

Mathematical Biology Seminar  
Wednesday, March 2, 2022  
Speaker: Dr. Antoni Luque,  
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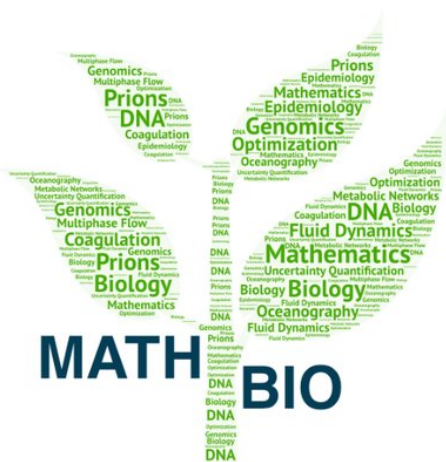
**Title:** Bridging the biophysics and evolution of viruses

**Time:** 11am

**Zoom Link:** <https://ucmerced.zoom.us/j/98050375649>

**Passcode:** 172069

**Abstract:** Viruses are the most abundant biological entity on Earth and play a pivotal role in regulating the evolution of organisms and the planet's biogeochemistry. Most viruses protect their genome in icosahedral shells made of multiple copies of the same protein. Viral icosahedral shells span two orders of magnitude in size and thousands of different architectures. Yet, the physical mechanisms that have selected such diverse viral structures are unknown. Here, I will share my lab's most recent contributions to this fundamental problem. First, I will introduce the generalized quasi-equivalence theory of icosahedral architectures as a framework to investigate systematically viral architectures and their protein components. Second, I will show how the physical relationship between the protein shell and genome of viruses has opened the door to characterize uncultured viruses, predict the existence of unknown viruses, and engineer new viruses from the environment. Finally, I will discuss a novel physical mechanism that may hold the key to how viruses explore different viral architectures



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