

# CURRICULUM VITAE

## **PRATHYUMNAN THIRUCHELVAM**

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### EDUCATION

- **Master of Technology (M. TECH) in Chemical Engineering** 2021-present  
*Specialization: Materials Science and Technology*  
**INDIAN INSTITUTE OF TECHNOLOGY (IIT-Guwahati)**, Assam, India | CGPA 9.39
- **Bachelor of Technology (B. TECH) in Chemical Engineering** 2017-2021  
**NATIONAL INSTITUTE OF TECHNOLOGY, Tiruchirappalli**, India | CGPA 8.77

### RESEARCH EXPERIENCE

**Master student at the Department of CHEMICAL ENGINEERING, INDIAN INSTITUTE OF TECHNOLOGY, GUWAHATI, Assam India** 2022/01- present

Project: *Electro-conductive polymer nano-composite hydrogels for energy and environment applications.*

Name of the Supervisor: **Dr. ASHOK KUMAR DASMAHAPATRA**

- Develop and characterize flexible conducting polymer hydrogels through a one-pot simple synthesis technique using only conductive cross-linkers, which will be used to fabricate flexible supercapacitor for wearable sensing devices.

**Research Intern at the Department of CHEMISTRY, NATIONAL UNIVERSITY OF SINGAPORE, Singapore** 2022/05-2022/07

Project: *Novel Metal-Organic Frameworks for the removal of Nano-plastics.*

Name of the Supervisor: **Dr. SURESH VALIYAVEETIL**

- Synthesized, optimized and characterized Zn, La, and Fe-based metal-organic frameworks using various organic ligands. Synthesized and characterized PMMA, PVC, and PS polymer nanoparticles (control studies).
- The MOFs were used to remove the nano-plastics, and their adsorption efficiency was evaluated. The adsorbed MOF was characterized and regenerated.
- Several cycles of regeneration were performed to evaluate the life cycle of MOFs. **Two manuscripts are under preparation for publication.**

**Online Intern at INSITUT DE CHIMIE ET PROCEDÉS POUR L'ÉNERGIE, L'ENVIRONNEMENT ET LA SANTÉ (ICPEES), UMR- 7515, UNIVERSITY OF STRASBOURG, France** 2020/07-2020/10

Project: *Macronization of graphene and other important 2D materials for practical applications*

Name of the Supervisor: **Dr. Hab. IZABELA JANOWSKA**

- The main goal of this bibliographic study is to understand the dimensional modelling of various 2D materials and to understand its structure-property relationship and its influence in real-life applications like energy storage and sensors. **One manuscript is under preparation for publication.**

**Research Intern at CSIR – CENTRAL ELECTROCHEMICAL RESEARCH INSTITUTE, MADRAS UNIT, MADRAS COMPLEX, Chennai, TamilNadu, India.** 2019/05-2019/07

Project: *Polymer Electrolyte Fuel Cell*

Name of the supervisor: **Dr. SANTOSHKUMAR D. BHAT**

- Electroplated and characterized the metallic bipolar plates with gold to test their I-V performance compared to the I-V performance of commercial graphite and metallic bipolar plates.
- Varied different parameters: Reactant flow rate, Temperature, Torque on the bipolar plates, and concentration of Pt/C catalyst to analyze I-V performance of gold electroplated metallic plate.
- Fabricated the membrane electrode assembly, optimized the torque in the fuel cell plate, and synthesized Pt/C catalyst of different concentrations.

Project: *Single module flow-electrode effective capacitive deionization for continuous water desalination*

Name of the supervisor: **Dr. N. BALASUBRAMANIAN**

- Assembled the single-module flow electrode apparatus. Synthesized different flow electrode materials: hard carbon, acid-activated carbon from sugarcane bagasse, and other biomass waste, Pd-doped carbon, graphene, and graphene oxide as a coating for the graphite electrodes.
- Analyzed the performance of the desalinating unit with different concentration salt solutions and minimized the loss of the water samples.

### ONLINE CERTIFICATIONS

- “*Structural Analysis of Nano-materials*” NPTEL course, conducted by IIT Roorkee. **Top 2% among 209 candidates.** A comprehensive study on the selection and structure-property relationship of the nanomaterial's, and the characterization techniques.

### SKILLS

- Experimental: Material Synthesis, Characterization (XRD, FTIR, UV-Vis, Fluorescence, Raman, TGA, SEM, EDX, BET, TEM, Fluorescence imaging, DLS and Zeta potential), fabrication.
- Software: MATLAB, Origin Lab, ImageJ, VMD, VESTA, Thermo-Calc., MS Office.

### PUBLICATIONS

- Chingakham Chinglenthoba, Jiawei Zuo, **Thiruchelvam Prathyumnan**, Suresh Valiyaveetil\*, Zinc based MOFs for Plastic Nanoparticles separation from Water. (*Under review in Journal of Hazardous Materials*)
- **Three manuscripts are under preparation for publication.**

### TEACHING ASSISTANSHIPS

- Chemical Engineering Thermodynamics July-Dec 2022
- Fluid Mechanics Laboratory Jan-May 2022

### CONFERENCES AND PRESENTATIONS

- Presented a solution for safe cooking and heating system to mitigate the fire-hazard due to open flame in Indian slums and rural areas under SDG-7 (Clean and Affordable Energy) at **UNLEASH India Lab'22**.
- “Graphene – A promising material for the Energy Storage Application” - Presented at International Workshop for Advanced Materials and Application (IWAMA'21) – **Won 2nd prize.**

### ACHIEVEMENTS AND FELLOWSHIPS

- Selected as one among the **Top 1000 young talents** (19,000 + applicants) worldwide for **UNLEASH India Lab'22** to innovate solutions to the Sustainable Development goals.
- Recipient of **Summer Research Fellowship'20** awarded by ICPEES, University of Strasbourg, France.
- Recipient of the ERASMUS MUNDUS - **UMICORE Industrial Scholarship'21** (declined offer)
- Achieved **All India Rank 20** in the National Engineering Olympiad 3.0 (Chemical Engineering Discipline).
- **State 1<sup>st</sup>** in EDUSAT'16, **EDUSOL Young Achiever Award'16** with a medal and EDUSOL scholarship.

### POSITION OF RESPONSIBILITY

**MANAGER | PRAGYAN Social Responsibility Team (an International Inter-Collegiate Technical Fest of National Institute of Technology, Tiruchirappalli).** 2018- 2021

- Mentored school students under the program “YoungTechie” for 2 months to exhibit their project at the PRAGYAN tech fest and ideated for various campus development initiatives such as Wall of Happiness.
- Organized an event CATALYST, a one-day flagship event to impart knowledge of Mathematics, Science among school students by performing simple experiments.