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# ISWI School Report

28 Oct – 4 Nov 2010, Bahir Dar, Ethiopia

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# Topics Covered

## **1. Space physics**

**The Sun and the dynamo process**

**The solar wind, magnetosphere and ionosphere system**

**Modeling the equatorial ionosphere**

**Neutral atmospheric dynamics**

## **2. Computational space physics**

**Typical numerical methods used in space physics**

**Numerical investigations of MHD equations**

## **3. Modern data analysis and interpretation methods**

**Typical time series analysis in space physics**

**Fourier and wavelet transforms**

**Bayesian statistical inversion theory and its application in ionospheric tomography**

**Introduction to Neural networks**

## **4. Scientific instruments for space exploration**

**Basic working principle of a magnetometer and calibration issues**

**Constructing VLF receivers and calibration**

**Building GPS receivers for ionospheric studies, calibrations, bias**

**Fundamentals of ionospheric radar**

## **5. Programming in Open source**

**How to use R programming language (introduction)**

**How to use Python Programming language (introduction)**

Recommendation from students for future schools:

Computer Language: IDL, GDL, Matlab

Access to literature, lecture notes

# Lecturers

1.	Prof Mark Moldwin	Michigan University, USA	
2.	Dr. Patricia Doherty	Boston College, USA	
3.	Prof Kiyohumi. Yumoto	Kyushu University, Japan	
4.	Dr. Anthea Coster	Massachusetts Institute of Technology(USA)	
5.	Dr. Susan Skone	University of Calgary, Canada	
6.	Dr. Christian Koch	German Aerospace Center, Germany	
7.	Dr. Natchimuthuk Gopalswamy	Goddard Space Flight Center,NASA, USA	
8.	Dr.Ron Caton	Air Force Research Laboratory, USA	
<del>9.</del>	<del>Dr.Keith Groves</del>	<del>Air Force Research Laboratory, USA</del>	<del>Canceled</del>
10.	Dr.Endawoke Yizengaw	Boston College, USA	
11.	Dr.Luigi Caraolo	ITCP, Italy	
<del>12.</del>	<del>Dr.Terry Bullet</del>	<del>Colorado university, USA</del>	<del>Canceled</del>
13.	Dr.Bayile Damtie	Bahir Dar University, Ethiopia	
14.	Dr.Gizaw Mengistu	Addis Ababa University, Ethiopia	
15.	Dr. Babatunde Rabi	Federal University of Technology, NIGERIA	

# Students

- Algeria 1
- Cameroon 1
- D. Rep. of Congo 1
- Ethiopia 22
- Ivory Cost 2
- Kenya 2
- Madagascar 1
- Malawi 1
- Nigeria 4
- Rwanda 1
- South Africa 1
- Sudan 1
- Tanzania 1
- Uganda 3
- Zambia 1
- Total participants: **43**

43 Students from 15 African countries  
Attended the ISWI School in Bahir Dar.

The largest number was from the host  
Country – Ethiopia

# Post-School

- CDs of lectures given to the students
- Potential short-term training suggested
- Lectures to be put on ISWI website  
([iswi-secretariat.org](http://iswi-secretariat.org))





# Installation of VHF Receiver



# Lab Visit, Bahir Dar University





# Field Trip: Lake Tana & Monasteries



# Sponsors

- The school was hosted by the Washera Geospace and Radar Science Laboratory of Bahir Dar University, Bahir Dar Ethiopia
- Sponsored by ICTP, Boston College, Oulu University, Kyushu University, Bahir Dar University, ISWI/NASA, AFOSR, and Addis Ababa University

