

Venkatesh Krishnamurthy

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EDUCATION

Carnegie Mellon University

Doctor of Philosophy, Materials Science & Engineering
Advisor: Prof. Venkat Viswanathan

Aug 2018 - Present

GPA: 3.97/4

Carnegie Mellon University

Master of Science, Materials Science

Aug 2018 - Present

GPA: 3.96/4

Indian Institute of Technology Madras

Bachelor of Technology + Master of Technology
Metallurgical & Materials Engineering

Jul 2013 – Jul 2018

GPA: 9.19/10

Major GPA: 9.49/10

PUBLICATIONS

Venkatesh Krishnamurthy, Venkatasubramanian Viswanathan, “Beyond Transition Metal Oxide Cathodes for Electric Aviation: The Case of Rechargeable CF_x ”, [ACS Energy Letters](#) (2020).

Venkatesh Krishnamurthy, Venkatasubramanian Viswanathan, “Energetics of Phase Transformation Mechanisms in Li-CF_x Batteries”, [Chemistry of Materials](#) (2022).

RESEARCH EXPERIENCE

High specific energy layered fluoride cathodes

Jan 2020 - Present

Advisor: Prof. Venkat Viswanathan

Doctoral thesis

- Proposed pathway towards rechargeability in Li-CF_x batteries by stabilizing intermediary discharge product
- Devised modified 3-electrode setup to quantify lithium recovered from intermediary product upon charging
- Developed new fluoride-ion battery concept with high specific energy utilizing layered fluoride cathodes
- Identified catalysts to enhance fluorine diffusion in layered fluorides to enable room-temperature synthesis
- Conceived two new phase transformation mechanisms in van der Waals layered materials
- Leading a collaboration with Prof. Yet-Ming Chiang’s group at MIT and Prof. Jay Whitacre’s group at CMU

Synthesis of Co-doped Na_xTiO_2 anode for sodium-ion batteries

Jun - Jul 2018

Advisor: Dr. Bijoy K Das

Summer internship, ARCI

- Created new sequential precipitation process to synthesize core-shell concentration gradient oxide particles
- Characterized oxide using XRD, fabricated coin cells and carried out electrochemical cycling

Finite element modeling of resistance spot welding

Jul 2017 - May 2018

Advisor: Prof. Murugaiyan Amirthalingam

Master’s project

- Developed two electrical interface resistance models, parameterized & validated models using literature data
- Incorporated resistance models in COMSOL Multiphysics and simulated resistance spot welding process

Synthesis & characterization of $\text{Y}_2\text{Ti}_2\text{O}_7$ -based ODS steels

May - Jun 2017

Advisor: Prof. B. S. Murty

Summer internship, IIT Madras

- Synthesized $\text{Y}_2\text{Ti}_2\text{O}_7$ via ball milling & heat treatment, solid state reaction and flame spray pyrolysis
- Characterized $\text{Y}_2\text{Ti}_2\text{O}_7$ powders using X-ray diffraction and particle size analysis
- Fabricated oxide dispersion-strengthened steel pellets via ball milling & spark plasma sintering
- Performed hardness and hot compression tests to study high temperature mechanical behavior

INTERESTS

Materials synthesis
Process R&D

Cell characterization
Finite element modeling

SKILLS

Technical skills

Materials synthesis, electrode & coin cell assembly, cell testing (BioLogic, Maccor), EIS, GITT, XRD, glove box, dry room experience

Programming languages

Python, bash, C++

AWARDS & HONORS

- Won best poster award at Pittsburgh Quantum Institute Quantum-2020.
- Awarded Ministry of Steel Scholarship by Govt. of India, 2016.
- Secured all India rank of 297 (amongst 1.4 million candidates) in JEE Mains 2013.
- Secured all India rank of 9 in Graduate Aptitude Test in Engineering (GATE) 2017.

RELEVANT COURSES

Six Sigma tools and techniques

Patents, licensing and innovation

Energy storage systems & devices

Materials in renewable energy technologies

EXTRA-CURRICULAR ACTIVITIES

Social responsibility

- Led a 4-member team in the solar electrification of Govt. Girls Higher Secondary School, Ashok Nagar, Chennai.
- Led a 3-member team in installation of drinking water desalination and purification system at Vedal village using capacitive deionization; improves yield to 80% as compared to 50% with reverse osmosis.

MSE Diversity, Equity and Inclusivity (DEI) student committee activities

- Organized guided tour of Alcoa Foundation Hall of American Indians at the Carnegie Museum of Natural History to commemorate Indigenous Peoples' Day 2021.
- Organized Graduate Application Support Program (GrASP) to assist applicants from disadvantaged backgrounds with MSE graduate applications.

Mentorship

- Mentored four students with their graduate application for CMU as a part of the MSE GrASP program.
- Tutored and mentored 20 freshmen at IIT Madras in math & physics and provided holistic guidance.