

## **NMMU doctoral graduate contributes to SKA project**

Kenyan-born Enoch Kirwa Rotich Kipnoo, 30, is the first NMMU Science doctoral graduate to focus his thesis on the cutting-edge Square Kilometre Array (SKA) project.

The SKA will be the world's largest and most sensitive radio telescope. It will be used by scientists to help us understand how the universe evolved and will focus on addressing questions that can only be answered using a radio telescope.

Enoch hails from Eldoret, in the western part of Kenya. "The area is well known for its rich soil, producing good crops, as well as many great athletes. It's fondly known as *the home of champions*. So if science didn't work out, I could have become an athlete," says Enoch.

His parents are uneducated farmers and practice both subsistence and commercial crop and pastoral farming.

As a boy, while out in the field grazing herds of cattle, Enoch drew inspiration for his future career from the planes flying overhead.

"I was fascinated by who the man flying the plane was and thought: I want to be that man, but soon changed my mind and decided I wanted to be the person building the plane."

His curiosity drove him to obtain good marks in Mathematics and Science with the aim of becoming an engineer. He later went on to do a BSc in Physics and Maths at Moi University in Kenya. Here, he also completed his masters in Physics majoring in Electronics.

In 2010, Enoch was introduced to NMMU's Optical Fibre Research Laboratory, and decided that it was an ideal place to complete his PhD in Physics and conduct experiments in optical communication.

In 2012, he received a scholarship funding from the National Research Foundation and SKA to complete his research.

"It's good being in this NMMU environment with world-class research facilities and surrounded by nature," says Enoch.

NMMU forms part of the signal and data transportation consortium of SKA.

Building the SKA will require the development of pioneering technology and innovation, which is where NMMU's new Centre of Broadband Communication comes in. Its researchers are seeking solutions in providing faster, cheaper, next-generation optical communication systems as well as for collecting enormous amounts of data gathered from the telescope facility.

Enoch's thesis '*Fibre Optic Network Supporting High Speed Transmission in the Square Kilometre Array, South Africa*' provides in-depth information on the high speed optical transport requirements for the Square Kilometre Array.

The main goal of his thesis was to develop and characterise a high speed optical fibre network suitable for telescope application. Its conclusion shows that he successfully designed and tested a

technology suitable for the mega project. The optical fibre transport in the SKA is an essential solution for the collection and transmission of the streaming astronomical data.

“Successful research takes patience, commitment, passion and hard work. I was fortunate I had a very good promoter and co-promoters, who were keen on my progress. I sincerely thank God for giving me the strength to do this.

“After three years, I’ve watched the birth of the SKA, I’m keen to see it reach full maturity and even more excited to see the fruits of the engineering work I was involved in.”

Enoch is currently a post-Doctoral student and works at NMMU’s Fibre Optical Research Laboratory which forms part of the Centre of Broadband Communication.

"Enoch has done excellent work for his thesis. His research findings in the area of optical fibre communication have proved invaluable in NMMU’s contribution to the SKA. Enoch is one of the very first NMMU students to be involved in the SKA project. We are all very proud of his success and share in the joy of his graduation,” says Enoch’s promoter Professor Tim Gibbon.

Enoch plans to return to Kenya to work. “The goal to change the world starts at home. I want to help develop my country either through teaching, inspiring, motivating or research,” says Enoch.