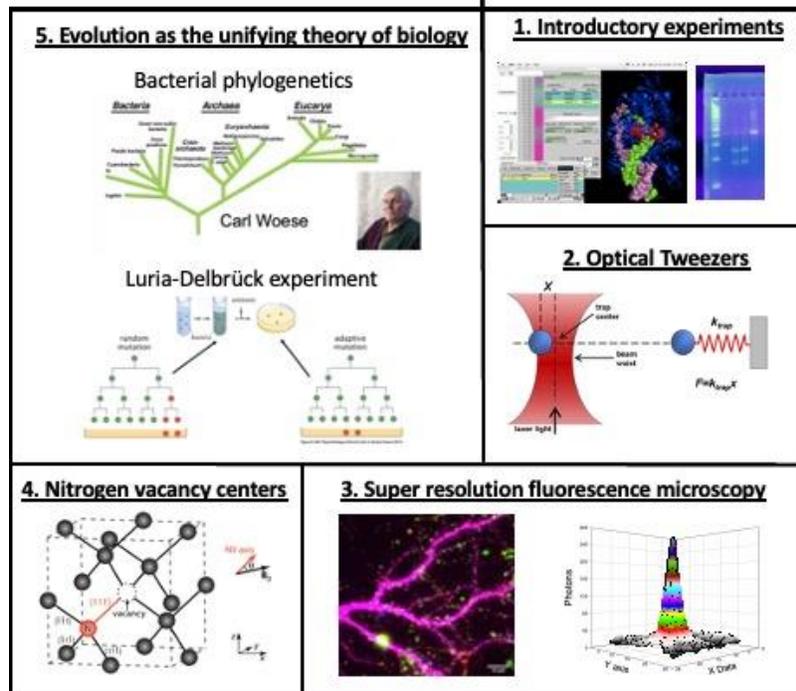


Special Topics in Physics, Physics 498 EBP: Experimental Biological Physics



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.

We will explore techniques such as optical imaging with resolution beyond the diffraction limit; using lasers to optically trap microorganisms and subcellular structures; using nitrogen vacancy centers (often used in single photon emission for quantum optics); and using the techniques of molecular biology as well as some statistical analyses to test hypotheses about how proteins fold and how evolution works. Each experiment resulted in a Nobel Prize and created entirely new sub-fields within biological physics and quantitative biology.

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

Instructors: Sangjin Kim and Sharlene Denos

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