



Faculty highlight

I have always considered physics a very intimidating field of study. I view it as genius work, something I cannot possibly relate to or use in everyday life. When it came to interviewing a physics professor, I had no idea where to begin. However, when I sat down with Dr. Sudarshan Fernando, Professor of Physics, his passion for the field and ease in explaining it made me realize that physics is everywhere.

Dr. Fernando realizes that many people, including myself, do not understand what he does on a daily basis. "Physics is figuring out how things work," he said. Whether you want to know how your GPS works or how you hear music playing from your phone, physics can help you understand.

Within physics, there are two main branches: theoretical and experimental. Dr. Fernando is a theoretical physicist; more specifically, he studies a narrower field called high energy physics which is studying nature in its smallest forms. These physicists take a mathematical approach to figure out the unknown. "We are working out that side of the puzzle," said Dr. Fernando.

I still wanted to understand how physics helps you figure out the unknown in



Dr. Sudarshan Fernando | Physics

talk to anyone. You simply watch and observe patterns. At first, you start to pick up on what is going on, and you think you understand how the game works. But then, something completely different happens, and you realize the rules are not as simple as you thought they were. Dr. Fernando explains, "Studying nature with physics is like that. You are trying to figure out this baseball game you knew nothing about."

Since Dr. Fernando arrived at Kutztown University 15 years ago, his mission has been to give students the best possible training. Research in high energy physics is not what it is for other fields in science. There are not as many experiments to be done. Instead, undergraduate students can spend extra time with

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nature and the world around us. To explain, Dr. Fernando used the analogy of someone going to a baseball game for the first time. Imagine you have never seen a game before. You do not know the rules and are not allowed to

professors through independent studies to learn more advanced topics, such as quantum field theory and general relativity, that will be discussed as they continue in their education.

Dr. Fernando encourages students who are interested in going further in the field to take advantage of opportunities. "Even though as a first year they may not want to think about four years ahead, they need to start preparing," he said. Current students in the Physics Program have taken advantage of what little time they have at Kutztown and have done some exceptional projects with various faculty to build upon their knowledge. From testing solar panel cells at cold temperatures to imitate space conditions to discovering new planets outside our Solar System, these students are quickly expanding the future of physics.

According to Dr. Fernando, Kutztown's Physics Program is blessed with remarkable students. The faculty members bring a diversity of expertise and credentials. The program has three tracks for students to follow—physics, astronomy, and engineering physics—and they are working on expanding even more. "One strength of our program is being able to adapt to whatever change is happening and offer more opportunities. That is definitely our goal: offering as many opportunities as possible to our students coming to Kutztown."

Physics is adaptable to students' interests and passions. Physics can be combined with mathematics, chemistry, biology, or even music, political science, or finance. Through the program, students acquire versatile skills, such as logical thinking and computing, and they become incredible problem-solvers, able to take on any situation. "It's our job to prepare them to be more competitive employees, not only in their first job out of college, but in their entire working career," said Dr. Fernando. "Make them leave this place with enough skills so they can make those promotions, change jobs, and [tackle] whatever they want to do in their life." Students can find their own way and career in the field by following their passions with the guidance of Kutztown's faculty. Physics really is everywhere.



Takumi Hawes | Biochemistry/Chemistry

“When I first came to Kutztown, I was a very quiet, shy, and socially awkward person. Now, I’m a slightly less quiet, shy, and socially awkward person,” said Takumi Hawes, a junior Biochemistry and Chemistry double major. Takumi arrived with goals, and he wasn’t going to let fear stand in his way. He has successfully pushed himself out of his comfort zone.

Takumi has been working on a protein biochemistry research project with Dr. Matthew Junker for the past year. In our bodies, cells go through a process called apoptosis which is the normal and controlled death of a cell. However, at times, cells can go into unregulated apoptosis, which can lead to cancers and other degenerative diseases, such as Parkinson’s disease. Dr. Junker and Takumi are working on engineering inhibitors of caspase, which is the enzyme that causes apoptosis, that would reduce the number of cells uncontrollably dying.

“The research experience has given me more confidence working in a lab setting,” said Takumi. The knowledge he has gained will help him be a competitive candidate for future internships, graduate school programs, and job positions. Aside from the knowledge he has gained, Takumi has firsthand experience in what he hopes to be for the rest of his life: a research scientist.

Although Takumi does find protein biochemistry interesting, he is keeping his options open. Having taken Analytical Chemistry I last semester and currently being enrolled in Analytical Chemistry II, he has discovered that these courses are some of his all-time favorites. He is finding a new passion, but this would not be the first time he changed his academic path. When Takumi first came to Kutztown, he was a Biology major on the Molecular/Micro/Cell Track, but after taking the zoology course, he discovered that was not the right fit. “What I did enjoy [were] the problem-solving aspects within my chemistry classes,” said Takumi, so he made the switch to a Biochemistry and Chemistry double major.

Takumi’s engagement on campus does not end with the research position.

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He has a long list of involvement—Supplemental Instructor for General Chemistry I, stand-by Chemistry tutor in the library, member of Phi Sigma Phi, Vice-President of Chemistry

experience—organizations, research projects, and academic courses—is helping to shape him into the person, student, and professional he wants to be.

Student highlight

Club, and a member of the Honors Program. According to Takumi, getting involved is all about connecting, and it’s essential to “Reach out to other people and professors. I think that’s very important, and don’t be afraid to ask.”

Takumi looked for these additional opportunities for involvement because he knew they would enrich his Kutztown University experience. As a Supplemental Instructor and stand-by tutor, Takumi is gaining quality job experience that will help him be prepared for teaching assistant positions when he gets to graduate school. His involvement in the Honors Program has motivated him to serve the community and to maintain a presence outside of his department.

Starting college with the whole world before you can be scary, but there are so many opportunities and chances to push yourself into places you’ve never even thought existed, all you have to do is get involved. Takumi’s engagement in every aspect of the KU

DEAN’S CORNER DR. DAVID BEOUGHER

Colin Powell is credited with making the statement that, "Endeavors succeed or fail because of the people involved." This issue of *The Collage* immediately reminded me of that maxim. We have chosen to highlight two members of the college—a teacher who has a passion for engaging, challenging, and inspiring students in and out of the classroom and a student who has risen to the challenges encountered on his KU journey. One provides insight into understanding the incredibly complex workings of our world and methods for understanding those processes. One serves as an example of an incredible academic journey filled with challenges and discoveries about the world and himself. Both serve as exceptional examples of the people with whom we share this exciting endeavor called college. I hope that you enjoy this edition of *The Collage*.



The March 2020 edition of *The Collage* was designed, edited and written by Courtney Morstatt '21, Professional Writing major, under the supervision of the CLAS Dean’s Office.