



Professor Zi Chen

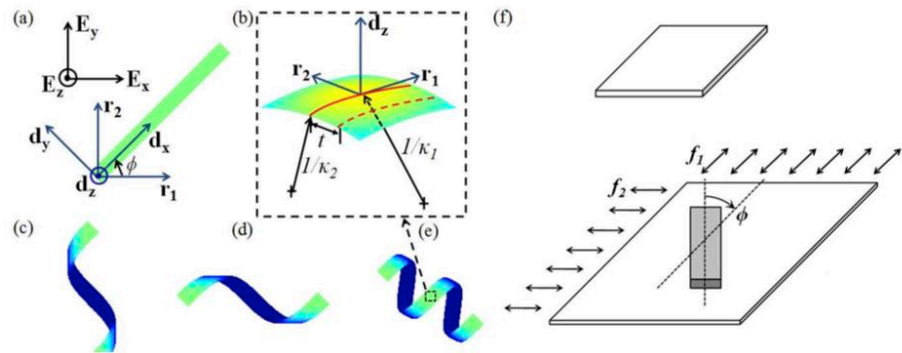


FIG. 1: Illustration of formation of a helical ribbon. (a) The vectors \mathbf{d}_x and \mathbf{d}_y are oriented along the length and widthwise axes of the ribbon, respectively. The bases \mathbf{r}_1 and \mathbf{r}_2 correspond to the principal axes of curvature. (b) Close-up view of a part of as-deformed helical ribbon in (e). (c) A cylindrical helical ribbon with $\kappa_2 = 0$. (d) A cylindrical helical ribbon with $\kappa_1 = 0$. (e) A general helical ribbon with non-zero κ_1 and κ_2 . (f) Fabrication of a helical ribbon. An elastic, adhesive strip was bonded to one pre-stretched sheet (or two sheets) of latex rubber, with a mis-orientation angle of ϕ .

From: Qiaohang Guo,* Anil K. Mehta, Martha A. Grover, Wenzhe Chen, David G. Lynn, Zi Chen.*[^] Shape selection and instability in helical ribbons, arXiv:1312.3571, Applied Physics Letters, 104, 211901, 2014

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Education:

BS, Materials Science and Engineering, Shanghai JiaoTong University 2002
BS, Computer Technology and Applications, Shanghai JiaoTong University 2003
MS, Materials Physics and Chemistry, Shanghai JiaoTong University 2005
PhD, Mechanical & Aerospace Engineering, Princeton University 2012

Research Interests:

Mechanical instabilities of thin structures; origami structures; energy harvesting devices; stretchable electronics; biomimetic materials/devices; nanofabrication; mechanics of morphogenesis; cell biomechanics; mechanics of DNA structures

Selected Publications:

- Zi Chen,[^] Xiaomin Han, Huang Zheng. Residual stresses and Poisson's effect drive shape formation and transition of helical structures, Journal of Elasticity, 119(1): 321-333, 2015.
- Q. Guo,* E. Dai,* X. Han,* S. Xie, E. Chao, and Z. Chen,[^] Fast nastic motion of plants and bio-inspired structures, Journal of The Royal Society Interface, 12: 20150598, 2015. (Featured cover article.)
- Zi Chen.[^] Shape Transition and Multi-stability of Helical Ribbons: a Finite Element Method Study, Archive of Applied Mechanics, 85: 331-338, 2015.

- Qiaohang Guo,*[^] Zi Chen,*[^] Wei Li, Pingqiang Dai, Kun Ren, Junjie Lin, Larry A. Taber, and Wenzhe Chen. Mechanics of Geometric Frustration in Helical Biomimetic Seashells, *Europhysics Letters*, 105: 64005, 2014. (Selected as EPL Highlights of 2014.)
- Zi Chen.[^] Geometric Nonlinearity and Mechanical Anisotropy in Strained Helical Nanoribbons, *Nanoscale*, 6: 9443-9447, 2014.
- Qiaohang Guo,* Anil K. Mehta, Martha A. Grover, Wenzhe Chen, David G. Lynn, Zi Chen.*[^] Shape selection and instability in helical ribbons, arXiv:1312.3571, *Applied Physics Letters*, 104, 211901, 2014 (featured on the cover).
- Qiaohang Guo,* Huang Zheng,* Wenzhe Chen, and Zi Chen.*[^] Modeling Bistable Behaviors in Morphing Structures through Finite Element Simulations. *Bio-Medical Materials and Engineering* 24:557-562, 2014.
- Wanliang Shan, Zi Chen, Chase P. Broedersz, Ankita A. Gumaste, Winston O. Soboyejo, and Clifford P. Brangwynne. Attenuated short wavelength buckling and force propagation in a biopolymer-reinforced rod, *Soft Matter* 9, 194-199, 2013.
- Wanliang Shan[^] and Zi Chen.[^] Large Deformation and Mechanical Instability of Elastic Rods. *Journal of Postdoctoral Research*, 1(2): 1, 2013 (invited review).
- Matthew A. Wyczalkowski,* Zi Chen,*[^] Benjamin Filas, Victor Varner, and Larry A. Taber. Computational Models for Mechanics of Morphogenesis, [Birth Defects Research Part C: Embryo Today](#), 96: 132-152, 2012. Editor's choice on the Cover (invited review).
- Zi Chen,[^] Qiaohang Guo, Carmel Majidi, Wenzhe Chen, David. J. Srolovitz, and Mikko Haataja. Nonlinear geometric effects in mechanical bistable morphing structures, *Physical Review Letters*, 109, 114302, 2012.
- Zi Chen, Carmel Majidi, David. J. Srolovitz, and Mikko Haataja. Tunable helical ribbons, *Applied Physics Letters*, 98: 011906, 2011.