



Beck Fellow David Quispe to shine light on renewable energy



David Quispe, Lamar University electrical engineering and mathematics double major, is using his summer to focus on a new solar energy material thanks to the 2018 David J. Beck Fellowship. Quispe will spend 10 weeks at Arizona State University researching the transparent conductive oxide layer in silicon heterojunction solar cells, comparing materials for this layer.

A graduate of La Porte High School, he is a member of the Reaud Honors College, and a recipient of 10 academic scholarships. He is very involved in LU's Institute of Electrical and Electronics Engineers Student Chapter, having served as program chair, treasurer, and student chair.

"Currently, indium tin oxide is most commonly used," said Quispe. "What I want to do is look at another material called indium oxide."

"I'll be determining the advantages and disadvantages of indium oxide with respect to indium tin oxide to determine how effective it would be to implement indium oxide," said Quispe. "There aren't many different materials used right now, so with this research, I'll be

exposing another material and expanding the variety."

In 2017, Quispe attended a Research Experience for Undergraduates program working under Director and Assistant Professor Zachary Holman and developed a hunger for more research experience. The fellowship brings him to work with Holman and the home and research group at ASU again this summer.

"This past summer I took a glimpse at research. I peeked through the door and said 'oh, this is interesting!'" said Quispe. "Being exposed to the research got me really hooked on it. I came back to Lamar ready and knowing exactly what I wanted."

"I was in a friendly environment where people want to help you, and so I was not afraid to ask basic questions," said Quispe. "That environment is exciting and healthy for my development going into my professional career."

Quispe says the fellowship will also provide him with personal growth.

"Being a Beck Fellow, specifically with this project in the research and solar energy path, will give me an opportunity to be more independent in my future research," said Quispe.

One of Quispe's mentors, Assistant Professor Ramesh Guduru, will assist him in being able to understand the results of his experiments and work toward writing a research paper.

"This past summer I was exposed to similar research. But when the grad students would explain some of the results and why things were happening, I only halfway understood," said Quispe. "I lacked some fundamental and background knowledge."

"Being with Dr. Guduru will make the research more solid," said Quispe, "his Ph.D. is based on material science and he is familiar with indium oxide, which is exactly what my research is focused on."

Quispe plans to bring his knowledge back to Beaumont to further advance Lamar's use of green energy.

"Being able to open the door for Lamar to renewable energy is a goal," said Quispe. "In Arizona, they are very heavy on being environmentally friendly with recycling and renewable energy and I'd like to bridge a connection between the two and hopefully introduce Lamar more into that world."

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"Currently, I am working with my other mentor, Dr. Cristian Bahrim, in researching the coastal environmental effects on solar cells and how we can reduce the negative effects," said Quispe.

"Hopefully with this as a start, I can come back from the summer and complete the connection between renewable energy and Lamar."

Following his Bachelor's at LU, Quispe desires to continue down a path of solar energy, pursue a Ph.D. in electrical engineering and eventually find a career in research in order to make electricity more accessible.

"A big idea would be getting into a government facility that works on solar energy research or maybe working at ASU," said Quispe. "Then when I am more independent, create my own business and, with all of my accumulated research, create a method that I can use to implement solar energy into underdeveloped countries."

Quispe's main inspiration is Nikola Tesla.

"When I was sixteen, I learned that Tesla had this goal of being able to provide electricity to the entire world through the Wardenclyffe Tower," said Quispe. "I was inspired by that--providing the world electricity is a great thing and there's a lot of underdeveloped countries that still don't have complete access to electricity."

Quispe receives funding through the Houston Livestock Show and Rodeo Metropolitan Scholarship, Jesse H. and Mary Gibbs Jones Scholars Program, Cardinal Residence Hall Scholarship, Cardinal Scholars Scholarship, Lamar Class of 1957 Scholarship, McMaster Honors Scholarship Fund, DuPont Scholarship in La Porte, INEOS Olefins and Polymers Scholarship in La Porte, and the Charles and Susan Gordan and Julia Gray Gordan Memorial Scholarship.

“Lamar has definitely helped me with funding my college education,” said Quispe. “I’m thankful Lamar provided me a way to go to college and on top of that it’s close to home, so I get to see my family just about every other week.”

“I really like that Lamar usually has classes of about 30 students. The smaller population makes the professors easier to communicate with and allows them to actually know you,” said Quispe. “Building that student-professor relationship really helps the learning.”

Quispe frequents the Deans' and President's list, is a member of the Honors Student Association, and serves as the student chair of the Institute of Electrical and Electronics Engineers Student Branch at Lamar University.

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