SONAR

CAMPUS MONDIAL DE LA MER
#3
September 2020

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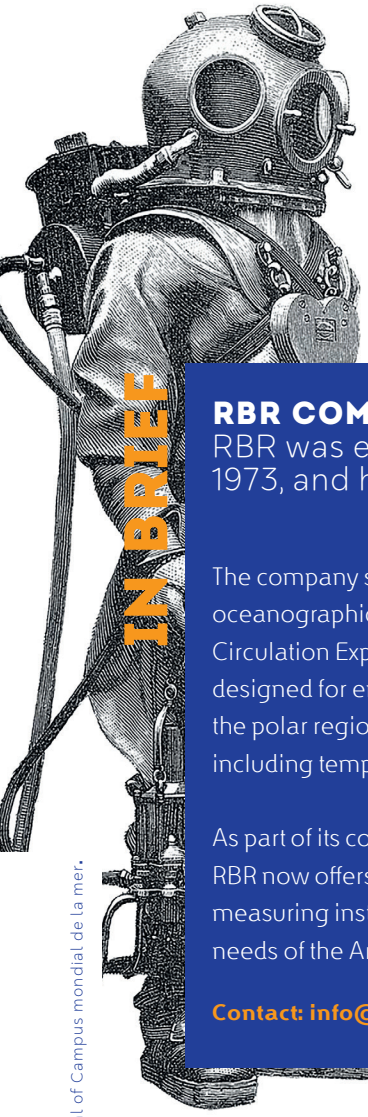
OBSERVATION



SONAR #3

CAMPUS MONDIAL DE LA MER

IN BRIEF

RBR COMES TO BREST

RBR was established in Ottawa, Canada, in 1973, and has now opened an office in Brest.

The company specialises in creating high-precision oceanographic instruments which meet World Ocean Circulation Experiment (WOCE) standards. RBR's sensors are designed for environments ranging from the deep ocean to the polar regions and to capture all possible ocean parameters including temperature, depth, salinity and oxygen levels.

As part of its commitment to developing low-energy solutions, RBR now offers a conductivity, temperature and pressure measuring instrument, RBRargo3 C.T.D, to meet the operational needs of the Argo network.

Contact: info@rbr-global.com

NEMOSENS, A MICRO-DRONE FOR OCEAN EXPLORATION.

RTSYS has designed and developed the NemoSens Micro-Autonomous Underwater Vehicle (µAUV) to make it easier for researchers and offshore industries to conduct hydrographic surveys at depths of up to 300m. The vehicle's open Linux architecture and modular payloads enhance the ease of operation: for instance it now has a built-in RBRlegato³ C.T.D.
This µAUV is under 90 cm long, with an autonomous range of 20 hours and a maximum speed of around 8 knots.

EDITO

Yves-Marie PAULET, Member of the Campus board, Vice-President of maritime affairs at Université de Bretagne Occidentale (UBO).

WE OBSERVE THE OCEANS AND COASTS SO WE CAN DESCRIBE AND UNDERSTAND THEM. WE AIM TO OPTIMISE HOW WE USE THEM, RECORD ANY CHANGES WE FIND THERE AND PLAN FOR THE FUTURE. BREST, AT THE WESTERNMOST ATLANTIC TIP OF FRANCE, HAS ALWAYS ACTED AS A GATEWAY FOR VOYAGES OF DISCOVERY. BREST'S TIDE GAUGE HAS NOW PRODUCED ONE OF THE LONGEST SEA LEVEL OBSERVATION SERIES IN THE WORLD. YET LONG BEFORE ITS INSTALLATION, PEOPLE LIVING ON THIS COAST WILL HAVE BEEN DEVELOPING SKILLS IN OBSERVING NATURAL OCEAN PROCESSES. THE SEA WAS VITALLY IMPORTANT TO THEM, FOR FISHING AND TRAVEL.

These original observations from a fixed point were soon enriched with added information gathered by ocean exploration missions, for which Brest was often the support base. The ocean slowly emerged from obscurity. The second half of the 20th century, and especially the first two decades of the 21st, have seen a real explosion in observation methods and tools. These have combined with a rapid growth in both the quantity and the precision of lines of scientific enquiry, in terms of both number and acuity. The marine science and technology community at Campus mondial de la mer is playing a major role in this exhilarating international adventure. It has expertise to offer in multiple disciplines, which can be mobilised in unique, crosscutting ways as part of a comprehensive package. The community has a wealth of equipment, much of it designed and produced in Brittany, which transmits many observations to computer terminals in the region every day. The equipment includes floats, instrumented buoys, benthic stations, hydrophones, biosensors, ROVs, AUVs and satellites. At present, our prime objective is to apply human and artificial intelligence so as to extract from the data those elements that will further enrich our understanding of the ocean system. From these observations, we will identify the variations and anomalies that indicate local or global systemic changes; we will ultimately enhance how we use the oceans and coastal zones in terms of both safety and sustainability.

Thus all the new data gathered increase the overall value and complexity of these observation series. These series may be long, but they still only cover several decades at best: a blink of the eye in the history of marine and coastal systems. That's why the Campus community has teams who specialise in making observations based on the past. They put their experience with biogeochemical and genomic tools to good use to explore sedimentary layers and calcareous shells and gain insights into the 'pristine' state of marine environments.

Sea Tech Week 2020 will run from 12 to 16 October, this time in a remote online format. It provides an opportunity to get up to speed with this real revolution in ocean and coastal observation – a revolution which will have many fundamental implications for how we use the ocean. A recent Future Science Brief published by the European Marine Board* recommends that we *"Increase collaborations between marine scientists, computer scientists, data scientists and data managers"*. This is precisely what we do at Campus mondial de la mer, as one of our core functions.

INFO + https://www.marineboard.eu/publication/future-science-brief

FEATURE REPORT: OBSERVATION

© Shom

UNDERSTANDING THE OCEAN: H2I AND SHOM

GAINING A BETTER UNDERSTANDING OF THE OCEAN IS CURRENTLY A PRIORITY, BOTH NATIONALLY AND INTERNATIONALLY. WE JOINED A ZOOM CALL ABOUT THIS WITH DENIS HAINS, CEO OF H2I[1], AND LAURENT KERLÉGUER, DIRECTOR GENERAL OF SHOM[2].

COULD YOU TELL US A BIT ABOUT YOUR ORGANISATIONS?

DENIS HAINS: I set up H2i after working for the Canadian government for 35 years, including six as General Manager of the Hydrographic Service. Our company is committed to creating a safer, more efficient and sustainable blue economy. We provide support and guidance to organisations moving into the hydrospatial[3] sector , with a focus on data and digital systems.

LAURENT KERLÉGUER: In organisational terms, Shom is overseen by the French Ministry of Armed Forces. We are the public body for geographic information on oceans and coastal waters. We aim to understand and describe the physical marine environment and how it interacts with the atmosphere, sea floor and coastal zones. We predict how it will develop and make the resulting information accessible.

H2I WORKS AT THE INTERNATIONAL AND SHOM AT THE NATIONAL LEVEL: ARE YOU FACING ANY MAJOR CHALLENGES?

DH: Broadly speaking, the major challenges we face internationally include the increased use of crowdsourced and satellite bathymetry. There's also the challenge of implementing a spatial marine data infrastructure based on temporal, dynamic hydrospatial data enhanced by artificial intelligence (AI) - and meeting the International Hydrographic Organization's standards. The United Nations Decade of Ocean Science for Sustainable Development (2021-2030) and the Nippon Foundation-GEBCO Seabed 2030 project both provide impetus and enthusiasm for this work.

LK: The main challenge is gaining an understanding of the ocean, which is essential for safe navigation, transporting goods, exploiting mineral resources, combating pollution and installing wind farms. It isn't 'just' about describing the ocean: it's also about channelling raw 'knowledge' into products and services tailored to their users.

WHAT DOES THE FUTURE LOOK LIKE?

DH: New technologies are being adopted and shaking up the hydrospatial sector. In particular, autonomous vehicles are totally revolutionising data acquisition at sea and along the coast. And for data gathered from a variety of sources to be efficient, easy to access and interoperable, they must comply fully with international standards and be quality certified by a competent authority.

LK: The DGA[4] has launched a programme designed to upgrade the Navy's hydrographic fleet and provide Shom with both autonomous surface and underwater vehicles, making ocean data acquisition more efficient. This will considerably increase the volume of data to be processed. Shom needs to prepare for this by increasing the level of automation in its processing chains, for example using AI: it's time to innovate.

SHOM IS CELEBRATING ITS 300TH ANNIVERSARY THIS YEAR. WHAT ARE YOU PLANNING FOR THE NEXT FEW YEARS?

LK: My predecessors identified very early on that it was important to map our coastlines: the original French Naval Mapping Department was established in 1720. This now seems a realistic aim, although it isn't a job you do only once, as the sea floor and our needs keep evolving. In future, Shom will continue to develop and adapt maritime products and services to these changing requirements.

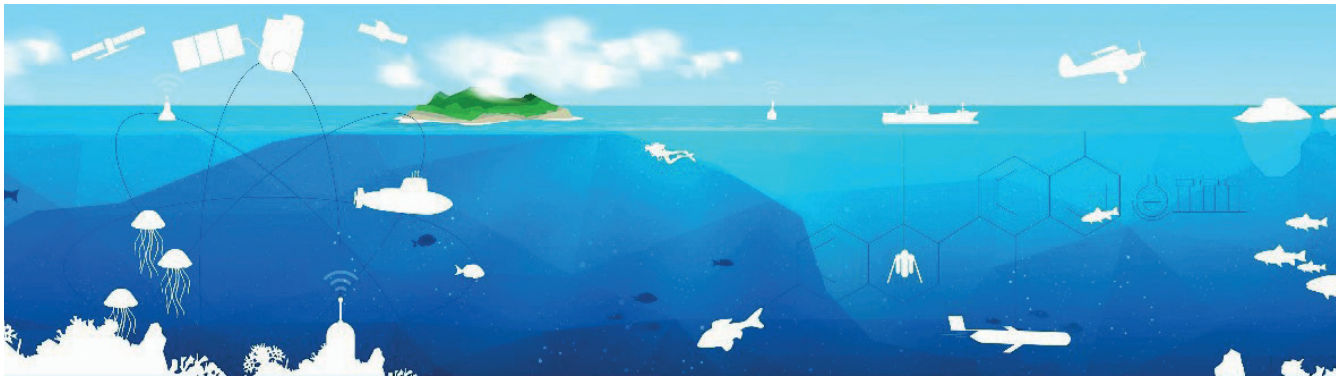
SHOM IS PART OF THE CAMPUS MONDIAL DE LA MER COMMUNITY. WHAT IS IT LIKE?

LK: The industry technology is so complex that projects need to draw on skills rarely all found together in a single organisation. Brittany obviously plays a major role here because it is highly specialised in the maritime sector - so it's a centre of excellence for oceanography. Campus mondial de la mer brings this community together, and Shom is proud to be part of that.

(1) Hains HYDROSPATIAL international Inc. (https://www.h2i.ca)
(2) French Hydrographic and Oceanographic Service (https://www.shom.fr)
(3) For a definition, see pp 84-93 in: https://iho.int/uploads/user/pubs/ihreview_P1/IHR_May2020.pdf
(4) French Defence Procurement Agency

LA SEA TECH WEEK®
HOSTS ITS FIRST OPEN DATA SESSION

THIS IS THE FIRST EVER SESSION AT SEA TECH WEEK® DEDICATED TO OPEN DATA.



Scheduled for Wednesday 14 October between 1:30 and 3:30pm, it aims to promote open access to marine data for the widest possible cross-section of people, making it easier to model complex ecosystems. Mark Hoebeke, a research engineer at CNRS , explains: *"Marine data cover many different angles including geological, chemical and biological."* He's one of the session organisers, based at Roscoff Marine Station; the other is Gilbert Maudire, who represents Ifremer's ODATIS (Ocean Data Information and Services) Ocean Cluster for France. *"Analysing these data sets also enables us to make predictions about the development of these ecosystems."* Where these data comply with the FAIR Principles[1], they can easily be reused by other researchers.

The session will open with an introduction providing details of the FAIR Principles. Next, five speakers will outline the data available at national and European level, and some possible ways to use them. There will be a question-and-answer session at the end of each presenta-tion.

(1) The FAIR Data Principles provide guidelines ensuring all digital assets are Findable, Accessible, Interoperable and Reusable (FAIR) both for machines and for people.

INFO + https://www.seatechweek.eu/Detailed-programme-794-0-0-0.html#OPENDATA

"CAMPUS MONDIAL DE LA MER IS AN EXEMPLARY KNOWLEDGE AND INNOVATION NETWORK."

CLAIRE JOLLY IS A HEAD OF UNIT IN THE OECD'S SCIENCE, TECHNOLOGY AND INNOVATION DIRECTORATE.

WHAT IS YOUR VIEW OF OUR CAMPUS? YOU VISITED TWO YEARS AGO - WHAT ARE YOUR IMPRESSIONS NOW?

Rational management of our seas and oceans is a growing challenge. The Campus was established at a pivotal moment, when we all needed to promote understanding of the ocean realm and its ecosystems, and to make better use of innovations emerging from the digital economy. Campus has really developed over the past two years. It is just one of several very interesting examples we have identified where new 'knowledge and innovation networks' have sprung up.
As they grow, we have a responsibility to acknowledge how these networks benefit us, and to identify areas for improvement. And this is something the OECD and Campus cooperate on. It's also the topic of our workshop on 12 October, which will focus on the contribution these networks make in terms of observation.
There are many countries where ocean research and innovation processes are undergoing a transformation, sometimes a rapid one. New ways of working together are gaining ground worldwide and breakthrough digital technologies are increasingly finding commercial and scientific applications.
The networks are initiatives that bring together a range of stakeholders under an organisational 'umbrella'. They are flexible and dedicated to specific research and innovation objectives. They are often national networks and work on a whole range of scientific and technological innovations which draw on many different sectors in the ocean economy, from robotics to biotechnology.

TELL US ABOUT YOUR WORKSHOP ON THIS COOPERATION MODEL

My workshop at Sea Tech Week® on 12 October will set out the contributions these networks make to ocean observation. We will also seek to identify some areas for improvement, especially with the aim of involving the private sector to a greater extent.
Both the OECD and Campus agree we still need to learn more about our oceans and to manage maritime activities better. In order to achieve this, it is essential to strengthen our observation systems and the chain through which decision-makers obtain data. With their links to other digital stakeholders, the maritime knowledge and innovation networks clearly have a role to play here.

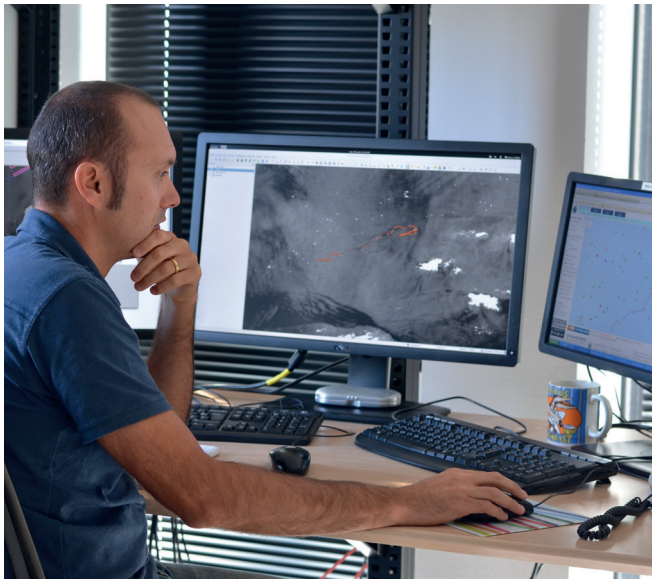
INFO + For more about the OECD's work on innovation and the ocean economy, see: https://www.oecd.org/ocean/topics/ocean-economy/

CLS OBSERVES THE OCEAN FROM ABOVE

TOULOUSE-BASED INTERNATIONAL COMPANY CLS (COLLECTE LOCALISATION SATELLITES) HAS HAD AN OBSERVATION SITE IN BREST SINCE 2008.

It specialises in satellite and drone-based ocean observation, and has created a ground receiving station for the acquisition and analysis of high-resolution satellite images in Brest. It's called Vigisat and is a first for France. Vincent Kerbaol is the station's manager: *"Some 40 people work here in Brest. We focus on two aspects, the first being maritime surveillance."* CLS monitors all human activity at sea throughout Europe, including fishing and merchant vessels, paying particular attention to pollution in the ocean and any illegal fishing or illicit trade. *"The second aspect is the environment. We can measure the wind, waves and ocean current from our images. We can track a hurricane and understand how strong it is and how it's developing."* The company manages lots of data, so it deals directly with data-related issues. Given this, CLS has recently strengthened its partnerships with engineering schools and universities, such as the new OceaniX[1] chair based at IMT Atlantique.

1 See p.08



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INFO + CLS > https://www.cls.fr/
VIGISAT > http://www.vigisat.eu/

© IUEM-UBO

OSU STATUS BRINGS TOGETHER RESEARCH UNITS AND SUPERVISORY BODIES

INFO + https://www-iuem.univ-brest.fr/observatoire

IUEM has been a Universe Science Observatory (OSU) since 2005. This structure, devised by the French National Institute for Earth Sciences and Astronomy (INSU) means OSUs can combine research units, develop long-term observation series and offer Masters and PhD studies.
The European Institute for Marine Studies (IUEM) performs observation-based research so it can predict future trends, including those relating to climate change. It can then establish the consequences of these for socio-ecological systems. Fred Jean, Director of IUEM, explains: *"IUEM is the only dedicated OSU in France which focuses solely on ocean sciences and coastal zones. It is overseen by CNRS, UBO and IRD".*

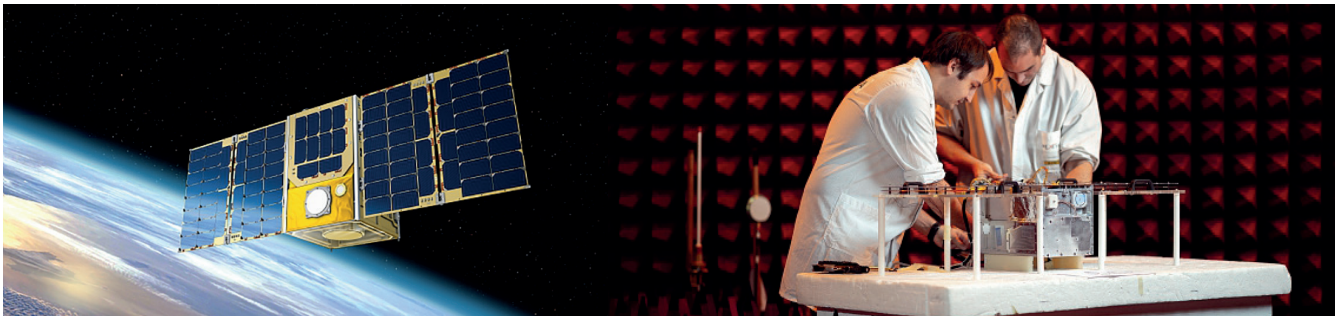
IUEM is made up of seven research units. It has great potential for interdisciplinary research spanning the fields of human and social sciences, sciences of the universe and life sciences. It is a unique focal point for marine science at national level. *"Its OSU status generates synergies between the parent bodies and the research units, allowing IUEM to create multidisciplinary observation, research and training programmes. These are key to understanding the way the ocean works."*

SEA-EU: UNITING EUROPEAN UNIVERSITIES AND PROMOTING MOBILITY

THE EUROPEAN UNIVERSITY OF THE SEAS BRINGS TOGETHER 6 DIFFERENT CAMPUSES.

The universities at Brest in France, Cádiz in Spain, Split in Croatia, Malta, Kiel in Germany and Gdansk in Poland joined forces in 2019 to work on marine science. Matthieu Gallou, President of the Université de Bretagne Occidentale (UBO), said: *"The issue which unites us is 'the resilience of coastal societies in the face of climate change'. It is something that affects all sectors, even including aspects such as culture and health."*
The SEA-EU programme is one of 17 to have won the first round of a call for proposals for university alliances supported by the European Union. *"We aim to forge stronger links and promote mobility between our universities. In particular, we plan to enable at least 50% of our students to study abroad within 10 years. We also intend to allow academic staff to launch joint research projects in our areas of study and travel to further their education and training."* The first scheduled evaluation of the SEA-EU programme will be in two years' time.

INFO + https://sea-eu.org/



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AUSTRALIA, GUEST OF HONOUR AT SEA TECH WEEK®

AUSTRALIA IS THE GUEST OF HONOUR AT THE 12TH EDITION OF SEA TECH WEEK® ORGANIZED BY CAMPUS MONDIAL DE LA MER FROM OCTOBER 12 TO 16 ON THE THEME OF MARINE OBSERVATION, FROM THE SEABED TO SPACE. THE OPPORTUNITY TO ZOOM IN ON THE LINKS BETWEEN THE AUSTRALIAN SMARTSAT CRC, OF WHICH THE LAB-STICC IS A MEMBER, AND BRETON RESEARCH ORGANIZATIONS.

"Super consortium" bringing together industry and academics to develop breakthrough technologies to initiate the development of Australia's space industry by transforming mining, agriculture and other sectors of the economy and aiming at contributing to the country's defence and national security needs, the CRC SmartSat, led by Prof. Andy Koronios, remains the largest such collaboration in Australian history to this day. Prior to being CEO & Managing Director of SmartSat CRC, Andy Koronios was a professor and the head of the School of Information Technology and Mathematical sciences at the University of South Australia (UniSA).

The participation of Brest stakeholders in this CRC is in line with the more general collaboration that Lab-STICC and its supervisory bodies have established with universities in the Adelaide region and ANU (Australian National University) in Canberra. This cooperation was established at the end of 2017 during the France - Australia merger stimulated by the Barracuda submarine program, won by Naval Group. It has grown steadily since then, in many other areas and in particular space through SmartSat. Three of Lab-STICC's supervisors have signed the SmartSat agreement as associate members: IMT Atlantique, UBO and ENSTA Bretagne. *"As such, we took part in the French-Australian SmartSat conference in Adelaide at the end of 2019 to present our activities dedicated to space, which clearly cover the axes proposed by the Australians. A first thesis bringing together the Lab-STICC and the University of Adelaide was also recently launched with the support of the Brittany Region and various researcher mobilities have already been organized"*, explains Gilles Coppin, professor at IMT Atlantique, and associate professor at the University of Adelaide and at UniSA. *"While SmartSat programs 1 and 2 are more oriented towards technological aspects such as payload design or satellite communication, program 3 offers subjects strongly aligned with the earth observation and remote sensing analytics and processing of satellite data, particularly maritime data, at the heart of the main theme of Sea Tech Week 2020, and in line with existing and future Breton initiatives".*

Professor Andy Koronios expressed his strong support for this French-Australian research and academic collaboration. *"SmartSat is committed to this very important collaboration between the French and Australian space research ecosystems. French research institutions such as IMT Atlantique, UBO and ENSTA Bretagne have very strong capabilities which align closely with SmartSat's research programs. We look forward to strengthening our collaboration with these partners and although the current global health challenges have prevented us from participating in person during the Sea Tech Week, we look forward to mapping our collaboration agenda and exchanging researchers and students as soon as possible"*, Professor Koronios explained. *"I offer my best wishes for the success of this year's virtual Sea Tech Week!"*

INFO + SmartSat CRC > https://smartsatcrc.com/
Lab-STICC > https://www.labstic.fr/en

WAVES: FROM BREST TO SAN DIEGO, CONSTRUCTIVE COLLABORATION

FABRICE ARDHUIN IS RESEARCH DIRECTOR AT THE LABORATORY FOR OCEAN PHYSICS AND SATELLITE REMOTE SENSING (LOPS) AT IUEM, UNIVERSITÉ DE BRETAGNE OCCIDENTALE. AT THE END OF JUNE HE RETURNED FROM A PRODUCTIVE YEAR-LONG COLLABORATION WITH THE UNIVERSITY OF CALIFORNIA SAN DIEGO.

Fabrice is an ocean wave specialist who has spent this year working on a numerical wave modelling tool which offers improved precision, especially with regard to wave height and direction. The main application for this tool is in the shipping industry and for naval operations.
Fabrice discovered during his time in San Diego how much constructive collaboration there could be between the expertise of his home institution and the data available in the States: *"UC San Diego is a pioneering marine science institution. You can't compare the budgets of a French university and an American university, but we can be very proud of the level of research we conduct in Brest. And our respective areas of expertise feed in to and complement one another."* For instance, Brest works a lot with data gathered by satellite, whereas UC San Diego works in situ. *"I shared my expertise with them, and in return I got to work with data which weren't available to me in Brest. This sort of collaboration can help improve our future research models."*

INFO + Fabrice Ardhuin is a co-creator of M.A.R.C, an online modelling tool: marc.ifremer.fr

TECHNOPOLE MARITIME DU QUÉBEC: A KEY CAMPUS PARTNER

FOR SOME YEARS NOW, CAMPUS MONDIAL DE LA MER HAS BEEN IN CLOSE PARTNERSHIP WITH TECHNOPOLE MARITIME DU QUÉBEC (TMQ), THE INNOVATIVE MARITIME NETWORK BASED IN RIMOUSKI. OUR RESPECTIVE REGIONS ARE WELL KNOWN AS HUBS OF OCEAN SCIENCE EXPERTISE, AND WORK TOGETHER ON INNOVATION IN SCIENCE, THE ECONOMY AND THE MARITIME SECTOR. WE INCREASE CONTACT AND INTERACTION BETWEEN REPRESENTATIVES OF RESEARCH AND INDUSTRY.

Rimouski is a city of 50,000 people where the Rimouski river flows into the Gulf of St Lawrence, 300 kilometres east of Quebec City. The city is renowned in Quebec's maritime sector as a centre of excellence, as illustrated by the cluster of specialist establishments there*. In 2010, Brest métropole partnered with the French Navy for a visit to Quebec on institutional, scientific and business aspects. This notably resulted in Brest métropole and Technopôle Brest-Iroise signing a cooperation agreement with TMQ.

FRUITFUL COOPERATION

Noémie Giguère, Executive Director at TMQ, elaborates: *"Technopole maritime du Québec is a nonprofit organisation that was established by regional stakeholders in 2000. Its influence now extends across the province, even reaching national and international level. Our members are spread across distances of over 1,000 km. This is a hub dedicated to science, technology, and marine biotechnology. Our objectives are mainly socio-economic in nature. We also aim to promote dialogue between industry and research, with a focus on innovation."*

The cooperation between TMQ and Campus has certainly borne fruit. *"Since we started joint projects with Brest, we have received support from the Canadian government fund for decentralised cooperation between France and Quebec. This shows how effective and beneficial the partnership is for both regions." TMQ plays an active part in Sea Tech Week every other year. Its members often visit France at other times too, and host French maritime contacts in Quebec. "This is a partnership which has enabled Brittany and Quebec to interact a great deal on research. For example, our research centres have exchanged ideas about fisheries and marine cartography."*

SEA TECH WEEK® AND OCEAN HACKATHON®

EDue to the health crisis arising from the Covid-19 pandemic, this year's Sea Tech Week will mainly be held online. *"Taking part is important for us, even if it is remotely. This is a major event, and one of the only international occasions we have on the horizon."* Another unique feature of this year's Week will be the Ocean Hackathon® which TMQ is organising - Canada's first. *"We are really excited. We announced a call for challenges, and nine were selected. The competing teams will tackle several topics relating to the Gulf of St Lawrence. The next thing to look forward to will be the grand final in Brest!"*

WHY A SOFT LANDING?

TMQ and its partners at Campus have also been helping companies through 'soft-landing' exchanges for two years now. These are part of an immersive programme of introduction to businesses in the other country which runs roughly once a year, both in France and in Quebec. Noémie Giguère explains: *"First we choose the candidates. Then we create a one or two-week programme during which they meet local and economic stakeholders - we tailor the programme to suit them." Participating companies have given very positive feedback on the programme. "They really appreciate the experience we've provided. Most companies are still in touch with the stakeholders from the other country. This also proves how relevant our partnership is, and how its influence is still spreading after ten years."*

**Rimouski is home to the Maritime Institute of Quebec (IMQ), Rimouski Institute of Marine Sciences (ISMER), Innovation maritime (IMAR), the Maurice Lamontagne Institute, the St. Lawrence Global Observatory, the Research and Development Center in Coastal and Ocean Mapping and the Marine Biotechnology Research Center (CRBM).*

INFO + https://tmq.ca/

FORESIGHT

MAKING ARTIFICIAL INTELLIGENCE AN ASSET FOR THE REGION

AI IS A TRUE GROWTH AREA RIGHT NOW, RECRUITING FROM A VARIETY OF PROFESSIONS AND CALLING ON RESEARCHERS' EXPERTISE. TWO MAJOR AI-RELATED PROJECTS WERE LAUNCHED IN BREST IN SEPTEMBER: MICROSOFT'S AI SCHOOL AND THE OCEANIX CHAIR AT IMT ATLANTIQUE.

On 19 October, 20 learners will join the first intake as Microsoft's French Tech Brest+ AI School opens its doors. These AI apprentices from a variety of backgrounds all share a love of maths and programming. John Queffelec, a consultant to Technopôle Brest-Iroise on artificial intelligence, helps dispel the mystery for us as this project arrives in our area: *"Artificial intelligence is a broad term which encompasses many different disciplines. The technologies which these disciplines produce need large amounts of data for their algorithms to work on. Microsoft's AI school aims to train people in the 'art and craft of handling data".* The school will produce developers capable of creating professionally deployable, structured databases.

WORKING WITH THE NINE BIGGEST EMPLOYERS

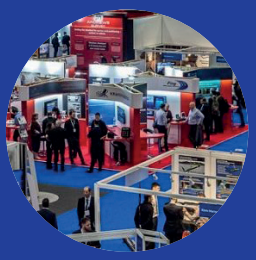
Successful applicants for a school place will receive seven months' intensive training at the ISEN engineering school, part of the Yncréa federation's Ouest region. This will be followed by a year on a part-time placement with one of Finistère's nine biggest employers: the university hospital (CHRU), Brest métropole, Crédit Mutuel Arkéa, Alcatel, Thales, Crédit Agricole, Eureden, Cap Gemini and Verlingue. *"All our employers need these skills. The trainees will receive a very practical education based on teamwork, which will get them up and running quickly."* The coming of this AI school is something for the Brest region to celebrate. *"This is the first time we have attracted a major digital player like Microsoft. This school lays the foundations for an excellent future with artificial intelligence in Brest. Ultimately, our locally trained talent will feed in to Finistère's AI ecosystem which is really vibrant. We offer fertile ground for business, as well as having banks and investment funds, all of which are helping to establish the AI school alongside academic research bodies."*

A CHAIR OVERLOOKING THE OCEAN

In another badge of honour for research in Brest, IMT Atlantique has a new chair of excellence for artificial intelligence as applied to oceanography: OceaniX. Ronan Fablet, Professor at IMT Atlantique and the current post holder, explains: *"This research chair will give us four years to make the most of the vast quantities of ocean data we have available. Developing artificial intelligence tools will allow us to use data from satellites, drones and floats. Ultimately we will gain a better understanding of what's happening in the ocean and be able to predict situations."* The work he describes could have an impact on areas such as shipping and climate change, especially through the study of ocean currents. The chair will bring together 15 permanent researchers from September onwards. *"We also enjoy support from industry partners, and 10 PhDs will be funded in this field. It is almost unique in France today to have such experts on ocean AI who can work on data supplied by technicians from the Microsoft AI School. They will give Brest an exceptional opportunity to be at the cutting edge of these research areas."*

INFO + For a list of OceaniX chair partners, see: https://rfablet.github.io/projects/2019-oceanix

SAVE THE DATE



Oceanology International 2020

[1-3 December 2020 in London]

Oceanology International has been the world's largest ocean technology exhibition and conference for over 50 years. With an audience of 6,000+ expected virtually and physically in 2020, it is a cannot miss event for those involved in exploring, monitoring, developing or protecting the world's oceans, from seabed to surface and beyond.

www.oceanologyinternational.com

Human Health and Ocean Symposium

[2-4 December 2020 in Monaco]

The purpose of the "Human Health and Ocean Symposium" is to provide an update on the various risks human activities expose the oceans to, and the threats that those activities and the resulting ocean degradation pose to human health, but also to consider the various benefits that the Ocean can bring to the health and wellbeing of populations.

www.oceanhealthmonaco.org

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