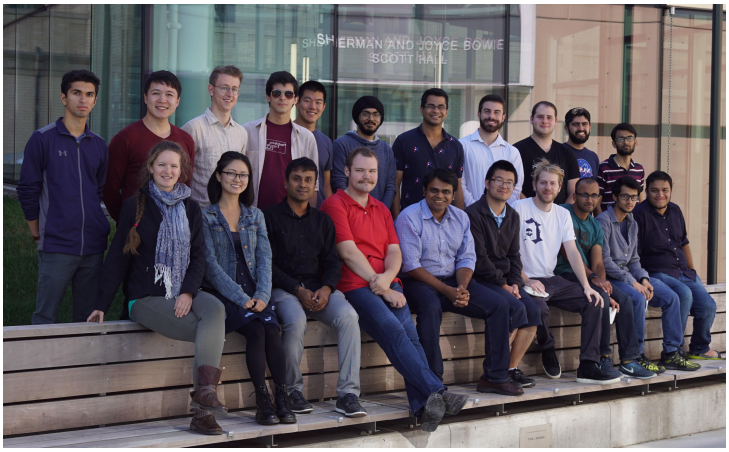
Positions in Venkat Viswanathan's Group
Carnegie Mellon University

Our interdisciplinary group comprises of nearly ∼30 researchers (16 PhD students, 4 Postdocs) working on technologies that can lead to a transition to sustainable energy, supported by several federal funding agencies and industrial sponsors. We actively recruit from MechE, ChemE, Materials Science and Physics departments at Carnegie Mellon. Students are encouraged to pick the discipline that is the best fit for them. However, if you have a strong interest in **joining our group**, please apply to the **MechE department** and indicate your interest to work in our lab in your research statement. Research Website



Projects for 2018-19 cycle

- **Electrochemical Ammonia Synthesis:** 2D nitride-based heterostructures and lattice-nitrogen involving mechanisms for electrochemical ammonia production. (1 PhD position)
- **Electrocatalysis Beyond Scaling Relationships:** Enabled through the use of Anchor sites or pre-adsorbed species and high-entropy alloys. Synergistic electrode-electrolyte design with electrolyte formulations. (1 PhD position)
- **Batteries for Electric Aircraft:** Electrolyte engineering coupled with tortuosity design to achieve high discharge rates, high specific energy. Collaboration with Yet-Ming Chiang and Zunum Aero. Read more about this project here. (1 PhD position)
- **Low-Temperature Charging:** Optimize electrode-electrolyte design coupled with advanced charging protocols. (1 PhD position)
- **Bayesian Inference Approaches for Cell Testing:** Design of experiments in conjunction with synergistic computational models enabling 'maximal-information-gain' and parameter estimation to analyze use-case-specific battery performance. Collaboration with Voltaiq, B. Poczos (ML, CMU). (1 PhD or postdoc position)
- **GPU-Enhanced Computational Modeling:** Demonstrate >10x speed-up in computational material discovery and optimization at the same level of modeling fidelity, leveraging our computing infrastructure. (1 PhD or postdoc position)
- **Synthesis Machine Learning:** Data-driven precursor and process conditions combined with DFT data to learn synthesis routes for advanced cathodes. (1 PhD or Postdoc position)

Methodological interests

- Computational material design
- Density functional theory simulations
- Phase-field modeling
- Data-driven material discovery
- Controls for Energy Systems
- High-performance (GPU) computing

Expected Skill Sets:

- Deep understanding of thermodynamics and mathematics (numerical methods)
- Strong programming skills (MATLAB/Mathematica/Python/C/C++)