

SCIENTIST/OFFICERS BIO-DATA

a. NAME:			
Dr. Manjusha Battabyal			
b. QUALIFICATION:			
Ph. D , Cryogenic Engineering			
c. DESIGNATION:			
Scientist			
d. CONTACT INFORMATION:			
CENTRE FOR AUTOMOTIVE ENERGY MATERIALS, ARCI, IITM RESEARCH PARK, TARMANI, CHENNAI 600 0113. Ph. +044 66632817 email: manjusha.battabyal@gmail.com			
e. EXPERIENCE:			
Project Scientist (middle level)	2016- till date	Centre for Automotive Energy Materials (CAEM), ARCI, IITM Research Park, Chennai	Thermoelectric Materials for Automotive Applications and Device Fabrication
DST Scientist	2013- 2015	Centre for Automotive Energy Materials (CAEM), ARCI, IITM Research Park, Chennai	Thermoelectric Materials for Automotive Applications and Device Fabrication
Collaborator Scientist	2010-2012	EPFL, Switzerland	Processing, Microstrure and Mechanical Properties of W based Composites for the First Wall Component in Future Fusion Power Reactor

Post-Doctoral Scientist	2009-2010	Chalmers University of Technology, Sweden	Microstructure and Microhardness Studies in Thermal Sprayed Ni-Al Bond Coat Materials
Post-Doctoral Fellow	2006-2008	Swiss Federal Laboratory for Materials Technology, EMPA, Switzerland	Development and Optimization of Metal-Diamond Composites for Heat Sink Applications
Ph. D	2002 – 2006	Indian Institute of Technology, Kharagpur	Electrical and Thermal Transport on Silver Doped Lanthanum Manganites

f. RESEARCH AREA OF INTEREST

Powder Metallurgy, Squeeze Casting, SPS and HIPping, Thermoelectric Materials and Device Fabrication, High Temperature Materials, Transmission Electron Microscopy, Thermophysical Properties, Mechanical Testing,

g. LIST OF JOURNAL PUBLICATIONS

PAPERS IN REFERRED JOURNALS

1. H. Subramaniam, D. Sivaprahasam, **M. Battabyal**, R. Gopalan, Phase stability and thermoelectric properties of $\text{Cu}_{10.5}\text{Zn}_{1.5}\text{Sb}_4\text{S}_{13}$ tetrahedrite, *J. Alloys. Comp.*, **667** (2016) 323.
2. **M. Battabyal**, B. Priyadarshini, D. Sivaprahasam, N S. Karthiselva, R. Gopalan, The effect of Cu_2O nanoparticle dispersion on the thermoelectric properties of n-type skutterudites, *J. Phys. D: Appl. Phys.*, **48** (2015) 455309.
3. L. Veleva. R. Schaublin, **M. Battabyal**, T. Polsiki, N. Baluc, Investigation of microstructure and mechanical properties of W-Y and W-Y₂O₃ materials fabricated by powder metallurgy method, *Int. J Refractory Metals and Hard Materials*, **50**, 210 (2015).
4. **M. Battabyal**, P. Spätig, B. S. Murty, N. Baluc, Investigation of microstructure and microhardness of pure W and W-2wt.%Y₂O₃ materials before and after ion-irradiation, *Int. J Refractory Metals and Hard Materials*, **46**, 168 (2014).

5. **M. Battabyal**, P. Spätig, N. Baluc, Effect of ion-irradiation on the microstructure and microhardness of the W-2wt.%Y₂O₃ composite materials fabricated by sintering and hot forging, *Fusion Engg and Design*, **88**, 1668 (2013).
6. M. Rieth , S. L. Dudarev , S. M. Gonzalez de Vicente , T. Ahlgren, S. Antusch, N. Baluc, M. Balden, M.-F. Barthe, **M. Battabyal**, et al, Review of the EFDA programme on W materials, *Journal of Nuclear Material*, **442**, S173 (2013).
7. S. Wurster, N. Baluc, **M. Battabyal**, T. Crosby, J. Du, C. Garcia Rosales, A. Hasegawa, A. Hoffmann, A. Kimura, H. Kurishita, R.J. Kurtz, H. Li, S. Noh, J. Reiser, J. Riesch, M. Rieth, W. Setyawan, M. Walter, J.-H. You, R. Pippan, Recent progress in R&D on tungsten alloys for divertor structural and plasma facing materials, *Journal of Nuclear Material*, **442**, S181 (2013).
8. **M. Battabyal**, R. Schäublin, P. Spätig, M. Walter, M. Rieth, N. Baluc ,
MICROSTRUCTURE AND MECHANICAL PROPERTIES OF A W-2wt.%Y₂O₃
COMPOSITE PRODUCED BY SINTERING AND HOT FORGING, *Journal of Nuclear Material*, **442**, S225 (2013).
9. M. Rieth , S. L. Dudarev , S. M. Gonzalez de Vicente , T. Ahlgren, S. Antusch, N. Baluc, M. Balden, M.-F. Barthe, **M. Battabyal**, et al, Recent progress on tungsten materials research for nuclear fusion applications in Europe, *Journal of Nuclear Material*, **432**, 482 (2013).
10. M. Battabyal, R. Schäublin, P. Spätig, N. Baluc, W-2wt.%Y₂O₃ COMPOSITE: MICROSTRUCTURE AND MECHANICAL PROPERTIES, *Materials Science and Engineering A* **538**, 53 (2012).
11. U. Klement, L. Hollang, S.R. Dey, **M. Battabyal**, O. V. Mishin, W. Skrotzki, Effect of annealing on texture development and grain orientation in electrodeposited Ni, *Solid State Phenomena* **160**, 235 (2010).
12. Kotaro Ishizaki, **Manjusha Battabyal**, Yoko Yamada Pitini, Radu Nicula and Sebastien Vaucher, Microwave Sintering Explored by X- Ray Microtomography, *Ceramic Transactions* **209**, 211 (2010).
13. **M. Battabyal** , O. Beort, S. Kleiner, S. Vaucher and L. Rohr, Heat conduction across metal-diamond interface, *Dia. Rel. Mater.* **17**, 1438 (2008).
14. **Manjusha Battabyal** and T. K. Dey, Electrical resistivity and magneto- resistance of

$\text{La}_{0.7}\text{Sr}_{0.3-x}\text{Ag}_x\text{MnO}_3$ pellets between 10 and 450K, Int. J. Mod. Phys. B. **21**, 707-722 (2007).

15. **Manjusha Battabyal** and T. K. Dey, Thermal and electronic transport in $\text{La}_{0.7}\text{Sr}_{0.3-x}\text{Ag}_x\text{MnO}_3$ compounds, Physica B **373**, 46-53 (2006).
16. **Manjusha Battabyal** and T. K. Dey, Seebeck coefficient in polycrystalline $\text{La}_{0.7}\text{Sr}_{0.3-x}\text{Ag}_x\text{MnO}_3$ pellets: analysis in terms of a phase separation model, J. Phys.: Condensed Matter **18**, 493-505 (2006).
17. **Manjusha Battabyal** and T. K. Dey, Electrical conductivity in $\text{La}_{1-x}\text{Ag}_x\text{MnO}_3$ pellets between 10 and 350K, Physica B **367**, 40-47(2005).
18. **M. Battabyal** and T. K. Dey, Thermal conductivity of silver doped lanthanum manganites between 10 and 300K, J. Phys. and Chem. Solids, **65**, 1895 (2004).
19. **Manjusha Battabyal** and T. K. Dey, Low temperature electrical transport in Ag substituted LaMnO_3 polycrystalline pellets prepared by a pyrophoric method, Solid State Comm. **131**, 337 (2004).
20. **M. Battabyal**, A. Ray and T. K. Dey, Magneto-transport studies in Yttrium doped Lanthanum manganites between 10-300K, Indian Journal of Pure and Applied Physics **41**, 443 (2003).

PAPERS IN CONFERENCE PROCEEDINGS

1. M. Battabyal, P. Spätig, L. Veleva, N. Baluc, M. Q. Tran, 'Development of W based materials for fusion power reactors', proceedings of the 24th Fusion Energy Conference (2012), San Diego, USA, p1-p7.
2. Battabyal Manjusha, Klement Uta, Norell Mats, Goutier Simon, Markocsan Nicolaie, 'Comparison of microstructure in Ni-Al single splats and millimeter sized droplets' proceedings of the 25th International Conference on Surface Modification Technologies', University West in Trollhättan, Sweden, SMT25 2011, p3-p12.
3. Manjusha Battabyal and T. K. Dey, Low temperature thermoelectric properties of silver doped lanthanum manganites, Indian Journal of Cryogenics, (2005).

4. **M. Battabyal** and **T. K. Dey** 'Low temperature electrical resistivity in $\text{La}_{0.7}\text{Sr}_{0.3-x}\text{Ag}_x\text{MnO}_3$ pellets at cryogenic temperatures' Proceedings of the International Symposium on Advanced Materials And Processing (2004), held at Material Science Center in IIT Kharagpur, India.

h. Meetings/Conferences

1. **M. Battabyal**, Invited talk on advanced automotive materials at College of Engineering, Anna University, Chennai, 19th March, 2016.
2. **M. Battabyal**, Invited talk at International Conference on Frontier in Materials Science and Technology, held at NIST, Orissa, 10-11th December, 2015.
3. **M. Battabyal**, B. Priyadarshini, D. Sivaprahasam and R. Gopalan, Nanostructure control to enhance figure of merit in bulk filled skutterudites, Contributory talk at 2nd Indo-US workshop on thermoelectrics held at NPL New Delhi, India on 15-17th December 2014.
4. **M. Battabyal**, P. Spätig, N. Baluc, Effect of ion-irradiation on the microstructure and microhardness of the W-2wt.%Y₂O₃ composite materials fabricated by sintering and hot forging, Symposium on Fusion Technology (SOFT-2012), Belgium.
5. **M. Battabyal**, P. Spätig, L. Veleva, N. Baluc, M. Q. Tran, 'Development of W based materials for fusion power reactors', 24th Fusion Energy Conference (2012), San Diego, USA.
6. **M. Battabyal**, R. Schäublin, P. Spätig, P. Unifantowicz, N. Baluc, MICROSTRUCTURE AND MECHANICAL PROPERTIES OF A W-2wt.%Y₂O₃ COMPOSITE PRODUCED BY SINTERING AND HOT FORGING, ICFRM-15, USA (October, 2011).
7. **M. Battabyal**, 'Microstructural characterization of HVOF sprayed Inconel 718 coating on Inconel 718 substrate ' at VOLVO Aero-corporation, Trollhättan, Sweden (April, 2009).
8. **M. Battabyal**, 'Metal-matrix composites for thermal applications' at EMPA, Materials Science and Technology, Switzerland (December, 2008).

9. **M. Battabyal**, O. Beffort, S. Kleiner, 'Heat transport across the metal-diamond interface' at EMPA, Materials Science and Technology, Switzerland (April, 2007).
10. **M. Battabyal**, L. Hollang, S.R. Dey, W. Skrotzki, U. Klement 'Interfacial Characterization of the Thermal Sprayed Ni-Al Splat on the Ti-Al-V Substrate ' 3rd International Conference on Texture and Anisotropy of Polycrystals (ITAP-3) (2009), Göttingen, Germany.
11. K. Ishizaki, **M. Battabyal**, Y. Yamada Pitini, R. Nicula and S. Vaucher 'Microwave Sintering Explored by X-Ray Microtomography ' Sintering 2008, California, USA.
12. Vaucher Sebastien, Nicula R, **Battabyal M**, Ishizaki K, Unifantowicz P, Schmidt B, Stir M, Catala J.-M 'Microwave Materials Processing: In-Situ Analytics ' Advanced Processing for Novel Functional Materials (APNFM-2008) ,Dresden, Germany.
13. **M. Battabyal**, O. Beffort, S. Kleiner, S. Vaucher and L. Rohr 'Heat transport across the metal-diamond interface' 18th European Conference on Diamond, Diamond-Like Materials, Carbon Nanotubes and Nitrides (2007), Berlin, Germany.
14. Attended the 9th Seminar 'Computer Modeling and Microwave Power Engineering' March 5-6, (2007) Valencia, Spain.
15. **M. Battabyal** and T. K. Dey 'Low temperature electrical resistivity in $\text{La}_{0.7}\text{Sr}_{0.3-x}\text{Ag}_x\text{MnO}_3$ pellets at cryogenic temperatures' International Symposium on Advanced Materials And Processing (2004), held at Material Science Center in IIT Kharagpur, India.
16. **Manjusha Battabyal** and T. K. Dey 'Low temperature thermoelectric properties of silver doped lanthanum manganites' Indian Cryogenic Council Conference (2004), B.E. College, Calcutta, India.
17. **Manjusha Battabyal** and T. K. Dey, 'Low temperature resistivity minimum in silver doped lanthanum manganites prepared by novel pyrophoric method', Material Research Society of India (2004), Banaras Hindu University, India.
18. **M. Battabyal**, A. Ray, T. K. Dey, ' Magneto-transport studies in yttrium doped lanthanum manganites between 10-300K ' National Conference on Thermo-physical Properties (2002), University of Rajasthan, Jaipur, India.

I. AWARDS AND HONORS

1. Gold-medalist, received four gold medals for securing first position in the university (among 1500 students) during Bachelors Degree in physics.
2. Qualified in the prestigious national level Graduate Aptitude Test for Engineering (GATE)-2001, conducted by Indian Institute of Technologies. AIR-71.
3. Doctoral fellowship granted by Indian Institute of Technology, Kharagpur (2002-2006).
4. National scholarship granted by Dept. of Education, Govt. of India, during undergraduate study (1993-2000).

j.PHOTOGRAPH



k. Affiliation to Professional Societies

1. Associate Member of Indian Institute of Metals.
2. Associate Member for Swiss Society of Optics and Microscopy.
3. Elsevier Reviewer Recognition award (2015).