

Discover the Physics Behind Our Planet

Why choose this program?

Because it's **unique in Italy** - the only Master's that lets you explore the entire Earth system *through the lens of physics*:

- Earth's interior
- Oceans
- Atmosphere
- Cryosphere
- Their complex interactions

What will you learn?

You'll gain **solid theoretical foundations** and advanced tools to understand natural phenomena such as:

- How earthquakes originate
- How magma rises through the crust
- How weather forms
- How oceans and atmosphere move

With courses in:

- Continuum and fracture mechanics
- Fluid dynamics
- Radiation-matter interaction
- Numerical modeling
- Time-series and big-data analysis

Your future career

A Master's in *Physics of the Earth System* opens doors to:

- **PhD programs** in Italy and abroad
- **Research institutions** (INGV, CNR, ARPAE...)
- **Environmental monitoring and risk assessment**
- **Natural resource management**
- **Industry and tech sectors** needing strong quantitative skills
- **Insurance and reinsurance** for natural-risk modelling

Hands-on experience

Field and laboratory courses give you practical skills - for example, **subsurface imaging** used in geophysics and even archaeology.

Credits: img 1 NASA e img 2
NASA/Goddard Space Flight Center
Scientific Visualization Studio;
img 3 D. Evans, T. Becker e B. Eglington.
Graphic design: Angela Graci



PoE

SECOND CYCLE DEGREE/
TWO YEAR MASTER IN

PHYSICS OF THE EARTH'S INTERIOR, OCEAN AND ATMOSPHERE

LM 17 - PHYSICS

Department of Physics and Astronomy - DIFA

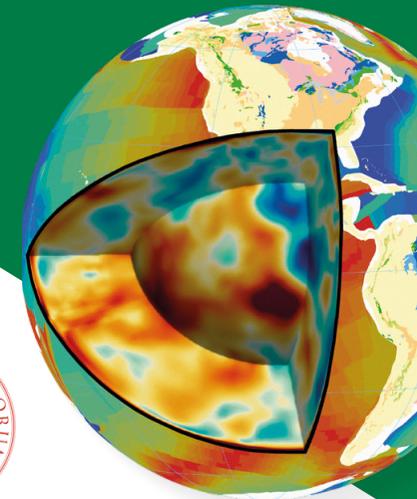
Get in touch

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Discover
the course



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
DIPARTIMENTO DI FISICA E ASTRONOMIA
"AUGUSTO RIGHI"

Choose Your Future Path

In the first year you can choose among **three learning paths**:

A. Meteorology and Physics of the Atmosphere:

- Atmospheric Chemistry
- Atmospheric Physics and Meteorology
- Atmospheric Radiation: Theory and Modelling
- Climatology
- Complex Terrain Meteorology
- Data Assimilation for Dynamical Systems
- Dynamic Meteorology
- Earth Observation for Climate Science
- Laboratory of Atmospheric Measurements and Observations
- Microphysical Processes
- Planetary Boundary Layer and Turbulent Dispersion

B. Physics of the Solid Earth and Environmental Geophysics:

- Earth System Interactions
- Foundations of Geophysics 1: Solids
- Foundations of Geophysics 2: Fluids
- Geophysical Geodesy
- Inversion of Geophysical Data
- Laboratory of Geophysics
- Laboratory of Seismology
- Laboratory of Numerical Geophysics
- Seismology
- Physics of Volcanism
- Tectonophysics
- Time Series Analysis and Signal Processing

C. Physics of the Earth System:

- Atmospheric Physics and Meteorology
- Climatology
- Coastal Oceanography
- Dynamic Meteorology
- Earth System Interactions
- Foundations of Geophysics 1: Solids
- Foundations of Geophysics 2: Fluids
- Data Assimilation for Dynamical Systems
- Geophysical Geodesy
- Numerical Laboratory of the Ocean and the Atmosphere
- Physical Oceanography
- Physics of Volcanism

STATEMENT OF LEARNING CURRICULUM CONFORMITY

to the World Meteorological Organization (WMO)

You can get this if you graduate in PoE and if you passed the appropriate courses.

By enrolling in **Physics of the Earth's Interior, Ocean, and Atmosphere**, you can train to become a *seismologist*, a *volcano physicist*, a *physicist of the atmosphere* or a *meteorologist*.

The field trip
Water, Air and Fire



Admission

Submit your application online by the prescribed deadlines (see the **official call for applications**).

Needed documents:

- CV
- Transcript of records of your qualification with exams taken
- Copy of a valid identity document
- Proof of (at least) B2 level of knowledge of the English language

Students possessing a first-cycle degree in the class L-30 (Fisica, Astronomia) are admitted automatically.

A Committee will assess the suitability of the application of students from different backgrounds, based on curricular content. In particular, candidates are required to have passed exams allowing them to gain university-level knowledge of basic mathematics, physics and geophysics.

For your thesis, you can gain real-world experience with an **internship** at one of our partner institutions or companies.

“In the chain of causes and effects, no single fact can be considered in isolation; every phenomenon is linked to many others, and through this network of connections, the great system of Nature is revealed.”

— Alexander von Humboldt, *Cosmos*, 1845

“Everything should be made as simple as possible, but not simpler.”

— Albert Einstein