



THE JOURNAL OF CAMPUS MONDIAL DE LA MER



FUROPEAN BUSINESS STANDYATTON CENTRES NETWORK DEEAN AS A COMMON DENOMINATOR

NARWHAL CHALLENGE
THEY'RE DISCOVERING THE CAMPUS
AREA AND ITS COMMUNITY

MARINE CLUSTER

NEW PARTNER
OF CAMPUS MONDIAL DE LA MER

THE NEW JOURNAL OF CAMPUS MONDIAL DE LA MER



THE OCEAN: WHERE IT ALL BEGINS.

BIOLOGY AND MARINE TECHNOLOGIES, MRE, SHIPBUILDING, FISHING, HEALTH AND ECOLOGY. THERE ARE SO MANY DOMAINS LINKED TO THE SEA THAT UNITE A VAST COMMUNITY OF BUSINESS PARTNERS, STUDENTS AND MEMBERS OF INSTITUTIONS AND ASSOCIATIONS, ALL OF THEM BASED ON THE WEST TIP OF BRITTANY AND ITS 1,400KM OF COASTLINE.

Gathered in the Campus mondial de la mer, they're busily working together to put Brittany on the map thanks to its study into the marine sectors as well as to champion the development of a sustainable maritime economy, Blue Economy.

Within this journal you'll discover the actions that help all the protagonists of the Campus mondial de la mer to progress. The ocean is their profession and their passion. They hope to share this with you.

NEWS IN BRIEF



LINWOOD PENDLETON,

FRANCE'S EXPERT FOR THE DECADE OF OCEAN SCIENCE.

A teacher and researcher at the University of Western Brittany (UBO), a member of the AMURE laboratory within the IUEM (European Institute for Marine Studies) and an expert in marine conservation, Linwood Pendleton is France's sole representative within the group of experts consulted about the United Nations Decade of Ocean Science for Sustainable Development (2021-2030).

QUIET-OCEANS

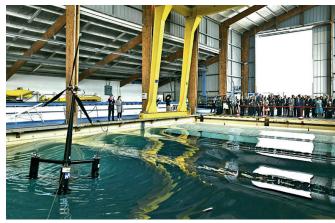
SECURES ITS FIRST CONTRACT IN CANADA!

Quiet-Oceans analyses underwater noise. Within this remit and thanks to the cooperation of the Technopole Maritime de Québec in Rimouski, Brest métropole and the Technopôle of Brest, the company has benefited from a soft landing experience in Québec. Result: a first contract followed by a selection at a call for tender. Quiet-Oceans heads off to tune into Canadian seas!



AT THE HEART OF THE G7 MEETING OF THE PARLIAMENTS' PRESIDENTS.

Last September, the Ifremer (French National Institute for Ocean Science) and the University of Western Brittany/IUEM hosted the G7 meeting of the Parliaments' Presidents to discuss marine-related challenges. Through visits, demonstrations, exhibitions and meetings with researchers, they tackled the preservation and governance of the seas and oceans. Objective of this day: to serve as a G7 brainstorming platform, which will fuel the agenda of the Decade of Ocean Science (2021-2030).



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THE CAMPUS MONDIAL DE LA MER OPEN TO THE WORLD

AT THE NORTH-WEST TIP OF EUROPE, AT THE HEART OF SEA BORNE TRADE, ON THE WATERFRONT: THE CAMPUS MONDIAL DE LA MER
BENEFITS FROM THE PERFECT VANTAGE POINT FROM WHICH TO EXERT ITS INFLUENCE THROUGHOUT THE WORLD. FOR ITS SECOND
ASSEMBLY MEETING, IT IS WORTH POINTING OUT THAT THE CAMPUS MONDIAL DE LA MER RELIES ON THREE FORMATIVE
AND COMPLEMENTARY DOMAINS: TRAINING, RESEARCH AND ECONOMIC DEVELOPMENT. TAKING ACTION LOCALLY AND GLOBALLY,
TAKING AN INTEREST HERE AND THERE: OUR ACTIONS AND OUR PROJECTS UNITE PEOPLE FAR BEYOND OUR BORDERS IN FINISTÈRE,
BRITTANY, FRANCE OR INTERNATIONALLY...







EUROPEAN MARINE BOARD / EUROPEAN BUSINESS & INNOVATION CENTRES

NETWORK: OCEAN AS A COMMON DENOMINATOR.

Pictures: Gilles Lericolais & Javier Echarri.

OCEAN PRESERVATION AND THE MARITIME ECONOMY REPRESENT AN EVEN GREATER PART OF TODAY'S MAJOR CHALLENGES. **THE PRESIDENT OF THE EUROPEAN MARINE BOARD, GILLES LERICOLAIS AND JAVIER ECHARRI, CEO OF THE EUROPEAN BUSINESS & INNOVATION CENTRES NETWORK,** DISCUSS THEIR VISION OF BLUE ECONOMY AND THE ROLE OF THEIR NETWORKS IN THESE FIELDS.

HOW IS BLUE ECONOMY INVOLVED IN INTERNATIONAL DISCUSSIONS?

Gilles Lericolais: The term 'Blue growth' emerged in 2014 within the "Horizon 2020" programme, but it has since been called into question as it is difficult to reconcile growth and sustainability. The terms more commonly used today are blue economy and bio-economy, where the desire is to move away from a fossil-fuel dependent economy to one based on natural and sustainable resources. Incorporating a vision of marine bio-economy, the latter can only be achieved through international cooperation. Our understanding of the ocean is, by its very definition, linked to international marine research. The ocean plays a key role in climate change and it is at breaking point, which is something scientists have been warning us about for many years.

Javier Echarri: Specific local features can influence and promote a degree of specialisation, which brings significant assets to each maritime region. However, growth also requires a globalised approach in this regard. Today, it is inconceivable not to link local activity to a global understanding of customers, markets developments and scientific progress. For companies, an understanding of the potential competition, which often stems from different disciplines, whilst addressing the same market, is absolutely crucial.

WHAT ROLES DO EMB AND EBN PLAY IN THESE COLLABORATIONS?

GL: EMB is a 34-member association spanning 17 European countries dedicated to oceanographic research, whose expertise is recognised within the context of the European Framework Programme. Its purpose is to ensure that the research necessary for sound knowledge and a good understanding of the oceans

is taken into consideration. This involves international partnerships with equivalent organisations such as the Consortium for Ocean Leadership or the Partnership for Observation of the Global Oceans.

JE: EBN is a network whose aim is to complement the support already offered by its members to innovative start-ups, scale-ups and SMEs at an international level. We do so by organising specific working groups for our members, notably in the maritime domain. Through these actions, EBN provides an international network of support organisations serving these companies in the maritime domain, as well as contacts with major corporate groups and investors

HOW IMPORTANT IS THE CAMPUS MONDIAL DE LA MER IN BOOSTING THE AREA'S APPEAL AND INFLUENCE?

GL: In addition to this area, it is important to pool knowledge and try to have a common vision amongst marine universities in order to educate future generations of researchers and teachers about the major issues in the domain of marine research, in order to prepare them for studying ways to preserve the global ocean.

JE: It is important to have a clear stand in each sector. Campus mondial de la mer has a rightful place in the maritime sector. Its international standing, together with the significant work it has done in the maritime domain in recent years in Brest and Brittany, means that the Campus is the perfect venue for maritime professionals on both a scientific and entrepreneurial level to come together.



ISblue:

A FRENCH GRADUATE SCHOOL SPECIALISED IN MARINE SCIENCES AND TECHNOLOGIES.

INAUGURATED LAST JANUARY, ISBLUE (INTERDISCIPLINARY SCHOOL FOR THE BLUE PLANET) FORMS PART OF THE 29 FRENCH GRADUATE SCHOOLS OF RESEARCH SELECTED IN 2017 WITHIN THE CONTEXT OF THE PROGRAMME D'INVESTISSEMENTS D'AVENIR (FRENCH INVESTMENT PROGRAMME).

Uniting two universities, four engineering colleges and three research bodies on the Breton headland, ISblue is geared at Master's and PhD students and aims to promote "training through and for research", explains the director, Anne-Marie Tréguier, "in order to train up future international experts in marine sciences and technologies".

A GLOBAL AIM

"ISblue shall make its mark on the global map for maritime-based training: it has the authority to become a reference for both French and overseas students". To achieve this, members are working on preparing new courses: "Masters (A level+5) very closely linked to the PhD and research, as well as being geared towards overseas protagonists. They will welcome more overseas students, whether



or not they are French-speaking, with courses in English". Subjects studied will include biology, physics and marine biochemistry, as well as management, sustainability of the coastline, integrated management of coastal areas, economics and law... "They are interdisciplinary courses, which draw on our members' multitude of skills and excellence". ISblue is already supporting new courses: online courses, ocean data science courses in English, apprenticeship in new techniques, specific tools (photogrammetry, modelling...) and seeks "to promote educational innovation and new lessons that take advantage of the latest technologies and advances in research".





BLUE TRAIN ON THE RAILS

The Blue Train project aims to flesh out both the initial training provision (Master's degree or professional path...) and the ongoing one (transverse, individualised and professionalised courses) in the domain of marine biotechnologies. Coordinated by Sorbonne University and supported by the Station Biologique de Roscoff (Roscoff marine station), it has Programme d'investissements d'avenir (French Investment Programme) approval, under the section "Partenariats

pour la Formation Professionnelle et l'Emploi" (Partnerships for Professional Training and Employment) and groups together a consortium of 24 public and private partners. A professional degree in Bio-industry Biotechnologies and Marine Biotechnologies has just been launched with 9 apprentices. Blue Train should enable around 250 students to be trained over 5 years, as well as 800 employees and jobseekers.

GOAT* PROJECT:

A UNIQUE COLLABORATION WITH INDIA.

THE ECOLE NAVALE (FRENCH NAVAL ACADEMY) IS TREATING ITSELF TO A GOLDEN PARTNERSHIP WITH THE INDIAN INSTITUTE OF TECHNOLOGY (IIT) WHICH IS BEING CREATED IN GOA. WHEN THE EXCELLENCE OF THE COURSE AVAILABLE ON THE BRETON HEADLAND COMBINES WITH THE ONE OF INDIAN ENGINEERS AND RESEARCHERS, IT IS POSSIBLE TO ACHIEVE A GREATER MUTUAL UNDERSTANDING OF THE SEA!

An IIT often comprises over 10,000 students and offers cutting-edge scientific and technical courses. India boasts around twenty IITs and one of them has concluded a partnership with an academic and industrial consortium in Brittany, including Naval Group, initiated by the Ecole Navale and headed up by the Campus mondial de la mer. "The IIT in Goa is one of the rare IITs close to the sea, with which we immediately got in contact, explains Matthieu Leclerc, director of development and partnerships at the Ecole Navale:

the idea is to develop lines of research linked to marine sciences and technologies".

Following on from the first official signing and two visits to Finistère by an Indian delegation during Sea Tech Week at the end of 2018



and last October, the first projects are emerging. "From MRE to marine biotechnologies, corrosion, naval construction as well as non-destructive testing, the common lines of development are numerous and appeal to both companies and researchers. For example, the Indians are keen to take inspiration from the Cedre** and reproduce it in India". The next step is the signing in January 2020 of a Memorandum of Understanding for students and researchers. "The first exchanges will be in the spring as the IIT in Goa will be sending some students over to continue their graduation projects in Finistère".

*for Goa-Atlantic

**Cedre: international expert in accidental pollution of the waters



NALANI SCHNELL IS EXPLORING THE FASCINATING WORLD OF FISH LARVAE.

NALANI SCHNELL-AURAHS IS A RESEARCHER AT THE MUSEUM NATIONAL D'HISTOIRE NATURELLE **(FRENCH NATIONAL MUSEUM OF NATURAL HISTORY).** IT'S IN CONCARNEAU THAT SHE PRACTICES HER SPECIALITY, THE STUDY AND CLASSIFICATION OF FISH LARVAE.

At 39 years of age, the young German researcher in systematics and comparative anatomy has already travelled a great deal: London, the US, Japan, Germany, then Paris and finally Brittany. "I asked to join the Concarneau marine station to establish a closer connection to my study topic". Why fish larvae? "Because they teach us a great deal about the evolution of the species. During my thesis on dragonfish in deep water, I noticed that they lack vertebrae. And it's thanks to the observation of the larvae that I understood where this phenomenon came from: the ossification of the spinal column starts with the tail in such creatures!" Therefore, the larvae make it possible to explain certain transitory structures and even make advances in taxonomy. They are also evidence of climate change. "The acidification of the ocean can slow skeletal development in certain species". Nalani Schnell records and classifies the larvae of the North Atlantic which flesh out the

Museum's vast collection, even breeding them herself and contributing to the citizen science project 'Objectif Plancton' thanks to which some 500 specimens from twenty or so families have already been put into the collection. "Sorting and identifying all the larvae protected by our collections would take me 5 lifetimes!"

INFO +: An exhibition of 65 photos of larvae taken by Nalani Schnell clad the railings of the "Jardin des Plantes" in Paris (until 5 January 2020).



IMBER FUTURE OCEANS 2: THE OCEAN FOR ALL.

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The Campus mondial de la mer welcomed the second edition of the IMBeR *Open Science Conference* in Brest in June: 540 researchers and students from 40 different nationalities participated in it and presented some very innovative results. The international IMBeR programme aims to understand and compare the structure of oceanic and human systems and the way they work in order to ensure sustainability.

INFO +: www.campusmer.fr/Actualités-IMBeR-2nd-Open-Science-Conference







SEABELIFE:DEPROGRAMMING CELL DEATH.

A START-UP TO PROMOTE BASIC RESEARCH: THIS IS THE CONCEPT BEHIND SEABELIFE, WHICH IDENTIFIES AND DEVELOPS MOLECULES OF MARINE ORIGIN CAPABLE OF PREVENTING PROGRAMMED CELL DEATH. A VITAL INNOVATION FOR EMERGENCY MEDECINE.

SeaBeLife is a young biopharmaceutical company created in March 2019 which "has been designed to develop molecules capable of treating acute pathologies by using an innovative mechanism of action: the deprogramming of cell death". Morgane Rousselot, doctor of biochemistry and chemical engineer, is the president of SeaBeLife. "Our primary focus for now is acute hepatic and renal failure, namely the sudden cessation of hepatic and renal functions, following such eventualities as hepatotoxic drug intoxication (through the likes of paracetamol) or nephrotoxic anti-cancer treatments".

COMBINING RESEARCH AND ENTERPRISE

SeaBeLife is also a story of researchers: two of the project's founders hail from the Roscoff marine station, the third from the IRSET (Research Institute for Environmental and Occupational Health)

in Rennes. "SeaBeLife enhances the value of basic research work, like the project NecroTrail, supported by the Institut National du Cancer (French National Cancer Institute), which studies regulated necrosis. We've also bombarded Roscoff's unique molecular library to identify molecules capable of deprogramming this necrosis". SeaBeLife, which is housed at the Roscoff marine station, is seeking investors to bolster its activity before canvassing pharmaceutical laboratories for marketing.



Picture: Morgane Rousselot © SeaBeLife



ITS COMMUNITY.

THIS MONTH, 7 PEOPLE FROM 4 START-UPS ARE VISITING BREST AND THE BRETON HEADLAND WITHIN THE CONTEXT OF THE NARWHAL CHALLENGE SUPPORTED BY LE VILLAGE BY CA FINISTÈRE AND CAMPUS MONDIAL DE LA MER. COMING FROM THE NETHERLANDS, THE FORU-SOLUTION ENTERPRISE RANKS AMONG ITS CANDIDATES.

NARWHAL CHALLENGE: IT ALL BEGINS IN EINISTÈDE

Since the spring, the start-ups and supporters of international projects within the maritime sector have been invited to apply to participate in the Narwhal Challenge, a week-long tailored immersion designed to offer international entrepreneurs an opportunity to discover the region's economic and academic assets, meet commercial partners and explore the extraordinary living environment. Boasting meetings with the network of companies and manufacturers, pitches in front of a community of experts and potential

investors, it is the ideal programme to present one's project. Next, an acceleration programme lasting several months in 2020 will enable start-ups to get a foothold in our region and settle here.

FORU-SOLUTION: "MEETING POTENTIAL PARTNERS"

Foru, which stands for Floating Oil Recovery Unit, is an innovative Dutch company specialising in the recovery of offshore oil. "It's an adjustable down-draught system that recovers oil at high speed, explains Director, Bert Sibinga. Our solution is robust and easy to deploy. It enables the recovery

© Foru-solution

of floating oil in ports and even rough seas in difficult offshore conditions".

Foru applied to the Narwhal Challenge to have the chance to come along and present its work. "In Brest, like elsewhere in the world, it's still difficult to apply the new environmental measures. Our solution may appeal to the region's partners or potential clients". Foru is already linked to Cedre, the French expert in water pollution and it is notably coming to Brest to meet with local economic protagonists.



POLYMARIS BIOTECHNOLOGY:

A MARINE-BASED BIODEGRADABLE PLASTIC.

FOR DOZENS OF YEARS POLYMARIS, BASED IN BREST (FINISTÈRE), HAS BEEN WINNING OVER THE COSMETICS SECTOR WITH ITS NATURAL POLYMERS THAT STEM FROM MARINE MICROORGANISMS. NOW, THE SME IS TAKING A VERY KEEN INTEREST IN BIOPLASTICS. IN 2020, IT WILL LAUNCH THE PRODUCTION OF A TOP-OF-THE-RANGE, 100% BIO-BASED AND 100% DEGRADABLE PLASTIC.

The scientific team has gathered together a collection of 1,000 microorganisms from the Breton coast. Among these, 7 have been selected for their ability to naturally synthesize sugar molecules (exopolysaccharides), which have enabled Polymaris to access the cosmetics market and collaborate with Phytomer, Biotherm and Chanel... as well as to work on water treatment for Engie.

Within this private and unique collection, one microorganism is really packing a punch: it naturally produces a biodegradable bioplastic. Though the principle behind microorganisms producing bioplastic has been known about since the seventies, never before has a marine clone been capable of producing so much.

Polymaris also boasts another asset which is enabling it to succeed where others have failed: industrial vision. They hope that their product, which is more expensive than classic plastics albeit more virtuous, will be able to enter top-of-the-range markets like aerospace and the medical domains...





NEW PARTNER OF CAMPUS MONDIAL DE LA MER.

CAMPUS MONDIAL DE LA MER AND SOUTH COAST MARINE CLUSTER, WHICH SHARE A NUMBER OF COMMON VALUES AND SIMILARITIES THAT ENABLE EXCHANGES IN THE ACADEMIC, GOVERNMENTAL AND ECONOMIC DOMAINS, HAVE JUST SIGNED A PARTNERSHIP AGREEMENT. THE PERFECT OPPORTUNITY THEN TO PRESENT THE BRITISH CLUSTER WITH ITS COORDINATOR, SHELDON RYAN.

WHAT IS THE SOUTH COAST MARINE CLUSTER?

Sheldon Ryan: It is a public, business and research partnership, which brings together the breadth of our ocean economy, which is working to continue to strengthen marine and maritime-related economic growth and productivity across the south coast of the UK. We focus on different fields such as marine research, environmental and digital technology, advanced marine engineering, offshore renewables, defence, as well as marine and maritime skills. We work closely with our national umbrella organisation for the ocean economy, Maritime UK.

WHAT ARE ITS MISSIONS?

SR: The cluster aims to champion and promote our sector internally, nationally and internationally, boost collaboration, investment in R&D and clean growth, as well as create centres of excellence to maintain a regional competitive advantage.

WHAT IS YOUR RELATIONSHIP WITH CAMPUS MONDIAL DE LA MER?

SR: We have just signed a collaboration agreement, which is a great step forward in formalising what is already a great relationship. In addition to this, there are already numerous organisational links, including Brittany Ferries, Thales and numerous existing skills and research partnerships that link our two clusters.

WHAT LED TO THE SIGNATURE OF THIS PARTNERSHIP AGREEMENT?

SR:South Coast Marine Cluster invited Campus mondial de la mer to exhibit at the Marine Tech Expo event in 2018. Following this, we exhibited at the Sea Tech Week in Brest. The opportunity to collaborate more was obvious to both organisations - plus you have amazing food and wine in France, so what's not to like?

WHAT DO YOU EXPECT FROM IT?

SR: Ultimately, both clusters see opportunity in working together. Our clusters both have world class ocean economies that have a strong offer for the rest of the world, particularly as we move to a more sustainable economy. While our ocean economies are very similar, we both have distinctive world class assets. Both clusters promote clean economic growth: if we can increase understanding and collaboration between the two areas then I am sure that this will lead to additional trade and innovation.

HOW ARE THE TWO ORGANISATIONS GOING TO WORK TOGETHER?

SR: We have met with and promoted our offer to numerous global maritime clusters, which is great but with Campus mondial de la mer in Brittany, we can take practical steps to establish partnerships and collaborations, helped of course by our proximity, and great transport links through Brittany Ferries. Our collaboration agreement is just a first step towards working more closely together. We have agreed a reciprocal soft-landing offer, where businesses will receive support to establish their business across the Channel with local advice on finding premises, skills, business support and customers. To kick start this, in December, Campus mondial de la mer has done excellent work in brokering a bespoke set of meetings in Brittanu for a trade delegation from South Coast Marine Cluster. Looking at the meetings schedules, it seems like we have a lot of opportunities for collaboration around autonomy, aquaculture and offshore renewables. In June 2020, our cluster will do the same in the UK. As part of our collaboration agreement, we have agreed to partner our parallel marine technology events, Marine Tech Expo and Sea Tech Week. We are also keen to collaborate around digital events including the Ocean Hackathon®, where Campus mondial de la mer has established a really successful model.

«Our clusters both have world class ocean economies that have a strong offer for the rest of the world.»



ALL FOR APPLICATIONS

After a 4th edition simultaneously gathering together over 350 participants across 8 cities in France and Mexico, in early 2020 the Campus mondial de la mer will be launching its call for applications to roll out Ocean Hackathon® with a greater international emphasis. The 5th edition will take place from 9 to 11 October 2020.



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OCEAN HACKATHON®:

A FOURTH INTERNATIONAL MULTIPLE-VENUE EDITION.

THE CHALLENGE OCEAN HACKATHON® LAUNCHED EACH YEAR BY THE CAMPUS MONDIAL DE LA MER STIRS UP A FEVER PITCH OF EXCITEMENT FOR A WEEKEND. DURING THE FOURTH EDITION IN OCTOBER 2019, 350 PARTICIPANTS SIMULTANEOUSLY WORKED ON PROJECTS IN BREST AND 7 OTHER CITIES, INCLUDING MEXICO. THE GRAND FINALE IS SCHEDULED FOR 12 DECEMBER DURING THE CAMPUS ASSEMBLY IN BREST.

"Algorithm for the remote detection of Sargasso": such was the prize-winning project from Mexico at the last Ocean Hackathon® organised in Brest and multiple other venues back in October. The first international participation for this hackathon dedicated to marine-related digital data, it was the obvious choice choice for Valérie Barbosa, from the French Embassy which backed Mexico's involvement: "the organisation of the Ocean Hackathon® in Mexico seemed extremely timely as it enabled us to promote scientific cooperation within an innovative context and showcase two of our central themes: ocean and artificial intelligence". The Embassy applied on behalf of Mexico and worked closely with the Campus:

"the organising team demonstrated a great deal of flexibility and patience in adapting to our needs and specific requirements with catch-up meetings via Skype or phone, the creation of specific communication material

and the implementation of a registration portal in Spanish together with the adaptation of promotional items..." In Mexico, the event stirred up considerable enthusiasm and benefited from 8 partnerships with institutions, "and the public response has been very positive, since we've received 120 registration requests for just 55 places!" The participants, tutors and those taking on the challenges are very pleased with the hackathon experience: "everyone highlighted the very positive atmosphere and dynamism of the event. The Speed Learning sessions were very much appreciated, as was the mini aperitif/ pizza/music night on the Saturday. Those involved with the institutions marvelled at the results obtained after the intensive 48hrs stint of work." This success means that we can already plan for the 2020 edition in Mexico: "we're very much hoping to get other coastal cities involved too".







SAVE THE DATE!

OI London

[17 > 19 March 2020

Oceanology International: the 49th edition of the largest exhibition of marine sciences in the world is held in the UK with the aim of helping you get your fill of the latest innovations and technological advances.

European Maritime Day

[14 > 15 may 2020]

Meet in the port city of Cork (Ireland) for the European Maritime Day and its numerous workshops, conferences and meetings geared around the Blue Economy and the future of the oceans.

Brest International Maritime Festival

. 10 > 16 july 2020]

For its 8th edition, the Maritime Festival is taking you on a circumnavigation of the globe with 6 stopovers and as many exotic new surroundings, whilst shining a spotlight on the scientific and climatic challenges faced by the ocean.