

Nabin Sarmah

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CURRENT PROFILE:

Assistant Professor, Department of Energy, Tezpur University, Tezpur, Assam, India

WORK/RESEARCH EXPERIENCES:

Post-Doctoral Research Fellow (June 2013-September2014): Environment and Sustainability Institute, University of Exeter, UK; Project: ‘Development and Integration of Biomass and Concentrating Photovoltaic System for Rural and Urban energy Bridge: BioCPV’.

Post-Doctoral Research Associate (January2012 – April2013): Heriot Watt University, UK; Project: Development and Integration of Biomass and Concentrating Photovoltaic System for Rural and Urban energy Bridge: BioCPV.

Research Assistant (April 2011 – December 2011): ‘Active Solar Panel Initiative’ in Mechanical Engineering department, Heriot Watt University, UK.

PhD project (2008 - 2012): ‘Design and Performance Evaluation of a Low Concentrating Line-axis Dielectric Photovoltaic System’ in Mechanical Engineering Department, Heriot-Watt University, UK.

Masters project (2006 - 2007): ‘Functionalization of Multi-walled carbon nanotubes and application in phenolic resin-based composites’ in the National Physical Laboratory, New Delhi

EDUCATIONAL BACKGROUND:

Doctor of Philosophy (Mechanical Engineering), Heriot-Watt University, UK	2008-2012	
Master of Technology (Energy Technology), Tezpur University, India	2005-2007	(1 st Class)
Master of Science (Physics), Tezpur University, India	2001-2003	(1 st Class)
Bachelor of Science (Physics), Gauhati University, India	1997-2001	(1 st Class)

RESEARCH GRANTS

- Co-Investigator of Tezpur University for the IMPRINT project “Multi-Crop Residue Processing Technology Package for Production of Fuel and Fertilizer”, Grant amount ₹ 1,40,78,592 (IMP/2019/000247); 2019; Funded by: DST-SERB, India.
- Principle Investigator of Tezpur University for the project “India-UK Center for Education and Research in Clean Energy (IUCERCE)”; Grant amount: ₹ 74,56,400 (DST/RCUK/JVCCE/2015/04(4) (G)); 2017
- Principle Investigator of UGC Start-Up grant: ₹ 6,00,000 (F.30-33/2014 (BSR)); 2015
- Research grant of £4000: Through EU 7-framework early researcher programme to carry-out collaborative research work in Indian Institute of Technology Guwahati, India (December2012-February2013).

FELLOWSHIP/SCHOLARSHIP

PhD fellowship from Heriot-Watt University, UK (May2008-April2011)

Achieved an exchange student scholarship to work in the Beijing Jiaotong University, China for two months during PhD (January2011-March2011)

TEACHING:

Assistant Professor (Tezpur University, India): Taking lectures on the ‘Solar Energy’ and general laboratory courses for M.Tech. in Energy Technology program.

Teaching Fellow (Heriot-Watt University, UK): Worked as teaching fellow in the University of Exeter and delivered lecture for undergraduate course on Renewable Energy (2013-2014).

Teaching Assistant (Heriot-Watt University, UK): Worked as a teaching assistant for module ‘Renewable Energy Technologies’ and ‘Fundamental of Renewable Energy’ of the ‘M.Sc. in Renewable Energy’ courses (2009-2012).

SUPERVISION:

- ❖ Currently Supervising 4 PhD Students and 4 Masters Students as Primary Supervisor
- ❖ Supervised 10 Master Students in Tezpur University for project of one-year duration
- ❖ Supervised 2 PhD student as mentor (or proxy-supervisor) during Post-doctoral position in University of Exeter, UK:
 - Design and development of receiver assembly for high concentrating photovoltaic system with micro-fin for passive cooling.
 - Secondary concentrator design for high concentrating photovoltaic system.
- ❖ Supervised 3 Masters students, 3 undergraduate students and 3 exchange students as a co-supervisor during PhD and Post-Doctoral Positions in Heriot-Watt University and University of Exeter.

PUBLICATIONS:

Journal papers:

1. G. P. Smestad, T. A. Germer, H. Alrashidi, E. F. Fernández, S. Dey, H. Brahma, N. Sarmah, A. Ghosh, N. Sellami, I. A. I. Hassan, M. Desouky, A. Kasry, B. Pesala, S. Sundaram, F. Almonacid, K. S. Reddy, T. K. Mallick, L. Micheli, “Modelling photovoltaic soiling losses through optical characterization”, Scientific Reports, 10:58, 1 - 13 (2020).
2. A. Ghosh, N. Sarmah, S. Sundaram, T. K. Mallick, “Numerical studies of thermal comfort for semi-transparent building integrated photovoltaic (BIPV)-vacuum glazing system”, Solar Energy, 190, 608-616, (2019) (Impact Factor: 4.374)
3. B. J. Saharia, H. Brahma, N. Sarmah, “A review of algorithms for control and optimization for energy management of hybrid renewable energy systems”, Journal of Renewable and Sustainable Energy, 10, 053502, (2018) (Impact Factor:1.337).
4. B. Talukdara, S. Buragohain, S. Kumar, V. Umakanth, N. Sarmah, S. Mahapatra, “Effect of spectral response of solar cells on the module output when individual cells are shaded”, Solar Energy, 137, 303-307, (2016) (Impact Factor: 3.685).
5. L. Micheli, E. Fernández, N. Sarmah, S. Senthilarasu, K. S. Reddy, T. K. Mallick, “Small-Volume Fabrication of a 144-Cell Assembly for High-Concentrating Photovoltaic

- Receivers”, *Journal of Solar Energy Engineering*, 138, 0310081-03100810, (2016) (Impact Factor: 1.934)
6. K. Shanks, N. Sarmah, J. P. Ferrer-Rodriguez, S. Senthilarasu, K. S. Reddy, E. F. Fernández, T. K. Mallick, “Theoretical investigation considering manufacturing errors of a high concentrating photovoltaic of cassegrain design and its experimental validation”, *Solar Energy*, 131, 235-245 (2016) (Impact Factor: 3.469)
 7. L. Micheli, N. Sarmah, X. Luo, K.S. Reddy, T. K. Mallick, “Design, Development and Analysis of a Densely Packed 500× Concentrating Photovoltaic Cell Assembly on Insulated Metal Substrate”, *International Journal of Photoenergy*, 2015, 1-18, 2015, (DOI:10.1155/2015/341032) (Impact Factor: 1.563).
 8. N. Sarmah, T. K. Mallick, “Design, fabrication and outdoor performance analysis of a low concentrating photovoltaic system”, *Solar Energy*, 112, 361-372, 2015 (Impact Factor: 3.541).
 9. L. Micheli, N. Sarmah, X. Luo, K. S. Reddy, T. K. Mallick,” Design of 16-Cell Densely-Packed 500× Concentrating Photovoltaic Receiver”, *Energy Procedia*, 54, 185-198, 2014 (Impact Factor: Not available; Publisher: Elsevier).
 10. H. Baig, N. Sarmah, D. Chemisana, J. Rosell, T. K Mallick, “Enhancing Performance of a Linear Dielectric Based Concentrating Photovoltaic System”, *Energy*, 73, 177-191, 2014 (Impact Factor: 4.159).
 11. N. Sarmah, B. S. Richards, T. K. Mallick, “Design and indoor performance analysis of a low concentrating dielectric photovoltaic module”, *Solar Energy*, 103, 390-401, 2014 (Impact Factor: 3.541).
 12. F. Muhammad-Sukki, S. H. Abu-Bakar, A. B. Munir, S. H. M. Yasin, R. Ramirez-Iniguez, Scott G McMeekin, Brian G Stewart, N. Sarmah, T. K. Mallick, R. A. Rahim, “Feed-in Tariff for Solar Photovoltaic: The rise of Japan”, *Renewable Energy*, 67, 636-643, 2014 (Impact Factor: 3.361).
 13. E. F. Fernández, F. Almonacid, N. Sarmah, P. Rodrigo, T. K. Mallick, P. Pe´rez-Higueras, “A model based on artificial neuronal network for the prediction of the maximum power of a low concentration photovoltaic module for building integration”, *Solar Energy* 100, 148-158, 2014 (Impact Factor: 3.541).
 14. F. Muhammad-Sukki, S. H. Abu-Bakar, R. Ramirez-Iniguez, Scott G. McMeekin, Brian G. Stewart, N. Sarmah, T. K. Mallick, A. B. Munir, S. H. M. Yasin, R. A. Rahim, “Mirror symmetrical dielectric totally internally reflecting concentrator for building integrated photovoltaic systems”, *Applied Energy*. 113, 32-40, 2014 (Impact Factor: 5.261).
 15. L. Micheli, N. Sarmah, X. Luo, T.K. Mallick, “Opportunities and Challenges in micro- and nano- technologies for Concentrating Photovoltaic Cooling: a review”, *Renewable & Sustainable Energy Reviews*. 20, 595-610, 2013 (Impact Factor: 5.510).
 16. H. Baig, N. Sarmah, K. C. Heasman, T. K. Mallick, “Numerical modelling and experimental validation of a low concentrating photovoltaic system”, *Solar Energy Materials and Solar Cells*. 113, 201-219, 2013 (Impact Factor: 5.030).
 17. S. Maiti, N. Sarmah, P. Bapat, T. K. Mallick, “Optical analysis of a photovoltaic V-trough system installed in Western India”, *Applied Optics*. 51, 8606-8614, 2012 (Impact Factor: 1.649).
 18. N. Sarmah, B. S. Richards, T. K. Mallick, “Evaluation and optimisation of the optical performance of low-concentrating dielectric compound parabolic concentrator using ray-tracing methods”, *Applied Optics*, 50, 3303-3310, 2011 (Impact Factor: 1.649).

Conference Papers:

1. H. Brahma, L. Baruah and N. Sarmah, “Electrical and thermal modelling to evaluate photovoltaic module performance in varying outdoor condition” In: 2nd International Conference on Energy, Power and Environment (ICEPE), 1-2 June, 2018, Meghalaya.
2. J. Mahanta, B. J. Saharia and N. Sarmah, “Comparative Performance Analysis of Chopper circuits in MPPT for Solar PV applications” In: IEEE International Conference on Current Trends towards converging technologies (ICCTCT), 1-3 March, 2018, Tamil Nadu.
3. J. Mahanta, P. Barman, B. Sharma and N. Sarmah, “A Prototype Model of Flap like Propulsion system” In: IEEE International Conference on Current Trends towards converging technologies (ICCTCT), 1-3 March, 2018, Tamil Nadu.
4. B. J. Saharia, J. Mahanta and N. Sarmah, “Control and energy management of a hybrid PV-microhyrdo power generation system- A conceptual framework” In: National Conference on Non Conventional Energy: Harvesting Technology and Its Challenges, 10-11 November, 2017, AEC, Assam.
5. L. Micheli, E. F. Fernández, G. P. Smestad, H. Alrashidi, N. Sarmah, N. Sellami, I. Al. Hassan, A. Kasry, G. Nofuentes, N. Sood, B. Pesala, S. Senthilarasu, F. Almonacid, K. S. Reddy, M. Muller, T. K. Mallick, “A unified global investigation on the spectral effects of soiling losses of PV glass substrates: preliminary results” In: IEEE 44th Photovoltaic Specialist Conference (PVSC), June 2017, USA.
6. B. Talukdar, S. Mahapatra and N. Sarmah, “A comparative study of grid-connected photovoltaic systems in four different locations of India” In: International Conference on Advances in Energy Research (ICAER), 15-17 December, 2015, Mumbai.
7. S. Buragohain, S. Mahapatra, N. Sarmah, S. Kumar, “Shading and Mismatch effect on the Performance of PV Module” In: International Conference on Advances in Energy Research (ICAER), 15-17 December, 2015, Mumbai.
8. L. Micheli, N. Sarmah, X. Luo, E. F. Fernández, K. S. Reddy, T. K. Mallick, “Technical Issues and Challenges in the Fabrication of a 144-Cell 500× Concentrating Photovoltaic Receiver”, In: IEEE PVSC Conference, 2014, USA.
9. L. Micheli, N. Sarmah, X. Luo, K. S. Reddy, T. K. Mallick, “Design and Production of a 2.5 kWe Insulated Metal Substrate-based Densely Packed CPV Assembly”, In: CPV-10 Conference, 2014, USA.
10. K. Shanks, N. Sarmah, K. S. Reddy, T. K. Mallick, “The design of a parabolic reflector system with high tracking tolerance for high solar concentration”, In: CPV-10 Conference, 2014, USA.
11. E. F. Fernández, F. Almonacid, N. Sarmah, T. K. Mallick, I. Sanchez, J. M. Cuadra, P. Rodrigo, P. Pérez- Higuera, “Performance analysis of the linear model for estimating the maximum power of a HCPV module indifferent climatic conditions”, In: CPV-10 Conference, 2014, USA.
12. G. Z. Naman , A. Ivaturi, S. Senthilarasu, B. Prabhakara , N. Sellami, N. Sarmah , T. K. Mallick, H.M.Upadhyaya, “ Development of a concentrated photovoltaic thermal hybrid system for heat and power generation in Nigeria”, In proceeding of the PVSAT-10, 2014, Loughborough, UK.

13. G. Z. Naman , A. Ivaturi, S. Senthilarasu, B. Prabhakara , N. Sellami, N. Sarmah , T. K. Mallick, H.M.Upadhyaya, “Compound Parabolic Concentrators’ Designs for Equatorial Africa”, In: *1st Africa-PVSEC Conference, 2014. Durban.*
14. R. Ramirez-Iniguez, F. Muhammad-Sukki, S. R. Abu-Bakar, S. G McMeekin, B. G. Stewart, N. Sarmah, T. K. Mallick, A. B. Munir, S. R. M. Yasin, R. A. Rahim, “Rotationally Asymmetric Optical Concentrators for Solar PV and BIPV Systems”, 4th IEEE International Conference on Photonics, 2013, Melaka, Malaysia.
15. T. Mallick, N. Sarmah, S. Banerjee, L. Micheli, K. S. Reddy, P. Ghosh, G. Walker, S. Choudhury, M. Pourkashanian, J. Hamilton, D. Giddings, M. Walker, K. Manickam, A. Hazara, S. Balachandran, S. Lokeswaran, D. Grant, W. Nimmo, A. Mathew, “Design concept and configuration of a hybrid renewable energy system for rural electrification in India through BioCPV project”, In: International Conference on Advances in Energy Research (ICAER), 10-12 December, 2013, Mumbai.
16. L. Micheli, N. Sarmah, X. Luo, K. S. Reddy, T. K. Mallick, “Development of a novel 16-cell densely packed 500x CPV assembly on insulated metal substrate”, In: International Conference on Advances in Energy Research (ICAER), 10-12 December, 2013, Mumbai.
17. M. Theristis, G. E. Arnaoutakis, N. Sarmah, T. K. Mallick, T. S. O'Donovan, "Solar spectrum dependent thermal model for HCPV systems", In: 13th UK Heat Transfer Conference, 2013, London.
18. M. Theristis, M. E. Arnaoutakis, N. Sarmah, T. K. Mallick, and T. S. O'Donovan, "3D thermal numerical analysis of a densely packed concentrating photovoltaic receiver," In: International Conference on Advances in Energy Research (ICAER), 10-12 December, 2013, Mumbai.
19. L. Micheli, N. Sarmah, X. Luo, K. S. Reddy, T. K. Mallick "Thermal effects of micro-fins geometry on a silicon receiver for a CPV cooling purpose." In Conference proceeding of 28th EU PVSEC, Paris, France, 2013.
20. K. Shank, N. Sarmah, K. S. Reddy, T. K. Mallick, “The design and optical optimization of a two stage reflecting high concentrating photo volatic module using ray trace modelling” In proceedings of PVSAT-9 conference, 10-12 April 2013, Swansea, UK.
21. L. Micheli, N. Sarmah, X. Luo, K. S. Reddy, T. K. Mallick, “Infrared reflecting coverglass for multijunction cells in a terrestrial high-concentrating photovoltaic system”, In proceeding of the 27th EU PVSEC, 24th – 28th September 2012, Frankfurt, Germany.
22. M. Theristis, N. Sarmah, T. K. Mallick, T. S. O'Donovan, “Design and numerical analysis of enhanced cooling techniques for a high concentration photovoltaic (HCPV) system”, In proceeding of the 27th EU PVSEC, 24th – 28th September 2012, Frankfurt, Germany.
23. N. Sarmah, A. Ghosh, T. K. Mallick, Indoor performance analysis of a low concentrating photovoltaic module for building integration, In Proceeding of the CPV-8, 16th – 18th April, 2012, Toledo, Spain.
24. H. Baig, K. C. Heasman, N. Sarmah, T. K. Mallick, Solar cells design for low and medium concentrating photovoltaic systems, In Proceeding of the CPV-8, 26th - 18nd April, 2012, Toledo, Spain.
25. N. Sarmah, B. S. Richards, T. K. Mallick, “Development and characterisation of a low concentrating dielectric photovoltaic concentrator”, In proceeding of the SWC-2011, 28thAugust - 2nd September, 2011, Kasel, Germany.
26. N. Sarmah, S. K. Natarajan, B. S. Richards, T. K. Mallick, “Numerical investigation of thermal and electrical behaviour of concentrating photovoltaic module with low

- concentrating dielectric photovoltaic concentrator”, In proceeding of the PVSAT-7, 6th-8th April, 2011, Heriot-Watt University, Edinburgh.
27. N. Sarmah, B. S. Richards, T. K. Mallick, “Design and performance evaluation of a prototype dielectric photovoltaic concentrator”, In proceeding of the PVSAT-6, 24th-26th March, 2010, Chilworth Manor, Southampton.
28. N. Sarmah, B. S. Richards, T. K. Mallick, “Optimised Line Axis Dielectric Asymmetric Compound Parabolic Photovoltaic Concentrator: An Optical Performance Analysis”, In proceeding of the PVSAT-5, 1st-3rd April, 2009, Glyndwr University, Wrexham.