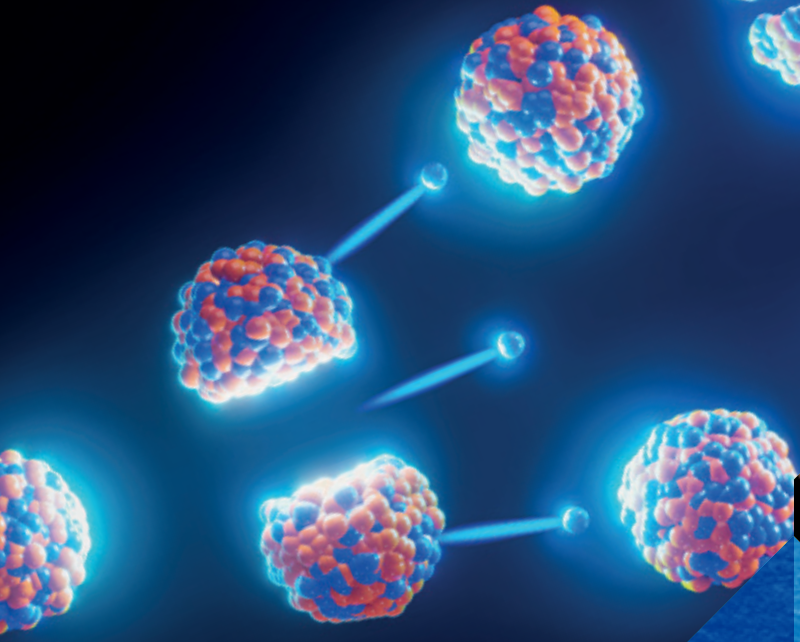


ISFIN

amU

Nuclear fusion, fission and instrumentation institute
Aix Marseille Université

photo credit: A. Aubert CEA

photo credit: Valentin Valéro

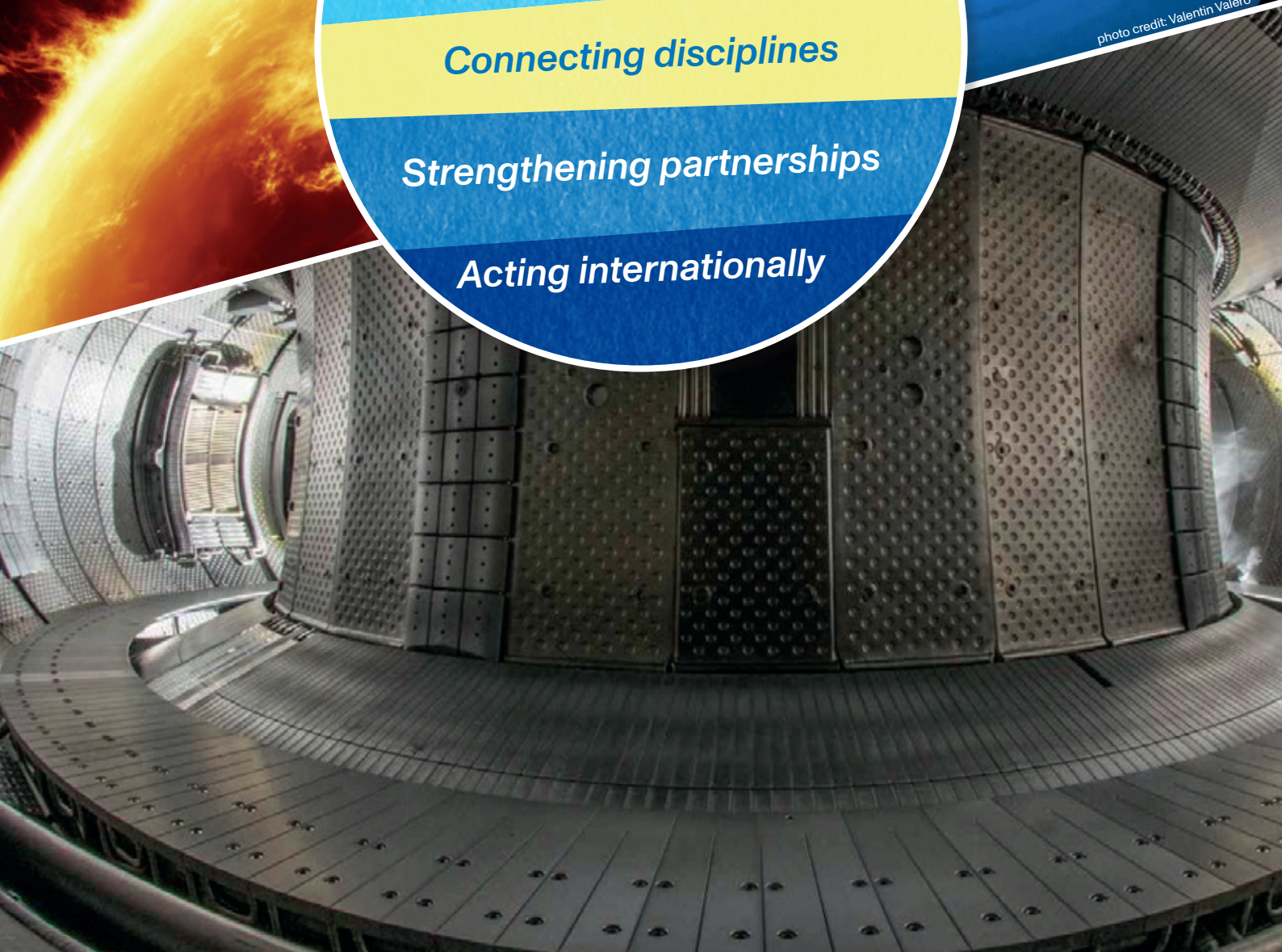
Forming a community

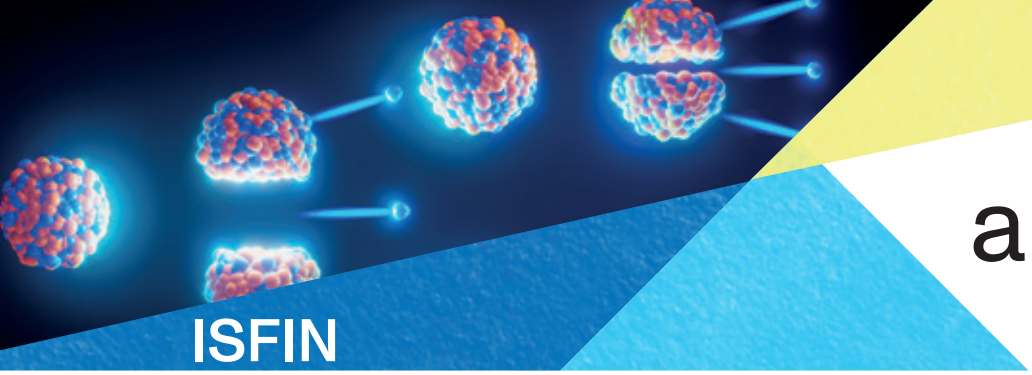
Training through and for research

Connecting disciplines

Strengthening partnerships

Acting internationally





ISFIN

amU Nuclear fusion, fission and instrumentation institute
Aix Marseille Université

Our aim: to develop a European centre of excellence for research and training in nuclear fusion, fission and instrumentation

The transition to low-carbon energy sources represents a crucial challenge in the face of climate change. Nuclear fission energy, and soon fusion energy, the energy of the stars, is one of the keys to this transition. Our institute is fully committed to research and training in instrumentation for major nuclear facilities, characterisation of materials and structures, and fusion science. Our interdisciplinary approach incorporates the societal dimension, which is fundamental to the success of this transition.

Over the next decade, our ambition is to make Aix-Marseille a leading European centre for research and training in these areas, by establishing solid partnerships with major local players such as CEA, ITER, IRSN and EDF.

Forming a community

- 10 research units
- 1 faculty
- more than 240 students (master's and doctoral)
- 3 doctoral schools
- 2 joint laboratories
- more than 100 staff

Low-carbon energy

Fusion and fission

Instrumentation in nuclear environments

Materials and structures

Hot plasmas and plasma-wall interactions

Training through and for research

- PLATINUM platform for prototyping, virtual reality and remote access to nuclear facilities
- Development of an interdisciplinary doctoral programme
- Immersion research projects on major nuclear facilities

Acting internationally

- International mobility of doctoral and master's students
- International Master's courses (IMSci-Nu and Fusion EP)
- Conferences and season schools (ANIMMA, ITER School, EFMMIN)

Connecting disciplines

- Physics
- Social Sciences
- Instrumentation
- Mathematics

Shared facilities
Incentive calls for projects
Theme days

Strengthening partnerships

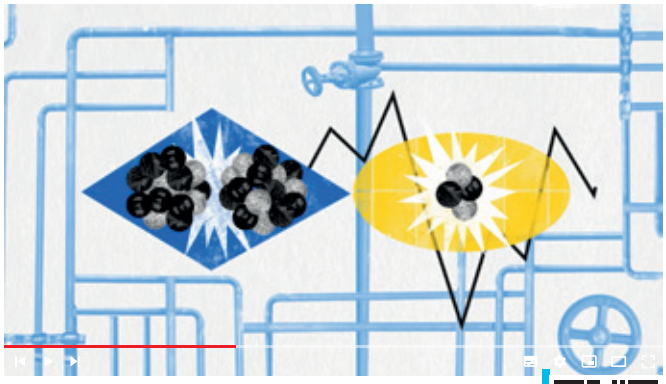
- CNRS
- Centrale Méditerranée
- CEA
- ITER IO
- IRSN
- EDF
- CAPENERGIES

amidex Aix Marseille Université

Aix Marseille Université institutes: facilitators to strengthen the research-training link, interaction with the economic and cultural world, interdisciplinarity and internationalisation around twenty or so strategic fields of research. Their core unifying role: training a new generation of academics to meet the scientific and societal challenges of our time!

Learn about ISFIN

amU ISFIN Aix Marseille Université



Watch the institute's animated film

The institute as seen by its members

Meet our executive office

Director:
Yannick Marandet

Deputy research director:
Christelle Reynard-Carette

Project manager:
Sara Ploquin-Donzenac

Deputy training director:
Gilles Cartry

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

Focus on the institute's cross-sectoral dialogue and societal dimension

The interdisciplinary nature of the institute fosters collaboration between physicists, mathematicians, thermal engineers and mechanical engineers to bring its projects to fruition. It also promotes cross-sectoral dialogue by integrating the human sciences, particularly involving the research area of"Social justice in energy transition, risks and society". This approach is specifically based on the organisation of a scientific programme centred around regular events such as conferences, visits to nuclear sites and discussions on scientific publications. This enables researchers from different disciplines to engage in dialogue and question their practices in the light of societal issues.

Contact

Director: Yannick Marandet
Project manager: Sara Ploquin-Donzenac

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Institute - ISFIN

Training at ISFIN

amU Nuclear fusion, fission and instrumentation institute
Aix Marseille Université

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

Training at ISFIN

amU ISFIN Aix Marseille Université

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

Our ecosystem

more than 200 master's students[1]

around 40 PhD students[2]

4 key master's

- Instrumentation Measurement Metrology, *Instrumentation and Measurement Science for Major Nuclear Research Facilities (IMSci-Nu) specialisation*
- Instrumentation Measurement Metrology, *Instrumentation of Test Facilities (IME) specialisation*
- Fundamental Physics and Applications, *Physics specialisation (FunPhys)*
- European Master of Science in Nuclear Fusion and Engineering Physics, Erasmus Mundus (Fusion EP)

1 interdisciplinary doctoral programme

1 partner faculty

- Faculty of sciences (FS)

3 partner doctoral schools

- Marseille mathematics and computer sciences (ED 184)
- Physics and science of matter (ED 352)
- Engineering sciences (ED 353)

Consult all master's degree specialisations:

[1] students enrolled on master's specialisations attached to the institute
[2] doctoral students enrolled in our partner doctoral schools

Our key actions

- Study tours (ITER, CEA Cadarache, Jules Horowitz reactor, CABRI reactor)
- Research and training platform (PLATINUM platform for prototyping, virtual reality and remote access to nuclear fission and fusion facilities) in partnership with the Instrumentation Division
- Seasonal schools (EFMMIN, ITER School, IMSci-Nu school)
- Study grants for Master's students
- Master's projects in laboratories (AMU laboratories, CEA Cadarache platforms and laboratories)

2020-2023

5 annual study tours

3 seasonal schools

9 study grants per year

60 working master's students per year

110 laboratory master's projects per year

55 laboratory master's internships per year

"Thanks to an ISFIN scholarship, I was able to take part in the prestigious Erasmus Mundus programme, Fusion EP. I've had an exciting academic year at Aix Marseille Université. The ISFIN grant was a springboard for my academic career, as I subsequently obtained an IAEA grant and am now pursuing my dream of a career in nuclear fusion."

Bojana Stefanoska
(Northern Macedonia)
Alumni Master Erasmus Mundus Fusion EP

Our international training initiatives

CIVIS alliance
European civic university

An international Master's specialisation
with 23 supporting organisations, including 17 international organisations

An Erasmus Mundus master's degree
co-accredited by 8 European universities

20 nationalities
represented among our students

International mobilities
on 5 continents for PhD and master's students

Contact

Deputy training director: Gilles Cartry

isfin-direction@univ-amu.fr

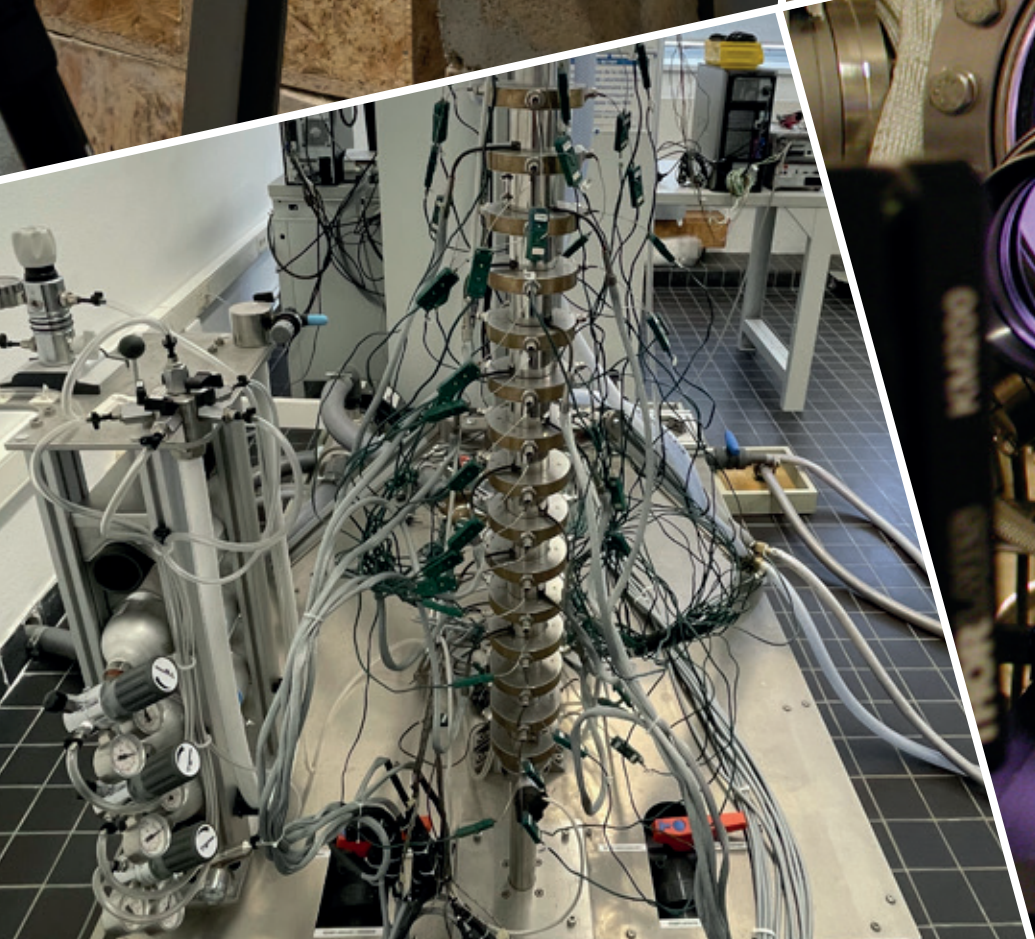
www.univ-amu.fr/isfin

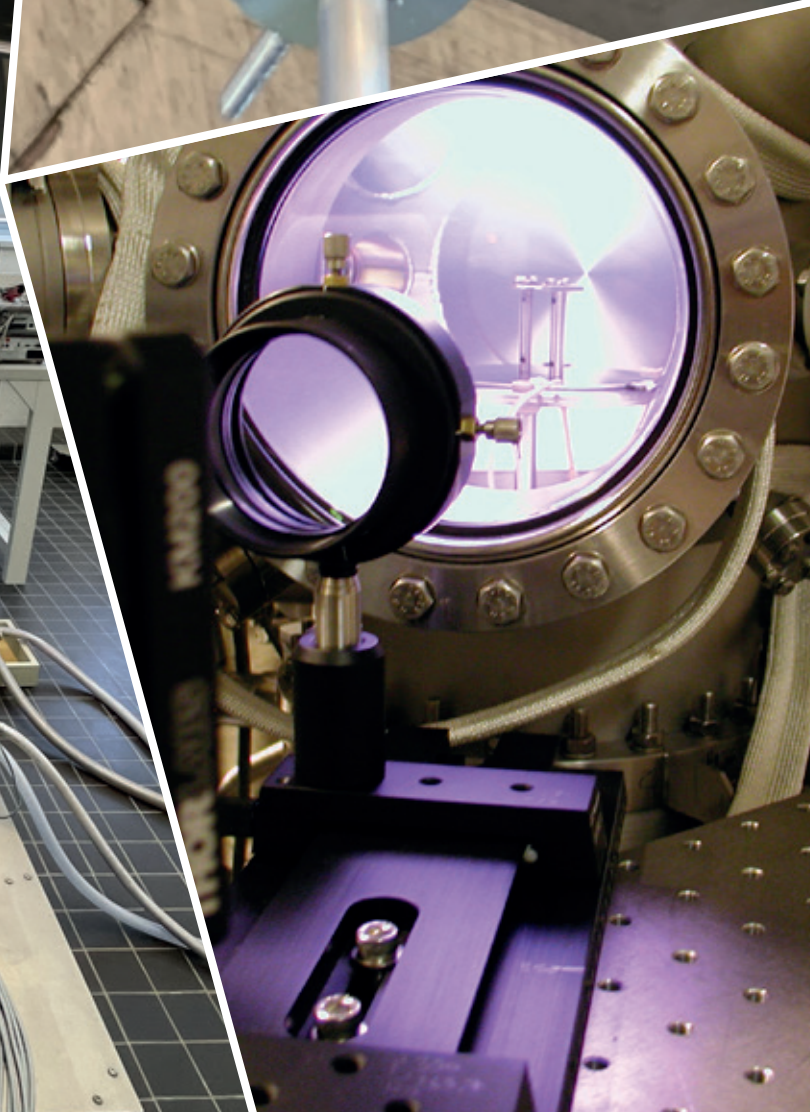
Research at ISFIN

amU Nuclear fusion, fission and instrumentation institute
Aix Marseille Université

Bringing together the strengths in nuclear science of the Aix-Marseille site to consolidate our international scientific position

amU ISFIN Aix Marseille Université





Research at ISFIN

amU ISFIN Aix Marseille Université

Bringing together the strengths in nuclear science of the Aix-Marseille site to consolidate our international scientific position

Research ecosystem

10 research units

2 joint laboratories with the CEA

Aix Marseille Université
CNRS
Centrale Méditerranée

more than **100** staff

150 CEA employees

IRESNE
IRFM

Energy

- Comparative and European international law (DICE)
- Fresnel Institute (FRESNEL)
- University institute for industrial thermal systems (IUSTI)
- Mechanics and acoustics laboratory (LMA)
- Mediterranean centre for sociology, political science and history (MESOPOLHIS)
- Joint Laboratory for Modeling, Inspection and characterization of materials and STRuctures for Advanced Low carbon energies (MISTRAL)

Advanced science and technology

- Centre for theoretical physics (CPT)
- Marseille institute for mathematics (I2M)
- Provence institute for materials, microelectronics and nanosciences (IM2NP)
- Joint laboratory for instrumentation and measurement in extreme environments (LIMMEX)
- Mechanics, modelling and clean processes laboratory (M2P2)
- Physics of the interactions of ions and molecules (PIIM)

Our main areas of research

- Edge plasma physics and plasma-wall interactions
- Magnetised plasma confinement physics
- Nuclear instrumentation and detection: sensors, rugged electronics
- Materials and structures: characterisation and modelling
- Thermal diagnostics and thermodynamic characterisation
- Social justice in the energy transition, risks and society

Our key actions

- Structuring research in partnership
  – 3 calls for thesis jointly funded projects (10 theses jointly funded)
- Stimulation of inter-laboratory work
  – 3 calls for projects
  – €400 thousand invested in pooled facilities
- Developing interdisciplinarity
  – 1 call for projects
  – €420 thousand invested in 2 awardee projects
- Involvement in the organisation of international conferences and workshops such as ANIMMA and PSI
- PLATINUM platform for conducting on-site and online experimental and digital research with international partners
- 4 calls for international mobility projects for doctoral students
  – 15 long-term mobility projects on 3 continents

"I head up the 3P-3F interdisciplinary project involving 3 laboratories and 2 CEA Institutes. The aim of this ISFIN-funded project is to study and predict the evolution of the thermo-physical properties of materials after their use in a nuclear environment. A physico-chemical, thermal and nuclear approach provides a better understanding of thermal measurements in fusion and fission."

Jean-Laurent Gardarein
A*MIDEX 3P-3F project,
IUSTI Lecturer-Researcher

Contact

Deputy research director: Christelle Reynard-Carette
isfin-direction@univ-amu.fr
www.univ-amu.fr/isfin

ISFIN's partnerships

amU ISFIN Aix Marseille Université

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

"We collaborate with ISFIN by conducting joint research projects, co-piloting Master's courses and jointly organising international scientific events. This lets us pool our skills to initiate cross-disciplinary fission-fusion initiatives, particularly in nuclear instrumentation and measurement for innovative solutions for the Cadarache centre's major experimental facilities."

Abdallah Lyoussi
Research director at CEA, IRESNE

Our key partners include

Internationally

Nuclear Reactor Laboratory (MIT)

Fusion-EP and IMSci-Nu master's partners

Jožef Stefan Institute (JSI)

Morocco Nuclear Centre (CNESTEN)

University of Lancaster

Laboratories in the European EUROfusion programme

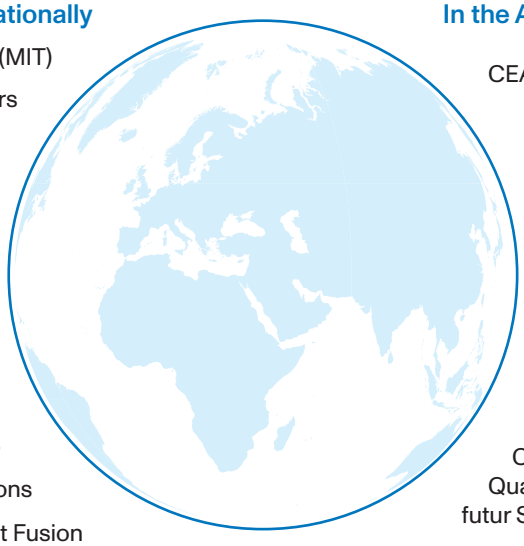
Belgian Nuclear Centre (SCK-CEN)

In France

CNRS

University of Nuclear Professions

Magnetic Confinement Fusion Research Federation (FR-FCM)



In the Aix-Marseille area

CEA Cadarache

ITER-IO

IRSN (Institute for radiological protection and nuclear safety)

EDF

Centrale Méditerranée School

Capénergies competitiveness cluster

Campus des Métiers et des Qualifications d'Excellence - Industrie du futur Sud - Provence-Alpes-Côte-d'Azur

Our key actions

Thesis co-funding programme with key partners (CEA, ITER, IRSN)

Joint organisation of season schools
- ITER School: 170 participants
- EFMMIN: 65 participants
- IMSci-Nu School

Joint organisation of international conferences
- ANIMMA: 400 people
- PSI: 450 people

Organisation of 3 theme days a year

2023

Innovative nuclear reactors day with 8 start-ups, 340 participants

Contact

Director: Yannick Marandet
Project manager: Sara Ploquin-Donzenac
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www.univ-amu.fr/isfin

amU ISFIN Aix Marseille Université

Photo credit: G. LeSénéchal:CEA

amU Nuclear fusion, fission and instrumentation institute
Aix Marseille Université

The ISFIN institute brings together teams on 7 university and scientific sites

Graphic design: DIRCOM AMU | October 2024 | photo credits: Escalanta, Sarah Chambon, Jean Fondacci and Aix-Marseille Université (Eléa Ropiot)

The Aix Marseille Université institutes are coordinated by the Amidex foundation

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

amU Aix Marseille Université · cnrs · Inserm · cea · IRD Institut de Recherche pour le Développement France · Centrale Méditerranée · sciencespo.aix · Hôpitaux Universitaires de Marseille ap·hm · INSTITUT PAOLI-CALMETTES unicancer Marseille