Dr. Siddhartha Roy

Assistant Professor, Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur
Telephone (office): +91 3222 283270, E-mail: Siddhartha@metal.iitkgp.ac.in

Research areas

- Advanced metal matrix and ceramic matrix composites
- Porous metals and ceramics
- Non-destructive characterization
- Elasticity analysis of anisotropic materials
- Diffraction based stress analysis in multiphase materials
- Laser processing of advanced alloys and composites

Academic qualification

Doktor der Ingenieurwissenschaften (Dr.-Ing.) with *summa cum laude* (Distinction)
Faculty of Mechanical Engineering, Universität Karlsruhe (TH), Germany, 2006 - 2009
Dissertation: Metal/ceramic composites from freeze-cast preforms: domain structure and mechanical properties

Master of Technology (M.Tech) with DAAD - M.Tech Sandwich Model Scholarship (cpi: 9.71 in a scale of 10)
Department of Metallurgical Engineering and Materials Science, Indian Institute of Technology Bombay, 2003 - 2005
Dissertation: High temperature mechanical properties of cellular solids produced from hollow stainless steel spheres (carried out in the framework of *DAAD – Masters Sandwich Model Scholarship* at Institut für Werkstoffkunde I, Universität Karlsruhe (TH), Germany)

Bachelor of Engineering *in Metallurgical Engineering (1st Class)*
Department of Metallurgical Engineering, Jadavpur University, India, 1998 – 2002

***Professional and research experience* (**in reverse chronological order**)**

July 2018 – continuing: Assistant Professor Grade I, Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur, West Bengal, India

September 2015 – June 2018: Senior Materials Engineer at Mechanical Engineering Division, BKW Energie AG, Bern, Switzerland

March 2013 – August 2015: Head of Materials Laboratory, Kennametal Stellite GmbH, Koblenz, Germany

July 2011 – February 2013: Project leader within the scope of 4. DFG Nachwuchsakademie, Institute of Applied Materials (IAM-WK), Karlsruhe Institute of Technology, Germany

August 2009 – June 2011: Post Doctoral Scientist, Institute of Applied Materials (IAM-WK), Karlsruhe Institute of Technology, Germany

January 2006 – July 2009: Research Associate, Institut für Werkstoffkunde I, Universität Karlsruhe, Germany

Awards/Recognitions

- Honorarium of 500 GBP from Taylor & Francis for the article “Review on developments of bulk functionally graded composite materials” published in International Materials Reviews
- Outstanding reviewer recognition by Materials Science and Engineering A, several occasions
- Listed in **Marquis Who’s Who in the World 2012** edition
- Young investigator grant for 2 years from German Research Foundation (DFG) within the scope of 4th DFG Nachwuchsakademie
- DAAD-Masters Sandwich Model Scholarship from Deutscher Akademischer Austausch Dienst, September 2004 – May 2005
- Scholarship from Ministry of Human Resource Development, Government of India for the complete duration of M.Tech degree

Publications and presentations

Publications Summary

No. of publications in peer-reviewed journals: 35
No. of publications in conference proceedings: 7
No. of books/book chapters: 3
No. of oral presentations: 19

Citation summary (Source: Google Scholar)

Profile URL: https://scholar.google.ch/citations?user=mI_Dgm0AAAAJ&hl=en
IIT Kharagpur researcher profile: https://iitkgp.irins.org/profile/158314
Exaly profile: https://exaly.com/author/7156261/siddhartha-roy
Scopus profile: https://www.scopus.com/authid/detail.uri?authorId=36063948000

Summary statistics (as of 30.12.2022)

Google Scholar
No. of citation: 687
h-index: 16
i-10 index: 20

Exaly project
Ranking in terms of no. of papers: top 14%
Ranking in terms of citations: top 17%
Ranking in terms of h-index: top 11%
Avg. impact factor: 4.5

List of publications

Books/book chapters

1. ***S. Roy***, J. Gibmeier, K. A. Weidenmann, A. Wanner, Effect of phase architecture on mechanical properties of interpenetrating metal/ceramic composites, pp. 77-86, in Materials Challenges and Testing for Manufacturing, Mobility, Biomedical Applications and Climate Ed.: W. Udomkichdecha, T. Böllinghaus, A. Manonukul, J. Lexow, Springer, Switzerland, 2014 (ISBN: 978-3-319-11339-5)
2. ***S. Roy***, J. Gibmeier, K.A. Weidenmann, A. Wanner, Mechanical properties of innovative metal/ceramic composites based on freeze-cast ceramic preforms, pp. 213-220, in Materials Challenges and Testing for Supply of Energy and Resources Ed.: T. Böllinghaus, J. Lexow, T. Kishi, K. Kitagawa, Springer, Germany, 2012 (ISBN: 978-3-642-23347-0)

3. ***S. Roy***, Metal/ceramic composites from freeze-cast preforms: domain structure and mechanical properties, Dissertation, University of Karlsruhe (TH), Germany, publication series: Werkstoffwissenschaft und Werkstofftechnik Ed.: D. Löhe, A. Wanner, P. Gumbsch, O. Kraft, P. Elsner, V. Schulze, Shaker Verlag GmbH, Aachen, Germany, 2009 (ISBN: 978-3-8322-8581-4)

Peer reviewed journals:

1. M. K. Nayak, ***S. Roy***, I. Manna, Effect of substrate surface roughness on the microstructure and properties of laser surface cladding of Tribaloy T-400 on mild steel, Surface and Coatings Technology, accepted
2. S. Ray, P. Jana, S. K. Kar, ***S. Roy***, Influence of monomodal K_2CO_3 and bimodal K_2CO_3 + NaCl as space holders on microstructure and mechanical properties of porous copper, Materials Science and Engineering A, 862, 144516, 2023
3. ***S. Roy***, P. Albrecht, K. A. Weidenmann, Influence of ceramic freeze-casting temperature on the anisotropic thermal expansion behaviour of corresponding interpenetrating metal/ceramic composites, Journal of Materials Engineering and Performance, accepted, doi: 10.1007/s11665-022-07769-2
4. N. Kota, P. Jana, ***S. Roy***, Elastic properties of porous silicon nitride fabricated via a low-temperature sintering route, Ceramics International, doi: 10.1016/j.ceramint.2022.10.178
5. A. K. Naik, Md. Nazeer, D. K. V. D. Prasad, T. Laha, ***S. Roy***, Development of functionally graded ZrB_2-B_4C composites for lightweight ultrahigh-temperature aerospace applications, Ceramics International, 48, 33332-33339, 2022
6. Md. Nazeer, P. Jana,M. J. Oza, K. G. Schell, E. C. Bucharsky, T. Laha, ***S. Roy***, Ultrasonic study of the elastic properties of monolithic and hybrid functionally graded composites with equivalent overall compositions, Materials Letters, 323, 132594, 2022
7. P. Maurya, N. Kota, J. Gibmeier, A. Wanner, ***S. Roy***, Review on study of internal load transfer in metal matrix composites using diffraction techniques, Materials Science and Engineering A, 840, 142973, 2022
8. P. Jana, S. Ray, D. Goldar, N. kota, S. K. Kar, ***S. Roy***, Study of the elastic properties of porous copper fabricated via the lost carbonate sintering process, Materials Science and Engineering A, 836, 142713, 2022
9. M. Sai Charan, A. K. Naik, N. Kota, T. Laha, ***S. Roy***, Review on development of functionally graded composite materials, International Materials Reviews, 67, 797-863, 2022
10. P. Jana, M. J. Oza, K. G. Schell, E. C. Bucharsky, T. Laha, ***S. Roy***, Study of the elastic properties and thermal shock behavior of Al-SiC-graphite hybrid composites fabricated by spark plasma sintering, Ceramics International, 48, 5386-5396, 2022
11. N. Kota, M. Sai Charan, T. Laha, ***S. Roy***, Review on development of metal/ceramic interpenetrating phase composites and critical analysis of their properties, Ceramics International, 48, 1451-1483, 2022
12. P. Maurya, L. Vaishnavi, I. Sen, ***S. Roy***, A critical assessment of the processing parameters yielding an optimum combination of mechanical properties in cast Al-B_4C composites, Transactions of the Indian Institute of Metals, 74, 1279-1294,2021

13. N. Kota, P. Jana, S. Sahasrabudhe, ***S. Roy***, Processing and characterization of Al-Si alloy/SiC foam interpenetrating phase composite, Materials Today Proceedings, 44, 2930-2933, 2021

14. M. J. Oza, K. G. Schell, E. C. Bucharsky, T. Laha, ***S. Roy***, Developing a hybrid Al-SiC-graphite functionally graded composite material for optimum composition and mechanical properties, Materials Science and Engineering A, 805, 140625, 2021

15. ***S. Roy***, A. Nagel, K. A. Weidenmann, Anisotropic thermal expansion behavior of an interpenetrating metal/ceramic composite, Thermochimica Acta, 684, 178488, 2020

16. ***S. Roy***, J. Frohnheiser, A. Wanner, Effect of ceramic preform freeze-casting temperature and melt infiltration technique on the mechanical properties of a lamellar metal/ceramic composite, Journal of Composite Materials, 54(15), 2001-2011, 2020

17. ***S. Roy***, J. Gibmeier, K. G. Schell, E. C. Bucharsky, K. A. Weidenmann, A. Wanner. M. J. Hoffmann, Internal load transfer in an interpenetrating metal/ceramic composite material studied using energy dispersive synchrotron X-ray diffraction, Materials Science and Engineering A, A753, 247-252, 2019

18. ***S. Roy***, K. G. Schell, E. C. Bucharsky, K. A. Weidenmann, A. Wanner, M. J. Hoffmann, Processing and characterization of elastic and thermal expansion behaviour of interpenetrating Al12Si/alumina composites, Materials Science and Engineering A, A743, 339-348, 2019

19. C. Simpson, P. J. Withers, T. Lowe, ***S. Roy***, A. Wanner, Damage evolution in freeze cast metal/ceramic composites exhibiting lamellar microstructures, Frattura ed Integritá Strutturale, 33, 134-142, 2015

20. ***S. Roy***, J. Gibmeier, V. Kostov, K. A. Weidenmann, A. Nagel, A. Wanner, Load partitioning study in a 3D interpenetrating AlSi12/Al_2O_3 metal/ceramic composite, Materials Science Forum, 772, 103-107, 2014

21. Y. Sinchuk, ***S. Roy***, J. Gibmeier, R. Piat, A. Wanner, Numerical study of internal load transfer in metal/ceramic composites based on freeze-cast ceramic preforms and experimental validation, Materials Science and Engineering A, A585, 10-16, 2013

22. ***S. Roy***, K. G. Schell, E. C. Bucharsky, K. A. Weidenmann, A. Wanner, M. J. Hoffmann, Characterisation of elastic properties in porous silicon carbide performs fabricated using polymer waxes as pore formers, Journal of the American Ceramic Society, 96, 2269-2275, 2013

23. ***S. Roy***, P. Albrecht, L. Przybilla, K. A. Weidenmann, M. Heilmaier, A. Wanner, Effect of phase architeture on thermal expansion behavior of interpenetrating metal/ceramic composites, Ceramic Transactions, 240, 33-43, 2013

24. ***S. Roy***, K. G. Schell, C. Bucharsky, P. Hettich, S. Dietrich, K. A. Weidenmann, A. Wanner, M. J. Hoffmann, Processing and elastic property characterisation of porous SiC preform for interpenetrating metal/ceramic composites, Journal of The American Ceramic Society, 95, 3078-3083, 2012

25. ***S. Roy***, J. Gibmeier, V. Kostov, K. A. Weidenmann, A. Nagel, A. Wanner, Internal load transfer and damage evolution in a 3D interpenetrating metal/ceramic composite, Materials Science and Engineering A, A551, 272-279, 2012

26. ***S. Roy***, J-M. Gebert, G. Stasiuk, R. Piat, K. A. Weidenmann, A. Wanner, Complete determination of elastic moduli of interpenetrating metal/ceramic composites using ultrasonic techniques and micromechanical modelling, Materials Science and Engineering A, A528, 8226-8235, 2011
27. ***S. Roy***, A. Wanner, T. Beck, T. Studnitzly, G. Stephani, Mechanical properties of cellular solids produced from hollow stainless steel spheres, Journal of Materials Science, 46, 5519-5526, 2011
28. ***S. Roy***, O. Stoll, K. A. Weidenmann, A. Nagel, A. Wanner, Analysis of the elastic properties of an interpenetrating AlSi12-Al2O3 composite using ultrasound phase spectroscopy, Composites Science and Technology, 71, 962-968, 2011
29. ***S. Roy***, J. Gibmeier, V. Kostov, K. A. Weidenmann, A. Nagel, A. Wanner, Internal load transfer in a metal matrix composite with a three dimensional interpenetrating structure, Acta Materialia, 59, 1424-1435, 2011
30. ***S. Roy***, B. Butz, A. Wanner, Damage evolution and domain-level anisotropy in metal/ceramic composites exhibiting lamellar microstructures, Acta Materialia, 58, 2300-2312, 2010
31. R. Piat, ***S. Roy***, A. Wanner, Material parameter identification of interpenetrating metal/ceramic composites, Key Engineering Materials, 417-418, 53-56, 2010
32. ***S. Roy***, J. Gibmeier, A. Wanner, Residual stresses in novel metal/ceramic composites exhibiting a lamellar microstructure, Powder Diffraction Suppl., 24(S1), S59-S64, 2009
33. ***S. Roy***, J. Gibmeier, A. Wanner, In-situ study of internal load transfer in a novel metal/ceramic composite exhibiting lamellar microstructure using energy dispersive synchrotron X-ray diffraction, Advanced Engineering Materials, 11, 471-477, 2009
34. T. Ziegler, A. Neubrand, ***S. Roy***, A. Wanner, R. Piat, Elastic constants of metal/ceramic composites with lamellar microstructures: finite element modelling and ultrasonic experiments, Composites Science and Technology, 69, 620-626, 2009
35. ***S. Roy***, A. Wanner, Metal/ceramic composites from freeze-cast ceramic preforms: domain structure and elastic properties, Composites Science and Technology, 68, 1136–1143, 2008

Conference proceedings:

1. ***S. Roy***, F. Kessler, K. A. Weidenmann, A. Wanner, A. Nagel, Thermal expansion behavior of an interpenetrating metal/ceramic composite, Proceedings of 19. Symposium: DGM Verbundwerkstoffe und Werkstoffverbunde, ISBN: 978-3-00-042309-3, 385-393, 2013, Karlsruhe, Germany
2. ***S. Roy***, K. G. Schell, C. Bucharsky, P. Hettich, S. Dietrich, K. A. Weidenmann, A. Wanner, M. J. Hoffmann, Processing and non-destructive characterisation of porous silicon carbide preforms for metal/ceramic composite fabrication, Proceedings of CELLMAT 2012
3. Y. Sinchuk, R. Piat, ***S. Roy***, J. Gibmeier, A. Wanner, Inelastic behavior of the single domain of metal-ceramic composites with lamellar microstructure, Proceedings of Applied Mathematics and Mechanics (PAMM), 11, 285-286; 2011

4. ***S. Roy***, O. Stoll, K. A. Weidenmann, A. Wanner, A. Nagel, Elastic properties of an interpenetrating metal matrix composite, Proceedings of 18. Symposium: DGM Verbundwerkstoffe und Werkstoffverbunde, ISBN: 978-3-00-033801-4, 139-144, 2011, Chemnitz, Germany
5. ***S. Roy***, J-M. Gebert, A. Wanner, Complete stiffness characterization of a lamellar metal/ceramic composite using ultrasonic spectroscopy techniques, Paper No. F19.1, Proceedings of the 17th International Conference on Composite Materials, July 27-31, 2009, Edinburgh, Scotland
6. ***S. Roy***, J. Gibmeier, A. Wanner, Residual stresses in novel metal/ceramic composites exhibiting a lamellar microstructure, Advances in X-ray Analysis, 52, 739-746, 2009
7. ***S. Roy***, B. Butz, A. Wanner, Damage evolution and anisotropy in freeze cast metal/ceramic composites: an in-situ SEM analysis, Paper No. 303, Proceedings of the 13th European Conference on Composite Materials, June 2-5, 2008, Stockholm, Sweden

Oral presentations (as author or co-author):

1. Development of functionally graded ZrB2-B4C composites for lightweight ultrahigh-temperature aerospace applications, International Conference on Global Trends in Traditional to Space Ceramics (GT-TSC'22), IIT-BHU, December 8-9, 2022
2. X-ray microscopy analysis of functionally graded SiC particle reinforced aluminum matrix composites using dual-energy tomography, 6th International Congress on 3D Materials Science Washington DC, June 29th, 2022
3. Metal/ceramic composites with interpenetrating architectures for optimum thermal and mechanical properties, Third Indian Materials Conclave and 32nd Annual General Meeting of MRSI, 22.12.2021 ***(invited lecture)***
4. Porous ceramics and interpenetrating metal/ceramic composites for defense and aerospace applications, Faculty Development Program organized by the Department of Mechanical Engineering, IIT Tirupati, 06-10.12.2021 **(*invited lecture*)**
5. Thermal expansion behavior of an interpenetrating metal/ceramic composite, 19. Symposium: DGM Verbundwerkstoffe und Werkstoffverbunde, 3-5th July 2013, Karlsruhe, Germany
6. In-situ study of compressive damage evolution in metal/ceramic composites based on freeze-cast ceramic perform, Workshop Research in Mechanics of Composites, Dec 6-7, 2012, Bad Herrenalb, Germany
7. Processing and non-destructive characterization of porous silicon carbide preforms for metal/ceramic composite fabrication, CELLMAT 2012, Nov 7-9, 2012, Dresden, Germany
8. Effect of phase architecture on thermal expansion behavior of interpenetrating metal/ceramic composites, MS&T 2012, Oct 7-11, 2012, Pittsburgh, USA
9. Effect of phase architecture on mechanical properties of interpenetrating metal/ceramic composites, 3rd World Materials Research Institute Forum (WMRIF) Workshop for Young Scientists, Aug 27 – Aug 31 2012, Bangkok, Thailand

10. Interpenetrating SiC/Al alloy composites for optimum thermo-mechanical properties, Sitzung des DGM-Fachausschusses “Metallische Verbundwerkstoffe”, May 24, 2012, Lausanne, Switzerland

11. Elastic behavior and internal load transfer in a ceramic foam based metal/ceramic composite, Sitzung des DGM-Fachausschusses “Metallische Verbundwerkstoffe”, November 15, 2011, Aalen, Germany

12. Load partitioning study in a 3D interpenetrating Al2O3/AlSi12 metal matrix composite, 6th International Conference on Mechanical Stress Evolution by Neutrons and Synchrotron Radiation (MECASENS 6), September 7-9, 2011, Hamburg, Germany

13. Elastic properties of an interpenetrating metal matrix composite, 18. Symposium: DGM Verbundwerkstoffe und Werkstoffverbunde, Mar 30 – Apr 01 2011, Chemnitz, Germany

14. Mechanical properties of innovative metal/ceramic composites based on freeze-cast ceramic preforms, 2nd World Materials Research Institute Forum (WMRIF) Workshop for Young Scientists, Aug 31 – Sept 3 2010, Berlin, Germany

15. Metal/ceramic composites from freeze-cast preforms: domain structure and mechanical properties, Combined seminar of Institut für Fahrzeuzsystemtechnik und Mobile Arbeitsmaschinen Leichtbautechnologie/KIT-CART, Institut für Technische Mechanik Mechanik und Festigkeitslehre and Fraunhofer-Institut für Chemische Technologie ICT, Karlsruher Institut für Technologie, 24th February 2010 (invited)

16. Metal/ceramic composites from freeze-cast preforms: domain structure and mechanical properties, Forschungsseminar Kontinuumsmechanik und Homogenisierungsmethoden, Institut für Technische Mechanik, Karlsruher Institut für Technologie, 11th July 2009, Germany (invited)

17. Residual stresses and load partitioning in novel metal/ceramic composites exhibiting lamellar microstructures, Sitzung des Fachausschusses 13 Eigenspannungen, 05-06 May 2009, Oppurg, Germany

18. Damage evolution and anisotropy in freeze cast metal/ceramic composites: an in-situ SEM analysis, 13th European Conference on Composite Materials (ECCM13), June 2-5, 2008, Stockholm, Sweden

19. Innovative metal/ceramic composites from freeze-cast preforms: domain structure and mechanical behavior, National Metallurgical Day Annual Technical Meeting (NMD-ATM, 2007), November 14-16, 2007, Mumbai, India

Other professional activities

- Expert member of Junior Technical Assistant selection committee at IIT Jodhpur, May, 2022
- Reviewer of research project proposal for **Rajiv Gandhi Science and Technology Commission, Government of Maharashtra, India**
- International reviewer for Partnership Program – Joint Applied Research Projects – PCAA 2011 by **National Council for Research and Development, Romania**
- Reviewer for journal **Composites Part A**
- Reviewer for journal **Powder Metallurgy**
- Reviewer for journal **Journal of Composite Materials**
- Reviewer for journal **Thermochimica Acta**

- Reviewer for journal **Science Advances**
- Reviewer for journal **Journal of The European Ceramic Society**
- Reviewer for journal **Journal of Alloys and Compounds**
- Reviewer for journal **Metallurgical and Materials Transactions A**
- Reviewer for journal **Advanced Powder Technology**
- Reviewer for journal **Review of Scientific Instruments**
- Reviewer for journal **Ceramics International**
- Reviewer for journal **Materials Science and Engineering A**
- Reviewer for journal **Journal of Materials Science Research**
- Reviewer for journal **Transactions of The Indian Institute of Metals**
- Reviewer for journal **SADHANA**
- Reviewer for journal **Heliyon**
- Reviewer for journal **Composites Communications**
- Reviewer for the Proceedings of 18th DGM (Deutsche Gesellschaft für Materialkunde) Symposium on Composite Materials

Thesis supervision

Doctoral thesis

No.	Name	Topic/Area	Status
01	Navya Kota	Hybrid interpenetrating metal/ceramic composites	Ongoing
02	Md. Nazeer	Self-lubricating ceramic matrix composites	Ongoing
03	Sukanta Sarkar	CNT reinforced Al matrix composites	Ongoing
04	Kumar Karuna Nidhi (co-supervisor)	Ultrasonic study of cast iron based composites	Ongoing
05	Siddharth	Hybrid porous ceramics and functionally graded metal/ceramic composites	Ongoing
06	Ajit Kumar Naik	Functionally graded ultra high temperature ceramic composites	Ongoing
07	Chandan Kumar	Creep and fatigue of metal matrix composites	Ongoing
08	Sumit Kumar Ray	Processing and characterization of porous copper	Ongoing
09	Manish Kumar Nayak (co-cupervisor)	Laser cladding of Co-based alloys	Ongoing

Master thesis (completed)

Lars Przybilla: Thermomechanische Analyse eines Metallmatrix-Komposites mit interpenetrierender Struktur (in German)

Oza Meet Jaydeepkumar: Processing and characterization of Al-SiC-graphite functionally graded composite material (FGM)

Diya Goldar: Analysis of the relationships predicting the dependence of Young's Modulus and Poisson's Ratio on Porosity in porous materials

Mainak Haldar: Processing and characterization of porous ceramics

Pooja Maurya: Reviews on assessment of the processing parameters yielding an optimum combination of mechanical properties in Al-B_4C composites fabricated via casting route, and internal load transfer in metal/ceramic composites using diffraction studies

Saicharan Munagala: Processing of metal/ceramic interpenetrating phase composites – a critical review

Vallu Jayanth: Literature review on functionally graded composite materials

R Ajithkannan: Development of novel laser additive manufactured composite claddings for enhanced wear resistance

Danush Prasad: Study of the elastic properties of Cu-SiC composite foams

Akhoury Pratyush Kumar: Characterization of Porous Si_3N_4/SiC Ceramics Prepared via rapid Nitridation of Si and SiC Powder

Externally funded projects

- **Development of ZrB_2/B_4C functionally graded materials for high-temperature aerospace applications**
  Role: Principal investigator
  Funding organization: Aeronautics R&D Board (ARDB), India
  Funding amount: Rs. 33.77 lakhs
  Funding duration: 06.2021 – 05.2024

- **Ultrasound Phase Spectroscopy based Study of Deformation and Damage Mechanism in Porous Copper under Monotonic and Fatigue Loading Conditions**
  Role: Principal investigator
  Funding organization: Science and Engineering Research Board (SERB), India
  Funding amount: Rs. 32.01 lakhs
  Funding duration: 12.2020 – 12.2022

- **Multi Scale Modeling and Prediction of Microstructure for Processing of Aluminium - Lithium Alloy for Structural Application**
  Role: Principal investigator
  Funding organization: NALCO India Ltd.
  Funding amount: Rs. 26.01 lakhs
  Funding duration: 12.2020 – 07.2022

- **Development of Hybrid Interpenetrating Metal/Ceramic Composites and Study of their Mechanical and Thermal Expansion Characteristics**
  Role: Principal investigator
  Funding organization: ISIRD, SRIC Indian Institute of Technology Kharagpur
  Funding amount: Rs. 28.00 lakhs
  Funding duration: 03.2019 – 02.2022

- **Effect of processing parameters on the residual stresses and internal load transfer in metal matrix composites**
  Role: Principal investigator
  Funding organization: German Research Foundation (DFG)
  Funding amount: 194,000 Euros

Funding duration: 07.2011 – 06.2013

Teaching

- MT30001 – Materials Engineering (for students of Mechanical Engineering, jointly with Prof. Sujoy Kumar Kar)
- MT41025 – Non-destructive Testing
- MT60005 – Materials for Advanced Nuclear Power Plants (new course developed and introduced for post-graduate students)
- MT60201 – Advanced Hybrid Materials (new course developed and introduced for post-graduate students)

Short term courses and industrial trainings

- Co-ordinator for TEQIP III sponsored short term course “Non-destructive Testing for Failure Analysis and Prevention”, IIT Kharagpur, 20.05 – 22.05.2019
- 6 hours training at Tata Metalliks Limited Kharagpur in July, 2019 on “Non-destructive Testing” and “Statistical Analysis of Experimental Data”

Membership of professional bodies

- Indian Institute of Metals (Life Member)