

# 15th IDPASC Summer School



**Monday, July 20, 2026 - Wednesday, July 29, 2026**

**Natal - RN**

## **Program**

The 15th IDPASC Summer School offers a carefully curated program designed to provide participants with a comprehensive understanding of cutting-edge topics in Particle Physics, Astrophysics, and Cosmology (PASC).

## 20 July

### Registration

### Welcome to the IDPASC School

Bertrand Laforge, Nuno Castro, and Mario Pimenta

### Student Pitch Talks (5 minutes)

25 std X 5 minutes  
All Students

### Discussion on Pitch Talks & Group Photo

All Students + Lecturers

### Welcome Cocktail (Ponta Negra)

First round is on us.

## 21 July

### Statistical Tools I - Uncertainties & Likelihoods

Lecturer:  
Martin Makler (CBPF)

### Python for Physics - Basics & Data Handling

Lecturer:  
Edmar Purcino (UFBA)

### Statistical Tools II - Model Fitting & Significance

Lecturers:  
Martin Makler (CBPF)

### Hands-On: Python + ROOT for Data Analysis

Lecturers:  
Edmar Purcino (UFBA) + Tutors

## 22 July

## **Particle Physics I - The Standard Model**

Lecturer:  
Oscar Éboli (IF, USP)

## **Astroparticle Physics I - Cosmic Rays & Neutrino Telescopes**

Lecturer:  
Arman Esmaili (PUC, RJ)

## **Particle Physics II - Beyond the Standard Model**

Lecturer:  
Oscar Éboli (IF, USP)

## **Astroparticle Physics II - Experimental Projects**

Lecturer:  
Arman Esmaili (PUC, RJ)

## **Dinner**

## **Challenges in Particles and Astroparticles Physics**

Public Panel with the Invited Lecturers

# **23 July**

## **Neutrino Physics - Oscillations & Mass Hierarchy**

Lecturer:  
Renata Zukanovich Funchal (IF, USP)

## **Machine Learning I - Fundamentals & Applications in HEP**

Lecturer:  
Edmar Purcino (UFBA)

## **Hands-On - Intro to Machine Learning for Physics Data**

Lecturers:  
Edmar Purcino (UFBA) + Tutors

# **24 July**

## **Particle Physics III - Collider Physics & Experimental Signatures**

Lecturer:  
Oscar Éboli (IF, USP)

## **Dark Matter II: Direct and Indirect Searches**

Lecturer:  
Carlos Yaguna (UPTC, Tunja)

## **Neutrino Physics: Recent Measurements and Perspectives**

Lecturer:  
Renata Zukanovich Funchal (IF, USP)

## **Hands-On Group Project Launch: Group Data Challenge**

Tutors

# **25 July**

## **Excursions**

Excursions

## **Closed Session: Meeting of the IDPASC Executive Committee**

Executive Board meetings:  
Annual Scientific Committee and Academic Council of the IDPASC network.

# **26 July**

Beach day

# **27 July**

## **Heavy-Ion Collisions: QGP & Extreme Conditions**

Lecturer:  
César Bernardes (SPRACE, NCC)

## **Experimental Techniques I: Detectors and Instrumentation**

Lecturer:  
Ana Amélia Machado (Unicamp)

## **Experimental Techniques II: Trigger, DAQ & Analysis Chains**

Lecturer:  
Thiago Tomei (SPRACE, NCC)

## **Hands-On Session: Accelerator Physics (Simulation Lab)**

Lecturers:  
Gabriela Hoff & Tutors

## 28 July

### **Cosmology - The Early Universe**

Lecturer:  
Raul Abramo (IF, USP)

### **Astrophysics I - Stellar Evolution & Compact Objects**

Lecturer:  
Riccardo Sturani (IFT, Unesp)

### **Astrophysics II: Cosmological Observables & Surveys**

Lecturer:  
Raul Abramo (IF, USP)

### **Working Session: Group Project**

All Lecturers & Tutors

## 29 July

### **Gravitational Waves - Observations & Implications**

Lecturer:  
Riccardo Sturani (IFT, UNESP)

### **Examination & Discussion**

All

### **Group Project Presentations**

Students Groups

### **Round Table - Future of PASC Research & Career Paths**

All lecturers