



# UNIVERSITÀ DI PARMA

Dipartimento di Scienze Matematiche, Fisiche ed Informatiche - DSMFI

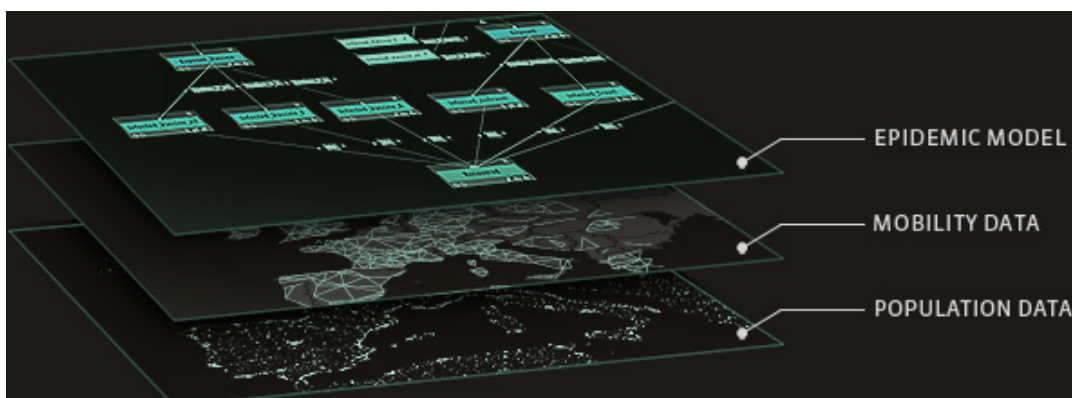
SEMINARIO DI DIPARTIMENTO

**Vittoria Colizza**

*Inserm & Sorbonne Université Paris, France*

## Epidemic threshold on temporal networks

**Abstract:** Our understanding of communicable diseases prevention and control is rooted in the theory of host population transmission dynamics. The network of host-to-host contacts along which transmission can occur drives the epidemiology of communicable diseases, determining how quickly they spread and who gets infected. A large body of epidemiological, mathematical and computational studies has provided a number of insights into the understanding of the process and the identification of efficient control strategies. The explosion of time resolved contact data has however opened the stage to new challenges. What are the structural and temporal aspects, and possibly their non-trivial interplay, that are critical for disease spread? To answer this question, I will introduce the infection propagator approach, a theoretical framework for the assessment of the degree of vulnerability of a host population to disease epidemics, once we account for the time variation of its contact pattern. By reinterpreting the tensor formalism of multilayer networks, this approach allows the analytical computation of the epidemic threshold for an arbitrary time-varying network of host contacts, i.e. the critical pathogen transmissibility above which large-scale propagation occurs. I will apply this framework to a set of empirical time-varying contact networks and show how it can be used to test different intervention strategies for infection prevention and control in realistic settings.



Giovedì 15 Novembre – ore 16:30  
Aula Newton – Plesso Fisico