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Khatai '23 Discovers Potential Through Eckley Research in Quantum Optics

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BLOOMINGTON, Ill. — Through his research in quantum physics as an Eckley Scholar, Ali Khatai '23 is confident in his decision to pursue graduate work directly after Illinois Wesleyan University.

As a double major in physics and computer science, Khatai is interested in both the quantum computing and quantum communication fields. His ongoing research is in optics, including bessel beams and optical trapping, which is a technique that uses light scattering to hold an object in place.

“The Eckley fellowship is probably the highlight of my college experience,” said Khatai. “Not only did I get to conduct high level research, I got funded for it as well. I finally got to apply all the physics and math that I had been learning in class towards a real world application, which honestly makes learning a lot more fun and immersive.”

Khatai was mentored by B. Charles and Joyce Eichhorn Ames Professor of Physics Gabe Spalding. Spalding “always makes sure that students have freedom to incorporate their own ideas and encourages them to be creative,” Khatai said.

“During the summer we started off by trying to implement an algorithm that allows us to use a spatial light modulator to correct for aberrations in an optical system,” said Khatai.

Once the algorithm was successful, he said Spalding suggested using it to “create low-cost optical traps that could be used in undergraduate labs to teach optical trapping, as current optical traps are too expensive for most undergraduate programs.”

Khatai and Spalding will continue work on this project throughout the fall semester.

“After conducting research over the summer, I realized that although this work is really hard, it is what I want to continue doing and it helped me reach the decision to apply to grad school right after graduating,” Khatai said. “I learned a lot about my potential and how I can best apply my skills to learn and achieve more.”

Established by the late IWU President Emeritus Robert Eckley and his wife Nell, the Eckley Summer Scholar program provides a stipend of \$4,000 for each scholar to spend the summer conducting academic research or artistic activity under the mentorship of a faculty member. The program is designed to develop and deepen a student’s creative and research competencies.



Ali Khatai '23

By Maria Harmon '23