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PhD
Metallurgical and Materials Engineering
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Examination	Institute	Year
PhD in Metallurgical and Materials Engineering	IIT Kharagpur	2022
M. Tech. in Process Engineering (Metallurgical Engineering and Materials Science)	IIT Bombay	2013
B.Tech. in Metallurgical and Materials Engineering	NIT Warangal	2010
Intermediate/+2	Alphores Junior College, Karimnagar	2006
Matriculation	VishwaPragathi Vidyalayam, Huzurabad	2004

RESEARCH INTERESTS

- Nano-micro mechanics, Mechanical behavior of materials, Alloy Design, Structure Property Correlation, Phase Transformations, Materials Characterization, Advanced Materials, Hydrogen Embrittlement, Additive Manufacturing, modeling and simulations in the above-mentioned fields.

PUBLICATIONS IN REFERRED JOURNALS

- Gunti, A., Maity, T., & Das, J. (2024). Size effect in ultrafine Ti-Fe-(Sn) lamellar composites during micro- and nanoindentation. *Journal of Materials Engineering and Performance*, 1-9.
- Gunti, A., & Das, J. (2022). Effect of cold rolling on the serrated flow behaviour of $Zr_{41.2}Ti_{13.8}Cu_{12.5}Ni_{10}Be_{22.5}$ bulk metallic glass during nanoindentation. *Journal of Materials Research*, 37(4), 976–989.
- Gunti, A., & Das, J. (2022). Effect of testing conditions on the nanomechanical behaviour of surface and inner core of as-cast Zr-base bulk metallic glassy plates, *Materials Science and Engineering A*, 845 143206 (1-15)
- Gunti, A., & Das, J. (2022). Size effect and anisotropy in cold rolled Zr-base bulk metallic glasses during nanoindentation. *Journal of Non-Crystalline Solids*, 593 121767 (1-13).
- Gunti, A., Jana, P. P., Lee, M. H., & Das, J. (2021). Effect of cold rolling on the evolution of shear bands and nanoindentation hardness in $Zr_{41.2}Ti_{13.8}Cu_{12.5}Ni_{10}Be_{22.5}$ bulk metallic glass. *Nanomaterials*, 11(7) 1670.
- Jana, P. P., Gunti, A., & Das, J. (2019). Improvement of intrinsic plasticity and strength of $Zr_{55}Cu_{30}Ni_5Al_{10}$ metallic glass by tuning the glass transition temperature. *Materials Science and Engineering A*, 762 138102 (1-7).

CONFERENCE PROCEEDINGS

- Gunti, A., Das, J., Indentation size effect and related mechanisms in Vitreloy-1 Poster, 26th International Symposium on Metastable, Amorphous and Nanostructured Materials (ISMANAM), 08-12 July 2019, Raintree, Annasalai, Chennai, IIT Madras, India (Poster)

WORK EXPERIENCE

- Working as a faculty in **NIT Hamirpur (Sept 2023-present)**
- Worked as a faculty in **NIT Warangal (Jan 2023 - July 2023)**
- Taught Non-Destructive testing, Materials science and Engineering and Corrosion Engineering lab
- Worked as a faculty in **NIT Warangal (2014-2015)**
- Taught Phase Transformations and Heat Treatment and handling Phase Transformations & Heat Treatment and Characterization techniques labs. Taught Transport Phenomena and handled Materials Processing and Microstructure Evolution lab
- Worked as a lecturer in Rajiv Gandhi Institute for Steel Technology (2014)
- Taught Physical Metallurgy, Heat Treatment subjects and handled Physical Metallurgy and Mechanical Metallurgy Lab

KEY ACADEMIC PROJECTS

Development of Nitride Coatings on TZM alloy by Cathodic Arc Deposition Technique CAD (PVD), Synthesis and Characterization of Titanium Aluminide alloy (BARC)

May - July 2009

- Developed AlN_2 , TiN_2 and AlN_2 - TiN_2 composite coatings over TZM alloy substrate by CAD
- AlN_2 - TiN_2 coating **increased 87.40% hardness** of the TZM sheet when compared to plain TZM sheet
- Annealing Ti-Al alloy at 800°C for 9hrs **enhanced its hardness, density 80 and 26%** respectively

Microwave Dielectric properties of low temperature sintered Zinc Titanate Ceramics

[Bachelor's Dissertation]

- Low Temperature Co fired Ceramics (LTCC) are used in novel multilayer communication modules
- V_2O_5 - B_2O_3 doped zinc titanate ceramics were prepared and lowered the sintering temperature
- Better value of microwave dielectric properties of $\epsilon_r=18.45$ and $Q_{xf}=14,276$ were observed, which is a promising candidate in field of multilayer devices requiring low sintering temperature (<900 °C)

Mechanical Properties of Intercritical Annealed and Intercritical Rolled Dual Phase Steels

[Master's Dissertation]

- Effect of soaking time in intercritical region on microstructural evolution and mechanical properties
- Analyzed the effect of intercritical annealing and rolling at different temperatures on microstructural evolution and mechanical properties
- Studied the effect of rolling reduction in intercritical region on microstructural evolution and mechanical properties

Nano Micro-Mechanical Studies of As-Cast and Cold Rolled Zr-Based Bulk Metallic Glasses

[PhD Dissertation]

- Explored the variation of the mechanical behavior at the surface and inner core of the Zr-base BMG plates with different fragility parameter under different testing conditions, to correlate the activation volume with the STZ size, and number of atoms in STZs to understand the nano-/micro-mechanics of deformation
- Investigated the effect of different extent of cold rolling strains on the hardness and Young's modulus as well as the anisotropic properties on rolling-width (RW), normal-rolling (NR), normal-width (NW) planes at different loads using instrumented indentation. Established a correlation between evolution of the shear bands with cold rolling strain on NR plane
- Investigated the effect of loading rate on the serration behavior using instrumented indentation at numerous loading rates in between of 1.66 mN/s and 16.66 mN/s on NR, RW and NW planes of as-cast and differently cold rolled samples. Examined the effect cold rolling strain on the evolution of plasticity and change in deformation behavior BMGs by analyzing the serration behavior in terms of pop-in depth, pop-in distribution, deformation acceleration factor of as-cast and all cold rolled specimens
- Evaluated the effect of cold rolling on hardness and indentation size effect (ISE) of as-cast and cold rolled Zr-based BMGs using instrumented nanoindentation on NR, RW and NW planes. Explored the possible reasons behind the size effect in BMGs and length scale of ISE using the existing models. Scanning electron microscope studies were performed on the indentation impressions of as-cast and all cold rolled samples to examine any change in the deformation behavior

COURSE PROJECTS AND SEMINARS

Grain Boundary Sliding during Superplasticity

- Extensive literature survey to understand the grain boundary sliding in superplastic materials

Computational methods for bulk metal forming

- Studied A general anisotropic yield criterion using bounds and a transformation weighting tensor

Diffusion of Titanium and its alloys

- Compared major mechanisms and proposed models to understand phenomena

Towards a cleaner greener and safer Indian steel industry

Analyzed various steelmaking processes and proposed more environmentally friendly mechanism

ACADEMIC ACHIEVEMENTS AND AWARDS

- **All India 84th Rank in GATE (Graduate Aptitude Test in Engineering)** 2011
- Highest percentage (**97%**) in Sanskrit for **two consecutive** years in Intermediate 2004-2006
- Topped with aggregate (93.83%) in physics, chemistry and mathematics in Intermediate 2004-2006
- Secured the **highest aggregate percentage (96%)** in mathematics and science in school 2004

INDUSTRIAL EXPOSURE

Visakhapatnam Steel Plant (RINL)

Nov 07 – Dec 07

- Extensively analyzed the processing of various units of plant like BF, SP, CO and SMS
- Submitted a detailed report along with suggestion for enhancing the efficiency of processes

Bhilai Steel Plant (SAIL)

May 08 – June 08

- Studied steel-making via BOF, VAD/Ladle Furnace/RH-Degasser and continuous casting route
- Provided some key inputs on materials handling and its procurement to BF units

TEACHING ASSISTANTSHIP

- Assisted professor in conducting **Electronic Materials** class for 120 Undergraduate students
- One of the Member in Handling of the **Mechanical Testing** Lab of **120** Students and designed **new experiments** for the lab curriculum and successfully conducted them
- TA for Materials characterization subject and lab, Advanced materials and processes
- TA for Diffraction techniques in materials engineering subject

POSITIONS OF RESPONSIBILITY

Core team member of Publicity Technozion, a National Level Technical Fest of NITW 2009-2010

- Led a team of **20 members** and done fest publicity in over 250 engineering colleges all over India
- **Increased over 1000 Registrations** over last year and played a key role in the success of fest

Event Organizer, Technozion, a National Level Technical Fest of NITW

2008

- Organized the Quiz contest at the institute
- Led the **team of 8** members for formulating rules and regulations for the event

Disciplinary Committee, Technozion, a National level Technical Fest of NITW

2008

- Worked in a **team of 25** members during the fest
- **Controlled around 6000 members** without any disciplinary issues during the fest

EXTRA CURRICULAR ACTIVITIES

- Secured **3rd position** in mixed competition which consist of **cricket, badminton and basketball** sports among 32 teams of the institute 2012
- Awarded **Silver medal** in kabaddi tournament in NITW 2010
- Secured **1st position** in short movie making competition organized by Photography club, NIT Warangal

PUBLICATIONS IN REFERRED JOURNALS

- 1) Gunti, A., Jana, P. P., Lee, M. H., & Das, J. (2021). Effect of cold rolling on the evolution of shear bands and nanoindentation hardness in $Zr_{41.2}Ti_{13.8}Cu_{12.5}Ni_{10}Be_{22.5}$ bulk metallic glass. *Nanomaterials*, 11(7) 1670 (1-18). <https://doi.org/10.3390/nano11071670>; Impact factor: 5.7
- 2) Gunti, A., & Das, J. (2022). Effect of testing conditions on the nanomechanical behaviour of surface and inner core of as-cast Zr-base bulk metallic glassy plates, *Materials Science and Engineering A*, 845 143206 (1-15). <https://doi.org/10.1016/j.msea.2022.143206>; Impact factor: 6.4
- 3) Gunti, A., & Das, J. (2022). Effect of cold rolling on the serrated flow behaviour of $Zr_{41.2}Ti_{13.8}Cu_{12.5}Ni_{10}Be_{22.5}$ bulk metallic glass during nanoindentation. *Journal of Materials Research*, 37(4), 976–989. <https://doi.org/10.1557/s43578-022-00502-8>; Impact factor: 2.9
- 4) Gunti, A., & Das, J. (2022). Size effect and anisotropy in cold rolled Zr-base bulk metallic glasses during nanoindentation. *Journal of Non-Crystalline Solids*, 593 121767 (1-13). <https://doi.org/10.1016/j.jnoncrysol.2022.121767>; Impact factor: 4.5
- 5) Jana, P. P., Gunti, A., & Das, J. (2019). Improvement of intrinsic plasticity and strength of $Zr_{55}Cu_{30}Ni_5Al_{10}$ metallic glass by tuning the glass transition temperature. *Materials Science and Engineering A*, 762 138102 (1-7). <https://doi.org/10.1016/j.msea.2019.138102>; Impact factor: 6.4
- 6) Gunti, A., Maity, T., & Das, J. (2024). Size Effect in Ultrafine Ti-Fe-(Sn) Lamellar Composites during Micro- and Nanoindentation. *Journal of Materials Engineering and Performance*. <https://doi.org/10.1007/s11665-024-09364-z>; Impact factor: 2.3

CONFERENCE PROCEEDINGS

- 1) Gunti, A., & Das, J. (2019). Indentation size effect and related mechanisms in Vitreloy-1, ISMANAM 2019, Anna Salai, Madras, India.