DEVESH MISRA
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I. SUMMARY OF QUALIFICATIONS

Positions held:

- Chair of Metallurgical, Materials and Biomedical Engineering and Freeport McMoRan Distinguished Chair, University of Texas at El Paso (from September 1, 2014 to August 31, 2018)
- Graduate Program Coordinator of Chemical Engineering Dept., University of Louisiana, Lafayette.
- Founding Director, Institute for Materials Research and Innovation, University of Louisiana, Lafayette.
- Associate Director, Louisiana Accelerator Center, University of Louisiana, Lafayette.
- Distinguished Professor, University of Louisiana, Lafayette - *R1 Research University.*
- Stuller Endowed Chair in Metallurgy and Professor of Chemical Engineering, and Adjunct Professor of Mechanical Engineering, University of Louisiana, Lafayette.
- Deputy Director and Scientist, Defense Metallurgical Research Laboratory, Defense Research and Development Organization, Hyderabad, India.

Nationally and internationally acclaimed scholarly achievements and accomplishments:

- Recognized on Stanford University's list of world's top 2% scientist – 3 years in a row.
- Fellow of Alpha Sigma Mu, Fellow of American Society for Materials International, and Fellow of Institute for Materials, London, UK; Ontario Center for Materials Research Award, Canada.
- President, MRS - El Paso chapter; Editor-in-Chief of international journals Artificial Cells, Nanomedicine and Biotechnology and Materials Technology: Advanced Performance Materials)
- Jerry Silver Award; Charles Hatchett Award; Composite Award; Innovator Award; Lee Hsun Award; Binani Gold Medal; Pandya Silver Medal.
- Distinguished Professor, University of Louisiana, Lafayette.
- Distinguished Alumnus, Indian Institute of Technology (BHU), Varanasi, India.
- Young Scientist, Indian National Science Academy and Defense Scientist of the Year, India.

II. EDUCATION

1980-84 Ph.D., Materials Science and Metallurgy, University of Cambridge, UK.

1975-80 Bachelor of Technology, Metallurgical Engineering, Indian Institute of Technology, (BHU) Varanasi, India.

III. PROFESSIONAL EXPERIENCE

UNIVERSITY OF TEXAS AT EL PASO, 2014-present

2018-present Professor, Department of Metallurgical, Materials and Biomedical Engineering.

2014-18 Professor and Chair, Department of Metallurgical, Materials and Biomedical Engineering and Freeport McMoRan Distinguished Chair (until August 31, 2018)
Graduate Program Director of interdisciplinary program in Materials Science and Engineering, University of Texas at El Paso (from Sept. 1, 2014 to August 31, 2018)

UNIVERSITY OF LOUISIANA, LAFAYETTE, 2001-2014

2013-14 Director, Institute for Materials Research and Innovation, University of Louisiana at Lafayette

2013-14 Associate Director, Louisiana Accelerator Center, University of Louisiana at Lafayette.

2009-14 Distinguished Professor, University of Louisiana, Lafayette.

2012-14 Adjunct Professor of Mechanical Engineering, University of Louisiana, Lafayette.

2004-14 Founding Director, Center for Structural and Functional Materials, (Founding Director - conceived 2001, approved in 2004 by the Board of Regents of Louisiana).

2002-13 Graduate Program Coordinator of the Chemical Engineering Department, University of Louisiana, Lafayette.

2001-14 Stuller Endowed Chair in Metallurgy and Professor of Chemical Engineering, Department of Chemical Engineering, University of Louisiana, Lafayette.

TECHNOLOGY CENTER, LTV CORPORATION, USA (1997-2000)

1997-00 Product Development R&D Engineer, Technology Center, LTV Corporation, USA.

McMASTER UNIVERSITY, HAMILTON, CANADA (1996-1997)

1996-97 Visiting Faculty (auspices of Ontario Center for Materials Research Award program)

NATIONAL INSTITUTE FOR STANDARDS AND TECHNOLOGY, Maryland (1994-1995)

1994-95 Guest Faculty (while on sabbatical leave).

UNIVERSITY OF PENNSYLVANIA, PHILADELPHIA (1993-1994)

1993-94 Visiting Faculty (under the United States Agency for International Development program: Indo-US cooperative program).

DEFENSE METALLURGICAL RESEARCH LABORATORY, DEFENSE RESEARCH AND DEVELOPMENT ORGANIZATION (DRDO), HYDERABAD, INDIA (1984-1996)

1992-96 Deputy Director and Scientist 'E', Defense Metallurgical Research Laboratory, Defense Research and Development Organization (DRDO), Hyderabad, India.

1988-92 Assistant Director and Scientist 'D', Defense Metallurgical Research Laboratory, Defense Research and Development Organization (DRDO), Hyderabad, India.

1984-88 Division Leader and Scientist 'C', Defense Metallurgical Research Laboratory (DMRL), Defense Research and Development Organization (DRDO), Hyderabad, India.

IV. TEACHING EXPERIENCE

2001-14 University of Louisiana, Lafayette – courses developed and taught the following courses: Materials in Engineering, Advanced Materials, and Nanostructures and Nanomaterials

2014-present The University of Texas at El Paso - courses developed are the following:

MME 4303: METALS PROCESING

This course is an introduction to methods used for processing metals and alloys in relation to mechanical properties. The course aims to integrate processing fundamentals required to obtain desired properties, for instance, nucleation and growth of crystals, diffusion, application of phase diagrams and transformation diagrams, superplasticity, and superelasticity with the traditional and upcoming processing methods. Another important objective is to illustrate the developments that are currently taking place in the field of metals processing (strip casting, thin slab casting, thermo-mechanical controlled processing, ring rolling, quenching and partitioning, to list a few). This is demonstrated with the help of case studies.

MME 4404: MATERIALS PROCESSING AND MANUFACTURING

This course is an introduction to different manufacturing processes. The properties, design and processing of metals, ceramics, polymers, and composite products are covered. Specialized manufacturing concepts that are being developed are also covered and compared with the conventional methods of processing.

MASE 6390/MME 5304: PHASE TRANSFORMATION AND MICROSTRUCTURES

The topics covered include solidification and crystalline imperfections, thermally activated processes and diffusion in solids as it relates to phase transformation, phase diagrams – non-ferrous alloys, iron-carbon systems, diffusion-controlled transformation, stress-induced transformation, and strain-induced transformation.

MASE 6400: CONCEPTS IN MATERIALS SCIENCE AND ENGINEERING

The course on concepts in materials science and engineering provides fundamental understanding of the four classes of engineering materials, metals, polymers, ceramics, and composite materials including with particular focus on process-structure-property relationship embracing nanotechnology and nanostructured materials. The emphasis is on concepts that enable us to obtain superior mechanical properties. Some of the concepts include low lattice misfit, ordered hardening, coherency hardening, high entropy alloys, severe plastic deformation, reverse micelle, and phase reversion etc.

MASE 6305: ADVANCED MATERIALS PROCESSING

The objective is to introduce methods of synthesis and applications of nanostructured materials and how the structural and functional properties are different from that of the conventional bulk materials. Strong emphasis is on nanotechnology as it relates to advanced materials processing.

MASE 6195/6196: GRADUATE SEMINAR

Guiding and training graduate students in making an effective presentation.

V. AWARDS, HONORS and PATENTS

2021 *Outstanding Sponsored Research Award* - University of Texas at El Paso.

2018 Fellow of Alpha Sigma Mu Society.

2018 Best Mentor and Advisor, University of Texas at El Paso.

2017 Lee Hsun Award of Institute for Metal Research for pioneering research in Materials Science.

2016-present President, Materials Research Society (MRS) – El Paso chapter.

2015 *AIST 2015 Jerry Silver Award* for the research study entitled, “The Effect of Coiling Temperature on the Mechanical Properties of Ultrahigh-Strength 700 MPa Grade Steel Processed via Thin-Slab Casting.”

2014,15,19 *Outstanding Sponsored Research Award* - University of Texas at El Paso.

2014 *Hind Ratan Award* (translated "Jewel of India") from the Government of India - The award recognizes exceptional services to the society, achievements, and contributions to the field and for the significant efforts made in building relations between India and North America, and more importantly for keeping the “Flag of India High”. The award was given in New Delhi, India at a gala ceremony on January 26, 2014, the Republic Day of India.

2013 *Distinguished Alumnus Award* of the Indian Institute of Technology (BHU), Varanasi, India

2013 *Innovator Award*, University of Louisiana at Lafayette.

2013 Certificate of Appreciation in Research and Sponsored Activities, University of Louisiana at Lafayette.

2013 *College of Engineering Researcher Award*, University of Louisiana at Lafayette.

2012 US Patent (8197890 B2), “Method of making magnetic nanorods.”

2011 US Patent 7964013 B2, “FeRh-FePt core-shell nanostructure for ultra-high density storage media.”

2009 *University of Louisiana at Lafayette - Distinguished Professor* of Chemical Engineering.

2009 *College of Engineering Researcher Award*, University of Louisiana at Lafayette.

2009 US Patent (7504130 B1), “Process for the synthesis of antimicrobial nanoparticles with magnetic core and photocatalytic shell: TiO_2-$NiFe_2O_4$ system.”

2009 US Patent (7635518), “Dendritic magnetic nanostructures and method for making the same.”

2007 *Charles Hatchett Award 2007* for published work on the science and technology of niobium and it alloys, conferred by the Institute of Materials, UK for the paper *“*High strength microalloyed CMn(V-Nb-Ti) and CMn(V-Nb) pipeline steels processed through CSP thin-slab technology: Microstructure, precipitation and mechanical properties, Materials Science and Engineering A 424 307-317 (2006). The award is sponsored by Companhia Berasileria de Metallurgia E Mineracao (CBMM) and selected by the Charles Hatchett Award International panel.

2007 *Composite Award 2007* for published work of particular merit in the field of composites, conferred by the Institute of Materials, UK.

2005 *Elected Fellow* of the American Society for Materials (ASM) International in recognition of distinguished contributions to the field of materials science and engineering.

2003 *Selected 2003 ASM/IIM Distinguished Lecturer* (American Society for Materials/Indian Institute of Materials) by the American Society for Materials International.

2002 *Elected Fellow* of the Institute of Materials, London in recognition of notable and widely acknowledged personal contributions to the advancement of science and technology of materials.

2002 Registered as Chartered Professional Engineer.

2003 US Patent (6488790) for the development of a new high strength low alloy steel.

1996 *Ontario Center for Materials Research (OCMR) Visiting Scientist Award* in Advanced Materials, implemented at McMaster University, Canada.

1993 *Indo-US Science and Technology Fellowship in Advanced Materials.*

1992 *Defense Scientist of the Year Award in Materials Science*, awarded by the Defense Research and Development Organization, India for significant contributions in Materials Science.

1991 *Steel Eighties Award*, awarded by The Indian Institute of Metals, for contributions in engineering steels.

1987 *Binani Gold Medal*, awarded by The Indian Institute of Metals, for a non-ferrous paper, adjudged to be of the highest merit among those published in the Transactions of the Indian Institute of Metals.

1987 *Young Scientist Medal*, awarded by The Indian National Science Academy, for contributing to the understanding of interfaces in materials.

1985 *Pandya Silver Medal*, awarded by The Indian Institute of Metals, for a paper adjudged to be of the highest merit among those published in the Transactions of the Indian Institute of Metals.

1980 *Oppenheimer Fellowship*, awarded by the University of Cambridge, UK.

VI. Professional and Synergistic Activities

- **Editor-in-Chief/Associate Editor, On the Editorial Board of peer-reviewed international journals:**

(i) *Editor-in-Chief,* Artificial Cells, Nanomedicine and Biotechnology (2020 – present), published by Taylor and Francis, London (2020-present)
(ii) *Editor-in-Chief,* Materials Technology – Advanced Performance Materials, published by Taylor and Francis, London (2012-present)
(iii) *Editorial Board* of Materials Science and Engineering A (2004-present); (iv) On the *Board of Review* of Materials and Metallurgical Transactions (2001-present)
(iv) *Associate Editor,* Materials Science and Technology journal of the Institute of Materials, Minerals, and Mining, London (2005-2014)
(v) *Editorial Panel Member* and *North American Editor* for Materials Science and Technology journal of The Institute of Materials, UK (2001-05)
(vi) On the *Editorial Advisory Board* of Surface and Interfaces Analysis, Guest Editor of the Special Issue on Surfaces and Interfaces in Materials (2001-10)
(vii) On the *Editorial Board* of Zeitschrift fur Metallkunde (1998-04)
(viii) *Editor*, Transactions of the Indian Institute of Metals (1994-99)
(ix) *Assistant Editor,* Transactions of Indian Institute of Metals (1986-94)
(x) Reviewer for more than 50 journals – some of them are: Acta Biomaterialia, Advanced Biomaterials, Advanced Drug Delivery Reviews, Advanced Healthcare Materials, Applied Ceramic Technology, Applied Clay Science, Applied Materials and Interfaces, Applied Surface Science, Biomacromolecules, Biomaterials, Ceramics International, Chemistry and Sustainability Energy Materials, Chemistry of Materials, European Journal of Inorganic Chemistry, Industrial and Engineering Chemistry Research, International Journal of Materials Product and Technology, International Journal of Materials Research, International Journal of Molecular Sciences, International Journal of Nanomedicine, International Journal of Pharmaceutics, Iron and Steel Making: Processes, Products and Applications, Journal of Agriculture and Food Chemistry, Journal of Alloys and Compounds, Journal of Alloys and Compounds, Journal of American Chemical Society (JACS), Journal of Applied Physics, Journal of Applied Polymer Science, Journal of Biomaterials Applications, Journal of Biomaterials Science: Polymer Edition, Journal of Biomedical Materials Research: Part B, Journal of Biomedical Nanotechnology, Journal of Biomedical Nanotechnology, Journal of Biomedical Photonics, Journal of Biomedical Research A, Journal of Chemistry and Physics of Solids, Colloids and Surfaces: Biomaterials, Journal of Crystal Growth, Journal of Materials Processing Technology, Journal of Materials Science, Journal of Molecular Liquids, Journal of Nanoparticle Research, Journal of Nanoscience and Technology, Journal of Pharmacy and

Pharmacology, Journal of Physical Chemistry and Chemical Physics, Journal of Physics and Chemistry of Solids, Journal of Polymer Science Part B: Polymer Physics, Journals of Biomaterials Applications, Langmuir, Macromolecular Bio Science, Macromolecular Rapid Communications, Materials and Design, Materials Chemistry and Physics, Materials Letters, Materials Science and Engineering A, B and C, Monatshefte fur Chemie, MRS Bulletin, Physica B, Physica Status Solidi, Physics Review Biomacromolecules, Research on Chemical Intermediates, Royal Society of Chemistry – Advances, Science of Advanced Materials, Scripta Materialia, Small, Sol-Gel, Tribology International, Tribology Letters.

- **Engagement with Professional Societies - President and Membership of Professional Societies (local chapter/national/international) and Member of National and International Review Panels:** President of MRS-El Paso chapter (current); Member of Institute of Materials, London; Member of ASM International; Member of TMS, *Executive Member* of American Society for Materials – Cleveland chapter; *Member of Educational and Student Affairs Committee Cleveland Chapter) of* American Society for Materials (ASM) International.

Academic Advisor to the Manufacturing Partnership of Louisiana, located at the University of Louisiana at Lafayette campus (a federal institution supported by NIST, Gaithersburg, MD)

Primary Activities: As a member of MRS, TMS, ASM International, and Institute of Materials (London), participated and organized events involving students to inspire and educate them how materials profoundly influence the quality of our lives and the planet. Interactive exhibits and community programs emphasized materials, from the mundane to the mysterious, and highlighted ways in which materials scientists worldwide are playing a major role in a sustainable world.

- **Served on State, National and International Research Proposal Review Panel Teams:** State (Board of Regents of Louisiana; University of Texas System-Mexico Collaborative Research program); National (NSF, DOE, NIH, ONR, DOD, ACS, US Department of State – US Civil Research and Development Foundation, American Association for Advancement of Science); NIST and the US-Israel Binational Industrial Research & Development (BIRD) Foundation); International Science Foundation (National Science and Engineering Research Council, Canada (NSERC); Georgia National Science Foundation; Swiss National Science Foundation; Austrian National Foundation; Israel-Italy Collaborative Science program; Czech Science Foundation; Netherlands Science Foundation).
- Program reviewer for University of Texas System-Mexico Collaborative Research program, Georgia National Science Foundation, Swiss National Science Foundation, and Israel-Italy Collaborative Science program, Czech Science Foundation, National Institute of Standards and Technology (NIST) and the U.S.-Israel Binational Industrial Research and Development (BIRD) Foundation (2020)
- Program reviewer for Georgia National Science Foundation (2019)
- Program reviewer for Netherlands National Science Foundation (2018)
- Session Chair at the European Materials Congress, Seville, Spain (2013)
- Member of the Scientific Committee of 7Th International Conference on Physical and Numerical Simulations, Finland (2013)
- On the Editorial Committee of Value Added Microalloyed Steels Symposium, Singapore (2012)
- Member of Tulane University Cancer Research (2011-14)
- Co-organizer of Next Generation of Biomaterials Symposium, Materials Science and Technology (MST), Houston (2010)
- Session chair for Biomaterials Symposium of TMS 2010, Seattle.
- Session chair for Biomaterials Symposium of TMS 2009, San Francisco
- Session chair for Asia Pacific Polymer Congress: Science and Technology, New Delhi
- Session chair for symposium titled, 'Advances in Biomedical and Biomimetic Materials: Advanced Materials,' organized by Materials Science and Technology; Session Chair for Second International Conference on Thermo-mechanical Simulation and Processing

- Member of Biomaterials committee of The Minerals, Metals and Materials Society, USA (2008-16)
- Member of the Aluminum Advisory Group of ASM International
- Primary organizer of Nanocomposites session at TMS 2006 and edited the proceedings of the Nanocomposites symposium
- Organized and edited Special Issue on Nanocomposites for Materials Science and Technology journal of the Institute of Materials, UK
- **Engagement with the Local Community and Outreach:** Participated as judge in Science Fair and attended fundraising events such as Doctors without Borders in Louisiana. Science Fair judge for Horizon Schools, El Paso.

Outreach activity organized as UTEP faculty and President of MRS El Paso chapter – In 2021 organized a campus wide event titled, "Science, Society, and Sustainability," with Dr. Knicole Colon and Dr. Ellen Ochoa. Dr. Colon was a research astrophysicist at NASA Goddard Space Flight Center. Dr. Ochoa is a former astronaut and Director of NASA Johnson Space Center and member of the National Science Foundation's National Science Board. There was a two-part event for a chat on the scientific careers of Dr. Ochoa and Dr. Colon and a discussion on women and minorities in STEM and leadership positions.

- Invited students and teachers from El Paso high schools in 2022 and 2023 to visit UTEP as part of the MRS – El Paso chapter activity (President of MRS El Paso Chapter) with the objective to encourage them to consider STEM disciplines for higher education.

VII. MENTORING/ADVISING OF GRADUATE STUDENTS

Graduate Student Advisees MS and Ph.D. – UNIVERSITY OF LOUISIANA and UTEP

Past: M. Dasari (2002), S. Vaddiraju (2002), K.K. Tenneti (2003), A. Kale (2003), V. Maheswari (2003), A. Dasari (2003), S.Kolluru (2003), S. Sarang (2004), S. Gubbala (2004), S. Nair (2004), T. Mossa (2005), R. Hadal (2005), H. Nathani (2005), M. Tanniru (2005), A. Mudaliar (2006), S. Awate (2006), J. Rawat (2006), R. Thridandapani (2006), C. Deshmane (2007), A. Nag (2007), B. Sunkara (2007), N. Ramisetti (2007), N. Surampadi (2007), Rajasekhar Anumolu (2008), Vishal Gaurav Rajan (2007-08), Rajesh Venkatasubramanian (2008), Rohan Gudavalli (2008), V. Ramuni (2009), Sachin Mali (2009), Jinesh Shah (2009), N. Maganti (2010), Y. Yang (2010), Y. Chen (2010), C. Nune (2011), Q. Bao (2011), F. Zeng (2011), B. Girase (2011), P. Venkatsurya (2011), H. Narsale (2012), P. Chaudhari (2012), V. Challa (2012), G. Nakka (2014), P. Venkatsurya (2014), K.C. Nune (2014), E. Eduardo (2015), P. Trivedi (2017), S. Challa (2017), E. Reyes (2018), K.T. Natarajan (2018), Christian I. Rodarte (2018), Y. Injeti (2019), Jesus Garcia (2019, B. Yu (2019), N. Gong (2020), C. Hu (2021), H. Dong (2021), J. Kim (2022).

Current 4: M.R. Weaver, A.J. Maldonado, C. Guerrrero, A. Banerjee.

UTEP: MS (5) and PhD Students (8) Mentored/Advised, and Current 4 PhD students

1. Eduardo Andrade
   MS (2015)
   Acoustic emission characteristics of damage accumulation in Kevlar® 49 composites

2. Victor Manuel, Ornelas
   MS (2016)
   Wettability of magnesium based alloys

3. Venkata Sai Ananth, Challa
   PhD (2017)
   The Interplay between Grain Size and Austenite Stability on Deformation Behavior of High Strength-High Ductility Combination Nanostructured Stainless Steel

4. Pramanshu Trivedi
   PhD (2017)
   Process-Structure-Property Relationship in Magnesium-Based Biodegradable Alloy for Biomedical Applications

5. Edgar Ivan Reyes
   MS (2018)
   Tribological Characterization of Ti-Based Alloys for Biomedical Applications in Simulated Body Fluid

6. Venkata Vignesh Nataranjan
   PhD (2018)
   Streamlining Alloy Design and Thermo-mechanical Processing Parameters for High Strength Line Pipe Steels and Hot Rolled Microalloyed Steels: Process - Structure - Property Paradigm

7. Venkata Sai Yashwanth Injeti
   PhD (2019)
   Understanding of Deformation and Fracture Behavior in Next Generation High Strength-High Ductility Steels

8. Jesus Gabriel Garcia
   MS (2019)
   Energy Efficiency and Fatigue Failure on Gears and Bearings for Processing Rebar Steel

9. Bing Yu
   PhD (2019)
   Processing, Structure and Mechanical Behavior of Advanced Engineering Steels

10. Na Gong
    PhD (2020)
    Cellular Response of Metallic Materials and Microstructure Entropy Guided Understanding of Strength in Biomedical Austenitic Stainless Steels

11. Chengyang HU
    PhD (2021)
    Structure-Property Relationship in High Strength- High Ductility Combination Austenitic Stainless Steels

12. Hangyu Dong
    PhD (2021)
    Phase Transformation and Strain Hardening Mechanisms in Advanced Engineering Steels

13. Jaehyun Kim
    MS (2022)
    Ultrahigh Strength-High Ductility Combination Low Density Austenitic Steel: Effect of Aging Temperature and Strain Rate

14. Mathew Weaver (PhD - current)

15. Andres Maldonado (PhD - current)

16. Agniprava Banerjee (PhD – current)

17. Craig Guerrero (PhD – current)

VIII. MENTORING OF POST-DOCTORAL SCHOLARS

UNIVERSITY OF LOUISIANA

1. Dr. S. Rana (October 2003- July 2006)
2. Dr. S. Shanmugam (May 2004-April 2007)
3. Dr. Q. Yuan (May 2005-present)
4. Dr. J. Zhang (May 2006-May 2007)
5. Dr. S. Nayak (February 2007-June 2009)
6. Dr. W.W. Thein-Han (September 2007-November 2009)
7. Dr. J. Zhiyong (September 2007-April 2013)
8. Dr. H. Huang (October 2009-present)
9. Dr. P. Mahanandia (January 2010-May 2010)
10. Dr. Z. Zhang (July 2009-present)
11. Dr. D. Depan (May 2010-present)
12. Dr. J. Xu (August 2012-February 2012)
13. Dr. Wenhao Zhou (September 2013-September 2014)
14. Dr. Guizhi Xiao (September 2013-September 2014)
15. Dr. M. Tong (November 2013- April 2014)

UTEP

1. Dr. S. Kiranair (January 2014-December 2014; partly at the University of Louisiana, Lafayette)
2. Dr. X. Wan (January 2014-December 2014; partly at the University of Louisiana, Lafayette)
3. Dr. K.C. Nune (January 2015-May 2028)
4. Dr. A. Kumar (January 2015-January 2017)
5. Dr. K. Wang (April 2015-2016)
6. Dr. S. Patil (January 2017-January 2019)
7. Dr. K. Li (January 2017-January 2019)
8. Dr. J. Zhang (June 2018-September 2018)

IX. GRANTS

(Nationally Competitive Grants)

Project Title: Ultrafine-grained Magnesium Alloys Manufactured by Multi-axial Forging: Elucidating Mechanisms of Achieving Both High Strength and High Ductility
Period: 2022-25 (current)
Source and Amount of Funding: **National Science Foundation** – Advanced Manufacturing; $442,403
Role in Project: Principal Investigator (no co-PI)

Project Title: Collaborative Research: The Interaction of Surfaces Structured at the Nanometer Scale with the Cells in the Physiological Environment
Period: 2023-26 (current)
Source and Amount of Funding: **National Science Foundation** – Chemical and Biomedical Engineering program: $438,509.
Role in Project: Principal Investigator (in collaboration with Baylor College of Medicine)

Project Title: The Relationship between Grain Structure and Deformation Behavior to the Fracture Mechanism in High Strength-High Ductility Combination Nanostructured Materials
Period: 2016-21
Source and Amount of Funding: **National Science Foundation**; $430,084.
Role in Project: Principal Investigator (no co-PI)

Project Title: Characterization of Samples and Support for Rebars, Beams, and Sections Produced with Niobium
Period: 2019-22
Source and Amount of Funding: **CBMM North America**; $293,997.
Role in Project: Principal Investigator (no co-PI)

Project Title: Understanding Structure-Property-Process Paradigm in Thin Slab Casting of High Strength Niobium Microalloyed Steels
Period: 2017-19
Source and Amount of Funding: **CBMM North America**; $224,998.
Role in Project: Principal Investigator (no co-PI)

Project Title: Streamlining Alloy Design and Thermo-mechanical Processing Parameters in Welded Linepipe Steels and 770 MPa (100XF) Hot Rolled Microalloyed Steels
Period: 2015-19
Source and Amount of Funding: **ArcelorMittal, Global R&D Center, Chicago**; $221,112.
Role in Project: Principal Investigator (no co-PI)

Project Title: Advanced Nanoscale Deformation with Imaging System for Multiscale Study of the Mechanical Behavior of Advanced Materials and Biomolecules
Period: 2015-16
Source and Amount of Funding: **National Science Foundation**; $257,958.
Role in Project: Principal Investigator (with collaborators from UTEP)

Project Title: Acquisition of an Advanced Thermal Analysis and Imaging System for Integration with Interdisciplinary Research and Education in Low-density Organic and Inorganic Materials
Period: 2016-17
Source and Amount of Funding: **Army Research Office, Department of Defense**; $494,532.
Role in Project: Principal Investigator (with collaborators from UTEP)

Project Title: Processing-Structure-Property Relationship in the Fabrication of Hybrid Nanostructured Materials with Tunable Architecture
Period: 2013-18
Source and Amount of Funding: **National Science Foundation** - Nanomanufacturing: $362,183.
Role in Project: Principal Investigator (no co-PI) (transferred from the University of Louisiana, Lafayette)

Project Title: The Interplay between Grain Size and Austenite Stability on Constitutive Deformation Behavior of High Strength – High Ductility Combination Nanostructured alloys
Period: 2013-16
Source and Amount of Funding: **National Science Foundation**; $338,264.
Role in Project: Principal Investigator (no co-PI) (transferred from the University of Louisiana, Lafayette)

Project Title: Nanoscale Near-surface Deformation Response in Nanostructured Materials
Period: 2009-12
Source and Amount of Funding: **National Science Foundation**; $319,156
Role in Project: Principal Investigator

Project Title: Interfacial Nucleation and Growth of Hierarchical Structures and Phases in Nanocomposites
Period: 2009-10
Source and Amount of Funding: **National Science Foundation**; $188,445
Role in Project: Principal Investigator (no co-PI)

Project Title: Research Experience for Undergraduates
Period: 2009-10
Source and Amount of Funding: **National Science Foundation**; $8,000
Role in Project: Principal Investigator (no co-PI)

Project Title: Phase reversion-induced nanometer-sized grains in materials
Period: 2008-11
Source and Amount of Funding: **National Science Foundation**; $301,325
Role in Project: Principal Investigator (no co-PI)

Project Title: Research experience for undergraduates
Period: 2008-11
Source and Amount of Funding: **National Science Foundation**; $24,000
Role in Project: Principal Investigator (no co-PI)

X. Regular peer-reviewed journal publications with undergraduate and graduate students, post-doctoral scholars and research scholars: UTEP

PUBLICATIONS: 2018-2024

1. A Comparative Study on the Tribological Behavior of Ti-6Al-4V and Ti-24Nb-4Zr-8Sn Alloys in Simulated Body Fluid Materials Technology
   V.S.Y. INJETI, K.C. NUNE, E. REYES, S. LI and R.D.K. MISRA
   MATERIALS TECHNOLOGY: ADVANCED PERFORMANCE MATERIALS, DOI: 10.1080/10667857.2018.1550138 (2018).

2. Aging Phenomenon in Low Lattice Misfit Cobalt-free Maraging Steel: Microstructural Evolution and Strengthening Mechanism
   K. LI, L. WEI, B. AN, B. YU and R.D.K. MISRA
   MATERIALS SCIENCE AND ENGINEERING A, 739 (2018) pp. 445-454

3. The Determining Role of Nanoscale Mechanical Twinning on Cellular Functions of Nanostructured Materials
   K.C. NUNE, I. MONTES, V.S.Y. INJETI, M.C. SOMANI and R.D.K MISRA
   JOURNAL OF THE MECHANICAL BEHAVIOR OF BIOMEDICAL MATERIALS, 88 (2018) pp. 185-195.

4. Alginate/poly(amidoamine) injectable hybrid hydrogel for cell delivery
   S.S. PATIL, K.C. NUNE, and R.D.K. MISRA
   JOURNAL OF BIOMATERIAL APPLICATIONS, 33 (2018) pp. 295-314.

5. The Significance of Deformation Mechanisms on the Fracture Behavior of Phase Reversion-induced Nanostructured Austenitic Stainless Steel
   R.D.K. MISRA, V.S.Y. INJETI, and M.C. SOMANI
   SCIENTIFIC REPORTS-NATURE, 8:7908 (2018) pp 1-13.

6. On the Origin and Contribution of Extended Kinks and Jogs and Stacking Fault Ribbons to Deformation Behavior in an Ultrahigh Strength Cobalt-free Maraging Steel with High Density of Low Lattice Misfit Precipitates
   K. LI, B. YU, R.D.K. MISRA, G. HAN, S. LIU, Y.F. SHEN, and C.J. SHANG
   MATERIALS SCIENCE AND ENGINEERING A, 728 (2018) pp. 208-217.

7. Characterization and Mechanical Properties of Cladded Stainless Steel 316L with Nuclear Applications Fabricated using Electron Beam Melting
   I.A. SEGURA, J. MIRELES, D. MERMUDEZ, L.E. MURR, K. LI, V.S.Y. INJETTI, R.D.K. MISRA
   JOURNAL OF NUCLEAR MATERIALS, 507 (2018) pp. 164-176.

8. The Significance of Macromolecular Architecture in Governing Structure-Property Relationship for Biomaterial Applications: AN Overview
   S.S. PATIL and R.D.K. MISRA

MATERIALS TECHNOLOGY: ADVANCED PERFORMANCE MATERIALS, 33 (2018) pp. 364-386.

9. Strengthening of cobalt-free 19Ni3Mo1.5Ti maraging steel through high-density and low lattice misfit nanoscale precipitates
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V.S.A. CHALLA, X.L. WAN, M.C. SOMANI, L.P. KARJALAINEN, R.D.K. MISRA
MATERIALS SCIENCE AND ENGINEERING A, 613 (2014) pp. 60-70.

61. Interplay between Cellular Activity and Three-dimensional Scaffold-cell Constructs with Different Foam Structure Processed by Electron Beam Melting
K.C. NUNE, R.D.K. MISRA, S.M. GAYTAN, L.E. MURR
JOURNAL OF BIOMEDICAL MATERIALS RESEARCH: PART A, 103 (2015) pp. 1677-1692.

62. Biological Response of Next-generation of 3D Ti-6Al-4V Biomedical Devices Using Additive Manufacturing of Cellular and Functional Mesh Structures
K.C. NUNE, R.D.K. MISRA, S.M. GAYTAN, L.E. MURR
JOURNAL OF BIOMATERIALS AND TISSUE ENGINEERING, 4 (2014) pp 755-771.

XI. Invited/review articles - peer-reviewed

1. Process-structure-biofunctional paradigm in cellular structured implants: an overview and perspective on the synergy between additive manufacturing, biomechanical behavior and biological functions – Invited
R.D.K. Misra and K.P. Misra
Artificial Cells, Nanomedicine and Biotechnology, 51 (2023) 2278156.

2. A perspective in the understanding of strength-toughness combination during processing of engineering alloys
R.D.K. Misra
Materials Technology, 38 (2023) 2278000.

3. ZnO-based quantum dots for biosensing,
R.D.K. Misra and K.P. Misra
Biomedical Materials and Devices (2023) 99-107.

4. Nanostructuring of biomaterials and reducing implant related infections via incorporation of silver and copper as antimicrobial elements – An Overview
   J. Feng, S.Y. Tong, E.S. Thian, et al, N. Gong, K.P. Misra, R.D.K. Misra
   Mats Tech., 37 (2022) 867-879.

5. Laser-cladding of high entropy alloy coatings: an overview
   N. Gong, K.P. Misra, R.D.K. Misra, H. Liu
   Materials Technology: Advanced Performance Materials (2023).

6. Developments and perspectives on robust nano- and micro-structured binder-free electrodes for bi-functional water electrolysis and beyond,
   S. Chandrasekharan et al. R.D.K. Misra
   Advanced Energy Materials,12 (2022) 2200409.

XII. Book

Ceramic Science and Engineering – Basics to Recent Advancements, edited book by K.P. Misra and R.D.K. Misra, Elsevier (2022).

XIII. Book Chapters

1. 3D Printed Titanium Alloys for Orthopedic Applications, Book Chapter 3 in Titanium in Medical and Dental Applications
   A. Kumar and R.D.K. Misra.
   Titanium in Medical and Dental Applications, Eds. F.H. Froes and M. Qian, Woodhead Publishing, Elsevier, Chapter 3.4, p. 251.

2. Fundamentals of Ceramics: Introduction, Classification and Applications – R.D.K. Misra and K.P. Misra, Ceramic Science and Engineering – Basics to Recent Advancements, Eds. K.P. Misra and R.D.K. Misra, Elsevier, 2022, p. 5-19.

3. Advanced Ceramics, K.P. Misra and R.D.K. Misra, Ceramic Science and Engineering – Basics to Recent Advancements, Eds. K.P. Misra and R.D.K. Misra, Elsevier, 2022, p. 21-43.

4. Ultrafine-Grained Magnesium Alloys Manufactured by Multi-axial Forging: Elucidating Mechanisms of Achieving Both High Strength and High Ductility, Magnesium Technology 2024, Chapter 23, TMS; ISBN: 978-3-031-50239-2, ©The Minerals, Metals & Materials Society 2024, A. Leonard et al. (eds.), Magnesium Technology 2024, The Minerals, Metals & Materials Series (with graduate students A.J. Maldonado and Mathew Weaver).

XIV. Conference Presentations 2015-2024

1. Multiaxial forging of magnesium alloys: elucidating mechanism of high strength-high ductility combination
   A.J. MALDONADO, M.R. WEAVER, R.D.K. MISRA
   TMS, Orlando, 2024.

2. Ultrahigh strength high ductility 1 GPa low density austenitic steel with ordered precipitates
   J. KIM, R.D.K. MISRA
   TMS 2022.

3. Multifunctional Nanostructured Materials at the International Conference on Materials Science and Spectroscopy, September 22-24, 2021. Plenary invited lecturer.

4. Damage-resistant steel design: Exploring the limits of metastability-engineering, December 4, 2020, Organized MIT, Boston – INVITED.

5. Multifunctional Magnetic Nanocarrier for Targeted Drug Delivery, International Conference on Multifunctional Materials, December 28-30, 2020 – INVITED.

6. High strength-toughness combination in engineering steels: A perspective on the development of concepts – Invited
   R.D.K. MISRA, Damage-resistant steel design: Exploring the limits of metastability-engineering, December 4, 2020, Organized MIT, Boston.

7. Multifunctional Magnetic Nanocarrier for Targeted Drug Delivery – Plenary Lecture
   R.D.K. MISRA, International Conference on Multifunctional Materials, December 28-30, 2020.

8. Novel Concepts for Tough Ductile Ultra-High Strength Martensitic / Bainitic Steels Containing Finely Divided Retained Austenite
   MS&T, Portland, 2019.

9. Interplay of Microstructure and Deformation Behavior in Low Lattice Misfit Precipitates-Containing 19Ni3Mo1.5Ti Maraging Steel
   K. LI, B. YU and R.D.K. MISRA, TMS Conference (2019).

10. The Infuence of Multi-step Partitioning on the Microstructure and Mechanical Properties of High Strength-high Ductility Medium-manganese Steels
    K. LI, B. YU and R.D.K. MISRA, TMS Conference (2019).

11. Harnessing the Science of Nanostructured Materials for Structural and Functional Applications, Materials Science and Engineering Department, Texas A&M, November 19, 2018 (Invited).

12. The Effect of Long-period Stacking Ordered (LPSO) Structure and Deformation Behavior of Rare Earth Alloys
    K. LI and R.D.K. MISRA
    MS&T Conference, Columbus, Ohio (2018).

13. Deformation Behavior and Mechanism of Ultrahigh Strength Cobalt-free 19Ni3Mo1.5Ti Maraging Steel during Tensile Deformation
    K. LI, B. YU and R.D.K. MISRA
    MS&T Conference, Columbus, Ohio (2018).

14. Osteoblast Response to Magnesium-Strontium Alloy: Effect of Surface Coatings
    K.C. NUNE, R.D.K. MISRA, W. WANG
    TMS Conference, Phoenix, 2018.

15. Strengthening in cobalt-free maraging steel through high density and low lattice misfit nanoscale precipitates
    K. LI and R.D.K. MISRA
    TMS Conference, Phoenix, 2018.

16. Microstructure, mechanical properties and deformation of multiaxially forged ultrafine-grained Mg-2Zn-2Gd alloy
    K. LI and R.D.K. MISRA
    TMS Conference, Phoenix, 2018.
17. Impact of Aluminum on the Microstructure and Deformation Behavior in Medium-Mn TRIP Steels
    B. YU and R.D.K. MISRA
    TMS Conference, Phoenix, 2018.

18. Processing-Structure-Mechanical Property Relationship in Nb-Ti Microalloyed Steel: Continuous Cooling versus Interrupted Cooling
    V.V. NATARAJAN, R.D.K. MISRA, D.M. SIDORENKO, M.D. MULHOLLAND, M. MANOHAR and J.E. HARTMANN
    TMS Conference, Phoenix, 2018.

19. Relationship of Grain Size and Deformation Mechanism to the Fracture behavior in High Strength–High Ductility Nanostructured Austenitic Stainless Steel
    Y. INJETI and R.D.K. MISRA
    TMS Conference, Phoenix, 2018.

20. Microstructure, Mechanical Properties and Deformation Behavior of Mg-Gd-Y-Zn-Zr Alloy
    K. LI and R.D.K. MISRA
    Magnesium Technology 2018, TMS, 2018.

21. The Impact of Aluminum on the Microstructure and Deformation Behavior in Medium-Mn TRIP Steels
    B. YU and R.D.K. MISRA
    MS&T Conference, Pittsburgh, 2017

22. Significant Influence of Carbon and Niobium on the Precipitation behavior and Microstructural Evolution and their Consequent Impact on Mechanical Properties in Microalloyed Steels
    V.V. NATARAJAN, R.D.K. MISRA, D.M. SIDORENKO, M.D. MULHOLLAND, M. MANOHAR and J.E. HARTMANN
    MS&T Conference, Pittsburgh, 2017.

23. Biodegradation and Biological Response of Magnesium-based Alloys for Orthopedic Applications: Process-Structure-Functional Property Relationship

S. PATIL, P. TRIVEDI, K.C. NUNE and R.D.K. MISRA
MS&T Conference, Pittsburgh, 2017.

24. Osteoblast Functions of 3D Printed Porous Ti-6Al-4V Scaffolds
K.C. NUNE, R.D.K. MISRA
MS&T Conference, Pittsburgh, 2017.

25. Ultimate Functionalities in 3D-Cellular Mesh Structures: Optimization of Structure-Mechanical Property Relationship via Unit Cell Design
K.C. NUNE, R.D.K. MISRA
MS&T Conference, Pittsburgh, 2017.

26. Osteoblast Functions in 3D PRINTED Ti-6AL-4V Mesh Structures
K.C. NUNE, R.D.K. MISRA
SOCIETY FOR BIOMATERIALS CONFERENCE 2017, Minneapolis, MN

27. Osteoblast Functions in Functionally Graded Ti-6Al-4V 3D-Printed Mesh Structures
K.C. NUNE, R.D.K. MISRA
Next Generation Biomaterials, MS&T, Salt Lake City, Utah, October 24-27, 2016.

28. Electrical Field Mediated Growth of Osteoblast on 3D Printed Ti-6Al-4V Alloy Porous Scaffolds under Dynamic Conditions
A. KUMAR, K.C. NUNE and R.D.K. MISRA
Next Generation Biomaterials, MS&T, Salt Lake City, Utah, October 24-27, 2016.

29. Phase Reversion-induced Nanograined/Ultrafine-grained (NG/UFG) Low Carbon Microalloyed Steel: Low Temperature Superplasticity
V.S.A. CHALLA, Y. INJETTI, R.D.K. MISRA, J. HU, and L.X. DU
MS&T, Salt Lake City, Utah, October 24-27, 2016.

30. The Impact of Processing on Structure-property Relationship in Ultrahigh Strength Nb-Ti Microalloyed Steels
V.S.A. CHALLA, V. NATARAJAN, R.D.K. MISRA, M. MULLHOLLAND, D. SIDORENKO, and J.E. HARTMANN
MS&T, Salt Lake City, Utah, October 24-27, 2016.

31. Obtaining Ultimate Functionalities in 3D-cellular Mesh Structures
K.C. NUNE, R.D.K. MISRA
MATERIALS RESEARCH SOCIETY (MRS), Phoenix, March 28-April 02, 2016.

32. Engineering Bio-interfaces with Phase-reversion Induced Nanostructured Materials: Self-assembly of Protein at biointerfaces
K.C. NUNE, R.D.K. MISRA, M.C. Somani
MATERIALS RESEARCH SOCIETY (MRS), Phoenix, March 28-April 02, 2016.

33. Electric Field-Mediated Growth of Osteoblast: The Significant Impact of Dynamic Flow of Medium
A. KUMAR, R.D.K. MISRA

MATERIALS RESEARCH SOCIETY (MRS), Phoenix, March 28-April 02, 2016.

34. Biological Functionality of Extracellular Matrix-Ornamented Three-Dimensional Printed Hydroxyapatite and Ti-6Al-4V Scaffolds
    A. KUMAR, R.D.K. MISRA
    MATERIALS RESEARCH SOCIETY (MRS), Phoenix, March 28-April 02, 2016.

35. Electroconductive Hydroxyapatite-Titanium Disilicide Composite for the Bone Tissue Engineering Applications
    A. KUMAR, R.D.K. MISRA
    MATERIALS RESEARCH SOCIETY (MRS), Phoenix, March 28-April 02, 2016.

36. Electroconductive Hydroxyapatite-Titanium Disilicide Composite for the Bone Tissue Engineering.
    A. KUMAR and R.D.K. MISRA
    Next Generation Biomaterials – Bioinspired Materials Engineering, MS&T, Columbus, October 4-8, 2015.

37. Strain Hardening Behavior of Phase Reversion-Induced Nanograined/ultrafine-grained (NG/UFG) Austenitic Stainless Steel and Relationship with Grain Size and Deformation Mechanism
    V.S.A. CHALLA, R.D.K. MISRA, and M.C. SOMANI
    Advanced Steel Metallurgy: Products and Processing – Structures in Steel Part III, MS&T, Columbus, October 4-8, 2015.

38. Biological Response of Functionally Graded Titanium Alloy Mesh Structures
    K.C. NUNE, R.D.K. MISRA, and S.J. LI
    Next Generation Biomaterials – Session IV, MS&T, Columbus, October 4-8, 2015.

39. Biological Response of 3D Ti-6Al-4V Biomedical Devices using Additive Manufacturing of Cellular and Functional Mesh Structures
    K.C. NUNE, R.D.K. MISRA, L.E. MURR, and S. GAYTAN
    TMS, Orlando, March 16-19, 2015.

40. Deformation Mechanisms and Austenite Stability of Phase Reversion-Induced Nanocrystalline Austenitic Alloy
    V.S.A. CHALLA and R.D.K. MISRA
    TMS, Orlando, March 16-19, 2015.