Madhav Baral, Ph.D.
Assistant Professor of Mechanical Engineering – University of Kentucky
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Research Interests

Solid mechanics, Plasticity & ductile fracture, Sheet metal & tube forming, Constitutive modeling, Material characterization and manufacturing processes, Experimental and numerical Methods.

Appointments

2021-Present:	Assistant Professor, University of Kentucky
2020-2021:	Postdoctoral Research Associate, John Olson Advanced Manufacturing Center, University of New Hampshire
2020 fall:	Adjunct Professor, Southern New Hampshire University

Education

2020	**Ph.D.**, Mechanical Engineering, University of New Hampshire
2015	**M.S.**, Mechanical Engineering, University of New Hampshire
2013	**B.S.**, Mechanical Engineering, Nuclear Engineering (Double major), Idaho State University

Honors, awards & scholarships

2011, 2013	Dr. Russell L. Heath Memorial Scholarship
2012	Dora Dean Young scholarship
2012	Bob Thompson Memorial Scholarships
2012	National Tau Beta Pi Scholarship http://www.tbp.org/memb/ScholarArchives/ScholarBios/Bios12-13.pdf
2012	Nuclear Engineering 2+2 Scholarship from AREVA and ISU
2011	ASISIU-Idaho State University Scholarship

Journal publications

- Baral, M. & Korkolis, Y. P. (2020). Ductile fracture under proportional and non-proportional multiaxial loading. *Int'l Journal of Solids and Structures,* 210-211, 88-108.
- Baral, M., Ha, J., & Korkolis, Y.P. (2019). Plasticity and ductile fracture modeling of an Al-Si-Mg die-cast alloy. *International Journal of Fracture*, 1-21.
- Ha, J., Baral, M., & Korkolis, Y.P. (2019). Ductile fracture of AA6111 Aluminum sheets under proportional loading. *Journal of the Mechanics and Physics of Solids*, 132, 103685.
- Ha, J., Baral, M., & Korkolis, Y. P. (2018). Plastic anisotropy and ductile fracture of bake-hardened AA6013 aluminum sheet. *Int'l Journal of Solids and Structures*, 155, 123-139.
- Baral, M., Hama, T., Knudsen, E., & Korkolis, Y. P. (2018). Plastic deformation of commercially-pure titanium: experiments & modeling. *Int'l J. of Plasticity*, 105, 164-194.
- Tian, H., Brownell, B., Baral, M., & Korkolis, Y. P. (2017). Earing in cup-drawing of anisotropic Al-6022-T4 sheets. *Int'l Journal of Material Forming*, 10(3), 329-343.
- Zhai, J., Luo, T., Gao, X., Graham, S. M., Baral, M., & Korkolis, Y. P., & Knudsen, E. (2016). Modeling the ductile damage process in commercially pure titanium. *International Journal of Solids and Structures*, 91, 26-45.

Publications in conference proceedings (peer-reviewed)

- Baral, M. and Korkolis, Y.P. Ductile fracture modeling of aluminum tubes for hydroforming applications. *The 9th International Conference on Tube Hydroforming, TUBEHYDRO 2019*, Kaohsiung, Taiwan, Nov. 18-21, 2019.
- Baral, M. and Korkolis, Y.P. Ductile fracture modeling of aluminum tubes under combined internal pressure & axial loading. *The 13th International Conference on Numerical Methods for Industrial Forming Processes, NUMIFORM 2019*, Portsmouth, NH, June 23-27.
- Baral, M., Ha, J., and Korkolis, Y.P. Ductile fracture of heat-treated AA6111 sheet under proportional loading. *The 13th International Conference on Numerical Methods for Industrial Forming Processes, NUMIFORM 2019*, Portsmouth, NH, June 23-27.
- Ha, J., Baral, M., and Korkolis, Y.P. Ductile fracture of AA6111 alloy including the effect of bake-hardening. Kwansoo Chung Memorial Symposium, *The 11th International Conference and Workshop on Numerical Simulation of 3D Sheet Metal Forming Processes, NUMISHEET 2018*, Tokyo, Japan, July 30-Aug. 3.
- Ha, J., Baral, M., and Korkolis, Y.P. Ductile fracture of an Al-Si-Mg die-casting aluminum alloy. *Int'l Conf. on the Technology of Plasticity ICTP 2017*, Cambridge, UK, Sept. 17-22.

Conference proceedings */* presentations (selected)

- Ha, J., Baral, M., and Korkolis, Y.P. Ductile fracture study of a bake-hardened aluminum alloy using a new, cruciform-like specimen. *Int'l Seminar on Recent Advancements in Material Testing, Modeling and Simulation for Sheet Metal Forming*, Tokyo Univ. Agriculture & Technology, Jan 29, 2019.
- Kinsey, B.L., Kirsch, N., Baral, M., and Korkolis, Y.P. Acoustic sensor to monitor forming process. Workshop on Smart Factories: *Revolutionizing Manufacturing through Industry 4.0*, Durham, NH, Oct. 18, 2018.
- Baral, M., Ha, J., & Korkolis, Y. P. Ductile fracture behavior of anisotropic AA6111 sheet. *NEW.MECH, Brown University*, Providence, RI. September 29, 2018.
- Baral, M., Ha, J., & Korkolis, Y. P. Plasticity and ductile fracture of AA6111 sheet. *World Congress Experience, SAE International*, Detroit, MI. April 10-12, 2018.
- Baral, M. & Korkolis, Y. P. Plastic anisotropy and constitutive modeling of Commercially Pure Titanium. *NEW.MECH, Massachusetts Institute of Technology*, Cambridge, MA. October 14, 2017.
- Ha, J., Baral, M., and Korkolis, Y.P. Ductile fracture experiments and modeling of 6013 aluminum sheet. *NEW.Mech, Massachusetts Institute of Technology*, Cambridge, MA, October 14, 2017.
- Ha, J., Baral, M., and Korkolis, Y.P. Ductile fracture experiments and modeling of 6000 series of aluminum sheet. *2017 NADDRG Spring Symposium*, Plymouth, MI, May 18, 2017.
- Baral, M., & Korkolis, Y. P. Experimental characterization and constitutive modeling of Commercially Pure-Titanium. *I/UCRC for Metal Deformation Process, Northwestern University*, Evanston, IL. March 14-15, 2017.
- Korkolis, Y.P., Baral, M., Tian, H., Brownell, B.J., & Kinsey, B.L. Hole expansion of anisotropic Al-6022-T4 sheets. *2015 NADDRG Spring Meeting*, Evanston, IL. May 5, 2015.