Paul Plucinsky

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Education

Ph.D. in Mechanical Engineering from California Institute of Technology, 2017
M.S. in Structural Engineering from University of Michigan, 2011
B.S. in Civil and Environmental Engineering from University of Michigan, 2011

Professional Experience

2020 -	Assistant Professor, Aerospace & Mechanical Engineering, USC
2017 - 2020	Postdoctoral Scholar, Aerospace Engineering & Mechanics, UMN Advisor: Professor Richard D. James
2012 - 2017	Ph.D. Student, Mechanical Engineering, Caltech Advisor: Professor Kaushik Bhattacharya Thesis: The deformations of thin nematic elastomer sheets

Visiting Positions

2015	Visiting Researcher, NASA Langley Research Center, Hampton, VA (3 months) Host: Dr. Jerry E. Warren at the Structural Dynamics Branch
2014	Visiting Researcher, University of Bonn, Bonn, Germany (3 months) Host: Professor Stefan Müller at the Mathmatics Institute

Awards and Fellowships

2017	Centennial Prize for the Best Thesis in Mechanical and Civil Engineering
2014-2017	NASA Space Technology Research Fellowship
2016	ICTAM U.S. Early Career Travel Fellowship

Publications

1. F. Feng, X. Dang, R.D. James and **P. Plucinsky**. The designs and deformations of rigidly and flat-foldable quadrilateral mesh origami. *Journal of the Mechanics and Physics of Solids*, 142:104018, 2020
2. H. Seiner, **P. Plucinsky**, V. Debade, B. Benesova and R.D. James. Branching of twins in shape memory alloys revisited, *Journal of the Mechanics and Physics of Solids*, 141:103961, 2020
3. F. Feng, **P. Plucinsky** and R.D. James. Helical Miura origami. *Physical Review E*, 101:033002, 2020
4. F. Feng, **P. Plucinsky** and R.D. James. Phase transformations and compatibility in helical structures. *Journal of the Mechanics and Physics of Solids*, 131:74-95, 2019
5. **P. Plucinsky**, B.A. Kowalski, T.J. White and K. Bhattacharya. Patterning nonisometric origami in nematic elastomer sheets. *Soft Matter* 14:3127-3134, 2018

6. **P. Plucinsky**, M. Lemm and K. Bhattacharya. Actuation of thin nematic elastomer sheets with controlled heterogeneity. *Archive for Rational Mechanics and Analysis*, 227:149-214, 2018
7. **P. Plucinsky** and K. Bhattacharya. Microstructure-enabled control of wrinkling in nematic elastomer sheets. *Journal of the Mechanics and Physics of Solids*, 102:125-150, 2017
8. N. Liu, **P. Plucinsky** and A.E. Jeffers. Combining load-controlled and displacement-controlled algorithms to model thermal-mechanical snap-through instabilities in structures. *Journal of Engineering Mechanics*, 143(8):04017051, 2017
9. **P. Plucinsky**, M. Lemm and K. Bhattacharya. Programming complex shapes in thin nematic elastomer and glass sheets. *Physical Review E*, 94(1):010701, 2016
10. P. Cesana, **P. Plucinsky** and K. Bhattacharya. Effective behavior of nematic elastomer membranes. *Archive for Rational Mechanics and Analysis*, 218(2):863-905, 2015

Conference Publications

1. **P. Plucinsky** and K. Bhattacharya. Interplay of wrinkling and microstructure in nematic elastomer membranes. *XXIV ICTAM, 21-26 August 2016, Montreal, Canada*

Invited Presentations

2020	General design principles for shape-morphing with origami, *Applied Math Seminar, TU Dresden, Dresden Germany, March 2, 2020*
2019	Two examples of variational methods applied to pattern formation in materials, *Analysis and applied math seminar, University of Illinois Chicago, December 2, 2019*
	Active and architectured sheets: From nematic elastomers to rigidly foldable origami, *Mechanical Engineering Seminar, University of Houston, November 7, 2019*
	Active and architectured sheets: From nematic elastomers to rigidly foldable origami, *Workshop on the mathematical design of new materials, ICMS, Edinburgh, Scotland, March 11-15 2019*
	Patterns formation in active and achitectured sheets, *Workshop on mathematical models for pattern formation, CMU, Pittsburgh, PA March 8-10, 2019*
2018	Compatibility in helical structures and origami, *Physical Maths Seminar, Massachusetts Institute of Technology, November 30, 2018*
	The deformations of thin nematic elastomer sheets, *Workshop, Mathematics of Thin and Slender Structures (Analysis, Modeling and Simulation), TU Dresden, September 28, 2018*
	Microstructure, wrinkling and origami in nematic elastomer sheets, *IMA Working Group on Multiscale Strategies, University of Minnesota, June 22, 2018*
2017	The deformations of thin nematic elastomer sheets, *GALCIT Colloquium, California Institute of Technology, May 26, 2017*
2016	Interplay of wrinkling and microstructure in nematic elastomer membranes, *CMO-BIRS Workshop, Mathematical Problems of Orientationally Ordered Soft Solids, Oaxaca, Mexico, September 8, 2016*
2014	Towards an effective theory for nematic elastomers in the membrane limit, *Lunchtime seminar, Mathematical Institute, University of Oxford, November 6, 2014*

Conference Presentations

2019 Phase transformations and compatibility in helical structures, *SES 2019, Washington University of St. Louis, October 13-15, 2019*

Modeling branching microstructure and measuring interfacial energy in shape-memory alloys, *SES 2019, Washington University of St. Louis, October 13-15, 2019*

The designs and deformations of rigidly and flat-foldable Origami, *SES 2019, Washington University of St. Louis, October 13-15, 2019*

Helical Miura Origami, *SES 2019, Washington University of St. Louis, October 13-15, 2019*

Modeling branching microstructure and measuring interfacial energy in shape-memory alloys, *IUTAM Symposium of Phase Transitions in Shape Memory Alloys: Modeling and Applications, University of Texas, Austin, April 29, 2019*

2018 Patterning nonisometric origami in nematic elastomer sheets, *SIAM Conference on Mathematical Aspects of Material Science, Portland Oregon, July 12, 2018*

The designs and deformations of generalized Miura Origami, *SIAM Conference on Mathematical Aspects of Material Science, Portland Oregon, July 10, 2018*

The designs and deformations of generalized Miura Origami, *USNCTAM 2018, Chicago, Illinois, June 5, 2018*

Patterning nonisometric origami in nematic elastomer sheets, *APS March Meeting 2018, Los Angeles, California, March 5, 2018*

2017 Patterning origami in nematic elastomer sheets, *ILCE 2017, Houston, Texas, October 18, 2017*

Actuating origami in nematic elastomer sheets, *SES 2017, Boston, Massachusetts, July 27, 2017*

Microstructure-induced suppression of wrinkling in nematic elastomer sheets, *SES 2017, Boston, Massachusetts, July 25, 2017*

2016 Interplay of wrinkling and microstructure in nematic elastomer membranes, *SES 2016, College Park, Maryland, October 3, 2016*

Interplay of wrinkling and microstructure in nematic elastomer membranes, *XXIV ICTAM, Montreal, Canada, August 22, 2016*

Deformation of thin nematic elastomer sheets with controlled heterogeneity, *SIAM Conference on Mathematical Aspects of Material Science, Philadelphia, Pennsylvania, May 12, 2016*

Interplay of wrinkling and microstructure in nematic elastomer membranes, *SIAM Conference on Mathematical Aspects of Material Science, Philadelphia, Pennsylvania, May 9, 2016*

2015 Programming complex shapes in thin nematic elastomer and glass sheets, *SES 2015, College Station, Texas, October 29, 2015*

Effective behavior of nematic elastomer membranes, *McMat 2015, Seattle, Washington, June 30, 2015*

Effective behavior of nematic elastomer membranes, *PACAM XV, Champaign, Illinois, May 19, 2015*

Teaching Experience

2019 Lecturer for the Spring Term course: Theory of Elasticity (core requirement for graduate students in solid mechanics), University of Minnesota

2013 Teaching assistant for ACM 100C: Partial Differential Equation, California Institute of Technology