Meet the Prof: Nadia Kaltcheva

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The following faculty Q&A was submitted by the University of Wisconsin Oshkosh Faculty Advocacy Committee, a committee of the Faculty Senate. Kenneth Price, associate professor of mathematics, wrote the introduction.

I am pleased to introduce Dr. Nadia Kaltcheva, associate professor of physics/astronomy at UW Oshkosh. Dr. Kaltcheva's scholarly work in astronomy has taken her around the world to professional positions in Bulgaria, Chile, Denmark, Germany, India, Scotland and South Africa. She shares her love of science through teaching and has directed 10 student conference presentations in the past two years alone.

Many students in my classes have worked with Dr. Kaltcheva. They speak very highly of their experiences completing research projects with her. It is encouraging to see fellow faculty making a difference in the professional lives of our students. The picture below shows Nadia with her husband, Matey.

How did you find your way to UW Oshkosh?

I chose Oshkosh because teaching is a very important part of my professional life, and this university provides the right balance for me. I enjoy working with students both in the classroom and on research projects.

Why did you choose to go into your field?

Physics was very interesting to me during my high-school years. To be honest, for a long time I was "undecided." Like most people, I was fascinated by the majesty of the night sky. I clearly remember seeing through a telescope the rings of Saturn and several clusters of stars for the first time. It was breathtaking. Now studying clusters of stars is a large part of my work.

What is your favorite thing about UW Oshkosh?

My students, my colleagues and the tranquility of our campus — all this blends together in a very pleasant and creative atmosphere. The overall atmosphere at UW Oshkosh is my favorite thing.

What is the professional accomplishment of which you are most proud?

The expertise I have developed over the years in obtaining distances to stars. This is used to map and study the spiral arms of our Milky Way galaxy. Measuring stellar distance is important and difficult to calculate. Without these distances, however, we cannot understand the structure of the universe.

Recently, in an international collaboration, we developed a high-precision method for certain stellar

types. Our method is expected to find application in the Gaia space mission due to launch next year. Gaia is a cornerstone mission in the European Space Agency scientific program. It will produce a much better understanding of the Milky Way than we can achieve with ground-based telescopes. The Gaia space station will be able to observe a billion stars!

What leadership or service activities are you involved in?

As a UW Oshkosh representative to the Wisconsin Space Grant Consortium, I promote opportunities on campus and mentor students on their space-related research. The consortium is part of a 52-member national organization created by Congress and run through NASA. The grants can be used for any space-related research or used to support space-related education programs.

What is the most common misperception about what you do?

Since stars are involved, a common misperception about astronomy is that it must be a romantic science with very limited immediate application in everyday life. This is not true. When physicists needed a way to share large data files, they created Ethernet, which became the Internet. Studying space led to placing high-tech satellites in orbit, which made the world smaller through communications and GPS.

Contemporary astronomy cannot be performed without the technological achievements of space science and engineering. Many advanced technologies are developed because of their applications to astronomy.

What is the most exciting project you are working on right now?

The Carina spiral feature is the largest segment of a spiral arm in the Milky Way seen from our position within the galaxy. Right now we have enough data not only to map its structure, but also to study the interactions between the stars and the interstellar matter to find out more about how stars form.

How does what you research help you to be an effective teacher?

The new things I learn through my research keeps me excited about science. Astronomy truly is in its golden age, when state-of-the-art space stations and incredibly precise telescopes are collecting vast amount of high-quality data. We dramatically increase our knowledge and develop a better understanding about our place in the universe.

Describe some ways your department serves northeastern Wisconsin.

Judging Science Olympiad competitions, working with local amateur astronomy clubs, providing hands-on demonstrations to students at local elementary schools are all important parts of our work. My department offers a bachelor’s degree in physics with three emphases: professional, applied and physics education. Now there is a dual degree program in physics/engineering with UW-Madison and the University of Minnesota.

We offer active research programs in astronomy, physics education and surface physics. This variety of programs helps us to accommodate students with different interests and skills, while preparing them better for the dynamic job market.

Tell us about your family.

My husband, Matey, is a professor of chemistry at the Milwaukee School of Engineering. We live in the countryside southeast of Fond du Lac. We have one daughter, Maria. She is a first-year graduate student in biology at Johns Hopkins University.

What are your hobbies?

Lately, it has been photography (mainly landscapes, birds and sunsets) and gardening. I like to read historical articles and novels. I also enjoy watching soccer and figure skating — I usually follow the major competitions in both sports closely.

- Read more faculty profiles.

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