

## Dr. Dileep Madapana

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### Research Experience

#### Institute Postdoctoral Fellow

*Department of Mechanical Engineering, Indian Institute of Technology Bombay (Sept 2024 – July 2026)*

#### MSCA P4F Fellow

*Industrial Laser Application, HiLASE, Institute of Physics CAS (July 2026- Present)*

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### Education:

#### Ph.D. in Metallurgical and Materials Engineering

*Indian Institute of Technology Kharagpur (2018–2024) (Supervisor: Prof. Jyotsna Dutta Majumdar)*

- **Thesis:** *Studies on Laser Surface Structuring and Laser Shock Peening of Ti6Al4V and Its Effects on Corrosion and Tribocorrosion Properties for Bioimplant Applications*

#### M.Tech in Metallurgical and Materials Engineering

*Indian Institute of Technology Kharagpur (2016–2018) (Supervisor: Prof. Jyotsna Dutta Majumdar)*

- **Thesis:** *Surface Modification of Ti-6Al-4V by Anodizing for Biomedical Applications*

#### B.Tech in Metallurgical and Materials Engineering

*National Institute of Technology Warangal (2011–2015)*

- **Thesis:** *Deformation Behavior of Cu-TiB<sub>2</sub> Composites Produced by Powder Metallurgy Technique*
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**Patents: Granted-2, Google Scholar Citations: 216, H Index: 9, i10-Index: 9**

#### Patents:

- 1) **Dileep Madapana**, Ravi Bathe, Indranil Manna, Jyotsna Dutta Majumdar “A Process for Surface Structuring of Ti6Al4V Using Nanosecond Laser” Indian Patent No: IN555651, (Granted on Dec 2024).
- 2) Dileep Madapana, Jyotsna Dutta Majumdar “A Method and System for Improving Corrosion and Tribocorrosion Resistance of Ti6Al4V Alloy” Indian Patent No: IN584645, (Granted on Mar 2026).

#### Journal Publications:

- 1) **Dileep Madapana**, Ravi Bathe, Indranil Manna, Jyotsna Dutta Majumdar "Ultrafast Laser-Induced Periodic Structuring of Titanium Alloy (Ti-6Al-4V)". J. of Materi Eng and Perform 30, 4000–4011 (2021). <https://doi.org/10.1007/s11665-021-05779-0>.
- 2) Maji, P., Nath, R.K., Karmakar, R. **Madapana, D** et al. "Wear and Corrosion Behavior of Al7075 Matrix Hybrid Composites Produced by Friction Stir Processing: Optimization of Process Parameters". JOM 73, 4397–4409 (2021). <https://doi.org/10.1007/s11837-021-04945-y>.
- 3) Amitesh Chakraborty, **M Dileep**, Shree Krishna, Sisa Pityana, D Sen, I Manna and J Dutta Majumdar "Wear and corrosion behavior of nano carbide dispersed AISI304

- stainless steel by laser surface processing", *Surf. Topogr.: Metrol. Prop.* 9 045039 (2021) <https://doi.org/10.1088/2051-672X/ac3dd9>.
- 4) Majumdar, J.D., **Madapana, D.** & Manna, I. "3-D Printing by Laser-Assisted Direct Energy Deposition (LDED): The Present Status". *Trans Indian Natl. Acad. Eng.* 6, 933–953 (2021). <https://doi.org/10.1007/s41403-021-00252-9>
  - 5) **Dileep, M.**, Majumdar, J.D. "Short and Ultrashort Laser Surface Processing of Alpha + Beta Titanium Alloy (Ti6Al4V): Present Status". *Trans Indian Natl. Acad. Eng.* (2022). <https://doi.org/10.1007/s41403-022-00333-3>
  - 6) **Dileep Madapana**, Ravi Bathe, Indranil Manna, Jyotsna Dutta Majumdar "Tribocorrosion Behaviour of Laser-Induced Periodic Surface Structured Ti6Al4V". *J Bio Tribo Corros* 9, 9 (2023). <https://doi.org/10.1007/s40735-022-00724-7>.
  - 7) **Dileep Madapana**, Harikrishnan Ramadas, Ashish Kumar Nath, and Jyotsna Dutta Majumdar "Studies on Laser Shock Peening on Nanomechanical and Mechano-Chemical Properties of Titanium Alloy (Ti6Al4V)" *JOM* 75, 109–119 (2023). <https://doi.org/10.1007/s11837-022-05504-9>.
  - 8) A.K. Shukla, D.P. Mondal, **D. Madapana**, J. Dutta Majumdar, Surface degradation behavior of aluminium cenosphere composite foam developed by powder metallurgy route, *Mater. Chem. Phys.* 295 (2023) 127107. <https://doi.org/10.1016/j.matchemphys.2022.127107>.
  - 9) **Dileep Madapana**, Ravi Bathe, Indranil Manna, Jyotsna Dutta Majumdar "Studies on Surface Characteristics and Bio-Corrosion behavior of Ultrafast Laser Structured Titanium alloy (Ti6Al4V)" *physica status solidi (a)*, (2024), <https://doi.org/10.1002/pssa.202300610>.
  - 10) **Dileep Madapana**, Ravi Bathe, Indranil Manna, Jyotsna Dutta Majumdar "Chemical and Mechanochemical degradations of Ultrafast Laser Surface Structured Ti6Al4V in Simulated body fluid Environment" *Applied Surface Science*, (2024), <https://doi.org/10.1016/j.apsusc.2023.159096>.
  - 11) **Dileep Madapana**, Harikrishnan Ramadas, Ashish Kumar Nath and Jyotsna Dutta Majumdar "Structure-Property-Process Parameters Correlation of Laser Shock Peened (LSP) Titanium Alloy (Ti6Al4V) without Protective Layer" *J. of Materi Eng and Perform* (2024). <https://doi.org/10.1007/s11665-023-08900-7>.
  - 12) **Dileep Madapana**, Ravi Bathe, Indranil Manna, Jyotsna Dutta Majumdar, " Effect of process parameters on the corrosion kinetics and mechanism of nanosecond laser surface structured titanium alloy (Ti6Al4V)" *Applied Surface Science Advances*, 20 (2024) 100580, <https://doi.org/10.1016/j.apsadv.2024.100580>.
  - 13) **Dileep Madapana**, Ravi Bathe, Indranil Manna, Jyotsna Dutta Majumdar " Laser surface structuring of titanium alloy (Ti-6Al-4V) for improved tribocorrosion resistance for bio-implant applications" *Tribology International*, (2024), 109711 <https://doi.org/10.1016/j.triboint.2024.109711>.
  - 14) Ramadas, H., Kumar Nath, A., **Madapana, D.**, & Dutta Majumdar, J. Role of heat treatment and laser shock peening on the electrochemical corrosion properties of 15–5 precipitation hardening stainless steel manufactured by laser powder bed fusion process. *Applied Surface Science*, (2024) 160969. <https://doi.org/10.1016/j.apsusc.2024.160969>.

- 15) A.K. Shukla, D.P. Mondal, **D. Madapana**, J. Dutta Majumdar "Studies on Aluminium Cenosphere Composite Foam Developed by Plasma Spray Assisted Additive Manufacturing" J. of Materi Eng and Perform, (2025), <https://doi.org/10.1007/s11665-025-10739-z>.
- 16) **Dileep Madapana**, Hari Krishnan Ramadas, Ashish Kumar Nath and Jyotsna Dutta Majumdar " Nanosecond Laser Shock Peening of Titanium alloys (Ti6Al4V) and its invitro-Tribocorrosion behavior" **Tribology International**, 110480 (2025) <https://doi.org/10.1016/j.triboint.2024.110480>.
- 17) **Madapana, D.**, Rao Nandam, S., & Marla, D. (2026). Investigation of Microhole Quality of Nickel-Based Single Crystal Super-alloy (CMSX-4) Processed by Ultrashort Laser. JLMN- Journal of Laser Micro/Nanoengineering, 21(2). <https://doi.org/10.2961/jlmn.2026.02.2003>
- 18) **Madapana, Dileep**, Ramadas, H., Nath, A. K., & Majumdar, J. D. (2026). Effect of laser shock peening parameters on electrochemical and tribocorrosion behaviour of Ti-6Al-4V alloy in simulated body fluid. Optics & Laser Technology, 203, 115761. <https://doi.org/10.1016/j.optlastec.2026.115761>
- 19) **Dileep Madapana**, Deepak Marla "Color Marking on Borosilicate Glass by nanosecond Laser-Induced Backward Transfer (LIBT) of Brass: Process mapping, Oxide Characterization, and Color Prediction Model" Optics and Laser Technology (Under review)
- 20) **Dileep Madapana**, Deepak Marla "Direct Patterning of Cu on glass by Laser-Induced Backward Transfer " Surface and Interfaces (Under review)
- 21) **Dileep Madapana**, Deepak Marla "Interfacial Bonding and Characterization of Nanosecond Fiber Laser-Welded Glass-to-Aluminum Joints " Journal of Materials Processing Technology (Under review)

#### Conference Proceedings:

- 1) **Madapana, Dileep**; Marla, Deepak. "Nanosecond Laser-Assisted Joining of Soda-Lime Glass With Aluminium Interlayer." Proceedings of the ASME 2025 International Mechanical Engineering Congress and Exposition (IMECE-INDIA2025), September 10-13, 2025, Hyderabad, India.
- 2) **Madapana, Dileep**; Nandam, Srinivasa Rao; Marla, Deepak. "Investigation of Microhole Quality of Nickel-Based Single Crystal Superalloy CMSX-4 Processed by Ultrashort Laser." Proceedings of LAMP2025 - 9th International Congress on Laser Advanced Materials Processing, July 2025, Tokyo, Japan.

#### Conferences:

- 1) NMD ATM 2021 (Online) IIT Kharagpur | *Oral Presentation* | "Tribocorrosion behavior of Ultrafast Laser processed Titanium Alloy (Ti-6Al-4V)".
- 2) MCI 2022 (Online) | *Oral Presentation* | "Corrosion Behavior of Ultrafast Laser Surface Processed Ti alloy (Ti-6Al-4V) in Simulated Body Fluid".
- 3) LAMP 2022 (Online), IIT Kharagpur | *Oral Presentation* | "Mechanical and Electrochemical Behavior of Laser Shock Peened Ti6AL4V".
- 4) NMD ATM 2022, Hyderabad, India | *Poster Presentation* | "Mechanical and Electrochemical Behavior of Laser Shock Peened Ti6Al4V."
- 5) ICPCM 2022, Raurkela, India | *Oral Presentation* | "Electrochemical behavior of Laser Shock Peening (LSP) of Titanium alloy (Ti6Al4V) in Simulated Body Fluid"
- 6) EMRS Spring Meeting 2023, Strasbourg, France | *Oral Presentation*

“Corrosion and Tribocorrosion of Ultrafast Laser Structured Titanium Alloy.” Research Scholars Day 2023, MMED, IIT KGP, India | *Oral Presentation* "Studied on Laser Shock Peening (LSP) of Titanium alloy (Ti6Al4V)".

- 7) LAMP 2025, ISE City, Japan | *Oral Presentation* | “Femtosecond laser drilling of Ni-based single crystal super alloy (CMSX-4)”.
- 8) ASME- IMECE 2025, Hyderabad, India | *Oral Presentation* | “Nanosecond Laser Joining of Glass to Glass using Al as an interlayer”.
- 9) WCMNM 2025, Valletta, Malta | *Oral Presentation* | “Interfacial chemistry of Nanosecond Laser Joining of Glass to Aluminium”.

#### **Technical Training and Workshops**

- Attended a workshop and short-term course on **Non-destructive Testing for Failure Analysis and Prevention** (2019) | IIT Kharagpur.
  - Attended a workshop on **Microstructural Characterization of Materials** (2021) | IIT Kharagpur.
  - Attended a micro-credit Course on **Laser Assisted Additive Manufacturing of Steel** (2023) | IIT Kharagpur.
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#### **Awards and Fellowships**

- Received **P4F Physics for Future-MSCA Cofund** Postdoctoral fellowship
- Received **Silver Citation** for my talk at the **FSEAM 2026** Conference
- Received travel grant for **ANRF Govt of India** to attend an international conference in Japan (ITS/2025/001252)
- **MHRD Fellowship for Doctoral Studies (2019–2023)**: Government of India-funded scholarship for research excellence.
- **MHRD Fellowship for M.Tech (2016–2018)**: Merit-based fellowship for postgraduate education.
- **DRDA Fellowship for Intermediate Education (June 2008 to June 2010)**: Merit-based fellowship during high school.

(Dileep Madapana)