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## Schonert '16 Thrives on Independent Work

Aug. 6, 2015

BLOOMINGTON, Ill.— When **Eckley Scholar** Ryan Schonert '16 (Fairmount, Ill.) asks his faculty mentors a question regarding his project, they've often answered "we're not sure."

Because when an undertaking involves replicating dust found light years away, in the outer reaches of space, there are a lot of unknowns. The interstellar dust – gathered in "clouds" and unobservable with conventional telescopes – is comprised of solid grains that absorb visible light.

"Although these dust grains block visible light, they emit thermal infrared radiation," said Schonert, a **chemistry** major. "These infrared wavelengths are useful because even though we can't see past the dust clouds, we still get information being radiated from these areas."

That information can be difficult to obtain. The dust itself is almost impossible to collect, so it must be replicated under conditions mimicking the environment as close as possible.

"By comparing the wavelength of light emitted by interstellar dust clouds with the light emitted by dust synthesized in the lab, we would potentially be able to identify physical and chemical characteristics of interstellar dust," said Schonert.

Part of Schonert's Eckley work is to develop a new procedure for producing iron silicate dusts in the lab. The independence to figure out how to do that has been the best part of the project, according to Schonert. Associate Professor of **Physics** Thushara Perera "tasked me with making the dust samples and figuring out how to test them, and it's been a great experience to prepare me for work after graduation," said Schonert, who is considering the field of forensic chemistry. "My favorite part of this research has been when my professors have said to me, 'we don't know the answer to your question.' They wanted me to try to figure something out, and if I wasn't making progress on how to figure out an apparatus, for example, or a method that was giving us problems, then we would figure it out together."

"The main reason Ryan has posed so many open-ended questions is because he has developed an aptitude for figuring things out on his own and has a fearlessness for trying new solutions to a problem," said Perera, who is Schonert's faculty mentor. "These strengths are crucial for success in a research environment, such as in graduate school or industry."



Ryan Schonert '16 said the favorite part of his research was when his professors didn't have an answer -- empowering him to seek a solution.



Ryan Schonert '16

Perera is currently building a custom Fourier transform spectrometer, an endeavor funded by a National Science Foundation grant. Information obtained using the spectrometer is expected to lead to a greater understanding of the conditions that prevail in those dusty regions of space.

In order to obtain the data, the dust has to be in the form of a polyethylene pellet so it can be inserted into the spectrometer. Schonert has been charged with developing a method to do that, too.

He has been working on aspects of the project for more than a year. After producing a magnesium silicate dust last summer, using published procedures under the guidance of Chair and Professor of Chemistry Rebecca Roesner, Schonert was ready this year to forge new paths. Roesner is also providing guidance to Schonert for his Eckley project.

"Ryan's work crosses the disciplines of physics, astronomy and chemistry, and that makes it exciting," said Perera. "If not for the neighborly atmosphere between small departments under the same roof [in the Center for Natural Science], I could not imagine enlisting a chemistry major such as Ryan and collaborating so closely with a

chemistry colleague like Professor Roesner on this work.”

Last summer’s research is best described as learning how to do what had already been done, and getting acquainted with the project, Schonert said. “This summer it’s all new – making new samples, figuring out how to make a matrix to make the pellets. It’s really exploring new ground to see what happens, and that’s been very exciting.”

The Eckley Scholars & Artists program was established by President Emeritus and Mrs. Robert S. Eckley before President Eckley passed away in 2012. The program is designed to develop and deepen a student’s creative and research competencies under the guidance of a faculty member. Eckley Scholars receive a \$4,000 stipend and campus housing for the summer.