

# Timothy G. Morrissey

Mechanical Engineering, Ph.D.  
Mechanical Engineering, M.S.  
Ceramic Engineering, B.S.

[tgmorrissey@gmail.com](mailto:tgmorrissey@gmail.com)  
+1 (315) 867-7773  
[tgmorrissey.com](http://tgmorrissey.com)  
Boulder, Colorado

## SUMMARY

I lead extremely talented and multidisciplinary teams to solve difficult technical problems which have scalable commercial viability and can make large, real-world impacts. I have grown a start up from zero, bringing in over \$1M in capital and non-dilutive investment to fuel early development and cumulative revenue >\$100k. I am most happy when using my leadership abilities to empower those around me to solve challenges at the intersection of technology and business.

My expertise in materials science and mechanical engineering gives me the unique ability to tackle relevant and meaningful engineering problems with a clear understanding of underlying scientific mechanisms. I have technical experience ranging from experimental energy harvesting, to soft robotics, to ceramics processing, as well as life experiences of living abroad and teaching in both Chamonix, France and Chiang Mai, Thailand

## EXPERIENCE

<b>Co-Founder and Chief Executive Office</b>   Artimus Robotics Inc.	December 2019 – Present
<b>Post-Doctoral Research Associate</b>   University of Colorado Boulder Keplinger Research Group   Self-funded	April 2019 – March 2020
<b>Graduate Research Associate and Laboratory Manager</b>   University of Colorado Boulder Keplinger Research Group   P.I. Dr. Christoph Keplinger	August 2015 – March 2019
<b>Graduate Research Associate</b>   University of Colorado Boulder High Temperature Materials Laboratory   P.I. Dr. Rishi Raj	August 2013 – August 2015
<b>Research Associate Post-BS</b>   Oak Ridge National Laboratory Ceramic Science and Technology Group   P.I. Dr. Andrew A. Wereszczak	June 2011 – December 2012
<b>Laboratory Assistant</b>   Alfred University Whiteware Research Center   P.I. Dr. William M. Carty	September 2010 – December 2010
<b>Ceramic Engineering Intern</b>   CoorsTek Inc. Ceramic Material Processing Group	May 2010 – August 2010

## EDUCATION

<b>Doctorate of Philosophy</b>   University of Colorado Boulder Mechanical Engineering: Material Science Track Thesis Title: <i>Ionic Systems for Electromechanical Transducers: Energy Harvesting and Soft Robotics</i>	May 2019 GPA: 3.80/4.00
<b>Master of Science</b>   University of Colorado Boulder Mechanical Engineering: Material Science Track	August 2016 GPA: 3.57/4.00
<b>Bachelor of Science with Honors</b>   Inamori School of Engineering, Alfred University <b>Ceramic Engineering:</b>	May 2011 GPA: 3.65/4.00 <i>Cum Laude</i>
<b>Study Abroad</b>   University of Canterbury, New Zealand	Summer/Fall 2009

## CONTINUED EDUCATION

<b>Venture Capital by Brad Bernthal and Jason Mendelson</b>   CU-Boulder (audit)	Fall 2018
<b>Commercialization Academy</b>   CU-Boulder hosted by the Technology Transfer Office	2018 – 2019
<b>ZAPI!, An NSF i-corps Short Course</b>   CU-Boulder in conjunction with LA i-Corp Node	May 2018
<b>Entrepreneurship for Engineering</b>   CU-Boulder (audit)	Spring 2018
<b>National School on Neutron and X-Ray Scattering</b>   Oak Ridge and Aragon National Laboratory	June 2015
<b>Lead TA Training and Fall Teaching Intensive</b>   Graduate Teaching Program, CU-Boulder	May 2016

## TEACHING EXPERIENCE

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<b>Department Lead TA</b>   Mechanical Engineering, CU-Boulder	2016 – 2018
<b>Graduate TA</b>   Introduction to Research, CU-Boulder	Fall 2016
<b>Graduate TA</b>   Graduate Material Science, CU-Boulder	Fall 2015
<b>Summer Camp Instructor</b>   CU Science Discovery	Summer 2014
<b>Graduate TA</b>   Undergraduate Thermodynamics, CU-Boulder	Fall 2013
<b>Online Mathematics and Science Tutor</b>   Quexter.Org	Spring/Summer 2014
<b>ESL Teacher</b>   The Araya Foundation, Thailand	April – August 2013
<b>Mathematics Teacher Ages 7-14</b>   British Ski Academy, Chamonix France	January – April 2013
<b>Calculus and Physics Tutor</b>   Alfred University	2008 – 2011
<b>Substitute Elementary School Teacher</b>   Little Falls City School District	May 2009 – March 2010

## MENTORING EXPERIENCE

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<b>Founder of 1<sup>st</sup> year PhD student mentorship group</b>   Department Lead TA	2016 – 2018
<b>Undergraduate Project Group</b>   1 <sup>st</sup> year Engineering Project Class	Spring 2017
<b>Master Student Supervisor</b>   Keplinger Research Group (2 students)	2015 – 2019
<b>Undergraduate Researcher Supervisor</b>   Keplinger Research Group (2 students)	2015 – 2019
<b>High School Research Experience</b>   CU Science Discovery Program (2 students)	Summer 2016

## AWARDS AND HONORS

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<b>Department Fellowship</b>   Mechanical Engineering Department, CU-Boulder	May 2017
<b>Spotlight on Student Research</b>   Mechanical Engineering Department, CU-Boulder	April 2016
<b>Best Talk in Mechanics Session</b>   Graduate Engineering Annual Research & Recruitment Symposium	March 2016
<b>Honorable Mention</b>   National Science Foundation Graduate Research Fellowship	April 2014
<b>1<sup>st</sup> Year Best Talk</b>   Graduate Engineering Annual Research & Recruitment Symposium	March 2014
<b>Dean's Fellowship</b>   CU-Boulder	2013 – 2014
<b>Outstanding Mechanical Engineering Research Potential Fellowship</b>   CU-Boulder	2013 – 2014
<b>Dean's List</b>   Alfred University	2007 – 2011

## ACADEMIC SERVICE

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<b>Graduate Student Advisory Committee</b>   College of Engineering and Applied Science, CU-Boulder	2016 – 2017
<b>PhD Student Orientation Leader</b>   Mechanical Engineering Department, CU-Boulder	2016 – 2017
<b>Graduate Student Representative</b>   Mechanical Engineering Faculty Search, CU-Boulder	2015 – 2016
<b>Student Board Member</b>   CU Backcountry Ski Club	2015 – 2016
<b>Session Student Chair</b>   Graduate Engineering Annual Research & Recruitment Symposium	March 6, 2014
<b>Engineering Group Leader</b>   Purple and Gold Days (Recruitment), Alfred University	Fall 2011
<b>Experimental Design</b>   Ceramic Powder Processing Lab, Alfred University	Fall 2010
<b>Student Club Vice-president</b>   Saxon Skiing & Snowboarding, Alfred University	2010 – 2011
<b>Member of Engineering Honor Society</b>   Tau Beta Pi, Alfred University	2010
<b>Member of National Professional Ceramic Engineering Society</b>   Keramos, Alfred University	2009
<b>Student Volunteer</b>   New Zealand Department of Conservation, Quail Island	2009

## ASSOCIATE PEER REVIEWER

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Advanced Materials Technologies	Nature Materials	Soft Matter
Applied Physics A	Science Robotics	Soft Robotics
Energy Materials	Smart Materials and Structures	Sustainability
Nature Communications		

## SPEAKING ACTIVITIES

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<b>Host and Moderator</b>   Mechanical Engineering Ask-Me-Anything Virtual Session, CU-Boulder	2017 – 2018
<b>Student Panel Moderator</b>   College of Engineer and Applied Science Orientation, CU-Boulder	2016 – 2017
<b>Student Panel Moderator</b>   Mechanical Engineering Orientation, CU-Boulder	2016 – 2017

## PUBLICATIONS

Peer Reviewed

Google Scholar Link: [scholar.tgmorrissey.com](https://scholar.tgmorrissey.com)  
Research ID: M-4136-2016

- [5] **Timothy G. Morrissey**, Shane K. Mitchell, Alexandra T. Jaros, Eric Ambos, Christoph Keplinger. “**Mechanical to Electrical Energy Conversion with Variable Electric Double Layers**”. *Energy Technology*, 2019, , 7, 4, 1801007.
- [4] Eric Acome, Shane K Mitchell, **Timothy G. Morrissey**, Maddison B Emmett, Clair Benjamin, Madaline King, Miles Radakovitz, Christoph Keplinger. “**Hydraulically Amplified Self-Healing Electrostatic Actuators with Muscle-Like Performance**”. *Science*, 2018, 359, 61-65  
[LINK](#)  
[Covered in the world news; Altmetric score of 363 with 44 tracked news stories]
- [3] Yue Cao\*, **Timothy G. Morrissey\***, Eric Acome, Sarah I. Allec, Bryan M. Wong, Christoph Keplinger<sup>†</sup>, and Chao Wang<sup>†</sup>. “**A Transparent, Self-Healing, Highly Stretchable Ionic Conductor**”. *Advanced Materials*, 2017, 29, 1605099 (\*\*Equal contribution)  
[LINK](#)  
[Covered in the world news; Altmetric score of 320 with 42 tracked news stories, **#9 of all time in this journal**]
- [2] Jean-Marie Lebrun, **Timothy G. Morrissey**, John S. C. Francis, Kevin C. Seymour, Waltraud M. Kriven, and Rishi Rishi. “**Emergence and Extinction of a New Phase during On-Off Experiments Related to Flash Sintering of 3YSZ**”. *Journal of the American Ceramic Society*, 2015, 98: 1493–1497  
[LINK](#)
- [1] Andrew A. Wereszczak, **Timothy G. Morrissey**, Charles N. Volante, Phillip J. Farris, Robert J. Groele, Randy H. Wiles, Hsin Wang, “**Thermally Conductive Epoxy Molding Compounds with MgO-Filler**”. *IEEE Transactions on Components, Packaging and Manufacturing Technology*, 2013, Vol. 3 No. 12  
[LINK](#)

### Proceeding Papers

- [3] Cosima Schunk, Levi Pearson, Eric Acome, **Timothy G. Morrissey**, Nikolaus Correll, Christoph Keplinger, Mark E. Rentschler, and J. Sean Humbert. “**System Identification and Closed-Loop Control of a Hydraulically Amplified Self-Healing Electrostatic (HASEL) Actuator**”. IEEE International Conference on Intelligent Robots and Systems, Madrid, Spain, 2018.  
[LINK](#)
- [2] Andrew A. Wereszczak, **Timothy G. Morrissey**, Mattison K Ferber, Kaye P Bortle, Elliott A Rodgers, Georgiy Tsoi, JM Montgomery, Y Vohra, S Toller. “**Responses of Siliceous Materials to High Pressure**”. *Advances in Ceramic Armor IX*. 2013. Paper 04-01, Issue 5, Vol. 34  
[LINK](#)
- [1] **Timothy G. Morrissey**, Ethan E. Fox, Andrew A. Wereszczak, Daniel J. Vuono, “**Low Velocity Sphere Impact of Soda Lime Silicate Glass**”. *Advances in Ceramic Armor VIII*, 2012, Paper 05-07, Issue 5, Vol. 33  
[LINK](#)

Government Reports

- [5] Andrew A. Wereszczak, **Timothy G. Morrissey**, Mattison K. Ferber, Kaye P. Bortle, Elliott A. Rodgers, Georgiy Tsoi, Jeffrey M. Montgomery, Y.K. Vohra, S. Toller. "**High Pressure Responses of Siliceous Materials**". *Defense Technical Information Center*. 2013. ORNL/TM-2013/4  
[LINK](#)
- [4] **Timothy G. Morrissey**, Ethan E. Fox, Andrew A. Wereszczak, Mattison K. Ferber. "**Initial Examination of Low Velocity Sphere Impact of Glass Ceramics**". *SciTech Connect*. 2012. ORNL/TM-2012/139  
[LINK](#)
- [3] Andrew A. Wereszczak, Chad E. Duty, Daniel J. Vuono, Hsin T. Lin, Gerald E. Jellison, **Timothy G. Morrissey**, Joseph A. Angelini, Jon J. Carberry. "**Promoting Large Grain Formation in Thin Net-Shaped Multicrystalline Silicon Wafers**". *CRADA Final Report*. 2012. Not publically available
- [2] **Timothy G. Morrissey**, Mattison K. Ferber, Andrew A. Wereszczak, Ethan E. Fox. "**Low Velocity Sphere Impact of a Borosilicate Glass**". *SciTech Connect*. 2012. ORNL/TM-2012/60  
[LINK](#)
- [1] Andrew A. Wereszczak, Ethan E. Fox, **Timothy G. Morrissey**, Daniel J. Vuono. "**Low Velocity Sphere Impact of a Soda Lime Silicate Glass**". *Defense Technical Information Center*. 2011. ORNL/TM-2011/259  
[LINK](#)

## PRESENTATIONS

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- [19] **"Ionic Systems for Electromechanical Transducers: Energy Harvesting and Soft Robotics"**. *PhD Thesis Defense for the University of Colorado Boulder*. February 19, 2019
- [18] **"Artimus Robotics, Life-like Motion for the Next Generation of Robotics and Automation"**. *College of Engineering and Applied Science Bay Area Alumni Event, CU-Boulder*. November 15, 2018
- [17] **"Artimus Robotics, Life-like Motion for the Next Generation of Robotics and Automation"**. *Lab Venture Challenge, CU-Boulder*. November 15, 2018 [**\$125k grant awarded, \$1k Audience choice awarded**]
- [16] **"Communicating Your Research"**. *Graduate Teaching Program, CU-Boulder*. November 2, 2018 [**Invited guest lecture**]
- [15] **"HASEL Artificial Muscles"**. *NASA iTech Forum*. October 23, 2018 [**Top 10 national**] [LINK](#)
- [14] **"Communicating Your Research"**. *ME Department Professional Development Program, CU-Boulder*. October 5, 2018 [**Invited guest lecture**]
- [13] **"Ionic systems for electromechanical transducers: Energy harvesting and soft robotics"**. *PhD Comprehensive Exam, CU-Boulder*. August 1, 2018
- [12] **"Mechanical to Electrical Energy Harvesting Using Variable Electric Double Layer Capacitors"**. *Materials Research Society Spring Meeting*. April 8, 2018
- [11] **"Soft Robotics, Flash Sintering, and Energy Generation"**. *Undergraduate Seminar Series, Alfred University*. March 15, 2018 [**Invited talk**]
- [10] **"Beyond Dielectric Elastomer Generators: Energy Harvesting with Variable Electric Double Layer Capacitors"**. *SPIE Smart Structures + Nondestructive Evaluation*. March 8, 2018
- [9] **"Communicating Your Research"**. *ME Department Professional Development Program, CU-Boulder*. February 2, 2018 [**Invited guest lecture**]
- [8] **"How X-Men's Wolverine Inspired Us to Develop a Self-Healing Material for Robots and Electronic Devices"**. *Advanced Design and Manufacturing, Cleveland*. March 29, 2017 [**Invited talk**]
- [7] **"TA/RA Logistic Workshop"**. *Mechanical Engineering Orientation, CU-Boulder*. August 24, 2017
- [6] **"Mechanical Engineering Graduate Program Information Session for Prospective PhD Student"**. *Graduate Engineering Annual Research & Recruitment Symposium, CU-Boulder*. March, 2017
- [5] **"Communicating Your Research"**. *Introduction to Research Class, CU-Boulder*. November 1, 2016 [**Invited guest lecture**]
- [4] **"TA/RA Logistic Workshop"**. *Mechanical Engineering Orientation, CU-Boulder*. August 16, 2017
- [3] **"Soft Machines: For Renewable Energy and Artificial Muscles"**. *Graduate Engineering Annual Research & Recruitment Symposium, CU-Boulder*. March 3, 2016 [**Invited talk, awarded talk**]
- [2] **"An Overview of Flash Sintering"**. *Graduate Engineering Annual Research & Recruitment Symposium, CU-Boulder*. March 6, 2014 [**Invited talk, awarded talk**]
- [1] **"Low Velocity Sphere Impact of a Soda Lime Silicate Glass"**. *36th International Conference and Expo on Advanced Ceramics and Composites*. January 24, 2012

## MEDIA

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NASA Talk – Video

[https://www.youtube.com/watch?v=fl91DNkX7Xk&ab\\_channel=NASAItech](https://www.youtube.com/watch?v=fl91DNkX7Xk&ab_channel=NASAItech)

Funded in Colorado - Podcast

<https://innosphereventures.org/fundedincolorado-artimusrobotics/>

The Robot Industry - Podcast

<https://therobotindustrypodcast.com/podcast/artimus-robotics-and-hasel-actuation-technology/>

Futurized - Podcast

<https://www.futurized.co/e/soft-robotics/>

Riderflex - Podcast

[https://www.youtube.com/watch?v=qA8w737RnMo&feature=emb\\_title&ab\\_channel=Riderflex](https://www.youtube.com/watch?v=qA8w737RnMo&feature=emb_title&ab_channel=Riderflex)

Soft Robotics – Podcast

[https://open.spotify.com/episode/65u9Gu6pqP4Y40DsWHMHGY?go=1&utm\\_source=embed\\_v3&t=0&nd=1](https://open.spotify.com/episode/65u9Gu6pqP4Y40DsWHMHGY?go=1&utm_source=embed_v3&t=0&nd=1)

## TECHNICAL SKILLS

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### *Experimental Design and Fabrication*

**Electronical component control** | Data Acquisition, Relays, MOSFETS, Switches, Lights

**Electrical equipment control** | Wavefunction generators, Oscilloscopes, Multimeters, Multisources, LCR meters, Laboratory power supplies, High voltage power supplies (10-50kV)

**Fabrication and building** | Laser cutters, 3D-printers, Drills, Saws, Rotary tools, Soldering, Electronic fabrication

**High temperature furnace building** | Temperature control set-up, Custom design, port-holes, camera inclusions

### *Material Processing*

**Elastomer and polymer chemistry** | EcoFlex, PDMS, Hydrogels, Research materials

**Elastomer and polymer processing** | Casting, Molding, Spin, drop, and dip coating

**Particle processing** | Slurry and suspension handling and control, Ceramic, glass, metal, polymer forming techniques

**Environmental furnace control** | High temperature (up to 1800°C), Vacuum, Controlled gas, Open air, active cooling

**Plasma arc lamp processing**

**Screen and stencil printing for electronics packaging** | HMI printers

**Manufacturing ceramic production** | Industrial scale milling, spray drying, pressing

### *Imaging*

**Scientific photography** | Photograph camera and lenses, videography, composition, lighting

**Technical imaging tools** | Optical microscopy, stereoscopy, Scanning acoustic microscopy, Scanning electron microscopy, Digital microscopy (Keyence), Profilometry (Veeco)

### *Physical testing and characterization*

**Mechanical Testing** | Mechanical materials testing (Instron), Static micro testing (Zwick/Roell), Low velocity spherical impacting Shear testing (Nordson Dage), Laser shock peening impact, Diamond anvil cell testing  
Acoustic emission analysis, Fractography

**Characterization** | Glass surface stress meter (Orihara), Thermal constant analyzer (Hot Disk), Zeta-Potential Measurement, Energy-dispersive X-ray spectroscopy. Spectroscopy. Thermogravimetric Analysis. X-ray Diffraction Analysis. User operation of synchrotron,  
Particle characterizing (Brunauer, Emmett and Telle (BET), Microtrac, Sedigraph)

### *Computer*

**Images** | MATLAB, Adobe Lightroom 6, Apple Final Cut Pro X, Adobe Photoshop, GIMP 2.0, ImageJ

**Data analysis** | MATLAB, Labview, Microsoft Excel, Python

**Controls** | MATLAB, Labview

**Drawing** | SolidWorks, CorelDraw, Power Point

**Information Presentation** | Microsoft PowerPoint, Word, G Suite KaleidaGraph

**Additional** | Basic HTML and Google sites design, ANSYS thermal modeling, X'Pert High Score Pro

### *Interpersonal skills*

**Conveying information** | Presentation, Teaching, Public speaking, Idea/Business Pitching, Lecturing, Reporting

**Writing** | Technical, Instructional, Lay-person

**Leadership** | Organization, Team management, Lab management, Meeting hosting

## HOBBIES

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Youtube videos | [youtube.tgmorrissey.com](https://www.youtube.com/tgmorrissey)

Restoring vintage truck camper

Skiing every month of the year