CURRICULUM VITAE

TINA GHARA

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Personal Details

Date of Birth: 27 September 1994

Gender: - Male
Nationality: Indian
Permanent address: C/O-Batakrishna Ghara,
Vill.-Purbabahala,
P.O.- Mecheda,
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Present Address: B. R. Ambedkar Hall of Residence
IIT Kharagpur, Kharagpur, West Bengal, India

Present Status

I am presently a PhD research scholar at the **Department of Mechanical Engineering, Indian Institute of Technology Kharagpur**. I have recently submitted my thesis. My research includes the residual stress analysis in grit blasted substrates as well as plasma sprayed ceramic coatings. Investigations on several aspects like, residual stress profile, dislocation density, hardness, roughness, etc. of various important substrate materials such as, low carbon steel, C-45 steel, SS-316, Ti-6Al-4V, Inconel 718, and Hastelloy X after grit blasting has been carried out. In addition, effect of grit blasting parameters on these responses of substrate materials with widely varying mechanical properties have been studied. A novel analytical model of indentation depth upon abrasive impact has also been developed considering elastic recovery and strain hardening characteristics of the substrate material. Furthermore, in-flight particle characteristics such as, particle temperature and velocity of alumina during plasma spraying were monitored using a particle monitoring system (DPV) and the coatings were developed at different particle characteristics to understand the processing-structure-property relationships. For the first time, the segregated effect of particle temperature and velocity on the properties of plasma sprayed alumina coatings were explored. Moreover, an in-depth investigation on the properties such as, residual stress depth profile and mechanical properties of different oxide ceramic coatings having a wide range of thermo-physical properties, deposited under comparable in-flight conditions, was undertaken.

Educational Background

Doctor of Philosophy (PhD):

Specialization : Thermally sprayed coatings
Period : 2017 to 2022 (Thesis submitted)
Institution : Indian Institute of Technology Kharagpur, Kharagpur, West Bengal

Master of Technology (M.Tech):

Specialization : Production Engineering
Period : 2015 to 2017
University : Maulana Abul Kalam Azad University of Technology, West Bengal
Institution : Kalyani Government Engineering College, Kalyani, Nadia, West Bengal
DGPA : 9.3
Thesis title : Design and Manufacture of an Abrasive Jet Machining Setup and Investigation on Its Machining Performance

Bachelor of Technology (B.Tech):

Specialization **:** Mechanical Engineering
Period **:** 2011 to 2015
University **:** Maulana Abul Kalam Azad University of Technology, West Bengal
Institution **:** Kalyani Government Engineering College, Kalyani, Nadia, West Bengal
DGPA **:** 8.95

Higher Secondary (HS):

Passing Year **:** 2011
Board **:** West Bengal Council of Higher Secondary Education
Institution **:** Kolaghat Thermal Power Plant High School
% of marks obtained **:** 88%

Madhyamik (SE):

Passing Year **:** 2009
Board **:** West Bengal Board of Secondary Education
Institution **:** Gopalganj Priyanath Banibhaban (H.S)
% of marks obtained **:** 84.12%

Other Examination Qualified:

Examination	Year	Details
GATE	2017	Marks- 65.33, Score- 687

Areas of Research Interests

- Abrasive Jet machining
- Surface engineering
- Thermal spraying processes, e.g., plasma spraying, HVOF spraying, cold spraying
- Materials characterization
- Residual stress analysis in Grit blasting and thermally sprayed coatings
- Online particle monitoring during thermal spraying processes

Skills and Expertise

- Hands-on skills and expertise

(i) X-Ray Diffraction based material characterization (Panalytical, Empyrean)

- ✓ Phase analysis
- ✓ Rietveld refinement
- ✓ Residual stress measurement and analysis
- ✓ Grazing Incidence (GI) phase analysis
- ✓ Micro phase and stress analysis
- ✓ Texture scan
- ✓ Dislocation density calculation

(ii) Scanning Electron Microscopy (Zeiss, EVO 18 Research)

- ✓ Secondary electron (SE) and Back scattered electron (BSE) image processing
- ✓ Energy dispersive spectroscopy (EDS) analysis

(iii) Plasma Spraying System (Metco 9MB system)

- ✓ Deposition of metallic and ceramic coatings on metallic substrates

(iv) DPV and Accuraspray particle Monitoring System (Tecnar automation, Canada)

- ✓ Measurement of in-flight particle temperature, velocity, diameter, etc. of the molten particles

(v) Optical Microscope and zoom microscope (Zeiss, Axio Vert A1)

- ✓ Image processing

(vi) 3D Surface Profilometer (Talysurf 50, Taylor Hobson)

(vii) Microhardness Tester (Leco LM 700)

- ✓ Hardness measurement
- ✓ Indentation fracture toughness measurement

(viii) Semi-automatic polishing machine (Struers)

- ✓ Polishing of metallic and ceramic materials for metallographic study

(ix) Electropolishing machine (Struers make)

(x) Ball on disk tribometer (Ducom)

(xi) High temperature tribometer (Anton Paar)

(xii) Scratch tester (Ducom)

- Working knowledge on other instruments

(i) Transmission Electron Microscopy (TEM)
(ii) Depth sensing indentation- Elastic modulus measurement
(iii) Electron Backscatter Diffraction (EBSD)
(iv) Field Emission Scanning Electron Microscope (FESEM)
(v) Auger Spectroscopy

Awards & Achievements

Year	Awards/Achievements
2017 to present	: Institute Scholarship (provided by Ministry of Human Resource Development, Government of India) from Indian Institute of Technology Kharagpur during PhD
2017	: University **Gold Medal** from Maulana Abul Kalam Azad University of Technology, West Bengal in MTech (Production Engineering)
2015 to 2017	: GATE Scholarship (provided by Ministry of Human Resource Development, Government of India) from Kalyani Government Engineering College during M.Tech.
2015	: Secured **first (1st)** in BTech Mechanical Engineering 2015-Batch of Kalyani Government Engineering College, Kalyani, Nadia
2011 to 2015	: West Bengal MERIT-CUM-MEANS Scholarship
2009 to 2011	: MEDHA scholarship from RAKSHABANDHAN FOR EDUCATION

Positions of Responsibility

Participation in academic and administrative committees and responsibilities

- Served as the Second Senate Member (SSM) of B.R. Ambedkar Hall of Residence, IIT Kharagpur for the academic year 2018-2019.
- Served as the Student Auditor of B.R. Ambedkar Hall of Residence, IIT Kharagpur for the academic year 2019-2020

Teaching Experience

Teaching assistance of the following laboratory and theory classes

- Introduction to Manufacturing Processes
- Machine Tools and Machining laboratory
- Engineering Mechanics
- Engineering Drawing

Subjects of Teaching Interest

- Introduction to Manufacturing Processes
- Machine Tools and Machining Processes
- Advanced Machining Processes
- Materials Science and Engineering
- Engineering Drawing

Publications

Journal

1. **Tina Ghara,** P. P. Bandyopadhyay, Understanding the Role of In-flight Particle Temperature and Velocity on the Residual Stress Depth Profile and Other Mechanical Properties of Atmospheric Plasma sprayed Al_2O_3 Coating, ***Journal of the European Ceramic Society,*** April 14 2022**,** https://doi.org/10.1016/j.jeurceramsoc.2022.04.019

2. **Tina Ghara**, S. Paul, P. P. Bandyopadhyay, Analytical and experimental analysis of indentation depth upon abrasive impact on metallic substrates, ***Materials Chemistry and Physics***, 280, 2022, 125865. https://doi.org/10.1016/j.matchemphys.2022.125865

3. Debajyoti Bhaduri, **Tina Ghara**, Pavel Penchev, Soumitra Paul, Catalin I Pruncu, Stefan Dimov, David Morgan, Pulsed laser polishing of selective laser melted aluminium alloy parts, ***Applied Surface Science,*** 558, 2021, 149887. https://doi.org/10.1016/j.apsusc.2021.149887

4. **Tina Ghara**, S. Paul, P. P. Bandyopadhyay, Effect of grit blasting parameters on surface and near-surface properties of different metal alloys, ***Journal of Thermal Spray Technology***, 30(1), 2021, pp.251-269. https://doi.org/10.1007/s11666-020-01127-1

5. **Tina Ghara**, S. Paul, P. P. Bandyopadhyay, Influence of Grit Blasting on Residual Stress Depth Profile and Dislocation Density in Different Metallic Substrates, ***Metallurgical and Materials Transactions A***, 52(1), 2021, pp.65-81. https://doi.org/10.1007/s11661-020-06055-x

6. Barun Haldar, **Tina Ghara**, Rasid Ansari, Santanu Das, P. Saha, Abrasive jet system and its various applications in abrasive jet machining, erosion testing, shot-peening, and fast cleaning, ***Materials Today: Proceedings***, 5(5), 2018, pp.13061-13068. https://doi.org/10.1016/j.matpr.2018.02.293

7. Rashid Ansari, **Tina Ghara**, D.K. Adak, G. Desta, Santanu Das, Barun Haldar, Study on erosion wear of steels under varying abrasive jet, ***Materials Today: Proceedings***, 5(11), 2018, pp.25027-25035. https://doi.org/10.1016/j.matpr.2018.10.303

8. **Tina Ghara,** P. P. Bandyopadhyay, Mechanical Properties and Residual Stress in Plasma Sprayed Ceramic Coatings Deposited Under Comparable Particle Temperature and Velocity, ***Journal of Thermal Spray Technology, …….. Accepted for publication.***

Book Chapter

1. **Tina Ghara**, G. Desta, Santanu Das, Barun Haldar, Abrasive Jet Machining: Drilling of Porcelain Tiles and Soda Lime Glass. ***In: Advances in Materials, Mechanical and Industrial Engineering, Lecture Notes on Multidisciplinary Industrial Engineering,*** Springer, Cham., Chapter 9, pp.189-208, 2019, https://doi.org/10.1007/978-3-319-96968-8_9

Conference Paper

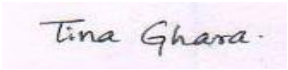
1. Barun Haldar, **Tina Ghara**, Rasid Ansari, Santanu Das, P. Saha, Abrasive jet system and its various applications in abrasive jet machining, erosion testing, shot-peening, and fast cleaning, International Conference on Materials, manufacturing and Modeling **(ICMMM 2017)**, Vellore Institute of Technology (VIT), Vellore, Chennai, India, 2017.

2. Rashid Ansari, **Tina Ghara**, D.K. Adak, G. Desta, Santanu Das, Barun Haldar, Study on erosion wear of steels under varying abrasive jet, International Conference on Advances in Materials and manufacturing Applications **(IConAMMA 2017)**, Amrita Vishwa Vidyapeetham University, Bangaluru, Karnataka, India, 2017.

3. **Tina Ghara**, Rashid Ansari, D. K. Adak, Ahmed M., Santanu Das, Barun Haldar, Abrasive jet drilling of porcelain tiles and soda lime glass under different conditions, 1st International Conference on Mechanical Engineering **(INCOM 2018)**, Jadavpur University, Kolkata, 2018.

Communicating Languages: Bengali, English, and Hindi

Declaration: I hereby declare that all the informations given above are true to the best of my knowledge.



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