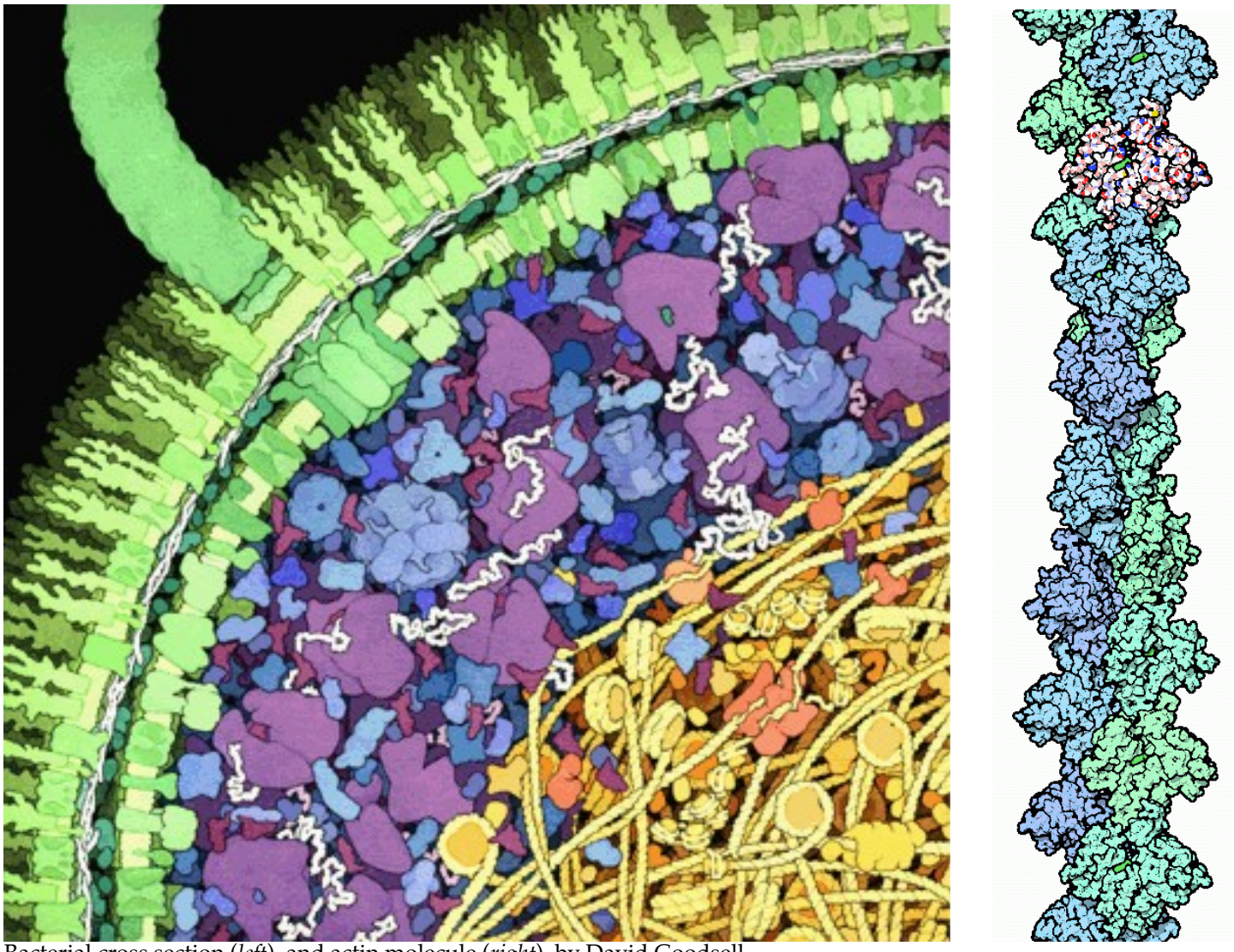
WASHINGTON STATE UNIVERSITY

Offered Fall Semester 2017
Biological Physics 466/566

Physics 466 (undergraduate) or 566 (graduate, conjoint) provides a fundamental physical understanding of the operation of **cells, biomolecules and molecular machines.**

MWF 4:10-5:00pm, Webster 17 (3 cr) Instructor: Fred Gittes, Clinical Professor of Physics and Astronomy: gittes@wsu.edu (https://physics.wsu.edu/people/faculty/fred-gittes/)

Topics: We will study **biomolecules, random walks, diffusion, Einstein relations, entropic forces, stretching and melting of biopolymers, small-system thermodynamics, osmotic forces, ionic motion, chemical reactions, enzymes, self-assembly, protein folding, Brownian ratchets, molecular machines, cell movement and division, swelling and electroosmotic control, membranes, ion channels and ion pumps.** A physical point of view will be emphasized. This is a fast-paced and challenging course. Prerequisites: Calculus-based physics (Physics 201-202), calculus (Math 171-172), Chemistry (105-106). **Ask me if you do not exactly match these prerequisites.** Additionally, bioscience students carry out skill-building work in physics and mathematics; physics and engineering students explore background material in molecular cell biology. Graduate (566) students carry out calculational and/or literature research projects on topics of current interest. Required text: **P. Nelson, Biological Physics: Energy, Information, Life.**



Bacterial cross section (*left*), and actin molecule (*right*), by David Goodsell.