GOURAV MUNDHRA

Room 315, Krishna Hostel, IIT Madras, Chennai 600036
(+91)7003417075 ⋄ gourav.nitdurgapur.mse17@gmail.com, gmundhra@smail.iitm.ac.in

EDUCATION

Indian Institute of Technology Madras *August 2017 - Present*
and National Tsing Hua University Taiwan
Joint Doctoral Program
Master of Science and Doctor of Philosophy
Major: Metallurgical and Materials Engineering

National Institute of Technology Durgapur *July 2013 - June 2017*
Bachelor of Technology GPA: 8.9, Rank: 4/85
Metallurgical and Materials Engineering

CAREER OBJECTIVE

To become a materials scientist with thorough expertise in novel materials design and development; also understanding and establishing relationships between Structure-Properties-Processing-Performance paradigm of materials. A firm believer of mantra, "Great works are performed not by strength but by perseverance". Thus, looking for challenging opportunities, to solve the problems through hard work, clever engineering and cutting-edge research through extensive collaborations.

PROJECTS

Light-weight multicomponent alloys for aircraft engines *July 2017 - Present*
Supervisor(s): Prof. B. S. Murty and Prof. J. W. Yeh
Advanced Materials Research Laboratory, IIT Madras
and High Entropy Materials Research Center, NTHU Taiwan
Joint Doctoral Student
The project aims at developing new light-weight aluminium-based multicomponent alloys by using Calphad approach coupled with experiments. State-of-the-art materials characterisation techniques would be used to probe into the structure-property correlation. Structural property of these alloys would be investigated using hardness, compression and tension tests.

Lanthanum hafnate as a prospective TBC material for gas turbines *May 2017 - July 2017*
Supervisor: Prof. K. T. Jacob
Department of Materials Engineeing, IISc Bangalore
INAE Summer Research Fellow
We calculated the standard Gibbs energy of formation of Lanthanum Hafnate from the EMF data, to access its high temperature stability and validating the fact whether its promising candidate for use as TBCs in gas turbines operated at elevated temperatures.

Deformation texture studies on commercially pure aluminium *May 2016 - July 2016*
Supervisor: Dr. Nilesh Gurao
Department of Materials Science and Engineeing, IIT Kanpur
SURGE Research Fellow
We studied the effect of magnitude of prestrain on the tensile behavior of Commercially pure aluminum, texture studies were also performed, and the samples were characterized using X-Ray Diffraction and Electron Back Scattered Diffraction.

TQM principles for operational excellence in a steel industry *May 2016 - July 2017*
Supervisor: Prof. Amit Ganguly
Department of Metallurgical and Materials Engineering, NIT Durgapur
Final year undergraduate student
We used the Total Quality Management and Toyota Production System principles to achieve operational excellence in an EAF based steel plant by taking up a particular case and studying how these help in achieving excellence in the steel industry.

TECHNICAL STRENGTHS

Programming	C++, Java.
Software & Tools	Thermo-Calc (2019a and later versions) - Graphical and console mode, Origin 2019, Microsoft office 2016, Xpert highscoreplus 3.0, Adobe, Digital micrograph 2.11, etc.
Processing	Vacuum arc melting and suction casting, Fritsch P-5 planetary ball mills, High Vacuum furnace, Cold compaction unit (Insmart), Resistance heating furnace.
Characterisation	XRD Xpert Pro PANalytical, Optical microscopy, SEM, TEM Tecnai T12, Surface Area Analyser (SMART SORB 92), Particle Size Analyser (Microtrac), DSC (SETARAM Labsys Evo 1600 C).
Testing	Bulk and Micro-hardness testing, Universal Testing Machine, Impact Testing, Fatigue testing, Non Destructive Testing (Ultrasonic Testing, Eddy Current, Dye Penetrant, Magnetic Particle, and Radiography).
Other skills	Glove box, Accutex AU-300iA Wirecut EDM.

SCHOLASTIC ACHIEVEMENTS

1. Secured AIR 47 in FTRE conducted at National level.
2. Recipient of MHRD fellowship to pursue Doctoral studies at IIT Madras directly after B.Tech.
3. Recipient of Sanmarg Ram Avatar Gupt Pratibha Puraskar (2013) for academic excellence.
4. Recipient of PBPMS award for academic excellence (2013).
5. Recipient of Edudigm certificate of appreciation.

RECENT PUBLICATIONS

1. **Gourav Mundhra**, V. S. Hariharan and B. S. Murty, "Design of a novel Al-Ti-Zr light-weight alloy: CALPHAD and Experiments", J. Alloys Compd. 835 (2020): 155304.

POSITIONS OF RESPONSIBILTY

1. Student in-charge of the Vacuum arc melting and suction casting unit of the AMR group, Dept. of MME at IIT Madras.
2. Student in-charge of the X-Ray Diffraction unit of the AMR group, Dept. of MME at IIT Madras.
3. Student in-charge of the high vacuum heat treatment furnace unit of the AMR group, Dept. of MME at IIT Madras.
4. Member of NEN, NIT Durgapur Chapter from May 2015-May 2017
5. Member of ISMANAM 2019 transport committee.

RESEARCH INTERESTS

1. Computational alloy development: CALPHAD Approach and experiments.
2. Light-weight high performance alloys.
3. Mechanical Testing.
4. Advanced materials characterisation (SEM, TEM, Atom probe tomography, etc.)

RELEVANT GRADUATE LEVEL COURSES

1. Principles and techniques of transmission electron microscopy 2. Mechanical behaviour of materials 3. Thermodynamics and kinetics of materials 4. Advanced phase transformations 5. X-Ray diffraction techniques 6. Advanced powder processing 7. Deformation and failure of materials at elevated temperatures 8. Structure and properties of grain boundaries and interfaces.

WORKSHOPS/CONFERENCES ATTENDED RECENTLY

1. Attended the "ISMANAM 2019 Pre-conference workshop on advances in nano-scale characterisation of materials" organised by National Facility for Atom Probe Tomography (NFAPT), IIT Madras in 2019.
2. Attended the workshop on "Advanced concepts in light-weighting through materials, design and manufacturing" organised by Deakin-IITM COE, IIT Madras in 2019.
3. Attended the TEQIP sponsored workshop on "Crystallography for materials science" organised by Department of Materials Science and Engineering, IIT Delhi in 2019.
4. Attended a workshop on "Residual Stress measurement" organised by Pulstec USA, Inc.
5. Attended the workshop on "Atom probe tomography organised by National Facility for Atom Probe Tomography (NFAPT), IIT Madras in 2018.
6. Attended a workshop on "Electric vehicles" at IIT Madras Research Park in 2018.

PERSONAL TRAITS

1. Highly motivated and eager to learn new things.
2. Strong motivational and leadership skills.
3. Ability to work as an individual as well as in group.

REFERENCES

1. Prof. B. S. Murty
Director,
Indian Institute of Technology Hyderabad,
and
Girija and R. Muralidharan Institute Chair Professor,
Indian Institute of Technology Madras,
E-Mail: bsm@iith.ac.in, murty@iitm.ac.in

2. Prof. Jien-Wei Yeh
Director,
High Entropy Materials Research Center,
and
Distinguished Professor,
Dept. of materials science and engineering,
National Tsing Hua University Taiwan,
E-Mail: jwyeh@mx.nthu.edu.tw

3. Dr. Nilesh Prakash Gurao
Associate Professor,
Dept. of Materials Science and Engineering,
Indian Institute of Technology Kanpur,
E-Mail: npgurao@iitk.ac.in