Curriculum Vitae of Dr. Sujoy Kumar Kar

NAME IN FULL: SUJOY KUMAR KAR **ADDRESS:** METALLURGICAL AND MATERIALS ENGINEERING DEPARTMENT, INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR, KHARAGPUR, WEST MIDNAPUR, WEST BENGAL, 721302, INDIA	**Date of Birth: 03 JANUARY, 1979** **Nationality: INDIAN** **Email: sujoy.kar@metal.iitkgp.ernet.in , sujoy.kar@gmail.com** **Phone: +91 7602646515 (cell), +91 3222 283258 (O)**

EDUCATIONAL QUALIFICATIONS:

Degree / Examination	University / Institution	Year	Specialization	Division / Class	% of Marks	Rank in Board / University
Ph.D.	THE OHIO STATE UNIVERSITY, USA	2005	MATERIALS SCIENCE & ENGINEERING	1st	3.86 / 4.0	NA
M.Tech. or Equiv./ M.Sc. / **M.S.**	THE OHIO STATE UNIVERSITY, USA	2003	MATERIALS SCIENCE & ENGINEERING	1st	3.87 / 4.0	NA
B.Tech. for Equiv./ B.Sc. / B.A.	IIT KHARAGPUR, INDIA	2001	METALLURGICAL & MATERIALS ENGINEERING	1st	8.88/ 10.0	**FIRST RANK**
H.S. or Equivalent	RAMAKRISHNA MISSION RESIDENCIAL COLLEGE, NARENDRAPUR	1997	SCIENCES, STATISTICS, LANGUAGES	1st	85.6 %	
Madhyamik or Equivalent	RAMAKRISHNA MISSION VIDYAPITH, PURULIA	1995		1st	88.2%	

EXPERIENCE (Indicated the latest first)

University / Organization	Designation	From	To	Total Period	Nature of Experience
Metallurgical and Materials Engineering Dept., IIT Kharagpur	Assistant Professor	25 May 2010	Present (30 November 2018)	> 8 years	Teaching, Research and Research Guidance
GE Global Research Center	Lead Scientist (later), Initially joined as research scientist	08 August, 2005	21 May 2010	4 years 10 months	Research, Research Guidance
The Ohio State University	Graduate Research Associate	19 September, 2001	29 July, 2005	3 YEARS 10 months	Research
Cognizant Technology Solutions	Software Engineer	21 MAY, 2001	31 August, 2001	3 & half months	Software development
TATA STEEL	Intern	08 May, 2000	July, 2000	2 months	Technical project

Research Guidance

Degree	Number Completed	Number in progress
Doctoral	2	6
M.Tech/MS	10	4

Publication details:

Publication/ Patent/ Copyright type	Number accepted/ published
Publication in Referred Journal/s[International]	29
Publication in Proceeding of seminars/Conferences[International]	6
Disclosure for patent	1

Sponsored research/ consultancy presently undertaken;

Project Name	Sponsored by	Duration (months)	Project Value (in lakhs of INR)
Development of High Performance Materials for Various Defence Related Applications	DRDO	36	442.45
Impacting Research Innovation and Technology (IMPRINT) Round-I Operational Project for IMPRINT I Cell at IIT Kharagpur	MHRD	24	195.6
IMPRINT Cell at Indian Institute of Technology Kharagpur (ITK)	SERB, DST	12	20
Exploring Solutions for Various Technological Challenges in Metal Additive Manufacturing Technology and Sharing the Relevant Know-how with Indian Heavy Engineering Industries	Dept. of Heavy Industries	60	499.4
Indigenous Development of Ultra High Strength Steel with Stainless Property for Space Application (IMPRINT Project No.: 6456)	MHRD + Ministry of Steel	36	281
Setting Up High-End Testing Facilities of Materials for Biomaterials, Aerospace and Automotive Applications (SGDRI-2015) (as co-PI)	IIT Kharagpur	36	250
Completed			
Study of correlation between Processing, Microstructure, Microtexture and Property in a high strength, beta Titanium alloy Ti-5Al-5Mo-5V-3Cr	Defence Research Development Organization	36	37
Experimental Evaluation on FLD and forming behavior of differently heat treated IN718 material	Indian Space Research Organization	36	28
Correlation between Processing, Microstructure, Microtexture & Property in β Titanium alloy	Indian Institute of Technology Kharagpur	44	5
Artificial Neural Network Modeling of Materials	General Electric	12	2.5
FIST PROGRAM – 2012 (as Co-PI)	Department of Science and Technology	60	245

Brief Outline of Research contribution:

1) Ti Alloy Research: 11 Publications, 1 PhD, 1 M.Tech.
i) Developed stereological procedures to quantify different microstructural features in α/β Ti alloy
ii) Developed model for quantitative predictions of properties from microstructure input data
iii) Discovered the reasons behind anomalous trend of strength with prior β grain size
iv) Discovered the desired microstructure and hence the optimized processing window to obtain best combination of Yield Strength and Fracture Toughness in near β Ti alloy
v) Discovered the mechanisms of formation of colony vs. basketweave microstructure in alpha beta Ti alloys;
vi) Constructed the TTT diagram for Ti-5553 alloy.
2) Ni Alloy Research: 8 publication, 2 ongoing PhD
i) Developed microstructure based temperature sensitive stress strain model for Ni based superalloy
ii) Established dependency of misfit strain between γ and γ′ on cooling rate for Haynes 282 alloy.
iii) High temperature LCF behaviour of Haynes 282 alloy as a function function of temperature, microstructure and strain range
3) High temperature materials: 5 publications
i) Developed validated thermodynamic databases for Mo-Ti-Zr-C and Mo-W-Si-C systems
ii) Phase field modelling of solidification microstructure and phase stability prediction at the substrate bond coat interface for Nb-Si-Ti-Hf based alloys.
4) Others: Al alloys, GaAs, Composite material, Steel: 7 publications

Research Areas:

- Physical and Mechnical Metallurgy
- Processing-Microstructure-Microtexture-Property Relationship
- Materials and property modeling
- Materials systems: Ti alloys and Ni based superalloys and steels for energy applications

Awards & Honours:

• Patents & Publication Award in recognition of impactful contributions in the area of publications from GE Global Research Center (2008)
• Institute Silver Medal From IIT Kharagpur as the best BTech student of the outgoing batch of 2001 in the department of Metallurgical and Materials Engineering Me (2001)
• J C Ghosh Memorial Prize Award for standing first by merit in Metallurgical and Materials Engineering Department, IIT Kharagpur (2001)
• Ava Sanyal Memorial Award given to the student with the highest GPA in the class (2000)
• Bengal Ingot Silver Medal Award from the Institute of Indian Foundry men for the best project work in foundry at undergraduate level (2002)
• Indranil Award for Metallurgy from the Mining, Geological and Metallurgical Institute of India (2000)
• First Prize in Technical Paper Contest in a national symposium COMPOSIT on Advanced Materials in IIT Kharagpur (2000)

Member of Professional Bodies:

• Member : TMS, ASM International, Indian Institute of Metals, Alpha Sigma Mu (the International Professional Honour Society for Materials Science & Engineering)
• Committee member of two different technical groups of : The Minerals, Metals & Materials Society (TMS)

Publications in SCI Journals:

2017 - 2018:

- Thermo-mechanical processing window for phase recrystallization inTi-5Al-5Mo-5V-3Cr alloy *by* Sen M., Suman S. , Kumar M. , Banerjee T. , Bhattacharjee A. , Kar S. K. Materials Characterization 146 **55-70** (2018)
- High temperature low cycle fatigue behaviour in Haynes 282 An investigation on influence of microstructure *by* Barat K., Ghosh M. , S S. , Tarafder S. , Kar S. K. Metallurgical and Materials Transactions A - (2018)
- Effect of solution treatment on formability of IN718 sheets and their post-forming metallurgical characterizations for space applications *by* Prasad S., Panda S. K., Kar S. K., Murty S. , Sharma S. C. Materials Science and Engineering A - (2018)
- Creep Fatigue Interaction under Different Test Variables: Mechanics and Mechanisms *by* Barat K., S S. , Kar S. K., Tarafder S. Journal of Testing and Evaluation 46 - (2018)
- Prediction of fracture and deep drawing behavior of solution treated IN718 sheets: numerical modeling and experimental validation *by* Prasad S. K., Panda S. K., Kar S. K., Murty S. , Sharma S. C. Materials Science and Engineering: A 733 **393-407** (2018)
- Effect of solution treatment on the formability and part performance of IN718 sheet material *by* Prasad S. K., Panda S. K., Kar S. K., Murty S. , Sharma S. K. Advances in Materials and Processing Technologies 4 **680-694** (2018)

2016 - 2017:

- Microstructures, forming limit and failure analyses of Inconel 718 sheets for fabrication of aerospace components *by* Prasad S., Panda S. K., Kar S. K., Murty S. , Sharma S. C. **Journal of material engineering and performance** 26 1-18 (2017)

2014 - 2015:

- Ultrasonic quantification of high temperature cyclic damage in an advanced nickel based superalloy *by* Kaustav Barat, A. Metya , S. Sathpathy, S. Sivaprasad, S. Tarafder and Sujoy Kumar Kar *Materials Science and Engineering A*, **625, 194-204** (2015)
- Influence of PWHT on toughness of high chromium and nickel containing martensitic stainless steel weld metals *by* M. Divya, C. Das, S. Mahadevan, Shaju Albert, R. Pandian, Sujoy Kar, Arun Bhaduri, and T. Jayakumar *Metallurgical and Materials Transactions A*, **46A, 2554-2567** (2015)
- Influence of boron and nitrogen in the heat affected zone of modified 9Cr-1Mo steel - Gleeble simulation study *by* C.R. Das, A.K.Bhaduri , S.Lakshmi, Sujay Chakravarty, Sujoy Kumar Kar, S.K.Albert *Welding in the World*, **DOI 10.1007/s40194-0** (2015)
- Effect of Bending Strain in Forming Limit Strain and Stress of IN-718 Sheet Metal *by* Sajun Prasad, Sushanta Panda, Sujoy Kumar Kar, S.V.S. Narayana Murty, S.C. Sharma *Materials Science Forum*, **Accepted** (2015)

Publications: 2013 – 2014:

- Microstructure based and temperature dependent model of flow behavior of a polycrystalline nickel based superalloy *by* Sujoy Kumar Kar, S. K. Sondhi *Materials Science and Engineering: A*, **601 , 97-105** (2014)
- Phase Stability in the Mo-Ti-Zr-C system via Thermodynamic Modeling and Diffusion Multiple Validation *by* Sujoy Kumar Kar, Voramon S. Dheeradhada, and Don M. Lipkin *Metallurgical and Materials Transactions A*, **44 (8) 3999 - 4010** (2013)

- Effect of solution treatment and aging on microstructure and tensile properties of high strength beta titanium alloy, Ti-5Al-5V-5Mo-3Cr *by* Shashi Shekhar Rajdeep Sarkar Sujoy Kar Amit Bhattacharjee *Materials and Design Online version: http://dx.doi.org/10.1016/j.matdes.2014.04.015*, **Online published** (2014)
- Processing-Microstructure-Yield strength correlation in a near beta Ti alloy, Ti-5Al-5Mo-5V-3Cr *by* Sujoy Kumar Kar, Swati Suman, S Sivaprasad, Atanu Chaudhuri, Amit Bhattacharjee *Materials Science and Engineering A*, **610, pp. 171-180** (2014)

Publications: 2012 – 2013:

- Microstructure–fracture toughness correlation in an aircraft structural component alloy Ti–5Al–5V–5Mo–3Cr *by* Atasi Ghosh, S. Sivaprasad, Amit Bhattacharjee, Sujoy Kumar Kar *Materials Science and Engineering: A*, **Volume 568, Pages 61** (2013)
- Quantitative Microstructural Characterization of a near beta Ti alloy, Ti-5553 under Different Processing Conditions *by* Sujoy Kumar Kar, Atasi Ghosh, Nishant Fulzele, Amit Bhattacharjee *Materials Characterization*, **81 37-48** (2013)
- Review of Phase Transformations in Multicomponent Melts, edited by Dieter M. Herlach *by* Sujoy Kumar Kar *Materials and Manufacturing Processes*, **Volume: 28, pp: 225** (2013)

Publications: 2009 – 2010:

- Evolution of microstructure and mechanical properties during annealing of cold-rolled AA8011 alloy *by* R.K. Roy, S. Kar, S Das *Journal of Alloys and Compounds*, **468(1-2), 122-129** (2009)
- Solidification Microstructure Evolution Modeling in Nb-Si Based Intermetallics-Strengthened-Metal-Matrix Composites *by* S Kar, B P Bewlay, Y Yang *Advanced Intermetallic-Based Alloys for Extreme Environment and Energy Applications, ed. M. Palm et.*, **Volume 1128** (2009)
- Phase equilibrium in Mo-Rich Mo-Ti-Zr-C alloys *by* Dheeradhada, V.S., Lipkin, D.M., Wark, D.A., Kar, S., Tiearney, T.C. *Processing Materials for Properties 2008, PMP III*, **744-749** (2009)

Publications: 2008 – 2009:

- A CALPHAD-Based Phase Equilibrium Model Of Mo-Ti-Zr-C *by* S Kar, Don Lipkin *Proceedings of TMS Annual Meeting: Computational Thermodynamics and Kinetics*, (2008)

Publications: 2007 – 2008:

- Thermodynamic and microstructural modeling of Nb-Si based alloys *by* S. Amancherla Sundar, S. Kar, B Bewlay, Y Yang Austin Chang *Journal of phase equilibria and diffusion*, **28, 2-8** (2007)

Publications: 2006 – 2007:

- Selection of alpha variants during microstructural evolution in alpha/beta titanium alloys *by* E. Lee, R. Banerjee, S. Kar, D. Bhattacharyya, and, H. L. Fraser *Philos. Mag. A*, **87(24), 3615** (2007)
- Root-like Structure at the Nanowire / Substrate Interface in GaAs Nanowires *by* R. Banerjee, D. Bhattacharyya, A. Genc , S. Kar , R. Ratan, A.P. Shah , M.R. Gokhale , and B. M. Arora *Appl. Phys. Lett.*, **88, 031919** (2006)
- A study of precipitation and recrystallization behavior of aluminum alloy AA1235 *by* R.K Roy, S. Kar, K. Das and S.Das *J. of Mat. Sci.*, **41, 1039-1045** (2006)

- Design Tools for Structural Metallic Materials *by* Collins, PC, Kar, S, Searles, T, Koduri, S, Viswanathan, GB, Tiley, J, Banerjee, R, and Fraser, HL *Proceedings of Frontiers in the Design of Materials (FDM-NMD-ATM)*, (2006)

Publications: 2005 – 2006:

- Modeling The Tensile Properties in Beta-Processed Alpha/Beta Ti Alloys *by* S. Kar, T. Searles, E. Lee, G.B. Viswanathan, J. Tiley, R. Banerjee, H. L. Fraser *Metallurgical and Materials Transactions A*, **37A (3), 559** (2006)
- Rapid Characterization of Titanium Microstructural Features for Specific Modeling of Mechanical Properties *by* T. Searles, J. Tiley, A. Tanner, R. Williams, B. Rollins, E. Lee. S. Kar, R. Banerjee, and H. L. Fraser *Measurement Sci. Technol.*, **16(1), 60** (2005)
- Quantification of Alpha Laths in Alpha/Beta Titanium Alloys *by* R E A Williams, T Searles, S Kar, M Uchic, D Dimiduk and H Fraser *Microscopy and Microanalysis*, **11, Supplement S02** (2005)
- Microstructures and tensile properties of commertial purity aluminum alloy AA1235 under different annealing conditions *by* R.K. Roy, S. Kar, K. Das and S. Das *Materials Letters*, **59 2418-2422** (2005)
- Evolution of In-Situ generated Reinforcement Precipitates In Metal Matrix Composites *by* S. Sen, S.K. Kar, A.V. Catalina, D.M. Stefanescu, and B.K. Dhindaw *Transactions of the Indian Institute of Metals, An International Journal of Minerals, Metals and Mat*, **vol. 58, 709-714** (2005)
- Influence of Crystallographic Variant Selection on Microstructural Evolution in Titanium Alloys *by* S. Kar, R. Banerjee, E. Lee, and H. L. Fraser *Solid-Solid Phase Transformations in Inorganic Materials, Edited by J. M. Howe et. al.*, (2005)

Publications: 2004 – 2005:

- Quantification of microstructural features in alpha/ beta Titanium alloys *by* J. Tiley, T. Searles, E. Lee, S. K. Kar, R. Banerjee, J. C. Russ and H. L. Fraser *Mat. Sci. Eng. A*, **372 (1-2), pp 191** (2004)

Some Earlier Publications:

- Quantification of microstructural features in alpha/ beta Titanium alloys *by* J. Tiley, T. Searles, E. Lee, S. K. Kar, R. Banerjee, J. C. Russ and H. L. Fraser *Mat. Sci. Eng. A*, **372 (1-2), pp 191** (2004)
- Modeling the Relationships between Microstructural Parameters and the Tensile Properties in Ti-6Al-4V using Neural Networks and Fuzzy Logic Models *by* J. Tiley, R. Banerjee, T. Searles, S. Kar, and H. Fraser *Titanium 2003: Proceedings of the Tenth World Conference on Titanium*, (2003)
- Infiltrated cast SiCP reinforced Al/Mg alloy matrices composites – experimental and modeling studies *by* B.K. Dhindaw, S.K. Thakur, S.K. Kar, and V. Vohra *Proceedings of Solidification and Casting Science Conference*, (2001)
- Investigation of GaAs nanowires grown via MOVPE using the Vapour−Liquid−Solid technique *by* A Bhattacharya, R Banerjee, R Ratan, S Kar, M R Gokhale, A P Shah, J Bhattacharyya, K L Narasimhan, B M Arora *10th European workshop on MOVPE*, **8 - 11 June** (2003)