

Energy storage student slam
Speaker biographies



Ignacio Arzuaga

Ignacio Arzuaga is a PhD candidate working with Professor Einstein in the Rock Mechanics group at the Civil and Environmental Engineering Department. Originally from Argentina, he graduated from the University of Buenos Aires (UBA) in 2013. He worked for three years as a structural engineer before joining MIT in 2016. His research combines imaging techniques with data analysis and acoustic emissions to learn about fracture mechanics in rocks. The main applications of his work are in geo-energy systems (like geothermal energy and unconventional oil & gas) and underground energy storage.



Kyle Buznitsky

Kyle is a third year PhD student in Mechanical Engineering, where he is researching high-temperature thermal energy storage. Prior to his time at MIT, Buznitsky attended Rutgers University, where he graduated summa cum laude in 2020 with a major in mechanical engineering and a minor in economics. While at Rutgers, he was involved in research on Focused Laser Spike (FLaSk) Rheology, a thin-film metrology technique developed in Jonathan Singer's Hybrid Micro/Nanomanufacturing Laboratory (HMNL). In his time at MIT, Buznitsky has worked in the ASE Lab under Asegun Henry, focused on developing a thermal energy storage concept known as Thermal Energy Grid Storage (TEGS). TEGS involves storing energy as heat in graphite blocks at temperatures up to 2400°C and converting back to electricity using thermophotovoltaics (TPVs), moving the heat between the graphite storage medium and TPV emitter by pumping liquid tin. His work has focused on developing a high-temperature TPV emitter and designing a laboratory-scale prototype of the entire TEGS system, which he is now in the process of testing.



Carlos Díaz-Marín

Carlos Díaz-Marín is a fourth-year graduate student in Mechanical Engineering interested in developing low-cost and high-performance materials for water and energy applications. Using a combination of models, synthesis, and characterization, he has designed moisture-hungry hydrogels with exceptional water capture capabilities. These hydrogels, due to their low-cost components, such as polymers and salts, can have costs as low as \$1-10/kg of material. Díaz-Marín is exploring the use of these materials for decentralized atmospheric

freshwater production and sorption-based thermal energy storage. In particular, by leveraging the enthalpy of sorption of these materials, these hydrogels hold huge potential for low-grade thermal energy storage, which can enhance by up to 41% the efficiency of building heating and cooling, a sector accounting for almost 25% of all worldwide electricity use.



Pamela Duke

Pamela Duke is a senior at MIT majoring in finance and minoring in economics and environment & sustainability. At MIT, she is part of the Climate Scholars Program and is working with the Sloan Sustainability Initiative this year on the Climate Pathways Project. Her project involves using the En-ROADS model to engage with utilities on decarbonization strategies. After graduation, she will be starting as an investment banking analyst in New

York in June. In the future, she wants to use a career in finance to support clean energy investments and help corporations achieve emissions targets.



Amanda Farnsworth

Amanda Farnsworth is a fourth-year PhD candidate in the Chemical Engineering Department. She is interested in decarbonizing the power sector. Specifically, her thesis deals with capacity expansion modeling linked to MIT's SESAME (Sustainable Energy System Analysis Modeling Environment). She uses this tool to evaluate decarbonization strategies from a variety of different angles. She has highlighted regional decarbonization challenges across the US

and has also highlighted the importance of predictable variable renewable integration in a robust power system. Currently, she is assessing the potential of fusion technology in a more decarbonized future based on technoeconomic analysis and manufacturing constraints.



Anakha Ganesh

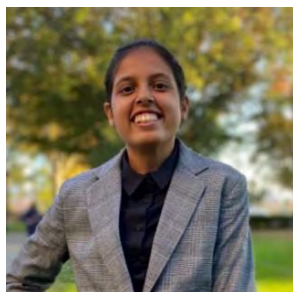
Anakha Ganesh is a first-year undergraduate student studying computer science and economics and energy. She is from Union City, CA, and enjoys sunny weather. Her interests include renewables and healthy food habits. In the future, she hopes to make renewables outcompete nonrenewables in the market. In her free time, she enjoys hiking and spending time with friends and family.



Thomas Lee

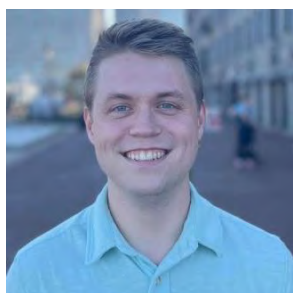
Thomas Lee is a PhD student in the MIT Institute for Data, Systems, and Society, focused on optimization methods for energy systems and markets. He conducts research in Andy Sun's lab in the Operations Research Center and through the MIT Energy Initiative. His research interests include incorporating multistage stochastic optimization and market power for energy storage modeling, and transmission

system optimization. Prior to MIT, Lee worked as a power trading professional covering Western US gas/power and PJM financial transmission rights at Boston Energy Trading and Marketing (part of Mitsubishi Corporation) and developed energy storage optimization models at Amp Energy where he supported valuation for a global investment portfolio of battery projects including Australia, UK, and ERCOT. He started his career as a quantitative research analyst in the global macro team at AQR. He graduated from the University of Pennsylvania with Bachelor's degrees in economics (Wharton) and computer science, and an MS in electrical engineering.



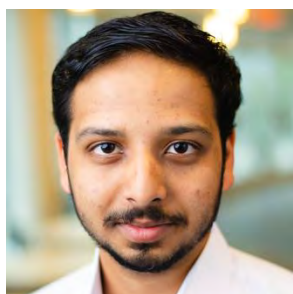
Mrigi Munjal

Mrigi Munjal's research focuses on assessing materials barriers to scaling of sodium-ion batteries in terms of how processes in the lab scale to manufacturing processes, using techniques such as techno-economic analysis, machine learning techniques like NLP, and discussions with relevant equipment suppliers. Outside of research, Munjal can be found playing table tennis or exploring Boston by foot.



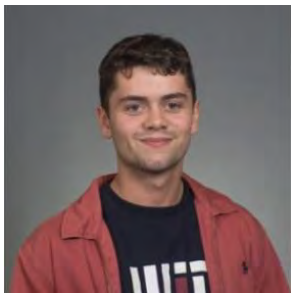
Jim Owens

Jim Owens is a third year PhD candidate in Chemical Engineering. He is broadly interested in sustainability and addressing challenges at the intersection of research and commercialization. His research at the MIT Energy Initiative serves to augment electric vehicle-grid interactions in high-renewable futures, with a focus on vehicle-to-grid (V2G) technologies. His work to date has centered on identifying optimal load shifting, discharge, and infrastructure buildout strategies for emerging EV fleets—such that substantial stationary storage and firm generator capacity investments may be deferred, and more renewables developed. Similarly, he is examining how redesigned utility rates can better incentivize vehicle participation in V2G markets, ultimately bolstering grid stability.



Aniket Patankar

Aniket Patankar is a PhD candidate at the Mechanical Engineering Department at MIT working on carbon-neutral fuel production. For his PhD dissertation, Patankar has developed a novel reactor system for efficiently producing green hydrogen from solar energy. This patent-pending "Reactor Train" system is five times more efficient than competing thermochemical systems. This was achieved by incorporating radiative internal heat recovery and efficient oxygen removal in a novel, integrated system. Patankar obtained his Master's degree from MIT in 2020, where he developed numerical solvers for high-fidelity computational fluid dynamics (CFD) simulations of two-phase flows while accounting for phase change and non-ideal thermodynamics. Patankar is an alum and class of 2017 valedictorian of IIT Bombay.



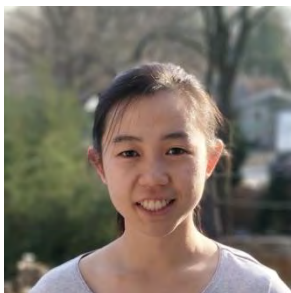
Nick Price

Nick Price is a final-year student completing his Master's at MIT in the Chemical Engineering department on an exchange program from Imperial College London. His research focuses on creating computationally lightweight, large-scale battery models. Price is passionate about sustainability and the intersection between math, chemistry, and renewable energy.



Melissa Stok

Melissa Stok is an MIT junior majoring in Materials Science and EECS. She has a passion for sustainability and is deeply connected within the space at MIT as a member of UA Sustainability, a MITOS Student Researcher, a Waste Watcher, and a co-lead of the Student Sustainability Committee. After graduating MIT, she hopes to pursue a career in the renewable energy industry, which falls at the intersection of her passions and academic interests.



Joy Zeng

Joy Zeng is a sixth year PhD student in the Department of Chemical Engineering, advised by Karthish Manthiram and Yuriy Roman. She received a Bachelor's in chemical engineering from Stanford, where she worked with Bruce Clemens on photoelectrochemical water oxidation at gallium arsenide nanowires. Here at MIT, she studies catalysts for electrochemical carbon conversion reactions. Some of her work has been funded by the MIT Energy

Initiative energy fellowship. Outside of research, Zeng has been involved with the MIT community as a departmental teaching development fellow, departmental REFS member, and a member of MIT Sport Taekwondo.



Chuwei Zhang

Chuwei Zhang is a first-year graduate student at MIT, who is majoring in mechanical engineering. She is a research assistant in Sili's Deng Energy and Nanotechnology Group. Zhang's research interest is in the flame-assisted spray pyrolysis method, especially for lithium-ion battery materials.