



1. EDUCATION

- **Ph.D** (Materials Science and Engineering): University of Nebraska, Lincoln, USA August 2005.
- **MS** (Metallurgical Engineering): University of Utah, Salt Lake City, Utah, USA, August 2003.
- **ME** (Metallurgical Engineering): Jadavpur University, Calcutta, India.
- **BE** (Metallurgical Engineering): Calcutta University, Howrah, India.

2. EMPLOYMENT

2.1. Academic/Research

1. **Professor:** Dept. of Metallurgical and Materials Engineering, Indian Institute of Technology (IIT), Kharagpur, India, December 2018 – Present.
2. **Associate Professor:** Dept. of Metallurgical and Materials Engineering, Indian Institute of Technology (IIT), Kharagpur, India, September 2013 – December 2018.
3. **Visiting Professor:** Dept. Of Mechanical & Materials Engineering, University of Nebraska, Lincoln, USA, May-July 2010.
4. **Assistant Professor:** Dept. of Metallurgical and Materials Engineering, Indian Institute of Technology (IIT), Kharagpur, India, April 2008 – August 2013.
5. **Visiting Faculty:** Dept. of Metallurgical and Materials Engineering, Indian Institute of Technology (IIT), Kharagpur, India, August 2007 – March 2008.
6. **Post Doctoral Research Associate:** M.D.-ERL (Medical micro-Device Engineering Research Lab), Dave C. Swalm School of Chemical Engineering, Mississippi State University, Starkville, Mississippi State, USA, August 2006 – July 2007.
7. **Post Doctoral Research Associate:** CMRA (Center for Materials Research and Analysis) and College of Engineering and Technology, University of Nebraska-Lincoln, Lincoln, Nebraska, USA, June 2005 – July 2006.
8. **Research Assistant:** Dept. of Mechanical Engineering (Specialization in Materials and Chemicals), University of Nebraska-Lincoln, Lincoln, Nebraska, USA, May 2002 – May 2005.
9. **Research Assistant:** Dept. of Metallurgical Engineering, University of Utah, SLC, Utah, USA, Sept. 1999 – Dec. 2001.
10. **Research Assistant:** Dept. of Materials and Metallurgical Engineering, Indian Institute of Technology (IIT), Kanpur, India, May 1998 – April 1999.
11. **Teaching Assistant:** Dept. of Materials and Metallurgical Engineering, Indian Institute of Technology (IIT), Kanpur, India, May 1997 – April 1998.
12. **Tutor:** Sachdev College Tutorial Center, Calcutta, India, August 1995 – May 1996.

2.2. Industrial

13. Quality Control Engineer: Westing House Saxby Farmer Ltd., Calcutta, India, January 1990 – January 1993.

14. Graduate Engineer Trainee: Westing House Saxby Farmer Limited, Calcutta, India, January 1989 – December 1989.

3. RESEARCH AREAS

1. NiTi-Based Shape Memory Alloys
2. Shape Memory Polymer Composite
3. Permanent Magnets & Magnetic Nanofluids
4. Magnetic Shape Memory Alloys (Heusler)
5. Bio-, Energy-, and 2D-materials (MXenes).

4. TEACHING AREAS

4.1 Theory Courses Taught/Teaching

- Diffusion in Metallurgical Processes
- X-ray Diffraction & Transmission Electron Microscopy
- Materials' Characterization
- Defects & Diffusion in Crystalline Solids
- Solidification Processing
- Casting & Solidification
- Magnetism & Magnetic Materials (New Course developed in Solid State Physics)

4.2 Laboratory Courses Taught/Teaching

- Electron Microscopy in Materials Science and Engineering
- X-ray Diffraction and Electron Microscopy
- Phase Transformation and Heat Treatment
- X-ray Diffraction & Transmission Electron Microscopy
- Introduction to Engineering Materials
- Materials' Characterization

3. REFEREED JOURNAL PUBLICATIONS

1. M. Sai Bhargava Reddy and Shampa Aich, "Recent Progress in Surface and Heterointerface Engineering of 2D MXenes for Gas Sensing Applications", *Coordination Chemistry Reviews*, Volume 500, 1st February (2024), 215542. <https://doi.org/10.1016/j.ccr.2023.215542>. (IF: 20.6)
2. Akila Raja and Shampa Aich, "Magnetic properties of gadolinium and/or dysprosium substituted Sm–Co nanocomposite ribbons", *Journal of Rare Earths*, Available online 10 August (2023).

3. A. Raja, I.A. Al-Omari, J.E. Shield, **S. Aich**, “A combined study on microstructure, microchemistry and magnetic behavior of $(\text{Sm}_{0.12}\text{Co}_{0.88})_{95}\text{Hf}_1\text{B}_4$ nano-composite ribbons by electron microscopy and atom probe tomography”, *Journal of Alloys and Compounds*, Volume 966, 5 December (2023), 171525.
4. A. Oraon, T. Adhikary, M. Tirugabathina, B. Kumar, S. Ghosh, **S. Aich**, “Microstructure and Magnetic Properties of $\text{Co}_{82-(x+y)}\text{Zr}_{13}\text{V}_5\text{B}_x\text{Si}_y$ melt-spun ribbons”, *Journal of Alloys and Compounds*, Volume 965, 25th November (2023), 171436.
5. K.A. Saraswathi, M. Sai Bhargava Reddy, N. Jayarambabu, **Shampa Aich**, Tumu Venkatappa Rao “Highly sensitive Non-enzymatic, Non-Invasive Disposable Electrochemical Polyaniline Nanocaps based Sweat Sensor for Glucose Monitoring” *Materials Letters* Volume 349, 15 October (2023), 134850.
6. M. S. Bhargava Reddy, S. Kailasa, Bharat C. G. Marupalli, K. K. Sadasivuni, and **S. Aich**, “A Family of 2D-MXenes: Synthesis, Properties, and Gas Sensing Applications”, *ACS Sensors*: Vol. 7, (2022), pp. 2132–2163.
7. A. Oraon, T. Adhikary, G.P. Das, S. Ghosh, A. Garg, A. Raja, and **S. Aich**, “Combined experimental and DFT studies of $\text{Co}_{82}\text{Zr}_{12}\text{V}_{6-x}\text{B}_x$ melt-spun ribbons to investigate structure and magnetic properties”, *Journal of Magnetism and Magnetic Materials*, Vol. 547, (2022), pp.,168940.
8. M.S.B. Reddy, D. Ponnamma, K.K. Sadasivuni, **S. Aich**, S. Kailasa, H. Parangusan, M. Ibrahim, S. Eldeib, O. Shehata, M. Ismail, and R. Zarandah, “Sensors in advancing the capabilities of corrosion detection: A review”, *Sensors and Actuators: A. Physical*, Vol. 332, (2021), pp. 113086.
9. B.C.G. Marupalli, A. Behera, and **S. Aich**, “A critical review on Nickel-Titanium thin film shape memory alloy fabricated by Magnetron Sputtering and influence of process parameters”, *Transaction of the Indian Institute of Metals*, Vol.74, (2021), pp. 2521–2540.
10. G. Bhattacharya, N. Chaudhary, V. Prakash, T. Adhikary, **S. Aich**, and V. Adyam, “Electron transport characteristics of FeGa, Ni/n-Si junctions by impedance spectroscopy”, *Superlattices & Microstructures*, Vol. 156, (2021), pp. 106958.
11. Bharat C.G. Marupalli, T. Adhikary, B.P. Sahu, R. Mitra, and **S. Aich**, “Effect of annealing temperature on microstructure and mechanical response of sputter deposited Ti-Zr-Mo high-temperature shape memory alloy thin films”, *Applied Surface Science Advances*, Vol. 6, (2021), pp. 100137.
12. D. K. Satapathy, I.A. Al-Omari, and **S. Aich**, “Magnetocaloric properties of $\text{Ni}_{50}\text{Mn}_{28}\text{Ga}_{22}$ melt-spun ribbons”, *Philosophical Magazine Letters*, Vol.102 (1), (2022), pp. 1-14.
13. T. Adhikary, R. P. Rajak, B.C.G Marupalli, A. Oraon, G. Bhattacharya, V. Adyam, and **S. Aich**, “Synthesis of Ni/Ti thin film by magnetron sputtering to study the effect of annealing time on microstructure and mechanical properties”, *International Journal of Materials and Product Technology*, Vol. 62 (1-3), (2021), pp. 65 - 79.

<https://dx.doi.org/10.1504/IJMPT.2021.115217>

14. A. Oraon, B. P. Das, M. Michael, T. Adhikary, P. Dhar, **S. Aich** and S. Ghosh, "Impact of magnetic field on the thermal properties of chemically synthesized Sm-Co nanoparticles based silicone oil nanofluid", *Journal of Thermal Analysis and Calorimetry*, Vol. 147, (2022), pp. 1933-1943.
<https://doi.org/10.1007/s10973-021-10572-1>
15. D. K. Satapathy, S. Biswas and **S. Aich**, "Microstructure and micro-texture evolution in rapidly solidified melt-spun $\text{Ni}_{50}\text{Mn}_{28}\text{Ga}_{22}$ ribbons", *Journal of Magnetism and Magnetic Materials*, Vol. 527, (2021), pp. 167784.
16. D. K. Satapathy and **S. Aich**, "Magnetomechanical properties of melt-spun off-stoichiometric $\text{Ni}_{50}\text{Mn}_{28}\text{Ga}_{22}$ ribbons", *Journal of Magnetism and Magnetic Materials*, Vol. 24, (2021), pp. 167639.
17. B. P. Das, A. Oraon, T. K. Nath, T. Adhikary, **S. Aich** and P. Pramanik, "Room temperature ferromagnetism in chemically synthesized dilute magnetic semiconducting $(\text{In}_{0.95}\text{Mn}_{0.05})_2\text{O}_3$ nanoparticles" *Journal of Materials Science: Materials in Electronics*, Vol. 31, (2020), pp. 22872–22880
18. S. Sharma, **S. Aich** and B. Roy, "Low Temperature Steam Reforming of Ethanol Over Cobalt Doped Bismuth Vanadate $[\text{Bi}_4(\text{V}_{0.90}\text{Co}_{0.10})_2\text{O}_{11-\delta}]$ (BICOVOX)] Catalysts for Hydrogen Production", *Journal of Physics and Chemistry of Solids*, Vol. 148, (2021), pp. 109754.
19. A. Raja, T. Adhikary, I.A. Al-omari, G.P. Das, D.K. Satapathy, A. Oraon, J.E. Shield, and **S. Aich**, "Rapidly solidified Sm-Co-Hf-B magnetic Nano-composites: Experimental and DFT studies" *Journal of Magnetism and Magnetic Materials*, Vol. 504, (2020), pp. 166645.
20. A. Oraon, R. Oraon, **S. Aich**, and G. Sinha, "Simulation-Based Design of Optimized Symmetric M Magnet Modified with Ferromagnetic Shell, *IEEE Transactions on Magnetics*, Vol. 56, (2020), pp. 1-7.
21. V. Singh, A. Rao, A. Tiwari, P. Yashwanth, M. Lal, U. Dubey, **S. Aich** and B. Roy, "Study on the effects of Cl and F doping in TiO_2 powder synthesized by a sol-gel route for biomedical applications", *Journal of Physics and Chemistry of Solids*, Vol. 134, (2019), pp. 262-272.
22. M.R. Kumar, C.K. Behera, S. Mohan, and **S. Aich**, "Synthesis and Characterization of Titanium and Titanium Nitride Deposition on High Speed Steel Substrate", *Materials Today: Proceedings*, Vol. 18, (2019), pp. 5416–5420.
23. K. Meghana, D. Satapathy, I.A. Al-Omari, T. Adhikary, and **S. Aich**, "Microstructure and Magnetic Properties of Co-doped rapidly solidified $\text{Ni}_{50}\text{Mn}_{25-x}\text{Co}_x\text{Ga}_{25}$ Heusler alloys", *Materials Letters*, Vol. 245, (2019), pp. 162-165.
24. D. K. Satapathy and **S. Aich**, "Time dependent nanomechanical properties of NiMnGa Heusler alloy", *Journal of Alloys & Compounds*, Vol. 788, (2019), pp. 10-20.
25. A. Rao, V. Singh, A. Tiwari, Y. Padarthi, NVM Rao, **S. Aich** and B. Roy, "Investigating the Effect of Dopant Type and Concentration on TiO_2 Powder Microstructure via Rietveld Analysis", *Journal of Physics and Chemistry of Solids* Vol. 113, (2018), pp. 164-176.

26. A. Behera, **S. Aich**, and S. Ghosh, "Simulation of magnetron sputtered Ni/Ti thin film and the effect of annealing", *Emerging materials research*, Vol. 6 (2), (2017), pp. 254-259.
27. A. Behera, R. Suman, **S. Aich** and S. S. Mohapatra, "Sputter-deposited Ni/Ti double-bilayer thin film and the effect of intermetallics during annealing", *Surf. Interface Anal.*, Vol. 49, (2017), pp. 620–629.
28. A. Dey, **S. Aich**, S. Ghosh, S.S. Mohapatra, A. Kumar, and A. Behera "Multi-scale modeling of deposition and re-sputtering of $\text{Ni}_x\text{Ti}_{1-x}$ thin film in a magnetron sputtering chamber", *Computer methods in Material Science*, Vol. 17, (2017), pp. 156-168.
29. B. Singh, S. Ghosh, **S. Aich**, and B. Roy, "Low temperature solid oxide electrolytes (LT-SOE): A review", *Journal of power source*, Vol. 339, (2017), pp. 103-135.
30. B. Geetha Priyadarshini, **S. Aich**, and M. Chakraborty, "Nano-crystalline Ni-Ti alloy thin films fabricated using magnetron co-sputtering: Effect of substrate conditions", *Thin Solid Films*, Vol. 616, (2016), pp. 733-745.
31. **S. Aich**, M.K. Mishra, C. Sekhar, D. Satapathy, and B. Roy, "Synthesis of Al-doped Nano Ti-O scaffolds using a hydrothermal route on Titanium foil for biomedical applications", *Materials Letters*, Vol. 178, (2016), pp. 135-139.
32. B. Roy and **S. Aich**, "Synthesis of Mixed-Phase TiO_2 Powders in Salt Matrix and their Photocatalytic Activity", *Materials & Manufacturing processes*, Vol. 31, (2016), pp. 1628-1633.
33. A. Bhowmik, R. Malik, S. Prakash, T. Sarkar, M.D. Bharadwaj, **S. Aich**, and S. Ghosh, "Classical molecular dynamics and quantum ab-initio studies on lithium-intercalation in interconnected hollow spherical nano-spheres of amorphous Silicon", *Journal of Alloys & Compounds*, Vol. 665, (2016), pp. 165–172.
34. B.G. Priyadarshini, N. Esakkiraja, **S. Aich**, and M. Chakraborty, "Resputtering effect on nanocrystalline Ni-Ti alloy films", *Metallurgical & Materials Transaction A*, Vol. 47 (4), (2016), pp. 1751-1760.
35. A. Behera and **S. Aich**, "Characterization and Properties of magnetron sputtered nanoscale bi-layered Ni/Ti thin film and the effect of annealing", *Surface & Interface Analysis*, Vol. 47, (2015), pp. 805-814.
36. C. Shekhar, B. Roy and **S. Aich**, "Synthesis of Nanostructured Oxide-scaffold on Nitinol surfaces to improve Biocompatibility", *Surface Engineering*, Vol. 31(10), (2015), pp. 747-751.
37. D. Roy, M. Gupta, S. Ghosh and **S. Aich**, "Bombardment of Ni and Ti atoms on $\text{Ni}_x\text{Ti}_{1-x}$ Thin Film under Negative Substrate Bias and its Effect on Film Deposition Rate and Film Crystallinity – Classical Molecular Dynamics Simulation and Experimental Validation", *International Journal of Current Research* (2015).
38. B. G. Priyadarshini, **S. Aich**, and M. Chakraborty, "Substrate bias voltage and deposition temperature dependence on properties of rf-magnetron sputtered titanium films on silicon (100)", *Bull. Mater. Sci.*, Vol. 37 (7), (2014), pp. 1691–1700.
39. B.G. Priyadarshini, **S. Aich** and M. Chakraborty, "On the microstructure and interfacial properties of sputtered Nickel thin film on Si (100)", *Bull. Mater. Sci.*, Vol. 37 (06), (2014), pp. 1265–1273.

40. B.G. Priyadarshini, M.K. Gupta, S. Ghosh, M. Chakraborty, and **S. Aich**, “Role of Substrate Bias during Deposition of Magnetron Sputtered Ni, Ti and Ni-Ti Thin Films”, *Surface Engineering*, Vol. 29 (09), (2013), pp. 689–694.
41. D. Roy and **S. Aich**, “Effect of Sputtering Process Parameters on the Magnetron Sputtered Ni-Ti-Cu thin Films”, *International Journal of Current Research*, Vol. 5 (01), (2013), pp. 075-079.
42. **S. Aich**, “Solar Energy Conversion – Chemical Aspects”, Wiley-VCH, *Materials and Manufacturing Processes*, Vol. 28, (2013), p. 1276.
43. D. Roy and **S. Aich**, “Effect of Hafnium on Nickel-Titanium based Thin Film Coating by DC/RF Magnetron Sputtering Technique” *Journal of NanoScience, NanoEngineering & Applications*, Vol. 2 (3), (2012).
44. D. Roy and **S. Aich**, “Effect of Film Residual Stress on the Crystallization Behaviour of Nickel-Titanium Based Sputtered Binary and Ternary Thin Film”, *International Journal of Mechanics Structural*, Vol. 3 (2), (2012), pp. 119-126.
45. B. Roy, P.A. Fuierer, and **S. Aich**, “Photovoltaic performance of dye sensitized solar cell based on rutile TiO₂ scaffold electrode prepared by a 2 step bi-layer process using molten salt matrices”, *Materials Letters*, Vol. 65, (2011), pp. 2473-2475.
46. B. Roy, L. Li, and **S. Aich**, “Effect of salt composition on photovoltaic performance of the dye sensitized solar cells prepared from nano anatase TiO₂ powder using NaCl-Na₂HPO₄·2H₂O salt matrices,” *J. Mater. Sci.*, Vol. 46, (2011), p. 7611.
47. B. Roy, P.A. Fuierer, and **S. Aich**, “Synthesis of TiO₂ scaffold by a 2 step bi-layer process using molten salt synthesis technique”, *Powder Technology*, Vol. 208, (2011), pp. 657-662.
48. B. G. Priyadarshini, **S. Aich**, and M. Chakraborty, “Structural and morphological investigations on DC-magnetron sputtered nickel films deposited on Si (100)”, *J. Materials Science*, Vol. 46 (9), (2011), pp. 2860-2873.
49. **S. Aich** and J.E. Shield, “Effect of Wheel Speed on the Microstructures and Magnetic Properties of Rapidly Solidified Sm-Co Alloys”, *Journal of Alloys and Compounds*, Vol. 502, (2010), pp. 63–67.
50. B. G. Priyadarshini, **S. Aich**, and M. Chakraborty, “An Investigation on Phase Formations and Microstructures of Ni-rich Ni-Ti Shape Memory Alloy Thin Films”, *Metallurgical Transactions A*, Vol. 42 (11), (2011), pp. 3284-3290.
51. **S. Aich**, S. Das, I.A. Al-Omari, P. Algaraswamy, S. Ghoshchowdhury, M. Chakraborty, J.E. Shield, and D.J. Sellmayr, “Microstructure and Magnetic Properties of Rapidly Solidified Ni₅₄Fe_{27-2x}Ga_{19+2x} Heusler Alloys”, *Journal of Applied Physics*, Vol. 105, (2009), pp. 1-3.
52. **S. Aich**, “Introduction to Materials Chemistry – H.R. Allcock”, Wiley & Sons, in *Materials and Manufacturing Processes*, Vol. 24, (2009), pp. 709-710.
53. **S. Aich** and J. E. Shield, “A Study on The Order-Disorder Phase Transformations of Rapidly Solidified Sm-Co-based Permanent Magnets” *Journal of Magnetism and Magnetic Materials*, Vol. 313, (2007), pp. 76-83.
54. **S. Aich** and J.E. Shield, “Effect of Nb and C Additives on the Microstructures and Magnetic Properties of Rapidly Solidified Sm-Co Alloys”, *Journal of Alloys and Compounds*, Vol. 425, (2006), pp. 416-423.
55. **S. Aich** and J.E. Shield, “Highly Coercive Rapidly Solidified Sm-Co Alloys”, *J. Appl. Phys.*, Vol. 99, (2006), p. 08B521.

56. J.E. Shield, J. Zhou, **S. Aich**, V.K. Ravindran, R. Skomski and D.J. Sellmyer, "Magnetic Reversal in Three-Dimensional Exchange-Spring Permanent Magnets", *J. of Appl. Phys.*, Vol. 99, (2006), p. 08B508.
57. **S. Aich**, J. Kostogorova and J.E. Shield, "Magnetic Behavior of Sm-Co-based Permanent Magnets During Order/Disorder Phase Transformations", *J. Appl. Phys.*, Vol. 97, (2005), pp. 10H108 1-3.
58. J.E. Shield, V.K. Ravindran, **S. Aich**, A Hsiao and L.H. Lewis, "Rapidly Solidified Nanocomposite SmCo₇/fcc Co Permanent Magnets", *Scripta Materialia*, Vol. 52, (2005), pp. 75-78.
59. I.A. Al-Omari and **S. Aich**, "Magnetic and Structural Studies of GdFe_{2-x}Hf_x Alloys", *J. Alloys and Compounds*, Vol. 375, (2004), pp. 31-33.
60. **S. Aich** and J.E. Shield, "Phase Formation and Magnetic Properties of SmCo_{5+x} Alloys with The TbCu₇-type Structure", *J. Magnetism and Magnetic Materials*, Vol. 279, (2004), pp. 76-81.
61. A Hsiao, **S. Aich**, L.H. Lewis and J.E. Shield, "Magnetization Processes in Melt-Spun Sm-Co Alloys with The TbCu₇-type Structure", *IEEE Transactions On Magnetism*, Vol. 40, (2004), p. 2913.
62. **S. Aich** and K.S. Ravi Chandran, "TiB Whisker Coating on Titanium Surfaces by Solid-State Diffusion: Synthesis, Microstructure and Mechanical Properties", *Metallurgical and Materials Trans. A*, Vol. 33A, (2002), pp. 3489-3498.

4. PATENT

1. K.S. Ravi Chandran and **S. Aich**: "Integral Titanium Boride Coatings On Titanium Surfaces And Associated Methods", US Patent (U-3480), 2002.
2. A. Kumar, D. Roy, A.S. Ghosh and **S. Aich** "Thin film coating for preventing biofouling of submerged surfaces", Indian Patent No.413153, 2022.

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5. BOOK CHAPTER

1. Bharat C.G. Marupalli, **Shampa Aich** and Tapasendra Adhikary, “Methods for fabrication of NiTi micro- and nanoalloys”, Ed:- S. Thomas, A. Behera and T. A. Nguyen, “NICKEL-TITANIUM SMART HYBRID MATERIALS From Micro- to Nano-Structured Alloys for Emerging Applications”, Elsevier Inc., Netherlands, United Kingdom, United States, (2022).
2. A. Behera, **S. Aich** and T. Theivasanthi, “Magnetron sputtering for development of nanostructured materials” in book: “Design, Fabrication, and Characterization of Multifunctional Nanomaterials”, January 2022
DOI: [10.1016/B978-0-12-820558-7.00002-9](https://doi.org/10.1016/B978-0-12-820558-7.00002-9)
3. **S. Aich**, D.K. Satapathy and J.E. Shield, “Rapidly Solidified Rare-earth Permanent Magnets :: Processing, Properties and Applications”, Ed:- Sam Zhang Shanyong, “Advances in Magnetic Materials: Processing, Properties, and Performance”, CRC Press, Taylor & Francis, Boca Raton London New York, (2016).
4. **S. Aich** and B. Roy, “Titanium Oxide Nano- and Submicron-structured Coating for Ti and Ti Related Bio-implants”, Ed:- A.K. Srivastava, “Oxide Nanostructures: Growth, Microstructures and Properties”, Pan Stanford Publishing Pte. Ltd., CRC Press, Taylor & Francis Group, Singapore, (2014).

6. CONFERENCE PROCEEDINGS (Paper/Publications)

1. A. Raja, and **S. Aich**, “Enhancement of magnetic properties of Sm-Co nano composite ribbons by heavy lanthanide doping”, Materials Today: Proceedings - International Conference on Nanotechnology for Sustainable Living and Environment (ICON-NSLE 2022), 76 (2023) 256-262.

2. Deepak Satapathy, P Babu, Imad Al-Omari, **Shampa Aich**, “Magneto-mechanical properties and Magneto-caloric behaviour of Rapidly Solidified Melt-spun $\text{Ni}_{50}\text{Mn}_{28}\text{Ga}_{22}$ Heusler Alloy”, Supplemental UE: TMS 2022 Conference Proceedings.
3. Ajit Behera, **S. Aich**, Asit Behera, A. Sahu, “Processing and Characterization of magnetron sputtered Ni/Ti thin film and their annealing behaviour to induce shape memory effect”, Materials Today: Proceedings- 4th International Conference on Materials Processing and Characterization 2 (2015) 1183 – 1192.
4. **S. Aich**, B. Geetha Priyadarshini, M. Gupta, S. Ghosh, and M. Chakraborty, “Formation of Crystalline and Amorphous Phases during Deposition of $\text{Ni}_x\text{Ti}_{1-x}$ Thin Film on Si Substrate – Interpretation of Experimental Results Using Molecular Dynamics Simulations”, *Supplemental Proceeding: Materials Processing and Interfaces, Volume 1, Published online: 18th May 2012, Symposium Proceedings, 141ST TMS 2012 Annual Technical Meeting, Orlando, Florida, USA.*
5. B. Geetha Priyadarshini, **Shampa Aich**, Madhusudan Chakraborty, “Studies on Ni-Ti Thin Films grown by Bias Assisted Magnetron Sputtering”, *Conference Proceedings, 140th TMS 2011 Annual Technical Meeting, San Diego, California, USA.*
6. **Shampa Aich**, Chandra Sekhar, Mrinal Mishra, “Nanostructured Bio-scaffold for Bone Implants, Stents: A Biomedical Evolution”, *Collected Proceedings, 139th TMS 2010 Annual Technical Meeting & Exhibition, Seattle, WA, USA.*
7. **S. Aich** and J.E. Shield, “Structure and Properties of Rapidly Solidified Sm-Co Alloys”, *Proceedings of 18th Workshop on HPMA (High Performance Magnets & their Applications) Workshop, Annecy (France), August 2004.*

7. CONFERENCE PROCEEDINGS/PRESENTATIONS (Oral Presentations)

1. International Conference → 20 Oral Presentations.
2. National Conference → 1 Oral Presentation.

8. CONFERENCE PROCEEDINGS (Abstracts for Poster Presentations)

International Conference → 5 Poster Presentations

9. INVITED TALK

1. **Shampa Aich**, Akila Raja, Shrantik K Dey, and Gautam Sinha, “Exchange-coupled Nano-composite Rare-Earth Hard Magnetic Ribbons; processing, properties and applications”, IIM-ATM 2023, November 22-24, 2023– KIIT-Bhubaneswar, Odisha, INDIA.
2. **Shampa Aich** and Dibyendu Roy, “Anti-microbial Behaviour of Ni-Ti and Ni-Ti-Cu Thin-film Surfaces”, ICMESM 2022, July 12-14, 2022, London, UK.
3. **S. Aich**, P. Dixit, U.L.S. Manikanta, M.V.A.S. Chaitanya, K.B. Walters and A.R. Minerick, “Silica Nano-encapsulated Cu-SiO₂ and Fe₃O₄-SiO₂ Core-Shell Nanoparticles”, ICON-NSLE 2022, April 14-16, 2022, BITS-PILANI, Pilani Campus, INDIA.

4. **S. Aich**, “Magnetic Materials and Their Applications”, March 2022, IIITDM Kancheepuram, Chennai, INDIA.
5. **Shampa Aich**, “Materials Science & Engineering Major Breakthroughs & Future”, National Technology Day, May 2021, CSIR-AMPRI, India.
6. **S. Aich**, “Advanced Functional Materials”, July 2019, CSIR-AMPRI, India.
7. **S. Aich**, “Smart Materials based on Metallic Materials used in Actuation”, June 2019, IIT-Madras, India.
8. **S. Aich**, D.K. Satapathy, K. Meghana, S. Das, I.A. Al-Omari and J.E. Shield “Magnetic Shape Memory Alloy and Its Applications”, ICPCM, December 2019, NIT-Rourkela, Orissa, INDIA.
9. **S. Aich**, “Magnetic Materials and their Applications”, Short Term Course on Advances in Materials, March 2019, NIT-Rourkela, Orissa, INDIA.
10. **S. Aich** and A. Behera, “Multi-layered sputter deposited Ni/Ti thin film SMAs :: Solid state inter-diffusion and formation of intermetallics”, FiMPART 2015, Hyderabad, India.
11. **S. Aich**, “Magnetron sputtered NiTi-based thin film shape memory alloys”, CALM 2014, SSM University, Chennai, India.
12. **S. Aich**, S. Das, M. Vijaykumar, K. Kumar, M. Chakraborty, and J.E. Shield, “Rapidly Solidified NiFeGa(Al) and CoNiGa(Al) Ferromagnetic Shape Memory Alloys in Heusler Family”, *NMD-ATM-2013*, November, Varanasi, India.
13. **S. Aich**, R. Mallik, T. Sarkar, A. Sinha, A. Panwar, M. Dixit Bharadwaj and S. Ghosh, “Microstructural and electrochemical characterization of $\text{Li}_3\text{V}_2(\text{PO}_4)_3/\text{C}$ composite and LiFePO_4 synthesized by novel methods”, EMSI 2013, Kolkata, India
14. **S. Aich**, “Microstructure and Magnetic Properties of Rapidly Solidified Heusler Type Ferromagnetic Shape Memory Alloys”, July 2010, Nebraska Center for Materials and Nanoscience, University of Nebraska, Lincoln, Nebraska, USA.

10. RESEARCH PROPOSAL SANCTIONED / FUNDED RESEARCH PROGRAM

(a) Sponsored Research Projects (Sanctioned):

S. No	Title	Sponsoring Agency and Officer Concerned	Period	Amount
1.	High-Temperature Shape Memory Thin Film as Micro-Valves in Aerospace Applications	<i>Scheme for Promotion of Academic and Research Collaboration (SPARC)</i>	2 years since July 2023	INR Rs. 41,50,286/-
2.	Development of prototype NdFeB magnet materials for making accelerator magnets	<i>Board of Research in Nuclear Sciences (BRNS), Mumbai, India</i>	3 Years since April 2020	INR Rs. 32,15,500/-

3.	Influence of layer configuration, annealing temperature and time on the microstructure, texture, and nano-indentation properties of NiTi shape memory alloy thin film produced by magnetron sputtered bi-layered and multi-layered Ni/Ti thin films.	<i>Council of Scientific and Industrial Research, CSIR complex, New Delhi, India</i>	3 years since February 2016	INR Rs. 19,68,000/-
4.	Ti/TiB ₂ bi-layered and multi-layered Coating on Steel Substrate by Physical Vapor Deposition (PLD, sputtering) Techniques to Improve Tribological Vapor Deposition (PLD, Sputtering) Techniques to Improve Tribological Properties (high wear/abrasion resistance, low friction coefficient) and Cutting Efficiency	<i>Council of Scientific and Industrial Research, CSIR complex, New Delhi, India</i>	4 years since August 2010	INR Rs. 25,00,000 /-
5.	Nanoscale Developments in a Co-based Heusler Type Co-Ni-Ga Ferromagnetic Shape Memory Alloy	<i>Institute Scheme for Innovative Research and Development (ISIRD) at IIT (Indian Institute of Technology), Kharagpur, India</i>	2 years from January 2008	INR Rs. 3,52,000 /-
6.	Characterization of Metal-Silica Core-Shell Nanoparticles: An Electron Microscopy Study	<i>Department of Energy (DOE) Sustainable Energy Research Center (SERC) at MSU (Mississippi State University), USA</i>	6 months from February 2007	USD \$6000, equivalent to Rs. 3,00,000 /-

11. MEMBER: PROFESSIONAL BODY

1. Indian Institute of Metals (IIM) – Life Member
2. Electron Microscopy Society of India (EMSI) – Life Member

11. HONORS/AWARDS/MERITS/PROFESSIONAL CONTRIBUTIONS

1. **Winner (Topper) in Sigma-Xi Graduate Student Research poster competition:**
“Synthesis & Characterization of SmCo-based Rapidly Solidified Melt-spun ribbons”
University of Nebraska-Lincoln, Lincoln, Nebraska, April, 2004.

2. **Journal Reviewer** - Journal of Applied Physics (IF – 2.25), Journal of Alloys and Compounds (IF – 4.65), Materials Letter (IF-3.02), Metallurgical & Materials Transactions (IF – 2.27), Materials Science & Engineering C (IF – 5.88).

12. STUDENTS SUPERVISION (IIT-Kharagpur)

1. **Doctoral:**

- Geetha Priyadarshini, PhD, January 2012 (Topic:- Ni, Ti, and NiTi thin films).
- Dibyendu Roy, PhD, August 2015 (Topic:- NiTi binary and NiTiX ternary thin films).
- Ajit Behera, PhD, July 2016 (Topic:- Ni/Ti multi-layered thin films).
- Deepak Satapathy, PhD, September 2020 (Topic:- Magnetic Shape Memory Alloys).
- Akash Oreon, PhD, December 2022 (Topic:- REPM/REFPM/Hard magnets).
- Akila R, PhD, May 2023 (Topic:-Rare-Earth Permanent Magnets).
- Meghana Kinnera, PhD, expected 2024 (Topic:- Magnetic Shape Memory Alloys).
- M. BharatCharan Gour, PhD, expected 2024 (Topic:- Shape Memory Alloys).
- Tapasendra Adhikary, PhD, expected 2024 (Topic:- Shape Memory Alloys).
- Anusha M, PhD, expected 2025 (Topic:- Shape Memory Alloys)
- **Bhargava M Reddy, expected 2027 (Topic:- 2D MXenes Gas Sensors)**
- Sibani Mahapatra, expected 2027 (Topic:- SMA/MSMA-polymer nanocomposite)
- Shrantik K Dey, expected 2027 (Topic: Rare-Earth Permanent Magnets)

2. **Masters:**

- Already Graduated → 31 M.Tech students (including Dual Degree).
- 2 students, M.Tech, Expected in 2024.
- **Best Project Award achieved by a student** (a dual degree student of mine).

3. **Bachelors:**

- Already Graduated → 36 B.Tech students (including Dual Degree).

14. **ACTIVITIES/CONTRIBUTION**

14.1 **Departmental Activity**

Examination In-Charge, Faculty Advisor

14.2 **Institute Activity**

Member, Internal Complaints Committee (ICC), CO- Principal In-charge - SQUID Laboratory, Central Research Facility

14.3 **Other Activity (Outside Institution/Organization)**

Member, Research Council, CSIR-AMPRI, Bhopal, INDIA.

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