PHYSICAL MATHEMATICS SEMINAR

How does a virus self-assemble?

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ABSTRACT:

I don't know the answer to the question posed in the title, but I will try to show that it is an interesting problem. Simple viruses consist of RNA and proteins that form a shell (called a capsid) that protects the RNA. The capsid is highly ordered, the proteins being arranged in an icosahedral shell. Many such viruses can self-assemble: you can mix the RNA and the capsid proteins in a test tube, and they will spontaneously form infectious viruses (don't worry -- none of the viruses I will discuss will infect you, unless you are a plant or bacterium). To understand how this self-assembly process happens, we do experiments on a much larger, model system: attractive colloidal particles on the surface of a sphere. On the curved droplet surface, the particles form branched networks of slender domains, a consequence of an elastic instability. These results show that Gaussian curvature can fundamentally alter the growth and shape of ordered domains, which suggests that the viral assembly pathway may be anything but trivial. I will conclude by showing new optical experiments that attempt to resolve the kinetics of assembly of a single viral capsid..

TUESDAY, APRIL 28, 2015
2:30 PM
Building E18, Room 466A

Reception following in Building E17, Room 401A
(Math Dept. Common Room)

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