

Kenya: Balazs Szendroi, University of Oxford, UK, and the Department of Mathematics and Applied Statistics, Maseno University, Kenya

Contacts: Professor John Ogonji (Dean), Professor Omolo Ongati (Head of Department), Dr David Stern (Lecturer)

Maseno University is a relatively young university, situated right on the Equator not far from Lake Victoria. The Mathematics Department is one of the most active in the country, having both senior and junior members engaged in research. While the department is relatively strong in modern Applied Statistics teaching, there is an urgent need to review the undergraduate mathematics curriculum and to update the MSc degree, as well as to provide research mentoring in both pure and applied mathematics and give support to Dr Stern's small algebra research group.

The first visit of the mentor was arranged for 9-21 April 2010 to coincide with a visit by Professor David Mond (Warwick), whose trip was supported by local funds from MACKNET, the Maths And Computer science, Kenya, NETwork. The following sessions were held during the course of the visit.

- (i) Five talks by the mentor on "*Geometry with Mathematica*" to the whole department and other MACKNET members. These comprised a fast undergraduate-level course on Euclidean, spherical and hyperbolic geometry, with demonstrations in Mathematica.
- (ii) Three talks by the mentor to Dr Stern's research group on "*Partitions, quivers and DT invariants*".
- (iii) Five talks by Professor Mond on "*Aspects of teaching linear algebra*".
- (iv) Three talks by Dr Stern on "*Teaching statistics in Kenya*".
- (v) Four round-table discussions on curriculum design, research mentoring and the use of computers in teaching.

The trip concluded with visits to Masinde Muliro University (Kakamega), Strathmore University (Nairobi), and Starehe School (Nairobi).

Visit of Michael Oyengo (Maseno) to the UK and Germany July 2010. Mr Oyengo visited Oxford for a week, where there were extensive discussions on the joint research project "*Polar quivers*" and we also discussed his future academic plans. Mr Oyengo also visited Reading, as well as Augsburg and Osnabruck (Germany) on this trip.

Visit of mentor's graduate student Ben Davison in Maseno, November 2010. The visit included a pure mathematics workshop with local speakers. Mr Davison also gave a series of lectures on "*Toric geometry*" and visited Strathmore University in Nairobi.

The second visit by the mentor took place over 9-24 August 2011. The main activities were as follows.

- Further collaborative work with Dr Stern and Mr Obiero on quivers.
- A lecture to high school students from Maseno and surrounding areas in the context of the first Maseno University MathCamp
- The mentor was the main organizer of the Workshop on Pure Mathematics preceding the 1st Strathmore University International Conference in Mathematical Sciences, 15-17 August, where seven Maseno staff members took part
- The mentor was a plenary speaker at the 1st Strathmore University International Conference in Mathematical Sciences, 18-20 August; about 20 Maseno members of staff took part at this conference.

Benefits for the Maseno department were identified as follows:

1. The Strathmore Pure Mathematics Workshop and the Conference were judged to be very successful for all involved; the young Maseno researchers could present their work to their peers in Kenya, and listen to a varied programme of talks by international experts. The success of the workshop and conference inspired Strathmore to continue this series; this year there will again be a workshop, with it is hoped that the conference will become a biannual event. There are strong links between Maseno and Strathmore, and a regular series of events in Strathmore would be a great benefit to the Maseno group.
2. In particular, Mr Obiero established contacts at this meeting to the young group of algebraic geometers in Nairobi, primarily Mr Jared Ongaro and Dr Damian Maingi.
3. The collaboration involving Dr Stern and Mr Obiero is beginning to bear fruits. Dr Stern is due to visit Oxford for May 2012, supported by funds from an Oxford EPSRC Platform Grant, to push the results further. Mr Obiero has been admitted as a graduate student to Oxford to work with me on aspects of this project; funding for this is presently sought for.
4. The project supported the group around Dr Stern in various of their activities aimed at improving mathematics education and research in Kenya; alongside the Strathmore events, this included the Maseno MathCamp, and various other ongoing initiatives, where I could provide some external advice.