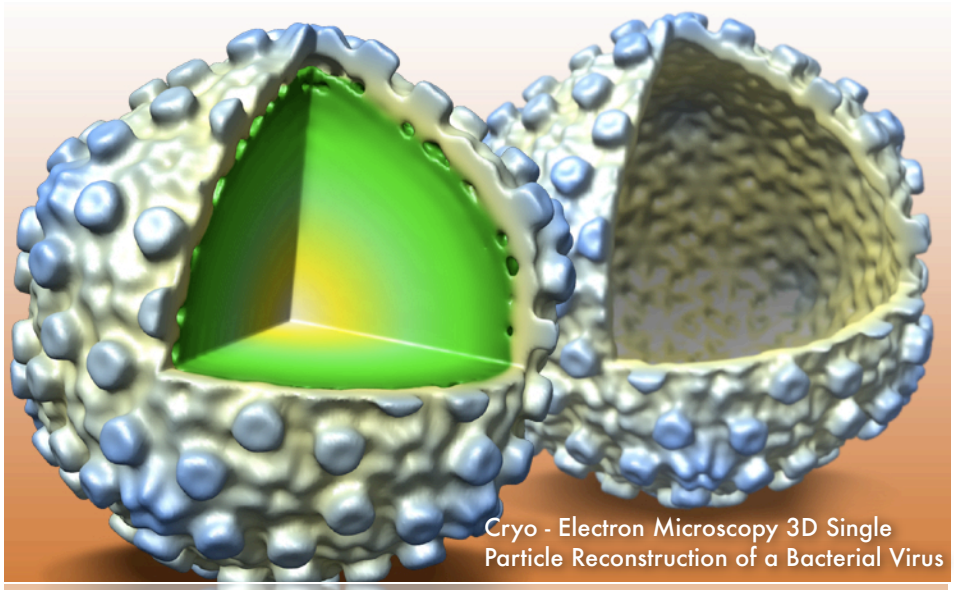
Physical Virology

GRADUATE COURSE

LECTURER:
PROF. ALEX EVILEVITCH



Physical Virology is the study of

The properties of viruses related to: their structure and biological activity; their use as carriers and vectors (biomedical applications); their use as platforms for novel chemistry.

The self-assembly of: virus capsids and components; whole viruses; superstructures of viruses.

Like all branches of physical science, physical virology encompasses a search for simplifying generalities. However, viruses display a kaleidoscopic diversity that imposes limits on any generalization and provides tremendous opportunity for discovery.

The course covers latest methods in biological physics as well as fundamentals in physics of DNA, protein self-assembly and membranes using viruses as a physical object. This course also provides introductory level biochemistry and molecular biology lectures so that students with any background can participate in the course. Being an interdisciplinary and up-to-date research field involving fundamental theory and numerous applications, the emerging field of physical virology is aimed to attract students from any of the natural science disciplines (physics, chemistry and biology).

Tu & Th 10-11.20 am, start 8/31/10

Course for Physics, Biology and Chemistry Students
Open to undergrads upon agreement with the course instructor
12 Units, Course Code 33-784
No course prerequisites
Info at: www.cmu.edu/physics/virology
E-mail: alexe@cmu.edu

Carnegie Mellon University

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Course participants will learn state-of-the-art account of recent advances in the experimental analysis and modeling of structure, function and dynamics of viruses. It is an interdisciplinary course that also integrates a review of relevant experimental techniques, such as cryo-electron microscopy, atomic force microscopy, microcalorimetry, light scattering and mass spectrometry with the latest results on the biophysical and mathematical modeling of viruses. The course comprehensively covers the structure and physical properties of the protein envelopes that encapsulate and hence protect the delicate viral genome, their assembly and disassembly, the organization of the viral genome, infection, evolution, as well as applications of viruses in biomedical nanotechnology.