# 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 | Approved amount (INR) | Duration | Status |
|---|---|---|---|---|
| SERB-ECR | Evaluation of creep behavior of AlCoCrFeNiMo0.5 high strength high entropy alloy | 51.97 | 3 years six months | Completed |
| SERB-CRG | Investigation of the high temperature deformation and creep behavior of Fe-Mn-Al-C low density steels | 43.71 | 3 years | On going |
| DST | Near net shape manufacturing of grain-oriented transformer grade electrical steel | 55.56 | 3 years | Ongoing |
| 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 | 245.16 | 3 years | Awaiting for the sanction letter |
| VSSC (Consultancy) | Mechanical properties and textural variation at different locations of fuel chamber | 1.8 | 3 months | On going |
| Brogwarner (Consultancy) | Creep experiments | | Yet to start | Yet to start |

## 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.

## 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., A**45**, 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. 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.

8. 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.

9. 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)

10. 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.

11. 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.

12. Dudala Srinivas, Krishna S Chenna, Korla Rajesh, Microstructural evolution and grain-growth kinetics of Al0. 2CoCrFeNi high-entropy alloy, Phil Mag Let,**101**, 11,444-454, 2021.

13. 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.

14. Palguna Yasam, Kannan A Rajesh, Sairam Kotla, Shanmugam N Siva, Korla Rajesh, Microstructure and mechanical properties of wrought Al0. 2CoCrFeNiMo0. 5 high entropy alloy using gas tungsten arc welding process, Mater Let, **317**, 132109, 2022.

15. 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.

16. Tamboli Rameez R, Dudala Srinivas, Andersen Dustin Valle Nathalie, Eswara Santhana, Korla Rajesh, Fujiwara Hiroshi, Guennec Benjamin, Ameyama Kei, Bhattacharya Basudev, Quantitative prediction of Al and learning grain boundary character in Al-rich interstitial free steel, Scripta Mater, **219**,114858, 2022.

17. Palguna Yasam, Kotla Sairam, Korla Rajesh, High temperature deformation behavior of Al0. 2CoCrFeNiMo0. 5 high entropy alloy: Dynamic strain ageing, J Alloys and Comp, **930**, 167422, 2023.

18. 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.

19. 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.

20. Sairam Kotla, Phaniraj MP, Rajesh Korla, Effect of molybdenum on recrystallization behavior of Fe30Mn5Al1C-x Mo lightweight austenitic steels, Scripta Mater, **230**, 115399, 2023.

21. Palguna Yasam, Korla Rajesh, Comparative study of microstructure and mechanical properties of thermo-mechanically processed Al (0. 2, 0. 5) CoCrFeNiMo0. 5 high-entropy alloys, Phil Mag Let,**103**, 2170490, 2023.

22. Sai Ram Kotla, RamaKrushna Sabat and Rajesh Korla, The role of molybdenum on evolution of deformation texture in the cold rolled Fe30Mn5Al1C- x Mo lightweight austenitic steels, Vacuum, Accepted.

**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 <100> Σ 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 Al0.2CoCrFeNiMo05. multi component alloy, ICSMA 19, France, June 2022.