

## CURRICULAM VITA

### **DR. ANISH KARMAKAR**

Assistant Professor

Metallurgical & Materials Engineering

Indian Institute of Technology, Roorkee

[anish.met@gmail.com](mailto:anish.met@gmail.com)

[anish.karmakar@mt.iitr.ac.in](mailto:anish.karmakar@mt.iitr.ac.in)

+91-7602645469



---

#### **Present Address:**

Department of Metallurgical and Materials Engineering,  
Indian Institute of Technology, Roorkee  
Roorkee, Uttarakhand - 247667,  
India

#### **Permanent Address:**

Post + Village - Kharar,  
Thana - Ghatal,  
Paschim Medinipur-721222  
West Bengal,  
India

---

#### **PERSONAL DETAILS**

Gender: Male

Date of Birth: 16<sup>th</sup> December 1987

Marital Status: Married

Blood Group: A+

---

#### **EDUCATION**

##### **2013-17 Doctor of Philosophy (Ph.D)**

Metallurgical and Materials Engineering, IIT Kharagpur

Thesis: Study on the ferrite grain structure and precipitation in thermo-mechanically tailored HSLA steel.

Supervisor: Dr. Debalay Chakrabarti

##### **2010-12 Master of Science (M.S.)**

Metallurgical and Materials Engineering, IIT Kharagpur

Thesis: Rapid transformation annealing (RTA) treatment for developing mixed microstructure in low-carbon steel.

Supervisor: Dr. Debalay Chakrabarti

##### **2005-09 Bachelor of Engineering (B.E.)**

Metallurgy and Materials Engineering, BESU, Shibpur

Thesis: Diffusion bonding of Ni and Ti alloys by Al interlayer.

Supervisor: Prof. Subrata Chatterjee and Dr. Sukumar Kundu

- 2005**            **Higher Secondary**  
West Bengal Council of Higher Secondary Education  
Grade: 85.6%
- 2003**            **Secondary**  
West Bengal Board of Secondary Education  
Grade: 90.3%

## **RESEARCH EXPERIENCE**

---

**Nov. 2017-Apr. 2018 National Post-Doctoral Fellow, IISc Bangalore**

**Activities:**

- Influence of local microtexture and microstructure on dwell fatigue behaviour and fatigue crack growth rates in Ti-6242 alloy.

**Dec. 2012-Jul. 2017 Doctoral Candidate, IIT Kharagpur**

**Activities:**

- Expertise in texture (micro and macro) measurement and analysis.
- Handled microscopy: SEM (Zeiss EVO 60) and TEM (JEOL JEM-2100).
- Expertise in Instrumented Charpy impact testing and subsequent data analysis.
- Operated X-Ray diffractometer (Panalytical High Resolution XRD PW 3040/60) for macro-texture measurement.
- Completed courses on Transmission Electron Microscopy, Materials Characterization.

**Aug. 2010-Dec. 2012 Post-Graduate Student, IIT Kharagpur**

**Activities:**

- Experienced in using salt-bath furnace.
- Learned some knowledge about Gleeble 3500® thermo-mechanical simulator.
- Learned using Thermo-Calc data base.
- Carried out phase quantification through XRD.

**Jul. 2005-Jul. 2009 Under-Graduate Student, Bengal Engineering and Science University, Shibpur (Presently IEST, Shibpur)**

**Activities:**

- Came across several characterization techniques such as Optical Microscopy, Scanning Electron Microscopy, Diffusion Bonding Furnace, X-Ray Diffraction analysis.

## **TEACHING EXPERIENCE**

---

**Apr. 2018-Jan. 2019 Assistant Professor**

Dept. of Metallurgical and Materials Engineering  
NIT Warangal  
Course Taught:

Introduction to Materials (MM-5111) to 1<sup>st</sup> Year M-Tech  
(Materials Technology & Industrial Metallurgy)  
X-Ray Diffraction and Electron Microscopy (MM-401) and  
X-Ray Diffraction and Electron Microscopy Laboratory  
(MM-404) to 4<sup>th</sup> Year B-Tech

**Dec. 2012-Dec. 2014 Teaching Assistant**, IIT Kharagpur (part of PhD work)

Course: Title: Materials Characterization Lab. Teachers: Prof.  
S. Das and Prof. Debalay Chakrabarti.

Course: Title: Deformation Behaviour of Materials Lab.

Teachers: Prof. K. K Ray, Prof. Rahul Mitra and Prof. Debalay Chakrabarti.

**Activities:**

- Guided students to understand the fundamental concepts of phase transformation, annealing.
- Took laboratory classes on mechanical working of materials.

**SKILLS**

---

**Hand on Experiences:** Optical microscopy with image analysis, Scanning Electron Microscope with Electron Back Scatter Diffractometer, X-Ray Diffractometer, Tensile Testing Machine, and Charpy Impact Testing Machine.

**Soft Skills:** Matlab, Microsoft Office, Thermo-Calc, Image J Analyzer, Origin-Pro, X'Pert High Score Plus.

**Language:** Bengali (Native language)  
Hindi (Speak, read and write)  
English (Speak, read and write)

**INDUSTRIAL EXPOSURE**

---

**2008** 1-month vocational training in **Vizag Steel Plant, RINL, Visakhapatnam**, India, as a part of B. E. program.

**2009-10** 8 months experience (**Shift Superintendent - pot line operation**) in an integrated aluminium plant (**Vedanta Aluminum limited, Jharsuguda**), **Sterlite Group**.

**FELLOWSHIPS AND AWARDS**

---

**2018** **Inspired faculty award** by **DST** (Department of Science and Technology).

**2017** **National post-doctoral fellowship** by **SERB** (Science and Engineering Research Board).

**2013-17** **Institute (MHRD) assistantship** in the Ph.D. program.

- 2012**                      **Best poster presentation** award in the “**NMD-ATM 2012**” organized by IIM Jamshedpur Chapter; Tata Steel, limited; NML Jamshedpur.
- 2010-12**                      2 years **Junior Research Fellowship** in a project funded by CSIR, New Delhi (While pursuing MS program).
- 2009**                      **All India Ranked 101** on Metallurgical Engineering (MT) in the GATE Examination.

#### POSITION OF RESPONSIBILITY

---

- 2018**                      Faculty in charge of **Mineral Dressing Laboratory**, Coarse Coordinator of **M-Tech (Industrial Metallurgy)** and Departmental Academic Committee-Post Graduate (**DAC P&G**) **member** in the **Dept. of Metallurgical & Materials Engg, NIT Warangal**
- 2014**                      One of the organizers of the “**Research Scholar Day-2014**” organized by Department of Metallurgical and Materials Engineering, IIT Kharagpur.
- 2010**                      Ensuring quality and purity of molten metal up to 99.7% before tapping from the pot and **ensuring minimum rejection** by defect analysis as part of QC (Quality Control) department, **Vedanta Aluminum Limited, Jharsuguda**
- 2009**                      The **convener of volunteer sub-committee** in ‘REBECA’ (annual cultural fest of BESU, Shibpur).

#### PUBLICATIONS

---

- **A. Karmakar**, M. Ghosh, D. Chakrabarti, “*Cold-rolling and Inter-critical Annealing of Low-Carbon Steel: Effect of Initial Microstructure and Heating-Rate*”, **Materials Science & Engineering A**, Vol. 564 (2013), pp. 389–399.
- **A. Karmakar**, A. Karani, S. Patra, D. Chakrabarti, “*Development of Bimodal Ferrite-Grain Structures in Low-Carbon Steel Using Rapid Intercritical Annealing*”, **Metallurgical and Materials Transactions A**, Vol. 44A (2013), pp. 2041-2052.
- **A. Karmakar**, D. Chakrabarti, “*Comparison between Conventional Annealing and Rapid-Transformation Annealing of Low-Carbon Steel*”, **International Journal of Metallurgical Engineering**, Vol. 2 (2) (2013), pp. 137-141.
- **A. Karmakar**, R. D. K. Misra, S. Neogy, D. Chakrabarti, “*Development of Ultrafine-Grained Dual-Phase Steels: Mechanism of Grain Refinement during Intercritical Deformation*”, **Metallurgical and Materials Transactions A**, Vol. 44 (9) (2013), pp. 4106-4118.

- **A. Karmakar**, S. Sivaprasad, S. K. Nath, R. D. K. Misra, D. Chakrabarti “*Comparison Between Different Processing Schedules for the Development of Ultrafine-Grained Dual-Phase Steel*”, **Metallurgical and Materials Transactions A**, Vol. 45 (5) (2013), pp. 2466-2479.
- **A. Karmakar**, R. D. K. Misra, S. Neogy, D. Chakrabarti “*Development of Ultra-fine Grained Dual-Phase Steels: Mechanism of Grain Refinement during Inter-critical Deformation*”, **Materials Science Forum**, Vol. 783 (2014), pp. 674-678.
- **A. Karmakar**, S. Sivaprasad, S. Kundu, D. Chakrabarti, “*Tensile Behavior of Ferrite-Carbide and Ferrite-Martensite Steels with Different Ferrite Grain Structures*”, **Metallurgical and Materials Transactions A**, Vol. 45 (4) (2013), pp. 1659-1664.
- **A. Karmakar**, S. Kundu, S. Roy, S. Neogy, D. Srivastava, D Chakrabarti, “*Effect of Microalloying Elements on Austenite Grain Growth in Nb-Ti and Nb-V Steels*”, **Materials Science and Technology**, Vol. 30 (6) (2014), pp. 653-664.
- S. Roy, **A. Karmakar**, S. Mukherjee, S. Kundu, D. Srivastava, D. Chakrabarti “*Effect of Starting Microstructure on Austenite Grain Sizes Developed after Reheating of HSLA Steel*”, **Materials Science and Technology**, Vol. 30 (10) (2014), pp. 1142-1153.
- **A. Karmakar**, M. Mandal, A. Mandal, MB Sk, S. Mukherjee, D. Chakrabarti “*Effect of Starting Microstructure on the Grain Refinement in Cold-Rolled Low-Carbon Steel During Annealing at Two Different Heating Rates*”, **Metallurgical and Materials Transactions A**, Vol. 47 (1) (2016), pp. 268-281.
- C. Halder, **A. Karmakar**, Sk. Md. Hasan, D. Chakrabarti, M. Pietrzyk, N. Chakraborti “*Effect of Carbon Distribution during the Microstructure Evolution of Dual Phase Steels studied using Cellular Automata, Genetic Algorithms and experimental strategies*”, **Metallurgical and Materials Transactions A**, Vol. 47 (12) (2016), pp. 5890-5906.
- **A. Karmakar**, P. Sahu, S. Neogy, D. Chakrabarti, R. Mitra, S. Mukherjee, S. Kundu “*Effect of Cooling Rate and Chemical Composition on Microstructure and Properties of Naturally Cooled Vanadium-Microalloyed Steels*”, **Metallurgical and Materials Transactions A**, Vol. 48 (4) (2017), pp. 1581-1595.
- **A. Karmakar**, S. Biswas, S. Mukherjee, D. Chakrabarti, Vinod Kumar “*Effect of Composition and Thermo-mechanical Processing Schedule on the Microstructure, Precipitation and Strengthening of Nb-Microalloyed Steel*”, **Materials Science & Engineering A**, Vol. 690 (2017), pp. 158–169.
- **A. Karmakar**, S. Mukherjee, S. Kundu, D. Srivastava, **R. Mitra**, D. Chakrabarti “*Effect of composition and isothermal holding temperature on the precipitation hardening in Vanadium-microalloyed steels*”, **Materials Characterization**, Vol. 132 (2017), pp. 31– 40.
- **A. Karmakar**, M. Mandal, D. Chakrabarti “*Development of different novel microstructures in low-carbon steel by thermomechanical processing and their properties*”, **IIM Metal News**, Vol.

20 (7) (2017), pp. 12-19.

- A. Mandal, **A. Karmakar**, D. Chakrabarti, C. Davis “*Effect of alloying and coiling temperature on the microstructure and bending performance of ultra-high-strength strip steel*”, **Metallurgical and Materials Transactions A**, Vol. 49 (12) (2018), pp. 6359-6374.
- A. Bhattacharya, **A. Karmakar**, A. Karani, M. Ghosh, D. Chakrabarti “*Processing of Ultrafine-Grained Steels by Warm Rolling and Annealing*”, **Journal of Materials Engineering and Performance**, Vol. 28 (2) (2019), pp. 753-768.
- R. Pradhan, **A. Karmakar**, M. Ghosh, D. Chakrabarti “*Effect of thermomechanical processing on microstructural evolution in precipitation strengthened ferrite steel*”, **SN Applied Sciences**, Vol. 1 (7) (2019), pp. 663 (1-15).
- **A. Karmakar**, K. Barat “*Effect of elasto-plastic compatibility of grains on void-initiation criteria in low-carbon steel*”, **Philosophical Magazine Letters**, 99 (7) (2019), pp. 261-273.

## CONFERENCE PROCEEDINGS

---

- “*Development of Non-Conventional Microstructures in Steel*” by Sk. Md. Hasan, **A. Karmakar**, A. Singhanian, S. Pan, D. Chakrabarti in **NMD-ATM 2010** (National Metallurgists Day, Annual Technical Meet).
- “*Developing ultra-fine grained HSLA steel by thermo-mechanical processing*” by **A. Karmakar**, S. Patra, D. Chakrabarti in **ICAMMP-2011** (International Conference on Advances in Materials and Materials Processing, IIT Kharagpur).
- “*Development of ultrafine grain structure and bimodal grain structure in low carbon steel using different thermo-mechanical processes*” by **A. Karmakar**, S. Patra, V. Kumar, D. Chakrabarti in **NMD-ATM 2011**.
- “*Effect of bimodal distribution in ferrite grain sizes on the tensile properties of low-carbon steels*” by **A. Karmakar**, S. Patra, Sk. Md. Hasan, N. Narasaiah, D. Chakrabarti in **NMD-ATM 2012**.
- “*Comparison between conventional (recrystallisation) annealing and rapid transformation annealing of low-carbon steel*” by **A. Karmakar**, Sk. Md. Hasan, D. Chakrabarti in **NMD-ATM 2012**.
- “*Bimodal grain structure in low carbon steels: Effect on properties*” by **A. Karmakar**, S. Patra, D. Chakrabarti in **NMD-ATM 2013**.
- “*Development of ultra-fine grained dual phase steel: Mechanism of grain refinement*” by **A. Karmakar**, R.D.K. Misra, S. Neogy, D. Chakrabarti in **NMD-ATM 2013**.
- “*Effect of Heating Rate on the Microstructure Formation during Intercritical Annealing of Cold-rolled Low-carbon Steels*” by **A. Karmakar**, M. Mandal, A. Mandal, S. Mukherjee, D.

Chakrabarti in **PTM 2015 (Solid-Solid Phase Transformations in Inorganic Materials, Whistler, BC, Canada)**.

- “*Effect of cooling rate on precipitation strengthening in naturally cooled vanadium micro-alloyed steels with varying carbon and nitrogen*” by **A. Karmakar**, P. Sahu, S. Mukherjee, S. Kundu, D. Chakrabarti in **NMD-ATM 2015**.
- “*Effect of cooling rate on microstructure and properties of naturally cooled vanadium micro-alloyed steels*” by **A. Karmakar**, P. Sahu, S. Neogy, D. Chakrabarti, R. Mitra, S. Mukherjee, S. Kundu, in **EMSI 2016 (Electron Microscopic Society of India)**.
- “*Optimizing the Cooling Rate for Maximum Precipitation Strengthening of Naturally Cooled V Micro-Alloyed Steels*” by **A. Karmakar**, P. Sahu, S. Neogy, D. Chakrabarti, R. Mitra, S. Mukherjee, S. Kundu, in **MS&T 2016 (Technical Meeting and Exhibition, Materials Science and Technology)**, Salt Lake City, Utah, USA).
- “*Development of Bimodal Ferrite Grain Distribution to Enhance the Ductility of Dual Phase 600 (DP 600) Steel*” by J. Krishnan, M. Mukherjee, **A. Karmakar**, S. B. Singh, in **TMS 2017 (146<sup>th</sup> Annual Meeting and Exhibition, San Diego, California, USA)**.
- “*Effect of composition and thermomechanical controlled processing on precipitation and strengthening of Nb-microalloyed steel*” by **A. Karmakar**, D. Chakrabarti & Vinod Kumar in **NMD-ATM 2017**.
- “*Development of different novel microstructures and their properties in low carbon steel*” by **A. Karmakar**, M. Mandal, D. Chakrabarti in **NMD-ATM 2018**.
- “*Effect of Mo and Ti addition on the recrystallization kinetics during sub-critical annealing and tensile property of HSLA steel*” by P. Modak, **A. Karmakar**, R. Gupta, S. Neogi, D. Chakrabarti in **MS&T 2018 (Technical Meeting and Exhibition, Materials Science and Technology)**, Columbus, Ohio, USA.
- “*Effect of Thermo-mechanical Schedule on Microstructural Development in Precipitation Reinforced Ferritic Steel*” by **A. Karmakar**, D. Chakrabarti, S. Mukherjee in **NMD-ATM 2019**.

## BOOK CHAPTER

---

“*Microalloyed Steels*”, by S. Das, **A. Karmakar**, S.B. Singh, High performance ferrous alloys, **Springer Nature**, March, 2020

## REFEREES

---

- Dr. Debalay Chakrabarti, Professor, IIT Kharagpur, Dept. of Metallurgical and Materials Engineering. **debalay@gmail.com, debalay@metal.iitkgp.ernet.in**.
- Dr. Nirupam Chakrabarti, Professor, IIT Kharagpur, Dept. of Metallurgical and Materials Engineering. **nchakrab@gmail.com, nchakrab@metal.iitkgp.ernet.in**.

□ Dr. Satyam Suwas, Professor, IISc Bangalore, Dept. of Materials Engineering.  
**satyamsuwas@iisc.ac.in.**

I hereby declare that the information given here is up to date and best of my knowledge.



Anish Karmakar  
Roorkee: 14. 02. 2020.