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## Babak Kondori, Ph.D.

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### Professional Profile

Dr. Kondori specializes in metallurgy, materials science, solid mechanics, failure analysis and fracture mechanics. He has expertise in identifying the relationships between processing, structure, properties, and performance of materials used in automotive, aerospace, energy, consumer product, and electronics industries. For the last 13 years, Dr. Kondori has performed research on issues related to the processing, deformation, damage, fracture, and creep of engineering materials. He has extensive experience in fractography, mechanical testing techniques, microstructural characterization, thermal analysis methods, heat treatment, materials selection, and computational/numerical modeling.

Dr. Kondori completed his postdoctoral studies working on the development of a discrete mesoscale framework to model deformation and failure of amorphous materials. This research worked toward establishing a fundamental understanding of the mechanisms associated with shear band formation and evolution in amorphous materials, e.g., bulk metallic glasses and glassy polymers. He also worked on the modeling of deformation at small scales, applied to Micro-Electro-Mechanical Systems. Dr. Kondori's Ph.D. dissertation was the first study on the effects of stress state on damage and fracture of magnesium alloys. His work combined uniaxial and notched bar experiments with high-resolution X-ray tomography analyses to identify mechanisms of damage and fracture in magnesium alloys that were previously not-understood.

### Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, Texas A&M University, 2015

M.Sc., Metallurgical and Materials Engineering, University of Tehran, Iran, 2009

B.Sc., Metallurgical and Materials Engineering, University of Tehran, Iran, 2006

Dissertation Writing Fellowship, Texas A&M University, 2015.

Graduate Student Travel Award, SES/ASME Conference, 2013.

Texas A&M University Institute for Advanced Study Fellowship, 2012.

### Academic Appointments

Postdoctoral Fellow, Texas A&M University, 2015-2019.

Teaching Assistant, Physical Metallurgy, University of Tehran. 2006-2009

## Languages

Farsi

## Publications

Vasoya M., Kondori B., Benzerga A.A. and Needleman A., "Limits on transformation strains for non-negative dissipation", *Journal of Applied Mechanics*, Vol 86, 2019, 051005.

Kondori B., Morgeneyer T.F., Helfen L., and Benzerga A.A., "Void growth and coalescence in a magnesium alloy studied by synchrotron radiation laminography", *Acta Materialia*, Vol. 155, 2018, pp. 80–94.

Kondori B., Madi Y., Besson J. and Benzerga A.A., "Plastic anisotropy characterization of magnesium alloy AZ31", *International Journal of Plasticity*, 2018, In Press, <https://doi.org/10.1016/j.ijplas.2017.12.002>.

Kondori B., Benzerga A.A. and Needleman A., "Discrete shear-transformation-zone plasticity modeling of notched bars", *Journal of the Mechanics and Physics of Solids*, Vol. 111, 2018, pp. 18–42.

Kondori B., Benzerga A.A. and Needleman A., "Discrete dislocation simulations of compression of tapered micropillars", *Journal of the Mechanics and Physics of Solids*, Vol. 101, 2017, pp. 223–234.

Kondori B. and Mahmudi R., "Effect of Ca on microstructure and creep properties of AM60 magnesium alloy", *Materials Science and Engineering: A*, Vol. 700, 2017, pp. 438-447.

Basu S., Dogan E., Kondori B., Karaman I. and Benzerga A.A., "Towards designing anisotropy for ductility enhancement: a theory-driven investigation in Mg-alloys", *Acta Materialia*, Vol. 131, 2017, pp. 349–362.

Basu S., Dogan. E, Kondori B., Karaman I. and Benzerga A.A., "Ductility enhancement in Mg alloys by anisotropy engineering", *Magnesium Technology 2017*, pp. 153–158.

Kondori B. and Benzerga A.A., "Modeling damage accumulation to fracture in a magnesium-rare earth alloy", *Acta Materialia*, Vol. 124C, 2017, pp. 225–236.

Kondori B., Benzerga A.A. and Needleman A., "Discrete shear transformation zone plasticity", *Extreme Mechanics Letters*, Vol. 9, 2016, pp. 21–29.

Selvarajou B., Kondori B., Benzerga A.A. and Joshi S.P., "On plastic flow in notched hexagonal close packed single crystals", *Journal of the Mechanics and Physics of Solids*, Vol. 94, 2016, pp. 273–297.

Kondori B. and Benzerga A.A., "On the notch ductility of a magnesium-rare earth alloy", *Materials Science and Engineering: A*, Vol. 647, 2015, pp. 74–83.

Kondori B. and Benzerga A.A., "Effect of stress triaxiality on the flow and fracture of Mg alloy AZ31", *Metallurgical and Materials Transaction A*, Vol. 45, 2014, pp. 3292–3307.

Kondori B. and Benzerga A.A., "Fracture strains, damage mechanisms and anisotropy in a magnesium alloy across a range of stress triaxialities", *Experimental Mechanics*, Vol. 54, 2014, pp. 493–499.

Kondori B. and Benzerga A.A., "Discrete dislocation simulations of taper effects in micropillar compression", *TMS2013 Supplemental Proceedings*, pp. 701–709.

Raygan S., Kondori B. and Yangijeh H.M., "Effect of mechanical activation on the production of SiC from silica sand", *International Journal of Refractory Metals and Hard Materials*, Vol. 29, 2011, pp. 10–13.

Kondori B. and Mahmudi R., “Effect of Ca additions on the microstructure, thermal stability and mechanical properties of a cast AM60 magnesium alloy”, *Materials Science and Engineering: A*, Vol. 527, 2010, pp. 2014–2021.

Kondori B. and Mahmudi R., “Impression creep characteristics of a cast Mg alloy”, *Metallurgical and Materials Transaction A*, 2009, Vol. 40A, pp. 2007–2015.

### **Presentations**

Kondori B., Vasoya M., Benzerga A.A. and Needleman A., “Limits on transformation strains for non-negative dissipation”, *International Conference on Plasticity, Damage, and Fracture*, January 03–09 2019, InterContinental San Juan, San Juan, Puerto Rico (Invited Speaker).

Kondori B., Benzerga A.A. and Needleman A., “Deformation in Amorphous Notched Bars; A Discrete Shear Transformation Zone Plasticity Analysis”, *TMS*, March 11–15 2018, Phoenix, Arizona (Invited Speaker).

Kondori B., Morgeneyer T., Helfen L. and Benzerga A.A., “Damage and Fracture of Notched AZ31 Magnesium Alloy: A Microtomography Analysis”, *Magnesium Technology Symposium*, *TMS*, March 11–15 2018, Phoenix, Arizona (Poster Presentation).

Kondori B., “Deformation, Damage and Fracture in “Less-Ductile” Metals”, January 18 2018, Louisville, Kentucky (Invited Speaker).

Kondori B., Benzerga A.A. and Needleman A., “Discrete shear-transformation-zone plasticity modeling of notched bars”, *ICPDF*, January 3–9 2018, San Juan, Puerto Rico (Invited Speaker).

Kondori B., Morgeneyer T. and Benzerga A.A., “Damage and Fracture of Notched AZ31—A Microtomography Analysis”, *MRS*, November 26–December 01 2017, Boston, Massachusetts.

Kondori B., Benzerga A.A. and Needleman A., “Amorphous Notched Bars – A Discrete STZ Plasticity Analysis”, *MRS*, November 26–December 01 2017, Boston, Massachusetts.

Kondori B., Benzerga A.A. and Needleman A., “Discrete shear transformation zone plasticity”, *Seminar*, May 18 2017, Vancouver, British Columbia, Canada.

Kondori B., Benzerga A.A. and Needleman A., “Modeling deformation in amorphous materials via evolution of discrete shear transformation zones”, *TMS*, February 26 – March 2 2017, San Diego, California (Invited Speaker).

Kondori B. and Benzerga A.A., “Damage and fracture in magnesium AZ31, experiments and modeling”, *Magnesium Technology Symposium*, *TMS*, February 26–March 2 2017, San Diego, California (Poster Presentation).

Basu S., Dogan E., Kondori B., Karaman I. and Benzerga A.A., “Towards engineering of anisotropy for ductility enhancement in Mg alloys”, *Magnesium Technology Symposium*, *TMS*, February 26–March 2 2017, San Diego, California.

Kondori B., “Deformation and fracture in “less-ductile” metals”, February 23 2017, Huntsville, Alabama (Invited Speaker).

Kondori B. and Benzerga A.A., “Micromechanical modeling of damage and fracture in magnesium alloys”, *24th ICTAM*, August 21–26 2016, Montreal, Canada.

Kondori B., Needleman A. and Benzerga A.A., "Effects of taper on micropillar compression: a discrete dislocation simulation", Dislocations, September 19–23 2016, West Lafayette, Indiana.

Kondori B. and Benzerga A.A., "Modeling ductile fracture in magnesium alloys", ASME International Mechanical Engineering Congress, November 13–19 2015, Houston, Texas.

Kondori B. and Benzerga A.A., "Investigation of fracture in magnesium WE43 alloy", Magnesium Technology Symposium, SES Meeting, October 26–28 2015, College Station, Texas.

Kondori B. and Benzerga A.A., "Damage and fracture in AZ31 alloy: experiments and modeling", SES Meeting, October 26–28, 2015, College Station, Texas.

Kondori B. and Benzerga A.A., "Effect of stress triaxiality on the flow and fracture of AZ31", AmeriMech Symposium: Material Property Identification, December 10–12 2014, Austin, Texas.

Kondori B. and Benzerga A.A., "Fracture behavior of textured Mg alloys", MRS, Dec 1–6 2013, Boston, Massachusetts.

Kondori B. and Benzerga A.A., "Anisotropy in deformation and fracture properties of AZ31", SES Meeting and ASME-AMD Annual Meeting, July 28–31 2013, Providence, Rhode Island.

Kondori B., Needleman A. and Benzerga A.A., "Taper effects in micropillar compression", SES Meeting and ASME-AMD Annual Meeting, July 28–31 2013, Providence, Rhode Island.

Kondori B. and Benzerga A.A., "Discrete dislocation simulations of taper effects in micropillar compression", TMS, March 3–7 2013, San Antonio, Texas.

## Peer Reviewer

International Journal of Plasticity

Scientific Reports

Materials Science and Engineering A

Metallurgical and Materials Transactions A

Journal of Alloys and CompoundsMetals

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