

## School on Pathogen Dynamics, Climate and Global Change

### Program:

FIRST WEEK: January 12 to 16		
Monday, January 12		
9:00	9:45	<b>Registration</b>
10:00	11:30	<b>Lecture 1:</b> Introduction to course and transmission models for microparasites (M. Pascual)
15 min COFFEE BREAK		
11:45	1:00	<b>LAB 1:</b> Estimation of the basic reproductive number (A. King)
LUNCH BREAK		
2:30	3:30	<b>Lecture 2:</b> Macroparasite models and dynamics (A. Dobson)
15 min COFFEE BREAK		
3:45	5:15	<b>LAB 2:</b> Parameter estimation for deterministic models (A. King)
5:30	6:30	<b>Lecture 3:</b> The mathematics of stochastic processes I (M. Marsili)
Tuesday, January 13		
9:30	10:30	<b>Lecture 4:</b> Case study: Complex stochastic dynamics in an infectious disease system, pertussis (A. King)
10:30	11:30	<b>Lecture 5:</b> The mathematics of stochastic processes II (M. Marsili)
30 min COFFEE BREAK		
12:00	1:00	<b>Lecture 6:</b> Seasonality and the population dynamics of infectious diseases (G. DeLeo)
LUNCH BREAK		
2:30	4:00	<b>LAB 3:</b> Stochastic simulation (A. King)
15 min COFFEE BREAK		
4:15	5:15	<b>Lecture 7:</b> Cholera dynamics and climate variability (M. Pascual)
5:15	6:30	<b>Discussion: introduction to group projects (G. Canziani)</b>
Wednesday, January 14		
9:30	10:30	<b>Lecture 8:</b> Structured population models: malaria along an endemicity gradient (G. Gomez)
10:30	11:30	<b>Lecture 9:</b> The mathematics of stochastic processes II (M. Marsili)
30 min COFFEE BREAK		
12:00	1:00	<b>LAB 4:</b> Stochastic simulation (A. King)
LUNCH BREAK		
2:30	4:00	<b>Lecture 10:</b> Malaria dynamics and climate change (M. Pascual)
15 min COFFEE BREAK		
4:15	5:15	<b>Lecture 11:</b> Infectious diseases and wildlife: Arctic environments and climate change (A. Dobson)
5:15	6:30	<b>Setting the stage for groups' projects (G. Canziani)</b>

<b>Thursday, January 15</b>		
9:30	11:30	<b>Lecture 12/LAB5:</b> Analysis and re-analysis as a proxy for observations of climate variables (A. Tompkins)
<b>30 min COFFEE BREAK</b>		
12:00	1:00	<b>Lecture 13:</b> The theory of particle filters (A. King)
<b>LUNCH BREAK</b>		
2:30	4:30	<b>LAB 5:</b> Particle filters in practice (A. King)
<b>15 min COFFEE BREAK</b>		
4:45	5:45	<b>Lecture 14:</b> The population dynamics of Schistomatosis (G. DeLeo)
5:45	6:45	<b>GROUP DISCUSSION: self-organization</b>
<b>Friday, January 16</b>		
9:30	10:30	<b>Lecture 15:</b> Numerical weather prediction and climate models (A. Tompkins)
<b>30 min COFFEE BREAK</b>		
10:30	11:30	<b>Lecture 16:</b> Parasites, climate and fuzzy inference systems (G. Canziani)
<b>LUNCH BREAK</b>		
2:30	5:30	<b>GROUP DISCUSSIONS/WORK</b>
<b>WEEKEND - FREE</b>		
<b>SECOND WEEK: January 19 to 23</b>		
<b>Monday, January 19</b>		
9:30	10:30	<b>Lecture 17:</b> Malaria and climate variability (M. Pascual)
10:30	11:30	<b>Lecture 18:</b> Biodiversity and infectious diseases (G. DeLeo)
<b>15 min COFFEE BREAK</b>		
11:45	12:30	<b>LAB 6:</b> Netcdf and R (A. Tompkins)
<b>LUNCH BREAK</b>		
1:30	3:30	<b>Work on group projects</b>
<b>15 min COFFEE BREAK</b>		
3:45	5:00	<b>LAB 7:</b> Inference for emerging infections: Ebola as a case study (A. King)

Tuesday, January 20		
9:30	10:30	<b>Lecture 19:</b> Spatial spread of infectious diseases: population-based approaches I (G. Canziani)
10:30	11:30	<p><b>Participants' presentations:</b></p> <p>1 - Restructuring of the epidemiological surveillance system for Avian Influenza and Newcastle disease in Brazil (Mariana Ramos Queiroz)</p> <p>2 - Quantitative descriptions of Wolbachia impact in disease-vectors: computing the bits and finding the pieces (Caetano Souto Maior Mendes)</p>
<b>30 min COFFEE BREAK</b>		
12:00	1:00	<p><b>Participants' presentations:</b></p> <p>1- Pseudospectral Methods for Numerical Solution of Optimal Control Problems: This may be useful for biomathematics? (Andres David Baez)</p> <p>2 - Quasi-cycles in an epidemic model (May Anne Mata)</p>
<b>LUNCH BREAK</b>		
2:30	5:15	<b>Work on group projects</b>
<b>15 min COFFEE BREAK</b>		
5:30	6:30	<b>Lecture 20:</b> Land-use change, ecosystem services and disease emergence (A. Dobson)
Wednesday, January 21		
9:30	11:30	<b>Lecture 21/LAB 8:</b> VECTRI model of climate-driven malaria dynamics (including lab demonstration) (A. Tompkins)
<b>30 min COFFEE BREAK</b>		
11:30	12:30	<p><b>Participants' presentations:</b></p> <p>1 - The role of weather on the relation between influenza and influenza-like illness (Sander van Noort)</p> <p>2 - The Scientific Impact of Nations: Journal Placement and Citation Performance (Matthew Michalska-Smith)</p>
<b>LUNCH BREAK</b>		
1:30	4:30	<b>Work on group projects</b>
<b>15 min COFFEE BREAK</b>		
4:45	5:45	<b>Lecture 22:</b> Multi-host, Multi pathogen systems (A. Dobson)

<b>Thursday, January 22</b>		
9:30	10:30	<b>Lecture 23:</b> Spatial spread of infectious diseases: population-based approaches II (G. Canziani)
10:30	11:00	<b>Participants' presentations:</b> 1 – What can interaction Webs tell us about special roles? (Elizabeth Sander)
<b>30 min COFFEE BREAK</b>		
11:30	12:30	<b>Work on group projects</b>
<b>LUNCH BREAK</b>		
1:30	4:30	<b>Work on group projects</b>
<b>15 min COFFEE BREAK</b>		
4:45	6:30	<b>Work on group projects</b>
<b>Friday, January 23</b>		
9:30	11:30	<b>Group Presentations</b>
<b>30 min COFFEE BREAK</b>		
12:00	1:00	<b>Group Presentations</b>
<b>LUNCH BREAK</b>		
2:30	3:30	<b>Group Presentations / Closing 'ceremony' ☹</b>