

Rajesh Korla

Dr. Rajesh Korla

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Education:

Doctor of Philosophy (Ph.D.)

Department of Materials Engineering, Indian Institute of Science, Bangalore, India
Dissertation: Grain boundary sliding in bicrystals: Experiments and atomistic simulations.
Supervisors: Prof. Atul H. Chokshi and S. Karthikeyan
Emphasis: Understanding the mechanisms behind tension-compression asymmetry using experimental analysis and molecular dynamics simulations.

Master of Engineering (M.E.) (2006)

Department of Materials Engineering, Indian Institute of Science, Bangalore, India
Dissertation: *Creep and grain boundary sliding in AZ31 Mg alloy*
Supervisor: Prof. Atul H. Chokshi
Emphasis: Developed a constitute equation for grain boundary sliding in the grain size regime where both grain boundary sliding and dislocation creep mechanisms contribute significantly to the overall strain in the material.

Bachelor of Technology (B.Tech.) (2004)

Department of Metallurgical & Materials Engineering, National Institute of Technology, Warangal, India

Professional Experience:

- Assistant Professor (2016 -till date), IIT Hyderabad, Department of MSME.
- Post-doctoral research fellow (2014 to 2016) University of Oxford.
- Research Associate (2006-2007) Indian Institute of Science, Bangalore.

Sponsored Research Projects:

Funding agency	Project title	Funding (Lakh. INR)	Duration	Status
Seed Grant	Investigating the possibility of superplasticity in High entropy AlCoCrFeNi dual phase alloy at high temperature.	3.0	3 years	Completed
SERB-ECR	Evaluation of creep behavior of AlCoCrFeNiMo0.5 high strength high entropy alloy	51.97	3 years six months	Completed (PI)
SERB-CRG	Investigation of the high temperature deformation and creep behavior of Fe-Mn-Al-C low density steels	43.71	3 years	Ongoing (PI)
DST	Near net shape manufacturing of grain-oriented transformer-grade electrical steel (Co-PI)	55.56	3 years	Ongoing (Co-PI)
DFTM-GTRE	Numerical simulations of Process modelling and experimental validation of Selective Laser Melted Fan Inlet Guide Vanes and Fuel Atomizer Body components for Aero-engine end-use application (Co-PI)	245.16	3 years	Awaiting Ongoing
VSSC (Consultancy)	Mechanical properties and textural variation at different locations of fuel chamber	1.8	3 months	On going
DIA-DRDO	Optimization of Electron Beam AM process of Ti-6Al-4V to minimize the anisotropy in, high temperature mechanical properties, creep, fatigue and fatigue crack growth and demonstrate printing of real-time component with optimized process parameters.	552.5	3 Years	Ongoing (PI)

ER&IPR	Understanding the microstructure, morphology, and evolution of phases in high-temperature W-alloys and additively manufactured Ni-based superalloys by high-end correlative microscopy.	272	2 Years	Ongoing
Brogwarner (Consultancy)	Accelerated Creep tests and simulations	22.5	1 year	Completed

Research Interest:

Deformation Behavior of Materials at room temperature as well as at high temperature, Creep, Superplasticity, Micromechanical deformation, MD simulations.

Skills and Expertise:

Characterization techniques: TEM, SEM, EBSD, Micro and Nanoindentation, FIB, AFM, XRD, Bulk X-ray texture and Optical profilometer.

Testing: Mechanical testing at high temperatures in constant load, stress and cross head velocity modes. Experience in design and setting-up creep testing frame with a provision of high temperature imaging for strain measurement using digital image correlation technique, alloy design.

Simulations: Molecular dynamic simulations using LAMMPS.

Achievements:

- Topper of the batch in MTech at IISc Bangalore
- Best metallography award for both Optical and SEM categories in the annual student's symposium 2012, IISc Bangalore.
- Best poster award for my student in NMD ATM-2021
- Best poster award for my student in ICAMMC-2021

Professional activities:

- Convener for the preconference workshop SICE-2022, Hyderabad
- Editor for Advances in Structural Integrity for Mechanical, Civil, and Aerospace Applications: Proceedings of SICE 2022

- Actively involved in the development of new MTech programs: MTech in additive manufacturing, Online MTech in Industrial Metallurgy, ICME.
- Handling department MTech admissions for the past 5 years.
- Faculty advisor for the 2016 UG batch
- Department timetable in charge for Jan-Aprl'16 and Jan-Aprl'17 and Jan-April ,18 semesters
- DUGC member and chairman for the year 2019
- Institute central workshop (Makers Space) committee member.
- Institute Green office faculty in charge for the past 4 years

Teaching activities:

- Number of credits taught till now 66 with average feedback 3.94.
- New courses introduced with a credit equivalent to 7 from my expertise.
- Participated in developing online MTech program Industrial Metallurgy
- Involved in the teaching of interdisciplinary MTech Programs, Integrated Computational Materials Engineering and Additive Manufacturing.
- Also involved in the institute curriculum book committee for the year 2016-17
- Setting up foundry teaching lab and mechanical behavior of Materials teaching lab, Foundry lab.

List of Publications:

1. Korla Rajesh, Chokshi Atul H, Strain-rate sensitivity and microstructural evolution in a Mg–Al–Zn alloy, Scripta Mater., **63**, 913-916, 2010.
2. Korla Rajesh, Chokshi Atul H., A constitutive equation for grain boundary sliding: an experimental approach, Metall Mater Trans., **A45**, 698-708, 2014.
3. Prasad K Eswar, Rajesh K, Ramamurty U, Micropillar and macropillar compression responses of magnesium single crystals oriented for single slip or extension twinning, Acta mater, **65**, 316-325, 2014.
4. Koundinya NTBN, Chawake Niraj, Korla Rajesh, Kottada Ravi Sankar, A simple and versatile machine for creep testing at low loads (6–300 N) and on miniaturized specimens: Application to a Mg-base alloy, Review of Scientific Instruments, **89**, 10, 2018
5. Wilkinson Angus J, Collins David M, Zayachuk Yevhen, Korla Rajesh, Vilalta-Clemente Arantxa, Applications of multivariate statistical methods and simulation libraries to analysis of electron backscatter diffraction and transmission Kikuchi diffraction datasets, Ultramicroscopy, **196**, 88-98, 2019.

6. Wilkinson Angus J, Zayachuk, Yevhen Collins, David M Korla, Rajesh ,Applications of Multivariate Statistical Methods to Analysis of Electron Backscatter Diffraction and Transmission Kikuchi Diffraction Datasets, *Microscopy and Microanalysis*, **23**, 544-545, 2017.
7. Ramakrishna M, Koppoju Suresh, Telasang Gururaj, Korla Rajesh, Padmanabham G, Effect of solutionizing temperature on the microstructural evolution during double aging of powder bed fusion-additive manufactured IN718 alloy, *Mater Char*. **172**, 110868, 2021.
8. Ganguly R, Rajesh K, Acharyya A, Ramadurai R, Study of stiffness and flexible sensing performance of poly-vinylidene fluoride (PVDF) a piezo polymer with varying polarization components, 14th Nanotechnology Materials and Devices Conference, 978-1 (2019)
9. Gunapu DV, Santhosh Kumar Prasad, Y Bhavani Mudigunda, V Sushma, Yasam Palguna. Rengan Aravind Kumar, Korla Rajesh, Vanjari Siva Rama Krishna, Development of robust, ultra-smooth, flexible and transparent regenerated silk composite films for bio-integrated electronic device applications, *Int J of Biological Macromolecules*, **176**, 498-509, 2021.
10. Raineesh KP, Sairam K, Rajesh K, Prasad K Eswar, Novel approach to characterize the deformation under Berkovich and spherical indentations: Study on magnesium single crystals, *Phy Rev Mater*, **5**, 083604, 2021.
11. Dudala Srinivas, Krishna S Chenna, Korla Rajesh, Microstructural evolution and grain-growth kinetics of Al_{0.2}CoCrFeNi high-entropy alloy, *Phil Mag Let*, **101**, 11,444-454, 2021.
12. Krishna S Chenna, Muneshwar Pravin, Pant Bhanu, Korla Rajesh, Hot Deformation Behavior and Processing Map of Cu-Cr-Nb-Zr Alloy, *Journal of Mater Eng and Perform*, 1-13, 2022.
13. Palguna Yasam, Kannan A Rajesh, Sairam Kotla, Shanmugam N Siva, Korla Rajesh, Microstructure and mechanical properties of wrought Al_{0.2}CoCrFeNiMo_{0.5} high entropy alloy using gas tungsten arc welding process, *Mater Let*, **317**, 132109, 2022.
14. Kali Naresh, Korla Rajesh, Korla Srikanth, Influence of nanoparticles on mechanical properties of hybrid polymer-layered fibre metal laminates (FMLs), *Transactions of the Indian Institute of Metals*, **75**, 1979-1988, 2022.
15. Tamboli Rameez R, Dudala Srinivas, Andersen Dustin Valle Nathalie, Eswara Santhana, Korla Rajesh, Fujiwara Hiroshi, Guennec Benjamin, Ameyama Kei, Bhattacharya Basudev, Quantitative prediction of AI and learning grain boundary character in Al-rich interstitial free steel, *Scripta Mater*, **219**, 114858, 2022.

16. Palguna Yasam, Kotla Sairam, Korla Rajesh, High temperature deformation behavior of Al_{0.2}CoCrFeNiMo_{0.5} high entropy alloy: Dynamic strain ageing, *J Alloys and Comp*, **930**, 167422, 2023.
17. Kannan A Rajesh, Palguna Yasam, Korla Rajesh, Kumar S Mohan, Pramod R Shanmugam, N Siva, Hot tensile deformation and fracture behavior of wire arc additive manufactured Hastelloy C-276, *Welding in the World*, 1-11, 2023.
18. Krishna S Chenna, Yasam Palguna, Dudala Srinivas, Kotla Sairam, Muneshwar Pravin, Pant Bhanu, Korla Rajesh, Recrystallization Behavior of Cold-Rolled Cu-Cr-Nb-Zr Alloy Investigated by Differential Scanning Calorimetry, *J of Mater Eng and Perform*, 1-8, 2023.
19. Sairam Kotla, Phaniraj MP, Rajesh Korla, Effect of molybdenum on recrystallization behavior of Fe₃₀Mn₅Al₁C-x Mo lightweight austenitic steels, *Scripta Mater*, **230**, 115399, 2023.
20. Kali Naresh, Korla Rajesh, Korla Srikanth, Impact Behaviour of Nano-Hybrid (Carbon/Glass) Fibre Metal Laminates: An Experimental Study, *Arabian Journal for Science and Engineering*, **48**, 3881-3891, 2023.
21. Palguna Yasam, Korla Rajesh, Comparative study of microstructure and mechanical properties of thermo-mechanically processed Al (0.2, 0.5) CoCrFeNiMo_{0.5} high-entropy alloys, *Phil Mag Let*, **103**, 2170490, 2023.
22. Sai Ram Kotla, Rama Krushna Sabat and Rajesh Korla, The role of molybdenum on evolution of deformation texture in the cold rolled Fe₃₀Mn₅Al₁C- x Mo lightweight austenitic steels, *Vacuum*, **212** (2023) 112244.
23. Yasam Palguna and Rajesh Korla, Superplastic like flow behavior in Al_{0.2}CoCrFeNiMo_{0.5} high entropy alloy. *Mater letters.*, 2023, 135789.
24. S Ghosh, U Bhattacharjee, J Dutta, K Sairam, R Korla, SK Martha, Ultrathin, flexible and smooth carbon coating extends the cycle life of dual ion batteries, *J of Power Sources*, **584** (2023) 233585.
25. SC Krishna, P Yasam, S Dudala, S kotla, P muneshwar B pant and R korla, Recrystallization behavior of cold rolled Cu-Cr-Nb-Zr investigated by differential scanning calorimetry, *J Mat Engg Perform.*, **33** (2024) 136-143.
26. Y Palguna, K Sairam, AR Kanan, NS Shanmugam, R Korla and JP Oliveira, *Scripta Mater.*, **241** (2024) 115887.

27. Srinivas D., SC Krishna and R Korla, Macrostructure, Microstructure, and Mechanical Properties of Al_{0.2}CoCrFeNi High-Entropy Alloy Produced by Vacuum Induction Melting, *Trans Indian Inst Metals.*, **77** (2024) 1489-1497.
28. Sairam Kotla, Sabat Rama Krushna, Kumar SS Satheesh, Phaniraj MP, Korla Rajesh, The Role of Molybdenum on Room Temperature Tensile Behavior of Recrystallized Fe₃₀Mn₅Al₁C x Mo Lightweight Austenitic Steels, *Trans IIM*, **77** (2024) 2431-2437.
29. Krishna S Chenna, Yasam Palguna, Muneshwar Pravin, Pant Bhanu, Korla Rajesh, Dynamic Recrystallization Behavior of Cu–Cr–Nb–Zr Alloy, *Metallography, Microstructure, and Analysis*, **13** (2024) 764-778.
30. Kannan A Rajesh, Shanmugam N Siva, Sanjeeviprakash K, Palguna Yasam, Korla Rajesh, Lee Wonjoo, Jeong YuHyeong, Yoon Jonghun, Room and high-temperature tensile properties of austenitic stainless steel 321 fabricated by wire arc additive manufacturing, *Journal of Materials Research and Technology*, **36** (2025) 3996-4004.
31. Palguna Yasam, Sairam Kotla, Srinivas Dudala, Krishna S Chenna, Korla Rajesh, Effect of Annealing on the Microstructural Stability and Mechanical Properties of Al_{0.2}CoCrFeNiMo_{0.5} High-Entropy Alloy, (2025) 1-10.
32. Desetti Sujatha, Nagini M Babu, D Arvindha, Palguna Yasam, Rajesh Korla, Murty BS, A Novel Precipitation-Hardened Medium-Entropy Alloy with Excellent Tensile Properties, **56** (2025) 415-423.
33. Sairam Kotla, Phaniraj MP, Rajesh Korla, Role of Molybdenum in High-Temperature Uniaxial Tensile Deformation Behaviour of Fe-30Mn-5Al-1C-xMo Lightweight, *Metal Mater Tran A*, **56** (2025) 1799-1816
34. Talluri Gopi, Nagini M, Babu D Arvindha, Palguna Yasam, Rajesh Korla, Murty BS, Maurya RS, Designing A Eutectic Multi-Principal Element Alloy For Strength-Ductility Synergy, *Journal Of Alloys And Compounds*, **976** (2025) 173278.

LIST OF CONFERENCES AND SYMPOSIA ORAL PRESENTATIONS

1. Rajesh Korla, S. Karthikeyan and Atul H. Chokshi, “Substructure Evolution during Grain Boundary Sliding in Al Bicrystals”, TMS 2013, San Antonio, Texas, USA.
2. Rajesh Korla, S. Karthikeyan and Atul H. Chokshi, “Molecular dynamics study of γ surfaces of special boundaries of Al” ICSMA-16 (2012), Bangalore, India.
3. Rajesh Korla, S. Karthikeyan and Atul H. Chokshi, “Molecular dynamic study of tension compression asymmetry in γ surface of $\langle 100 \rangle \Sigma 5$ symmetrical tilt grain boundary”

International symposium for research scholars on metallurgy, materials science & engineering-2012, IIT-Madras, India.

4. Rajesh Korla and Atul H. Chokshi, "Texture reversibility in Mg AZ31 alloy under multi axial compression: Influence on flow behavior', ICOTOM-2011 Mumbai, India.
5. Rajesh Korla and Atul H Chokshi, Dynamic recrystallization in AZ31 Mg alloy and its influence on grain boundary sliding contribution to creep, NMD-ATM-2010, Bangalore, India.
6. Srinivas Dudala, Chenna Krishna S and Rajesh Korla, Influence of grain size and temperature on the deformation behavior of $Al_{0.2}CoCrFeNi$ High entropy alloy, International conference on high entropy materials, Jeju Island, South Korea, 9-12 Dec 2018
7. K.Sairam Gouda Korla Rajesh, Texture reversibility in Mg AZ31 alloy by twinning under multi axial compression, NMD-ATM, Jamshedpur, Kolkata, 11-13 Nov 2018.
8. Yasam Palguna and Rajesh Korla, Microstructure and Mechanical Behaviour of $Al_{(0.5,2)}CoCrFeNiMo_{0.5}$ High Entropy Alloy, NMD-ATM, Jamshedpur, Kolkata, 11-13 Nov 2018.
9. Srinivas Dudala, Chenna Krishna S and Rajesh Korla, Microstructural Evolution and Grain Growth Kinetics in $Al_{0.2}CoCrFeNi$ High Entropy Alloy, NMD-ATM, Jamshedpur, Kolkata, 11-13 Nov 2018.
10. S. Chenna Krishna, Abhay K Jha, Bhanu Pant, Rajesh Korla, Processing and Characterization of Cu-Cr-Nb-Zr alloy produced through Ingot Metallurgy, Research Scholar symposium on Materials Science and Engineering-IIM, Trivandrum, 2018.
11. Rajesh Korla and Yasam Palguna, Design of high entropy alloys for high temperature applications, Conference on High Temperature Structural Materials, Bangalore, Indian Institute of Science, Feb 2020.
12. Rajesh Korla and Yasam Plaguna, High temperature deformation and creep behaviour of $Al_{0.2}CoCrFeNiMo_{0.5}$ multi component alloy, ICSMA 19, France, June 2022.