

Burak BASARAN, Ph.D.

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EDUCATION

<i>University of Houston, Houston, TX (As a part of ongoing J-1 Academic Training)</i>		
Visiting Assistant Prof., Dept. of Engr. Tech., Mechanical Engr. Tech. Program		August 2011–June 2012
<i>University of Kentucky, Lexington, KY (As a part of ongoing J-1 Academic Training)</i>		
Postdoctoral Research Fellow/ Instructor, Mechanical Engineering		September 2009–August 2011
<i>Texas A&M University, College Station, TX</i>		
Ph.D., Materials Science & Engineering	GPA: 3.50/4	January 2004–August 2009
M.S., Mechanical Engineering	GPA: 3.75/4	August 2003
<i>Gazi University, Ankara, Turkey</i>		
M.S., Mechanical Engineering	GPA: 3.25/4	June 2001
<i>Osmangazi University, Eskisehir, Turkey</i>		
B.S., Mechanical Engineering	GPA: 80/100	June 1996

WORK EXPERIENCE

Instructional Associate Professor:

- *Department of Engineering Technology, Mech. Engr. Tech. Program, University of Houston* Aug2020–Present
Instructor/ curriculum developer to the following courses:

MECT 1330 Engineering Graphics (fundamentals of technical drafting and mechanical design via SolidWorks)
MECT 2354 Introduction to Mechanics (success marker foundation course in MET program, fundamentals of engineering mechanics, Statics)
MECT 3355 Strength of Materials (fundamentals of mechanical behavior in engineering materials and applications in mechanical design)
MECT 3358 Dynamics of Mechanisms (fundamentals of dynamics theory and applications in mechanism design/modeling via SolidWorks Motion)
MECT 4323 Applications in Stress Analysis (upper intermediate/advanced applications to further understand mechanical behavior in engineering materials and case studies in mechanical design)
MECT 4372 Materials Technology (introduction to materials science for engineers)

Instructional Assistant Professor:

- *Department of Engineering Technology, Mech. Engr. Tech. Program, University of Houston* June 2015–Aug 2020
Instructor/ curriculum developer to the following courses:

MECT 1330 Engineering Graphics (fundamentals of technical drafting and mechanical design via SolidWorks)
MECT 2354 Introduction to Mechanics (success marker foundation course in MET program, fundamentals of engineering mechanics, Statics)
MECT 3355 Strength of Materials (fundamentals of mechanical behavior in engineering materials and applications in mechanical design)
MECT 3358 Dynamics of Mechanisms (fundamentals of dynamics theory and applications in mechanism design/modeling via SolidWorks Motion)
MECT 4323 Applications in Stress Analysis (upper intermediate/advanced applications to further understand mechanical behavior in engineering materials and case studies in mechanical design)

Visiting Assistant Professor:

- *Department of Engineering Technology, Mech. Engr. Tech. Program, University of Houston* Jan 2015–June 2015
Instructor/ curriculum developer to the following courses:

MECT 1364 Materials & Processes (fundamentals of materials science & conventional manufacturing techniques in mechanical engineering practice)
MECT 3355 Strength of Materials (fundamentals of mechanical behavior in engineering materials and applications in mechanical design)
MECT 3358 Dynamics of Mechanisms (fundamentals of dynamics theory and applications in mechanism design/modeling via ProEngineer Mechanism 5.0)
MECT 3342 Elements of Plant Design (fundamentals of industrial plant components and their design via Aveva PDMS)

Lecturer:

- Department of Engineering Technology, Mech. Engr. Tech. Program, University of Houston Sept 2014–Jan 2015
Instructor to the following courses:

MECT 3355 Strength of Materials (fundamentals of mechanical behavior in engineering materials and applications in mechanical design)

Interim Department Head:

- University of Turkish Aeronautical Association, College of Engineering Dec 2013–Feb 2014
Department of Mechatronics Engineering

Assistant Professor:

- Univ. of Turkish Aeronautical Association, College of Engr., Dept. of Mechatronics Engr. Sept 2012–Feb 2014
Instructor/ curriculum developer to the following courses:

PHYS 101 Engineering Physics I (foundations of mechanics and applications, undergrad level in English)

AES 552 Research Methods in Engineering (foundations of mechanical design methodology, grad level in English)

PHYS 102 Engineering Physics II (foundations of electromagnetics and applications, undergrad level in English)

MCH 201 Engineering Mechanics (combination of Statics and Mechanics of Materials, theory and applications, undergrad level in English)

MCH 203 Elements of Design in Mechatronics Engineering I (combination of classical methods in engineering technical drawing and applications of CAD via SolidWorks, undergrad level in English)

Visiting Assistant Professor:

- Department of Engineering Technology, Mech. Engr. Tech. Program, University of Houston Aug 2011–June 2012
Instructor to the following courses:

MECT 1330 Engineering Graphics (fundamentals of technical drafting and mechanical design via ProEngineer Wildfire 5.0)

MECT 3355 Strength of Materials (fundamentals of mechanical behavior in engineering materials and applications in mechanical design)

MECT 3358 Dynamics of Mechanisms (fundamentals of dynamics theory and applications in mechanism design/modeling via ProEngineer Mechanism 5.0)

MECT 4275 Senior Design I (first part of the capstone mechanical design class for senior students; project selection and implementation of mechanical design process through analytical and computational methods)

Post-doctorate Research Fellow:

- Department of Mechanical Engineering, University of Kentucky Sept 2009–Aug 2011
Design and manufacturing of novel test setups for concurrent thermal-magnetic-mechanical characterization of (intelligent) metallic alloys and polymers. Synthesis, development and thermo-magneto-mechanical characterization of Magnetic, High Temperature, High Strength Shape Memory Alloys and Shape Memory Polymer composites. Training and mentoring of graduate and undergraduate students in research.

Instructor:

- Department of Mechanical Engineering, University of Kentucky Fall 2010–Spring 2011
ME 205 Computer Aided Engineering Graphics (fundamentals of mechanical design and technical drafting via ProEngineer Wildfire 5.0)

Graduate Research Assistant:

- Department of Mechanical Engineering, Texas A&M University 2000–2009
Accomplished M.S. thesis research
Carried out experiments for industry on prototype shape memory alloy wire design & manufacturing
Conducted Ph.D. dissertation research; collaborated with researchers from Russia, Germany, Japan and US national labs
Supervised (use, maintenance and training of new users) multi-platform XRD facility in Materials Science and Engineering materials characterization lab
Supervised (use, development, maintenance and training of new users) thermo-magneto-mechanical test setup in MESAM group materials characterization lab for shape memory alloys
- Department of Mechanical Engineering, Gazi University, Ankara, Turkey 1997–2000
Accomplished M.S. thesis research
Participated in applied tribological investigation of wear analysis of subway railroad system in Ankara, Turkey for the Municipality of Ankara City

Graduate Teaching Assistant:

- Department of Mechanical Engineering, Texas A&M University 2004
Undergraduate course: Materials and Manufacturing Selection in Design, +100 students, conducted the lab work/ experiments, graded homework/ quizzes
- Department of Mechanical Engineering, Gazi University, Ankara, Turkey 1997–2000
Undergraduate course: Computer Aided Design and Manufacturing, +50 students, taught basic and advanced skills of mechanical

technical drawing by AutoCAD & Autodesk Mechanical Desktop, planned the curriculum of the computer based new version of the whole course, prepared and graded exams/ homeworks/ quizzes

Internships:

- *Mechanical Manufacturing and Maintenance Plant of Ministry of Agriculture Sugar Processing Corporation (T.C. Seker Makina Fabrikasi), Eskisehir, Turkey* June 1995–August 1995
Administrative leadership and executive organization internship for manufacturing plant engineers
- *Diesel and Electric Locomotives Manufacturing Plant of Ministry of Transportation (TULOMSAS), Eskisehir, Turkey* June 1994–August 1994
Conventional and advanced manufacturing processes in mechanical engineering internship

****** COURSES DR. BASARAN CAN OFFER ******

Materials Science, Materials Science Lab, Mechanics (Strength) of Materials, Mechanics of Materials Lab, Technical Drawing & Engineering Graphics, Computer Aided Design & Manufacturing (CAD/CAM), Computer Aided Engineering (CAE) & Simulation, Engineering Mechanics: STATICS, Engineering Mechanics: DYNAMICS, Machine Elements (mechanical design of machines, theory and applications), Mechanism Design and Synthesis, Mechanical Vibrations, Manufacturing Methods in Mechanical Engineering, Physical Metallurgy, Crystallography and Materials Characterization Techniques (X-ray diffraction, optical and electron microscopy), Advanced CAD/CAM, Senior Design (Capstone) Projects.

****** SPONSORED SCIENTIFIC PROJECTS DR. BASARAN PARTICIPATED IN ******

- (2020-2023) **RET Site: High School Teacher Experience in Engineering Design and Manufacturing** (University of Houston)
[This work is supported by NSF, total award \$579,490, senior technical personnel]
- (2013-2014) 19198-Yoğunlaştırılmış Güneş Enerjili Sıcak Hava Motoru (Stirling) İle Elektrik Üretimi {Design & Manufacturing of a Solar Powered Stirling Engine for Sustainable Energy Production} [TÜBİTAK 1511 Öncelikli alanlar araştırma teknoloji geliştirme ve yenilik projeleri destekleme programı ve Eryiğit Endüstriyel Makina ve Tıbbi Cih. İml., Ostim, Ankara, Turkey]
- (2009-2011) **Role of aging time on the microstructure and shape memory properties of NiTiHfPd single crystals** (University of Kentucky)
[This work was supported in part by the NASA Fundamental Aeronautics Program, Aeronautical Sciences Project and the NASA EPSCOR Program under Grant No NNX11AQ31A and KY EPSCoR RID Program under Grant No 3049024332 and RFBR Project with Grant no 10-03-0154-a.]
- (2009-2011) **Compressive response of nickel-rich NiTiHf high-temperature shape memory single crystals along the [1 1 1] orientation** (University of Kentucky)
[This work was supported in part by the KY NASA EPSCoR (N08R02B) and NASA Fundamental Aeronautics Program under the Supersonics Project, Dale Hopkins, API.]
- (2009-2011) **Effects of aging on [111] oriented NiTiHfPd single crystals under compression** (University of Kentucky)
[This work was supported in part by the NASA Fundamental Aeronautics Program under the Supersonics Project, Dale Hopkins, API, the NASA EPSCOR program under Grant No. NNX11AQ31A, KY EPS- 290 CoR RID program under Grant No. 3049024332 and RFBR Project with Grant No. 10-03-00154a.]
- (2008-2009) **Shape Memory Response in Ni40Co10Mn33Al17 Polycrystalline Alloy** (University of Kentucky)
[This study was supported by the Global COE Project and by Grant-in-Aids from the CREST, Japan Science and Technology Agency (JST) and from the Japanese Society for the Promotion of Science (JSPS). In addition, BB and IK acknowledge the support from the U.S. National Science Foundation, Division of Materials Research, Award No. 0909170.]
- (2004-2009) **Ph.D. research project** (Texas A&M University): “Magnetic Field-Induced Phase Transformation and Power Harvesting Capabilities in Magnetic Shape Memory Alloys”
[This work was supported by US Army Research Office, contract no. W911NF-06-1-0319 (Program Director: Dr. David Stepp), National Science Foundation – Division of Civil, Mechanical, and Manufacturing Innovation, contract no. 0709283, and Deutsche Forschungsgemeinschaft. Use of the Advanced Photon source at Argonne National Laboratory was supported by the US Department of Energy, Office of Science, Office of Basic Energy Sciences, under contract no. DE-AC02-06CH11357.]
- (2000-2003) **M.S. research project #2** (Texas A&M University): “*Optimization Studies on Thermal & Mechanical Manufacturing Processes for Multifilament Superconducting Tape & Wire*” [TAMU Research Foundation]
- (1997-2000) **M.S. research project #1** (Gazi University): “*Experimental Investigation of Pitting Dispersion on Helical Gears*” [Gazi University Research Foundation]
- (1996) **Undergraduate Senior Design Project** (Eskişehir Osmangazi University): “*Design & Manufacturing of a Radial Fan for Industrial HVAC Applications*”

RESEARCH EXPERIENCE**Post-doc Research Associate:**

- Founding (from scratch) and organization of research facilities in Karaca group (University of Kentucky) for research in materials science
- Mechanical design and manufacturing of novel test setups for concurrent thermal-magnetic-mechanical characterization of intelligent metallic alloys and polymer composites (including MTS servo-hydraulic test frame retrofitted with 9 Tesla superconducting magnet)
- Synthesis (arc-melting, induction casting, mechanical alloying), development (phase diagram construction) and thermo-magneto-mechanical characterization of single & polycrystalline Magnetic Shape Memory Alloys for aerospace/micro fluidics/energy harvesting applications (NiMnGa, NiMnCoGa, NiMnCo[In, Sn, Sb], FeMnGa)
- Synthesis, development and thermo-mechanical characterization of single & polycrystalline High Temperature/High Strength Shape Memory Alloys for aerospace/oil & gas industry/biomedical applications (NiTiHf, NiTiHfPd, NiTiHfCu)
- Thermo-mechanical and chemical characterizations of various iron ores for Nippon Steel Corp.
- Microstructural/chemical characterization of engineering materials through Scanning Electron Microscopy, Transmission Electron Microscopy, Energy/Wavelength Dispersive X-ray Spectroscopy, X-ray Diffraction, optical microscopy, Differential Scanning Calorimetry, Thermal Gravimetric Analysis
- Hands-on and theoretical training and education of graduate/undergraduate/high school students in research for materials science and mechanical engineering

Ph.D. Dissertation details: *“Characterization of Magnetic Field-induced Phase Transformation & Variant Reorientation in Ferromagnetic & Metamagnetic Shape Memory Alloys”*

- Design, manufacturing, evolution and maintenance of a novel thermo-magneto-mechanical test frame for characterization of conventional and Magnetic Shape Memory alloy systems to be used in actuator, sensing and energy harvesting applications
- Concurrent examination and optimization (heat treatment and magneto-mechanical training) on thermal, mechanical and magnetic (combined) behaviors of various Magnetic and Metamagnetic Shape Memory alloy systems (NiMnGa, NiMnCoIn, NiFeGa, CoNiGa, NiFeCoGa)
- Investigation of micromechanical evolution mechanisms of Magnetic Field Induced Variant Reorientation and Magnetic Field Induced Phase Transformation phenomena in NiMnGa and NiMnCoIn alloys by crystallography techniques in X-ray diffraction (XRD), Transmission Electron Microscopy (TEM), Scanning Electron Microscopy (SEM) and Neutron Scattering
- Sensor and Waste Mechanical Energy Harvesting applications of NiMnGa and NiMnCoIn alloys in industry
- Study of orientation and temperature dependence of shape memory properties in Magnetic Shape Memory Alloys

M.S. Thesis #2 details: *“Optimization Studies on Thermal & Mechanical Manufacturing Processes for Multifilament Superconducting Tape & Wire”*

- Synthesis of ceramic based, Bismuth-Strontium-Calcium-Copper-Oxide (BSCCO) high temperature superconducting powders
- Manufacturing and reshaping (compaction of ceramic powder by wire drawing) of single filament, silver alloy clad BSCCO superconducting wires to form bundles for having multifilament wires to understand materials related parameters to be able to build dependable superconducting magnets for industrial applications.
- Forming multifilament cables into thin tapes to understand severe deformation involved parameters affecting superconductivity to be able to build dependable superconducting magnets for industrial applications
- Heat treatment studies to optimize superconductivity in multifilament wires and tapes to diminish probability of quenching failure
- Design and manufacturing of add-ons to modify a tubular heat treatment furnace for inert gas purging
- Scanning Electron Microscopy (SEM) investigation of powder-metal clad interface to understand deformation and heat treatment involved parameters affecting superconductivity in multifilament cables and tapes

M.S. Thesis #1 details: *“Experimental Investigation of Pitting Dispersion on Helical Gears”*

- Design, manufacturing and development of a closed-loop-torque-circulating universal gear fatigue test setup
- Mechanical design and manufacturing of the helical test gears
- Several million cycle tests on helical gears with various tooth profile (profile correction factor and helix angle) under different loading to understand generation mechanism of different modes of surface fatigue phenomena to prevent unexpected failure in industrial machinery gearboxes
- Statistical analysis and 3D macrostructural investigation of pitting dispersion on fatigued gear surfaces by surface roughness detection, chemical mapping, and digital imaging to assess life expectations in industrial machinery gearboxes

B.S. Senior Thesis details: *“Design & Manufacturing of a Radial Fan for Industrial HVAC Applications”*

- Design and manufacturing of a scaled, working model of a high performance/heavy duty industrial radial fan in a mechanical plant

SUMMARY OF TECHNICAL/ INDUSTRIAL QUALIFICATIONS

- High hands-on experience with specimen preparation and experimental laboratory equipment design, fabrication and use of:*

Lathe, mill, drill, rotary sawing machines, press, roller, EDM, hydraulic wire drawing bench, grinding, brazing, welding, soldering
 Bruker X-ray Diffraction machine with high temperature Be dome and He cooled Cold Finger platforms
 MTS Hydraulic Testing Frames for tension/ compression
 LakeShore Cryogenics Electromagnet Oxford Cryogenics 9Tesla Superconducting Magnet
 Microscopy: Optical, SEM, TEM Differential Scanning Calorimeter (DSC)
 Vickers Micro-hardness Tester Atomic Force Microscopy
 Superconducting Quantum Interference Device (SQUID) Arc-melter with inert atmosphere
 18Tesla Extraction Type Magnetometer Heat treatment furnaces: Tubular and box
 Low/ High Vacuum Systems and Vacuum Pumps Hot Glasswork for vacuum sealing of heat treatment specimens
- Highly experienced in Mechanical Design:*

Working knowledge of materials for industrial design (metals, ceramics, and polymers)
 Working knowledge on conventional manufacturing techniques (machining/shaping, welding/brazing)
 Working knowledge on international mechanical/metallurgical standard codes, mechanical tolerances, and standard mechanical parts/ tooling

Master user of 3D modeling softwares including **SolidWorks, ProEngineer Wildfire, Creo Parametric, AutoCAD**, Autodesk Inventor, Ideas
- Programming Languages:* Basic, Pascal, Matlab
- Scientific Software Packages:* **SolidWorks** finite elements analysis, **ANSYS Workbench**, **ProEngineer Thermal & Mechanical FEA modules**, Igor Pro, Maple, Matlab, Accelrys Materials Studio materials atomic scale design, PowderCell crystallography, Recell crystallography, PDIndexer crystallography, ReciPro crystallography
- Selected Graduate Coursework:*

Fundamentals of TEM & SEM	Advanced TEM	X-ray Crystallography
Scientific Instrument Making	Physical Phenomena in Materials	Energy Methods
Theory of Elasticity	Mechanics of Active Materials	Introduction to Finite Elements Method
Materials Science & Engineering	Fundamentals of Eng. Fracture Mech.	CAD
		Physical Metallurgy
- Linguistic Skills:* Turkish (native), English (fluent both written and spoken), Spanish (basic)

PUBLICATIONS

Peer Reviewed Journal Publications

- I. Kaya, H. Tobe, H.E. Karaca, **B. Basaran**, M. Nagasako, R. Kainuma, Y.I. Chumlyakov, "Effects of aging on the shape memory and superelasticity behavior of ultrahigh strength Ni₅₄Ti₄₆ alloys under compression", *Materials Science & Engineering A*, v. 678, pp 93-100, 2016
- H.E. Karaca, A.S. Turabi, Y.I. Chumlyakov, I. Kireeva, H. Tobe, **B. Basaran**, "Superelasticity of [001]-oriented Fe_{42.6}Ni_{27.9}Co_{17.2}Al_{9.9}Nb_{2.4} ferrous shape memory alloys", *Scripta Materialia*, v. 120, pp 54-57, 2016
- A.S. Turabi, H.E. Karaca, H. Tobe, **B. Basaran**, Y. Aydogdu, Y.I. Chumlyakov, "Shape memory effect and superelasticity of NiMnCoIn metamagnetic shape memory alloys under high magnetic field", *Scripta Materialia*, Vol. 111, pp. 110-113, 2016
- H.E. Karaca, E. Acar, G.S. Ded, S.M. Saghaian, **B. Basaran**, H. Tobe, M. Kok, H.J. Maier, R.D. Noebe, Y.I. Chumlyakov, "Microstructure and transformation related behaviors of a Ni_{45.3}Ti_{29.7}Hf₂₀Cu₅ high temperature shape memory alloy", *Materials Science and Engineering: A*, Vol. 627, 2015, pp 82-94
- H.E. Karaca, S.M. Saghaian, H. Tobe, E. Acar, **B. Basaran**, M. Nagasako, R. Kainuma, R.D. Noebe, "Diffusionless phase transformation characteristics of Mn_{75.7}Pt_{24.3}", *Journal of Alloys and Compounds*, 589, (2014) 412-415
- H.E. Karaca, S.M. Saghaian, G. Ded, H. Tobe, **B. Basaran**, H.J. Maier, R.D. Noebe, Y.I. Chumlyakov, "Effects of nanoprecipitation on the shape memory and material properties of an Ni-rich NiTiHf high temperature shape memory alloy", *Acta Materialia*, v 61, n 19, pp 7422-7431, 2013
- H.E. Karaca, I. Kaya H. Tobe, **B. Basaran**, M. Nagasako, R. Kainuma, Y. Chumlyakov, "Shape memory behavior of high strength Ni₅₄Ti₄₆ alloys", *Materials Science and Engineering: A*, Vol. 580, 2013, Pages 66-70
- H.E. Karaca, E. Acar, G.S. Ded, **B. Basaran**, H. Tobe, R.D. Noebe, G. Bigelow, Y.I. Chumlyakov, "Shape memory behavior of high strength NiTiHfPd polycrystalline alloys", *Acta Materialia* 61 (2013) 5036-5049
- H.E. Karaca, A.S. Turabi, **B. Basaran**, A.K. Pathak, I. Dubenko, N. Ali, Y.I. Chumlyakov, P. Li, "Compressive Response of Polycrystalline NiCoMnGa High-Temperature Meta-magnetic Shape Memory Alloys", *Journal of Materials Engineering and Performance*, Vol. 22, n. 10, pp. 3111, 2013
- E. Acar, H.E. Karaca, **B. Basaran**, F. Yang, M.J. Mills, R.D. Noebe, Y.I. Chumlyakov, "Role of aging time on the microstructure and shape memory properties of NiTiHfPd single crystals", *Materials Science and Engineering: A*, v 573, pp. 161-165, 2013

- J.A. Monroe, I. Karaman, **B. Basaran**, Ito, R.Y. Umetsu, R. Kainuma, K. Koyama, Y.I. Chumlyakov, “Direct measurement of large reversible magnetic-field-induced strain in Ni-Co-Mn-In metamagnetic shape memory alloys”, *Acta Materialia*, v 60, n 20, pp. 6883-6891, 2012
- H.E. Karaca, **B. Basaran**, I. Karaman and Y.I. Chumlyakov, “Stress-Induced Martensite to Austenite Phase Transformation in Ni₂MnGa Magnetic Shape Memory Alloys,” *Smart Materials and Structures*, v 21, n 4, 2012
- H.E. Karaca, E. Acar, **B. Basaran**, R.D. Noebe, G. Bigelow, A. Garg, F. Yang, M.J. Mills and Y.I. Chumlyakov, “Effects of aging on [111] oriented NiTiHfPd single crystals under compression”, *Scripta Mater.* (2012), <http://dx.doi.org/10.1016/j.scriptamat.2012.06.028>
- H.E. Karaca, I. Karaman, Y.I. Chumlyakov, **B. Basaran** and H.J. Maier, “Compressive Response of NiFeGa Ferromagnetic Shape Memory Alloy Single Crystals,” *Scripta Materialia*, submitted to *Acta Materialia*, 2011
- H.E. Karaca, S. Saghaian, **B. Basaran**, G.S. Bigelow, R.D. Noebe, Y.I. Chumlyakov, “Compressive Response of Nickel-rich NiTiHf High Temperature Shape Memory Single Crystals along the [111] Orientation”, *Scripta Materialia*, v. 65, n. 7, pp 577-580, 2011
- W. Ito, **B. Basaran**, R.Y. Umetsu, I. Karaman, R. Kainuma, K. Koyama, K. Ishida, “Shape Memory Response in Ni₄₀Co₁₀Mn₃₃Al₁₇ Polycrystalline Alloy”, *Mater. Trans.*, Vol. 51, pp 525, 2010.
- H.E. Karaca, I. Karaman, **B. Basaran**, Y.I. Chumlyakov, H.J. Maier, “Magnetic Field-Induced Martensitic Phase Transformation in NiMnCoIn Ferromagnetic Shape Memory Alloys”, *Advanced Functional Materials (Invited)*, Vol. 19, pp 1-16, 2009.
- H.E. Karaca, I. Karaman, A. Brewer, **B. Basaran**, Y.I. Chumlyakov , H.J. Maier, “Shape Memory and Pseudoelasticity Response of NiMnCoIn Magnetic Shape Memory Alloy Single Crystals”, *Scripta Materialia*, Vol. 58, Issue 10 pp. 815-818, 2008.
- H.E. Karaca, I. Karaman, **B. Basaran**, D.C. Lagoudas, Y.I. Chumlyakov , H.J. Maier, “On The Stress-Assisted Magnetic Field-Induced Phase Transformation in Ni₂MnGa Ferromagnetic Shape Memory Alloys”, *Acta Materialia*, Vol. 55, p 4253-4269, 2007
- I. Karaman, **B. Basaran**, H.E. Karaca, A.I. Karsilayan, “Energy harvesting martensite variant reorientation mechanism in a NiMnGa magnetic shape memory alloy”, *Applied Physics Letters*, Vol. 90, n 17, p 172505, 2007
- H.E. Karaca, I. Karaman, **B. Basaran**, D.C. Lagoudas, Y.I. Chumlyakov, H.J. Maier, “One-way Shape Memory Effect Due to Stress-Assisted Magnetic Field-induced Phase Transformation in Ni₂MnGa Magnetic Shape Memory Alloys”, *Scripta Materialia*, Vol. 55, pp. 803-806, 2006.
- I. Karaman, H.E. Karaca, **B. Basaran**, D.C. Lagoudas, Y.I. Chumlyakov , H.J. Maier, “Stress-assisted Reversible Magnetic Field-induced Phase Transformation in Ni₂MnGa Magnetic Shape Memory Alloys”, *Scripta Materialia*, Vol. 55., pp. 403-406, 2006.
- H.E. Karaca, I. Karaman, **B. Basaran**, Y.I. Chumlyakov, H.J. Maier, “Magnetic Field and Stress Induced Martensite Reorientation in NiMnGa Ferromagnetic Shape Memory Alloy Single Crystals”, *Acta Materialia*, Vol. 54, pp.233-245, 2006.

Peer reviewed articles in conference proceedings:

- K. Haldar, D.C. Lagoudas, **B. Basaran** and I. Karaman, “Constitutive Modeling of Magneto-Mechanical Coupling Response of Magnetic Field-Induced Phase Transformations in NiMnCoIn Magnetic Shape Memory Alloys,” *Proceedings of the SPIE, Behavior and Mechanics of Multifunctional Materials and Composites 2010*, Edited by Zoubeida Ounaies, Jiangyu Li, Vol. 7644, pp. 764410, 2010.
- D.C. Lagoudas, K. Haldar, **B. Basaran**, I. Karaman, “Constitutive Modeling Of Magnetic Field-Induced Phase Transformation In NiMnCoIn Magnetic Shape Memory Alloys”, *Proceedings of the ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems 2009, SMASIS2009*, v 1, p 317-326, 2009, *Proceedings of the ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems 2009, SMASIS2009*
- D. Smith, P. McIntyre, **B. Basaran**, M. Yavuz, “SiC composite: A new fuel cladding for high-temperature cores”, *Global 2003: Atoms for Prosperity: Updating Eisenhowers Global Vision for Nuclear Energy, 2003*, Pages 1821-1823
- **B. Basaran**, M. Yavuz, “Optimization studies on thermal and mechanical manufacturing processes for multifilament superconducting tape and wire”, 2003 MRS Fall Meeting; Boston, MA, Materials Research Society Symposium Proceedings, Volume EXS, Issue 3, 2004, Article number EE5.32, Pages 125-127

International collaboration reports:

- **B. Basaran**, W. Ito, R.Y. Umetsu, I. Karaman, R. Kainuma, K. Ishida, “Direct Measurement of Reversible Magnetic-Field-Induced Strain in Ni-Mn-Co-In Metamagnetic Shape Memory Alloys”, In 2009 Annual Report of High Field Laboratory for Superconducting Materials, Institute for Materials Research, Tohoku University, Japan.
- T. Li, **B. Basaran**, H.E. Karaca, K. Saito, F.A. Williams, “Chemical Kinetic Model of Iron Ore Sintering Processes”, Final Technical Report submitted to Mr. Junichi Nakagawa Nippon Steel Company, Kimitsu Works, Japan, Feb. 2011

CONFERENCE PRESENTATIONS

- H. E. Karaca, **B. Basaran**, M. Souri, K. Wieman, “Compressive response of epoxy-based shape memory polymers”, SPIE Smart Structures 2011, Conference 7978: Behavior and Mechanics of Multifunctional Materials and Composites V, San Diego, California, 6-10 March 2011
- H. E. Karaca, **B. Basaran**, G. S. Ded, S. Saghaian, R. D. Noebe, H. J. Maier, “Two-way shape memory behavior of Ni-Ti-Hf based high-temperature shape memory alloys”, SPIE Smart Structures 2011, Conference 7978: Behavior and Mechanics of Multifunctional Materials and Composites V, San Diego, California, 6-10 March 2011
- H. E. Karaca, **B. Basaran**, A. Pathak, A. S. Turabi, I. Dubenko, N. Ali, Y. I. Chumlyakov, “Investigation of Co-doped NiMnGa as a high temperature metamagnetic shape memory alloy for actuator applications”, SPIE Smart Structures 2011, Conference 7978: Behavior and Mechanics of Multifunctional Materials and Composites V, San Diego, California, 6-10 March 2011
- **B. Basaran**, H. E. Karaca, G. Ded, S. Saghaian, R. Noebe, H.J. Maier, “Two Way Shape Memory and Superelasticity Behavior of Ni- Ti- Hf Based High Temperature Shape Memory Alloys”, MS&T 2010, Structural Materials for Aerospace and Defense: Challenges and Prospects Symposium, Houston, Texas, October 17-21, 2010
- H.E. Karaca, **B. Basaran**, A.S. Turabi, Y.I. Chumlyakov, ”Improvement of Magnetic Field-Induced Actuation Performance in NiMn-based Shape Memory Alloys”, MS&T 2010, Magnetoelectric Multiferroic Thin Films and Multilayers Symposium, Houston, Texas, October 17-21, 2010,
- M. Souri, K Wieman, H.E. Karaca, **B. Basaran**, “Thermo-mechanical Properties of Epoxy Shape Memory Polymers”, MS&T 2010, Light Weight Materials for Vehicles and Components Symposium, Houston, Texas, October 17-21, 2010
- H. E. Karaca, G. Ded, **B. Basaran**, S. Saghaian, R. Noebe, H.J. Maier, Y.I Chumlyakov, “Superelastic Response of NiTiHf-Based Shape Memory Alloys”, Special Workshop on Shape Memory Alloys, June 20 - 24, 2010, Istanbul, Turkey.
- W. Ito, **B. Basaran**, R.Y. Umetsu, I. Karaman, R. Kainuma, K. Ishida, “Shape Memory Response and Magnetic Properties in the NiCoMnAl Polycrystalline Alloy”, Special Workshop on Shape Memory Alloys, June 20 - 24, 2010, Istanbul, Turkey
- C. Yegin, **B. Basaran**, I. Karaman, W. Ito, R.Y. Umetsu, R. Kainuma, H.E. Karaca, Y.I. Chumlyakov, “Magneto-Thermo-Mechanical Characterization of Meta-Magnetic Shape Memory Alloys”, Special Workshop on Shape Memory Alloys, June 20 - 24, 2010, Istanbul, Turkey
- H. E. Karaca, G. Ded, R. Noebe, **B. Basaran**, S. Saghaian, “Characterization of aged Ni-Ti-Hf High Temperature Shape Memory Alloys”, The International Conference on Shape Memory and Superelastic Technologies (SMST), Pacific Grove, CA, May 16-20, 2010
- **B. Basaran**, H.E. Karaca, G. Ded, S. Saghaian, “ Thermo-mechanical Characterization of High Temperature Shape Memory Alloys as A Promising Emerging Aerospace Technology”, 35th AIAA Dayton Cincinnati Aerospace Science Symposium 2010
- G. Ded, H. E. Karaca, R. Noebe, **B. Basaran**, “Mechanical Characterization of Ni-Ti-Hf High Temperature Shape Memory Alloys”, SPIE International Symposium on Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring, San Diego, CA, March 7-11, 2010
- A. Hatemi, H. E. Karaca, G. Ded, S. Saghaian, **B. Basaran**, “Characterization of Indentation Response and Shape Memory Surface Morphology of Ni-Ti-Hf-Cu and Ni-Ti-Hf-Pd High Temperature Shape Memory Alloys”, SPIE International Symposium on Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring, San Diego, CA, March 7-11, 2010.
- I. Karaman, R. Zhu, **B. Basaran**, H.E. Karaca, Y. I. Chumlyakov “Crystallographic Orientation and Heat Treatment Effect on Magnetic Field-Induced Phase Transformations of NiMnCoIn Metamagnetic Shape Memory Alloys”, 2009 Materials Research Society Fall Meeting, Boston , MA, November 30-December 4, 2009 (Invited).
- H.E. Karaca, I. Karaman, **B. Basaran**, Y.I. Chumlyakov, ” Characterization of Magnetic Field-Induced Phase Transformations in NiMnCoIn Meta-Magnetic Shape Memory Alloys”, Materials Science & Technology, Pittsburg, PA, October 25-29, 2009
- **B. Basaran**, I. Karaman, R. Zhu, H.E. Karaca, Y. I. Chumlyakov, “The Effect of Simultaneous Stress and Magnetic Field on the Actuator Type Response of NiMnCoIn and NiMnCoSn Metamagnetic Shape Memory Alloys”, ASME 2009 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS09), Oxnard, California, September 20-24, 2009
- H.E. Karaca, I. Karaman, **B. Basaran**, Y.I. Chumlyakov, H.J. Maier, ” Magnetic Field-Induced Phase Transformations in NiMn- based Shape Memory Alloys”, ASME 2009 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS09), Oxnard, California, September 20-24, 2009
- K. Haldar, D. Lagoudas, **B. Basaran** and I. Karaman, “Modeling of Magnetic Field-Induced Phase Transformations in NiMnCoIn Magnetic Shape Memory Alloys”, ASME 2009 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS09), Oxnard, California, September 20-24, 2009
- **B. Basaran**, I. Karaman, H.E. Karaca, and A.I. Karsilayan, “Utilization of Magnetic Shape Memory Alloys in Energy Harvesting”, ICOMAT 2008, June29-July4, 2008, SantaFe, NM

- I. Karaman, H.E. Karaca, **B. Basaran**, Y. Chumlyakov, and H.J. Maier, “Magnetic Field-Induced Phase Transformation in NiMnCoIn Shape Memory Alloys”, ICOMAT 2008, June29-July4, 2008, SantaFe, NM
- H.E. Karaca, I. Karaman, S. Badakhshan, **B. Basaran**, Y. Chumlyakov, D. Niklasch, and H.J. Maier, “Shape Memory Behavior of NiFeGa(Co) Ferromagnetic Shape Memory Single Crystals””, ICOMAT 2008, June29-July4, 2008, SantaFe, NM
- I. Karaman, H.E. Karaca, **B. Basaran**, Y.I. Chumlyakov, and H. J. Maier, “Magnetic Field-Induced Phase Transformation in NiMnGa and NiMnCoIn Shape Memory Alloys”, SPIE International Symposium on Smart Structures and Materials & Nondestructive Evaluation, March 9-13, 2008, San Diego, CA.
- **B. Basaran**, H.E. Karaca, I. Karaman, A.I. Karsilayan, “Energy harvesting using NiMnGa magnetic shape-memory alloys”, SPIE International Symposium on Smart Structures and Materials & Nondestructive Evaluation, March 9-13, 2008, San Diego, CA.
- H.E. Karaca, **B. Basaran**, I. Karaman, Y. Chumlyakov, D. Niklasch, H.J. Maier, “Compressive response of NiFeGa Ferromagnetic Shape Memory Single Crystals”, 44th Annual Technical Meeting of Society of Engineering Science, October 24-47, 2007, College Station, TX.
- **B. Basaran**, H.E. Karaca, I. Karaman, Y. Chumlyakov, “Enhancing Actuator Properties of NiMnCoIn Magnetic Shape Memory Alloys by Field-Induced Phase Transformation”, 44th Annual Technical Meeting of Society of Engineering Science, October 24-47, 2007, College Station, TX.
- I. Karaman, H.E. Karaca, **B. Basaran**, Y.I. Chumlyakov, and H. J. Maier, “Magnetic Field-Induced Phase Transformation in NiMnGa and NiMnCoIn Shape Memory Alloys”, International Symposium on Shape Memory Materials for Smart Systems, European Materials Research Society Fall 2007 Meeting, Warsaw, Poland, September 17th to 21st, 2007
- H.E. Karaca, **B. Basaran**, I. Karaman, Y.I. Chumlyakov, H. J. Maier,” Multi-phase transformation in NiMnGa Magnetic Shape Memory Alloys (MSMAs)”, 2007 TMS Annual Meeting, February 25-March 1, 2007, Orlando, Florida.
- H.E. Karaca, I. Karaman, **B. Basaran**, Y. I. Chumlyakov and H.J. Maier, “Remarkable Pseudoelastic Response of Co₄₈Ni₃₃Al₂₉ and Ni₅₄Ga₂₇Fe₁₉ Ferromagnetic Shape Memory Alloys under Tension and Compression The 7th European Symposium on Martensitic Transformations and Shape Memory Alloys”, September 10-15, 2006, Bochum, Germany.
- **B. Basaran**, H.E. Karaca, I. Karaman, Y.I. Chumlyakov, and H. J. Maier, “Guidelines to Increase Actuation Stress in NiMnGa Magnetic Shape Memory Alloys”, The 7th European Symposium on Martensitic Transformations and Shape Memory Alloys, September 10-15, 2006, Bochum, Germany.
- H.E. Karaca, **B. Basaran**, I. Karaman, Y.I. Chumlyakov, H. J. Maier, “Cobalt Based Ferromagnetic High Temperature Shape Memory Alloys (SMAs)”, May 7-11, SMST 2006, Pacific Grove, CA.
- H.E. Karaca, **B. Basaran**, I. Karaman, Y.I. Chumlyakov, H. J. Maier, “Magneto-thermo-mechanical Characterization of NiMnGa Single Crystals to Reveal Guidelines to Increase Actuation Stress by Magnetic Field Induced Phase Transformation and Variant Reorientation”, Characterization of Minerals, Metals and Materials, March 12-16, 2006, San Antonio, TX. Symposium in TMS Annual Meeting & Exhibition
- **B. Basaran**, H.E. Karaca, I. Karaman, Y.I. Chumlyakov, H. J. Maier, “Few Guidelines To Increase Actuation Stress in NiMnGa Magnetic Shape Memory Alloys (MSMAs)”, Wechsler Symposium on Radiation Effects, Deformation and Phase Transformations in Metals and Ceramics” TMS Annual Meeting & Exhibition, March 12-16, 2006, San Antonio, TX.
- H.E. Karaca, **B. Basaran**, I. Karaman, Y.I. Chumlyakov and H.J. Maier, “Magnetic and Conventional Shape Memory Characteristics of Co₃₈Ni₃₃Al₂₉ and Ni₂MnGa Shape Memory Alloys”, International Conference on Martensitic Transformations, June 14-17 2005, Shanghai, China.
- H.E. Karaca, **B. Basaran**, I. Karaman, Y.I. Chumlyakov, H. J. Maier, “Magnetic and Conventional Shape Memory Characteristics of Co₃₈Ni₃₃Al₂₉ and Ni₂MnGa Shape Memory Alloys”, SPIE's 12th Annual International Symposium on Smart Structures and Materials, March 6-10, 2005, San Diego, CA.

CAREER DEVELOPMENT

- ACUE Certificate in Effective College Instruction, University of Houston, Feb 2022-Jan 2023
- Worcester Polytechnic Institute Project Based Teaching Workshop, Worcester, MA, Jun 21-24, 2022
- Cougar Chairs Leadership Academy (CCLA) Certification, University of Houston, 2020–2021
- ASEE Advanced National Effective Teaching Institute (NETI-3B) Workshop, Online, Jan 2021.
- ASEE Advanced National Effective Teaching Institute (NETI-2) Workshop, Tampa, FL, Jun 2019.
- How to Engineer Engineering Education Workshop (NETI-1), Bucknell University, Lewisburg, PA, Jul 2018.
- Co-designing a Research Agenda to Amplify Engineering Education Efforts at Hispanic Serving Institutes (HSI) Workshop, ASEE Conf., Salt Lake City, UT, Jun 2018.
- Rethinking Engineering Education at HSIs Workshop, UT El Paso, El Paso, TX, Mar 2018.
- Diploma of Preparing Future Faculty National Certificate Program at University of Kentucky, Jan 2010-June 2011: Five pedagogical graduate courses taken, teaching practicum finalized.
- Shape Memory Alloys for the Oil Industry Workshop, College Station, TX, Dec 2008.
- Edward Tufte’s Presentation Skills Workshop, Austin, TX, Oct 2007.
- “The seven habits of the highly effective people” workshop, Texas A&M University, Apr 2006.

SERVICE

- **UH Provost's Teaching Excellence Awards Committee:** Member, College of Technology representative, 2020-2023
- **UH College of Technology, Undergraduate Academic Committee:** Member, Dept. of Engr. Technology representative, 2017-ongoing
- **UH College of Technology, Bylaws Committee:** Member, Dept. of Engr. Technology NTT faculty representative, 2018-2021
- **UH College of Technology, Dean's Advisory Committee:** Member, Dept. of Engr. Technology NTT faculty representative, 2018-2020
- **UH College of Technology, Formula SAE Tech Student Organization:** Faculty Advisor, 2019-ongoing
- Regular Reviewer to professional peer reviewed journals
- Regular Reviewer to professional organization conference proceedings
- External reviewer for promotion
- Internal reviewer for promotion

HONORS AND AWARDS

- **Fulbright Scholarship for International Exchange Students Program:** M.S. studies at Texas A&M University, Mechanical Engineering Department, 2000-2003
- **Dean's award for Outstanding Graduation:** 3rd place among class of 1996, Mechanical Engineering, Osmangazi University, Eskisehir, Turkey
- **ASME Auxiliary scholarship for non-American students:** 2000-2001 academic year
- 1st place in Student Research Week Poster Competition, Texas A&M University, 2008
- **Best Technical Presentation & Paper Award in Materials Science,** 35th AIAA Dayton-Cincinnati Aerospace Science Symposium, March 9th, 2010
- Member of *Golden Key International Honor Society*, 2011
- Recipient of *NSF* all-inclusive travel grant to ASEE 2018 Conference at Salt Lake City, UT
- Nominated and inducted to *Marquis Who's Who*, 2019
- **UH College of Technology Teaching Excellence Award,** 2020

PROFESSIONAL AFFILIATIONS

- *American Society for Engineering Education (ASEE)*
- *Society of Automotive Engineers (SAE)*
- *American Society for Metals (ASM)*
- *The International Society for Optical Engineering (SPIE)*
- *American Society of Mechanical Engineers (ASME)*
- *Society of Engineering Science (SES)*
- *The Minerals, Metals & Materials Society (TMS)*

EXTRACURRICULAR ACTIVITIES

- 2003-present Member of TAMU Chapter of Fulbright Alumni
- 2000-2009 Member of Turkish Student Association at TAMU
- 2005-2007 Vice-coach of Shotokan Karate Club at TAMU (black belt holder)
- 2002-2005 Senior team member, Fighting Aggie Judo Club at TAMU (black belt holder)
- 2009-2011 Member of Turkish Student Association at University of Kentucky