The Department of Physics welcomes Jingyue Liu and Oliver Beckstein as newest members of the ASU Physics faculty. Their insights as to their current and future research plans as they join the ASU Physics community follow below.

**Professor Jingyue Liu**

*Nanoscale Science Research Effort*

My research focuses on understanding the fundamental properties of nanostructures and nanostructured systems, and their synthesis-structure-performance relationships. We develop and utilize advanced electron microscopy techniques to determine the atomic structure of nanoscale systems and correlate the observed structural/compositional variations with the changes in their properties. We emphasize understanding the formation processes of nanostructures (via physical, chemical, or electrochemical routes) with a goal of developing robust and scalable synthesis methodologies.

**Assistant Professor Oliver Beckstein**

*Biological Physics Research Effort*

I am using computer simulations to quantitatively understand biological processes from the atomic level upwards, in particular proteins that transport signaling molecules such as neurotransmitters across the cell membrane. I seek to calculate the rate of transport and how it is altered by small molecules such as drugs. Predicting responses of physiological processes from their material components may lead to a better understanding of the processes at the core of happiness, diseases such as depression, or drug addiction.
Spring Semester Starts with a Bang

Enrollment in physics courses at ASU increases in the spring semester as students complete their math prerequisites. It seems that each year we set a new record for attendance, and this spring semester is no exception with over 5000 students enrolled in our lectures and labs. Our new faculty, Oliver Beckstein and Jingyue Liu, are initiating exciting research programs, working with graduate students, and are involved in teaching. It is always interesting to learn of the breadth of interests of each new colleague. Jingyue has broad interests related to sustainable energy and Oliver’s expertise will build our biological physics research in new directions of neurological cell function.

For our faculty, it is an exciting time to meet with our new classes and challenge students both with learning about physical phenomena and learning to solve problems like a physicist. Many of our courses for our physics majors are taught in a studio style where students work in small teams solving problems or deriving the mathematical basis for physical phenomena. It is a privilege to teach a course in this format where we can actively participate in our students’ learning.

There are so many other things going on that build to a crescendo this time of year. In the next weeks Origins will host a discussion between Lawrence Krauss, Director of Origins, and Richard Dawkins on “Something from Nothing?” In addition, the Beyond Center will present the Science Fiction Meets Science Fact lecture, and this year Paul Davies, physicist and Director of Beyond, will discuss “Time travel: can it really be done.” I hope you can come to one of these public events (see our website for links).

I also want to thank everyone who supported our annual Focus Forward. Your donations help our students in so many different ways.

Sincerely,
Bob

**Undergraduate Problem of the Month**

The figure shows a small coil C (area = 1.0 cm², 200 turns) mounted on one end of a balance beam and introduced between the poles of an electromagnet. The length of the arm OA of the balance beam is 30 cm. When there is no current through the coil the balance is in equilibrium.

When there is a current I = 22 mA through the coil the equilibrium is restored by putting an additional counter-weight of mass m = 60 mg on the balance pan. Find the magnetic field at the spot where the coil is located.

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**Participant Eligibility Rules & Processes:**
- Any ASU undergraduate student may participate.
- Submissions are due the end of the month (Jan 31) to the Physics Main Office (PSF 470) by 5pm and must include your name and ASU ID number.
- The solution will be posted in the Physics Main Office (PSF 470) until 5pm on Feb 7.
- For every correct solution turned in, the ASU undergraduate student will earn a special treat. The ASU undergraduate student who turns in the most correct solutions at the end of the academic year will be recognized at the Physics Annual Awards Ceremony.

The Department of Physics is not responsible for lost or incomplete entries.

Special thanks to Dr. Alarcon for contributing January’s Undergraduate Problem of the Month.

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**Faculty Trivia**

How well do you know your physics faculty? Try your hand at the trivia question below:

This professor’s grandfather is from Catalonia...

Click here to submit your guess and discover the answer.