

Program

“São Paulo School Advanced Science on High Energy and Plasma Astrophysics in the CTA Era (SPSAS-HighAstro)”

Date: May 21-31, 2017

Venue: São Paulo, Brazil, Universidade de São Paulo, IAG-USP

Support: FAPESP, IAG-USP

The School will contain mini-courses (**lectures**) that will cover six fundamental topics:

- Radiation processes in high energy astrophysics
- Cosmic ray acceleration
- Cosmic ray propagation
- Non-thermal radiation magneto-hydrodynamics (RMHD) in gamma-ray sources (supernova remnants, pulsar winds, black holes, and jets)
- Imaging Gamma-Ray emission with cherenkov telescopes
- Gamma-ray data analysis with cherenkov telescopes

In addition to the lectures above, the School will include **key-talks** to complement the fundamental topics discussed in the lectures, and **invited-talks** that will focus on the CTA project as well as other aspects of high-energy astrophysics and multi-messengers from the Universe. There will be also **hands-on** activities during the afternoon sessions for training the students with theoretical exercises, simulations of detection and treatment of gamma-ray data using the tools employed in the FERMI and CTA collaborations, as well as numerical simulations of MHD processes in high-energy astrophysical sources. The School will also include **poster sessions** with the presentation of the works of the students. Finally, there will be **technical visits** on Saturday to the laboratories LNLS (Brazilian Synchrotron Light Laboratory) and INPE (National Institute of Space Research).

The program is as follows:

Opening:

Elisabete M. de Gouveia Dal Pino (Chair of the SPSAS-HighAstro) and Laerte Sodre (Director of IAG-USP)

Lectures:

- *Lecture I: Non-thermal radiation magneto-hydrodynamics (MHD) in gamma-ray sources (supernova remnants, pulsar winds, black holes, and jets): Sasha Tchekhovskoy (University of California, Berkeley, USA)*
- *Lecture II: Cosmic ray propagation: Vladimir Ptuskin (Russian Academy of Sciences, Russia)*
- *Lecture III: Very High Energy Gamma-Ray Emission From Celestial Objects measured with Imaging Air Cherenkov Telescopes: Razmik Mirzoyan (Max Planck Institute for Physics – Munich, Germany)*
- *Lecture IV: Gamma-Ray data analysis with Cherenkov Telescopes: Gernot Maier (DESY Zeuthen, Germany)*
- *Lecturer V: Radiation processes in high energy astrophysics: Roberto Aloisio (GSSI, Italy)*
- *Lecturer VI: Cosmic ray acceleration: Pasquale Blasi (Arcetri Astrophysical Observatory, Italy)*

Key Talks:

- *Key Talk 1: Space versus Ground Based Gamma-Ray Astronomy with FERMI and CTA: Julie McEnery (FERMI/LAT – NASA, USA)*
- *Key Talk 2: Unveiling the Gamma-Ray Universe with the CTA: the Key Science Program: Stefano Vercellone (IASF Palermo Observatory, Italy)*
- *Key Talk 3: Particle Diffusion in Turbulent Media: Huirong Yan (DESY Zeuthen, University of Potsdam, Germany)*
- *Key Talk 4: Particle Acceleration by Magnetic Reconnection: Elisabete M. de Gouveia Dal Pino (IAG-USP, Brazil)*

Invited talks:

- *Invited Talk 1: ASTRI Mini-Array – a CTA Precursor: Giovanni Pareschi (Osservatorio Astronomico di Brera, Italy)*
- *Invited Talk 2: FAPESP: Science in Sao Paulo and Brazil - Carlos Brito Cruz (Scientific Director of FAPESP, Brazil)*
- *Invited Talk 3: Brazilian Participation in the CTA: Vitor de Souza (IFSC-USP, Brazil)*
- *Invited Talk 4: Active Galactic Nuclei seen with Gamma-Rays: Ulisses Barres de Almeida (CBPF, Brazil)*
- *Invited Talk 5: The different ways of searching for Dark Matter: Fabio Iocco (ICTP-SAIFR, Brazil)*
- *Invited Talk 6: High Energy Messengers of the Non-thermal Universe – from X- and gamma-rays to gravitational waves:- Ricardo Sturani (IIP-UFRN, Brazil)*
- *Invited Talk 7: AUGER Project: Ronald Shellard (CBPF, Brazil)*

Hands-on Activities:

- *Hands-on I: Alexander Tchekhovskoy (Uni. Berkeley, USA)*
- *Hands-on II: Ulisses Barres de Almeida (CBPF, Brazil)*
- *Hands-on III: Rodrigo Nemmen (IAG-USP, Brazil)*
- *Hands-on IV Rodrigo Nemmen (IAG-USP, Brazil)*
- *Hands-on V: Ulisses Barres de Almeida, Elisabete M. de Gouveia Dal Pino, Grzegorz Kowal, Rodrigo Nemmen*
- *Hands-on VI: Grzegorz Kowal (EACH-USP & UnicSul, Brazil)*

Monitors: *Paramita Barai, Luis Kadowaki, Pankaj Kushwaha, Chandra Singh (IAG-USP, Brazil)*

Preliminary Time Table

Sunday, Day 1

Arrival

Monday, Day 2

8:00 Registration

	Monday Day 22	Tuesday Day 23	Wednesday Day 24	Thursday Day 25	Friday Day 26	Saturday Day 27	Sunday Day 28	Monday Day 29	Tuesday Day 30	Wednesday Day 31		
09:00-9:30	Opening	Lecture II	Lecture I	Lecture IV	Lecture IV	Visits to LNLS & INPE (all day)	FREE DAY	Lecture V	Lecture V			
09:30-10:30	Invited Talk 1											
10:30-11:00	Coffee-break	Coffee-break	Coffee-break	Coffee-break	Coffee-break					Coffee-break	Coffee-break	Coffee-break
11:00-12:30	Lecture I	Lecture III	Lecture II	Key Talk 1	Key Talk 2					Lecture VI	Lecture VI	Invited Talk 7
												Closure
12:30-14:30	Lunch	Lunch	Lunch	Lunch	Lunch					Lunch	Lunch	Lunch
14:30-16:00	Invited Talk 2	Lecture I	Lecture III	Key Talk 3	Poster Session					Invited Talk 4	Key Talk 4	Departure
	Invited Talk 3							Invited Talk 5				
16:00-16:30	Coffee-break	Coffee-break	Coffee-break	Coffee-break	Coffee-break					Coffee-break	Coffee-break	
16:30-18:30	Poster Session	Hands-on activity I	Hands-on activity II	Hands-on activity III	Hands on activity IV					Hands-on activity V	Hands-on activity VI	
18:30-21:30	Welcome Cocktail			Pizza Dinner					Brazilian Dinner			

