Dr. Amit Bhosale

Department of Hydro and Renewable Energy
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Research Interests

PEM Fuel Cells, Electrolysers, Stack Development, Cylindrical Fuel Cells, Contact Resistance Management

Work Employment

January'20– **Assistant Professor**, Department of Hydro and Renewable Energy, Indian Institute of Technology Roorkee, Uttarakhand, India

November'17– January'20 **Institute Post Doctoral Fellow**, Department of Chemical Engineering, Indian Institute of Technology Madras, India

Mentor: Prof. Raghunathan Rengaswamy

July'17– October'17 **Project Scientist**, Department of Chemical Engineering, Indian Institute of Technology Madras, India

May'11– December'11 **Assistant Professor**, Department of Technology, Shivaji University, Kolhapur, India

July'10– January'11 **Post Graduate Engineer Trainee**, Arvin Meritor, Bengaluru, India

Education

2012–2017 **Ph.D.** Department of Energy Science and Engineering, Indian Institute of Technology Bombay, India, CGPA: 8.18/10

Supervisor: Prof. Prakash Ghosh

2008–2010 **M.Tech., Machine Design** Indian Institute of Technology Madras, CGPA: 7.59/10

2002–2007 **B.E., Mechanical Engineering**, Shivaji University, 68.73 %

Awards, Scholarships and Membership

2022 **Invited Missionary**, Research stay at University Paris Saclay.

2019 **Winner**, Carbon Zero Challenge (CZeroC) 2019, IIT Madras, Chennai.

2019 **Best Poster Presentation**, 4th International Conference on Physics of Materials and Materials Based Device Fabrication (ICPM-MDF-2019), Shivaji University, Kolhapur.

2019 **Member**, International Society of Electrochemistry (ISE).

2017 **Hydrogen Energy and Advanced Materials (HEAM) Scholar 2017**.

October 2016-December 2016 **Intern at Research and Innovation in Electrochemistry**, Institute of Molecular Chemistry and Materials, University Paris-Sud, France.

July 2012-June 2017 **Doctoral Fellowship**, Ministry of Human Resource Development, Government of India.

July 2008-May 2010 **Postgraduate Scholarship**, Ministry of Human Resource Development, Government of India.

2007 **First at**, TECHNOGLIPMSE-2007, Technical Paper Presentation, DKTE, Kolhapur.

2007 **Second at**, ASCENT-2007, Technical Paper Presentation, Dr. J.J. Magdum College of Engineering, Kolhapur.

2007 **Third at**, VISION 2007, Technical Paper Presentation, Sinhgad Academy of Engineering, Pune.

Publications

Journal Publications

- K Bheemalingeswara Reddy, **Amit C. Bhosale**, RP Saini, Performance parameters of lift-based vertical axis hydrokinetic turbines-A review, *Ocean Engineering* 266, 2022, 113089
- Ratikanta Nayak, Reeshab Goenka, **Amit C. Bhosale**, Prakash Ghosh, Phosphonated MWCNT- Poly (2, 5-Benzimidazole): Improved nanocomposite membrane for high-temperature fuel cells, *Advances in Natural Sciences: Nanoscience and Nanotechnology* 13(3), 2022, 035006
- **Amit C. Bhosale**, Suseendiran S.R. Kiran Rokhade and Raghunathan Rengaswamy, Effect of gas pressure and clamping pressure on interfacial contact resistance of a cylindrical polymer electrolyte membrane fuel cell, *International Journal of Sustainable Engineering* 14(6), 2021, 1791-1799
- **Amit C. Bhosale**, P.C. Ghosh, Loiċ Assaud, Preparation methods of membrane electrode assemblies for proton exchange membrane fuel cells and unitized regenerative fuel cells: A review, *Renewable and Sustainable Energy Reviews* 133, 2020, 110286
- Joumada Al Cheikh, Rosa Zakari, **Amit C. Bhosale** et al., Electrocatalytic properties of Mo3S4-based complexes with regard to the hydrogen evolution reaction and application to PEM water electrolysis, *Material Advances*, DOI: 10.1039/d0ma00138d
- **Amit C. Bhosale** and Raghunathan Rengaswamy, Interfacial contact resistance in polymer electrolyte membrane fuel cells: Recent developments and challenges, *Renewable and Sustainable Energy Reviews*, 115, 2019, 109351
- **Amit C. Bhosale**, Manthan Mahajan, Prakash C. Ghosh, Optimization of contact resistance with better gasketing for a unitized regenerative fuel cell, *International Journal of Hydrogen Energy*, 44, 2019, 20953-20962
- **Amit C. Bhosale**, Swapnil R. Mane, Debanand Singdeo, Prakash C. Ghosh, Modeling and experimental validation of a unitized regenerative fuel cell in electrolysis mode of operation, *Energy*, 121, 2017, 256–263.

- **Amit C. Bhosale**, S. Meenakshi, Prakash C. Ghosh, Root cause analysis of the degradation in a unitized regenerative fuel cell, *Journal of Power Sources*, 343, 2017, 275–283.

Book chapters

- Sunil Kumar Sethy, **Amit C. Bhosale**, Thermal management in Fuel Cells, 233-238, *Handbook of Research in Heat Transfer, Nova Publishers* 2022, 233-238
- **Amit C. Bhosale**, Suseendiran S. R., Ramya Ramkumar, Suman Roy Choudhury, Raghunathan R, Phosphoric acid fuel cells, *Comprehensive Renewable Energy, Second Edition* 2020

Conference Proceedings

- **Amit C. Bhosale**, Reeshab Goenka, P.C. Ghosh, Study of the degradation in a unitized regenerative fuel cell, Advances in Mechanical and Materials Technology, 2020, 295-304
- Suseendiran S R, Gowri Mohandass, **Amit C. Bhosale**, Raghunathan Rengasamy, Ramya Ramkumar, Suman Roy Choudhury, Performance Evaluation of a Cylindrical PEM Fuel Cell and the Stack, 14th International Renewable Energy Storage Conference 2020 (IRES 2020), 2021, 6, 119-126

Conference Talks

- **Amit C. Bhosale**, Swapnil R. Mane, Prakash C. Ghosh, Modeling of high pressure PEM electrolyser, International Conference on Science and Technology, Toronto, Canada, November 14-15, 2014
- **Amit C. Bhosale**, Prakash C. Ghosh, Degradation study of unitized regenerative fuel cell, International Conference on New and Renewable Energy Resources for Sustainable Future, Jaipur, India, February 2-4, 2017
- **Amit C. Bhosale**, Manthan A. Mahajan, P.C. Ghosh, Optimization of gasket for URFC with its preliminary testing, 4th International Conference of Chemical Engineering and Industrial Biotechnology, Kuala Lumpur, Malaysia, August 1-2, 2018
- **Amit C. Bhosale**, Kiran Rokhade, Suseendiran S.R. Raghunathan Rengaswamy, Effect of gas pressure on cylindrical fuel cells, 4th International Conference on Physics of Materials and Materials Based Device Fabrication (ICPM-MDF-2019), Shivaji University, Kolhapur, January, 8-10, 2019

Other Publications (Submitted/Under Preparation)

- Sathish Swaminathan, **Amit C. Bhosale**, Srinivasan Raman and Raghunathan Rengaswamy, Application of feedback control to humidity regulation in PEM fuel cells by mixing dry and humidified gases**(under preparation)**

Teaching Experience

at IIT Roorkee

Spring semester — **Fuel Cells (AHN-902), a Pre-PhD course**, Department of Hydro and Renewable Energy, IIT Roorkee, India.

Autumn and Spring semester — **Renewable Energy Sources Development Technology (IAH-302)**, Department of Hydro and Renewable Energy, IIT Roorkee, India.

Autumn semester — **Energy Conservation and Management (AHN-542)**, Department of Hydro and Renewable Energy, IIT Roorkee, India.

Spring semester — **Hydro Mechanical Equipment (AH-516)**, with Prof. R.P. Saini, Department of Hydro and Renewable Energy, IIT Roorkee, India.

at IIT Madras

Spring semester — **Principles of Fuel Cells (CH5013)**, with Prof. Raghuram Chetty, Department of Chemical Engineering, IIT Madras, India.

at Shivaji University

Autumn semester — **Engineering Graphics**, Department of Technology, Shivaji University, Kolhapur, India.

Autumn semester — **Introduction to Fluid Mechanics**, Department of Technology, Shivaji University, Kolhapur, India.

Laboratories

January'14–May'16 — **Experiments with Fuel Cells**, Department of Energy Science and Engineering, IIT Bombay, India.

July'11–December'11 — **Practicals on Fluid Mechanics**, Department of Technology, Shivaji University, Kolhapur, India.

- International Journal of Hydrogen Energy (IJHE)
- International Journal of Energy Research (IJER)

Workshops conducted

23-27 November'20 — Faculty Development Programme on "**Electrochemical Energy Conversion and Storage**" approved by AICTE Training and Learning (ATAL) academy.

2-3 November'21 — Short term course on "**Hydrogen Energy**" approved by National Hydro Power Corporation (NHPC).

Invited Talks

16 March'22 — "Contact Resistance Management in Fuel Cells" organized by SPARC (Indo-USA) Workshop, IIT Mandi..

28 Sept'21 — Advanced and Disruptive Technology Trends in Energy Sector: Energy Conservation and Efficiency" organized by Department of Hydro and Renewable Energy, IIT Roorkee.

16 Sept'21 — Renewable Energy- Emerging Technology: Hydrogen energy" sponsored by National Hydroelectric Power Corporation Ltd., Faridabad.

3 May'18 — Department of Nanoscience and Technology, Shivaji University, Kolhapur, India.