



5th IAGA Summer School

Hyderabad; India

August 16 – 20, 2021

Schedule Overview (Time zone IST)

Day	Time	Topic	Lecturer
Monday, August 16	14:00-15:30	Observational Geomagnetism	David Kerridge Elijah Sao Sabbas
	17:30-19:00	Discovering the Ionosphere and Magnetosphere	
	15:45-16:45	Practicals (Jupyter-David)	David Kerridge
Tuesday, August 17	14:00-15:30	Electromagnetism	Stephan Thiel Julie Carlut
	17:30-19:00	Paleomagnetism	
	15:45-16:45	Practicals (EM-Stephan)	Stephan Thiel
Wednesday, August 18	14:00-15:30	Electromagnetism	Stephan Thiel Gurfan Beig
	17:30-19:00	Upper atmosphere	
Thursday, August 19	14:00-15:30	Data Assimilation	Alexandre Fournier

Thursday, August 19			
17:30-19:00	90min	"FAIRIES: Efects SignAlIng the ElectRodynamic CouplIng between the AtmospherE and Space"	Eliah Sao Sabbas
15:45-16:45	60min	Practicals (Jupyter-Alexandr)	Alexandre Fournier
Friday, August 20			
14:00-15:30	90min	Magnetospheric physics	Yoshizumi Miyoshi
17:30-19:00	90min	Observational Geomagnetism	David Kerridge
15:45-16:45	60min	Practicals (Jupyter-David)	David Kerridge

Lectures and lecturers

Name of Lecturer: **David Kerridge**

djk@bgs.ac.uk

Affiliation: British Geological Survey, Edinburgh; UK



Description of my topic:

Geomagnetic fields: Observations, data and indices; Geomagnetic fields: Modelling.

Guided computer-based exercises including:

Signals in magnetic observatory data from seconds to decades

Examples of spherical harmonic analysis in action including using the IGRF to trace field lines and find conjugate points

Building a 'mini-IGRF' from a Swarm data set

Estimating the core radius using geomagnetic field models

Name of Lecturer: **Eliah Sao Sabbas**

eliahfersaosabbas@gmail.com

Affiliation: National Institute for Space Research – INPE

Ministry of Science, Technology and Innovation; Brazil



Description of my topic:

Lecture 1: Discovering the Ionosphere and Magnetosphere

This lecture will be a brief overview introducing basic knowledge about the Ionosphere and the Magnetosphere. It will also quickly introduce the electrodynamic coupling between the neutral atmosphere and these two ionized regions, leading up to Lecture 2.

Lecture 2: FAIRIES: EEffects SignAlIng the ElectRodynamic CouplIng between the AtmospherE and Space

This lecture will review the current knowledge about FAIRIES. It will start with the basics about thunderstorm electrification and atmospheric electrical discharges, i.e. lightning, where everything starts. It will proceed in presenting all Transient Luminous Events (TLEs) known up to date, i.e. sprites, halos, blue jets, gigantic jets and elves, and the more recently discovered High Energy Emissions from Thunderstorms (HEETs), i.e. Terrestrial Gamma Ray Flashes (TGFs), X-ray, neutron and electron-positron pair emissions.

Name of Lecturer: **Stephan Thiel**

stephan.thiel@sa.gov.au

Affiliation: **Geological Survey of South Australia**



Description of my topic:

Introduction to electrical and EM methods

Electrical conductivity of Earth materials

Source fields for electromagnetic induction

Theoretical background of electromagnetic methods with focus on magnetotellurics

Analysing MT data: dimensionality, strike, anisotropy

Modelling of MT data: from 1D to 4D

Case studies: Tectonics and mineral exploration

Case studies: Geothermal exploration and hydraulic fracture monitoring

Name of Lecturer: **Julie Carlut**

jcarlut@yahoo.fr

Affiliation: Institut de physique du globe de Paris



Description of my topic:

Paleomagnetism: Past instabilities of the geomagnetic field

The paleomagnetic record and its uncertainties

Inversions and short events, who's who?

From the Matuyama-Brunhes boundary to the Laschamps event: paleointensities and ^{10}Be

Name of Lecturer: **Gurfan Beig**

beig@tropmet.res.in

Affiliation: Indian Institute of Tropical Meteorology
Ministry of Earth Sciences, Govt. of India;
Pashan, Pune-411008, India



Description of my topic

Prof. Gufran Beig has identified important anthropogenic climate change signal in the upper atmosphere and made reliable estimate of role of atmospheric chemistry on regional climate change.... <http://safar.tropmet.res.in/beig/>

Name of Lecturer: **Alexandre Fournier**

fournier@ipgp.fr

Affiliation : Université de Paris, Institut de physique du globe de Paris, France



Description of my topic

Title: A quick introduction to data assimilation

This lecture will cover in an informal fashion the principles of data assimilation, and the bases of its sequential and variational implementation.

It will be complemented by hands-on practicals written in the python language.

Name of Lecturer: **Yoshizumi Miyoshi**

miyoshi@isee.nagoya-u.ac.jp

Affiliation: Institute for Space-Earth Environmental Research, Nagoya University



Description of my topic:

Title: "Coupling process between solar wind and inner magnetosphere"

The subject for the lecture is a coupling process between solar wind and inner magnetosphere.

We focus on how energetic particle distributions in the inner magnetosphere depends on the solar wind parameters and solar wind structures like CMEs and CIRs. Several characteristics