

ÖZGÜR KELEŞ

Assistant Professor

Biomedical, Chemical & Materials Engineering Department
San José State University, Eng. 385, One Washington Square,
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EDUCATION

Doctor of Philosophy
2009-2013

Purdue University
School of Materials Engineering
Thesis title: *Modeling failure of brittle porous ceramics*
Investigated the effects of pore-pore stress interactions on Weibull statistics of porous ceramics through finite element and Monte Carlo simulations to improve reliability in ceramics.
Advisors: Dr. Keith J. BOWMAN and Dr. R. Edwin GARCÍA

Master of Science
2005-2008

Middle East Technical University
Department of Metallurgical and Materials Engineering
Thesis title: *Production and characterization of alumina fiber reinforced squeeze cast aluminum alloy matrix composites*
Produced metal matrix composites through squeeze casting and vacuum infiltration, for which I designed and built a furnace.
Advisor: Dr. Ali KANKANLI

Bachelor of Science
2000-2005

Middle East Technical University
Department of Metallurgical and Materials Engineering

WORK EXPERIENCE

Research
Teaching
Service

Assistant Professor, Aug 2015–Present
Biomedical, Chemical & Materials Engineering Department (BCME)
San José State University
Teach foundational level classes and perform research on reliability of additively manufactured materials, reliability of ceramics, and stochastic fracture.

Research
Teaching
Advising
Laboratory management

Senior Research Associate and Lecturer, Jul 2013–Jul 2015
Mechanical, Materials and Aerospace Engineering (MMAE)
Illinois Institute of Technology
Teach foundational level classes. Set up a laboratory. Test mechanical behavior of ceramic and pharmaceutical materials. Simulated effects of stress interactions on fracture behavior of porous materials.

Research
Teaching

Graduate Research Assistant, Jan 2009–May 2013
School of Materials Engineering
Purdue University
Performed fundamental research on finite element modeling of brittle fracture. Taught parts of undergraduate classes and assisted teaching.

HONORS AND AWARDS

- The American Ceramic Society* Graduate Excellence in Materials Science Sapphire Award, The American Ceramic Society, 2012.
- Tau Beta Pi* Member of Tau Beta Pi, 2011.
- National business plan finalist* Finalist in national business plan competition, "Hybrid manufacturing of plastic injection molds: 3D Printing and casting," Entrepreneur-Investor Meeting, 2007.

PUBLICATIONS

- Acta Materialia* Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Stochastic failure of isotropic, brittle materials with uniform porosity," *Acta Materialia*, Vol. 61 (2013) pp. 2853–2862.
- Acta Materialia* Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Deviations from Weibull statistics in brittle porous materials," *Acta Materialia*, Vol. 61 (2013) pp. 7207–7215.
- Journal of the American Ceramic Society* Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Failure variability in porous glasses: Stress interactions, crack orientation, and crack size distributions," *Journal of the American Ceramic Society*, Vol. 97 (2014) pp. 3967–3972.
- International Journal of Fracture* Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Pore-crack orientation effects on fracture behavior of brittle porous materials," *International Journal of Fracture*, Vol. 187 (2014) pp. 293–299.
- AAPS PharmSciTech* Ö. KELEŞ, N.P. BARCENAS, D.H. SPRYS and K.J. BOWMAN, "Effect of porosity on strength distribution of microcrystalline cellulose," *AAPS PharmSciTech*, Vol. 16 (2015) pp. 1455–64.
- International Journal of Applied Glass Science* Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Sensitivity of fracture strength in porous glass," *International Journal of Applied Glass Science*, (2016) *In press*.
- Rapid Prototyping Journal* Ö. KELEŞ, C. W. Blewins, and K.J. BOWMAN, "Effect of build orientation on the mechanical reliability of 3D printed ABS," *Rapid Prototyping Journal*, (2016) *In press*.
- Journal of STEM Education* P. BOYLAN-ASHRAF, Ö. KELEŞ, S. FREEMAN, M. SHELLEY, R. CALFEE, "Can Students Flourish in Engineering Classrooms?," *Journal of STEM Education: Innovations and Research*, (2016) Accepted.
- ACS* N. GOBI, D. VIJAYAKUMAR, Ö. KELEŞ and F. EROGBOGBO, "Graphene Quantum Dots Infusion to Create Stronger, Tougher, and Brighter Polymer Composites," *ACS Applied Materials & Interfaces*, (2016) *Under review*.
- Acta Materialia* E. ANDERSON, J. HUYNH, and Ö. KELEŞ, "Stochastic fracture of additively manufactured short carbon fiber reinforced porous ABS," *Acta Materialia*, (2016) *In preparation*.
- Journal of Cleaner Production* A. K. CRESS, J. HUYNH, and Ö. KELEŞ, "Effect of recycling on the mechanical reliability of additively manufactured ABS," *Journal of Cleaner Production*, (2016) *In preparation*.

GRANTS AND CONTRACTS

- NSF* National Science Foundation CAREER Program, CAREER: Engineering stochastic fracture in porous materials via additive manufacturing, \$500,244, PI, 2016. (Pending)
- DoD* Department of Defense: Research and Education Program for Historically Black Colleges and Universities and Minority-Serving Institutions
Equipment/Instrumentation, Acquisition of a Metal Additive Manufacturing System for Research and Classroom use at San Jose State University, \$473,900, PI, 2016. (Pending)
- Chair position* San Jose State University, College of Engineering, Kordestani Endowed Chair Position, Reliability in additively manufactured materials and textured ceramics, \$39,509, PI, 2015.
- SJSU* San Jose State University, College of Engineering, Faculty Mini Grant Application for Support of Student Research Scholars, Effect of porosity on mechanical reliability of fused deposition modeled ABS, \$9,990, PI, 2015.

TEACHING EXPERIENCE

- Lecturer*
3 credit course MatE 115, Structure/Properties of Solids, 2016 Fall
San José State University
I am teaching an upper-level introduction to materials science class.
- Lecturer*
3 credit course MatE 25, Introduction to Materials, 2016 Fall
San José State University
I am teaching an introductory materials class.
- Lecturer*
3 credit course
Teacher rating 4.5/5 MatE 205, Advanced Mechanical Behavior of Solids, 2016 Spring
San José State University
I taught a graduate class on mechanical behavior. Teacher rating of 4.5 out of 5.
- Lecturer*
3 credit course
Teacher rating 4.7/5 MatE 115, Structure/Properties of Solids, 2015 Fall
San José State University
Teacher rating of 4.7 out of 5.
- Lecturer*
Teacher rating 4.8/5 MatE 25, Introduction to Materials, Laboratory Section, 2015 Fall
San José State University
Teacher rating of 4.8 out of 5.
- Lecturer*
3 credit course MS 201, Materials Science, 2015 Summer
Illinois Institute of Technology
I taught an introduction to materials science class.
- Lecturer*
3 credit course
Autodesk-Inventor
Arduino MMAE 232, Design for Innovation, 2015 Spring
Illinois Institute of Technology
I taught CAD, sustainable design, bio-inspired design, and various other topics through three projects: sustainable chair, trebuchet, and bio-inspired robot.

- Co-lecturer*
3 credit course MMAE 232, Design for Innovation, 2014 Fall
Illinois Institute of Technology
I taught parts of the class and assisted the laboratory sections.
- Lecturer*
3 credit course
Teacher rating 4.43/5 MS 201, Materials Science, 2014 Summer
Illinois Institute of Technology
I taught an introduction to materials science class, for which I got a teacher rating of 4.43 out of 5 with an evaluation response rate of 100%.
- Lecturer*
3 credit course
Teacher rating 4.49/5 MMAE 200, Introduction to Mechanics, 2014 Spring
Illinois Institute of Technology
I taught an introduction to mechanics–statics class containing 77 students. I got a teacher rating of 4.49 out of 5 with an evaluation response rate of 91%.
- Instructor and teaching assistant* MSE 335, Materials Characterization Laboratory, 2012 Fall
Purdue University
I taught basics of SEM and EDS in class and also through laboratory practices.
- Instructor and teaching assistant* MSE 250, Physical Properties in Engineering Systems, 2010 Spring
Purdue University
I conducted homework reviews and tutorials during the lecture.
- Instructor for materials laboratory class* ME 2340, Laboratory for Introduction to Materials Science, 2008 Fall
Northeastern University
I taught metallography, SEM, EDS, optical microscopy, hardness test, tensile test, four-point bend test, and Charpy impact test to sophomores.

PRESENTATIONS

- MS & T* Alex Cress and Ö. KELEŞ, “Effect of Build Parameters on the Variation in Mechanical Properties of Fused Deposition Modeled ABS,” Materials Science & Technology, 2016.
- Science for Everyone*
Public talk Ö. KELEŞ, “Impact of materials science on society,” Science for Everyone, Public talk, January 2013.
- Science for Everyone*
Public talk Ö. KELEŞ, “History of fracture mechanics,” Science for Everyone, Public talk, November 2012.
- Science for Everyone*
Public talk Ö. KELEŞ, “Bone and teeth fracture,” Science for Everyone, Public talk, October 2012.
- MS & T* Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, “Statistical failure analysis of crystallographically isotropic porous materials,” MS & T, 2012.
- MS & T* Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, “Statistical approaches applied to failure of isotropic materials with random cracks,” MS & T, 2011.
- Integrated computational materials education* Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, “Object oriented finite element modeling of brittle fracture,” Integrated computational materials education summer school, University of Michigan, 2011.

MS & T Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Mechanical properties and reliability of pharmaceutical powder processing tablets: A modeling approach," *Materials Science & Technology*, 2010.

Eli Lilly Co. Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Modeling and experimental investigation of fracture behavior of pharmaceutical powder compacts," *Eli Lilly and Company*, 2010.

POSTERS

K-12 education Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Brittle fracture in pharmaceutical powder compacts," *Next Generation Scholars Research Fair, Purdue University*, 2013.

K-12 education Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Modeling and experimental investigation of fracture behavior of pharmaceutical powder compacts," *Next Generation Scholars Research Fair, Purdue University*, 2012.

Gordon Research Conferences Highlighted Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Pore-pore interaction effects on fracture behavior of brittle materials and Weibull statistics," *Gordon Research Conferences*, 2012.

Pharmaceutical research Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Discrete element and peridynamics modeling of fracture behavior of pharmaceutical powder compacts," *Center for Pharmaceutical Processing Research meeting, Purdue University*, 2010.

Pharmaceutical research Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Modeling and experimental investigation of fracture behavior of pharmaceutical powder compacts," *Center for Pharmaceutical Processing Research meeting, Puerto Rico*, 2010.

Pharmaceutical research Ö. KELEŞ, R.E. GARCÍA and K.J. BOWMAN, "Modeling and experimental investigation of pharmaceutical powder processing," *Center for Pharmaceutical Processing Research meeting, Purdue University*, 2009.

PROFESSIONAL SOCIETIES

Associate member of The American Ceramic Society

Member of The Minerals, Metals & Materials Society

Member of The American Society of Mechanical Engineers

EXPERIMENTAL SKILLS

Additive manufacturing Additive manufacturing · 3D printing · Gel casting · Tape casing ·
Gel-casting Synchrotron X-ray and energy dispersive spectroscopy · Vacuum infiltration
SEM and squeeze casting for metal matrix composite production · Conventional
Sintering aluminum and steel casting · Metallography · Uniform droplet spray for
Mechanical tests powder manufacturing · Vertical Bridgman technique to grow single crystals ·
Ultrasonic testing Metal powder extrusion · Scanning electron microscopy · Optical
Synchrotron X-ray microscopy · Tensile, compression and bend tests · Diametral compression
test · Charpy impact test · Micro and normal hardness tests · Ultrasonic

testing of material properties · Metal and ceramic sintering · Ball milling · Roller and uniaxial powder compaction

COMPUTER SKILLS

FEM Finite element method-OOF2 and Abaqus · Finite volume method-FiPy ·
Autodesk-Inventor Discrete element method-LIGGGHTS · Peridynamics-LAMMPS · ThermoCalc
Python · Autodesk-Inventor · MATHEMATICA · FIT2D · PYTHON · MATLAB ·
Mathematica LabVIEW · L^AT_EX · Linux · Mac OS · Keynote · Microsoft Windows and
MATLAB Office · Photoshop · Photomatix

TECHNICAL TRAINING AND WORKSHOPS

Synchrotron X-ray In situ synchrotron X-ray characterization of lead-free ferroelectric ceramics under electric field, Argonne National Laboratories, 2014.

3D modeling Summer School on Materials in 3D: Modeling and Imaging at Multiple Length Scales, University of California Santa Barbara, 2013 (for two weeks).

Biomechanics Biomechanics of tissue and tissue-cell interaction summer school, Purdue University, 2012.

Engineering education Integrated computational materials education summer school, University of Michigan, 2011 (for two weeks).

Characterization Advanced materials characterization workshop, University of Illinois at Urbana-Champaign, 2010.

X-Ray spectroscopy Bruker D8 X-Ray applications training, Bruker AXS, WI, 2009.

Entrepreneurship Valorization and business plan training, VALOR Project, European Union Sixth Framework Program, 2007.

December 8, 2016