The Status of Space Science and Astrophysics Education in Uganda

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Introduction

Most developing countries have embarked on the expansion of their industrial base, modernisation of Agriculture, expansion of energy resources, exploration and exploitation of mineral resources

Skilled, dedicated and well motivated human resource is essential for such a programme to be successful

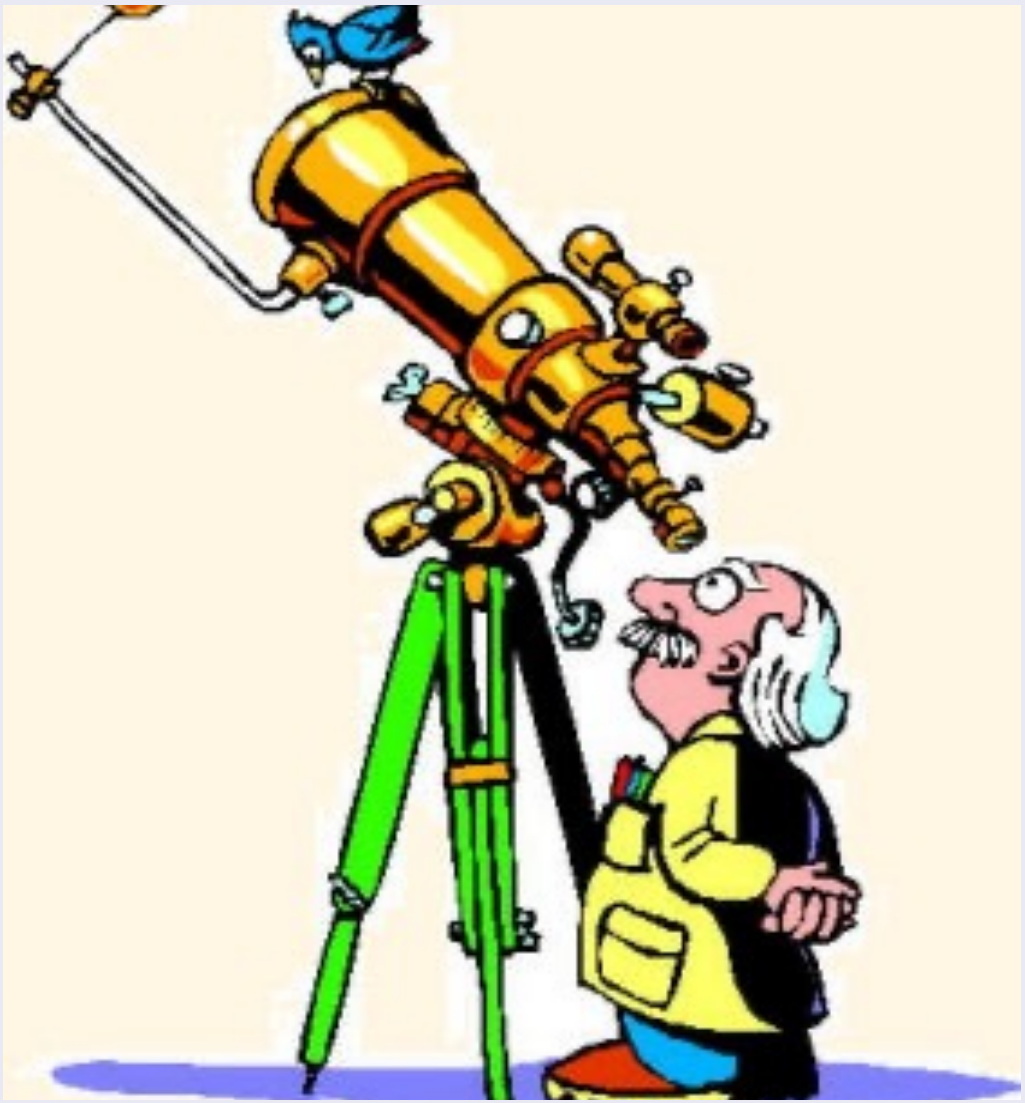
This requires development of policies to popularise and develop science and technology in order to provide the knowledge, skills, professional and technical expertise that is required

The challenge is that very few students are motivated and interested to pursue science subjects at A-level as well as science-related courses at tertiary institutions

There is therefore a need to motivate and interest students into science combinations at A-level

Introduction

Astronomy as a tool for attracting students



- Being aware of the power of astronomy in attracting students into science subjects, there was a need to introduce Astronomy
- Introduced Astronomy as a course unit in Physics in MUST in 2002 and outreach activities to schools
- These activities created awareness among students and also cultivated interest in pursuing further careers in astrophysics; as well as motivating and attracting students into sciences

Human Resource Development

There was a need to develop Astronomy and Space Physics; and the starting point s human resource development

Train students at postgraduate level (M.Sc and Ph.D) and also teaching staff taking some courses in Astrophysics and Space Physics

Introduction of Astrophysics and Space Science at Postgraduate level in 2011

Our postgraduate programmes are by coursework and research at both MSc and PhD level

With inadequate human resource at the beginning, we relied on collaboration with Universities and research institutions in Africa and Europe

Students were given "compact" lectures and training workshops which could last for 2 - 3 weeks

Human Resource Development

Students attending a workshop

- Training postgraduate students through lectures (local and visiting lecturers), workshops on research techniques, research visits and attending scientific meetings

Human Resource Development

Meeting with female Undergraduate students

- Meeting with female undergraduate student to motivate and encourage them to continue with studies at postgraduate level

Collaboration (Astrophysics)

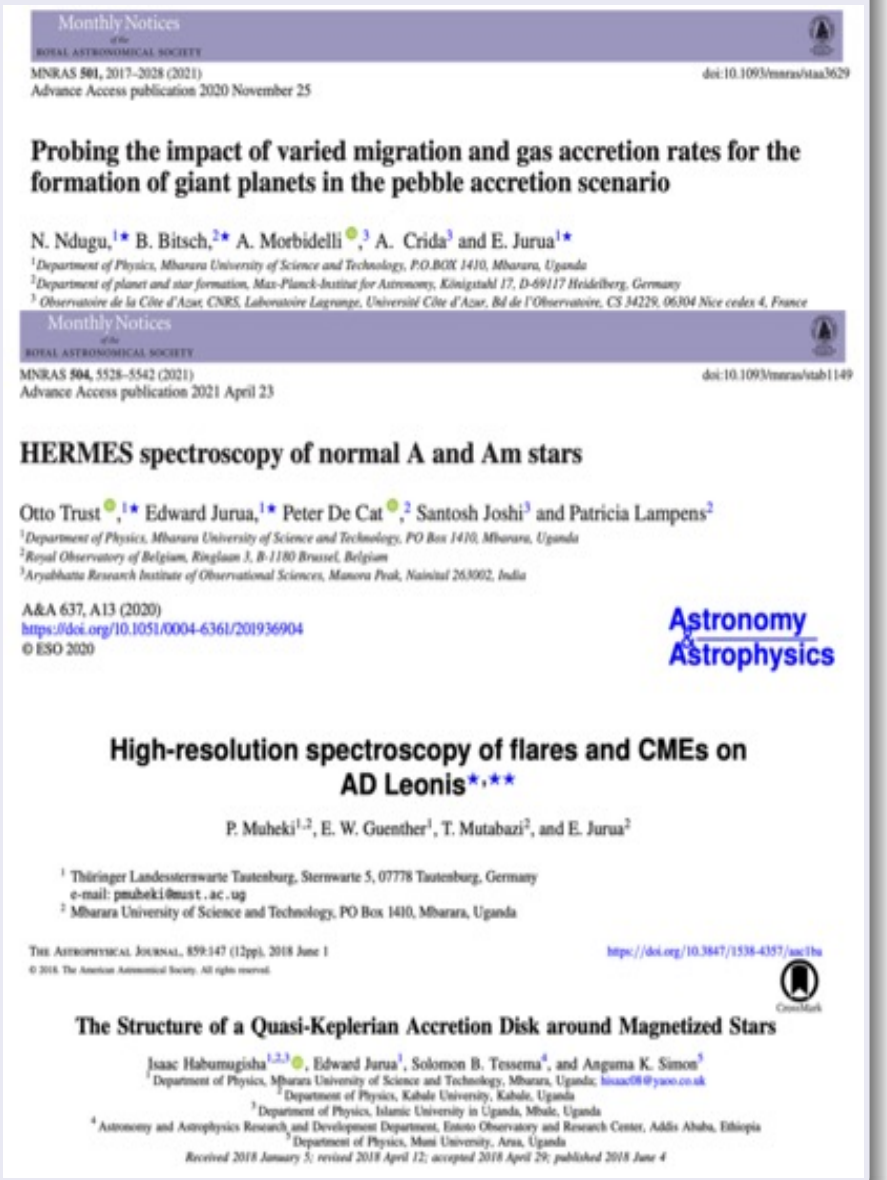
- South African Astronomical Observatory (SAAO)
  - Dr. Petri Vaisanen
  - Dr. Loius Balona
  - Dr. Mathew Schurch
- Thüringer Landessternwarte Tautenburg, Germany
  - Prof. Artie P Hatzes
  - Dr. Eike Guenther
- Royal Observatory of Belgium, Ringlaan
  - Dr. Peter De Cat,
  - Dr. Patricia Lampens
- Max-Planck-Institut for Astronomy, Heidelberg, Germany
  - Dr. Bertram Bitsch
- Observatoire de la Cote d'Azur, France
  - Prof. Alessandro. Morbidelli
- Aryabhatta Institute of Observational Sciences
  - Dr. Santosh Joshi
- Space Science and Geospatial Institute, Ethiopia.,
  - Prof. Mirjana Povic
- Now at the North West University, Mafikeng
  - Prof. Donald Kurtz
- University of Rwanda
  - Prof. Nkundabakura
  - Dr. Ntahompagaze

Collaboration (Space Physics)

- Swedish Institute of Space Physics
  - Dr. Stephan Buchert
- South African National Space Agency (SANSA)
  - Prof. Pierre J Cilliers
  - Dr. John Bosco Habarulema
- iThemba Laboratory, Cape Town, South Africa
  - Prof. Malik Maaza
  - Dr. Itani G. Madiba
- University of Rwanda
  - Dr. Uwamahoro Jean Claude
  - Prof. Uwamahoro Jean

Achievements

Selected Publications



Monthly Notices of the Royal Astronomical Society

MNRAS 501, 2017–2028 (2021) doi:10.1093/mnras/staa3629
Advance Access publication 2020 November 25

Probing the impact of varied migration and gas accretion rates for the formation of giant planets in the pebble accretion scenario

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HERMES spectroscopy of normal A and Am stars

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Astronomy & Astrophysics

High-resolution spectroscopy of flares and CMEs on AD Leonis★,★★

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The Structure of a Quasi-Keplerian Accretion Disk around Magnetized Stars

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- 12 PhDs have so far graduated (10 did their MSc with us; 2 Girls and 10 Boys)
- Overs 36 MSc students already graduated
  - over 22 from Uganda
  - over 12 from Rwanda
  - 2 from Ethiopia
- Increase in human resource
  - MUST (4 All PhD)
  - Busitema University (2 All PhD)
  - Muni University (3 All PhD)
  - Kabale University (2: 1 PhD and 1 MSc)
  - Mountains of the Moon University (2: PhD students)
  - Makerere University (1 PhD)
  - Gulu University (1 PhD)

Impact of the programme

- Introduction of some elements of Astronomy in the lower secondary school curriculum
- Development of National space programme. This started in 2011, but still in the infant stage after 12 years
- Introduction of Astrophysics and space science in some of the public Universities
- Installation of Receivers
  - Installation of SCINDA-GPS equipment at MUST
  - Scintillation and TEC Receiver (SANSA) at Busitema University
- Plan to convert Satellite dish at Mpooma into Radio telescope
- The current workshop taking place in Muni University

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- Muni University

THANK YOU VERY MUCH