

Columbia University  
Fu Foundation School of Engineering and Applied Science  
Curriculum Vitae

**Karen E. Kasza**

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**Education**

Harvard University	Ph.D., Applied Physics	2010
Thesis: “Mechanics of the Actin Cytoskeleton”, Advisor: David Weitz		
Harvard University	M.A., Applied Physics	2005
University of Chicago	B.A., Physics	2003

**Principal Fields of Interest**

mechanics of morphogenesis, living matter, mechanobiology, developmental biology, biomechanics, soft matter

**Awards and Honors**

Sloan Research Fellowship	2022-2024
Packard Fellowship for Science and Engineering	2018-2023
NSF CAREER Award	2018-2023
Clare Boothe Luce Assistant Professorship	2016-2021
Burroughs Wellcome Fund Career Award at the Scientific Interface	2014-2022
Helen Hay Whitney Foundation Postdoctoral Fellowship	2011-2014
National Science Foundation Graduate Fellowship	2007-2009
National Defense Science and Engineering Fellowship	2004-2007

**Academic Positions**

Columbia University Mechanical Engineering	Associate Professor	07/2022 — present
Columbia University Mechanical Engineering	Assistant Professor	01/2016 — 06/2022
Columbia University Biomedical Engineering	Affiliated Faculty	07/2017 — present
Sloan Kettering Institute	Postdoctoral Fellow	01/2010 — 12/2015

## Publications

Authorship convention in field: senior author listed last

Underlined authors indicate students or postdocs supervised

Published and in press (\*, corresponding author):

- J23. Matsuda M, Rozman J, Ostvar S, **Kasza KE**, Sokol S\*. Mechanical control of neural plate folding by apical domain alteration. *Nature Communications*, in press.
- J22. Herrera-Perez RM, Cupo C, Allan C, Dagle A, **Kasza KE\***. Tissue flows are tuned by actomyosin-dependent mechanics in developing embryos. *PRX Life*, 1 (1), 013004 2023. \*\*featured in *Physics Magazine*
- J21. Herrera-Perez RM, Cupo C, Allan C, Lin A, **Kasza KE\***. Using optogenetics to link myosin patterns to contractile cell behaviors during convergent extension. *Biophysical Journal*, 120(19), 4214-4229, 2021. \*\*featured as cover image of special issue on Biophysics of Development
- J20. Arriaga M, Arteaga DN, Fafalis D, Yu M, Wang X, **Kasza KE**, Lalwani AK, Kysar JW\*. Membrane curvature and connective fiber alignment in guinea pig round window membrane. *Acta Biomaterialia*, 136, 343-362, 2021.
- J19. Wang X<sup>#</sup>, Merkel M<sup>#</sup>, Sutter LB<sup>#</sup>, Erdemci-Tandogan G, Manning ML, **Kasza KE\***. Anisotropy links cell shapes to tissue flow during convergent extension. *Proceedings of the National Academy of Sciences USA*, 117 (24) 13541-13551, 2020. (<sup>#</sup>, these authors contributed equally)
- J18. Herrera-Perez RM and **Kasza KE\***. Manipulating the patterns of mechanical forces that shape multicellular tissues. (Review) *Physiology*, 34(6), 381-391, 2019.
- J17. **Kasza KE\***, Supriyatno S, Zallen JA\*. Cellular defects resulting from disease-related myosin II mutations in *Drosophila*. *Proceedings of the National Academy of Sciences USA*, 116(44), 22205-22211, 2019.
- J16. Herrera-Perez RM and **Kasza KE\***. Biophysical control of the cell rearrangements and cell shape changes that build epithelial tissues. (Review) *Current Opinion in Genetics & Development*, 51, 88-95, 2018.
- J15. Aksit A, Arteaga DN, Arriaga M, Wang X, Watanabe H, **Kasza KE**, Lalwani AK, Kysar JW. In-vitro perforation of the round window membrane via direct 3-D printed microneedles. *Biomedical microdevices*. 20(2):47, 2018.
- J14. Guo M, Pegoraro AF, Mao A, Zhou EH, Arany PR, Han Y, Burnette DT, Jensen MH, **Kasza KE**, Moore JR, Mackintosh FC, Fredberg JJ, Mooney DJ, Lippincott-Schwartz J, Weitz DA. Cell volume change through water efflux impacts cell stiffness and stem cell fate. *Proceedings of the National Academy of Sciences USA*. 114(41):E8618, 2017.
- J13. **Kasza KE**, Farrell DL, Zallen JA. Spatiotemporal control of epithelial remodeling by regulated myosin phosphorylation. *Proceedings of the National Academy of Sciences USA*. 111(32):11732, 2014.
- J12. **Kasza KE**, Zallen JA. Dynamics and regulation of contractile actin-myosin networks in morphogenesis. (Review) *Current Opinion in Cell Biology*. 23(1):30-8, 2011.
- J11. **Kasza KE**, Broedersz CP, Koenderink GH, Lin YC, Messner W, Millman EA, Nakamura F, Stossel TP, Mackintosh FC, Weitz DA. Actin filament length tunes elasticity of flexibly cross-linked actin networks. *Biophysical Journal*. 99(4):1091-1100, 2010.
- J10. Yao NY, Broedersz CP, Lin YC, **Kasza KE**, Mackintosh FC, Weitz DA. Elasticity in ionically cross-linked neurofilament networks. *Biophysical Journal*. 98(10):2147-53, 2010.

- J9. Broedersz CP, **Kasza KE**, Jawerth LM, Münster S, Weitz DA, MacKintosh FC. Measurement of nonlinear rheology of cross-linked biopolymer gels. *Soft Matter*. 6(17): 4120-4127, 2010.
- J8. **Kasza KE**, Koenderink GH, Lin YC, Broedersz CP, Messner W, Nakamura F, Stossel TP, MacKintosh FC, Weitz DA. Nonlinear elasticity of stiff biopolymers connected by flexible linkers. *Physical Review E*. 79(4 Pt 1):041928, 2009.
- J7. **Kasza KE**, Nakamura F, Hu S, Kollmannsberger P, Bonakdar N, Fabry B, Stossel TP, Wang N, Weitz DA. Filamin A is essential for active cell stiffening but not passive stiffening under external force. *Biophysical Journal*. 96(10):4326-35, 2009.
- J6. Huang F, Rotstein R, Fraden S, **Kasza KE**, Flynn NT. Phase behavior and rheology of attractive rod-like particles. *Soft Matter*. 5(14), 2766 – 2771, 2009.
- J5. Nakamura F, Heikkinen O, Pentikäinen OT, Osborn TM, **Kasza KE**, Weitz DA, Kupiainen O, Permi P, Kilpeläinen I, Ylännä J, Hartwig JH, Stossel TP. Molecular Basis of Filamin A-FilGAP Interaction and Its Impairment in Congenital Disorders Associated with Filamin A Mutations. *PLoS ONE*. 4(3):e4928, 2009.
- J4. **Kasza KE**, Rowat AC, Liu J, Angelini TE, Brangwynne CP, Koenderink GH, Weitz DA. The cell as a material. (Review) *Current Opinion in Cell Biology*. 19(1):101-107, 2008.
- J3. Liu J, Koenderink GH, **Kasza KE**, Mackintosh FC, Weitz DA. Visualizing the strain field in semiflexible polymer networks: strain fluctuations and nonlinear rheology of F-actin gels. *Physical Review Letters*. 98(19):198304, 2007.
- J2. Kaufman LJ, Brangwynne CP, **Kasza KE**, Filippidi E, Gordon VD, Deisboeck TS, Weitz DA. Glioma expansion in collagen I matrices: analyzing collagen concentration-dependent growth and motility patterns. *Biophysical Journal*. 89(1):635-50, 2005.
- J1. Ladavac K, **Kasza K**, Grier DG. Sorting mesoscopic objects with periodic potential landscapes: optical fractionation. *Physical Review E*. 70(1 Pt 1):010901, 2004.

### Chapters in Books

- B3. **Kasza KE** and Weitz DA. Mechanical Properties of Actin Networks, in *Comprehensive Biophysics, 1st Edition, Volume Four*, E. Egelman ed., Academic Press, 2012.
- B2. **Kasza KE**, Vader D, Köster S, Wang N, Weitz DA. Imaging techniques for measuring the materials properties of cells, in *Live Cell Imaging, 2nd Edition*, D. Spector, J. Swedlow, and R. Goldman eds., Cold Spring Harbor Laboratory Press, 2009.
- B1. Gardel ML, **Kasza KE**, Brangwynne CP, Liu J, Weitz DA. Mechanical response of cytoskeletal networks, in *Methods in Cell Biology, Biophysical Tools for Biologists, Volume Two: In Vivo Techniques*, D. J. J. Correia and H. William Detrich III eds., Academic Press, 89:487 – 519, 2008.

### Ph.D. Thesis

Kasza KE, *Mechanics of the Actin Cytoskeleton*, Harvard University, 2010.

### Patents

Aberration correction of optical traps. Curtis JE, Koss BA, Grier DG, Ladavac K, Kasza K. US Patent Application 0080316575, Dec. 2008

## Invited Talks

### University, Research Institute, and Virtual Seminar Series

- November 2, 2023. *Stress management: cell packings and tissue flows in developing embryos*. Physics Colloquium. Vanderbilt University, Nashville, TN.
- May 18, 2023. *Stress management: cell packings and tissue flows in developing embryos*. Biomechanical Engineering Seminar Series. Stanford University, Stanford, CA.
- April 13, 2023. *Stress management: cell packings and tissue flows in developing embryos*. Thursday Series, Duke University, Durham, NC.
- February 28, 2023. *Stress management: cell packings and tissue flows in developing embryos*. Levich Seminar Series, City College of New York, New York, NY.
- November 17, 2022. *Cell packings and tissue flows in developing embryos*. Dynamic Cellular Interfaces Seminar Series. WWU Munster, Munster, Germany.
- November 15, 2022. *Stress management: cell packings and tissue flows in developing embryos*. Mechanical Engineering and Applied Mechanics Colloquium. University of Pennsylvania, Philadelphia, PA.
- October 14, 2022. *Stress management: cell packings and tissue flows in developing embryos*. QBio Institute Seminar, Yale University, New Haven, CT.
- April 20, 2022. *Biophysical mechanisms controlling tissue flows during development*. Department of Biology Seminar Series. Wesleyan University, Middletown, CT.
- October 27, 2021. *Biophysical mechanisms controlling tissue flows during development*. Department of Chemical and Biological Engineering Seminar Series. Princeton University, Princeton, NJ.
- September 29, 2021. *Biophysical mechanisms controlling tissue flows during development*. Department of Mechanical Engineering Seminar Series. Texas A&M University, College Station, TX.
- May 24, 2021. *Biophysical mechanisms controlling tissue flows during development*. Department of Mechanical Engineering Seminar Series. Northwestern University, Evanston, IL.
- May 13, 2021. *Biophysical mechanisms controlling tissue flows during development*. Developmental Mechanics Virtual Seminar Series.
- May 3, 2021. *Biophysical mechanisms controlling tissue flows during development*. Biological Sciences Seminar. Columbia University, New York, NY.
- April 2, 2021. *Biophysical mechanisms controlling tissue flows during development*. Mechanical and Aerospace Engineering Seminar Series. Syracuse University, Syracuse, NY.
- January 14, 2021. *Biophysical mechanisms controlling tissue flows during development*. Virtual Gastrulation Zoom Talks.
- October 27, 2020. *Biophysical mechanisms controlling tissue flows during development*. Cell Migration Seminar Series.
- October 16, 2020. *Biophysical mechanisms controlling tissue flows during development*. Department of Cell and Systems Biology Seminar Series. University of Toronto, Toronto, Canada.
- February 20, 2020. *Building an embryo: mechanics of morphogenesis*. BioMed Club Seminar Series. Baruch College, New York, NY.

- November 21, 2019. *Morphogenesis across length scales: forces organizing cell behaviors in tissues*. Department of Biological Sciences Seminar Series. University of Arkansas, Fayetteville, AR.
- November 14, 2019. *Understanding and controlling the mechanical behavior of living tissues inside developing embryos*. Physics Colloquium, Lehigh University, Bethlehem, PA
- November 12, 2019. *Building the embryo: mechanisms controlling tissue flows during development*. Center for Studies in Physics and Biology, The Rockefeller University, New York, NY.
- March 28, 2019. *Controlling where and when mechanical forces are generated during tissue morphogenesis*. Department of Mechanical Engineering Colloquium Series, City College of New York, New York, NY.
- February 22, 2019. *Mechanics of morphogenesis: spatiotemporal control of the forces that shape epithelial tissues*. Mechanics Seminar Series, UW-Madison, Madison, WI.
- September 19, 2018, *Controlling where and when forces are generated during tissue morphogenesis*. Mechanics: Modeling, Experimentation, Computation (MMEC) Seminar, MIT, Cambridge, MA.
- September 12, 2016, *The forces that shape living tissues: building a fruit fly embryo*, Center for Neural Engineering and Computation Seminar Series, Columbia University. New York, NY.
- July 27, 2015, *Spatiotemporal control of the mechanical forces that shape tissues and embryos*, National Heart, Lung, and Blood Institute. National Institutes of Health. Bethesda, MD.
- April 9, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Biomedical Engineering Seminar, Cornell University. Ithaca, NY.
- March 20, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Biomedical Engineering Seminar, Northwestern University. Evanston, IL.
- March 17, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Biology Seminar, McGill University. Montreal, Canada.
- March 9, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Physics Seminar, University of Colorado. Boulder, CO.
- March 5, 2015, *Spatiotemporal control of the forces that drive cell rearrangements within multicellular tissues*, American Physical Society, Annual March Meeting. San Antonio, TX.
- March 2, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Mechanical Engineering Seminar, University of California. San Diego, CA.
- February 26, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Biomedical Engineering Seminar, University of Michigan. Ann Arbor, MI.
- February 19, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Mechanical Engineering Seminar, Columbia University. New York, NY.
- February 17, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Biomedical Engineering Seminar, Yale University. New Haven, CT.
- February 10, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Physics Colloquium, Syracuse University. Syracuse, NY.
- February 5, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Physics Colloquium, Brandeis University. Waltham, MA.

- February 2, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Biomedical Engineering Seminar, Boston University. Boston, MA.
- January 19, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Biology Seminar, Dartmouth College. Hanover, NH.
- January 12, 2015, *Spatiotemporal control of the forces that shape tissues*, Department of Developmental Biology Seminar, Washington University in St. Louis. St. Louis, MO.
- November 7, 2014, *Spatiotemporal control of the forces that shape tissues*, Condensed Matter & Biological Physics Seminar. Syracuse University. Syracuse, NY.
- April 7, 2014, *Spatiotemporal control of the forces that shape tissues*, Biophysics Seminar Series. Princeton University. Princeton, NJ.
- March 20, 2013, *Myosin II Dynamics during Embryo Morphogenesis*, American Physical Society, Annual March Meeting. Baltimore, MD.
- April 20, 2009, *Polymer physics of a reconstituted cell cytoskeleton*, Physics Department Seminar. Mount Holyoke College. Mt. Holyoke, MA.
- November 3, 2006, *Mechanics of Crosslinked Actin Networks and the Cell*, Mechanical Science and Engineering Department, University of Illinois at Urbana-Champaign, Bio-Interest Group Seminar.

### **Conferences, Workshops, Symposia**

- September 5-8, 2023. *Stress management: cell packings and tissue flows in developing embryos*. Packard Fellows 35<sup>th</sup> Anniversary Reunion Meeting, Colorado Springs, CO.
- August 13-18, 2023. *Stress management: cell packings and tissue flows in developing embryos*. Soft Condensed Matter Physics Gordon Research Conference, “The Soft and Sustainable Building Blocks of Living and Active Systems”, Colby-Sawyer College, New London, NH.
- February 23, 2023. *Stress management: cell packings and tissue flows in developing embryos*. Engineering in Medicine Symposium, Columbia University, New York, NY.
- December 2, 2022. *Stress management: cell packings and tissue flows in developing embryos*. New England Complex Fluids Workshop. Harvard University, Cambridge, MA.
- July 17-22, 2022. *Cell packings and tissue flows in developing embryos*. Signaling by Adhesion Receptors Gordon Research Conference, “Adhesion Across Scales: From Molecules to Morphogenesis”, Southern New Hampshire University, Manchester, NH.
- July 10-14, 2022. *Cell packings and tissue flows in developing embryos*. World Congress of Biomechanics. Taipei/Virtual.
- May 9-12, 2022. *Cell packings and tissue flows in developing embryos*. Workshop on Geometry, Topology, and Symmetry in Soft and Living Matter. Simons Center for Geometry and Physics, Stony Brook University, NY.
- October 13-15, 2019. *Epithelial tissue mechanics and morphogenesis during Drosophila development*. Society of Engineering Science Annual Technical Meeting, St. Louis, MO.
- September 4-7, 2019. *Understanding and controlling the forces that build multicellular tissue structures*. Annual Packard Fellows Meeting, Monterey, CA.
- August 14-16, 2019. *Spatiotemporal control of the mechanical forces that build and shape tissues during morphogenesis*. 2019 CMBBE, 16th International Symposium on Computer Methods on Biomechanics and Biomedical Engineering and 4th Conference on Imaging and Visualization, New York, NY.

- June 23-28, 2019. *Mechanical cues coordinating cell behaviors during morphogenesis*. 13th International Conference on Pathways, Networks, and Systems Medicine, Aegean Conferences, Chania, Crete, Greece.
- October 23, 2018, *Mechanics of morphogenesis: spatiotemporal control of the forces that shape epithelial tissues*. 2nd International Symposium on Mechanomedicine: In Memory of Christopher R. Jacobs, Columbia University, New York, NY.
- August 2-4 , 2018, *Understanding and controlling where and when forces are generated during tissue morphogenesis*, Multi-Cellular Engineered Living Systems (M-CELS) Workshop, Q Center, St. Charles, IL.
- February 21-23, 2018, *Physical forces coordinating epithelial cell behavior during morphogenesis*, Mechanics in Morphogenesis Workshop, Princeton Center for Theoretical Science, Princeton University, Princeton, NJ.
- October 17-19, 2017, *Physical forces coordinating epithelial cell behaviors during morphogenesis*, Soft Matter Symposium on Biomedicine & Mechanics in Tissues, Cells, and their Microenvironments, University of Florida, Gainesville, FL.
- March 16, 2017, *Force generation within tissues during development*, American Physical Society, Annual March Meeting. New Orleans, LA.
- December 5, 2016, *Multicellular tissue dynamics during morphogenesis*, Workshop on Adaptive Network Dynamics. UC Santa Barbara. Santa Barbara, CA.
- July 16, 2016, *Translating molecular-level force generation into tissue-level morphogenesis*, Developmental Mechanics Workshop, The Allied Genetics Conference. Orlando, FL.
- March 28, 2016, *The forces that shape living tissues: building a fruit fly embryo*, Physics of Development and Disease Workshop, Aspen Center for Physics. Aspen, CO.
- January 15, 2016, *Active forces that shape living tissues: building a fruit fly embryo*, Northeast Complex Fluids and Soft Matter Workshop, NYU Tandon School of Engineering. New York, NY.
- December 16, 2014, *Spatiotemporal control of the forces that shape tissues*, Biomedical Engineering/Biophysics/ Physics Stadtman Symposium. National Institutes of Health. Bethesda, MD.
- December 14, 2013, *Control of the myosin-generated forces that shape tissues by genetically altered myosin activity*, American Society for Cell Biology, Annual Meeting. New Orleans, LA.

## Contributed Talks

### Papers and Presentations at Conferences

- C52. Countryman AD, Herrera-Perez RM, Doherty CA, Shvartsman SY, **Kasza KE**. Optogenetic control of endogenous Rho signaling reveals biophysical principles of tissue morphogenesis. Minisymposium presentation at Cell Bio 2023, Boston, MA, December 2023.
- C51. Kusaka E, Ostvar S, Wang X, **Kasza KE**. Tissue structure and mechanics vary along the apical-basal axis in the *Drosophila* germband epithelium. Subgroup presentation at Cell Bio 2023, Boston, MA, December 2023.
- C50. Ostvar S, Liu X, Lesko A, Sutherland A, **Kasza KE**. Shaping the developing mouse neuroepithelium from the cell to the tissue scales. Poster presentation at Cell Bio 2023, Boston, MA, December 2023.

- C49. Cupo C, Allan C, Ailiani V, Cupo A, Ostvar S, **Kasza KE**. Shaping the mechanics of developing epithelia from the cellular to tissue scales in the *Drosophila* embryo. Poster presentation at Cell Bio 2023, Boston, MA, December 2023.
- C48. Qiu T, Countryman AD, **Kasza KE**. Using optogenetics to disentangle how mechanical cues coordinate cell behaviors during axis elongation in *Drosophila*. Poster presentation at Cell Bio 2022, Boston, MA, December 2023.
- C47. **Kasza KE**. Signatures of Cell Packings and Myosin Network Architecture Reveal Transitions in Embryonic Tissue Mechanics. Conference presentation at the SEM Annual Conference on Experimental and Applied Mechanics, Orlando, FL, June 6, 2023.
- C46. Ostvar S, Kusaka E, Wang X, Lesko A, Sutherland A, **Kasza KE**. 3D cell packing dynamics in converging and extending epithelial sheets. Conference presentation at American Physical Society March Meeting, Las Vegas, NV, March 2023.
- C45. Cupo C, Allan C, Ailiani V, Ostvar S, **Kasza KE**. Cell packings and myosin network architectures underlie local tissue mechanical behaviors in the fly embryo. Conference presentation at American Physical Society March Meeting, Las Vegas, NV, March 2023.
- C44. Countryman AD, Puri MS, Herrera-Perez M, Doherty CA, Shvartsman SY, **Kasza KE**, Optogenetic reconstitution of apicobasal shortening in early embryonic epithelia. Poster presentation at 64<sup>th</sup> Annual Drosophila Research Conference, Chicago, IL, March, 2023.
- C43. Countryman A, Doherty C, Shvartsman S, **Kasza KE**, *Optogenetic control of endogenous Rho/Rho-kinase signaling in the Drosophila germband*. Poster presentation at Cell Bio 2022, Washington DC, December 2022.
- C42. Cupo C, Allan C, **Kasza KE**, *Spatiotemporal Dynamics of Epithelial Cell Packings and Tissue Mechanics During Morphogenesis*. Conference presentation at NCS17: Northeast Complex Fluids and Soft Matter Workshop, Stevens Institute of Technology, Hoboken, NJ, June 24, 2022.
- C41. Cupo C, Allan C, Pomposelli A, **Kasza KE**, *Spatiotemporal Dynamics of Epithelial Cell Packings and Tissue Mechanics During Morphogenesis*. Conference paper and presentation at the SB3C Summer Biomechanics, Bioengineering, and Biotransport Conference, Eastern Shore, MD, June 21, 2022.
- C40. Herrera-Perez RM, Cupo C, **Kasza KE**. *Optogenetic control of tissue flows in developing embryos*. Conference presentation at the SEM Annual Conference on Experimental and Applied Mechanics, Pittsburgh, PA, June 14, 2022.
- C39. Ostvar S, Lesko, A, Cupo C, Sutherland A, **Kasza KE**. *Cell packing structure in converging and extending epithelial tissues near rigidity transitions*. Poster presentation at the Simons Workshop on Geometry, Topology, and Symmetry in Soft and Living Matter. Simons Center for Geometry and Physics, Stony Brook University, NY, May 20, 2022.
- C38. Herrera-Perez RM, Cupo C, **Kasza KE**. *Exploring cell mechanisms of tissue fluidity by optogenetic manipulation of Rho activity*. Conference presentation at the ASCB/EMBO Cell Bio Annual Meeting, Virtual Meeting, December 8, 2021.
- C37. **Kasza KE**, *Linking cell shapes to tissue flows during morphogenesis*. Conference presentation at the SEM Annual Conference on Experimental and Applied Mechanics, Virtual Meeting, June 17, 2021.
- C36. Cupo C, Allan C, Lin A, Herrera-Perez RM, **Kasza KE**, *Myosin network architecture during convergent extension*. Conference paper and presentation at the Virtual SB3C Summer Biomechanics, Bioengineering, and Biotransport Conference, June 16, 2021.



- C35. Wang X, Cupo C, Ostvar S, **Kasza KE**, *Cell-cell adhesion modulates tissue fluidity during epithelial morphogenesis*. Conference paper and presentation at the Virtual SB3C Summer Biomechanics, Bioengineering, and Biotransport Conference, June 16, 2021.
- C34. Cupo C, Allan C, Lin C, Herrera-Perez RM, **Kasza KE**, *Myosin network architecture and tissue fluidity during convergent extension*. Conference presentation at the 2021 Workshop on Multicellular Engineered Living Systems, June 1-3, 2021.
- C33. Herrera-Perez RM, Cupo C, **Kasza KE**, *Dissecting cell mechanisms of tissue fluidity using optogenetic manipulation of Rho activity*. Conference presentation at the Genetics Society of America Annual *Drosophila* Research Conference, Virtual, March 23 – April 1, 2021.
- C32. Wang X\*, Christian Cupo, and **Kasza KE**, *The Role of Cell-Cell Adhesion in Epithelial Tissue Mechanics and Morphogenesis*, Poster presentation at the NSF IMECE Virtual Conference, November 16-19, 2020. (\*, Poster Award)
- C31. **Kasza KE**, *Linking cell shapes to tissue flows during morphogenesis*, Conference presentation at “From Molecules to Organs: The Mechanobiology of Morphogenesis”, Mechanobiology Institute, National University of Singapore, October 28-30, 2020.
- C30. Wang X and **Kasza KE**, *Linking cell shapes to tissue mechanics during epithelial morphogenesis*, Conference presentation at the SEM Virtual Annual Conference on Experimental and Applied Mechanics, September 14-17, 2020.
- C29. **Kasza KE**, *Understanding and controlling the forces that build multicellular tissue structures*. Annual Packard Fellows Meeting, Virtual Meeting, September 9-12, 2020.
- C28. Wang X\*, Cupo C, and **Kasza KE**, *Cell-Cell Adhesion Links Cell Rearrangement and Cell Shape During Epithelial Morphogenesis*, Conference paper and presentation in the Ph.D. Student Paper Competition at the Virtual SB3C Summer Biomechanics, Bioengineering, and Biotransport Conference, June 17-20, 2020. (\*, awarded 1<sup>st</sup> Place)
- C27. Herrera-Perez RM and **Kasza KE**, *Spatiotemporal Control of Body Axis Elongation by Optogenetic Manipulation of Actomyosin Contractility*, Conference paper and presentation at the Virtual SB3C Summer Biomechanics, Bioengineering, and Biotransport Conference, June 17-20, 2020.
- C26. Wang X and **Kasza KE**, *Cell-Cell Adhesion Links Cell Shape and Rearrangement Speed During *Drosophila* Axis Elongation*, Poster presentation at the American Society for Cell Biology Annual Meeting, Washington, DC, December 7-11, 2019.
- C25. Herrera-Perez RM and **Kasza KE**, *Optogenetic Control of RhoGTPase Activity Reveals Dynamics of Contractile and Adhesive Machinery During Epithelial Morphogenesis*, Poster presentation at the American Society for Cell Biology Annual Meeting, Washington, DC, December 7-11, 2019.
- C24. Wang X and **Kasza KE**, *Systematic modulation of cell-cell adhesion in vivo modulates epithelial tissue mechanics and remodeling*, Conference paper and presentation in the Ph.D. Student Paper Competition at the SB3C Summer Biomechanics, Bioengineering, and Biotransport Conference, Seven Spring, PA, USA, June 25-28, 2019.
- C23. Wang X and **Kasza KE**, *Cell-cell adhesion in tissue mechanics and morphogenesis*, Conference presentation at the SEM Annual Conference on Experimental and Applied Mechanics, Reno, Nevada USA, June 3-6, 2019.
- C22. Wang X and **Kasza KE**, *Cell-cell adhesion in tissue mechanics and morphogenesis*, Conference presentation at the American Physical Society March Meeting, Boston, MA, March 4-8, 2019.

- C21. Herrera-Perez RM and **Kasza KE**, *Optogenetic control of contractile forces during Drosophila morphogenesis*, Conference presentation at the American Physical Society March Meeting, Boston, MA, March 4-8, 2019.
- C20. Zhang R and **Kasza KE**, *Coordination of cell-cell adhesion and contractility during tissue remodeling*. Conference presentation at the 10<sup>th</sup> Northeast Complex Fluids and Soft Matter Workshop, Rutgers University, New Brunswick, NJ, January 23, 2019.
- C19. Wang X and **Kasza KE**, *The role of cell-cell adhesion in tissue mechanics and morphogenesis*. Conference presentation at the 10<sup>th</sup> Northeast Complex Fluids and Soft Matter Workshop, Rutgers University, New Brunswick, NJ, January 23, 2019.
- C18. Wang X and **Kasza KE**, *The role of cell-cell adhesion in tissue mechanics and morphogenesis*. Conference presentation at the 77<sup>th</sup> New England Complex Fluids Meeting, Harvard University, Cambridge, MA, November 30, 2018.
- C17. Wang X and **Kasza KE**, *Systematically modulating cell-cell adhesion in vivo reveals mechanics of epithelial tissue morphogenesis*. Conference presentation at the 8<sup>th</sup> World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018.
- C16. **Kasza KE** and Herrera-Perez RM, *Controlling where and when forces are generated during tissue morphogenesis*. Conference presentation at the 8<sup>th</sup> World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018.
- C15. **Kasza KE** and Herrera-Perez RM, *Controlling where and when forces are generated during tissue morphogenesis*. Conference presentation at the SEM Annual Conference on Experimental and Applied Mechanics, Greenville, South Carolina USA, June 4-7, 2018.
- C14. Wang X and **Kasza KE**, *Cell-cell adhesion in tissue mechanics*. Conference presentation at the 9<sup>th</sup> Northeast Complex Fluids and Soft Matter Meeting, University of Pennsylvania, Philadelphia, PA, May 25, 2018.
- C13. Herrera-Perez RM and **Kasza KE**, *Optogenetic control of cell contractility during epithelial morphogenesis in Drosophila*. Conference presentation at the Genetics Society of America Annual Drosophila Research Conference, Philadelphia, PA, April 11-15, 2018.
- C12. Wang X and **Kasza KE**, *The role of cell-cell adhesion in epithelial tissue remodeling*. Conference presentation at the 8<sup>th</sup> Northeast Complex Fluids and Soft Matter Meeting, Columbia University, New York, NY, January 12, 2018.
- C11. Wang X and **Kasza KE**, *Systematically modulating cell-cell adhesion reveals cellular mechanisms of epithelial remodeling in Drosophila*, Conference poster presentation at the American Society for Cell Biology Annual Meeting, Philadelphia, PA, December 1-5, 2017.
- C10. Herrera-Perez RM and **Kasza KE**, *Spatiotemporal control of contractile forces in Drosophila using optogenetic tools*, Conference poster presentation at the Gordon Research Conference on Motile and Contractile Systems, New London, NH, July 30 - August 4, 2017.
- C9. **Kasza KE**, *Force Generation within Tissues During Embryo Development*, Conference presentation at the SEM Annual Conference on Experimental and Applied Mechanics, Indianapolis, IN, June 12-15, 2017.
- C8. Wang X and **Kasza KE**, *Mechanics and Morphogenesis of Epithelial Tissues*, Conference poster presentation at the Northeast Complex Fluids and Soft Matter Workshop (NCS7), Princeton, NJ, May 26, 2017.
- C7. **Kasza KE**, Farrel DL, and Zallen JA, *Myosin II regulation and activity provide spatial and temporal control of the forces that shape tissues*, Conference poster presentation at the American Society for Cell Biology, Annual Meeting. Philadelphia, PA, December 6-8, 2014.

- C6. **Kasza KE** and Zallen JA, *Mechanical regulation of myosin II in morphogenesis*, Conference poster presentation at the Evolution of Colloidal Matter Conference, Center for Soft Matter Research, New York University, June 27-29, 2013.
- C5. **Kasza KE** and Zallen JA, *Mechanical regulation of myosin II in morphogenesis*, Conference poster presentation at the Morphogenesis and Dynamics of Multicellular Systems Workshop, EMBL Heidelberg, Germany, September 7-9, 2012.
- C4. **Kasza KE** and Zallen JA, *Mechanical regulation of motor proteins in animal morphogenesis*, Conference poster presentation at the 6th Gotham-Metro Condensed Matter Meeting, The New York Academy of Sciences, November 11, 2011.
- C3. **Kasza KE** and Zallen JA, *Mechanical regulation of myosin II in morphogenesis*, Conference poster presentation at Mathematical Biology of the Cell: Cytoskeleton and Motility Workshop at the Banff International Research Station, Banff, Canada, July 31-Aug 5, 2011.
- C2. **Kasza KE** and Weitz DA, *Actin-Filamin Networks and Cell Mechanics*, Conference presentation at the American Physical Society March Meeting, Denver, CO, March 5-9, 2007.
- C1. **Kasza KE** and Weitz DA, *The actin cross-linker filamin plays a key role in the nonlinear mechanical response of living cells*, Conference presentation at the 5th World Congress of Biomechanics, Munich, Germany, July 29-Aug 4, 2006.

## **Selected Professional Service and Activities**

### **Professional Organization Membership**

1. American Physical Society (APS)
2. American Society for Cell Biology (ASCB)
3. Genetics Society of America (GSA)
4. Society for Experimental Mechanics (SEM)
5. Society for Developmental Biology (SDB)
6. Biophysical Society (BPS)

### **Conference Organizer**

1. Simons Center Workshop on Geometry, Topology, and Symmetry in Soft and Living Matter, Simons Center for Geometry and Physics, Stony Brook University, Stony Brook, NY, May 9-13, 2022 (co-organizer)
2. Annual Drosophila Research Conference, Virtual, March, 2021 (Techniques and Technology Plenary Session co-chair)
3. Mechanobiology and Embryogenesis session at the 8th World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018 (session co-chair)
4. 8<sup>th</sup> Northeast Complex Fluids and Soft Matter Workshop (NCS8), Columbia University, New York, NY. January 12, 2018 (co-organizer)

### **Professional Association Activity**

1. Chair, Technical Division on the Mechanics of Biological Systems and Materials, Society of Experimental Mechanics, June 2023 — present
2. Co-chair, Technical Division on the Mechanics of Biological Systems and Materials, Society of Experimental Mechanics, June 2021 — June 2023
3. Secretary, Technical Division on the Mechanics of Biological Systems and Materials, Society of Experimental Mechanics, June 2019 — June 2021

## **Financial Support**

1. Alfred P. Sloan Foundation; Sloan Research Fellowship in Physics, Role: Sole PI, 9/15/2022-9/14/2024
2. NIH, National Institute of General Medical Sciences, “MIRA: Mechanisms coordinating cell behaviors within tissues during development”, Role: Sole PI, 7/1/2020-4/30/2025
3. David & Lucile Packard Foundation, “Understanding and controlling the forces that build multicellular tissue structures”, Role: Sole PI, 10/15/2018-10/14/2023
4. National Science Foundation, “CAREER: Biophysical Mechanisms Underlying the Generation of Tissue Structure and Mechanics”, Role: Sole PI, 07/01/2018-06/30/2023
5. Columbia University, Provost’s Grants Program for Junior Faculty Who Contribute to the Diversity Goals of the University, Role: Sole PI, 02/01/2017-01/31/2018 (completed)
6. Henry Luce Foundation, Clare Boothe Luce Assistant Professorship, Role: Sole PI, 09/01/2016-08/31/2021 (completed)
7. Burroughs Wellcome Fund, Career Award at the Scientific Interface (faculty portion) Role: Sole PI, 01/01/2016-06/30/2022 (completed)
8. Burroughs Wellcome Fund, Career Award at the Scientific Interface (postdoctoral portion) Role: Sole PI, 04/01/2014-12/31/2015 (completed)
9. Hay Whitney Foundation, Postdoctoral Fellowship, Role: Sole PI, 04/01/2011-03/31/2014 (completed)