



The Abdus Salam International Centre for Theoretical Physics



Workshop on Infectious Diseases

23 January - 3 February 2012

hosted in
Arusha, Tanzania

The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, is organizing a Workshop on “*Infectious Diseases*”, to be held in *Arusha*, Tanzania from *23 January - 3 February 2012*.

SUMMARY AND PURPOSE

The theoretical problems involved in infectious disease dynamics are rapidly emerging as a deep area of intellectual enquiry. The challenges posed by the necessity to foresee the consequences of climate change and develop mitigation strategies require for example the use of mathematical tools. The problems involved are inherently non-linear, and rapidly can become complex, as witnessed by the emerging areas of Biocomplexity, Bioeconomics, and Sustainability Science. Mathematical models are required to inform control efforts, to develop predictive tools, to understand the consequences of environmental change and to extract critical parameters from empirical data. Infectious diseases essentially behave like forced nonlinear oscillators, driven by seasonal, interannual and non-stationary forces. They also involve fundamental problems related to the spatial and organizational scales of description, from the social networks underlying transmission to the strain diversity of the pathogens that allows them to evade the immune system. Capacity building in these areas will be central to the sustainable management of infectious diseases in all countries. These are problems that ultimately affect the quality of life for everyone on the planet.

PROGRAMME

The workshop will focus on mathematical models related to problems in infectious disease dynamics. The workshop will bring together applied mathematicians, disease ecologists, epidemiologists, physicists, and economists. Topics covered will include: population dynamics of infectious diseases, risk analysis, and effects of socio-environmental changes including climate, land-use, transportation, population growth, poverty and other socio-economic and sanitary issues. It will be organized as a series of background keynote lectures on specific topics and examples. These will be given by the four organizers and the guest lecturers. In addition, the participants will be encouraged to present a short talk describing their own work.

Participants will be able to acquire a close acquaintance with the newest developments in theory, models, parameter inference and data analysis, not only as listeners of the intensive lecture talks by outstanding scientists in this field, but also by active participation in computer demonstration and exercise. Specifically, group sessions will be organized in which participants from different regions and with complementary technical background will get together in small groups during the two weeks to address specific issues in conservation and natural resource management in changing environment, by using the mathematical techniques presented in the workshop and developing teamwork skills. Each group will illustrate the outcome of their work to all the attendants in oral presentations at the end of the workshop for further exchange of opinions. Some background in epidemiology, statistics, mathematics, or physics, or numerical computation is required.

PARTICIPATION

Applied mathematicians, disease ecologists, epidemiologists, physicists, and economists from all countries from Africa who are Members of the United Nations, UNESCO or IAEA may apply. The Workshop will be conducted in English therefore participants must have an adequate working knowledge.

As a rule, travel and daily subsistence expenses of participants are borne by their home institutions; limited funds are, however, available for some participants, from and working in an African country, will be selected by the Organizers. Such financial support is available only to those attending the entire activity. Every effort should be made by candidates to secure support for their travel fare (or at least part of the fare). **There is no registration fee to be paid.**

REQUEST FOR PARTICIPATION

The application form can be accessed at the activity website <http://agenda.ictp.it/smr.php?2279>. Once in the website, comprehensive instructions will guide you step-by-step, on how to fill out and submit the application form before **6 November 2011**.

ACTIVITY SECRETARIAT:

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&
MBI
(Mathematical Biosciences Institute
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DEADLINE
for requesting participation

6 November 2011