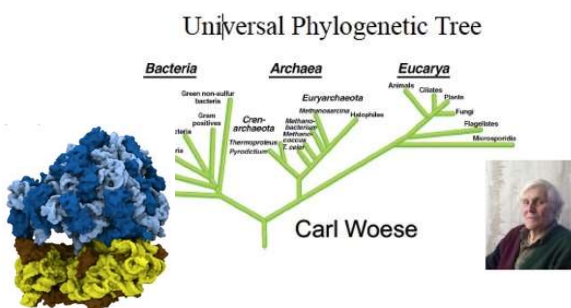
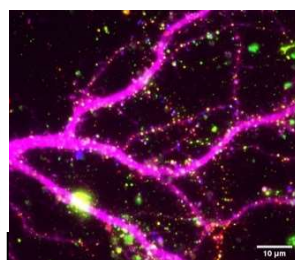
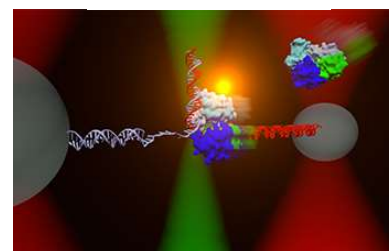




Super Resolution Imaging



Optical Tweezers



This course is meant for advanced undergraduate or graduate students in Physics who have pondered the connection between biology and physics and who want to explore some of the techniques used by experimental physicists to answer important biological problems. Physics has played a revolutionary role in biology, both in terms of using and developing new instruments (microscopy, cryo-EM) that allow us to see entirely new realms of space and time, and in terms of being able to model biological processes quantitatively. Not surprisingly, the world of living things is constrained by the laws of physics, and by knowing and applying those laws, one can get new insights.

Students in this advanced laboratory course will conduct 4 sets of experiments that involve cutting-edge methods and questions in biological physics. We will explore techniques such as optical imaging with resolution beyond the diffraction limit, using lasers to trap microorganisms and subcellular structures, and using the techniques of molecular and cell biology as well as some statistical analyses to test hypotheses about how proteins fold or how evolution works. *Each* experiment resulted in a Nobel Prize, often done by a physicist, and created entirely new sub-fields within biological physics and quantitative biology. You too can do Nobel-quality science!

Note: This course DOES satisfy the Physics Department Graduate Student “breadth requirements”.

Instructors: *Paul Selvin and Sharlene Denos*

Please email denos@illinois.edu or selvin@illinois.edu for more information or to sign up for this course.