



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

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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 7<sup>th</sup> 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	<b>Metagenomics</b> <ul style="list-style-type: none"><li>• Exploring the DNA Micro-World: Data Science Tools for Public Health</li></ul> <i>Dr. Alessandro Fuschi – Department of Physics and Astronomy, University of Bologna</i>
10.15 – 10.30	<b>Coffee Break</b> <p>The coffee break includes refreshments served outside the BP-2B classroom</p>
10.30 – 11.45	<b>Signal Processing</b> <ul style="list-style-type: none"><li>• PRISM: Physiological Regulation In Sleeping Mice</li></ul> <i>Prof. Stefano Bastianini – Department of Biomedical and Neuromotor Sciences, University of Bologna</i>
11.45 – 13.00	<b>Medical Image Analysis</b> <ul style="list-style-type: none"><li>• From Physics to Medical Image Segmentation: Is what we're doing random?</li></ul> <i>Dr. Riccardo Biondi – IRCCS - Istituto delle Scienze Neurologiche di Bologna</i>
13.00 – 14.00	<b>Lunch Break</b> <p>Lunch is served in classroom BP-2A on the same floor of the classroom</p>
14.00 – 16.00	<b>Metagenomics</b> <ul style="list-style-type: none"><li>• Data Science for genomics: protein language models and virus evolution</li></ul> <i>Dr. Francesco Durazzi – Department of Physics and Astronomy, University of Bologna</i>
16.00 – 16.30	<b>Coffee Break</b> <p>The coffee break includes refreshments served outside the BP-2B classroom</p>
16.30 – 18.30	<b>Computational Challenge</b> <ul style="list-style-type: none"><li>• A Not So Easy Ising Challenge</li></ul> <i>Dr. Stefano Polizzi – 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

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

<b>9.00 – 10.15</b>	<b>Medical Physics</b> <ul style="list-style-type: none"><li>• Physics applied to Medicine for Digital Pathology</li></ul> <p><i>Dr.ssa Camilla Marella – Medical Physics Unit, Azienda Unità Sanitaria Locale-IRCCS di Reggio Emilia, Reggio Emilia</i></p>
<b>10.15 – 10.30</b>	<b>Coffee Break</b> <p>The coffee break includes refreshments served outside the BP-2B classroom</p>
<b>10.30 – 11.45</b>	<b>Material Physics</b> <ul style="list-style-type: none"><li>• Photoelectrochemical production of solar fuels by semiconductor photoelectrodes</li></ul> <p><i>Dr. Raffaello Mazzaro – Department of Physics and Astronomy, University of Bologna</i></p>
<b>11.45 – 13.00</b>	<b>Material Physics</b> <ul style="list-style-type: none"><li>• Physical characterization of novel perovskite detectors</li></ul> <p><i>Dr. Andrea Civatti – Department of Physics and Astronomy, University of Bologna</i></p>
<b>13.00 – 14.00</b>	<b>Lunch Break</b> <p>Lunch is served in classroom BP-2A on the same floor of the classroom</p>
<b>14.00 – 16.00</b>	<b>Material Physics</b> <ul style="list-style-type: none"><li>• Semiconductor photoelectrodes: fabrication and optoelectronic characterization</li></ul> <p><i>Dr. Raffaello Mazzaro – Department of Physics and Astronomy, University of Bologna</i></p>
<b>16.00 – 16.30</b>	<b>Coffee Break</b> <p>The coffee break includes refreshments served outside the BP-2B classroom</p>
<b>16.30 – 18.30</b>	<b>Material Physics</b> <ul style="list-style-type: none"><li>• Mobility extraction by time-of-flight technique</li></ul> <p><i>Dr.ssa Laura Basiricò – Department of Physics and Astronomy, University of Bologna</i></p>



## 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 7<sup>th</sup> 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