

Haleh Ardebili

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Education

University of Maryland	College Park, MD	Mechanical Engineering	Ph.D.	2001
Johns Hopkins University	Baltimore, MD	Mechanical Engineering	M.S.	1996
Penn State University	University Park, PA	Engineering Science & Mechanics	B.S.	1994

Experience

2016-Present	Associate Professor of Mechanical Engineering, University of Houston.
2010-2016	Assistant Professor of Mechanical Engineering, University of Houston.
2009-2010	Postdoctoral Research Fellow, Rice University.
2004-2010	Lecturer, University of Houston.
2000-2003	Research Scientist, General Electric R&D at Niskayuna, NY.

Awards and Honors

1. NSF CAREER Award, "CAREER: Fundamental Science Underpinning Stretchable Lithium Ion Batteries" (2013–2018)
2. Texas Space Grant Consortium New Investigators Award (2014-2015)
3. Kittinger Teaching Excellence Award (2016)
4. TcSUH Award (2010-2018)
5. Cullen College of Engineering Outstanding Teacher Award (2013)
6. Finalist, "Science as Art" Exhibition and Contest at the MRS Conference (2011)
7. New Faculty Award (2010)
8. Invention Fulcrum of Progress-General Electric Award to Inventors (2003)
9. Women in Science Award from Saint John's University, NY (1988)

Professional Membership and Service

1. **Served as a reviewer:** Advanced Energy Materials, Carbon, Applied Physics Letters, National Science Foundation, National Research Foundation (Singapore), Nanoscale, Journal of Materials, Current Applied Physics, Journal of Visualized Experiments, Journal of Physical Chemistry, Journal of Applied Polymer Science, Journal of Applied Sciences, RSC Advances, Ionics
2. **Served as organizer and committee chair:** Lead-organizer, MRS symposium "Transport Properties In Nanocomposites", Boston, Dec 2013; Editor of MRS TT symposium proceedings, Dec 2013; Co-organizer, MRS symposium, "Mechanics of Energy Storage and Conversion", Spring 2015; Lead organizer for MRS Symposium, Spring 2016. Lead Topic Organizer, ASME Congress, "Nanomaterials for Energy", November 11 - 17, 2016, Phoenix, Arizona. Chair of ASME Technical Committee, 2015-2016.
3. **Contributor to the Houston National Public Radio Program** "Engines of our Ingenuity", 2012-present

4. **Memberships:** IEEE, ASME, MRS, and ACS

Patents, Papers, and Invited Talks

- **Selected Invited Talks:** MRS Fall Meeting, Boston, MA, Nov 2017; *Mechanics in Scientific Discovery*, Florence, Italy, June 2017; ACS Southwest Regional Meeting, November 10-13, 2016 in Galveston, TX; Flexible Batteries Symposium, San Diego, April 20; Texas Soft Matter Meeting, Aug 2015. TMS, Orlando, FL, March 2015; Composites at Lake Louise, Canada, Nov 2013; Advances in Batteries, ACS, New Orleans, LA, April 2013; Nanomaterials Symposium, TMS, San Antonio, TX, March 2013.

- **Book and Journal Publications (Selected List)**
 1. Berg, S., Akturk, A. Kammoun, M., and Ardebili, H. “Flexible batteries under extreme bending: interfacial contact pressure and conductance”, *Extreme Mechanics Letters*, 13, 108-115, 2017.
 2. Kammoun, M., Berg, S., and Ardebili, H., “Stretchable spiral thin-film battery capable of out-of-plane deformation”, *Journal of Power Sources* 332, 406-412, 2016.
 3. Kelly, T., Moradi Ghadi, B., Berg, S., and Ardebili, H. “In situ study of strain-dependent ion conductivity of stretchable polyethylene oxide electrolyte”, *Scientific Reports (Nature)* 6: 20128, 2016.
 4. Yayathi, S., Walker, W., Doughty, D., and Ardebili, H., “Energy distributions exhibited during thermal runaway of commercial lithium ion batteries used for human spaceflight applications”, *Journal of Power Sources*, 329, 197-206, 2016.
 5. Li, Q., and Ardebili, H., “Flexible thin-film battery based on solid-like ionic liquid-polymer electrolyte”, *J. of Power Sources* 303,17–21, 2016.
 6. Kammoun, M., Berg, S., and Ardebili, H., “Flexible thin-film battery based on graphene-oxide embedded in solid polymer electrolyte”, *Nanoscale*, 7, 17516-17522, 2015.
 7. Walker, W., Yayathi, S., Alvarez-Hernandez, A., Shaw, J., Ardebili, H., “Thermo-electrochemical testing and simulation of lithium-ion batteries operating in radiation driven space environments”, *Journal of Power Sources* 298, 217-227, 2015.
 8. Yuan, M., Erdman, J., Tang, C. and Ardebili, H., “High performance solid polymer electrolyte with graphene oxide nanosheets”, *RSC Advances*, 4, 59637, 2014.
 9. Li, Q. and Ardebili, H., “Atomistic investigation of the nanoparticle size and shape effects on ionic conductivity of solid polymer electrolytes”, *Solid State Ionics*, 268, 156-161, 2014.
 10. Li, Q., Wood, E. and Ardebili, H., “Elucidating the mechanisms of ion conductivity enhancement in polymer nanocomposite electrolytes for lithium ion batteries”, *Applied Physics Letters*, 102, 243903, 2013.
 11. Tang, C., Hackenberg, K., Fu, Q., Ajayan, P.M. and Ardebili, H., “High ion conducting polymer nanocomposite electrolytes using hybrid nanofillers”, *Nano Letters*, 12, 1152–1156, 2012.
 12. Tabatabaei, S., Kumar, A., Ardebili, H., Loos, P.J., and Ajayan, P.M., “Synthesis of Au-Sn alloy nanoparticles for lead-free electronics with unique combination of low and high melting temperatures”, *Microelectronics Reliability*, April 2012.
 13. Ardebili, H., and Pecht, M.G., *Encapsulation Technologies for Electronic Applications*, Elsevier, 2009

14. Ardebili, H., Wong, E.H., and Pecht, M., “Hygroscopic swelling and sorption characteristics of epoxy molding compounds used in electronic packaging”, *IEEE Transactions on Components and Packaging Technologies*, Vol. 26, No.1, p.206-214, March 2003.

• **Book and Journal Publications (Complete List)**

1. Berg, S., Akturk, A. Kammoun, M., and Ardebili, H. “Flexible batteries under extreme bending: interfacial contact pressure and conductance”, *Extreme Mechanics Letters*, 13, 108-115, 2017.
2. Zhu, B., Barnes, M. G., Kim, H., Yuan, M., Ardebili, H., and Verduzco, R., “Molecular engineering of step-growth liquid crystal elastomers”, *Sensors and Actuators B: Chemical*, 244, 433-440, 2017.
3. Kammoun, M., Berg, S., and Ardebili, H., “Stretchable spiral thin-film battery capable of out-of-plane deformation”, *Journal of Power Sources* 332, 406-412, 2016.
4. Kelly, T., Moradi Ghadi, B., Berg, S., and Ardebili, H. “In situ study of strain-dependent ion conductivity of stretchable polyethylene oxide electrolyte”, *Scientific Reports (Nature)* 6: 20128, 2016.
5. Yayathi, S., Walker, W., Doughty, D., and Ardebili, H., “Energy distributions exhibited during thermal runaway of commercial lithium ion batteries used for human spaceflight applications”, *Journal of Power Sources*, 329, 197-206, 2016.
6. Li, Q., and Ardebili, H., “Flexible thin-film battery based on solid-like ionic liquid-polymer electrolyte”, *J. of Power Sources* 303,17–21, 2016.
7. Kammoun, M., Berg, S., and Ardebili, H., “Flexible thin-film battery based on graphene-oxide embedded in solid polymer electrolyte”, *Nanoscale*, 7, 17516-17522, 2015.
8. Walker, W., Yayathi, S., Alvarez-Hernandez, A., Shaw, J., Ardebili, H., “Thermo-electrochemical testing and simulation of lithium-ion batteries operating in radiation driven space environments”, *Journal of Power Sources* 298, 217-227, 2015.
9. Sim, K., Chen, S., Li, Y., Kammoun, M., Peng, Y., Xu, M., Gao, Y., Song, J., Zhang, Y., Ardebili, H. and Yu, C., “High fidelity tape transfer printing based on chemically induced adhesive strength modulation”, *Scientific Reports (Nature)*, 5, 2015.
10. Kammoun, M., Lundquist, L., and Ardebili, H., “High proton conductivity membrane with coconut shell activated carbon”, *Ionics*, 21(6), 1665-1674, 2015.
11. Yuan, M., Erdman, J., Tang, C. and Ardebili, H., “High performance solid polymer electrolyte with graphene oxide nanosheets”, *RSC Advances*, 4, 59637, 2014.
12. Li, Q. and Ardebili, H., “Atomistic investigation of the nanoparticle size and shape effects on ionic conductivity of solid polymer electrolytes”, *Solid State Ionics*, 268, 156-161, 2014.
13. Walker, W., and Ardebili, H., “Thermo-electrochemical analysis of lithium ion batteries for space applications using Thermal Desktop”, *Journal of Power Sources*, 269, 486–497, 2014.
14. A. R. Adhikari, Rusakova, I, Ardebili, H., Luisi, J. Panova, N. I., Laezza, F., and Chu, W-K., “Thermal property and assessment of biocompatibility of poly(lactic-co-glycolic) acid/graphene nanocomposites”, *Journal of Applied Physics* 115, 054701, 2014.
15. Li, Q., Wood, E. and Ardebili, H., “Elucidating the mechanisms of ion conductivity enhancement in polymer nanocomposite electrolytes for lithium ion batteries”, *Applied Physics Letters*, 102, 243903, 2013.

16. Tang, C., Hackenberg, K., Fu, Q., Ajayan, P.M. and Ardebili, H., "High ion conducting polymer nanocomposite electrolytes using hybrid nanofillers", *Nano Letters*, 12, 1152–1156, 2012.
 17. Li, Q., Patel, C., and Ardebili, H., "Mitigating the dead-layer effect in nanocapacitors using graded dielectric films", *International Journal of Smart and Nano Materials*, 3(1), 23-32, 2012.
 18. Tabatabaei, S., Kumar, A., Ardebili, H., Loos, P.J., and Ajayan, P.M., "Synthesis of Au-Sn alloy nanoparticles for lead-free electronics with unique combination of low and high melting temperatures", *Microelectronics Reliability*, April 2012.
 19. Ardebili, H., and Pecht, M.G., *Encapsulation Technologies for Electronic Applications*, Elsevier, 2009
 20. Sharma, P., Ganti, S., Ardebili, H., and Alizadeh, A., "Scaling of thermal stresses in passivated nano-interconnects", *Journal of Applied Physics*, 95, No. 5, p 2763, 2004.
 21. Ardebili, H., Wong, E.H., and Pecht, M., "Hygroscopic swelling and sorption characteristics of epoxy molding compounds used in electronic packaging", *IEEE Transactions on Components and Packaging Technologies*, Vol. 26, No.1, p.206-214, March 2003.
 22. Ardebili, H., Hillman, C., Natishan, M., McCluskey, Pecht, M., and Peterson, D., "A comparison of the theory of moisture diffusion in plastic encapsulated microelectronics with moisture sensor chip and weight-gain measurements", *IEEE Transactions on Components and Packaging Technologies*, Vol. 25, No.1, pp. 132-139, March 2002.
 23. Sharma, P., Ardebili, H., and Loman, J., "A note on the thermal stresses in passivated metal interconnects", *Applied Physics Letters*, Vol. 79, No. 11, p 1706, 2001.
 24. Pecht, M., Ardebili, H., Shukla, A.A., Hagge, J.K., and Jennings, D., "Moisture ingress into organic laminates", *IEEE Transactions on Components and Packaging Technologies*, Vol. 22, No.1, pp.104-110, March 1999.
- **Patents**
 1. Ardebili, H., Dizon, T., Kammoun, M., "Stretchable and multifunctional batteries", US Patent App. 14/671,812, 2015
 2. Baumgartner, C.E., Fobare, D.F., DeJule, M.C., Wei, C.Y., Hennessy, W.A., Wojnarowski, R.J., Ardebili, H., Burdick, Jr., W.E. "Direct CsI scintillator coating for improved digital X-ray detector assembly longevity", Patent No. 6,720,561, April 13, 2004