technical Meeting, College Station, TX, October 16 - 19, 2022.
  21. **Connor Armstrong**, H. Jerry Qi, Producing Functional Fiber-Reinforced Polymer Composites via Hybrid Additive Manufacturing Process, Society of Engineering Science Annual Technical Meeting, College Station, TX, October 16 - 19, 2022.

## 2019

22. Roach, D., Kuang, X., Qi, H.J., 3D Printing of Liquid Crystal Elastomers as Soft Actuators for Multifunctional Devices, 22<sup>nd</sup> International Conference on Composite Materials, Melbourne, Australia, Aug. 11-16, 2019.
23. **Roach, D.**, Wong, J., Kuang, X., Hamel, C.M, Kovita, J., Qi, H.J., Developing Intelligent Structures and Devices Using Novel Smart Materials and Multi-Material Multi-Method (m4) 3D Printing. The 12th International Workshop on Structural Health Monitoring, September 10-12, 2019, Stanford, California, USA.
24. **Hamel, C.M.**, Kuang, X., Qi, H.J., A Reaction-Diffusion Model for Material Property Resolution in Digital Light Processing 3D Printing, 56<sup>th</sup> Annual Technical Meeting of the Society of Engineering Science (SES2019), Washington University, St. Louis, MO, October 13 - 15, 2019.
25. **Hamel, C.M.**, Qi, H.J., Machine Learning Based Design for Active Composites, 56<sup>th</sup> Annual Technical Meeting of the Society of Engineering Science (SES2019), Washington University, St. Louis, MO, October 13 - 15, 2019.
26. **Roach, D.**, Kuang, X., Wong, J., Hamel, C.M, Qi, H.J., Leveraging Multi-Material Multi-Method (m<sup>4</sup>), 56<sup>th</sup> Annual Technical Meeting of the Society of Engineering Science (SES2019), Washington University, St. Louis, MO, October 13 - 15, 2019.
27. **Wong, J.**, Roach, D., Kuang, X., Qi, H.J., 4D Printing Enabled Reconfigurable Antenna), 56<sup>th</sup> Annual Technical Meeting of the Society of Engineering Science (SES2019), Washington University, St. Louis, MO, October 13 - 15, 2019.
28. **Zhang, Q.**, Kuang, X., Qi, H.J., Digital volatilization induced rapid and robust shape-morphing structures, 56<sup>th</sup> Annual Technical Meeting of the Society of Engineering Science (SES2019), Washington University, St. Louis, MO, October 13 - 15, 2019.
29. **Weng, S.**, Kuang, X., Qi, H.J., 4D Printing of Glass Fiber-Regulated Composites with Tunable Shape and High Stiffness, 56<sup>th</sup> Annual Technical Meeting of the Society of Engineering Science (SES2019), Washington University, St. Louis, MO, October 13 - 15, 2019.
30. **Peng, X.**, Kuang, X., Roach, D., Qi, H.J., Multi-material 3D Printing: Integrating Digital Light Processing and Direct Ink Writing, 56<sup>th</sup> Annual Technical Meeting of the Society of Engineering Science (SES2019), Washington University, St. Louis, MO, October 13 - 15, 2019.

31. **Hamel, C.M.**, Qi, H.J., , Design of Soft Functional Composites Based on Machine Learning, ASME IMECE 2019, Salt Lake City, UT, Nov. 11-14, 2019.

## 2018

32. **Hamel, C.M.**, Qi, H.J., Numerical Implementation of Viscoelastic Constitutive Models with Phase Evolution, 13<sup>th</sup> World Congress on Computational Mechanics, New York, NY, July 22-27. 2018.
33. Qi, H.J., Multifunctional Components by a Multi-Material Multi-Method (m<sup>4</sup>) 3D Printer, RAPID + TCT, 2018, Orlando, FL, April 24-26, 2018.

## 2017

1. Wu, J., Zhao, Z., Hamel, C., Qi, H.J., Materials properties evolution during photopolymerization. 2017 ASME International Mechanical Engineering Congress and Exposition. Tampa, FL, Nov. 5-8, 2017.
2. Shi, Q., Kuang, X., Yum K., Qi, H.J. 3D Printing of Recyclable Vitrimer Epoxy. 2017 ASME International Mechanical Engineering Congress and Exposition. Tampa, FL, Nov. 5-8, 2017.
3. Dunn, C., Mu, Q., Qi, H.J. Design and Manufacturing of Shape Changing Structures and Devices using Hybrid 3D Printing. 21<sup>st</sup> International Conference on Composite Materials (ICCM), Xian, China, Aug. 20-25, 2017.
4. Wu, J., Zhao, Z., Hamel, C., Qi, H.J. Mechanics in Photopolymerization. The Chinese Congress of Theoretical and Applied Mechanics (CCTAM-2017), Beijing, Aug. 13-16, 2017.
5. Qi, H.J. Mechanics in Vitrimer Repair and Recycling. The Chinese Congress of Theoretical and Applied Mechanics (CCTAM-2017), Beijing, Aug. 13-16, 2017.
6. Ding, Z., Yuan, C., Dunn, M., Qi, H.J. A Direct 4D Printing Method using Multimaterial 3D Printing. The 28<sup>th</sup> Annual International Solid Freeform Fabrication Symposium, Austin, TX, Aug. 7-9, 2017.
7. **Wu, J.**, Qi, H.J., Materials properties evolution during photopolymerization. The 28<sup>th</sup> Annual International Solid Freeform Fabrication Symposium, Austin, TX, Aug. 7-9, 2017.
8. Kuang, X., Shi, Q., Qi, H.J., Recyclable 3D Printing of Vitrimer Epoxy. The 28<sup>th</sup> Annual International Solid Freeform Fabrication Symposium, Austin, TX, Aug. 7-9, 2017.
9. Ding, Z., Yuan, C., Dunn, M., Qi, H.J. A Direct 4D Printing Method using Multimaterial 3D Printing. 54<sup>th</sup> SES Annual Technical Meeting. Northeastern University, Boston, MA. Jul. 25-28, 2017.
10. **Zhao, Z.**, Fang, D., Qi, H.J., 3D Printing of Spatially Heterogeneous Lattice Materials. 54<sup>th</sup> SES Annual Technical Meeting. Northeastern University, Boston, MA. Jul. 25-28, 2017.
11. **Yuan, C.**, Roach, D., Dunn, C., Mu, Q., Kuang, X., Yakacki, C.M., Wang, T.J., Yu, K., Qi, H.J..3D Printed Reversible Shape Changing Soft Actuator Assisted by Liquid Crystal Elastomer. 54<sup>th</sup> SES Annual Technical Meeting. Northeastern University, Boston, MA. Jul. 25-28, 2017.
12. Yu, K., Dunn, M.L., Qi, H.J.. Interfacial Welding of Covalent Adaptable Network Polymers. 14<sup>th</sup> International Conference on Fracture (ICF 14). Rhodes, Greece, June 18-23, 2017.
13. Qi, H.J. Photo Origami. 4<sup>th</sup> Annual Workshop on ODISSEI. Florida International University, Miami, FL, Apr. 26-27, 2017.

## 2016

14. Zhao, Z., Qi, H.J., Origami by Frontal Photopolymerization, ASME IMECE 2016, Phoenix, AZ, Nov. 14-17, 2016. Qi, H.J., 3D Printing of Reversible Shape Changing Component, ASME IMECE 2016, Phoenix, AZ, Nov. 14-17, 2016.
15. Qi, H.J., Hybrid 3D Printing for Shape Changing Structure and Devices, 2016 Society of Engineering Science Conference, College Park, MD, October 2-5, 2016.
16. Yu, K., Shi, Q., Qi, H.J., Interfacial Welding of Dynamic Covalent Network Polymers, 2016 Society of Engineering Science Conference, College Park, MD, October 2-5, 2016.
17. **Yuan, C.**, Wang, T., Qi, H.J., 3D Printing of Active Origami with Complicated Folding Patterns, 2016 Society of Engineering Science Conference, College Park, MD, October 2-5, 2016.
18. **Zhao, Z.**, Qi, H.J., Shrinkage Induced self-folding origami during photopolymerization. 2016 Society of Engineering Science Conference, College Park, MD, October 2-5, 2016.
19. **Shi, Q.**, Yu, K., T.J., Wang, Qi, H.J., Recyclable 3D Printing of Thermosets based on Covalent Adaptable Networks. 2016 Society of Engineering Science Conference, College Park, MD, October 2-5, 2016.
20. **Lei, M.**, Yu, K., Qi, H.J., Influence of Structural Relaxation on the Thermomechanical and Shape Memory Performances of Amorphous Polymers, 2016 Society of Engineering Science Conference, College Park, MD, October 2-5, 2016.
21. **Wu, J.**, Yuan, C., Ding, Z., Wang, T., Dunn, M, Qi, H.J., Active Composites by Multi-material 3D Printing. 24<sup>th</sup> International Congress of Theoretical and Applied Mechanics. Montreal, Canada, Aug. 21-26, 2016.
22. Qi, H.J., Reversible Shape Changing Components by 3D Printing. 24<sup>th</sup> International Congress of Theoretical and Applied Mechanics. Montreal, Canada, Aug. 21-26, 2016.
23. Qi, H.J., Printed Active Composites using Multimaterial 3D Printing Method, 2016 Annual International Solid Freeform Fabrication Symposium, Austin, August 8-10, 2016.
24. **Dunn, C.**, Mu, Q., Qi, H.J, Integration of PolyJet 3D Printing and Direct Writing for Stretchable Electronics, RAPID Conference, Orlando, FL, May 16-19, 2016.
25. **Mu, X.**, Berton, T., Qi, H.J., Porous Structure by 3D Printing of UV-Curable Resin, RAPID Conference, Orlando, FL, May 16-19, 2016.
26. Qi, H.J, Active Materials and Composites for 4D Printing, RAPID Conference, Orlando, FL, May 16-19, 2016.

## 2015

1. **Isakov, M.**, Dunn, M.L., Qi, H.J., Additive Manufacturing of High Performance Self-actuating Structures, ASME International Mechanical Engineering Congress and Exhibition (IMECE), Houston, Nov. 13-19, 2015.
2. **Yu. K.**, Li, H., Dunn, M.L., Qi, H.J., Interfacial Mechanics of Covalent Adaptive Network Polymers with Bond Exchange Reactions, ASME International Mechanical Engineering Congress and Exhibition (IMECE), Houston, Nov. 13-19, 2015.
3. **Wu. J.**, Ding, Z., Yuan, C., Dunn, M.L., Qi, H.J., Multi-shape memory polymer composites by 3D printing, ASME International Mechanical Engineering Congress and Exhibition (IMECE), Houston, Nov. 13-19, 2015.
4. Mao. Y., Robertson, J., Mu, X., Qi, H.J., Cold programmed shape memory effects in anisotropic shape memory elastomeric composite, ASME International Mechanical Engineering Congress and Exhibition (IMECE), Houston, Nov. 13-19, 2015.
5. Qi, H.J., Digital Manufacturing enabled Soft Active Composites, 2015 SES conference, Prof. Mary Boyce Engineering Science Medal Symposium, College Station, TX, Oct. 26-28, 2015.

6. Yu, K., Qi, H.J., Evolution of Interface Properties during Surface Welding in Covalent Adaptable Network Polymers, Prof. Mary Boyce Engineering Science Medal Symposium, College Station, TX, Oct. 26-28, 2015.
7. **Mu, X.**, Sowan, N, Tumbic, J.A., Bowman, C.N., Mather, P.T., Qi, H.J., Photo-Induced Bending in a Light-Activated Polymer Laminated Composite, ASME Applied Mechanics and Materials Conference (McMAT), Seattle, WA, June 29-July 1<sup>st</sup>, 2015.
8. Yu, K., Dunn, M.L., Qi, H.J., Constitutive modeling of interfacial welding due to bond exchange reactions, SES Annual Technical Conference, Costa Mesa, CA, June 7-10, 2015.
9. Yang, H., Yu, K., Qi, H.J., A molecular dynamics study of bond exchange reactions for thermoforming and interface welding in covalent adaptable networks, SES Annual Technical Conference, Costa Mesa, CA, June 7-10, 2015.
10. Qi, H.J, Dunn, M.L., Active Composites for 4D Printing, SEM Annual Technical Conference, Costa Mesa, CA, June 7-10, 2015.
11. Yu, K., Dunn, M.L., Qi, H.J., Reshaping and recycling of thermoset polymers based on bond exchange reactions. PACAM-XV Conference, Urbana-Champaign, IL, May 19-21, 2015.
12. Qi, H.J, Dunn, M.L., Active Composites for 4D Printing, PACAM-XV Conference, Urbana-Champaign, IL, May 19-21, 2015.

#### **2014**

1. Qi., H.J., Maute, K., Dunn, M.L., 4D Printed Composites for Topology Transforming Devices, The 3rd Multifunctional Materials for Defense Workshop, Arlington, VA, August 18-22, 2014,
2. **Hua Yang**, Gao, Y., Shi, X.H., Qi, H.J., A molecular dynamics study of the bond exchange reactions in covalent adaptable networks, Society of Experimental Mechanics Annual Technical Conference. Greenville, SC, 06/01/14-06/05/14.
3. **Xiaoming Mu**, Qi, H.J., Photo-origami of laminate structure, Society of Experimental Mechanics Annual Technical Conference. Greenville, SC, 06/01/14-06/05/14.
4. **Kai Yu**, Philip Taynton, Wei Zhang, Martin L. Dunn, H. Jerry Qi (2014). Reprocessing and Recycling of Thermoset Polymers based on Bond Exchange Reaction. Society of Experimental Mechanics Annual Technical Conference. Greenville, SC, 06/01/14-06/05/14.
5. Kai Yu, Qi Ge, H. Jerry Qi (2014). Predicting Shape Fixity and Recovery of Shape Memory Polymers. Society of Experimental Mechanics Annual Technical Conference. Greenville, SC, 06/01/14-06/05/14.
6. Yu, K., Ge, Q., Qi, H.J., A Unified Approach to Predict Shape Fixity and Recovery of Amorphous Shape Memory Polymers by Using Reduced Time, The 9th International Conference on the Mechanics of Time Dependent Materials, Montreal, QC, Canada, 5/27/2014-5/30/2014.
7. Kai Yu, Philip Taynton, Wei Zhang, Martin L. Dunn, H. Jerry Qi (2014). Reprocessing and Recycling of Thermoset Polymers based on Bond Exchange Reaction. Mechanics of Time-Dependent Materials Conference. Montreal, QC, Canada, 5/27/2014-5/30/2014.
8. Qi Ge, Conner Dunn, Kai Yu, H. Jerry Qi, Martin L. Dunn, Active Composites by 4D Printing, MRS Spring 2014, Symposium XX: Shape Programmable Materials, San Francisco, CA, April 22, 2014.

#### **2013**

1. Qi Ge, Binglian Wang, Martin Dunn, H. Jerry Qi, Thermomechanical Behaviors of Anisotropic Shape Memory Elastomer Composites, 13<sup>th</sup> International Conference on

- Fracture June 16-21, 2013.
2. Kai Yu, H. Jerry Qi, Jeffrey W. Baur, David M. Philips, Design Considerations for Thermally Responsive SMP Composites with Internal Heating, 13<sup>th</sup> International Conference on Fracture June 16-21, 2013.
  3. Qi Ge, Binglian Wang, Martin Dunn, H. Jerry Qi, Thermomechanical Behaviors of Anisotropic Shape Memory Elastomer Composites, SEM Annual Conference, Lombard, IL, June 3-5, 2013.
  4. Kai Yu, H. Jerry Qi, Jeffrey W. Baur, David M. Philips, Design Considerations for Thermally Responsive SMP Composites with Internal Heating, PACAM XIII, Houston, TX, May 22-24, 2013.
  5. Kai Yu, Qi Ge, and H. Jerry Qi, Predicting Shape Fixity and Recovery of Shape Memory Polymers, PACAM XIII, Houston, TX, May 22-24, 2013.
  6. Qi Ge, Conner Dunn, H. Jerry Qi, Martin L. Dunn, Active Composites by 4D Printing, ASME IMECE, San Diego, CA , November 15-21, 2013.

## **2012**

1. M. D'Amato, J. Ryu, X. Cui, M. Dunn, H. Jerry Qi, Mechanics and Applications of Light-Activated Polymers, SEM XII International Congress & Exposition on Experimental and Applied Mechanics, Costa Mesa, CA, June 11-14, 2012.
2. Kai Yu, Ge (Kevin) Qi, Philip Kao, Kristofer Westbrook, H. Jerry Qi, Time Dependent Recovery of Shape Memory Polymer Composites with Magnetic Particles, SEM XII International Congress & Exposition on Experimental and Applied Mechanics, Costa Mesa, CA, June 11-14, 2012.
3. Feng Miao, Yifu Ding, H. Jerry Qi, Mechanics of Cell Alignment due to Contact Guidance by Substrate Surface Patterns (Poster), NSF Grantee Conference, Boston, MA, July 9-11, 2012.
4. M. D'Amato, J. Ryu, X. Cui, M. Dunn, H. Jerry Qi, Mechanics and Applications of Light-Activated Polymers, 8th International Conference on Mechanics of Time-Dependent Materials (MTDM 2012), Kanazawa, Japan, September 24 -26, 2012.
5. Qi Ge, Binglian Wang, Martin Dunn, H. Jerry Qi, Time-Temperature Dependent Behaviors of Shape Memory Elastomer Composites, 8th International Conference on Mechanics of Time-Dependent Materials (MTDM 2012), Kanazawa, Japan, September 24 -26, 2012.
6. M. D'Amato, J. Ryu, X. Cui, M. Dunn, H. Jerry Qi, Mechanics and Applications of Light-Activated Polymers, ASME 2012 International Mechanical Engineering Congress & Exposition, Houston, TX, November 9-15, 2012.
7. Kai Yu , H. Jerry. Qi, ' Design Considerations for Shape Memory Polymer Composites Containing Magnetic Particles, ASME 2012 International Mechanical Engineering Congress & Exposition, Houston, TX, November 9-15, 2012.
8. Qi Ge, Xiaofan Luo, Erika D. Rodriguez, Patrick Mather, Martin Dunn, H. Jerry Qi, Thermomechanical Constitutive Modeling for Triple Shape Polymeric Composites, ASME 2012 International Mechanical Engineering Congress & Exposition, Houston, TX, November 9-15, 2012.
9. Binglian Wang, Qi (Kevin) Ge, H. Jerry Qi, Finite Element Analysis of Shape Memory Elastomeric Composite, , ASME 2012 International Mechanical Engineering Congress & Exposition, Houston, TX, November 9-15, 2012.
10. H. Jerry Qi, Bahar Fata, Michael Sacks, A Forward Incremental Approach for Determining the Unloaded Configuration of the Growing Pulmonary Artery (Poster), Atlanta, GA, October 24-27, 2012.

## 2011

1. Qi Ge, Xiaofan Luo, Patrick Mather, Martin Dunn, H. Jerry Qi, Thermomechanical Constitutive Modeling of Shape Memory Elastomeric Composites, 2011 SEM conference, Uncasville, CT, June 13-16, 2011.
2. Kristofer Westbrook, Qi Ge, H. Jerry Qi, Time-dependent Recovery of Shape Memory Polymers, SES 2011 Annual Conference, Evanston, IL, October, 12-14, 2011.
3. Feng Miao, Xiaodong Cui, and H. Jerry Qi, Computational Study of Cell Adhesion on Substrate with Surface Patterns, SES 2011 Annual Conference, Evanston, IL, October, 12-14, 2011.
4. Gregory Pelkie, Philip Kao, H. Jerry Qi, Characterization of Viscoelastic Behaviors of Pulmonary Arterial Tissues, SES 2011 Annual Conference, Evanston, IL, October, 12-14, 2011.
5. Philip Kao, H. Jerry Qi, A Microstructure-based Model for Pulmonary Artery Tissues, SES 2011 Annual Conference, Evanston, IL, October, 12-14, 2011.
6. Feng Miao, Xiaodong Cui, H. Jerry Qi, Simulation of cell adhesive contact on a grooved rigid substrate, 2011 IMECE, Denver, CO., Nov. 14-17, 2011.
7. Binglian Wang, Qi Ge, Kevin Long, H. Jerry Qi, A General 3D Thermal-mechanical Constitutive Model for Soft Active Materials with Phase Evolution, 2011 IMECE, Denver, CO., Nov. 14-17, 2011.
8. Qi Ge, Martin Dunn, H. Jerry Qi, Thermo-mechanical Behaviors of Shape Memory Elastomer Composites, 2011 IMECE, Denver, CO., Nov. 14-17, 2011.

## 2010

1. Kao, P., Pelkie, G., Qi, H.J., Lammers, S., Hunter, K., Stenmark, K., Shandas, R., "A Microstructure-based Model for Pulmonary Artery Tissue", ASME 2010 IMECE, Vancouver, BC, CA, November 2010.
2. Pelkie, G., Kao, P., Sokol, S., Qi, H.J., "Characterization of Viscoelastic Behaviors of Pulmonary Arterial Tissues", ASME 2010 IMECE, Vancouver, BC, CA, November 2010.
3. Westbrook, K., Kao, P., Castro, F., Qi, H.J., "Temperature Dependent Recovery of Shape Memory Polymers", ASME 2010 IMECE, Vancouver, BC, CA, November 2010.
4. Qi, G., Dunn, M., Qi, H.J., "Constitutive Model of Shape Memory Elastomeric Composites (SMECs)", ASME 2010 IMECE, Vancouver, BC, CA, November 2010.
5. Long, K., Dunn, M., Qi, H.J., "Photo-Patterning with Light Activated Polymers", ASME 2010 IMECE, Vancouver, BC, CA, November 2010.
6. Westbrook, K., Castro, F., Qi, H., "Time Dependent Recovery of Shape Memory Polymers", SAMPE Fall Technique Conference, Salt Lake City, UT, October, 2010.
7. Qi, H.J., Ge, Q., Dunn, M., Mather, P., "Constitutive Model of Shape Memory Elastomeric Composites (SMECs)", The 7th International Conference on MTDM, Portoroz, Slovenia, September, 2010
8. Qi, H.J., Westbrook, K., Long, K., Dunn, M., Mather, P., "Shape Memory Behaviors in Semicrystalline Polymers with Stretch Induced Crystallization", The 7th International Conference on MTDM, Portoroz, Slovenia, September, 2010
9. Roy, S., Qi, H.J., "Micromechanical Modeling of Affine-Nonaffine Deformation in Cytoskeleton Mechanics", SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, May 2010.
10. Roy, S., Qi, H.J., "Micromechanical Modeling of Cytoskeleton, ASME NEMB Conference", Houston, TX, Feb. 2010.

11. Roy, S., Miao, F., Qi, H.J., "Computational Study of Cell Crawling by Contractile Stress Induced Retraction", ASME NEMB Conference, Houston, TX, Feb. 2010.

## 2009

1. Qi, H.J., Long, K.N., Dunn, M., 2009. "Mechanics of Soft Active Materials with Phase Evolution", ASME IMECE 2009, Orlando, FL, November, 2009.
2. Long, K.N., Dunn, M., Qi, H.J., 2009. "Photo-Mechanical Modeling of Photo-Activated Polymers", ASME IMECE 2009, Orlando, FL, November, 2009.
3. Qi, H.J., Castro, F., Westbrook, Hermiller, J, Havens, E., 2009. "Investigation of Thermo-Mechanical Behavior of Thermally Induced Shape Memory Polymers, SEM Conference", Albuquerque, NM, June, 2009.
4. Long, K.N., Dunn, M., Qi, H.J., 2009. "Photo-Mechanical Modeling of Photo-Activated Polymers", SMN 2009 Conference, Weihai, China, July, 2009
5. Qi, H.J., Westbrook, K., Castro, F., 2009. "A Thermo-Viscoelastic Model for Amorphous Shape Memory Polymers". SMN 2009 Conference, Weihai, China, July, 2009.
6. Qi, H.J, Castro, F., Hermiller, J., Havens, E. "Investigation of Thermo-Mechanical Behavior of Thermally Induced Shape Memory Polymers", SEM Conference, Albuquerque, NM, June, 2009
7. Hermiller, J.M., Cable, K.M., Hemmelgarn, C.D., Qi, H.J., and Castro, F., 2008. "Thermal Design Methodology for Attaching Morphing Components", in SPIE Conference on Smart Structures, San Diego, CA, March, 2009.
8. Castro, F., Qi, H.J., Hermiller, J.M., Havens, E., 2009, "Time Dependent Thermo-Mechanical Behavior of Thermally Induced Shape Memory Polymers", in SPIE Conference on Smart Structures, San Diego, CA, March, 2009.

## 2008

1. H. J. Qi, L. Xiao, 2008, A Multiscale Modeling Approach for Large Deformation Behavior of Erythrocyte Membrane (poster), NSF CMMI Grantee Conference, Knoxville, TN, January, 2008.
2. H. J. Qi, F. Castro, K. Long, K. Westbrook, 2008, CAREER: Integrative Research and Education on Multiphysical Behaviors of Soft functional Materials (poster), NSF CMMI Grantee Conference, Knoxville, TN, January, 2008.
3. Francisco Castro, H. Jerry Qi, Thermal Rates Effects to the Shape Change of Thermally Induced Shape Memory Polymers, MTDM'08, Monterey, CA , April, 2008.
4. Kevin Long, Timothy Scott, H. Jerry Qi, Chris Bowman, Martin L. Dunn, Modeling the Photomechanics of Light-Activated Polymers, IMECE, Boston, MA, November, 2009.
5. Sitikantha Roy and H. Jerry Qi, Micromechanical Modeling of Cytoskeleton, SES'08, Urbana-Champaign, IL, October, 2008.
6. Francisco Castro, H. Jerry Qi, Robin Shandas-, Thermo-Mechanical Behavior of Thermally Induced Shape Memory Polymers, SES'08, Urbana-Champaign, IL, October, 2008.
7. Kristofer Westbrook, H. Jerry Qi, Modeling the Coupled Diffusion and Swelling Deformation of Hydrogels, SES'08, Urbana-Champaign, IL, October, 2008.
8. Philip H. Kao, Steven R. Lammers, H. Jerry Qi, Robin Shandas, A constitutive model considering the orthotropy of the elastic and collagen fiber networks, SES'08, Urbana-Champaign, IL, October, 2008.



9. Kevin Long, Timothy Scott, H. Jerry Qi, Chris Bowman, Martin L. Dunn, Modeling the Photomechanics of Light-Activated Polymers, SES'08, Urbana-Champaign, IL, October, 2008.
10. Kevin Long, Timothy Scott, H. Jerry Qi, Chris Bowman, Martin L. Dunn, Modeling the Photomechanics of Light-Activated Polymers, SMASIS, Ellicott City, MD, October, 2008.
11. Sitikantha Roy and H. Jerry Qi, Constitutive Modeling of Cell Cytoskeleton, MRS Fall conference, Boston, MA, November, 2008.

## **2007**

1. H. J. Qi, F. Castro, J. M. Hermiller, D. E. Havens, On the Development of Constitutive Models of Finite Deformation Behavior of Shape Memory Polymers, SAMPE, SAMPE Fall Technical Conference and Exhibition Cincinnati, OH, Oct 29-Nov. 31, 2007.
2. P. Kao, H. Jerry Qi, Mechanical Properties of Fresh Artery Tissues and Elastin-Network, SES 2007, College Park, TX, October, 2007.
3. F. Castro, H. J. Qi, Thermo-mechanical Behaviors of Shape Memory Polymers, SES 2007, College Park, TX, October, 2007.
4. K. Long, M. Dunn, H. J. Qi, Shape Memory Effect of Shape Memory Polymers due to Nano-/Micro- Indentation, SES 2007, College Park, TX, October, 2007.
5. L. Xiao, H. J. Qi, A structural micromechanical approach for modeling large deformation behavior of red blood cells, SES 2007, College Park, TX, October, 2007.
6. H.J. Qi, Thermo-Mechanical Behaviors of Shape Memory Polymers, (**Keynote**), McMat 2007, Austin, TX, June, 2007.
7. L. Xiao, H.J. Qi, A Structural Micromechanical Approach for Modeling Large Deformation Behaviors of Red Blood Cells, McMat 2007, Austin, TX, June, 2007.
8. K. Westbrook, H.J. Qi, Design of Environmentally Responsive Hydrogel Based Sensors and Actuators, McMat 2007, Austin, TX, June, 2007.
9. P. Kao, H.J. Qi, A Comparative Study of Mechanical Properties of Fresh Artery Tissues and Elastin-Network, McMat 2007, Austin, TX, June, 2007.
10. L. Xiao, H.J. Qi, A Structural Micromechanical Approach for Modeling Large Deformation Behaviors of Red Blood Cells, The 5th International Conference on Nonlinear Mechanics, Shanghai, China, June, 2007.
11. K. Westbrook, H.J. Qi, Design of Environmentally Responsive Hydrogel Based Sensors and Actuators, The 5th International Conference on Nonlinear Mechanics, Shanghai, China, June, 2007.
12. H.J. Qi, F. Castro, Constitutive Modeling of Finite Deformation Behavior of Shape Memory Polymers, The 5th International Conference on Nonlinear Mechanics, Shanghai, China, June, 2007.
13. M. Dunn, K. Long, F. Castro, H. J. Qi Instrumented Indentation of Shape Memory Polymers, SPIE Conference on Smart Structures, San Diego, CA, March, 2007.

## **2006**

1. H.J. Qi, C. Yakacki, R. Shandas, K. Gall, Thermo-Mechanical Modeling of Shape Memory Polymers. MRS Spring Conference, San Francisco, CA, April, 2006.
2. K. Westbrook, H.J. Qi, Constitutive Modeling of Large Deformation Behavior of Thermo-Responsive Hydrogels. MRS Spring Conference, San Francisco, CA, April, 2006.
3. H.J. Qi, C. Yakacki, R. Shandas, K. Gall, Constitutive Modeling of Thermo-Mechanical Behavior of Shape Memory Polymers. U.S. National Congress of Theoretical and Applied Mechanics 2006 Conference, Boulder, CO, June, 2006.

4. K. Westbrook, H.J. Qi, Large Deformation Behavior of Thermo-Responsive Hydrogels, SES 2006, State College, PA, August, 2006.
5. H.J. Qi, C. Yakacki, R. Shandas, K. Gall, Thermo-Mechanical Finite Deformation Behavior of Shape Memory Polymers. SES 2006, State College, PA, August, 2006.
6. M.L. Dunn, H.J. Qi, Shape Memory Effect of Shape Memory Polymers due to Nano-/Micro-Indentation, ASME IMECE 2006, Chicago, November, 2006.
7. H.J. Qi, C. Yakacki, R. Shandas, K. Gall, Constitutive Modeling of Shape Memory Polymers and its Application to Shape Changing Biomedical Device Design. MRS Fall Conference, Boston, MA, 2006.
8. L. Xiao, H.J. Qi, Modeling of Large Deformation Behavior of Red Blood Cells, MRS Fall Conference, Boston, MA, 2006.
9. K. Westbrook, H.J. Qi, Photo-patterned Environmentally Responsive Composite Hydrogel Actuators. MRS Fall Conference, Boston, MA, 2006.

#### **2005**

1. H.J. Qi, C. Ortiz, M.C. Boyce, Protein forced unfolding and its effects on the finite deformation stress-strain behavior of biomacromolecular solids. MRS Spring Conference, San Francisco, CA, April, 2005.
2. H.J. Qi, C. Ortiz, M.C. Boyce, Biological Mechanism of Mechanical Behavior of Nacre. (Poster). MRS Spring Conference, San Francisco, CA, April, 2005.
3. H.J. Qi, C. Ortiz, M.C. Boyce, Biological Mechanism of Mechanical Behavior of Nacre. McMat 2005, Baton Rouge, LA, June, 2005.
4. H.J. Qi, M.C. Boyce, Stress-Strain Behavior of Thermoplastic Polyurethane Elastomer and Its Application to the Traction of Elastomers. McMat 2005, Baton Rouge, LA, June, 2005.
5. H.J. Qi, C. Ortiz, M.C. Boyce, Protein Forced Unfolding and Its Effects to the Finite Deformation Stress-Strain Behavior of Biomacromolecular Membrane and Solids. McMat 2005, Baton Rouge, LA, June, 2005.
6. H.J. Qi, C. Ortiz, M.C. Boyce, Protein Forced Unfolding and Its Effects to the Finite Deformation Stress-Strain Behavior of Biomacromolecular Membrane and Solids Summer Bioengineering Conference, Vail, CO, June, 2005
7. H.J. Qi, M.C. Boyce, Large Strain Rate Dependent Stress-Strain Behavior of Thermoplastic Polyurethane Elastomers. IMECE 2005, Orlando, FL, November, 2005.
8. H.J. Qi, C. Ying, S. Hsu, Nano-scale Mechanistic Study of Tribological Behavior of Silicon (Poster). CU-NIST Symposium, November, 2005.

#### **2004**

1. H.J. Qi, M.C. Boyce, C. Ortiz, Protein unfolding and mechanics of nacre, in Workshop on Reliability Issues in Nanomaterials (invited only), Boulder, CO, August 16-18, 2004.
2. B. Bruet, H.J. Qi, K.L. Frick, C. Ortiz, M.C. Boyce. Nanomechanical properties of individual nacre plates from *Trochus Niloticus* (poster), MRS Spring Meeting, San Francisco, CA, April, 2004.

#### **2003 and before**

1. H.J. Qi, K. Teo, K. Lau, J. Lao, M.C. Boyce, J. Robertson, W. Milne, Z. Ren, K.K. Gleason, Nanoindentation of Vertically Aligned Carbon Nanotubes, PMMA Coated Nanotubes, and ZnO Nanofibers, MRS Fall Meeting, Boston, MA, December, 2003.
2. H.J. Qi, M.C. Boyce, Influence of time dependence and cyclic softening on surface traction of elastomers, 40<sup>th</sup> Annual Technical Meeting, Society of Engineering Science, Detroit, MI,

- October, 2003.
3. H.J. Qi, M.C. Boyce, Topography studies of thermoplastic polyurethane upon cyclic micro scratching tests, 40<sup>th</sup> Annual Technical Meeting, Society of Engineering Science, Detroit, MI, October, 2003.
  4. H.J. Qi, M.C. Boyce, FEM simulations of micro indentation/scratching tests on elastomeric materials, 2003 ASME Mechanics and Materials Conference, Scottsdale, AZ, June, 2003.
  5. H. Qi, K. Teo, K. Lau, M.C. Boyce, J. Robertson, W. Milne, K.K. Gleason, On determining the mechanical properties of carbon nanotubes and vertically aligned carbon nanotube forests using nanoindentations, MRS Spring Meeting, San Francisco, CA, April, 2003.
  6. H. Qi, K. Lau, M.C. Boyce, K.K. Gleason, K. Teo, J. Robertson, W. Milne, Effects of processing conditions and dimensions on the mechanical properties of vertically aligned carbon nanotube forests, Annual APS March Meeting 2003, Austin, TX, March, 2003.
  7. H. Qi, M.C. Boyce, Micro in-situ SEM study of abrasive wear of elastomeric materials (poster), presented at 2001 Gordon Research Conference on Elastomers, Networks and Gels, Colby-Sawyer College, New London, NH, August, 2001.
  8. H. Qi, M.C. Boyce, Micro in-situ SEM study of abrasive wear of elastomeric materials, presented at the Symposium on the Durability of Elastomeric Material Systems, part of the national 2001 Mechanics and Materials Conference, San Diego, CA, June, 2001.

#### **D4. Invited Seminar Presentations:**

##### **2023**

1. Multimaterial Additive Manufacturing toward Shape Changing Structures and 4D Printing. Department of Mechanical Engineering, Boston University, Boston, MA, November 17, 2023.
2. Shape Memory Polymers and Multimaterials 4D Printing for Shape Morphing Structures, Toyota Research Institute of North America, Ann Arbor, MI, July 14, 2023.
3. Multi-material Additive Manufacturing for Shape Changing Devices and 4D Printing. Department of Mechanical and Industrial Engineering, Northeastern University, April 4, 2023.
4. Multimaterial Additive Manufacturing toward Shape Changing Structures and 4D Printing. Department of Mechanical Engineering, University of Houston, Houston, TX, January 18, 2023.

##### **2022**

5. Multi-material Additive Manufacturing for Shape Changing Devices and 4D Printing. Department of Aerospace and Mechanical Engineering, University of Southern California, September 28, 2022.
6. Multimaterial Additive Manufacturing toward Shape Changing Functional Devices and 4D Printing, Department of Aerospace Engineering, University of Illinois at Urbana-Champaign, February 7, 2022.

##### **2019**

7. Multi-material 3D Printing for Shape Changing Devices and 4D Printing, Department of Mechanical and Aerospace Engineering, Ohio State University, Columbus, OH, March 1<sup>st</sup>, 2019.

8. Multi-material 3D Printing for Shape Changing Devices and 4D Printing, Purdue Mechanical Engineering Graduate Seminar, School of Mechanical Engineering, Purdue University, West Lafayette, Indiana, November 7<sup>th</sup>, 2019.
9. Multi-material 3D Printing for Shape Changing Structures and 4D Printing, Sandia National Laboratories, Albuquerque, NM, December 3<sup>rd</sup>, 2019.

#### **2018**

10. 4D Printing: Making 3D Printing Alive, 2018. Northrup Grumann, Baltimore, MD, Aug. 2, 2018.

#### **2017**

1. 4D Printing: Making 3D Printing Alive, MIT, Oct. 13, 2017.
2. 4D Printing: Making 3D Printing Alive, Sandia National Labs, Albuquerque, NM, Jun. 8, 2017.
3. 4D Printing: Making 3D Printing Alive, Technion, Israel Institute of Technology, Haifa, Israel, Jun. 25, 2017.
4. Origami Folding Structures by 3D/4D Printing, Singapore University of Technology and Design, Singapore, May 31, 2017.
5. Active Composites Design for 4D Printing, Shenzhen Institute of Advanced Technology, Shenzhen, May 26, 2017.
6. Printed Active Composites and 4D Printing, North Carolina State University, Raleigh, NC, April, 30, 2017.
7. Active Composites Design for 4D Printing, Tsinghua University, Beijing, China, March 21, 2017.

#### **2016**

1. \*Vitrimers: Mechanics and Applications. Southwest Jiaotong University, Chengdu, China, Dec. 20, 2016.
2. \*Design of Active Composites for 4D Printing Applications, University of Illinois, Urbana Champaign, Nov. 8, 2016.
3. \*Active Composites Design for 4D Printing, Louisiana State University, Baton Rouge, Oct. 28, 2016.
4. \*Design of Active Composites for 4D Printing Applications, Oklahoma University, Oklahoma City, Oct. 24, 2016.
5. \*Active Composites Design for 4D Printing, University of Houston, Houston, Sep., 21, 2016.
6. \*4D Printing: Concept, Implementation, and Challenges, HP Lab, Palo Alto, CA, Sep. 16, 2016.
7. \*Design of Reversible Shape Changing Components for 3D/4D Printing Applications. Singapore University of Technology and Design, July 9, 2016.
8. \*4D Printing: Concept, Implementation, and Challenges, Johns Hopkins University, Baltimore, MD, Mar. 24, 2016.
9. \*4D Printing: Concept, Implementation, and Challenges, Boston University, Boston, MA, Jan. 22, 2016.

#### **2015 and before**

10. \*4D Printing: Concept, Implementation, and Challenges, Singapore University of Technology and Design, Singapore, Dec. 20-21, 2015.

11. \*Active Composites by 4D Printing, Southwest Jiaotong University, Chengdu, China, 10/17/2014.
12. \*Active Composites by 4D Printing, Institute of Electronic and Nanotechnology, Georgia Tech, Atlanta, GA, 9/18/2014.
13. \*Mechanics and Physics of Shape Memory Polymers, A-Star, Singapore, July 29, 2014.
14. \*Active Composites by 4D Printing, Colorado School of Mines, Golden, CO, 2/4/2014.
15. Mechanics and Physics of Shape Memory Polymers, Hunan University, Changsha, China June 21, 2013.
16. Mechanics of Phase Evolution in Soft Active Materials, Beijing Jiaotong University, Beijing, China, June 18, 2013.
17. Multiphysical Behaviors of Shape Memory Polymers, Xi'an Jiaotong University, Xi'an, Shaanxi, China, August 29, 2012.
18. Multiphysical Behaviors of Shape Memory Polymers, University of Texas, Austin, TX, April 17, 2012.
19. Multiphysical Behaviors of Shape Memory Polymers, Harbin Institute of Technology, Harbin, China, 12/23/2011.
20. Multiphysical Behaviors of Shape Memory Polymers, Beijing Jiaotong University, Beijing, China, 12/2/2011.
21. Physics and Mechanics of Shape Memory Polymers, Hong Kong PolyTechnic University, July 28, 2010.
22. Physics and Mechanics of Shape Memory Polymers, Fudan University, August 3, 2010.
23. Shape memory polymers: Physics and Mechanics, Beijing University, Beijing, China, December, 2009.
24. Mechanics of Cytoskeleton and Cell Crawling, Tsinghua University, Beijing, China, December, 2009.
25. Constitutive Models for Active Materials with Phase Evolution. ARFL/RXB, Wright-Patterson AFB, OH, April, 2009.
26. Soft Active Materials: The Smart Elastigirl, Theoretical and Applied Mechanics Council, Northwestern University January 22, 2009.
27. Soft Active Materials: The Smart Elastigirl, Sandia National Laboratories, Albuquerque, NM, October, 2008.
28. Modeling of Multiphysical Behaviors of Active Soft Materials, Liquid Crystal Material Research Center, University of Colorado, Boulder, CO, March 2008.
29. Smart Polymers: The Elastigirl. Tsinghua University, Beijing, June, 2007.
30. Smart Polymers: The Elastigirl. Xi'an Jiaotong University, Xian, Shannxi Provice, June, 2007.
31. Experiments and Constitutive Modeling on the Thermo-Mechanical Behaviors of Shape Memory Polymers, Cornerstone Research Group and Air Force Research Lab, Dayton, OH, January, 2007.
32. Soft Active Polymers: The Elastigirl. Sandia National Laboratories, Livermore, CA, November, 2006.
33. Smart Polymers: The Elastigirl. Civil and Environmental Engineering Department Seminar, Louisiana State University, Baton Rouge, LA, March, 2006.
34. Biological Mechanism of Mechanical Behavior of Nacre. Sandia National Laboratories, February, 2005.
35. Biological Mechanism of Mechanical Behavior of Nacre. Dept. Mechanical Engineering, Ohio State University, May, 2005.

## B. INDIVIDUAL STUDENT GUIDANCE

### B1. PhD. Students

#### B1.a Graduated PhD. Students (23)

Connor Armstrong, Renewable Bioproduct Institute (RBI) fellowship, Tandem Development of Novel Materials & Manufacturing Techniques for Direct Ink Write 3D Printing. Now postdoc at UIUC.

Stuart M. Montgomery, 08/2018-05/2023, Grayscale Digital Light Processing 3D Printing and its Applications in Advanced Manufacturing. Now at at Align Technology, Inc.

Xirui Peng, 08/2017-05/2022, Renewable Bioproduct Institute (RBI) fellowship, Multimaterial 3D/4D printing by integrating digital light processing and direct ink writing, now at Align Technology, Inc.

Devin Roach, 08/2016-05/2021, Developing Intelligent Structures and Devices Using Smart Materials and Multi-material Multi-method (M4) 3D Printing. Now as Assistant Professor at Oregon State University.

Qiang Zhang, 10/2018-09/2020, visiting PhD student, mechanics design of active composites for 4D printing. Co-advising with Prof. Daining Fang of Peking University

Shayuan Weng, 10/2018-09/2020, visiting PhD student, computational design of active composites, co advising with Prof. Ning Hu of Chongqing University

Craig Hamel, 08/2016-05/2020, Modeling of Polymeric Materials with Applications in Active Materials and Additive Manufacturing. Now as Staff Scientist at Sandia.

Vincent Li, 09/2014-12/2018, Chemical Engineering student, co-advising with Prof. Yulin Deng of ChBE), Renewable Bioproduct Institute (RBI) fellowship, 3D printing of functional composites. Now at International Paper, Inc.

Jiangtao Wu, 09/2014-06/2018, Mechanics of Photocuring. Now at Corning Inc.

Xiaoming Mu, 08/2012-07/2018, GT, Mechanics of Light Active Polymers. Now as an assistant professor at Wilkes University.

Chao Yuan, 06/2014-11/2017, Mechanics design of active composites for 4D printing, co-advising with Prof. Tiejun Wang of XJTU. At GT as a visiting student (11/2015-10/2017). Now at Xi'an Jiaotong Univ. as an assistant professor.

Quanyi Mu, 09/2014-08/2018, Electromechanical properties of conductive polymers, co-advising with Prof. Tiejun Wang of XJTU. At GT as a visiting student (11/2015-10/2016). Now at Ningxia University as an assistant professor.

Qian Shi, 11/2014-05/2018, Mechanical Behaviors of Polymers from FDM 3D Printing, co-advising with Prof. Tiejun Wang of XJTU. At GT as a visiting student (11/2015-10/2016). Now at Nanyang Technological University as a postdoc

Ming Lei, 06/2014-03/2018, Nonequilibrium behaviors of shape memory polymers, co-advising with Prof. Haobao Lu of Harbin Institute of Technology. At GT as a visiting student now (12/2015-11/2017). Now as an assistant professor at Northwestern Polytech University.

Hua Yang, 01/2012-06/2016, GT MD simulations of bond exchange reactions in covalent adaptable network polymers. Now a postdoc at Beijing Petroleum University.

Kai Yu, 08/2010- 07/2015, GT, Thermomechanical Behaviors of Active Network Polymers. Now as an assistant professor at University of Colorado Denver.

Qi Ge, 08/2009-12/2012, CU, “Thermal-Mechanics of Shape Memory Polymers and Composites”, co-advise with Martin Dunn. Now an associate professor at Southern China University of Science and Technology.

Binglian Wang, 08/2010-12/2012, CU, “Micromechanics and constitutive models for soft active materials with phase evolution”. Now at Caterpillar.

Feng Miao, 08/2008, 12/2012, CU, “Mechanics of Interaction between Cell Membrane and a Rigid Substrate”. Now at GM.

Francisco Castro, 09/2005-11/2009. “Thermo-Mechanical Behavior of Shape Memory Polymers”, November, 2009. Now in the ME Department at CU-Boulder.

Kristofer Westbrook, 08/2005 – 07/2010, CU, “Finite Deformation Constitutive Modeling of Soft Active Materials, Thermally Responsive Polymers”. Now at Simulia (ABAQUS).

Philips Kao, 08/2006 – 07/2010, CU, “Biaxial mechanical characterization and microstructure-driven modeling of elastic pulmonary artery walls of large mammals under hypertensive conditions”. Now a small business owner.

Kevin Long, 08/2006 – 06/2010, CU, “Mechanics of Light Activated Network Polymers”. Co-Advise with Martin Dunn, currently as a Distinguished Staff Scientist at Sandia National Laboratories.

### **B1.b In Process PhD. Students (3)**

Farzad Gholami, 02/2023-now, Multimaterial 3D printing for functional devices, pre-qual.

Teerapong Poltue, 08/2023-now, Machine learning based process optimization in 3D printing, pre-qual.

Marcus Fratarcangeli, 08/2018-now, Methods to stabilize grayscale 3D printing, pre-qual.

## **B2. M.S. Students (Indicate thesis option for each student)**

### **B2.a Graduated M.S. students**

Conner Dunn, 09/2015-08/2017, Active Composites by 4D Printing.

Lei Wang: 09/2014-06/2017, Mechanical Behaviors of Polymers from FDM 3D Printing, co-advising with Prof. Yiejun Wang of XJTU.

Jennie Ryu, 01/2011-present, CU, “Controlled Deformation of Light Activated Polymers”, co-advise with Martin Dunn

Gregory Pelkie, 08/2009-present, CU “Mechanical Behaviors of Arterial Tissues”.

Long Xiao, 08/2005 – 05/2008, CU, “Micromechanical Modeling of Large Deformation Behavior of Red Blood Cells”.

Will Francis, 08/2005 – 05/2007, CU, “Micromechanical Modeling of Fiber Reinforced Shape Memory Elastic Materials”. Co-advise with Martin Dunn

Y. Ge, 08/2004 – 05/2005, CU, “Micro Mechanics of Cytoskeleton of Red Blood Cell.”  
Transferred to Purdue University without finishing.

K. Tai (Co-advised with C. Ortiz), 09/2003 – 08/2004, MIT, “Micro- and nano- mechanics of cortical bone tissue”.

### **B2.b In Process M.S. students**

### **B3. Undergraduate Students**

2023

Nandita Gallacher            12/23-now      Sustainable 3D printing

2019

Jacob Skovran                12/2019-now    Large area DLP 3D printing

Yaoqing Wang                04/2019-now    3D printing of papers

2018

Thompson Berton            01/18-05/19, dual DIW 3D printing

Irene Hammel                01/18-05/19, 3D printing of LCE

Peter Blake                    01/18-05/19, 3D printing of LCE

2017

Marta Romero                01/17-, 3D printing

2016

Will Andrew                    08/16-12/16, 3D printing

Devin Roach                    01/2016-08/2016, 3D printing

Haidar Jamal                    02/2016-now, 3D printing

Tibor Gyorfi                    03/2016-now, 3D printing

Erik Shuster                    12/2016-now, 3D printing

Thomas Berton                01/2016-now, 3D printing of porous materials

Chang Hyeon Lim 05/2016-07/2016, Mechanics of two-stage curing polymers

2015

Justin Yoo,                      05/2015-08/2015, Hybrid 3D printing

Mo Yang,                        05/2015-08/2015, 4D printing

Esther Y. Shin,                05/2015-08/2015, 3D printing material characterization

Brittany Robinson,         05/2015-08/2015, 3D printing of biomaterials

Hirsh Patel,                    05/2015-08/2015, light activated polymers

Thompson Berton,         05/2015-08/2015, photo origami

2014

Alexander Ritchie,         05/2014-12/2014, 3D printing, one paper is in preparation

Nathan DeRussy,            05/2014-05/2015, 3D printing

John Jabour,                 05/2014-12/2014, Reprocessing polymers, one paper is in preparation

Brandyn Jackson,         05/2014-08/2014, Reprocessing polymers



At CU Boulder

Stacey Sokol, 08/2009, "Thermo-Mechanical Testing of Shape Memory Polymers"

Lucas Turpin, 09/2008, "Light-activated polymers".

Elizabeth Jones, 09/2008-05/2009, DLC apprentice, CU, "SMP Characterization"

Steven Szabados, 09/2008-05/2009, DLC apprentice, CU, "Hydrogel beads"

Erik Schmidt, 09/2008-05/2009, DLC apprentice, CU, "SMP Characterization"

Kevin Fiedler, 09/2007-05/2009, DLC apprentice, CU, "Hydrogel actuators"

Jennifer Miller, 09/2007-05/2008, CU, "Multiphysical behaviors of SMPs"

Christine Renes, 09/2007-05/2008, CU, "Multiphysical behaviors of SMPs"

Trenton Lynch, 05/2005 – 07/2007, CU, DLC apprentice (09/2006-05/2007),  
"Nanomechanical properties of diatoms".

K. Gredvig, 08/2004 – 08/2006. CU, "Surface mechanical properties of thermoplastic polyurethane".

K. Mcneilly, 08/2004 – 08/2005. CU, "Nanoindentation on thermoplastic polyurethane".

K. Joyce, (Co-advised with M.C. Boyce), 02/2002 – 06/2002. MIT, S.B. Thesis, "FEM simulations of Durometer Hardness".

G.F. Ebeling (Co-advised with M.C. Boyce), 02/2004 – 06/2004. MIT, S.B. Thesis, "Macro Scale Physical Model of Nanoindentation on Vertically Aligned Carbon Nanotube Forests".

#### **B4. Service on thesis or dissertation committees**

Kheira Benyahia, PhD thesis committee, UTBM (France), December 2023, advisor, Frederic Demoly

Marshall Johnson, PhD thesis Committee, ME December 2023, advisor, Surya Kalidindi

Alexandra Marnot, PhD thesis Committee, ChBE, October 2023, advisor, Blair Brettmann

Ju Hwan Shin, PhD thesis Committee, ME, December 2023, advisor, Min Zhou

Benjamin G. Stewart, PhD thesis committee, ME November 2023, advisor, Suresh Sitaraman

Haohui Zhang, PhD thesis committee, ME Spring 2022, advisor, Yuhang Hu

Jiahe Huang, PhD thesis committee, ChBE Fall 2021, advisor, Yuhang Hu

Larissa S. Novelino, PhD thesis committee, CivilE, fall 2020, advisor, Glaucio Paulino

Myela Paige, PhD thesis committee, ME, fall 2020, advisor, Kate Fu

Yaochi Wei, PhD thesis committee, ME, fall 2019, advisor, Min Zhou

Minling Liu, PhD thesis committee, BME, fall 2019, advisors, Wei Sun

Fengyi Zhang, PhD thesis committee, ChBE, fall 2018, advisors, Ryan Lively, Victor Breedveld

Emily Sanders, PhD thesis committee, Civil, fall 2018, advisor, Glaucio Paulino

Emily Fitzharris, PhD thesis committee, ME, fall 2017, advisor, Meisha Shofner and David Rosen

Kaikai Che, PhD thesis committee, ME, spring 2016, advisor: Julien Meaud

Alexis Noel, PhD thesis committee, ME, fall 2016, advisor, David Hu

Yen-Po Lin, PhD thesis committee, Aero, spring 2016, advisor, Minfeng Yu

Noah Dennis, MS thesis committee, ME, spring 2015, advisor: Shuman Xia

Kashyap Alur, MS thesis committee, ME, spring 2015, advisor: Julien Meaud

Masoumeh Aminzadeh, PhD thesis committee, ME, spring 2015, advisor: Tom Kurfess

Xiayun Zhao, PhD thesis committee, ME, spring 2015, advisor: David Rosen

Seokpum Kim, PhD thesis committee, ME, fall 2014, advisor: Min Zhou

## **B5. Mentorship of postdoctoral fellows or visiting scholars**

### **B5.a. Postdoctoral Fellows**

#### ***Current***

Liang Yue, postdoc fellow, 07/2020-now

Xiaohao Sun, postdoc fellow, 09/2020- now

Mingzhe Li, postdoc fellow, 07/2022-now

#### ***Past***

Yaochi Wei, 03/2021-02/2022 , now at Corning Inc.

Xiao Kuang, research scientist II, 09/2016- 10/2020, more than 30 papers published

Yiqi Mao, postdoctoral fellow, 02/2014-10/2015, 2 published, two papers submitted, two papers are in preparation. Now an associate professor at Hunan University, China.

Xiaodong Cui, 01/2011-08/2012

Philips Kao, 01/2011- 08/2011. Now a small business owner.

Sitikantha Roy, 10/2007 – 11/2009, CU, “Computational Mechanics of Cells”. Currently as an associate professor at India Institute of Technology, Delhi.

### **B5.b. Visiting Scholars**

Shigang Ai, visiting scholar, 12/2014-06/2015.

Hao Li, visiting scholar, 09/2014-08/2015.

Hailong Fan, visiting scholar, 15/2014-10/2015

Yuejie Wei, visiting scientist, 02/2014-05/2014

## **C. EDUCATION INNOVATION AND OTHER**

None

## **VI. SERVICE**

### **A. PROFESSIONAL CONTRIBUTIONS**

#### **A1. Editorial Board Memberships**

1. 12/2021-, Associate Editor, Programmable Materials
2. 09/2016-, Member of Editorial Board for the International Journal of Precision Engineering and Manufacturing – Green Technology.
3. 10/2017-, Member of Editorial Board for Multifunctional Materials
4. 10/2017-, Member of Editorial Board for Science China - Technological Sciences
5. 11/2018-, Member of Editorial Board for Polymers
6. 01/2019-12/2022, Member of Editorial Board for ACS Applied Materials and Interfaces
7. 01/2019, Member of Editorial Board for Mechanics of Soft Materials

## **A2. Society Offices, Activities, and Membership**

1. 09/2022-09/2024, Vice Chair, Gordon Research Conference on Multifunctional Materials and Structures
2. 1/2023- Member of of Board of Directors, Society of Engineering Science
3. 07/2022-, Vice President, Georgia Tech Sigma Xi
4. 11/2017-, Member of External Advisory Board for CREST Center for Next Generation Multifunctional Composites at Southern University
5. 01/2015-12/2018, Treasurer and Member of Board of Directors, Society of Engineering Science.
6. 08/2015-02/2016, Operation committee member, 2016 Gordon Conference on Multifunctional Materials and Structures.
7. 05/2014-05/2015, chair of Wolfgang Knauss Young Investigator Award in Society of Experiment Mechanics (SEM).
8. 06/2012-05/2014, chair of Mechanics of Time-Dependent Material Technical Division of SEM.
9. 11/2009-12/2010, chair of Mechanics of Soft Material Technical Committee of ASME Applied Mechanics Division (AMD).
10. 06/2009-06/2011, vice chair of Mechanics of Time-Dependent Material Technical Division of SEM.
11. 11/2007-10/2009, recording secretary of ASME AMD Executive Committee.

## **A3. Organization and Chairmanship of Technical Sessions, Workshops and Conferences**

1. Chair, 4D Materials Design and Additive Manufacturing Conference 2023, September 7-8, Atlanta, GA.
2. Co-organizer (with Renee Zhao), Symposium Functional Soft Composites - Design, Mechanics, and Manufacturing, 2023 Society of Engineering Annual Technical Conference, Minneapolis, MN, October 8 - 11, 2023.
3. Chairperson (with Prof. Yujie Wei of Institute of Mechanics of Chinese Academy of Science), IUTAM Symposium on Multiscale Architecting of Microstructures of Solids: Mechanics and Manufacturing (hybrid), Beijing, 06/26-28, 2022.
4. Co-organizer (with Renee Zhao), Symposium Functional Soft Composites - Design, Mechanics, and Manufacturing, 2022 Society of Engineering Annual Technical Conference, College Station, TX, USA, Oct 16-19, 2022.
5. Co-organizer (with Sharma, P., Sottos, N., Linda, S.), Eringen Medal Symposium, 2022 Society of Engineering Annual Technical Conference, College Station, TX, USA, Oct 16-19, 2022.
6. Co-chair (with Martin Dunn), US DoD-NSF Joint Workshop on Mechanics-Based Design of Intelligent Material Systems by Multimaterial Additive Manufacturing, 22<sup>nd</sup> International Conference on Composite Materials, Melbourne, Australia, Aug. 15, 2019.
7. Co-organizer (with C Lynch, I. Chasiotis), Track 5.8: Design and Manufacturing for Multifunctionality, ICCM-21, August 20-25, 2017.
8. Co-organizer (with H.Lee, S. Kang, Y. Li), Topic area of Printed Soft Active Materials, in ASME International Mechanical Engineering Congress and Exhibition (IMECE), Phoenix, Nov. 14-17, 2016.
9. Co-organizer (with S. Kang), 2016 Symposium on 3D Printing of Active Materials, 2016 SES Conference, College Park, MD, Oct. 2-5, 2016.

10. Organizer (with H. Lee), Topic area of Printed Soft Active Materials, in ASME International Mechanical Engineering Congress and Exhibition (IMECE), Houston, Nov. 13-19, 2015.
11. Organizer (with E. Arruda and J. Cao), 2015 SES conference, in Prof. Mary Boyce Engineering Science Medal Symposium, 2015 SES Conference, College Station, TX, Oct. 26-28, 2015.
12. Co-organizer (with E. Fang, and Y. Wei), Symposium on Predictive Modeling of Nonlinear Behaviors of Engineering Materials, ASME Applied Mechanics and Materials Conference (McMAT), Seattle, WA, June 29-July 1<sup>st</sup>, 2015.
13. Co-organizer, (with B. Antoun, A. Arzoumanidis, A., et al), *Symposium on Challenge in Time Dependent Constitutive Behavior of Materials*, in 2015 SEM Annual Conference & Exposition, Costa Mesa, CA, June 7-10, 2015.
14. Organizer, Symposium on 3D printing of soft materials, in PACAM-XV Conference, Urbana-Champaign, IL, May 19-21, 2015.
15. Organizer and co-organizer, (with Richard Hall, Hongbing Lu, G. P. Tandon, B. R. Antoun, Y.C. Lu), *Symposium on Time Dependent Constitutive Behavior of Materials*, In 2011-2014 SEM Annual Conference & Exposition.
16. Organizer (with Richard Hall, Hongbing Lu, G. P. Tandon, B. R. Antoun, Y.C. Lu), *Symposium on Time Dependent Constitutive Behavior and Failure/Fracture Processes*, In 2010 SEM Annual Conference & Exposition on Experimental and Applied Mechanics, Indianapolis, IN.
17. Co-Organizer (with S. Li and G. Bao), Bio-physics and bio-mechanics of cells, in ASEM 2010 First Global Congress on NanoEngineering for Medicine and Biology, Houston, TX.
18. Co-Organizer (with Richard Hall, Hongbing Lu, G. P. Tandon), *Symposium on Time Dependent Constitutive Behavior and Failure/Fracture Processes*, In 2009 SEM Annual Conference & Exposition on Experimental and Applied Mechanics, Albuquerque, NM.
19. Conference Co-Chair (with Richard B. Hall and Hongbin Lu), *6<sup>th</sup> International Conference on Mechanics of Time-Dependent Materials 2008*, Monterey, CA.
20. Co-Organizer (with Thao Nguyen, Rebecca Dupaix, Jorgen Bergstrom, Thao Nguyen), the 4<sup>th</sup> *Symposium of Mechanics of Soft Materials and Soft Biological Tissues* in SES 2008, Urbana, IL.
21. Organizer (with Rebecca Dupaix, Jorgen Bergstrom, Thao Nguyen), the 3<sup>rd</sup> *Symposium of Mechanics of Soft Materials and Soft Biological Tissues* in SES 2007, College Station, TX.
22. Co-Organizer (with Philip LuDec, and Gang Bao) the *Symposia on Mechanics in Biomedicine* in AMD McMat 2007, Austin, TX.
23. Co-Organizer (with Hongbin Lu and Richard B. Hall) the *Symposium on Time Dependent Behaviors of Polymer* in AMD McMat 2007, Austin, TX.
24. Co-Organizer (with Sanjeev Khanna), the *Symposium of Characterization of Nanomaterials for Biomedical Applications* in ASME 2006, Chicago, IL.
25. Organizer (with Jeff E. Bischoff, Jorgen Bergstrom), the 2<sup>nd</sup> *Symposium of Mechanics of Soft Materials and Soft Biological Tissues* in SES 2006 (22 presentations), State College, PA.
26. Organizer (with Jeff E. Bischoff, Jorgen Bergstrom), the *Symposium of Mechanics of Soft Materials and Soft Biological Tissues* in McMat 2005, Baton Rouge, LO.
27. Co-Organizer (with Sanjeev Khanna), the *Symposium of Characterization of Nanomaterials for Biomedical Applications* in ASME 2005, Orlando, FL.

28. Co-Organizer (With Richard B. Hall), the *2nd Symposium on Time Dependent Behaviors of Polymer* in ASME 2005, Orlando, FL.

**B. PUBLIC AND COMMUNITY SERVICE**

- NSF review panelist, 2-3 panels per year.
- AFOSR grant reviewer, 2-3 proposals per year
- 2019 ONR MURI grant reviewer
- Reviewer for Luxembourg National Research Fund (FNR) PEARL program, 06/2020
- Reviewer for Helmholtz International Labs of Helmholtz Association, 06/2020

**C. INSTITUTE CONTRIBUTIONS**

At Tech:

Chair of area committee of Manufacturing RAG, June, 2020.

Chair of area committee of Mechanics of Materials RAG, June, 2020.

Member of graduate development committee, fall 2019- now

Member of reappointment, promotion, and tenure committee, summer 2018-spring 2019

Member of graduate admission committee, fall 2014-spring 2015

Member of graduate committee, fall 2014-spring 2015

At University of Colorado at Boulder

**Department**

1. 09/2012-05/2013, mechanical engineering faculty search committee chair
2. 09/2010-05/2011, faculty search committee chair
3. 09/2009-05/2010, member of faculty search committee
4. 04/2009, leader for math topic in prelim exams in 2009
5. 09/2007-05/2008, member of faculty search committee
6. 09/2005-05/2007, member of graduate committee
7. 09/2005-05/2007, faculty member responsible for ME graduate seminars
8. 04/2005-04/2007, leader for Applied Mechanics topic in prelim exams in 2005-2007.
9. 09/2005-05/2006, member of ad hoc committee on "implementing matlab into ME curriculum"
10. 09/2004-05/2005, member of faculty search committee

**College**

1. 05/2006, judge for undergraduate DLC Apprenticeship Competition

**Campus**

1. 09-2012-, executive committee member of material science and engineering program.
2. 09/2012-05/2013, material science and engineering faculty search committee chair
3. 03/2005-05/2007, member of Task Force on International Graduate Education
4. 03/2007, reviewer for CU-NREL seed grants applications

