SUNG HOON KANG

3400 North Charles Street, Malone Hall 111, Baltimore MD 21218
shkang@jhu.edu, (410) 516-4135
http://kang.me.jhu.edu

EDUCATION

Harvard University Cambridge, MA
Ph.D., Applied Physics, School of Engineering and Applied Sciences May 2012
Thesis: Self-Organization of Bioinspired Fibrous Surfaces
Advisor: Prof. Joanna Aizenberg

Massachusetts Institute of Technology Cambridge, MA
S.M., Materials Science and Engineering 2004
Thesis: Evaporative Printing of Organic Materials & Metals and Development of Organic Memories
Advisor: Prof. Vladimir Bulović

Seoul National University Seoul, Korea
B.S., *summa cum laude*, Materials Science and Engineering 2000

RESEARCH INTEREST

Multifunctional materials/structures with tailored properties by computational modeling and 3D printing for applications including protection, sensing, energy harvesting, and biomedical devices

Materials and structures with tunable and/or adaptive mechanical properties

Pattern formation by self-organization of bioinspired polymeric nano/micro/macrostructures

Liquid wetting and repellency of bioinspired nanostructured surfaces

Novel micro/nanostructure fabrication approach

WORK EXPERIENCE

Johns Hopkins University Baltimore, MD
Assistant Professor, Dept. of Mechanical Engineering/Hopkins Extreme Materials Institute January 2015-present

Harvard University Cambridge, MA
Postdoctoral Fellow (Advisor: Prof. Katia Bertoldi) June 2012-December 2014

- ***Harnessing mechanical instability in soft materials to design materials with novel properties*** **(Wyss Institute Seed Project)**
  - Investigated new mechanisms to control behavior of soft periodic structures based on rational design using computational modeling and experiments for realizing mechanical metamaterials with novel properties.

Harvard University Cambridge, MA
Doctoral Researcher (Advisor: Prof. Joanna Aizenberg) 2008-May 2012

- ***Pattern formation by self-assembly of bioinspired polymer nanostructures***
  - Developed mechanisms for controlling pattern formation from bioinspired polymer nanofiber arrays by evaporative self-assembly, and modeled how hierarchical chiral structures emerge by interplay between bulk and surface properties of materials.
  - Developed a scale-independent mechanism to form a large-area ordered chiral structure by harnessing a swelling-induced instability in surface-attached soft cellular structures, and demonstrated how rational

design can be used to control appearance of mixed vs. uniform chiral structures from achiral micro/macro cellular structures.

- ***Liquid wetting and repellency of bioinspired nanostructured surfaces***
  - *Slippery liquid-infused porous surface (SLIPS)*: Developed a 2012 R&D 100 award-winning bioinspired strategy to create a surface with omniphobicity, self-repair, high-pressure stability, and optical transparency, and demonstrated a simple and versatile solution for a robust ultra-repellent surface by developing design principles for selecting physical and chemical properties of nanostructures.

EIC Laboratories, Inc. Norwood, MA
Staff Scientist (Supervisor: Dr. Krishna C. Mandal) 2004-2007

- *Air Force THz emitter & sensor project:* Contributed to winning the grant and studied doping effects of GaSe crystals for improving process capability and tuning spectra.
- *NIST and DOE solid state nuclear detector project:* Studied doping effect of Selenium alloys by FTIR, UV-Vis, DSC, XRD, SEM, I-V, and detection spectra measurement to find optimum detector fabrication parameters.

Massachusetts Institute of Technology Cambridge, MA
Graduate Research Assistant (Advisor: Prof. Vladimir Bulović) 2001-2004

- *Hewlett Packard molecular jet printer project*: Developed a thin film deposition system that can pattern metals and organic materials with variable feature sizes by using a MEMS shutter.
- *Solid-state organic memory project*: Demonstrated that organic light emitting devices with charge trap layers showed non-volatile memory behavior.

AWARDS AND HONORS

Invitee, National Academy of Engineering's US Frontiers of Engineering Symposium 2016
- 100 engineers, generally 30-45 years old from industry, universities, and government labs are invited to represent the full range of engineering fields.

NSF Fellowship for Summer Institute on Additive Manufacturing (Evanston, IL) 2013

Early Career Development Workshop Fellowship, Korean-American Scientists and Engineers Association 2013

Poster Award, Growth and Form: Pattern Formation in Biology, Aspen Center for Physics 2012

Graduate Student Award Gold Medal, Materials Research Society Fall Meeting 2011
- ***the highest honor for graduate students in materials research***, ~ 10 awardees/year in the world

Second Place Poster Award 2011
NSF Workshop and Freund Symposium on Future Directions of Mechanics Research (Providence, RI)

Second Place in Science as Art Competition, Materials Research Society Spring Meeting 2010
- Selected as the cover image of the textbook "Colloid and Surface Chemistry: A Laboratory Guide for Exploration of the Nano World".

NSF Fellowship for Faraday Discussion (FD) Graduate Research Seminar and FD 146 Meeting (Wetting) 2010

First Place in Photography Category, International Science and Engineering Visualization Challenge 2009

"Save Our Earth. Let's Go Green." (*Science* Vol. 327, p. 954, 2010.) - *Featured in various media worldwide including AAAS & NSF Press Release, MSNBC, The Telegraph, National Geographic, CNET, Popular Science, Chemistry World, and New Scientist and selected as the cover image of the textbook "Chemistry and Chemical Reactivity, 8th Edition".*

TEACHING

Johns Hopkins University Baltimore, MD

Instructor for EN. 530.417/618 Fabricatology – Advanced Materials Processing Spring 2017
- Teaches undergraduate/graduate course on fabrication.
- 34 students with various majors (mechanical engineering, engineering management, chemical biomolecular engineering, biomedical engineering, electrical engineering) enrolled.

Instructor for EN 530.436/636 Bioinspired Science and Technology Fall 2016
- Developed a new undergraduate/graduate course on bioinspired science and technology.
- 42 students with various majors (mechanical engineering, engineering management, biomedical engineering) are enrolled.

Instructor for EN. 530.417/618 Fabricatology – Advanced Materials Processing Spring 2016
- Taught undergraduate/graduate course on fabrication.
- 20 students with various majors (mechanical engineering, engineering management, biomedical engineering) enrolled.

Instructor for EN. 530.618 Fabricatology – Advanced Materials Processing Spring 2015
- Developed a new graduate course on fabrication.
- 24 students with various majors (mechanical engineering, engineering management, materials science, civil engineering) enrolled.

Harvard University Cambridge, MA

Teaching Fellow, Introduction to Materials Science and Engineering Fall 2008
- Designed and graded problem sets and exams, led sections to help students understand lectures better and work on problem sets, designed and led laboratory sessions and graded laboratory reports.

MENTORING AND OUTREACH

Johns Hopkins University Baltimore, MD

[Postdoctoral Fellow]
Dr. Santiago Orrego, Department of Mechanical Engineering May 2015-Present

[Ph.D. Students]
Lichen Fang, Department of Mechanical Engineering Fall 2015-Present

[Master Students]
Emilio Bachtiar, Department of Mechanical Engineering Fall 2016-Present
Azra Horowitz, Department of Biomedical Engineering Fall 2016-Present
Mohit Singhala, Center for Bioengineering Innovation and Design Fall 2016-Present
Yitao Chen, Department of Mechanical Engineering Fall 2015-Present

Shuyang Chen, Department of Mechanical Engineering January 2015-May 2016
Thesis: Self-Folding Transformer Robot Based on Bidirectional Shape Memory Polymer Composite Actuators
Rui (Olivia) Wang, Department Materials Science and Engineering Spring 2015-Summer 2015

[Undergraduate Students]
Urszula Krekora, Department of Chemical and Biomolecular Engineering Spring 2016-Present
Eugene Kang, Department of Mechanical Engineering Summer 2016-Present
Amy Boulier, Department of Mechanical Engineering Fall 2016-Present
Khalid Elawad, Department of Materials Science and Engineering Fall 2016-Present
Eyan Goldman, Department of Mechanical Engineering Fall 2016-Present
Arion Morshedian, Department of Mechanical Engineering Fall 2016-Present
Darius Irani, Department of Mechanical Engineering Spring 2017-Present
Sofia Diez, Department of Mechanical Engineering June-August 2016
Brett Caggiano, Department of Mechanical Engineering June-August 2016
Eugene Kang, Department of Mechanical Engineering June-August 2016

[Visiting Students]
Jing Li (Ph.D. student from Wuhan University of Technology) September 2015-Auguest 2017
Junjie Pan (Undergraduate student from Chongqing University January 2017-May 2017
Bohan Wang (Undergraduate student from Tsinghua University) July 2016-January 2017
Peisheng He (Undergraduate student from Shanghai Jia Tong University) September 2016-January 2017
Moses Kayondo (HEMI Extreme Science intern from Morgan State University) June-August 2015, 2016
Tila Assgari (HEMI Extreme Arts intern from Maryland Institute College of Art) June-August 2016
Yancheng Du (Undergraduate student from Tsinghua University) July-August 2016
Zeyu Zhu (Undergraduate student from Shanghai Jia Tong University) July-September 2016
Bo Yuan (Undergraduate student from Tsinghua University) October 2015-February 2016
Liujiang Yan (Undergraduate student from Tsinghua University) July-August 2015
Amanda Metcalf (HEMI Extreme Arts intern from Maryland Institute College of Art) June-August 2015
Daksh Arora (Undergraduate student from Indian Institute of Technology, Delhi) May-July 2015
Dharmendra Sharma (Undergraduate student from Indian Institute of Technology, Kharagpur) May-July 2015

Harvard University Cambridge, MA
Mentor for three Ph.D. students June 2012-December 2014
- Advised three research projects, paper writing and presentation, and career planning and preparation.
- Guided and collaborated to develop mechanical metamaterials by numerical modeling and experiments.

Mentor for three summer students (NSF REU program) Summer 2013
- Guided a summer research project to develop robust nanostructures for practical applications.
- Guided and collaborated to develop multi-stable structures by harnessing mechanical instability.
- Advised the career development of a female student and an under-represented minority student.

Mentor for two undergraduate students Spring 2011-Spring 2013
- Guided a senior mechanical design project to develop a new type of mechanics-based switch.
- Guided and collaborated to develop an analytical model for kinetics of hierarchical assembly.

Mentor for a visiting student from Ecole Polytechnique, France Summer 2009
- Guided and collaborated to study effects of introducing artificial nuclei on the ordering of assembly.

Museum of Science, Boston Boston, MA
Volunteer for Nano Days April 2013, March 2011 & 2010
- Conducted interactive hands-on demonstration of nanoscience for general public of various age groups.

Park Street School/Park Street Kids Boston, MA
Mentor for the annual science fair of the Park Street School January-February 2014
- Helped two sixth grade students to formulate problems, design experiments, and analyze results.
Volunteer for a preschool class March 2012
- Conducted interactive hands-on science demonstrations for sixteen preschool students and teachers.

PROFESSIONAL SOCIETIES AND SERVICE

Editorial Board Member – Scientific Reports November 2014-Present

Guest Editor – February 2016 issue of Materials Research Society Bulletin ("Beyond Conventional Lithography: Patterning via Self-Organization and Self-Folding")

Member - American Society of Mechanical Engineers, Materials Research Society, Society of Engineering Science, American Physical Society.

Journal Reviewer – Advanced Materials, ACS Materials &Interfaces, Nanoscale, Soft Matter, Smart Materials and Structures, Bioinspiration & Biomimetics, Advanced Materials Technologies, Science Advances, Journal of Mechanics of Materials and Structures, Journal of Mechanical Design, Micromachines, MRS Advances.

Proposal Reviewer - National Science Foundation, Army Research Office, American Chemical Society Petroleum Research Fund.

Invited Workshop Attendee
ARO Workshop on the Future of Vibration Energy Transfer in Solids and Structures October 2016
NSF Workshop on Interdisciplinary Frontiers of Designing Engineering Material Systems July 2016

Professional Society Technical Committee Leadership - Editor (2017), Secretary (2018), Vice Chair (2019), Chair (2020), ASME Technical Committee on Mechanics of Soft Materials

Conference Co-Organizer
American Physical Society March Meeting - Focus Session on Physics of Bioinspired Materials 2017
ASME International Mechanical Engineering Congress & Exposition - 3D Printed Soft Materials 2016
Society of Engineering Science Annual Meeting - Mechanics of 3D Printed Materials and Structures 2016
American Physical Society March Meeting – Focus Session on Physics of Bioinspired Materials 2016

Conference Session Chair
Society of Engineering Science Annual Meeting - Mechanics of 3D Printed Materials and Structures 2016
American Physical Society March Meeting – Focus Session on Physics of Bioinspired Materials 2016
Materials Research Society Fall Meeting - Architected Materials 2015
ASME International Mechanical Engineering Congress & Exposition - 3D Printed Soft Materials 2015
Society of Engineering Science Annual Meeting - Instability in Solids and Structures 2013
Society of Engineering Science Annual Meeting - Soft Active Materials and Structures 2012

Faculty Mentoring Focus Group – Whiting School of Engineering May 2015-Present

Thesis Committee Member
Mr. Xiaotong Fu (Ph.D. candidate in Chemical and Biomolecular Engineering) December 2016
"A New Platform For Microfluidic Sample Preparation Using On-Chip Electrokinetics"

Mr. Charles Dhong (Ph.D. candidate in Chemical and Biomolecular Engineering) October 2016
"Peeling Structured Surfaces in Viscous Environments: The Role of Deformation and Drainage Channels"
Mr. Longyu Zhao (Ph.D. candidate in Materials Science) February 2016-April 2016
"Design and Characterization of Fluidic and Thermal Properties of 3D Woven Lattic Materials for Heat Exchange Applications"
Ms. Barbara Murienne (Ph.D. candidate in Mechanical Engineering) January-March 2016
"Glycosaminoglycan Contribution to the Structure-Mechanical Properties of the Posterior Sclera"
Mr. ChangKyu Yoon (Ph.D. candidate in Materials Science) May 2015-Present
"Design, Characterization & Application of Stimuli Responsive Self-Folding Soft Microsystems"

Graduate Board Oral Examination Committee Member
Mr. Reza Yaghmaie (Ph.D. candidate in Civil Engineering) September 2016
Ms. Hahn Le (Ph.D. candidate in Electrical and Computer Engineering) August 2016
Mr. Longyu Zhao (Ph.D. candidate in Materials Science) April 2016
Mr. Gyeongwoo Cheon (Ph.D. candidate in Electrical and Computer Engineering) May 2015

Department Committee 2015-Present
ME Seminar Series & Course (Chair), Graduate Admission Committee (Member), Master of Science in Engineering Affairs/Advising (Member), Manufacturing Engineering ad hoc Committee (Member)

Hopkins Extreme Materials Institute Committee - Academic Committee (Member) 2015-Present

FUNDING

National Institute of Health, R21/R33 Grant (co PI) December 2016-November 2021 (expected)
- *Self-Unfolding RV-PA 3D Printed Conduits* (total award: $237,231 (R21) & $750,000 (R33))

National Science Foundation DMREF Program (co PI) September 2016-August 2020
- *Predictive Multiscale Modeling of the Mechanical Properties of Polymers 3D Printed Using Fused Filament Fabrication* (total award: $1,600,000)

Johns Hopkins Environment, Energy, Sustainability & Health Institute (co PI) July 2015-June 2016
– *Harvesting Energy from Flow-Induced Flutter of 'Piezoleaves' for Self-Powered Sensors* (total award: $25,000)

PUBLICATIONS (28 papers, 1891 citations, h-index=19 from Google Scholar)

(bold: graduate student or post-doc in my lab; *italics*: undergraduate in my lab; *: corresponding author)

[*after starting independent career*]

31. **S. Chen, J. Li, L. Fang**, *Z. Zhu*, and S. H. Kang*, "Simple Bidirectional Polymer Actuators for Self-Folding Transformer Robots," under review.

30. **S. Orrego**, K. Shoele, A. Ruas, K. Doran, *B. Caggiano*, A. Rips, R. Mittal*, and S. H. Kang*, "Harvesting Ambient Wind Energy with an Inverted Piezoelectric Flag," **Applied Energy**, under revision,

29. N. Wadhwa, J. G. Chen, J. B. Sellon, D. Wei, M. Rubinstein, R. Ghaffari, D. M. Freeman, O. Buyukozturk, P. Wang, S. Sun, S. H. Kang, K. Bertoldi, F. Durand, and W. T. Freeman, "A Motion Microscope for Visualizing and Quantifying Small Motions," under review.

28. P. Wang, Y. Zheng, M. C. Fernandes, Y. Sun, K. Xu, S. Sun, S. H. Kang, V. Tournat, and K. Bertoldi, "Harnessing Geometric Frustration to Form Band Gaps in Acoustic Networks," **Physical Review Letters**, 118, 084302 (2017).

27. Y. Zarate, S. Babaee, S. H. Kang, I. V. Shadrivov, D. N. Neshev, K. Bertoldi, David A. Powell, "Elastic Metamaterials for Tuning Circular Polarization of Electromagnetic Waves," **Scientific Reports**, 6, 28273 (2016).

26. J. Liu, T. Gu, S. Shan, S. H. Kang, J. C. Weaver, and K. Bertoldi, "Harnessing Buckling to Design Architected Materials That Exhibit Effective Negative Swelling," **Advanced Materials**, 28, 6619-6624 (2016). ***(>30 citations)***

25. S. H. Kang* and Michel Dickey*, "Patterning via self-organization and self-folding: beyond conventional lithography," **Materials Research Society Bulletin**, 41, 93-96 (2016). (***guest editor of the theme issue, invited review***)

24. S. Shan†, S. H. Kang†, J. R. Raney†, P. Wang, L. Fang, F. Candido, J. Lewis, and K. Bertoldi, "Multistable Architected Materials for Trapping Elastic Strain Energy," **Advanced Materials**, 27, 4296-4301 (2015). (†: equal contribution) ***(>30 citations)***

23. S. Shan, S. H. Kang, Z. Zhao, L. Fang, and K. Bertoldi, "Design of Planar Isotropic Negative Poisson's Ratio Structures," **Extreme Mechanics Letters**, 4, 96-102 (2015).

22. P. Wang, F. Casadei, S. H. Kang, and K. Bertoldi, "Locally Resonant Band Gaps in Periodic Beam Lattices by Tuning Connectivity," **Physical Review B**, 91, 020103(R) (2015). (Rapid Communications) ***(>20 citations)***

[*before starting independent career*]

21. S. H. Kang, S. Shan, A. Kosmrlj, W. L. Noorduin, S. Shian, J. C. Weaver, D. R. Clarke, and K. Bertoldi, "Complex Ordered Patterns in Mechanical Instability Induced Geometrically Frustrated Triangular Cellular Structures," **Physical Review Letters**, 112, 09870 (2014). - *Selected as Physical Review Letters Editors' Suggestion and Highlighted in Physics Synopsis.* ***(>40 citations)***

20. S. Shan, S. H. Kang, P. Wang, C. Qu, S. Shian, E. R. Chen, J. C. Weaver, and K. Bertoldi, "Harnessing Multiple Folding Mechanisms in Soft Periodic and Porous Structures to Design Highly Tunable Phononic Crystals," **Advanced Functional Materials**, 24, 4935 (2014). ***(>30 citations)***

19. J. Shim, S. Shan, A. Kosmrlj, S. H. Kang, E. R. Chen, J. C. Weaver, and K. Bertoldi, "Harnessing Instabilities for Design of Soft Reconfigurable Auxetic/Chiral Materials," **Soft Matter**, 9, 8198-8202 (2013). - *Highlighted on the Soft Matter blog.* ***(>40 citations)***

18. S. H. Kang†, S. Shan†, W. Noorduin†, M. Khan, J. Aizenberg, and K. Bertoldi, "Buckling-Induced Reversible Symmetry Breaking and Chiral Amplification Using Supported Cellular Structures," **Advanced Materials**, 25, 3380-3385 (2013). (†: equal contribution) - *Highlighted in the June 2013 issue of Nature Physics.* ***(>30 citations)***

17. A. Grinthal, S. H. Kang, A. K. Epstein, M. Aizenberg, M. Khan, and J. Aizenberg, "Steering Nanofibers: An Integrative Approach to Bio-Inspired Fiber Fabrication and Assembly," **Nano Today**, 7, 35-52 (2012). (***invited review***) ***(>40 citations)***

16. S. H. Kang, N. Wu, A. Grinthal, and J. Aizenberg, "Meniscus Lithography: Evaporation-Induced Self-Organization of Pillar Arrays into Moiré Patterns," **Physical Review Letters**, 107, 177802 (2011). - *Selected as Physical Review Letters Editors' Suggestion and Highlighted in Physics Today and Physics Synopsis.*

15. T.-S. Wong, S. H. Kang, S. K. Y. Tang, E. J. Smythe, B. D. Hatton, A. Grinthal, and J. Aizenberg, "Bioinspired Self-Repairing Slippery Surfaces with Pressure-Stable Omniphobicity," **Nature**, 477, 443-447 (2011). **-** *Featured on News & Views, highlighted in the issue and various media worldwide including BBC, the Times, Daily Mail, ABC (Australia & Spain), Discovery, Financial Times, Yahoo News (UK), Agence France-Presse, Sina (China), the Statesman (India), Nature Chemistry, Hot Topic Article in Nature Asia-Pacific, C&EN, AAAS EurekAlert, Chemistry World, Physics World, Spektrum Der Wissenschaft, New Scientist, and the Engineer.* ***(>790 citations)***

14. A. Seminara, B. Pokroy, S. H. Kang, M. P. Brenner, and J. Aizenberg, "On the Mechanism of Nanostructure Movement under Electron Beam and Its Application in Patterning," **Physical Review B**, 83, 235438 (2011).

13. D. J. Lipomi, R. V. Martinez, M. A. Kats, S. H. Kang, P. Kim, J. Aizenberg, F. Capasso, and G. M. Whitesides, "Patterning the Tips of Optical Fibers with Metallic Nanostructures Using Nanoskiving," **Nano Letters**, 11, 632-636 (2011). ***(>70 citations)***

12. S. H. Kang, B. Pokroy, L. Mahadevan, and J. Aizenberg, "Control of Shape and Size of Nanopillar Assembly by Adhesion-Mediated Elastocapillary Interaction," **ACS Nano**, 11, 6323-6331 (2010). **-** *Featured on the cover and highlighted in the issue.* ***(>40 citations)***

11. B. Pokroy, B. Aichmayer, A. S. Schenk, B. Haimov, S. H. Kang, P. Fratzl, and J. Aizenberg, "Sonication-Assisted Synthesis of Large, High-Quality Mercury-Thiolate Single Crystals Directly from Liquid Mercury," **Journal of the American Chemical Society**, 132, 14355-14357 (2010). **-** *Highlighted on C&EN.*

10. D. J. Lipomi, M. A. Kats, P. Kim, S. H. Kang, J. Aizenberg, F. Capasso, and G. M. Whitesides, "Fabrication and Replication of Arrays of Single- or Multi-Component Nanostructures by Replica Molding and Mechanical Sectioning," **ACS Nano**, 4, 4017-4026 (2010). **-** *Featured on the cover and highlighted in the issue.* ***(>50 citations)***

9. B. Pokroy, S. H. Kang, L. Mahadevan, and J. Aizenberg, "Self-Organization of a Mesoscale Bristle into Ordered, Hierarchical Helical Assemblies," **Science**, 323, 237-240 (2009). **-** *Highlighted in the issue, and various media including New York Times, NPR, Discovery, AAAS EurekAlert, C&EN, Technology Review, IEEE Spectrum, Science Daily, and New Scientist.* ***(>240 citations)***

8. K. C. Mandal, S. H. Kang, M. Choi, J. Chen, X.-C. Zhang, J. M. Schleicher, C. A. Schmuttenmaer, and N. C. Fernelius, "III–VI Chalcogenide Semiconductor Crystals for Broadband Tunable THz Sources and Sensors," **IEEE Journal of Selected Topics in Quantum Electronics**, 14, 284-288 (2008). ***(>20 citations)***

7. K. C. Mandal, S. H. Kang, M. Choi, R. David Rauh, "Rare-Earth Doped Potassium Lead Bromide Mid-IR Laser Sources for Standoff Detection," **International Journal of High Speed Electronics and Systems**, 18, 735 (2008).

6. K. C. Mandal, S. H. Kang, M. Choi, A. Kargar, M. J. Harrison, D. S. McGregor, A. E. Bolotnikov, G. A. Carini, G. C. Camarda, and R. B. James, "Characterization of Low-Defect $Cd_{0.9}Zn_{0.1}Te$ and CdTe Crystals for High-Performance Frisch Collar Detectors," **IEEE Transactions on Nuclear Science**, 54, 802-806 (2007). ***(>30 citations)***

5. K. C. Mandal, S. H. Kang *et al*, "Component Overpressure Growth and Characterization of High Resistivity CdTe Crystals for Radiation Detectors," **Journal of Electronic Materials**, 36, 1013-1020 (2007).

4. J. Chen, V. Leblanc, S. H. Kang. P. J. Benning, D. Shut, M. A. Baldo, M. A. Schmidt, and V. Bulović, "High Definition Digital Fabrication of Active Organic Devices by Molecular Jet Printing," **Advanced Functional Materials**, 17, 2722-2727 (2007). ***(>30 citations)***

3. V. Leblanc, J. Chen, S. H. Kang, V. Bulović, and M. A. Schmidt, "Micromachined Printheads for the Evaporative Patterning of Organic Materials and Metals," **Journal of Microelectromechanical Systems**, 16, 394-400 (2007).

2. K. C. Mandal, S. H. Kang *et al*, "Simulation, Modeling, and Crystal Growth of $Cd_{0.9}Zn_{0.1}Te$ for Nuclear Spectrometers," **Journal of Electronic Materials**, 35, 1251-1256 (2006). ***(>30 citations)***

1. S. H. Kang, T. Crisp, I. Kymissis, and V. Bulović, "Memory Effect from Charge Trapping in Layered Organic Structures," **Applied Physics Letters**, 85, 4666-4668 (2004). ***(>60 citations)***

INVITED PRESENTATIONS (24 invited talks)

S. H. Kang, "Design, Fabrication, and Characterization of Architected Materials for Energy Absorption and Vibration Propagation Control," University of Maryland, Baltimore County, Baltimore, MD, December 2016.

S. H. Kang, "The Future of Vibration Energy Transfer in Solids and Structures: Needs and Opportunities," Army Research Office Invited Workshop on the Future of Vibration Energy Transfer in Solids and Structures: Needs and Opportunities, Seattle, WA, October 2016.

S. H. Kang, "Design, Fabrication, and Characterization of Architected Materials for Energy Absorption and Vibration Propagation Control," University of Calgary, Calgary, AB, Canada, October 2016.

S. H. Kang, "Steering Behaviors of 3D Printed Materials and Structures," The United States Army Research Laboratory, Aberdeen, MD, August 2016.

S. H. Kang, "Design, Fabrication, and Characterization of Architected Materials for Energy Absorption and Tunable Vibration Propagation," Under Armour, Baltimore, MD, July 2016.

S. H. Kang, "3D Printing: A Technology That Transforms Our Lives," Engineering Innovation, Johns Hopkins University, Baltimore, MD, July 2016.

S. H. Kang, "Design, Fabrication, and Characterization of Architected Materials for Tunable Wave Propagation and Shape-Recoverable Energy-Absorption," Department of Mechanical and Materials Engineering, Portland State University, Portland, OR, May 2016.

S. H. Kang, "Architected Materials for Tunable Elastic Wave Propagation and Reversible Energy Absorption," Department of Mechanical Engineering, Stony Brook University, Stony Brook, NY, May 2016.

S. H. Kang, "Steering Interactions between Bioinspired Polymeric Fibrous Structures and Fluids," National Institute of Standards and Technology, Gaithersburg, MD, June 2015.

S. H. Kang, "3D Technologies and Their Applications for Architected Materials," Greater Baltimore Committee Education and Workforce, Baltimore, MD, May 2015.

S. H. Kang, "Steering Evaporation-Induced Self-Assembly of Nanopost Arrays by Interplay between Mechanics and Surface Chemistry," Foundations of Nanoscience, Snowbird, UT, April 2015.

S. H. Kang, S. Shan, J. R. Raney, P. Wang, J. Lewis, and K. Bertoldi, "Design, Fabrication and Characterization of Architected Materials for Tunable Wave Propagation and Shape-Recoverable Energy-Absorption," 2015 Mach Conference, Annapolis, MD, April 2015. **(keynote presentation of a session)**

S. H. Kang, "Harnessing Soft Materials for Functionality through Deformation and Instability," 4th EITA Young Investigator Conference, Cambridge, MA, August 2015.

S. H. Kang, "Harnessing Deformation and Instability of Soft Structured Materials for Tunable Structures and Devices," Department of Aeronautics and Astronautics, University of Washington, Seattle, WA, February 2015.

S. H. Kang and K. Bertoldi, "Soft Structured Materials: Functionality through Deformation and Instability," Materials Research Society Meeting, San Francisco, CA, April 2014.

S. H. Kang, "Steering Structured Surfaces: Harnessing Geometry, Mechanical and Surface Properties to Form Complex Functional Patterns by Self-Organization," Department of Mechanical and Industrial Engineering, University of Illinois, Chicago, IL, April 2014.

S. H. Kang, "Steering Structured Surfaces: Harnessing Geometry, Mechanical and Surface Properties to Form Complex Functional Patterns by Self-Organization," Department of Mechanical Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA, April 2014.

S. H. Kang, "Steering Materials and Structures Under Extreme Conditions: Harnessing Geometry, Mechanical and Surface Properties to Form Complex Functional Patterns by Self-Organization," Department of Mechanical Engineering, Johns Hopkins University, Baltimore, MD, March 2014.

S. H. Kang, "Steering Structured Surfaces: Harnessing Geometry, Mechanical and Surface Properties to Form Complex Functional Patterns by Self-Organization," Department of Mechanical Engineering, University of Connecticut, Storrs, CT, February 2014.

S. H. Kang, "Self-Organization of Bioinspired Structured Surfaces by Interaction with Liquid," Seoul National University, Seoul, Korea, July 2013.

S. H. Kang, "Harnessing Pattern Formation by Interaction between Liquid and Bioinspired Structured Surfaces," Korea Institute of Science and Technology, Seoul, Korea, July 2013.

S. H. Kang, B. Pokroy, L. Mahadevan, and J. Aizenberg, "Evaporation-Induced Self-Organization of Polymer Nanorod Arrays: When Structured Solids Met a Liquid," Society of Engineering Science 49th Annual Technical Meeting, Atlanta, GA, October 2012.

S. H. Kang and J. Aizenberg, "Steering Nanostructures: Controlling Self-Assembly of Bio-inspired Nanofibers," American Chemical Society Spring Meeting, San Diego, CA, March 2012.

S. H. Kang, B. Pokroy, L. Mahadevan, and J. Aizenberg, "Shape and Size Control of Polymer Nanopost Assembly by Adhesion-Mediated Elastocapillary Interaction: Interplay between Mechanics and Surface Science," Gordon-Kenan Research Seminar (Adhesion), Lewinston, ME, July 2011.

CONTRIBUTED PRESENTATIONS (>25 contributed talks)

S. H. Kang, "A Bidirectional Self-Folding Actuator Based on Bilayer Shape Memory Polymers and Its Application to a Self-Folding Transformer," ASME 2016 International Mechanical Engineering Congress, Phoenix, AZ, November 2016.

S. H. Kang, "Harnessing Deformation of Soft Materials for Multifunctionality," Gordon Research Conference (Multifunctional Materials and Structures), Ventura, CA, February 2016.

S. H. Kang, S. Shan, J. R. Raney, P. Wang, J. Lewis, and K. Bertoldi, "Architected Materials for Reversible Trapping of Elastic Strain Energy," Materials Research Society Fall Meeting, Boston, MA, December 2015.

S. H. Kang, S. Shan, J. R. Raney, P. Wang, J. Lewis, and K. Bertoldi, "Design and Fabrication of Shape-Recoverable Energy-Absorbing Structures by Numerical Modeling and 3D Printing," ASME 2015 International Mechanical Engineering Congress, Houston, TX, November 2015.

S. H. Kang, S. Shan, J. R. Raney, P. Wang, F. Candido, J. Lewis, and K. Bertoldi, "Harnessing Snapthrough Instablity for Shape-Recoverable Energy-Absorbing Structure," American Physical Society March Meeting, San Antonio, TX, March 2015.

S. H. Kang, S. Shan, F. Candido, and K. Bertoldi, "Shape Programmable Metamaterials," Materials Research Society Meeting, San Francisco, CA, April 2014.

S. H. Kang, S. Shan, A. Kosmrlj, and K. Bertoldi, "Formation of Complex Ordered Patterns in Buckling Induced Geometrically Frustrated Triangular Cellular Structures," Materials Research Society Meeting, San Francisco, CA, April 2014.

S. H. Kang, S. Shan, A. Kosmrlj, W. Noorduin, S. Shian, D. R. Clarke, and K. Bertoldi, "Complex Ordered Patterns in Mechanical Instability Induced Geometrically Frustrated Triangular Cellular Structures," American Physical Society March Meeting, Denver, CO, March 2014.

S. H. Kang, S. Shan, and K. Bertoldi, "Experiments, Modeling, and Analysis of Geometrically Frustrated Cellular Structures," Materials Research Society Meeting, Boston, MA, December 2013.

S. H. Kang, S. Shan, A. Kosmrlj, and K. Bertoldi, "Complex Ordered Patterns in Buckling-Induced Geometrically Frustrated Cellular Structures," ASME 2013 International Mechanical Engineering Congress, San Diego, CA, November 2013.

S. H. Kang and J. Aizenberg, "Self-Organization of Polymer Nanofiber Arrays for Bioinspired Multifunctional Systems," ASME 2013 International Mechanical Engineering Congress, San Diego, CA, November 2013.

S. H. Kang, S. Shan, A. Kosmrlj and K. Bertoldi, "Complex Patterns with Tunability by Coupling Mechanical Instability with Geometrical Frustration," New England Workshop on the Mechanics of Materials and Structures, Boston, MA, October 2013.

S. H. Kang, S. Shan, and K. Bertoldi, "Formation of Complex Ordered Patterns by Harnessing Mechanical Instability in Geometrically Frustrated Lattices," Society of Engineering Science 50th Annual Technical Meeting, Providence, RI, July 2013.

S. H. Kang, S. Shan, and K. Bertoldi, "Coupling Geometrical Frustration with Mechanical Instabilities to Design Surfaces with Three Dynamically Changing States," American Physical Society March Meeting, Baltimore, MD, March 2013.

S. H. Kang, S. Shan, W. Noorduin, M. Khan, K. Bertoldi, and J. Aizenberg, "Chiral Pattern Formation in Polymer-Based Supported Cellular Structures by Elastic Instability," Materials Research Society Meeting, Boston, MA, November 2012.

S. H. Kang, N. Wu, A. Grinthal, and J. Aizenberg, "Capillary-Induced Self-Organization of Soft Pillar Arrays into Moiré Patterns by Dynamic Feedback Process," American Physical Society March Meeting, Boston, MA, March 2012.

S. H. Kang, L. Mahadevan, and J. Aizenberg, "Pattern Formation by Self-Organization of Biologically-Inspired Fibrous Surfaces," Growth and Form: Pattern Formation in Biology, Aspen, CO, January 2012.

S. H. Kang, S. Shan, W. Noorduin, M. Khan, K. Bertoldi, and J. Aizenberg, "Instability-Induced Chiral Structure Formation in Surface-Attached Honeycombs," Materials Research Society Meeting, Boston, MA, November 2011.

S. H. Kang, S. Shan, W. Noorduin, M. Khan, K. Bertoldi, and J. Aizenberg, "Buckling-Induced Chiral Pattern Formation in Rationally Designed Surface-Attached Honeycombs," New England Workshop on the Mechanics of Materials and Structures, Cambridge, MA, October 2011.

T.-S. Wong, S. H. Kang, S.K.Y. Tang, and J. Aizenberg, "Robust Slippery Surfaces as Optically Transparent, Oleophobic, and Anti-icing Materials," 14th Nano Science and Technology Institute (NSTI) Nanotech Conference and Expo, Boston, MA, June 2011.

S. H. Kang, B. Pokroy, L. Mahadevan, and J. Aizenberg, "Self-Assembly of Nanofibers with Controlled Hierarchy and Shape by Adhesion Mediated Elastocapillary Interaction," NSF Workshop and Freund Symposium on Frontiers of Mechanics Research, Providence, RI, June 2011.

S. H. Kang, N. Wu, L. Mahadevan, and J. Aizenberg, "Meniscus Lithography: Using Moiré Effect for Controlling Self-Assembly by Evaporation," New England Complex Fluid Meeting, New Haven, CT, March 2011.

S. H. Kang, N. Wu, and J. Aizenberg, "Controlling Hierarchical Self-Assembly of Polymer Bristles by Manipulating Meniscus Movement," Materials Research Society Meeting, Boston, MA, November 2010.

S. H. Kang, B. Pokroy, L. Mahadevan, and J. Aizenberg, "Dynamic Wetting of Soft Fibrous Surface," Faraday Discussion 146 - Wetting, Richmond, VA, April 2010.

S. H. Kang, N. Wu, L. Mahadevan, and J. Aizenberg, "Fine Tuning of Pattern Formation in Evaporation-Induced Self-Assembly of Polymer Bristles," Materials Research Society Meeting, San Francisco, CA, April 2010.

S. H. Kang, B. Pokroy, L. Mahadevan, and J. Aizenberg, "Controlled Assembly of Biologically Inspired Arrays of Polymeric Fibers: Potential Applications," Materials Research Society Meeting, Boston, MA, November 2009.

S. H. Kang, N. Wu, and J. Aizenberg, "Effects of Meniscus Formation and Movement on Self-Assembly of Polymer Post Arrays," Kavli Institute, Cambridge, MA, November 2009.

S. H. Kang, B. Pokroy, L. Mahadevan, and J. Aizenberg, "Capillary Induced Chiral Self-Organization of High Aspect Ratio Polymeric Nanoposts: Investigating the Effects of Geometry and Elasticity," Gordon Research Conference (Soft Condensed Matter Physics), New London, NH, August 2009.

PATENTS

"Slippery Surfaces with High Pressure Stability, Optical Transparency, and Self-Healing Characteristics," J. Aizenberg, S. H. Kang, S. K. Y. Tang, T. S. Wong, U.S. Patent No. 9,121,306 and 9,121,307.

"Shape Recoverable and Reusable Energy Absorbing Structures, Systems and Methods for Manufacture Thereof," S. H. Kang, K. Bertoldi, J. R. Raney, J. A. Lewis, S. Sicong, U.S. Provisional Patent Application No. PCT/US2015/27385, filed in April 2015.

"Anti-Counterfeiting Methods," J. Aizenberg, X. He, S. H. Kang, T. S. Wong, U.S. Provisional Patent Application No. PCT/US2013/043627, filed in May 2013.