

BREST

# A wide range of training opportunities:

*From basic training in ship construction to university doctorate and various technical and engineering diplomas in between, Brest can offer all levels of training in the sea-related professions*



Ifremer

• **Université de Bretagne Occidentale** (University of Western Brittany):

**IUEM** (European university institute of the sea) and the Ecole Doctorale des Sciences de la Mer (Marine sciences graduate school)

The IUEM advanced research centre comprises the following research units – oceanic studies, LEMAR, Géomer, microbiology of extreme environments, marine chemistry, CEDEM and LEBHAM on which depend the Ecole Doctorale des Sciences de la Mer and the Masters in marine and coastal sciences (8 levels).

The Institut Universitaire de Technologie (University technology institute) comprises departments of mechanical and electrical engineering, electronics, computer science, applied biology and environmental studies.

• **The Ecole Navale** (Naval college) provides training in marine technology and its application in defence plus hydrodynamics and acoustics.

• **ENSIETA** (National advanced institute for armament engineering studies) offers engineering courses and specialist studies in the fields of naval architecture, offshore engineering, hydrography and on-board systems.

• **ISEN BREST** (Brest advanced institute in electronics and digital systems) provides courses in instrumentation and underwater acoustics.

• **ENST BRETAGNE** (National institute for advanced studies in telecommunications) offers courses in signal processing, underwater transmissions and satellite links.

• **ENIB** (National engineering college in Brest) teaches a Masters in virtual reality transmission studies and DEA advanced diploma in electronics/opto-electronics.

• **CEDRE** provides training sessions at all levels in prevention and combating of pollution.

• **IRD** (Institute for research development) offers training placements within its teams working on oceanographic physics, coastal modelling, acoustics, halieutic biology, etc.

• **DGA - CFBT** (Brest training centre) specialises in intra- and inter-company training in basic construction and ship repair trades – initial training (BAC, PRO and BTS), COPM (professional metallurgy certificate), ongoing training, etc.

• **Ecole des Hydrographes (SHOM)** (School of hydrography) offers advanced training to hydrography engineers – marine cartography, oceanography and measuring at sea.

• **IFREMER** provides practical placements in its 30 laboratories in Brest working on marine biology, marine cultures, geology, geophysics, coastal environment, marine technology, space oceanography, etc.

# BREST

## *The greatest concentration in Europe for research and development*

*When evoking marine science, both the diversity of means, and the skills and structures devoted to studying and exploiting the huge maritime realm of our planet, must be considered.*

*It's geographical location, combined with the know-how of local firms, researchers and a strong oceanographic tradition have all made Brest a focal point of excellence for the sea.*

*This situation reinforces, both nationally and internationally the strong position held by Brest and its region in:*

- Oceanography
- Defense
- Offshore
- Instrumentation
- Environment
- Marine biological resources
- Maritime safety

*Operating at the interface between those involved in research and in business and using innovation as a tool for regional development, the Technopôle Brest-Iroise initiates and heads up joint ventures aimed at*

- offering ongoing support to companies in developing their expertise and conquering new markets,
- promoting the transfer of technologies between partners.

*This new initiative has been developed particularly in Brest's areas of excellence – underwater acoustics and maritime safety, as well as in the fields of offshore operations and integrated coastal management.*



**TECHNOPÔLE  
BREST-IROISE**

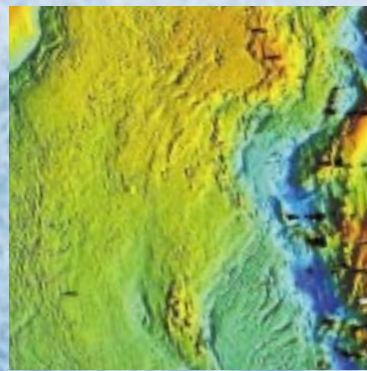
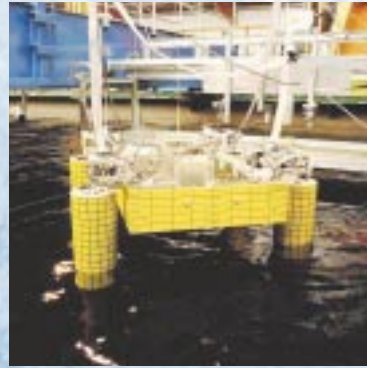
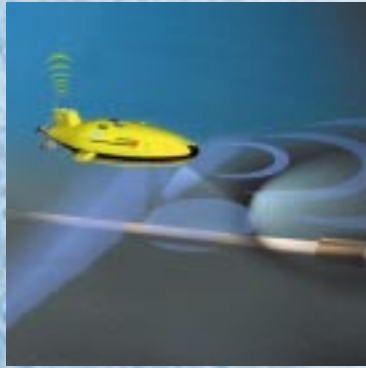
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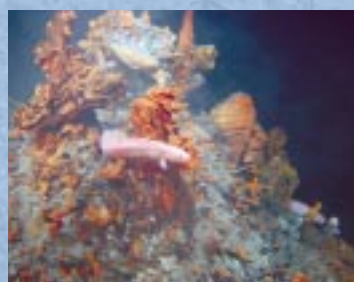


# BREST

Capital of marine science and technology



# Multidisciplinary capabilities in marine research and studies



- Study of large-scale geological structures of the world's oceans.
- Bathymetric and seismic surveys.
- Ocean dynamics, space and aerial oceanography. Ocean meteorology, studies of ocean conditions, currents and tides.
- Marine chemistry, geochemistry and water quality.
- Marine biology, biochemistry and microbiology. Toxicology. Halieutic and aquaculture research.
- Integrated research projects into coastal systems, modelling.
- Maritime law and economics.
- Environmental impact studies, discharge operations at sea.
- Seaweed.
- Polar oceans research.
- Cultural and scientific engineering

- IFREMER, UBO/IUEM,
- IFREMER, SHOM, DTRE, UBO/IUEM
- IFREMER, UBO/IUEM, SHOM, IRD, CETMEF, ACTIMAR, ENSTB, METEO FRANCE, ECOLE NAVALE, ATLANTIDE
- IFREMER, SHOM, CEDRE, PAE, UBO/IUEM MICROMER, IRD
- IFREMER, UBO/IUEM, CNRS, IRD, AFSSA, PAE, ESMISAB
- IFREMER, UBO/IUEM, ALLEGANS, CNRS, OIKOS, IRD
- UBO/IUEM, IFREMER
- IFREMER
- IFREMER, UBO/IUEM, CNRS, AFSSA
- INSTITUT POLAIRE, UBO/IUEM, CNRS
- OCÉANOPOLIS

BREST

# Excellence in ocean engineering

- DCN, THALES UNDERWATER SYSTEMS, IFREMER, SOFRESID ENGINEERING, IXSEA, ENSIETA, THALES IS, ICCAP, ROBOPLANET, GRANIT

- DCN, IFREMER, ECOLE NAVALE, ENSIETA, INSTITUT de la CORROSION, ROBOPLANET, UBO/IUP GÉNIE MÉCANIQUE

- IFREMER, UBO/IUEM, CETMEF, EPSHOM, PAE, CEDRE, IRD, ALIDADE, HOCER, NASCA, MICROMER, GEOMOD, ECOLE NAVALE, ACTIMAR

- IFREMER, DCN, IXSEA, CETMEF, ENST BRETAGNE, UBO/IUEM ATLANTIDE, BOOST, ENSIETA, NKE-MICREL

- GESMA, IFREMER, SHOM, SERCEL, THALES UNDERWATER SYSTEMS, IXSEA, ENSIETA, ISEN BREST, ENST BRETAGNE, ECOLE NAVALE, IRD, NKE-MICREL, ATLANTIDE

- CNRS (INSU), IFREMER, SERCEL, IXSEA, CETMEF, GESMA, THALES UNDERWATER SYSTEMS, THALES SYSTÈMES AÉROPORTÉS NKE-MICREL

- CEDRE, UBO/IUEM, CETMEF, PAE, GROUPE BASTIDE, ROBOPLANET

- IFREMER, UBO/IUEM, AFSSA, COFREPECHE

- INSTITUT POLAIRE, UBO/IUEM

- IFREMER, DCN (CETEB), CETMEF, ENSIETA

- SERCEL, IXSEA, ENSIETA, ECA,

- GEOMOD, CETMEF

- DCN, THALES UNDERWATER SYSTEMS

- GESMA, MARINE NATIONALE, DCN, ECA, SERCEL, IXSEA

- SOFRESID ENGINEERING

- HYDROCAP, SOFRESID ENGINEERING, ACTIMAR

- On-board systems, naval engineering

- Structural performance at sea, materials in marine environment, naval hydrodynamics

- Integrated coastal management

- Environmental monitoring systems using buoys, satellites, AUV and automated coastal stations.

- Underwater acoustics, seabed imagery, acoustic transmission and positioning

- Scientific and operational instrumentation

- Techniques and equipment for accidental water pollution prevention and control

- Fish farming technology, fish pathology

- Polar technologies

- Marine environment testing facilities.

- Underwater robotics. On-board intelligence systems.

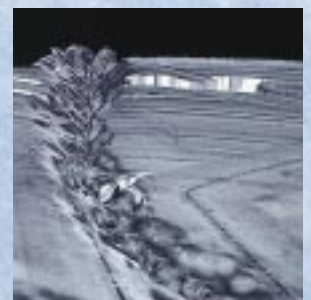
- Marine safety and maritime navigation systems and aids.

- Shipbuilding engineering.

- Naval warfare engineering.

- Submarine warfare.

- Marine renewable energy





# An industrial force



- Warship construction.
- Construction of equipment for tackling marine pollution.
- In-depth maintenance of surface vessels and submarines. Repairs to merchant shipping and variety of refitting operations for all ships and offshore platforms.
- Management of specialist ships.
- Design and production of on-board and self-contained systems. Instrumentation. Robotics.

- DCN
- GROUPE BASTIDE
- DCN, SOBRENA, SNEF, GROUPE BASTIDE, SOFRESID ENGINEERING, ICCAP



- Information management, signal processing and databases.
- Fishing and aquaculture.

- GENAVIR, DTRE
- THALES UNDERWATER SYSTEMS, GESMA, SERCEL, IXSEA, IFREMER, CETMEF, ECA, UBO, NKE-MICREL
- ATLANTIDE, THALÈS IS, CISI, NASCA, IFREMER, THALES SYSTÈMES AÉROPORTÉS, IXSEA, UBO
- Artisans spécialisés, COFREPÊCHE, UBO



- Development of economic potential of seaweed – food, cosmetics and health spa treatments.

- ALGOTHERM, SCIENCE ET MER, OCEALYS, UBO/UIEM Sté AQUACOLE D'OUESSANT

- Leisure boating industry

- Voilerie INCIDENCES, FOB, Chantiers LUCAS, Chantiers du GUIP, LATITUDE, KMT, YUCCA VOILES, VOILES OCEANS, BERRA MARINE, KANAHBEACH, EXOCET