



Dr. Rohit Satish

Postdoctoral Researcher
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OVERVIEW

Scientist engaged in the surface studies of High energy density cathodes for Li-ion battery applications

APPOINTMENTS

Postdoctoral Researcher

Lawrence Berkeley National Laboratory, USA

July 2019-Present

- Electrochemical and Structural characterization of Disordered Rock Salt materials as High Energy Cathode materials.
- Development of *operando* spectroscopy and microscopy techniques.

Principal Scientist

Involt Pte Ltd, Singapore

January 2019-June 2019

- Evaluation of supercapacitor electrode materials to achieve industry leading performance.
- Reduction in Electrochemical Resistances faced by Supercapacitor to allow for minimal losses during cycling.
- Conducting structural and Electrochemical Characterisation of Li-ion and supercapacitor electrodes.
- Quantifying metrics for Device lifetime.

Postdoctoral fellow

Nanyang Technological University, Singapore

January 2017-January 2019

- Part of Energizer Holdings USA, innovation collaboration to improve $Zn - MnO_2$ batteries.
- Modelling, Synthesis and Analysis of High Energy Density Lithium rich cathodes.
- Use of Pulsed laser deposition to generate pure thin films of $LiNi_{0.5}Mn_{1.5}O_4$ and NMC 532.
- Development of *operando* analysis cells for battery materials to be tested or observed on a laboratory as well as a synchrotron scale.
- Conducting Synchrotron diffraction and X-ray absorption spectroscopy measurements for powder samples as well as thin films.

- Synthesis of capacitive materials from organic waste materials for Hybrid Capacitors.

Project Officer- Lithium Safety

Nanyang Technological University, Singapore

October 2016-January 2017

- Develop Safety protocol for the handling of Lithium based batteries in NTU.
- Educate Energy storage labs about the current battery safety protocol.
- Auditing safety protocols in NTU affiliated labs.

EDUCATION

Doctor of Philosophy, Materials Science and Engineering

2012-2017

Nanyang Technological University, Singapore

[“Advanced Electrodes for Hybrid Electrochemical Capacitor Applications”](#)

Thesis advisor: Professor Madhavi Srinivasan

Bachelor of Technology, Chemical Engineering

2008-2012

Amrita Vishwavidyapeetham, Coimbatore, India

Academic/Research advisor: Dr Meera Balasubramaniam

“Developing Model Predictive Control to Optimise Energy Regeneration in Sugar Mills”

SPECIALISATION

1. Lithium ion battery and super capacitor materials design and characterization. Well versed with cell packing technologies including Coin cells, Pouch Cells and Cylindrical Cells.
2. Adept at analysing big data from time dependant spectroscopy measurements using Python.
3. Development of *operando* characterization techniques to study Li-ion batteries using Synchrotron X-rays.
4. X-ray diffraction and Rietveld refinement for structural analysis, using TOPAS.
5. X-ray absorption fine structure analysis of battery materials.
6. Electrochemical Characterisation of Lithium-ion Hybrid Electrochemical Capacitors.

PEER-REVIEWED JOURNAL PAPERS [\[statistics\]](#)

1. Sonal Kumar, Rohit Satish, Vivek Verma, Hao Ren, Pinit Kidkhunthod, William Manalastas Jr, Madhavi Srinivasan, [“Investigating FeVO₄ as a cathode material for aqueous aluminum-ion battery”](#), *Journal of Power Sources* **426**, 151-161 (2019).
2. Rodney Chua, Yi Cai, Zong Kui Kou, Rohit Satish, Hao Ren, Jun Jie Chan, Liping Zhang, Samuel A Morris, Jianming Bai, Madhavi Srinivasan, [“1.3 V superwide potential window sponsored by Na-Mn-O plates as cathodes towards aqueous rechargeable sodium-ion batteries”](#), *Chemical Engineering Journal* **370**, 742-748 (2019).

3. Vanchiappan Aravindan, Rohit Satish, Sundaramurthy Jayaraman, Srinivasan Madhavi, “[An Electrochemical Route to Alleviate Irreversible Capacity Loss from Conversion Type Fe₂O₃ Anodes by LiVPO₄F Pre-lithiation](#)”, *ACS Applied Energy Materials* **1**, 5198-5202 (2018).
4. Verma Vivek, Sonal Kumar, William Jr Manalastas, Rohit Satish, Madhavi Srinivasan, “[Progress in Rechargeable Aqueous Zinc and Aluminum Ion Battery Electrodes: Challenges and Outlook](#)”, *Advanced Sustainable Systems* **1**, 1800111 (2018).
5. Rohit Satish, Kipil Lim, Nicolas Bucher, Steffen Hartung, Vanchiappan Aravindan, Joseph Franklin, Jun-Sik Lee, Michael F Toney, Madhavi Srinivasan, “[Exploring the Influence of Iron Substitution in Lithium Rich Layered Oxides Li₂Ru_{1-x}Fe_xO₃: Triggering the Anionic redox reaction](#)”, *Journal of Materials Chemistry A* **27**, 14387 (2017).
6. Eldho Edison, Rohit Satish, Wong Chui Ling, Nicolas Bucher, Vanchiappan Aravindan and Srinivasan Madhavi, “[Nanostructured intermetallic FeSn₂-carbonaceous composites as highly stable anode for Na-ion batteries](#)”, *Journal of Power Sources* **343**, 296 (2017).
7. Rohit Satish, Vanchiappan Aravindan, Wong Chui Ling and Madhavi, Srinivasan, “[LiVPO₄F: A New Cathode for High-Energy Lithium Ion Capacitors](#)”, *ChemistrySelect* **1**, 3316 (2016).
8. Rohit Satish, Aravindan Vanchiappan, Chui Ling Wong, Kee Woei Ng and Madhavi Srinivasan, “[Macroporous carbon from human hair: A journey towards the fabrication of high energy Li-ion capacitors](#)”, *Electrochimica Acta* **182**, 474 (2015).
9. Rohit Satish, Vanchiappan Aravindan, Wong Chui Ling and Srinivasan Madhavi, “[Carbon-coated Li₃V₂\(PO₄\)₃ as insertion type electrode for lithium-ion hybrid electrochemical capacitors: An evaluation of anode and cathodic performance](#)”, *Journal of Power Sources* **281**, 310 (2015).
10. Wang Luyuan Paul, Yu Linghui, Rohit Satish, Zhu Jixin, Yan Qingyu, Srinivasan Madhavi, Xu Zhichuan, “[High-performance hybrid electrochemical capacitor with binder-free Nb₂O₅@ graphene](#)”, *RSC Advances* **70**, 37389 (2014).
11. Rohit Satish, Vanchiappan Aravindan, Wong Chui Ling, John B. Goodenough and Madhavi Srinivasan, “[Carbon-Coated Li₃Nd₃W₂O₁₂: A High Power and Low-Voltage Insertion Anode with Exceptional Cycleability for Li-Ion Batteries](#)”, *Advanced Energy Materials* **9**, 1301715 (2014).

PAPERS AT INTERNATIONAL CONFERENCES

1. Rohit Satish, Aravindan Vanchiappan, Nicolas Bucher, Steffen Hartung, Joseph Franklin, Chui Ling Wong, Madhavi Srinivasan, “[Understanding the Structural Evolution of Multiple Cationic Centres during Electrochemical Cycling of Lithium Rich Layered \$Li_2Ru_{1-x}Fe_xO_3\$](#) ”, *Meeting Abstracts, International meeting on Lithium Ion batteries* **2**, 933 (2016).
2. Rohit Satish, Aravindan Vanchiappan, Chui Ling Wong, Madhavi Srinivasan, “[VO₂ Nanoplatelets: A High Energy Electrode Material for Lithium Ion-Hybrid Electrochemical Capacitors](#)”, *Meeting Abstracts, The Electrochemical Society* **1**, 37 (2016).
3. Rohit Satish, Aravindan Vanchiappan, Chui Ling Wong, Madhavi Srinivasan, “[LiVPO₄F: A New Age High Voltage Cathode Material for Lithium Ion-Hybrid Electrochemical Capacitors](#)”, *Meeting Abstracts, The Electrochemical Society* **2**, 626 (2015).

WORKSHOPS ATTENDED

- Modern Methods of Rietveld refinement for Structural Analysis.Organised by Bruker,Stony Brook University and Brookhaven National Laboratory
- Data Analysis and Modeling of XANES and EXAFS Spectra: Applications to Nanomaterials.Organised by Brookhaven National Laboratory
- 9th SSRL School on Synchrotron X-Ray Scattering Techniques in Materials and Environmental Sciences-2018.Organised by Stanford Synchrotron Radiation Lightsource.
- EXAFS 2018 - SSRL Summer School on Synchrotron X-Ray Absorption SpectroscopyOrganised by Stanford Synchrotron Radiation Lightsource.

POSITIONS HELD AND AWARDS

- 2019 Principal Scientist heading the Research and Development effort of a Singapore based Energy Storage startup.
- 2017 Best Doctoral Thesis Commendation Award , Nanyang Technological University, Singapore.
- 2016-2019 Group Leader: Maintenance of the lab, delegation of Lab duties, ensuring a safe and ethical work atmosphere for all users.
- 2015-2016 Secretary of the Graduate Student Body at Nanyang Technological University.
- 2012 Nanyang Research Fellowship(2012-2016)