

DR. ANJALI JAYAKUMAR

EDUCATION

Doctor of Philosophy, Ph.D., Aug 2014–Feb 2019

School of Chemical and Biomedical Engineering, Nanyang Technological University Singapore

Pioneered the use of biochar-based composites in the Ph.D. research group. Extensive experience designing carbon-based functional materials such as biochar, graphene, metal oxides for energy storage/conversion

Bachelor of Technology, B.Tech, July 2009– May 2013

Chemical Engineering and Technology, National Institute of Technology Calicut, India

WORK EXPERIENCE

Lecturer in Chemical Engineering, School of Engineering, Newcastle University, UK

Dec 2022- Present

Working on sustainable materials and approaches for a human-centric mitigation and adaptation of climate change. Design of materials for clean energy and the environment with special focus on developing biochar and biochar-based composites involving engineering, material science, electrochemistry, and environmental science

Postdoctoral Research Associate, School of GeoSciences, University of Edinburgh, UK

Aug 2019- Nov 2022

Led the design and optimization of biochar production processes and biochar properties with batch, continuous and home-scale pyrolysis units in collaboration with fire scientists at Edinburgh Fire Research Centre, microbiologists and environmental scientists at Robert Gordon University, Aberdeen, UK, the University of Peradeniya, Sri Lanka and University of Alcalá, Spain. The biochar was investigated for several energy and environmental applications including biological water treatment and (bio)-electrochemical applications.

Process Engineer, Reliance Industries Ltd., India, July 2013 – June 2014

Process and operations department of an ethane-propane gas cracker plant

PUBLICATIONS

18 Peer-reviewed articles/book chapters, Google scholar citations-1016, h-index- 13 (select-few below, full list [here](#))

- **Moore, J; Jayakumar, A (co-first authors);** Soldatou, S; Mašek, O; Lawton, L; Edwards, C; Nature-Based Solution to Eliminate Cyanotoxins in Water Using Biologically Enhanced Biochar, ACS Environ Sci. Tech, Oct 2023
- **Jayakumar, A;** Morrisset, D; Koutsomarkos, V; Wurzer, C; Hadden, R; Lawton, L; Edwards, C; Masek, O; Systematic evaluation of pyrolysis processes and biochar quality in the operation of low-cost flame curtain pyrolysis kiln for sustainable biochar production, (invited) Current Research in Environmental Sustainability, Elsevier, March 2023
- Jiacheng Sun, **Jayakumar, A,** G. Díaz-Maroto, C; Mignard, D; Fermoso, J; Masek, O; Effects of feedstock types and physicochemical activation treatments on biochar properties and electrochemical performances for supercapacitor applications, preprint available at SSRN 4556356, 2023
- Christian Wurzer, **Anjali Jayakumar,** Ondřej Mašek, Sequential biochar systems in a circular economy, in Book Biochar in Agriculture for Sustainable Development Goals, Elsevier, May 2022
- **Jayakumar, A;** Wurzer Christian, Sylvia Soldatou, Christine Edwards, Linda Lawton, Ondrej Masek, New directions and challenges in engineering biologically-enhanced biochar for biological water treatment, Sci. Total Environ. 2021
- **Jayakumar, A;** Antony, R.P, J Zhao, Lee J.M, MOF-derived nickel and cobalt metal nanoparticles in a N-doped coral shaped carbon matrix of coconut leaf sheath origin for high performance supercapacitors and OER catalysis, Electrochimica Acta 2018

AWARDS AND GRANTS

- **Newcastle University Policy and Participatory Fund (PI)- RECLAIM:** Reclamation of eroded mine lands with biochar - Scoping the restorative justice potential and the socio-economic-ecological implications with a case study in Odisha, Eastern India, Aug 2023-July 2024
- **Seed funding for Collaboration and Partnership Projects (SCPP) (Co-I), Indian Institute of Technology, Bombay, India** - A combined experimental and computational investigation of greenhouse gas adsorption on biochar with Dr.Ojus Mohan, May 2023-October 2024
- **Newcastle University, Research Culture Fund (Co-I), Cross-Faculty Researcher Network Symposium,** March-June 2023- To represent interests of researchers across the University
- **School of GeoSciences, University of Edinburgh, Autumn Small Grant,** May 2022- 'Biochar Diaries – Illustrating biochar research, a carbon negative emission technology, in to comic strips, More details [here](#)
- **SAGES SALTIRE SERENE Award for Emerging Researcher** May-June 2022- To undertake research visit and training at Bioelectrogenesis group, University of Alcalá, Spain
- **Travel grant to attend Sino-UK Workshop at University of Liverpool,** Nov 2021 on Biomass Conversion and Utilisation, Newton Fund Researcher Links programme
- **Global Challenges Research Fund, Partnerships Fund, (PI)** April- Sept 2021- Led a transdisciplinary group of life and social scientists, filmmakers, educators, illustrators, and NGOs to create a collection of documentary films and teaching resources reflecting the multi-faceted experiences of climate change, in South Asia, details [here](#).
- **School of GeoSciences, University of Edinburgh, Autumn Small Grant Award,** Jan 2021- Participation in Metrohm UK Electrochemistry Summer School
- **Finalist for University of Edinburgh Good Research Practice Award** for the GCRF Project, 'Chasing Sustainability: Tales from South Asia', Nov 2022
- **Best Overall Presentation and Best Session Presentation** at the Annual Environmental Biotechnology Network Early Career Researcher Conference, Nottingham, UK, Sept 2022
- **1st prize winner** at the **Annual Ph.D. Symposium NTU Singapore** for Ph.D. thesis, March 2018
- **People's Choice Award** in the **Three Minute Thesis Competition,** NTU Singapore, Aug 2015

ENGAGEMENT AND RESEARCH VISITS

- **Conference Presentation** at Biochar III, Tomar, Portugal, Sept 2023, Evaluation of pyrolysis processes and biochar quality in the operation of flame curtain pyrolysis kiln for sustainable biochar production
- **Conference presentation** at Aquaconsoil, Prague, Czech Republic, Sept 2023, Nature-based solution for water treatment using Biologically Enhanced Biochar'
- **Conference Presentation** at Environmental Biotechnology Network ECR Conference, Edinburgh, Aug 2023, Humanising Science to Solve the Climate Crisis: Lessons from Biochar Research
- **Invited speaker,** Workshop on Industrial Biotechnology and Bioenergy in the Developing World, March 2023, Kew Gardens, UK
- **Invited speaker (virtual)** at Asia Pacific Biochar Conference, South Korea, 'Biologically Enhanced Biochar for energy and environmental applications', Oct 2022
- **Conference presentation** at the Environmental Biotechnology Network Early Career Conference, Nottingham, UK, Sept 2022, 'Nature-based solution for water treatment using biologically enhanced biochar'
- **Invited speaker** at University of Alcalá, Spain, 'Biochar for energy and the environment', May 2022
- **Invited Panellist** for AIMDay Circular Economy Online Workshop organised by Edinburgh Innovations to engage with industrial partners from Scottish Water and The Future Forest Company, March 2022
- **Invited Speaker** at a group discussion with [Climate Ark](#) on 'Chasing Sustainability: Tales from South Asia', 2021
- **Invited Speaker, School of Social and Political Science,** University of Edinburgh, Online workshop 'Teaching the social lives of Climate Change,' Learning through film and in interdisciplinary teams, Nov 2021
- **Invited Speaker Bio-Solutions Showcase,** Edinburgh Innovations, UK, Jan 2020, 'Biochar the black gold'

- **Invited Speaker IBI Biochar Conference**, Seoul, South Korea, November 2019, ‘Biomass Pyrolysis and Biochar Development for use in energy and electrocatalytic applications’.
- **Conference presentation in Materials Research Society Conference**, Boston, USA, November 2017 on ‘Carbon-based composites for energy storage and energy conversion’
- **Invited speaker at TEDxYOU** at TEDx Singapore at NTU, November 2015, ‘Graphene for supercapacitors’
- **Research Visit, Ilmenau University of Technology, Germany** November 2015- Study on electrodeposition in deep eutectic solvents under Prof. Andreas Bund

LEADERSHIP AND SERVICE

- **UK Environmental Biotechnology Network ECR Working Group Coordinator**, more details [here](#)
- **Postgraduate (Taught) Recruitment Officer** for Chemical Engineering, Newcastle University, May 2023-Present
- **Research Associate Champion**, School of Engineering, Newcastle University, May 2023-Present
- **Research Staff Representative**, School of GeoSciences, University of Edinburgh, Dec 2021- Nov 2022
- **Postdoctoral Representative and Mentor, University of Edinburgh Staff BAME network**, June 2019- Nov 2022.
- **President (elected), School Graduate Student Club**, NTU Singapore April 2017 – April 2018
- **Peer Reviewer** for Chemosphere Elsevier, Materials MDPI, Water MDPI, International Journal of Environmental Research and Public Health MDPI, Current Research in Environmental Sustainability, Elsevier

SUPERVISION AND TEACHING

PhD Supervision

- Co-supervisor to Prehas Prashant Madke, Indian Institute of Technology Bombay, Funded by Ministry of Education, India, A combined experimental and computational investigation of greenhouse gas adsorption on biochar
- Co-supervisor to Yi Zhang, University of Edinburgh, Biologically Enhanced Biochar for diclofenac removal from wastewater

Spring Semester 2023-24 (M.Sc. in Sustainable Chemical Engineering)

CME8012 Business and Environmental Management (Module Leader)

CME8038 Sustainable Industry