



# Origines

**amU** Institut origines,  
des planètes à la vie  
Aix Marseille Université



*Forming a community*

*Training through and for research*

*Connecting disciplines*

*Strengthening partnerships*

*Acting internationally*

# Origines

## Address the major scientific questions related to the formation of planets and emergence of life

The Origines Institute brings together astrophysicists, chemists, physicists, biologists, geologists, geophysicists, philosophers and epistemologists. It aims to form an interdisciplinary community to address major scientific questions linked to the origin of life, its presence and the possibilities for detecting such life in our galaxy; bring together expertise in different but complementary fields to make progress on aspects relating to the origin of our solar system, the evolution of matter within it, and how this evolution may have played a role in the emergence of life on Earth.

### Forming a community

**20**  
research  
units

**5**  
faculties

**6**  
doctoral  
schools

more  
than  
**200**  
staff

more  
than  
**500**  
students  
(master's and  
doctoral)

### Primordial matter

### Astrochemistry

### Astrobiology

### Concepts and definitions of life

### Habitability

### Exoplanets

### Training through and for research

- ▶ Funding of theses and doctoral modules in astrobiology
- ▶ Teaching platform (TRIPs recipient) accessible from bachelor's to master's level and optional teaching units in astrobiology
- ▶ Astrobiology summer school, seminars and workshops

### Acting internationally

- ▶ Membership of the European Astrobiology Institute
- ▶ Organisation of international workshops
- ▶ Collaboration with foreign universities

### Connecting disciplines

Physics

Chemistry

Biology

Philosophy

Geology

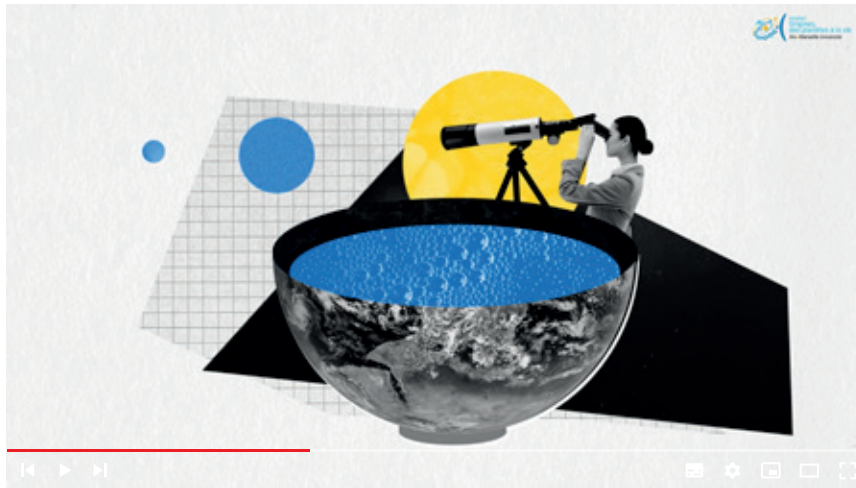
Shared  
facilities

Incentive calls  
for projects

Interdisciplinary  
teaching

### Strengthening partnerships

- ▶ CNRS national thematic institutes
- ▶ Institutional partners: CNES, ONERA...
- ▶ Industrial partners: Airbus Defense and Space, Adefy, Thales, Tekna, Analytical Mechanics Associates (AMA), Unistellar...



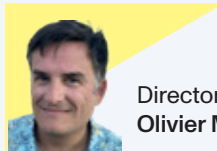
Watch the institute's animated film



## Meet our executive office



Deputy research director:  
**Magali Deleuil**



Director:  
**Olivier Mouis**



Deputy training director:  
**Isabelle Couturier**



Deputy director,  
Technical Platforms:  
**Sébastien Santini**



Project manager:  
**Jean-Charles Ize**



Deputy director, Socio-  
economic world relations:  
**Pascal Taranto**

Discover the entire governance team:  
<http://url.univ-amu.fr/institut-origines-gouvernance>

## Focus on

### Exomiologie project

The Exomiologie project, initiated within the Origines institute, researches into the origin of small primitive bodies in the solar system, the role of the impact of these bodies in shaping prebiotic environments on the primitive Earth and the consequences and products of impacts on planetary surfaces. All this without neglecting the societal, historical and philosophical viewpoints on catastrophic events linked to the origin of life on Earth. Here we bring together laboratories that approach these themes from complementary angles, such as celestial dynamics, biochemistry and data processing. The societal implications of an extraterrestrial origin of life on Earth via impacts are also studied.

## Contact

Director: **Olivier Mouis**  
Project manager: **Jean-Charles Ize**

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[www.univ-amu.fr/origines](http://www.univ-amu.fr/origines)



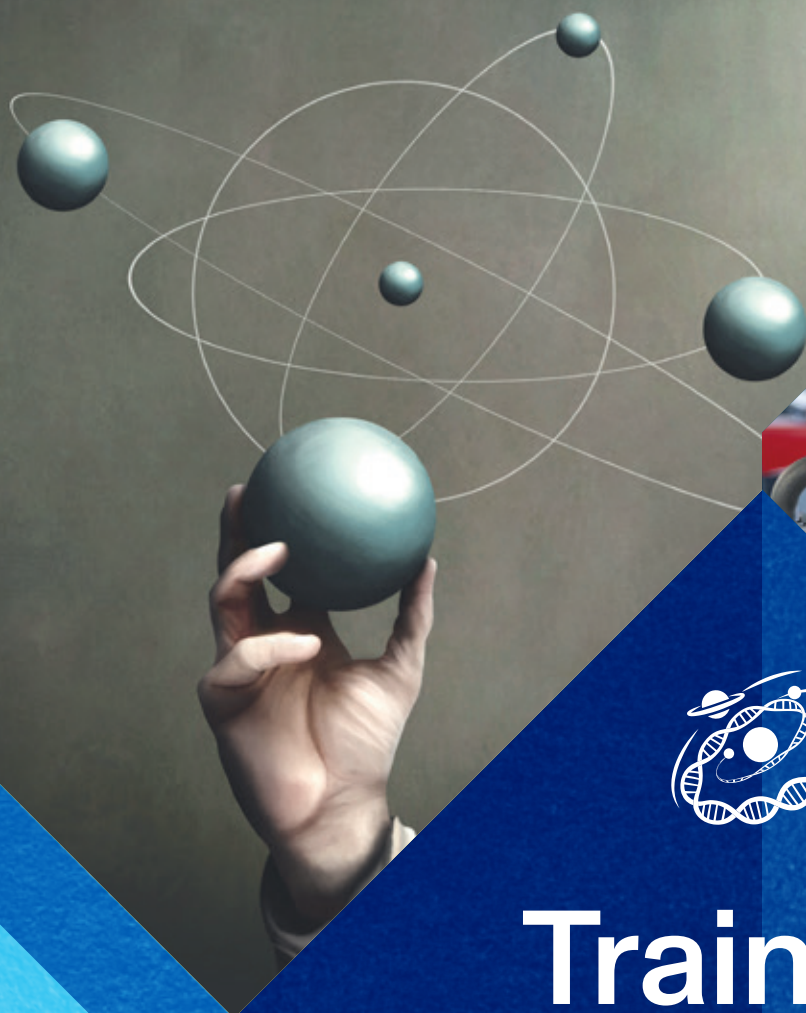
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Origines Institute



[institut.origines.amu](https://www.instagram.com/institut.origines.amu)



# Training at Origines

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Aix Marseille Université

*Training for, through and in research,  
with continuity from master's to doctorate level*

*Training for, through and in research,  
with continuity from master's to doctorate level*

## Our ecosystem

more than  
**500**  
master's students<sup>1</sup>

more than  
**20**  
PhD students<sup>2</sup>

**5**  
partner  
faculties

- ▶ Pythéas Institute - Observatory for the sciences of the universe (OSU Pythéas)
- ▶ Faculty of sciences
- ▶ Faculty of arts, letters, languages and humanities (ALLSH)
- ▶ Politech Marseille
- ▶ Faculty of law and political science (FDSP)

**6**  
partner  
doctoral  
schools

- ▶ Life and health sciences (ED 62)
- ▶ Chemical sciences (ED 250)
- ▶ Environmental sciences (ED 251)
- ▶ Physics and science of matter (ED 352)
- ▶ Spaces, cultures, societies (ED 355)
- ▶ Cognition, language and education (ED 356)

<sup>1</sup> students enrolled on master's specialisations attached to the institute  
<sup>2</sup> doctoral students enrolled in our partner doctoral schools

**8**

key master's

- ▶ Earth and Planetary Sciences, Environment
- ▶ Biodiversity, ecology and evolution
- ▶ Marine science
- ▶ Bio-geoscience
- ▶ Microbiology
- ▶ Philosophy
- ▶ Chemistry
- ▶ Physics

**1**

interdisciplinary  
doctoral  
programme

9 modules  
6 laboratories

Consult our full range  
of training courses:



## Our key actions

- ▶ Funding for theses and postdoctorates
- ▶ Astrobiology doctoral programme
- ▶ One summer school a year
- ▶ 5-month immersion internships in a research environment
- ▶ An instrumental and technological platform accessible from bachelor's to master's degrees
- ▶ Optional teaching units in astrobiology
- ▶ One Origines award per year

2021-2023

**7**  
Thesis  
grants

**9**  
Doctoral  
modules

**3**  
Postdoctoral  
students on the  
Exomiole project

**19**  
students availing  
themselves of our  
TRIP PITIO-EN  
teaching platform

**8**  
International  
partnership  
projects between  
universities

*"I'm a second-year PhD student and my thesis is funded by the Origines institute. I'm working on the characterisation of icy moons in the Solar System, and more specifically on the evolution of their liquid water oceans. Some of these moons have great astrobiological potential, and will be explored by future space missions over the next decade."*



**Alizée Amsler**  
PhD student at the Marseille  
astrophysics laboratory (LAM)

## Our international training

CIVIS alliance  
European civic  
university

Member of  
the European  
Astrobiology  
Institute

Exchange agreements  
with 8 foreign universities

Construction of a Graduate  
School as part of CIVIS

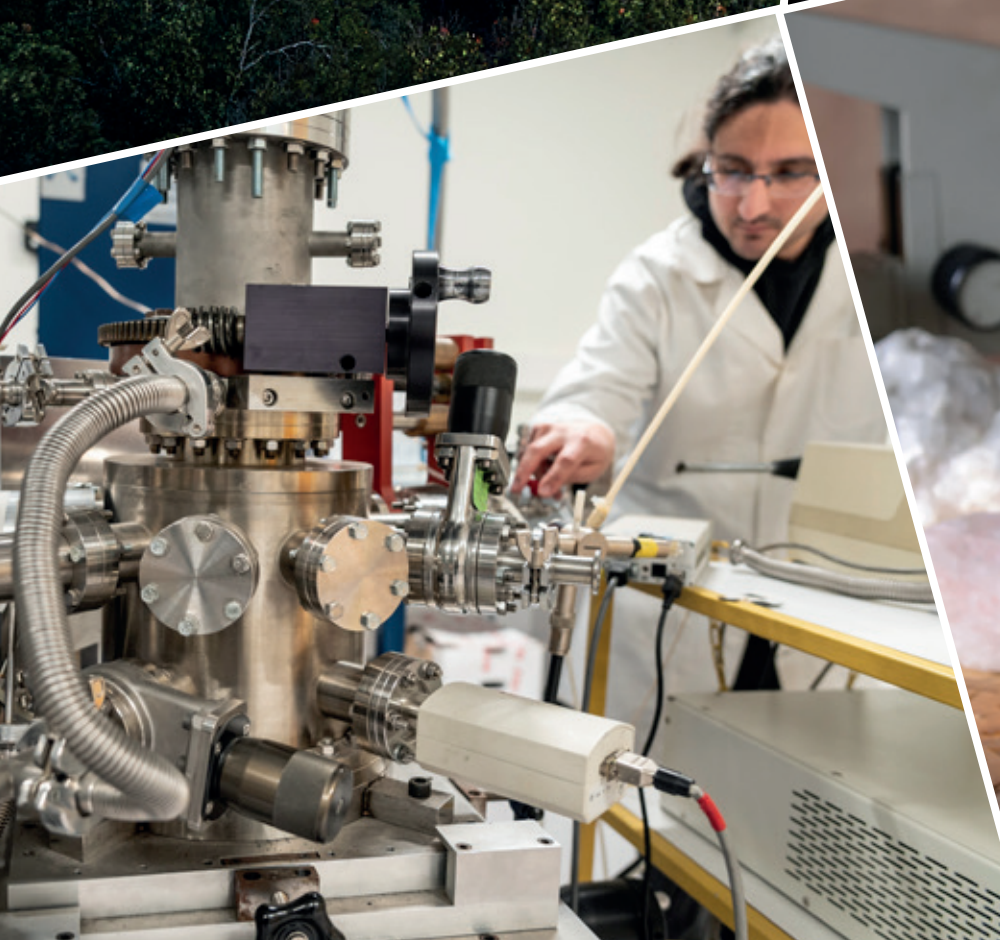
## Contact



# Research at Origines

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*Bringing together the strengths  
of the Aix-Marseille site to  
consolidate our international scientific position*



*Bringing together the strengths of the Aix-Marseille site to consolidate our international scientific position*

## Research ecosystem

20

research units

### Environment

- ▶ European research and teaching centre in environmental geosciences (CEREGE)
- ▶ Mediterranean institute of marine and terrestrial biodiversity and ecology (IMBE)
- ▶ Laboratory of environmental chemistry (LCE)
- ▶ Mediterranean institute of oceanography (MIO)

### Health and life sciences

- ▶ Bioenergetics and protein engineering (BIP)
- ▶ Laboratory for genomic and structural information (IGS)
- ▶ Microbes, evolution, phylogeny and infections (MEPHI)
- ▶ Ion channel and synapse neurobiology unit (UNIS)

### Advanced science and technology

- ▶ Centre for theoretical physics (CPT)
- ▶ Marseille interdisciplinary centre for nanoscience (CINAM)
- ▶ Fresnel institute
- ▶ Institute for radical chemistry (ICR)
- ▶ Provence institute for microelectronics and nanosciences (IM2NP)
- ▶ University institute for industrial thermal systems (IUSTI)
- ▶ Marseille astrophysics laboratory (LAM)
- ▶ Computer science and systems laboratory (LIS)
- ▶ Haute Provence Observatory (OHP)
- ▶ Physics of the interactions of ions and molecules (PIIM)

### Humanities

- ▶ Gilles Gaston Granger centre (CGGG)
- ▶ Laboratory for interdisciplinary media law and social change (LID2MS)

Aix Marseille  
Université

more  
than  
**200**  
staff

CNRS

## Our main areas of research

- ▶ Astrobiology
- ▶ Astrochemistry
- ▶ Prebiotic chemistry
- ▶ Emergence of life
- ▶ Exoplanets
- ▶ Planet formation
- ▶ Habitability
- ▶ Man's place in the universe
- ▶ Planetology
- ▶ Philosophy

## Our key actions

- ▶ Scientific project for an Origines junior professorship chair
- ▶ Interdisciplinary scientific project: Exomiolo
- ▶ International workshops
- ▶ One interdisciplinary day per year
- ▶ One Origines seminar per month

2021-2023

7

funded  
theses

3

funded  
postdoctorates

1

junior  
professor chair

more  
than  
**300**

participants in  
international  
workshops

*"I am the recipient of the Astrobiology Chair at the Origines institute. The project focuses on understanding the emergence of life in the solar system by characterising the moons of Jupiter and their environments, and preparing for the space exploration of Uranus and Neptune, which are still relatively unexplored but belong to a class of planets that are ubiquitous in our galaxy."*



**Vincent Hue**  
Teacher-researcher at the LAM,  
Deputy director of Institut Origines

## Contact

Deputy research director: Magali Deleuil

osu-origines-contact@univ-amu.fr

www.univ-amu.fr/origines



## Strengthening and developing special links with academic and institutional players and the socio-economic and cultural world

"I am proud of our successful collaboration with the Origines institute. Together, we have supported promising researchers through thesis co-funding and contributed to the success of major events such as the International Planetary Probe Workshop (IPPW) 2023 and the international Galilean Moons conference. This cooperation strengthens our commitment to space research and astrobiology. We look forward to new opportunities for collaboration."



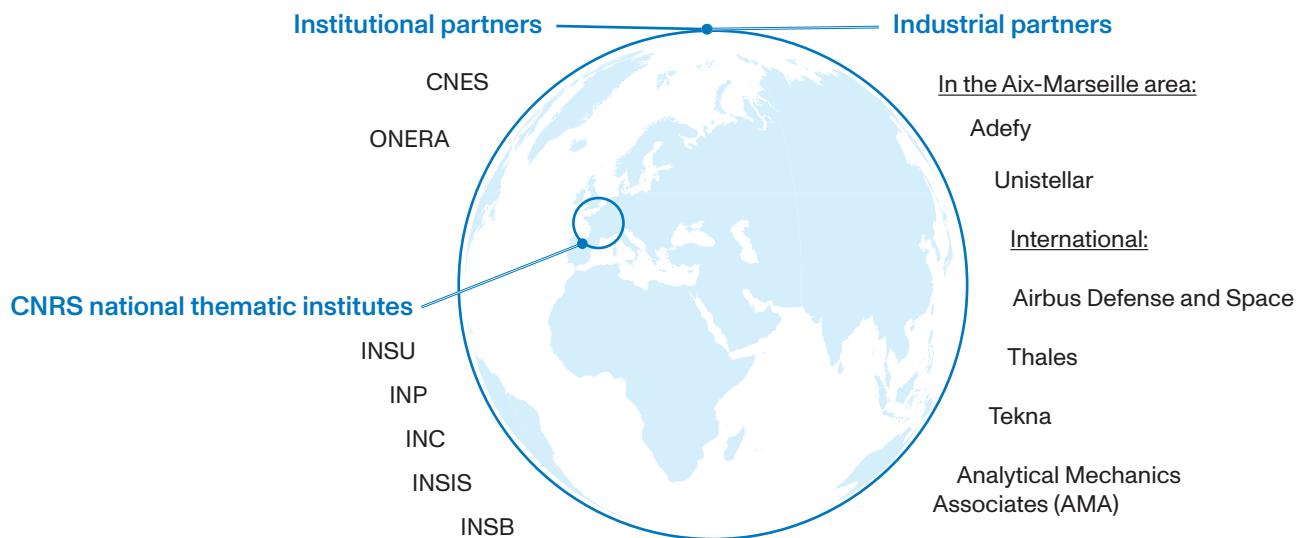
**Francis Rocard**  
Heading up the solar system exploration programme at the French national centre for space studies (CNES) since 1989

"The Origines institute, as the CNES's territorial relay for Exobiology, contributes to the national and international influence of this interdisciplinary theme and to the recognition of our respective institutions."



**Christian Mustin**  
Head of Research on Exobiology - Exoplanets - Planet Protection (CNES)

### Our key partners include



### Our key actions

Co-funding of these researching into origins

Organisation of international workshops



### Contact

Director: Olivier Mousis  
Project manager: Jean-Charles Ize

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$x \in [3; +\infty)$

$\sinh x = -i \sin(ix)$

$\frac{1}{\sqrt{2\pi}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right)$

$\forall \epsilon > 0 \exists N \in \mathbb{N} \forall n > N |x_n - a| < \epsilon$

$\sigma \sinh(x) = \frac{e^x - e^{-x}}{2}$

$\int dx = \frac{x^{n+1}}{n+1} + C$

$\log(x)$

$\cos C + \sin B \cdot \sin C \cos d$

$\log a + \log b$

$S = 4\pi R^2$

$V = \frac{4}{3}\pi R^3$

$(e^x)' = e^x$

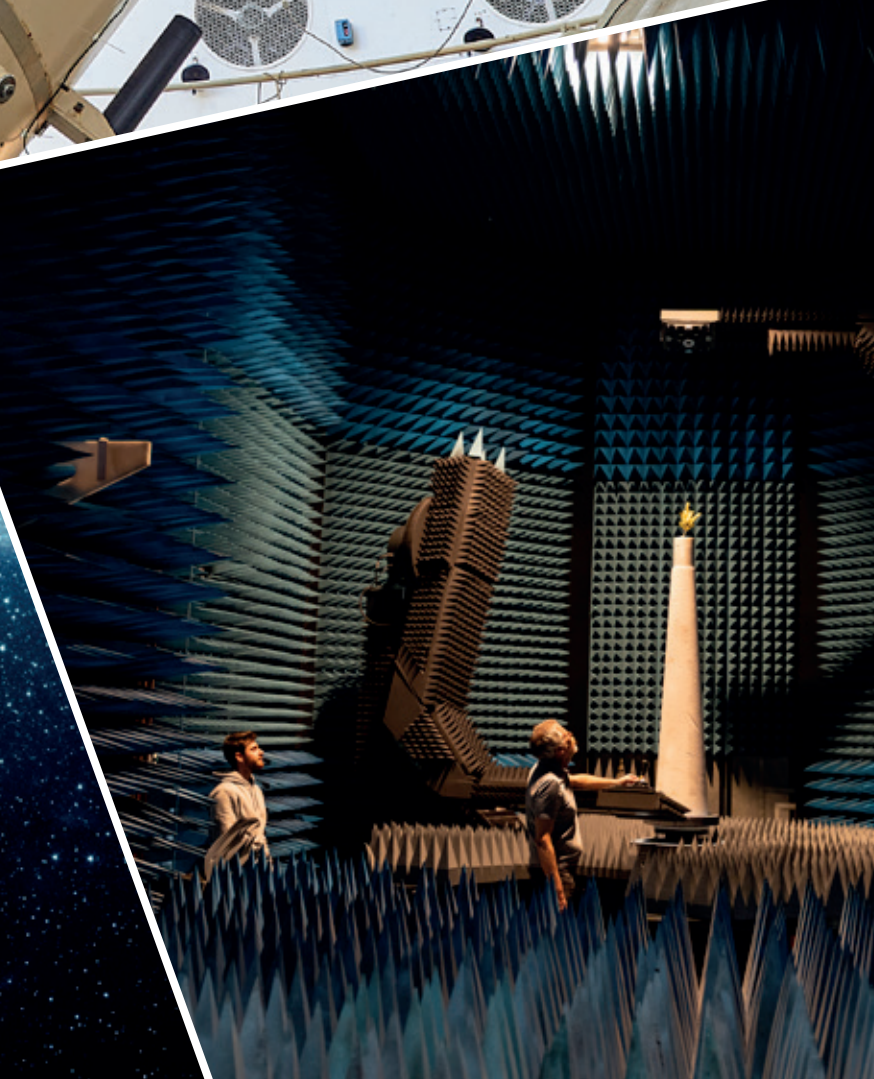
$\int_a^b f(x)$

$\pi = 3,14$

$y = |x-2|$

$\ln(a-b)$

$\cos x = \operatorname{Re} e^{ix}$





*The Origines institute brings together teams  
on 8 university and scientific sites*



The Aix Marseille Université institutes are coordinated by the Amidex foundation



The Aix-Marseille Excellence Initiative, a consortium between Aix Marseille Université and 8 partners

