**MADHUMANTI BHATTACHARYYA** **TEL :** +91-9830189594

PhD, McMaster University **E-mail :** madhumanti@iitism.ac.in

**Research Area:**

- Structure-Property Correlation
- Repair and Remanufacturing
- Physical Metallurgy of Steel/ Steel Design
- Microstructural/ Grain Boundary Engineering
- Friction Stir Welding
- Advanced high strength steel
- Microstructural Characterization

**Work experience:**

- Postdoctoral Fellow in University of Idaho (May 2019- Present)
- Visiting researcher in IIEST (Formerly, BESU) (Jan 2019-April 2019)
- Teaching Assistant in Materials Science Department, McMaster University (Sept 2012 to April 2018)
- Visiting researcher in IIEST (Formerly, BESU) (Jan 2012-April 2012)
- Deputy Manager in ESSAR STEEL LTD (June 2010-Dec 2011)

**Academic Background:**

| EXAMINATION PASSED | YEAR OF PASSING | BOARD/UNIVERSITY | NAME OF THE INSTITUTION | MARKS | DIVISION |
|---|---|---|---|---|---|
| Doctor of Philosophy in Materials Science & Engineering | 2018 | McMaster University | McMaster University | 3.95/4 | N/A |
| Master of Technology in Metallurgical & Materials Engineering | 2010 | IIT Kharagpur | IIT Kharagpur | 9.24/10 | N/A |
| Bachelor of Engineering in Metallurgy & Materials Engineering | 2008 | Indian Institute of Engineering Science and Technology, Shibpur | Indian Institute of Engineering Science and Technology, Shibpur | 80.5% | 1ST |
| Higher Secondary | 2003 | West BengaL Council of Higher Secondary Education (W.B.C.H.S.E) | Rahara Bhabanath Institution for Girls | 82.5% | 1ST |
| Madhyamik | 2001 | West Bengal Board of Secondary Education (W.B.B.S.E) | Rahara Bhabanath Institution for Girls | 86% | 1ST |

**Publications:**


- **Effect of Mn and C on grain growth in Mn steels, M Bhattacharyya**, Brian Langelier, Gary R Purdy, Hatem S Zurob, *Metall Mater Trans A* 50, 905–914 (2019). https://doi.org/10.1007/s11661-018-5032-2**.**
- **Effect of solute Nb on grain growth in Fe-30 Pct Mn steel, M Bhattacharyya,** Brian Langelier, Hatem S Zurob, *Metall Mater Trans A* 50, 3674–3682 (2019). https://doi.org/10.1007/s11661-019-05273-2.
- **Austenite grain growth in high manganese steels,M Bhattacharyya**, Yves Brechet, Gary R Purdy, Hatem S Zurob , *Metall Mater Trans A* 50, 5760–5766 (2019).

**https://doi.org/10.1007/s11661-019-05460-1.**

- **Pitting behavior of friction stir repair-welded 304L stainless steel in 3.5% NaCl solution at room temperature: role of grain and defect structures,** Anirban Naskar, **M Bhattacharyya,** Krishnan S Raja, Indrajit Charit, Jens Darsell, Saumyadeep Jana, *SN Appl. Sci.* 2, 2164 (2020). https://doi.org/10.1007/s42452-020-03935-0.

- **Processing-microstructure-property correlations for temperature-controlled friction stir welding of 304L SS plates, M Bhattacharyya,** Arnab Kundu, Krishnan S Raja, Jens Darsell, Saumyadeep Jana, Indrajit Charit,*Materials Science and Engineering: A*, *804*, 140635.,https://doi.org/10.1016/j.msea.2020.140635.

- **Friction stir processing of a high entropy alloy Fe42Co10Cr15Mn28Si5 with transformative characteristics: Microstructure and mechanical properties,** Anumat Sittiho**, M Bhattacharyya,** Jadzia Graves, Saurabh S Nene, Rajiv S Mishra, Indrajit Charit, *Materials Today Communications*, *28*, 102635,https://doi.org/10.1016/j.mtcomm.2021.102635.

- **Evaluation of residual stresses in isothermal friction stir welded 304L stainless steel plates, M Bhattacharyya,** Thomas Gnaupel-Herold, Krishnan S Raja, Jens Darsell, Saumyadeep Jana, Indrajit Charit, *Materials Science and Engineering: A*, *826*, 141982, https://doi.org/10.1016/j.msea.2021.141982.

- **Indentation investigation of 304L stainless steel friction stir weld simulated crack repair,** Nicolene van Rooyen, **M Bhattacharyya,** Indrajit Charit, Michael R Maughan, *Materials Science and Engineering: A*, *836*, 142691, https://doi.org/10.1016/j.msea.2022.142691.

- **Room temperature corrosion behaviour of plastically deformed AISI 304 stainless steel by friction stir welding in neutral and acidified chloride solutions,** Anirban Naskar**, M Bhattacharyya,** Krishnan S Raja, Indrajit Charit, Jens Darsell, Saumyadeep Jana, *Corrosion Engineering, Science and Technology*, *57*(7), 599-612.,https://doi.org/10.1080/1478422X.2022.2105682**.**

- **Chloride-Induced Stress Corrosion Cracking of Friction Stir-Welded 304L Stainless Steel: Effect of Microstructure and Temperature,** Anirban Naskar, **M Bhattacharyya,** Saumyadeep Jana, Jens Darsell, Krishnan S Raja, Indrajit Charit, *Crystals*, *14*(6), 556,https://doi.org/10.3390/cryst14060556.

- **A Feasibility Study on Crack Repair in Austenitic Stainless Steel Dry Storage Canisters Using Isothermal Friction Stir Welding, M Bhattacharyya,** Indrajit Charit, Krishnan Raja, Jens Darsell, Saumyadeep Jana, In *Pressure Vessels and Piping Conference*, vol. 83815, p. V001T01A099. American Society of Mechanical Engineers, 2020, https://doi.org/10.1115/PVP2020-21716.

**Book Chapter:**
**Comparison of Additive Manufacturing and Powder Metallurgy Methods and Their Components, Madhumanti Bhattacharyya,** Indrajit Charit**,** ASM International ,https://doi.org/10.31399/asm.tb.pmamfa.t59400247.

**Presentations:**

- **"Structure-property correlated in isothermal friction stir welded 304L SS" -** Oral presentation at TMS, San Diego, February 2020
- **"Structure-property correlated in isothermal friction stir welded 304L SS" -** Poster presentation at MS&T, Portland, October 2019
- **"Inhibiting Grain Growth in Microstructure Tailoring of Fe-30%Mn TWIP Steel" -** Oral presentation at graduate seminar series at the Dept of Materials Science and Engineering, McMaster University, December 2017
- **"Grain Boundary Segregation of Nb in Fe-30%Mn Austeniitic Steels" -** Oral presentation at Canadian Materials Science Conference (CMSC) , June 2016
- **"Grain Boundary Segregation of Nb in Fe-30%Mn Austeniitic Steels"-** Oral presentation at An MPMD Symposium Honoring Gary R. Purdy, TMS conference, Nashville, Tennessee, February 2016
- **"Grain Boundary Segregation of Nb in Fe-30%Mn Austeniitic Steels S"-** Oral presentation at graduate seminar series at the Dept of Materials Science and Engineering, McMaster University, February 2016
- **"Austenite Grain Coarsening Study on Nb Microalloyed Steels" –** Oral presentation at graduate seminar series at the Dept of Materials Science and Engineering, McMaster University, January 2014
- **"Microstructural Tailoring in High Silicon High Chromium Bearing Steel"** – Poster presentation at NMD, India, November 2009

**Highlights**:

1. Received **International Excellence Award** at McMaster University for the year 2015-16.
2. Received **Special Faculty International Student Bursary** at McMaster University for the year 2016-17.
3. Qualified Graduate Aptitude Test in Engineering (GATE), 2008.
4. Selected under the VT (Vocational Trainee) Scheme of Tata Steel (R&D) and did a project titled "A Study of the Effect of Iron Oxides on the Formation of Various Defects in Hot rolled Coils"

**Job Experience:**

- Working as a Product Developer in Hot Rolling and Plate Rolling Mill
- Stabilization and Property Analysis of Different Hot Rolled Grades
- Cost Reduction through Chemistry Optimization of various Steel Grades
- Failure Analysis of various Defects in Hot Rolled Coils and Plates.
- Part of the Team doing Audit in Plant

**Courses Taught:**

Laboratory Demonstration of the following courses (as a Teaching Assistant at McMaster University)

- Measurements and Communication (Jan-April,2013, Jan-April, 2017)
- Mechanical Behavior of Materials (Sept-Dec, 2013 and Sept-Dec,2014)
- Phase Transformations (Sept-Dec,2015, Jan-April, 2018)

**Special Trainings Undergone:**

- Basic working procedure and data processing of BT8 neutron diffractometer, National Institute of Standards and Technology, Gaithersburg, Maryland.
- Reconstruction and basic working procedure of **3D atom probe microscope** by CAMECA
- SIX SIGMA Yellow Belt Training, Essar Steel, India
- Statistical Process Control **(SPC),** Essar Steel, India
- Intellectual Property Rights **(IPR)** Essar Steel, India
- Integrated Management System **(IMS),** Essar Steel, India

**Volunteering:**

- Student member of Organizing committee, CMSC, 2016.
- Helped in conducting Oodles of Noodles Contest, *Engineering and Science Olympics, 2013*, Dept of Materials Science and Engineering, McMaster University
- Student member of Organizing committee, NMD 2009
- Member of Sister Nivedita Study Circle (SNSC) BESU, SHIBPUR.
- Hall president of Girls' Hostel, BESU, SHIBPUR
- Member of Cultural Committee, REBECA-2OO7.
- Organizer of **FOBECS** (Forum of Bengal Engineering College Students)
- Member of **SPICMACAY** (Society for the Promotion of Indian Classical Music and Culture Amongst Youth)
- Striker in the football team which played in the finals of ESSAR Football League

**Hobbies:**

- Singing, Playing Hawaiian Guitar
- Playing Table Tennis, Football, Cricket, Badminton
- Painting, Photography, Gardening
- Hiking, Biking, Swimming, Zumba, Gymming

**Languages Known:** English, Hindi & Bengali

**Social Work:**

- Worked as a social worker under Sister Nivedita Study Circle.

Co-ordinator of Gain waste and BESU partnership and collaboration for organic waste management and recycling in BESU campus