



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

DEPARTMENT
OF PHYSICS AND ASTRONOMY
"AUGUSTO RIGHI"

7th Physical Sensing and Processing Summer School

REGISTRATION
DEADLINE
June 30th

PHYSICS

FOR A BETTER PLANET

2nd edition

In English
Up to 50 participants
No participation fee
Lunch and
coffee breaks provided

**07/11
JULY
2025**

**ACCELERATORS
AI
BIOINFORMATICS
CLIMATE
GEOPHYSICS
HEALTH
MATERIALS
SOCIETY**

ORGANIZATION COMMITTEE:

Daniel Remondini, Nico Curti, Claudia Testa,
Luca Pasquini, Filippo Zaniboni, Cristian Vignali

INVITED SPEAKERS:

Irene Farabella, Istituto Italiano di Tecnologia – Genova
Fabio Monforti, Joint Research Centre – European Commission
James Grist, Oxford University – Oxford
Donato Vincenzi, University of Ferrara – Ferrara
Stefano Bastianini, Department of Biomedical and Neuromotor Sciences – Bologna
Antonio Buonerba, University of Salerno
Roberto Piacentini, University of Sacro Cuore
Camilla Marella, Fisica Medica - Arcispedale S. Maria Nuova

Info: difa.pspschool@unibo.it
VIA IRNERIO 46
40126 BOLOGNA (ITALY)





Physics for a Better Planet – II Edition

DIFA Summer School on Physical Sensing and Processing – VII edition

July 7 – 11, 2025

ALMA MATER STUDIORUM · University of Bologna

Day 1 – July 7, 2025

Aula Magna, via Irnerio, 46, 40126 Bologna BO

13.00 – 14.00 **Registration**

14.00 – 14.45 **Welcome and Introduction**

- Welcome to the 7th edition of the DIFA Summer School and Introduction about the topics discussed during the event

Prof. Daniel Remondini – Department of Physics and Astronomy (Bologna)

14.45 – 16.00 **Bioinformatics**

- Decoding Genome Folding: Chromatin Tracing and 3D Modelling Approaches

Prof.ssa Irene Farabella – Istituto Italiano di Tecnologia (IIT Genova)

16.00 – 16.30 **Coffee Break**

The coffee break includes refreshments served outside the BP-2B classroom

16.30 – 17.45 **Biophysics**

- Lithiated gold nanoparticles as promising therapy for Alzheimer's disease

Prof. Antonio Buonerba – Università degli Studi di Salerno (UNISA)

Prof. Roberto Piacentini – Università Cattolica del Sacro Cuore (UNICATT)



Physics for a Better Planet – II Edition

DIFA Summer School on Physical Sensing and Processing – VII edition

Day 2 – July 8, 2025

Aula BP-2B, viale Berti Pichat, 6/2, 40127 Bologna BO

8.30 – 9.00	Registration
9.00 – 10.15	Metagenomics <ul style="list-style-type: none">• Exploring the DNA Micro-World: Data Science Tools for Public Health <i>Dr. Alessandro Fuschi – Department of Physics and Astronomy, University of Bologna</i>
10.15 – 10.30	Coffee Break <p>The coffee break includes refreshments served outside the BP-2B classroom</p>
10.30 – 11.45	Signal Processing <ul style="list-style-type: none">• PRISM: Physiological Regulation In Sleeping Mice <i>Prof. Stefano Bastianini – Department of Biomedical and Neuromotor Sciences, University of Bologna</i>
11.45 – 13.00	Medical Image Analysis <ul style="list-style-type: none">• From Physics to Medical Image Segmentation: Is what we're doing random? <i>Dr. Riccardo Biondi – IRCCS - Istituto delle Scienze Neurologiche di Bologna</i>
13.00 – 14.00	Lunch Break <p>Lunch is at the participants' expense</p>
14.00 – 16.00	Metagenomics <ul style="list-style-type: none">• Data Science for genomics: protein language models and virus evolution <i>Dr. Francesco Durazzi – Department of Physics and Astronomy, University of Bologna</i>
16.00 – 16.30	Coffee Break <p>The coffee break includes refreshments served outside the BP-2B classroom</p>
16.30 – 18.30	Computational Challenge <ul style="list-style-type: none">• LLM – Large LUNGage Model <i>Dr. Tommaso Giacometti & Dr. Niccolò Barbieri – Department of Physics and Astronomy, University of Bologna</i>



Day 3 – July 9, 2025

Aula BP-2B, viale Berti Pichat, 6/2, 40127 Bologna BO

9.00 – 10.15	Geophysics
	<ul style="list-style-type: none">• Instrumental Monitoring for Natural Hazards: Landslides and Tsunamis <p><i>Dr. Cesare Angeli and Dr.ssa Martina Zanetti – Department of Physics and Astronomy, University of Bologna</i></p>
10.15 – 10.30	Coffee Break
	The coffee break includes refreshments served outside the BP-2B classroom
10.30 – 11.45	Geophysics
	<ul style="list-style-type: none">• Exploring the subsurface (without a shovel...): seismic refraction <p><i>Prof. Filippo Zaniboni – Department of Physics and Astronomy, University of Bologna</i></p>
11.45 – 13.00	Neuroscience
	<ul style="list-style-type: none">• Exploring advanced functional imaging <p><i>Prof. James Grist – Department of Physiology, Anatomy & Genetics, University of Oxford</i></p>
13.00 – 14.00	Lunch Break
	Lunch is at the participants' expense
<hr/>	
14.00 – 16.00	Geophysics
	<ul style="list-style-type: none">• Exploring the subsurface (with hammer...): seismic refraction <p><i>Prof. Filippo Zaniboni – Department of Physics and Astronomy, University of Bologna</i></p>
16.00 – 16.30	Coffee Break
	The coffee break includes refreshments served outside the BP-2B classroom
16.30 – 18.30	Medical Image Analysis
	<ul style="list-style-type: none">• MS lesions segmentation: a deep dive into tools, networks and sequences <p><i>Dr. Mattia Ricchi – Department of Informatics, University of Pisa</i></p>



Physics for a Better Planet – II Edition

DIFA Summer School on Physical Sensing and Processing – VII edition

Day 4 – July 10, 2025

Aula BP-2B, viale Berti Pichat, 6/2, 40127 Bologna BO

9.00 – 10.15

Medical Physics

- Physics applied to Medicine for Digital Pathology

Dr.ssa Camilla Marella – Medical Physics Unit, Azienda Unità Sanitaria Locale-IRCCS di Reggio Emilia, Reggio Emilia

10.15 – 10.30

Coffee Break

The coffee break includes refreshments served outside the BP-2B classroom

10.30 – 11.45

Material Physics

- Photoelectrochemical production of solar fuels by semiconductor photoelectrodes

Dr. Raffaello Mazzaro – Department of Physics and Astronomy, University of Bologna

11.45 – 13.00

Material Physics

- Physical characterization of novel perovskite detectors

Dr. Andrea Civatti – Department of Physics and Astronomy, University of Bologna

13.00 – 14.00

Lunch Break

Lunch is at the participants' expense

14.00 – 16.00

Material Physics

- Semiconductor photoelectrodes: fabrication and optoelectronic characterization

Dr. Raffaello Mazzaro – Department of Physics and Astronomy, University of Bologna

16.00 – 16.30

Coffee Break

The coffee break includes refreshments served outside the BP-2B classroom

16.30 – 18.30

Material Physics

- Mobility extraction by time-of-flight technique

Dr.ssa Laura Basiricò – Department of Physics and Astronomy, University of Bologna



Physics for a Better Planet – II Edition

DIFA Summer School on Physical Sensing and Processing – VII edition

Day 5 – July 11, 2025

Aula Magna, via Irnerio, 46, 40126 Bologna BO

9.00 – 10.15

General Science

- From Science to Policy. Some experiences from the European Commission's Joint Research Centre

Prof. Fabio Monforti – Joint Research Centre (European Commission)

10.15 – 10.30

Coffee Break

The coffee break includes refreshments served outside the BP-2B classroom

10.30 – 11.45

Material Physics

- Luminescent Downshifting (LDS) layers in photovoltaics

Prof. Donato Vincenzi – Dipartimento di Fisica e Scienze della Terra (Ferrara)

11.45 – 13.00

Closing Section and Summary

- Closing section of the 7th edition of the DIFA Summer School

Prof. Daniel Remondini – Department of Physics and Astronomy, University of Bologna

13.0 – 13.30

Acknowledgement

Acknowledgement and greetings