



COLUMBUS Brokerage Event

Knowledge Transfer in
Maritime Sensing Technologies



www.columbusproject.eu



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INTRODUCTION

The EU Strategy for Marine and Maritime Research (COM (2008) 534) underpins the EU Integrated Maritime Policy. Through excellence in science and innovation, it aims to support a thriving and sustainable marine and maritime economy. Science and technology have a vital role to play preserving the marine environment as well as supporting the **Blue Growth** strategy to enhance the economic potential of our seas and oceans. As such it is intended to be a key component that contributes to the **Europe 2020** goal of smart, inclusive and sustainable growth for Europe.

The Europe 2020 Flagship Initiative Innovation Union (2010) states: "We need to get more innovation out of our research". The European Commission focused on improved systems and methodologies for knowledge capture and transfer and a need to demonstrable impact from EU-funded research.

The Horizon 2020 COLUMBUS project is organizing a knowledge brokerage event in the framework of the AtlantOS General Assembly meeting.



The **COLUMBUS project** brings together 27 partners from 12 European countries. The project aims to ensure that applicable knowledge outputs generated through EU-funded science and technology research can be transferred effectively to advance the governance of the marine and maritime sectors while improving competitiveness of European companies and unlocking the potential of the oceans to create future jobs and economic growth in Europe (Blue Growth). Marine knowledge is generated, to a large extent, through analyses and application of the data and information obtained through monitoring and observation of our seas and oceans. The COLUMBUS project is structured around nine areas of competency, or nodes, including one on Monitoring and Observation. The Monitoring and Observation node has been examining some of the barriers preventing greater re-use of marine data and recently produced a best practice guide to promote the 'Use and Sharing of Marine Observations and Data by Industry' (http://www.columbusproject.eu/Columbus_engage_industry_best_practice.pdf).

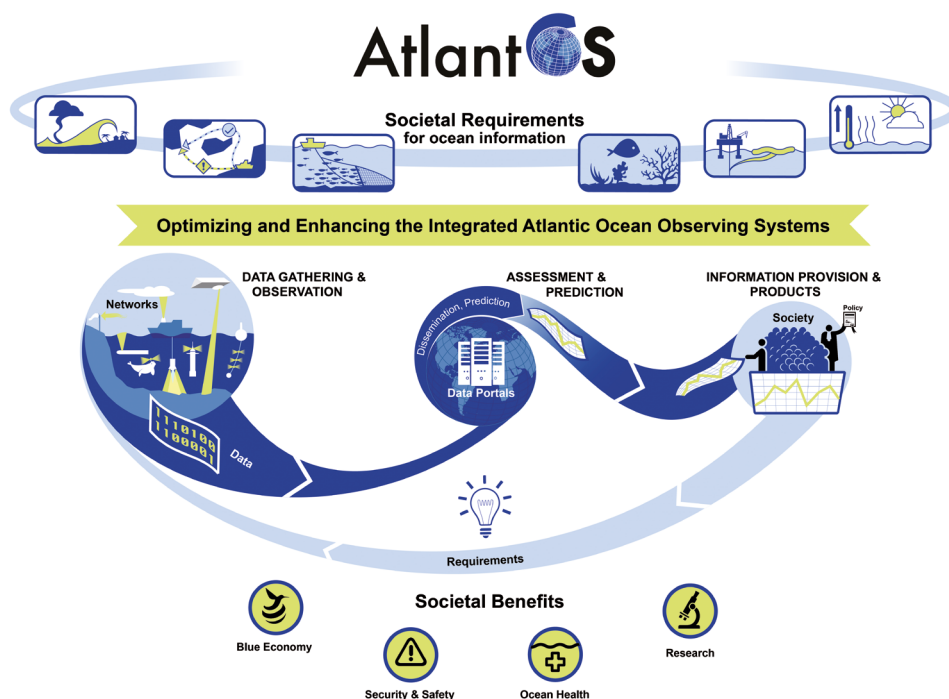


The **AtlantOS project** brings together 62 partners from 13 European countries as well as South Africa, Brazil, USA and Canada. The project aims to improve and innovate Atlantic observing by using the Framework of Ocean Observing towards an international, more sustainable, more efficient, integrated, and fit-for-purpose system. The AtlantOS initiative will have a long-lasting and sustainable contribution to the societal, economic and scientific benefit arising from this integrated approach. This will be delivered by improving the value for money, extent, completeness, quality and ease of access to Atlantic ocean data required by industries, product supplying agencies, scientists and citizens.



The value chain linking research and innovation to the aim of societal benefit by policy and individual decisions is based on best available scientific information and exchange, of which ocean observation is one part. Advancements in ocean research, technology, analysis, data management, information and synthesis products, operational services and commercial activities, and security on regional and national level are the main fields of application and impact of sustained ocean observation to generate added value. To enhance progress in the development of ocean observing systems it is key to increase the networking between research institutes, technology providers and stakeholders. **AtlantOS Newsletter, Volume 1, Issue 2.**

AtlantOS supports the value chain from observation to societal benefit



COLUMBUS is organizing specialized **brokerage events** as part of its communication, engagement and knowledge transfer activities, fostering collaboration between marine and maritime stakeholders and supporting transfer of research outputs to users. The AtlantOS General Assembly is an excellent opportunity to bring together representatives from some of the main stakeholders in the ocean observing and marine data value chain including, data gathering, i.e. sensor and observing platform developers, sensor interoperability experts, and product generation, i.e. data format, use and sharing experts. This brokerage event will facilitate the encounter between:

- European companies, focused on maritime sensing technologies and/or observing platforms that have recently participated in the development of new sensors, with the support of the European Commission-funded research and innovation projects ;
- Expert companies and institutions in marine sensor interoperability, data collection and transmission, and data sharing and use that will provide innovative cutting-edge solutions mostly developed with the support of the European Commission in the framework of research and innovation projects;
- Many of their potential users, among the AtlantOS partners, representing the European oceanographic and ocean observing and monitoring community.

Knowledge Output Definition

A **Knowledge Output** is the term used to describe a unit of knowledge that has been generated during a scientific project. It is not limited to 'de-novo' or pioneering discoveries but may also include new methodologies/ processes, adaptations, insights, alternative applications of prior know-how or knowledge . **COLUMBUS project**.

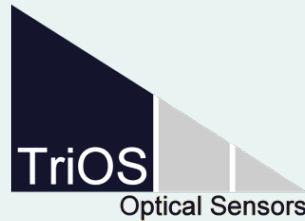
Harald Rohr



Harald Rohr is working at TriOS in Rastede, Germany. He received his diploma in physics from Bremen University in 2001.

Directly after his studies he was engaged by Optimare where he was responsible for services like sensor application in several scientific cruises, data processing and programming of data analysis tools for scientific institutes working in physical oceanography. During a fifteen-year engagement he has also led several R&D projects, like the development of the NEMO float and finally he became the head of the marine observing systems division in 2010.

In the beginning of 2016 he joined TriOS, where he is working in the R&D department. His focus is on the design and development of sensor systems and platforms accompanied by being project manager for R&D projects, especially those with a strong link to marine and ocean science.



TriOS Mess- und Datentechnik GmbH was founded in 1998 as a spin-off company of the University of Oldenburg by Rüdiger Heuermann.

TriOS is specialized in the development and manufacturing of optical sensors for measuring biological and chemical parameters in seawater, freshwater, drinking water and wastewater applications. Hyperspectral detection and analysis is one of the key techniques used for these sensors. Beside this also fluorescence techniques are used for various sensors.

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Yves Degrés



Electronical engineer Yves Degres is in charge of oceanographic instrumentation activity at nke since 1993. Since 2012, he is the managing director of the nke instrumentation company.

He has long experience in the development and commercialization of oceanographic instruments, and collaboration in R&D projects and international programs.



Nke instrumentation is a French company which develops, manufactures and commercializes oceanographic measuring instruments, since 1993.

Activities overview:

- Profiling Floats for oceans monitoring: ARVOR and Deep ARVOR type for CTD and DO measurement (Argo program), PROVOR type for BioGeoChemical application.
- Autonomous recorders for in-situ measurements in continental and marine waters. Multiparameter probes to measure standard physico-chemical parameters: Temperature, Pressure, Conductivity, Dissolved oxygen, Turbidity, Fluorescence, pH... Dedicated sondes to measure specific parameters: Force, Erosion slope, Corrosion.
- Sensors for water monitoring: Density, Turbidity, Conductivity-Temperature, pCO₂ and Silicate (New).
- Automated instrumented systems for environmental monitoring: instrumented buoys, EAF system for fishing vessels.

To support its internal R&D, nke instrumentation participates to national and international research programs, in collaboration with scientific institutes and private companies.

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Brokerage Event

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Hervé Precheur



Hervé Precheur is an electronics engineer, with more than 20 years of experience in the field of design and manufacture of instrumentation.

He has always been working in SMEs, where he has always been holding simultaneously technical and management positions, in companies in Spain and France, managing projects in Europe, China and the US.

In 2011 he cofounded Sensorlab, with two colleagues from the University of Las Palmas de Gran Canaria, that had developed a Spectrophotometric pH sensor. This has been his first experience in the oceanographic field.



Sensorlab started as a company manufacturing high accuracy Spectrophotometric pH sensors for oceanographic research, and has been since then working in other products such as a sensor routing platform, using SWE standards, as well as collaborating in the development of an optical interrogator for Fiber Bragg Grating sensors. It is also providing engineering services to other companies in the electronic instrumentation and telecom fields.

Website: www.sensorlab.es

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Carmem-Lara de Oliveira Manes



Carmem-Lara MANES is co-founder and R&D Director of Microbia Environnement. She is the company's responsible for R&D strategy, R&D programs and product development, coordinates the company's scientific staff and also works as a consultant of innovative solutions for environmental diagnosis of harmful microorganisms.

Since 2003, she holds a PhD in Biotechnology with an expertise in environmental microbiology, microbial diversity and big data handling. She has worked for over ten years in the academic sector (University Pierre et Marie Curie, CNRS - France) as an associate researcher in projects related to eukaryotic cell division and lately environmental microbial diversity. For the last five years her experience led her to the private sector where she worked as a consultant in the Water Desalination and Reuse Center at KAUST (Saudi Arabia) and as a team leader in the Institute of Technology Vale for sustainable development in Brazil before co-founding with Delphine GUILLEBAULT their own company, Microbia Environnement in 2013. Microbia Environnement is actually participating to the EU-SMS project (www.project-sms.eu) and its scientific staff was involved in several other EU projects dedicated to the development of molecular tools for toxic microorganism detection in the environment (e.g. FP5-DETAL, FP7-MIDTAL, FP7-uAQUA) and to the characterization of microbial diversity in water treatment processes (FP6-MEDINA). Currently Carmem-Lara MANES is in charge of product development for the EU-FP7 SMS project, as a partner PI, that will bring an innovative solution for an automatized system to detect several toxic microalgae.



SAS MICROBIA ENVIRONNEMENT is an innovative French startup company located in the Eastern Pyrenees founded in April 2013 by two researchers specialized in molecular biology and biotechnology, Dr Delphine Guillebault and Dr Carmem Lara Manes.

This company is intended to provide molecular tools and expertise in the field of environmental microbiology for various public and private economic actors in the water quality sector. MICROBIA ENVIRONNEMENT has two main strategic activity domains as a supplier of microbial diagnosis kits and as a provider of innovative solutions for quality analysis of environmental water. Because of a strong expertise in the field of biosensors and microarrays, one of its main objectives is to answer the end-user increasing needs of warning systems to anticipate risks linked to toxic or pathogenic micro-organisms providing fast, accurate & costeffective solution. Therefore, the company designs, develops and sells diagnosis kits for toxic/pathogenic environmental microorganism using microarrays and biosensors-based technologies. The company is responsible for the distribution of a microarray-based kit, resulting from the EUMIDTAL project (FP7), for the detection of marine toxic algae that provides rapid species simultaneous identification of toxic algae in seawater environments in few hours.

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Natalia Arure Álvarez Rojas



With a degree in Civil Engineering and an MSc in Marine Renewables, Natalia brings knowledge and expertise in engineering to the Aquatera Team. Prior to joining Aquatera in 2013, Natalia developed various projects related high roads drainage, river channellings and hydrology and hydraulic modelling for an engineering and architecture group in Spain.

She has also worked as a site manager and been in charge of various coastal constructions, leading teams of more than 30 people. She was tasked with managing the construction of a 3 km coastal promenade for the Spanish Government, demolition works and various national trails. Since shifting her focus to marine renewables, she has had the opportunity to work for Marine Scotland installing radars for the measurements of waves in the North Sea. Natalia's is keen to expand her experience and knowledge to support the marine renewable energy sector around the world.

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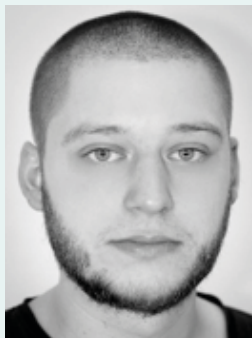


Aquatera was established in 2000 to provide a modern and innovative suite of environmental services and products. The company delivers to local, UK and worldwide markets and has established a strong track record in the renewable energy and other energy sectors. This work includes preparation of strategic environmental assessment (SEA) and environmental impact assessment (EIA) documents for renewable energy projects and strategies, as well as resource assessment studies, risk assessments, design advice, operations support, environmental surveying, developing visualisation tools and producing information and awareness materials.

Aquatera has a passion for renewable energy development, believing that it can provide substantial amounts of quality energy, which can be used to offset energy produced from carbon-emitting technologies.

In addition to experience in renewable energy, Aquatera and its associates have a vast knowledge of wider environmental and social studies, particularly in offshore and coastal areas. The team has completed numerous research projects, including a number funded by the UK Department of Trade and Industry (DTI) and other government bodies, and are expert practitioners in their various fields. Aquatera's support IT, multimedia and graphic design specialists are also leaders in their respective fields.

Christian Autermann



Christian Autermann works as researcher and senior software architect for the 52°North Initiative for Geospatial Open Source Software. Christian hold a Master degree in Geoinformatics and is currently pursuing his PhD dealing with the handling of large data sets within Sensor Web infrastructures.

His work is focused on Sensor Web technology as well as on Web-based Geo-Processing concepts. Besides this, he is an expert in the design of distributed software architectures, as well as database technologies including conventional RDBMS, but also other technologies such as SQLite, MongoDB or SciDB. In this context, Christian Autermann regularly conducts research as well as professional consulting and software development projects providing his expertise to customers in domains such as marine science, hydrology, and environmental monitoring.

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2°North Initiative for Geospatial Open Source Software GmbH coordinates activities of partners from research, industry, and public administration. Its mission is to foster the development of new concepts and technologies in Geoinformatics, in particular Sensor Web, Web-based Geoprocessing, Earth Observation, and Metadata.

The company has a long and outstanding record in the Geo-IT domain and is significantly contributing to the development of international standards. For example, 52°North is involved in the OGC and in the advancement of the INSPIRE directive. A pro-active innovation strategy is a central element of 52°North's activities. This becomes manifest in European and national research projects as well as the company's involvement in OGC Testbeds. This is complemented by consulting and software development projects helping customers to integrate up-to date technological developments into their operational infrastructures. 52°North focuses on the development of open source software to promote the use of its developments and to motivate external developers to contribute to the advancement of 52°North software. 52°North Sensor Web implementations are used by many parties in domains such as oceanography, hydrology and environmental monitoring. 52°North acts as a non-profit organization based on its shareholders agreement.

Brokerage Event

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Sergio Martínez Navas



Sergio Martínez is an engineer in computer systems and electronics graduated from the University of Barcelona, where he also started his professional career within the electronics department. He specialized in the development of critical real time embedded systems with wireless communications interfaces for the automotive and other specialized sectors. At the same time, he presented his master thesis in

electronics engineering, focusing on instrumentation and communication systems.

Since 2011, he is working at LEITAT within the Energy and Engineering Business Unit by providing integrated solutions to clients based on embedded software and image/data processing systems.

Since 2017, Sergio Martínez Navas is Principal Engineer leading the Embedded Processing and Communications group.

Most of his activities are developed in the framework of European projects, including the technical coordination of COMMON SENSE project, participation on working groups and involvement in different platforms. He recently started working on two large Horizon 2020 projects (ODYSSEA and CONNECT) in the field of embedded systems.

Website: www.leitat.org

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LEITAT (non-profit private association) is a Technological Centre specialising in production technologies. LEITAT develops R&D activities in the

areas of smart systems, materials sciences, environment, surface treatments, biotechnologies and renewable energies with extensive knowledge and experience in technological transfers and working within several industrial sectors.

LEITAT takes part each year in many projects financed by the regional and national governments, participates in projects co-funded by the European Commission and develops private R&D projects funded by industrial partners.

Energy & Engineering Business Unit is a multidisciplinary team who deal with physics, chemistry, mathematics, electrochemistry and engineering disciplines (electronics, mechanical, telecommunications, materials engineering).

The expertise in Smart systems area is focused on the development of those activities that use Information and Communication technologies in order to support the R&D in new concepts of intelligent systems based on autonomous sensors-actuators networks; industrial applications of smart systems; remote sensing and wireless networks; thermoelectric, energy harvesting and signal treatment and processing.

PROGRAMME

DAY: 23 November 2017

VENUE: Auditorio Alfredo Krauss, Las Palmas de Gran Canaria, Gran Canaria, Spain

TIME: 11:15 to 13:00, Conference Hall, in the framework of AtlantOS General Assembly session
Cross-cutting Issues and Emerging Networks: Sensors and New Instrumentation

ORGANIZERS: Ayoze Castro and Eric Delory (PLOCAN, Spain), Jay Pearlman (IEEE), Oonagh McMeel (Seascape), Dina Eparkhina (EuroGOOS), Natalia Arure (Aquatera, UK), and Matthew Mowlem (NERC-NOC, UK)

TIME	TITLE	SPEAKER	EC PROJECT
11:15 – 11:20	Opening: AtlantOS WP6 Knowledge transfer in new sensors & instrumentation	Jay Pearlman, WP6 Co-leader	ATLANTOS
11:20 – 11:25	Introduction to COLUMBUS and Ocean of Tomorrow Sensor Clustering	Oonagh McMeel, COLUMBUS Observation and Monitoring Competence Node	COLUMBUS
11:25 – 11:30	Knowledge Transfer and Innovation in Optical Sensors	Harald Rohr, TRIOS Ltd	NeXOS
11:30 – 11:35	Knowledge transfer and Innovation: Nutrient Electrochemical Sensor and EAF Sensor	Yves Degrés, Managing Director of NKE Instrumentation	NeXOS, SenseOCEAN
11:35 – 11:40	Knowledge transfer and Innovation: new interoperable pH sensor	Hervé Precheur, CEO of SensorLab S.L.	NeXOS
11:40 – 11:45	Knowledge transfer and Innovation: Compact Autonomous Sensor for Toxic Algal Species	Carmem-Lara, R&D Director of Microbia Environment	SMS
11:45 – 11:50	Knowledge transfer and Innovation: Low cost scalable sensor arrays for large scale hydrodynamics measurement	Natalia Rojas, AQUATERA Ltd	LAKHSMI
11:50 – 11:55	Knowledge transfer and Innovation: A novel MicroPlastics Sensor	Sergio Martinez, Principal Researcher in Smart System Area, LEITAT	COMMONSENSE
11:55 – 12:00	Knowledge transfer and Innovation: The COSTOF2 Controller	Corentin Troussard, International Sales Manager - RTsys	EMSODEV
12:00 – 12:05	Knowledge transfer and Innovation: Marine Sensors Interoperability	Christian Autermann, Manager in 52 North	NeXOS Bridges
12:05 – 13:00	Expert Panel on Sensor Systems Knowledge & Technology Transfer from Research to Market Moderator: Jay Pearlman - Setting the Scene: Perspectives from major research, observation and data infrastructures in Europe: Matt Mowlem (National Oceanographic Centre Southampton, UK), Erik Buck (European Global Ocean Observing System) and Jan-Bart Calewaert (European Marine Observation and Data Network) - Panel discussion with representatives from participating SMEs		

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