

Kenya: Dr Anotida Madzvamuse, University of Sussex, UK and Dr Richard Simwa and Dr James Nkubi Katende, School of Mathematics, University of Nairobi, Kenya

Partners in Nairobi were Dr Richard Simwa 2011, and Dr James Nkubi Katende 2012.

General description of partner department: The School of Mathematics has research activities in the areas of numerical analysis, ordinary and partial differential equations, analysis, and the mathematical modelling of biological and medical phenomena. In mathematical biology these include the mathematical modelling of malaria epidemics, elephant populations and HIV/AIDS.

In early 2011, the mentor visited the University of Nairobi for a ten-day period with the following objectives: to mentor staff and PG students; provide research textbooks and leading journals in the areas of mathematical biology; initiate co-supervision of PG students within the School of Mathematics; deliver a series of specialised lectures; join in discussions about new graduate courses.

Lectures delivered: As a result of the visit the following seminar and lectures were delivered by the mentor at the University of Nairobi and at the Kenya Wildlife Service Training Institute (KWSTI) in Naivasha:

- Colloquium: School of Mathematics, University of Nairobi, Kenya, 13th January, 2011.
- Colloquium: The Advanced Study Institute (ASI), Kenya Wildlife Service Training Institute (KWSTI), Naivasha, Kenya, 16th January, 2011.
- Special Lecture: School of Mathematics, University of Nairobi, Kenya, 18th January, 2011.

The following books which were subsequently purchased using the MARM funds:

- Infectious Diseases of Humans: Dynamics and Control (Oxford Science Publications) [Paperback] by Roy M. Anderson (Author), Robert M. May (Author)
- Epidemic Modelling: An Introduction (Cambridge Studies in Mathematical Biology) [Paperback] by D. J. Daley (Author), J. Gani (Author)
- Modeling Infectious Diseases in Humans and Animals [Hardcover] by Matt J. Keeling (Author), Pejman Rohani (Author)
- Essential Mathematical Biology [Paperback] by Nicholas F. Britton (Author)
- Mathematical Biology: I. An Introduction (Interdisciplinary Applied Mathematics) (Pt. 1) [Hardcover] by James D. Murray (Author)
- Mathematical Models in Biology (Classics in Applied Mathematics) [Paperback] by Leah Edelstein-Keshet (Author)
- An Introduction to the Mathematics of Biology [Hardcover] by Edward K. Yeaegers (Author), James V. Herod (Author), Ronald W. Shonkweiler (Author)

The mentor also recommended that the University of Nairobi Library should consider being a member of the following journals:

- Journal of Mathematical Biology, Mathematical Biosciences.
- Journal of Theoretical Biology.
- Proceedings of the National Academy of Sciences.

- Proceedings of the Royal Society B.
- Journal of the Royal Society Interface.
- PLOS computational biology.
- Bulletin for Mathematical Biology.
- SIAM Journal of Applied Mathematics.
- SIAM Journal of Dynamical Systems .
- Journal of Computational Physics.
- Journal of Computational Biology and Discrete and Continuous Dynamical Systems B.

Computers and software packages: The School of Mathematics agreed to purchase three workstations to be housed in their computing laboratory as part of its contribution towards alleviating the lack of high performing computers. These will run on Unix which will make it easier to install free numerical programming languages such as ALBERTA, MATLAB, Python, Octave, R, Scilab, etc

Conferences: Financial support was requested from the LMS to support up to two faculty from the University of Nairobi and four postgraduate students from the Masinde Muliro University of Science and Technology to assist with their attendance at the Kenyatta Conference in June 2011. The following were given modest financial assistance from the LMS to attend the conference.

- Staff: Prof Wandera Ogana, Prof Richard Simwa, Dr Jamen Were, Dr Isaac Kipchumba Kipchichir.
- Postgraduate students from the University of Nairobi: Josephine Kagundo, Amos Museti Shidiavai, Gilbert Nalisi, Jared Ongaro.
- Postgraduate students from MMUST: Mukoba Mulati, Trufosa Amunga.

The mentor proposed the introduction of a Research Journal Club (RJC) whose membership will be primarily research students and interested faculty. The RJC will meet once a term. The School of Mathematics through the RJC will organise a one-day research symposium entirely devoted to students presenting their research results or problems encountered or presenting a break-through journal of one's choice. Funding is solicited in support of hosting this one-day symposium on research.

Publications: nine articles have been published through this MARM partnership.