CV: Kallol Mondal (email: kallol@iitk.ac.in, Ph: 0512 2596156; Mobile: 9450418670)

1. Personal Information

(i) Name in full (Block letters): **KALLOL MONDAL**

(ii) Date of birth: 18 December 1972

(iii) Education:

- Bachelor of Engineering: Department of Metallurgy; Bengal Engineering College (Cal. Univ.) 1995
- Masters in Metallurgy: Department of Metallurgical and Materials Engineering, Indian Institute of Technology, Kharagpur 1998
- PhD: Department of Metallurgical and Materials Engineering, Indian Institute of Technology, Kharagpur 2005

(iv) Professional/research Experience:

- **Graduate Engineer Trainee**: Dec. 1995-July 1996:, Laksmi Precision Screws Ltd, Haryana, Metallurgical Laboratory In-charge
- **Senior Engineer**: Feb 1998-Feb 2001: Telco, Jamshedpur Foundry shop Shift In-charge
- **Senior research fellow**: March 05-August 05; IIT Kharagpur; Stress corrosion behavior of Hastelloy in HF
- **Postdoc**: Sept 2005- Sept 2007; NIMS, Japan; Development and mechanical behavior of metallic glass
- **Assistant Professor**: Dec 2007-25th March 2012, IIT Kanpur; Teaching/research
- **Associate Professor**: March 2012 – June 2016; IIT Kanpur; Teaching/research
- **Visiting Associate Professor**: Feb 2013-Dec 2013; Univ. British Columbia, Canada; Development of ceramics for Candu reactor
- **Professor**: July 2016 onwards; IIT Kanpur; Teaching/research

2. Teaching

(i) Courses (UG/PG)

- Materials degradation and prevention (UG): Instructor. (three times)

- Non-equilibrium processing of materials (UG+PG): Instructor (Best Teacher appreciation from the Director twice) (three times taught)
- Nature and properties of materials (UG): Tutor (once)
- TA 201 (Introduction to Manufacturing Processes) (UG): Instructor. (Twice: Once when combined course for Mechanical Engg. And MME, and once for MSE only). Tutor: (3 times)
- Engineering Thermodynamics (Institute Core course for UG): Tutor
- Thermodynamics (PG, Twice (this semester running)) (Best Teacher appreciation from the Director once)
- Heat treatment of materials and surface modification (UG+PG). (Twice) (Best Teacher appreciation from the Director once)
- Corrosion and Oxidation of Metals and Alloys (UG+PG): (Once) (Best Teacher appreciation from the Director once)
- Physical Metallurgy Laboratory (UG): Instructor (Once)
- Phase transformation (UG) (3 times)
- Thermodynamics and Phase Equilibria (UG) (Once)

(ii) New courses developed:

- Non-equilibrium processing of materials (Open to UG and PG): 2008 (Three times)
- Corrosion and Oxidation of Metals and Alloys (Open to UG and PG): 2012 (Currently teaching to 61 students, mainly UG in 2015-16 II sem).
- Thermal Spraying (in collaboration with Prof. Kantesh Balani): 2012

3. Supervision of Bachelor's/Master's Thesis

B.Tech

24 students (completed)

Surge students

Mr. S. Sarkar (2011 amd 2012)
Ms. D. Verma (2012)
Ms. S. Sengupta (2014)

Mr. S. Verma (2015)

TeQIP students

Ms. S. Verma (2014)
Mr. A. Mukherjee (2014)
Mr. A. Roy (2015)

Other students who have worked in my lab

Ms. Kundan Thakan (2014) with Prof. Sankaran (IIT Chennai)
Ms. Nivedita Mahesh (2014 with Prof. Lukas Bichler (UBC, Okanagan)

31 students (completed) **(***as per year of registration***)**

1. 2006: Diffusion induced grain boundary migration in Cu-Zn system-by Mr. Ajaya Kumar Pradhan (Co-Supervisor: Prof. S.P. Gupta)
2. 2007: Processing and corrosion behavior of nanocrystalline Fe80Si20 coatings-by Mr. Gaurav Gupta (Co-Supervisor: Prof. R. Balasubramaniam)
3. 2009: Crystallization and oxidation behavior of quinary Zr-based bulk metallic glass forming alloys-by Kuldeep Kumar
4. 2010: On the critical isothermal temperature for the optimum mechanical and corrosion behavior of carbide free bainitic steels-by Ashutosh Misra (Co-Supervisor: Prof. A. Upadhyaya)
5. 2011: Fabrication of porous Cu and Ag template using partial sintering and selective dissolution of Zn-by Madhumanti Mandal (Co-Supervisor: Prof. S. Sangal)
6. 2011: Effects of micro-alloying and heat treatment on corrosion behavior of cast Mg-Zn alloys-by Monalisa Mandal (Co-Supervisor: Prof. S. Shekhar)
7. 2011: Powder consolidation and characterization of Cu-8wt% Cr alloy prepared by mechanical alloying-by Suman Patra (Co-Supervisor: Prof. Gouthama)
8. 2012: Corrosion behavior of IF steel in various media and its comparison with mild and SS 304 steels-by Gajendra Pratap Singh (Co-Supervisor: Prof. S. Sangal)
9. 2012: Effect of machining configurations on the corrosion behavior of mild steels-by Manish Prakash (Co-Supervisor: Prof. S. Shekhar)
10. 2012: Effect of machining configurations on the oxidation behavior of mild steel-by Paulami Majumdar (Co-Supervisor: Prof. S. Shekhar)
11. 2013: Fabrication of porous alumina template using selective dissolution-by Manish Jain (Co-Supervisor: Prof. S. Sangal)
12. 2013: Development of highly ductile spheroidized steel from high C low alloy steel via optimized heat treatment route-by Soumendu Monia (Co-Supervisor: Prof. Gouthama)
13. 2013: A study on the onset of rebar corrosion induced longituninal cracks in reinforced concrete structures-by Behera Prasanna Kumar (Civil dept student with Prof. S. Mishra)
14. 2013: Corrosion behavior of Mg-based AE42 alloy in 3.5% NaCl solution-by Mukund Manish (Co-Supervisor: Prof. Gouthama)

15. 2014: Corrosion resistant Cr-coating on mild steel by powder roll bonding, by Shubhankar Khara (Co-supervisor: Prof. S. Sangal)
16. 2014: Effect of microstrucrual anisotropy and correlation between OCP, Rp and rust constituents on the corrosion behavior of mild steel- by Sanjay Choudhary (Co-supervisor: Prof. A. Garg)
17. 2014: Stress corrosion and alternate wear-corrosion effects on the degradation of low carbon steels- by Pratik V. Murkute (Co-supervisor: Prof. J. Ramkumar)
18. 2014: Effect of Machining configuration on the corrosion behavior of 304 stainless steel – by Vipin Nanda (Co-supervisor: Prof. S. Shekhar)
19. 2014: Effect of dynamic change in strain rate of the mechanical and stress corrosion cracking behavior of a mild steel - by Wg. Cdr. U Govindakrishnan (Co-supervisor: Prof. P. Venkitanarayanan)
20. 2011 (BT-MT): Development of controlled expansion (CE) alloys by accumulative roll bonding – by Sanu Kumar Gupta (Co-supervisor: Prof. S. Shekhar)
21. 2014: Structural relaxation and mechanical properties of four quinary Zr-based bulk metallic glasses – by V. Venkatesh (Co-supervisor: Prof. Gouthama)
22. 2011 (BT-MT): Effect of machining parameters on the corrosion behaviour of dual phase steel – by R.K. Parashar (Co-supervisor: Prof. S. Shekhar).
23. 2015: Development of very hard corrosion resistant roll-bonded Cr- coating on mild steel in presence of graphite – by Pankaj Kumar (Co-supervisor: Prof. S. Shekhar).
24. 2015: Amorphization of blast furnace hot metal and corrosion behavior of composite (amorphous + nanocrystalline) coating – by Nilanjan Mahata ((Co-supervisor: Prof. S. Sangal).
25. 2015: Surface micro-channelling of metals via electrochemical dissolution – by Ravi Kumar (Co-supervisor: Prof. J. Ramkumar).
26. 2012 (BT-MT): Development of multi-layered steels with variable compositions – by V. Rama Satya Sandilya (Co-supervisor: Prof. S. Sangal)
27. 2016: Controlled expansion Al-Si composites fabricated via Conventional Pressureless Sintering and SPS – by Asraful Haque (Co-supervisor: Prof. S. Shekhar)
28. 2016: Pickling of Si and Cr containing Steels – by Amit Bhardwaj (Co-supervisor: Prof. S. Shekhar)
29. 2016: Development of high strength rail clip – by Shubhendu Garg (Co-supervisor: Prof. S. Sangal)
30. 2016: Processing Map and Hot Deformation Study of Aluminium Alloy 7075 – by Ajay Kumar Soni (Co-supervisor: Prof. S. Shekhar)
31. 2016: Development of Multilayered Steel Composite and the Effect of Heat Treatment on Mechanical Properties – by Animesh Dutta (Co-supervisor: Prof. S. S. Singh)
32. 2017: Fabrication of Al-Si controlled expansion alloys using unique combination of pressureless sintering and hot forging – by Eshan Saraswat (Co-supervisor: Prof. S. Shekhar)
33. 2017: Enhanced Gold-enrichment on the surface of Ag-20wt%Au & Cu-20wt%Au alloys by dealloying in a novel electrolyte – Ankit Kumar (Co-supervisor: Prof. K. Kulkarni)
34. 2018: Art of making earthenware with variable porosity and high damping capacity - by Jayesh S. Zambre (Co-supervisor: Prof. B. Bhattacharya)

35. 2018: Wear behavior of composite (amorphous/nano-crystalline) coatings made from high phosphorus pig iron using high velocity oxygen fuel HVOF)and air plasma spray (APS) methods – by T. Dhamodar Naidu (Co-supervisor: Dr. Atanu Banerjee, Tata Steel).
36. 2019: Effect of composition on the dealloying of Ag-Au alloys in 40% w/w H_2SO_4, Jitendra Soni

Note: Three students will be completing in the present summer by July 2021. Three students from 202 batch have joined the group.

4. PhD supervision:

9 students: Awarded.
11 students on going:
One out of current 11 students has submitted thesis already.

Details of awarded students:

Name of student	Year of graduation and title	Current employment
Dr. A. K. Shukla	2013: Processing and Characterization of Dispersion Hardened Cu-Cr-Nb alloy for High Temperature Applications	ISRO Scientist
Dr. C. Chattopadhyaya	2014: Phase Transformation in Materials with reference to Amorphous Structure	NIFFT, Ranchi
Dr. S. Sharma	2014: Development of high strength wear resistant bainitic steels for rail and wheel application	Assistant Prof. NIT Jaipur
Dr. A.P. Moon	2015: Corrosion Behavior of pearlitic/ferritic-pearlitic and bainitic rail- axle-wheel steels	Tata Steel Jamshedpur (Engineer, R&D)
Dr. A. Varshney	2016: Development of low alloy strong and tough multiphase steels	Assistant Professor, MANIT Bhopal
Dr. Prabhat Kr. Rai	2019: Harmonic and gradient microstructures and their corrosion and wear behavior	JSW steel
Dr. Prvan Kr. Katiyar	2019: Comparative corrosion behavior of carbon steels with varying composition and microstructures in and outside concrete	Assistant Professor, NIT Hamirpur

Dr. Bharat Bhushan	2019: Synthesis and mechanism for the evolution of nanoporous Ag and nanosized ZnO particles by dealloying	Assistant Professor, Punjab Institute of Technology
Dr. Behera Prasanna Kumar	2021: A study on the corrosion behavior of plastically deformed reinforcing steel bars.	Looking for position

Postdoc: Dr. Himanshu Maharana (He was NPDF from 2017-till March 2019).

Dr. Kirtiratan Godbole, IPDF from March 2021- continuing

5. Knowledge dissemination:

- NPTEL MOOC Course on Heat Treatment and Surface Hardening (I and II) (Very popular course)

https://www.youtube.com/channel/UCT-4cCLEezCf8VOIuuwQG8A

- NPTEL Video lectures on Environmental Degradation (considered to be fifth highest viewership among all the metallurgy courses)

(http://iitmweb.iitm.ac.in/phase2/courses/113104061/) (**More than 6 lakhs viewer**)

- MOOC Course on **Corrosion** (Part I and Part II) newly floated). https://www.youtube.com/watch?v=zS0eaJRYgIM&list=PLFW6lRTa1g81kobA2tvZ84YHB2li6qwx7

6. Year-wise Selected Publications:

- 2021

1. Nisheeth Kr. Prasad, A.S. Pathak, S. Kundu, K. Mondal, Novel hybrid sacrificial anodes based on high phosphorus pig iron and Zn, Corrosion Sci. (in press)
2. Prasanna Kumar Behera, Sudhir Misra and K. Mondal (2021), On the corrosion of strained plain rebar in chloride-contaminated mortar and novel approach to estimate the corrosion amount from rust characterization, J. Mater Civil Engg. (in press).
3. Pavan Bijalwan, Charu Singh, Anil Kumar, Kuntal Sarkar, Nitu Rani, Tapas Laha, Atanu Banerjee, and K. Mondal (2021), Corrosion behaviour of Plasma sprayed Fe based metallic glass ($Fe_{73}Cr_2Si_{11}B_{11}C_3$ (at%) coatings in 3.5% NaCl solution, J. Non-Cryst. Sol. Vol 567, P 120913.
4. H. S. Maharana, K. Mondal (2021), Manifestation of Hall–Petch breakdown in nanocrystalline electrodeposited Ni-MoS_2 coating and its structure dependent wear resistance behavior, Surf. Coat. Tech., vol 410, P 126950.
5. Arun Rajput, J. Ramkumar and K. Mondal (2021) Effect of pearlitic morphology with varying fineness on the cavitation erosion behavior of eutectoid rail steel, Ultrasonics Sonochemistry, vol 71, p 105399.

6. Neetu, Prvan Kumar Katiyar, S. Sangal and K. Mondal (2021), Effect of various phase fraction of bainite, intercritical ferrite, retained austenite and pearlite on the corrosion behavior of multiphase steels, Corros. Sci. vol 178, P 109043.

-2020

7. Santigopal Samanta, K. Mondal, Monojit Dutta, Shiv Brat Singh (2020), Electroless NiP coatings over API X70 steel: effect of composition on the H-permeation and corrosion resistance, Surf. Coat. Tech. vol. 403, P 126356.
8. Prasanna Kumar Behera, Prvan Kumar Katiyar, Sudhir Misra and K. Mondal (2020), Effect of pre-induced plastic strains on the corrosion behavior of reinforcing bar in 3.5% NaCl solution, Metall. Met. Trans. A vol 52, pp 605-626.
9. Arti Sahu, Kallol Mondal, Raj Ganesh Pala (2020), Activated porous highly enriched Pt and Pd electrocatalysts from dealloyed noncrystalline alloys for enhanced hydrogen evolution, ChemElectroChem, vol 7, pp 4404-4416.
10. T. D. Naidu, Prabhat K. Rai, K. Sarkar, P. Bijalwan, A. Pathak, M. Dutta, A. Banerjee, K. Mondal (2020), Comparative wear behavior of semi-crystalline HVOF and plasma sprayed phosphorous-rich pig iron coatings, J. Thermal Spray Tech., vol 29, pp 2048-2064.
11. Santigopal Samanta, Charu Singh, Atanu Banerjee, K. Mondal, Monojit Dutta, Shiv Brat Singh (2020), Development of amorphous Ni-P coating over API X70 steel for hydrogen barrier application, Surf Coat. Tech. vol 403, 126356.
12. Santigopal Samanta, Puja Kumari, K. Mondal, Monojit Dutta, Shiv Brat Singh (2020), An alternative and comprehensive approach to estimate trapped hydrogen in steels using electrochemical permeation tests, Inter. J. Hydrog. Energ., vol 45, 26666-26687.
13. Dhananjay Dubey, Kondababu Kadali, Subha S. Panda, Ashwani Kumar, Jayant Jain, K. Mondal, Sudhanshu S. Singh (2020), Comparative Study on the Stress Corrosion Cracking Susceptibility of AZ80 and AZ31 Magnesium Alloys, Mater. Sci. Eng. A, vol 792, 139793.
14. A.Varshney, S.Sangal, A. K. Pramanick, K. Mondal (2020), On the extent of transformation of austenite to bainitic ferrite and carbide during austempering of high Si steel for prolonged duration and its effect on mechanical properties, Mater. Sci. Eng. A vol 793, 139764.
15. B. Bhushan, Kousar Jahan, Prvan Kumar Katiyar, B.S. Murty, K. Mondal (2020), Evolution of ZnO flowerets from dealloying of Cu-Zn alloy powder, Adv. Powder. Tech., vol 31, 3093-3101.
16. Eshan Saraswat, H.S. Maharana, S.V.S. Narayana Murty, S. Shekhar, Kamal. K. Kar, J. Ramkumar, K. Mondal (2020), Fabrication of Al-Si controlled expansion alloys by unique combination of pressureless sintering and hot forging, Adv. Powder. Tech. vol 31, 2820-2832.
17. Avisor Bhattacharya, Kallol Mondal, C.S. Upadhyay, Sandeep Sangal (2020), A phase-field study on the evolution of Widmanstatten-ferrite plates under mixed-mode of Transformation, Comput. Mater. Sci., vol 180, 109718.
18. Prabhat K. Rai, B. Satapathy, K. Sarkar, P. Bijalwan, M. Dutta, A. Banerjee and K. Mondal (2020), Experimental validation of glass forming ability of melt spun ribbons of

pig iron and its derivative compositions and their corrosion behaviour, J. Non-Cryst Sol. Vol 532, 119883.

19. H. S. Maharana, S.V.S. Narayana Murty, J. Ramkumar, K. Mondal (2020), Continuous and ordered surface microtexturing on Cu and Ni-based alloys by novel electrochemical dissolution, J. Alloys and Compound, vol 817, 153263
20. B. Bhuvaneshwari, S. Vivekananthan, G. Sathiyan, G. S. Palani, Nagesh R. Iyer, Prabhat K. Rai, K. Mondal and Raju Kumar Gupta (2020), Doping Engineering of V-TiO_2 for Its Use as Corrosion Inhibitor, J. Alloys and Compounds, vol 816, 152545.

-2019

21. H. S. Maharana, A. Basu and K. Mondal (2019), Effect of CTAB on the architecture and hydrophobicity of electrodeposited Cu-ZrO2 nano-cone arrays, Surf. Coat. Tech., vol 375, 323-333.
22. Prvan Kumar Katiyar, Prasanna Kumar Behera, Sudhir Misra and K. Mondal (2019), Effect of microstructures on the corrosion behavior of reinforcing bars (rebar) embedded in concrete, Metals and Materials International, vol 25, 1209-1226.
23. H. S. Maharana, Ravi Kumar, S.V.S. Narayana Murty, J. Ramkumar, K. Mondal (2019), Surface micro-texturing of dual phase steel and copper by combining laser machining and electrochemical dissolution, J. Mater. Proc. Tech., vol 273, 116260.
24. B. Bhushan, Prvan Kumar Katiyar, B.S. Murty and K. Mondal (2019), Synthesis of Hydrophobic Ni-VN Alloy Powder by Ball Milling, Adv. Powder Tech., vol 30, 1600-1610.
25. Kuntal Sarkar, P.K. Rai, Prvan Katiyar, Biswajeet Satapathy, Abhishek Subhash Pathak, Monojit Dutta, Atanu Banerjee, K. Mondal (2019), Composite (glass + crystalline) coatings from blast furnace pig iron by high velocity oxy-fuel (HVOF) process and their electrochemical behavior, Surf. Coat. Tech. vol 345, 72-83.
26. Prvan Kumar Katiyar, Sudhir Misra and K. Mondal (2019), Comparative corrosion behavior of five microstructures (pearlite, bainite, spheroidized, martensite and tempered martensite) made from a high carbon steel, Metall. Mater. Trans. A, vol 50A, 1489-1501.
27. H. S. Maharana, Prvan Kumar Katiyar and K. Mondal (2019), Structure dependent super-hydrophobic and corrosion resistant behavior of electrodeposited Ni-MoSe2-MWCNT coating, Appl. Surf. Sci., vol 478, 26-37.
28. Prabhat K. Rai, S. Shekhar, K. Yagi, K. Ameyama and K. Mondal (2019), Fretting wear mechanism for harmonic, non-harmonic and conventional 316L stainless steels, Wear, vol 424-425, 23-32.
29. Sandeep Sahu, Nitin Kumar Sharma, Sanjeev Kumar Patel, K. Mondal and S. Shekhar (2019), The effect of grain boundary structure on sensitization behavior in a Nickel-based superalloy, J. Mater. Sci., vol 54, 1797-1818.

-2018

30. B. Bhushan, B.S. Murty and K. Mondal (2018), A new approach for synthesis of ZnO nanorod flowerets and subsequent pure free-standing ZnO nanorods, Adv. Powder Tech., vol 30, 30-41.

31. Asraful Haque, S. Shekhar, S.V.S Narayana Murty, J. Ramkumar, K. Kar and K. Mondal (2018), Fabrication of controlled expansion Al-Si composites by pressureless and spark plasma sintering, Adv. Powder Tech. vol 29, 3427-3439.
32. P.K. Rai, S. Shekhar and K. Mondal (2018), Effects of grain size gradients on the fretting wear of a specially-processed low carbon steel against AISI E52100 bearing steel, Wear, vol 412-413, 1-13.
33. H. S. Maharana, A. Basu and K. Mondal (2018), Structural and tribological correlation of electrodeposited solid lubricating Ni-WSe2 composite coating, Surf. Coat. Tech., vol 349, pp 328-339.
34. Nisheeth Kr. Prasad, A. S. Pathak, S. Kundu and K. Mondal (2018), Possibility of high phosphorus pig iron as sacrificial anode, J. Mater. Eng. Perform., vol 27, 3335-3349.
35. B. Bhushan, B.S. Murty and K. Mondal (2018), Dealloying kinetics and mechanism of porosity evolution in mechanically alloyed $Ag_{25}Zn_{75}$ powder particles, Corrosion Science, vol 139, pp 155-162.
36. P.K. Rai, S. Shekhar and K.Mondal (2018), Development of gradient microstructure in mild steel and grain size dependence of its electrochemical response, Corrosion Science, vol 138, 85-95.
37. H. S. Maharana, S. Jena, A. Basu and K. Mondal (2018), High Temperature Oxidation Resistance of Electrodeposited Reduced Graphene Oxide (RGO) Reinforced Copper Coating, Surf. Coat. Tech., vol 345, 140-151.
38. N. Mahata, A. Banerjee, P.K. Rai, P. Bijalwan, A.S. Pathak, S. Kundu, M. Dutta, and K. Mondal (2018), Glassy blast furnace pig iron and design of other glassy compositions using thermodynamic calculations, J. Non-Cryst. Solids, vol 484, 95-104.
39. Rama Satya Sandilya V., S. Shekhar, S. Sangal and K. Mondal (2018), A novel method for fabricating multi-layered steels, J. Mater. Process. Tech., vol 254, 38-51.

-2017

40. A. Varshney, S.Sangal, Gouthama, A.K. Pramanik, K.Mondal (2017), Microstructural evidence of nano-carbides in medium carbon high silicon multiphase steels, Mater. Sci. Engg. A., vol 708, 237-247.
41. Nilanjan Mahata, A. Banerjee, P. Bijalwan, P.K. Rai, S. Sangal and K. Mondal, (2017). Electrochemical behavior of HVOF sprayed amorphous and nanocrystalline Fe-based Fe73.13Si11.12B10.79Cr2.24C2.72 composite coatings, J. Mater. Eng. Perform., vol 26, 5538-5552.
42. B. Bhushan, B.S. Murty and K. Mondal (2017), A two-step method for synthesis of micron sized nanoporous silver powder and ZnO nanoparticles, Adv. Powder Tech., vol 28, 2532-2541.
43. S. Choudhary, V. Nanda, S. Shekhar, A. Garg and K. Mondal (2017), Effect of microstructural anisotropy on the electrochemical behavior of rolled mild steel, J. Mater. Eng. Perform., vol 26, 185-194.
44. A. Varshney, S. Sangal and K. Mondal (2017), Exceptional Work Hardening behavior of medium carbon high silicon low alloy steels, Metall. Mater. Trans. A, vol 48, 589-593.

-2016

45. P.K. Rai, S. Shekhar, M. Nakatani, S. Vajpai, K. Ameyama and M. Ota (2016), Effect of harmonic microstructure on the corrosion behavior of SUS304L austenitic stainless steel, Metall Mater Trans A, vol 47, 6259-6269.
46. Ravi Johan, Nitin K. Sharma, K. Mondal, Shashank Shekhar (2017), Low temperature cross-rolling to modify grain boundary character distribution and its effect on sensitization of SS 304, J. Mater. Proc. Tech., vol 240, 324-331.
47. V. Venkatesh, Gouthama and K.Mondal (2017), Effect of cast temperature, size and annealing condition on the serrated flow during nano-indentation of Zr-based bulk metallic glasses, J. Alloys Compound., vol 692, 745-757.
48. Pratik Murkute, J. Ramkumar, S. Choudhary and K. Mondal (2016), Effect of alternate corrosion and wear on the overall degradation of a dual phase and a mild steel, Wear, vol 368-369, 368-378.
49. B.P. Kumar, A.P.Moon, K. Mondal, S. Misra (2016): Estimating critical corrosion for initiation of longitudinal cracks in RC structures considering phases and composition of corrosion products, ASCE's J. Mater. Civil Eng. 04016158; PP 1-12.
50. S. Sharma, S. Sangal and K.Mondal (2016), Wear Behavior of Bainitic Rail and Wheel Steels, Mater. Sci. Tech., vol 32, 266-274.
51. A.K. Shukla, S.V.S. Narayana Murty, S.C. Sharma and K.Mondal (2016), The serrated flow and recrystallization in dispersion hardened Cu-Cr-Nb alloy during hot deformation, Mater. Sci. Eng. A, vol 673 135-140.
52. S. Choudhary, A. Garg and K. Mondal (2016), Relation between open circuit potential and polarization resistance with rust and corrosion monitoring of mild steel, J. Mater. Eng. Perform., vol 25, 2969-2976.
53. S. Khara, S. Chaudhury, S. Sangal and K. Mondal (2016): Corrosion resistant Cr-coating on mild steel by powder roll bonding, Surf. Coat. Tech., vol 296, 203-210.
54. A. Varshney, S. Sangal, S. Kundu and K.Mondal (2016), Superior work hardening behavior of moderately high carbon low alloy super strong and ductile multiphase steels with dispersed retained austenite, Mater. Des., vol 99, 439-448.
55. C. Chattapadhyay, K.S.N. Satish Idury, Jatin Bhatt, K. Mondal and B.S. Murty (2016), Critical evaluation of glass forming ability criteria, Mater. Sci. Tech., vol 32, 380-400.
56. A. Varshney, S. Sangal, S. Kundu and K.Mondal (2016), Super strong and highly ductile low alloy multiphase steels consisting of bainite, ferrite and retained austenite, Mater. Des., vol 95, 75-88.

-2015

57. S. Monia, A.Varshney, Gouthama, S. Sangal, S. Kundu, S. Samanta and K. Mondal (2015), Development of highly-ductile Spheroidized Steel from High C (0.61 wt. % C) Low Alloy Steel, J. Mater. Eng. Perform., vol 24, 4517-4542.
58. K. Mondal and B.S.Murty (2015), Factors influencing oxidation Behavior of Metallic Glasses, IIM Transactions, vol 68, 1151-1154.
59. A.K. Shukla, S.V.S. Narayana Murty, S.C. Sharma and K.Mondal (2015): Constitutive modelling of hot deformation behavior of vacuum hot pressed Cu-8Cr-4Nb alloy, Mater. Des, vol 75, 57-64.

60. A.P. Moon, S. Sangal, S. Layek, S. Giribaskar and K.Mondal (2015), Corrosion behavior of high strength bainitic rail steels, Metall. Mater. Trans. A, vol 46, 1500-1518.
61. A. Siebert-Timmer, K. Mondal and L. Bichler (2014), Degradation of SPS fabricated YSZ and CeO2-YSZ ceramics in supercritical water, Int. J. Appl. Ceram. Tech. Page 1-9.
62. S. Sharma, S. Sangal and K.Mondal (2014), Wear behavior of newly developed bainitic wheel steels, J. Mater. Eng. Perform., vol 24, 999-1010.
63. M. Prakash, S. Shekhar, A.P. Moon and K. Mondal (2015), Effect of machining configuration on the corrosion behavior of mild steel, J. Mater. Proc. Tech., vol 219, 70-83.
64. S. Patra, Gouthama and K.Mondal (2015), Densification behavior of mechanically milled Cu-8 at% Cr alloy and its mechanical and electrical properties, Progress in Natural Science: Materials International, vol 24, 608-622.

-2014

65. C. Chattopadhyay, S. Sangal and K. Mondal (2014): Simulated isothermal crystallization kinetics from non-isothermal experimental data. IIM Trans., vol 67 (2014) 945-958.
66. K.D. Robles Arellano, L. Bichler, K. Mondal and R. Fong, (2014): Compressive creep behavior of spar plasma sintered 8 mol% yittria stabilized zirconia. J Mater Eng Perform., vol 23, 3680-3684.
67. M. Mandal, S. Sangal and K. Mondal (2014): Nanoporous Ag template from partially sintered Ag-Zn compact by dealloying. Bull. Mater. Sci., vol 37, 1353-1367.
68. S. Sharma, S. Sangal and K.Mondal (2014), Influence of subsurface structure on the linear reciprocating sliding wear behavior of steels with different microstructures, Metall. Mater. Trans. A, vol 45, 6088-6102.
69. S. Sharma, S. Sangal and K.Mondal, Reciprocating sliding wear behavior of newly developed bainitic steels, (2014): Metall. Mater. Trans. A., vol 45, 5451-5468.
70. M. Mandal, D. Singh, Gouthama, B.S. Murty, S. Sangal and K. Mondal (2014): Porous copper template from partially spark plasma sintered Cu-Zn aggregate via dezincification. Bull. Mater. Sci., vol 37, 743-752.
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107. K. Mondal, U.K. Chatterjee and B.S. Murty (2006): Electrochemical behavior of multicomponent amorphous and nanocrystalline Zr-based alloys in different environments. Corrosion Sci., vol 48, 2212-2225.
108. K. Mondal, U.K. Chatterjee and B.S. Murty (2006): Surface Oxides and Their Effect on the Oxidation Behavior of Amorphous and Nanoquasicrystalline Zr-Pd and Zr-Pt Alloys. J. Mater. Res., vol 21, 639-646.

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110. K. Mondal, U.K. Chatterjee and B.S. Murty (2005): Stress Corrosion Cracking Behavior of 8090 Al- Li Alloy in Chloride Medium. Corr. Engg. Sci. Tech., vol 40, 313-320.
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112. K. Mondal, U.K. Chatterjee and B.S. Murty (2004): Corrosion and Oxidation Behavior of Amorphous and Nanoquasicrystalline Phases in $Zr_{70}Pd_{30}$ and $Zr_{80}Pt_{20}$ Alloys. J. Non-Cryst. Sol., vol 334-335, 544-547.

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113. K. Mondal, U.K. Chatterjee and B.S. Murty (2003): Gibb's Free Energy for the Crystallization of Glass Forming Liquids. Appl. Phys. Lett., vol 83, 671-673.

Total Publication (as of 10th June 2021): 160

Conference proceeding: 3

1 A. Mukherjee, M. Ghosh, K. Mondal, P Venkitanarayanan, A.P. Moon and A. Varshney (2015), Study of mechanical properties, microstructures and corrosion behavior of al 7075 t651 alloy with varying strain rate, IOP Conf. Series: Materials Science and Engineering, Vol 75, 012031.

2 A. Moon, A.C. Vajpei, R. Balasubramaniam and K. Mondal (2010): Phase Analysis and Characterization of Rusts on Rail Steels. In: CORCON 2010, 23-25th September, Goa, India.

3 K. Mondal, B.S. Murty and U.K. Chatterjee (2005): Corrosion and oxidation behaviour of melt spun $Zr_{55}Ti_{25}Ni_{20}$ alloy. In: Proceedings of the International Conference on Advanced Materials Desisn and Development (ICAMDD-2005), Goa, December 2005 (in CD Rom).

7. Development

Following patents have been filed.

Sr. No	Developers	Description	Year
1	K. Mondal, MME, Mr. Tapendu Mandal, Research Scholar, MME ,Mr. Prem Prakash, MD, Cenogen Materials Pvt. Ltd.	Powder coating system development (2151/DEL/2010) Indian patent	Published on 25th October 2013 and awaiting examination
2	S, Sangal, N. Tiwari and K. Mondal	Solar drier: It is a RUTAG, IIT Kanpur development. We are in a process of hading over the technology to Rural India (small farmers).	2014 started patent document is with SIDBI
3	P.K. Rai, S. Choudhary, S. Shekhar and K.Mondal	Novel technique to generate controlled microstructure with refined and coarse grains	Patent filed (2017): 201711004918
4	Bharat Bhushan, B. S. Murty, K. Mondal	A two-step method of making Nanoporous silver micron sized powder particles	Patent Granted (2020) 342468
5	Rama Satya Sandilya V, S. Sangal, S. Shekhar, K.Mondal	Harmonic Multilayered Steel with Variable Composition	Patent granted (2020) Grant No: 340072
6	S. Sangal, K. Chandrasekhar, K. Mondal, A. Varshney, S. Sharma	A new process for making horseshoes for horses	Patent filed (2017) 201711004727
7	N. Mahata, V. Venkatesh, K.Mondal, S. Sangal, A. Banerjee	Glass forming alloys using high phosphorous pig iron	Patent filed (2017) 201731008474
8	Nisheeth Kr. Prasad, K.Mondal, S. Choudhary, S. Chatterjee and S. Kundu	High P pig iron as sacrificial anode for cathodic protection of underground mild steel structures	Patent filed (2017) 201731029652
9	Bharat Bhushan, Animesh Dutta, B. S. Murty, K. Mondal	Process for preparing ZnO nano-rod flowerets supported by Ni substrate and free standing pure ZnO.	Patent filed (2018) 201811008439
10	Bharat Bhushan, Prvan Kumar	Nickel-vanadium nitride hydrophobic alloy	Patent filed (2018)

	Katiyar, B. S. Murty, K. Mondal	powder	201811045364
11	Nisheeth Kr. Prasad, K.Mondal, S. Choudhary, S. Chatterjee and S. Kundu	High P pig iron (3.5 and 8%P) as sacrificial anode for cathodic protection of underground mild steel structures	Patent filed (2019) 201931006900
12	S. Khara, J. Zambre, S. Sangal, Ashim Bose, B. Bhattacharya, K. Mondal	Art of making earthenware with variable porosity and high damping capacity	Patent filed (2019) 201911038028
14	A. Bhattacharya, P.K. Rai, Neetu, S. Garg and all 8 members of Imprint proposal, K. Mondal et al.	High strength steel composition and method thereof	Patent filed (2019) 201911030090
15	K. Vishwanath, S. S. Singh and K. Mondal	Simulated marine environment device for corrosion testing	Patent filed (2019) 201911033731
16	Santigopal Samanta et al.	Ni-based amorphous coating for line pipe steel, for preventing atmosphering corrosion and hydrogen embrittlement	Patent filed (2020) 202031009500
17	D. Banik, G.P. Bajpai and K. Mondal	Press milling machine for making novel harmonic structure in metals and alloys	Patent filed (2020) 202011027557
18	S. Samanta, C. Singh, M. Dutta, K.T. Viswanath, K. Mondal and S.B. Singh	Ni-based amorphous coating for line pipe steel, for preventing atmosphering corrosion and hydrogen embrittlement	Patent filed (2020) 202033047371
19	S. Samanta, C. Singh, M. Dutta, K.T. Viswanath, K. Mondal and S.B. Singh	Ni-based amorphous coating for line pipe steel, for preventing atmosphering corrosion and hydrogen embrittlement	Patent filed (2020) 202033047372

8. Funding:

- ***Bulk metallic glass coating by mechanical milling/alloying: Institute support, completed, 2008-2010.***
- ***Bulk metallic glass coating: Department of Science and Technology, India Completed 2009-2012. (Co-PI: Prof. Gouthama)***
- ***Development of Corrosion and Wear Resistant Ni and Al-based Metallic Glass and Nanocrystalline Coatings: Naval Research Board, India sanctioned: Completed 2009-2013. (Co-PI: Prof. R. Balasubramaniam)***
- ***Role of particle size of yittria stabilized zirconia on the wear resistance of the plasma sprayed aluminium oxide coating, Space Technology Cell, Completed, 2012-2014. (Co-PI) (PI: Prof. K. Balani)***
- ***Rutag sub project (Solar power evaporative cooler for vegetable storage) 2015-16. Rutag India, IIT Kanpur. (PI) (Co-PI: Prof. S. Sangal, Prof. H.C. Verma, Prof. K. Kant)***
- ***Rutal sub project (Development of a thermal solar dryer for food processing, , 2015-16. Rutag India, IIT Kanpur. (Co-PI) (PI: Prof. S. Sangal)***
- ***Surface grooving of Cu/Ni based alloys using Jet Electrolytic dissolution for enhancement of heat transfer rate, Space Technology Cell, (Co-PI: Prof. J. Ramkumar) (2016-2018)***
- ***Layered steel for structural applications, DIC, MHRD, (Co-PI: Prof. S. Sangal and Prof. S. Shekhar) (2016-2018)***

- ***Surface texturing of bio-materials, ISRO Technology Cell, (as a Co-PI) (2016-2018)***
- ***High strength, wear and corrosion resistant steel for high speed rail and elastic clip, Imprint, (PI). (2017-continuing)***
- ***Development of controlled expansion (CE) Al-Si alloys by packed rolling, ISRO, (PI) 2017-2019)***
- ***In situ formed metal oxide coated inert anode for impressed current cathodic protection of steel structures, SERB, DST, (PI) 2021-2024***
- ***Synthesis Of Pure Lab6 Via Solid State Metallothermic Reduction (Ca/Mg/Al+B2o3+La2o3/Lacl3) And Subsequent Making Of Hallow Tube Of Lab6, ISRO, (PI) 2020-2022***
- ***Pitting in 120 mm Barrel cannon,Ordinace factory, Kanpur- 1st phase Completed, 2014-15.***
- ***Development of high strength highly ductile low carbon low alloy multiphase steels for structural applications, TATA Steel, Completed 2016.***
- ***Making of cake from lead grids without melting, Verdeen Chemicals Pvt. Ltd., Hapur, (Co-PI) (PI: Prof. S. Shekhar)***
- ***Thermodynamics of glass formation, TATA Steels, Jamshedpur. (sole PI)***
- ***Pitting in 120 mm Barrel cannon, Ordnance factory, Kanpur (~7 lakhs)- 2nd phase 2017.***
- ***Synthesis of Fe-based metallic glass from HPPI (Original and selected modified compositions) through rapid solidification, TATA Steel,***
- ***Characterization of scale formed on hot rolled Si-containing steel sheets and optimization of pickling condition for proper cleaning, TATA Steel,***
- ***Exploring the feasibility of using high phosphorus cast iron as sacrificial material, TATA Steel,***
- ***Lecture series on Fundamentals of Corrosion and its Application, TATA Steel,***
- ***Effect of ultrasonic cleaning on the metal surface of 105/37 mm cannon, Ordnance factory, Bareily, India,***
- ***Investigation on the hydrogen embrittlement susceptibility in NiP coated X70 steel by SSRT, TATA Steel.***
- ***Investigation on the hydrogen embrittlement susceptibility in NiP coated X70 steel by SSRT, TATA Steel***
- ***Synthesis of Fe-based glass coatings from HPPi (selected modificeed compositions (ii and iii) via HVOF and APS methods. Tata Steel***
- ***Long-Term Corrosion Study Of The Foundation System And Providing Feasible Options, Adani group Gujarat.***
- ***Gold coloring standardization, Titan India,***

10. Peer recognition:

(i) National Scholarship Award from WBBSE in the year 1989.
(ii) National Scholarship Award from WBCHSE in the year 1991.
(iii)Teaching Assistanceship by IIT, Kharagpur for the year 2002-2003.
(iv)High Value PhD Fellowship from SRIC, IIT Kharagpur 2004-2005

(v) Chairman of American Society of Metals (ASM) International (Student Chapter) Indian Institute of Technology Kharagpur 2003-2004.
(vi) Secretary of the Conference of Research Scholars on Metallurgical and Materials Engineering (CRSMSE-2003) held at Kharagpur on 30-31 August 2003.
(vii) Secretary of Indian Institute of Metals, Kanpur chapter, 2009-10.
(viii) Life member of Indian Institute of Metals (IIM) Membership number: K04 LM01 33419.
(ix) Life member of MRSI
(x) Member, Japan Institute of Metals 2006-2007
(xi) Among the top 20% reviewer for Metallurgical and Materials Transactions A.
(xii) Abhijeet Moon, Best paper award in CORCON 2010. Paper title: "Phase Analysis and Characterization of Rusts on Rail Steels" Other authors: Vajpei, A.C., Balasubramaniam, R., Mondal, K. In: CORCON 2010, 23-25th September, Goa, India.
(xiii) P K Kelkar Young Faculty Research Fellowship, 2012, IIT Kanpur.
(xiv) Editorial Board Member: Scientific Reports
(xv) K. Mondal, Mascot National Award – 2017, Electrochemical Society of India.
(xvi) Satish Chandra Agarwal Chair, IIT Kanpur: period 2018-2021
(xvii) Excellence in Teaching Award by IIT Kanpur in 2019.

Student's accolades:

(i) Best poster award for the paper: "Corrosion and Erosion Characteristics of In-situ Ball Milled Atmospheric Plasma Sprayed Ni-Ti Coating on Mild Steel" Authored by **A.P. Moon**, A. Barman, C. Chattopadhyay, S.T. Anand, N. Balaji, Gouthama and K.Mondal, ADNAN 2013, Chennai 2013.
(ii) Research paper authored by **Mr. Abhinav Varsheney** (PhD Student), Mr. D. Verma (Grad. Student), Prof. S. Sangal and Prof. K. Mondal in Transactions IIM has been adjudged for the IIM SAIL GOLD MEDAL.
(iii) **Prabhat K. Rai**, First prize in oral session, Railway Materials and Processing, Corrosion behaviour of SUS304L austenitic stainless steel with harmonic microstructure, NMD-2016, IIT Kanpur.
(iv) **H. S. Maharana:** Best poster award for the paper: "Electrophoretic Deposition of Cu-RGO Composite Coatings and its High Temperature Oxidation Resistance" Authored by H. S. Maharana, A Basu, K. Mondal, ICAMP ADMAT-SkyMat, Thiruvananthapuram, 14-16 Dec, 2017.
(v) **Prabhat Kumar Rai:** Best poster presentation award for the paper. "Corrosion and wear behavior of harmonic structured SUS304L austenitic stainless steel" Authored by Prabhat K. Rai, S. Shekhar, M. Nakatani, S. K. Vajpai, M. Ota, K. Ameyama, and K. Mondal, Advanced Materials and Nanotechnology, Osaka, Japan, 26-28 Oct, 2017.
(vi) **Prvan Kumar Katiyar:** Best poster award for the paper: "Corrosion behaviour of Newly Developed TMT Steel Rebars" Authored by Prvan Kumar Katiyar, S. Misra and K. Mondal, ICAMP ADMAT-SkyMat, Thiruvananthapuram, 14-16 Dec, 2017.

11. Contribution to the Institute

1. Head, Institute Counselling Service
2. Warden, SBRA
3. Chief Coordinator and Sports councilor, Inter-IIT annual sports meet (2009-11)
4. SSPC Chairman (2014-2015)
5. SENATE special committee member for making SSPC manual
6. Co-Chairman, Institute security (2012-March 2016)
7. Hostel warden Hall 2 (2008-2010)
8. Physical Metallurgy Coordinator, 2015 continuing
9. DUGC member (2015-2016)
10. Student's coordinator (2008)
11. UG industrial training (2008)
12. Staff committee (2014-15)
13. IRDC representative (2014-15)
14. Members department budget committee (2014-15)
15. Department representative to DORA (2015-16)
16. Head, Dept. of Materials Science and Engineering (April 2021 to 2024)

12. Participation in National/International level committees and running short-term training courses:

(i) Delivering lectures in several short courses:
Courses for NAL students organized by Aerospace Engineering, IIT Kanpur
TeQIP courses on heat treatment of Metals and Alloys (https://www.youtube.com/watch?v=iA2DoBJ4gCw)
TeQIP guest lecture at IIT Hyderabad on Characterizations

(ii) Active member of Rutag, India. Developing two products: Solar drier and Earthen cooler. (We have project on Solar drier and for earthen cooler, UP government has shown their keen interest)

(iii) Chairman of American Society of Metals (ASM) International (Student Chapter) Indian Institute of Technology Kharagpur 2003-2004.

(iv) Secretary of the CRSMSE-2003 held at Kharagpur on 30-31 August 2003.

(v) Secretary, IIM Kanpur Chapter, 2009-10.

(vi) Correspondence of IIM Metal News, Kanpur zone (2013-2016)

(vii) Handling the accommodation, transport and food for upcoming NMD-ATM 2016 in November at IIT Kanpur.

(viii) Member of Departmental Academic Committee (DAC) for Metallurgy Department of NIT Raipur.

13. Others

Fields of Specialization.

- Corrosion and oxidation behavior of metallic glass and its devitrified states (nanocrystalline states), Multi-phase and Bainitic steels, Magnesium alloys.
- Thermodynamics and Kinetic analysis of Glassy alloys, Physical metallurgy and phase transformation.

- Development of bulk metallic glass and nanocrystalline coating, Cr coating
- Development of rail/wheel/axle steels for Indian railways.
- Development of multi-phase high strength and ductile construction steels.
- Development of nanoporous metal and ceramics template for catalysis.
- Deformation behavior of bulk metallic glass.
- Archeometallurgy.

Reviewer:

Scripta Materialia, Corrosion Science, Materials Science and Engineering A and B, Applied Physics Letters, J. Alloys and Compounds, Materials Characterizations, etc.

Collaboration:

1. Prof. S. Misra, Civil, IIT Kanpur on Corrosion prediction in Rebar
2. Prof. B.S. Murty, IIT Chennai, on Glassy alloys as well nano-porous Ag and Cu templates
3. Prof. J. Bhatt, VNIT, Nagpur, on Glass forming ability
4. Dr. L. Bichler, Univ. British Columbia, on Structural ceramics and magnesium alloys.
5. Active collaboration with TATA Steel on multi-phase steel development and Corrosion resistant Fe-based amorphous alloy development
6. Prof. K. Ameyama, Ritsumeikan University
7. Dr. S. Kundu and Dr. A. Banerjee, TATA Steel, Jamshedpur
8. Dr. Sandip Ghoshchaudhary and Dr. G.K. Mandal (NML Jamshedpur)

Total citation: ~2000 (as per google scholar)
h index: 23: i10 index: 38