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Projects presentation**

« MEDITERRANEAN » 2018 CALL FOR PROJECTS

PROJECTS PRESENTATION

April 2020

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INTRODUCTION

The A*Midex Foundation, Initiative of excellence for the Aix-Marseille site, launches its second “Mediterranée” call for projects with the **objective of encouraging and supporting the development of Euro-Mediterranean collaborations with favoured research partners.**

The project must propose a **research-action** approach including a significant experimental aspect at local level. Emphasis was also placed on **interdisciplinarity and intersectorality**, in order to generate new knowledge, and the **strengthening of incoming and outgoing mobility within the Mediterranean basin**, in order to reinforce partnerships.

The objectives of this call for projects were to:

- Support long-term and ambitious Euro-Mediterranean partnerships
- Encourage the emergence of new avenues of reflection to consider the complexity of the Mediterranean region, its relationship to territories and human beings, and its impact on ecosystems
- Reinforce the positioning of the Aix-Marseille site as a major stakeholder at European and Mediterranean levels

For more information: read the [framework text](#) for this call

6 projects were selected in the frame of the « Mediterranean call for projects 2018 » for a total budget of **479 800€**. They were selected after an independent scientific evaluation, by two international experts per project, and were officially “labelled” by the A*Midex Steering Committee on 18 March 2019. The six projects started between 1st September 2019 and 1st February 2020, and have a duration of 2 years, extended to 3 years for projects wishing to organise themselves in view to submit a European project application in the final year.

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A*MIDEX MEDITERRANEAN PROJECT | “HOLODIV”
COLLABORATIVE PROJECT, COORDINATED BY DIDIER
AURELLE, WITH ALGERIA AND TURKEY



HOLODIV project, led by Prof. Didier Aurelle, and scientifically co-led by Marc Bally and Christelle Desnues, labelled by the A*Midex Foundation in the framework of the "Mediterranean 2018" call, started its activities in September 2019. This project strengthens Aix-Marseille's cooperation with the University of Istanbul in Turkey and the University Badji Mokhtar in Annaba in Algeria.

The project entitled "*Hologenome diversity and adaptation in Mediterranean gorgonians: tools for new management strategies of marine forests*" (HoloDiv) aims to contribute to the knowledge of the ecological status of Mediterranean ecosystems, which is essential for the preservation and management of biodiversity, particularly within marine protected areas (MPAs). The project will explore the adaptive potential of a structuring species of Mediterranean benthic ecosystems, the yellow gorgonian *Eunicella cavolini*, through an **integrated study of its genetic and microbial diversity (hologenome)**. A large part of the interest of the project lies in particular in the use of genomic tools that provide access to information on the evolution and response of species to **environmental constraints**.

The project will study populations in the East and West, North and South basins of the Mediterranean that are subject to local anthropogenic pressures (pollution, fishing) or preserved (MPAs). Genetic diversity, population demographics, and local adaptation of gorgonians will be studied. At the level of associated microbiomes, a global analysis of diversity (bacteria, viruses, eukaryotes) will be completed by a detailed study of the variations of certain key taxa. These results will be compared to standard ecological indicators to better understand the status and trajectories of the populations. The genetic tools developed will feed into a discussion with MPA managers for the design of innovative actions to promote population evolution.

The project is implemented at the [Mediterranean Institute of Oceanology \(MIO\)](#) in Aix-Marseille (UMR AMU-CNRS-IRD-UTLN), in association with teams from the [Microbes Evolution Phylogénie et Infections \(MEPHI\)](#) laboratory in Aix-Marseille (UMR AMU-IRD-CNRS) in partnership with the **University of Istanbul** in Turkey and the **Badji Mokhtar University** in Annaba, Algeria, as well as IFREMER (France) and the Calanques National Park (France). Collaboration between the various

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Mediterranean partners will make it possible to study these species under very different environmental conditions and over a wide geographical area. The involvement of Algerian and Turkish partners is essential for the ecological study of these gorgonians in their respective countries. This project will thus strengthen existing collaborations between AMU, Turkey and Algeria.

HoloDiv started on 1st September 2019 for a duration of 36 months. Over this period, the project will be supported by the A*Midex Foundation with a grant of 80,000 euros.

Contact: [Didier Aurelle](#)

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A*MIDEX MEDITERRANEAN PROJECT | “ADOSYN”
COLLABORATION PROJECT, COORDINATED BY RÉGIS GUIEU,
WITH SPAIN AND ITALY



ADOSYN project led by Prof. Régis Guieu, labelled by the A*Midex Foundation in the framework of the "Mediterranean 2018" call, started its activities in October 2019. This project strengthens Aix-Marseille's cooperation with the University of Florence (Italy), the University of Naples - Frederick II (Italy), and hospital institutions in Spain and Italy.

The project "**Adenosine profile characterization in neurocardiogenic syncope : an European multicentric investigation**" (ADOSYN) aims to **improve the diagnosis and treatment of neurocardiogenic syncope (NCS)**. SCNs are the most common syncopations on healthy hearts, affecting 40 per 1000 subject-years and profoundly altering the quality of life of patients due to falls and loss of autonomy. The precursor symptoms (nausea, sweating, abdominal pain, etc.) are inconsistent, and pharmacology is currently lacking in this area. The project is part of a longstanding Mediterranean collaboration in NCS research through a syncopated research network. It will provide a **better understanding of these syncopes and their prodromes (precursor symptoms) in order to better guide their treatment**. In particular, the project focuses on non-prodromal SCSs which are the most disabling because the patient does not have time to sit or lie down to limit falls, which can lead to serious accidents when unconsciousness occurs at the wheel or in the water, for example. This type of syncope sometimes requires the insertion of a pacemaker. The team of Prof. Régis Guieu and Prof. JC Deharo (Hôpital de la Timone, Marseille) have highlighted the involvement of a molecule, **adenosine**, which is responsible for a large part of the clinical manifestations, because this molecule released into the bloodstream has the power, in predisposed patients, to slow the heart rate and cause dilatation of the vessels creating a sudden drop in blood pressure. The aim of the project is to **collect blood samples from different centres around the Mediterranean** and to analyse adenosine concentrations, but also to analyse the pharmacological profile of its receptors as well as genetic polymorphism.

The project is being implemented at the [Centre de recherche CardioVasculaire et Nutrition](#) (C2VN) in Aix-Marseille (UMR AMU-INSERM-INRA), in conjunction with the Assistance-Publique des Hôpitaux de Marseille (AP-HM) and in partnership with the **University of Florence** (Italy), the **Tigullio Hospital** in Lavagna (Italy), the **Dexeus University Hospital** in Barcelona (Spain), and the **University of Naples - Frederic II** (Italy).

ADOSYN started on October 1st, 2019 for a period of 24 months. Over this period, the project will be supported by the A*Midex Foundation to with a grant of 80,000 euros.

Contact: [Régis Guieu](#)

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A*MIDEX MEDITERRANEAN PROJECT | "ENZIM-FC"
COLLABORATIVE PROJECT, COORDINATED BY LUCA
PASQUINI, WITH ITALY



From left to the right : Chrystelle Lebouin (MADIREL) Anne de Poulpiquet (BIP), Maria Luisa di Vona (Univ. Tor Vergata - Rome), Luca Pasquini (MADIREL)

Dr. Luca PASQUINI's project, named "ENZIM-FC", was approved by the A*Midex Foundation as part of the "Mediterranean 2018" call. It began its activities in October 2019. This project will strengthen Aix-Marseille's cooperation with the Tor Vergata University of Rome (Italy).

Research into energy storage and conversion devices is an important challenge for humanity at the beginning of this century. The project entitled "**ENZymatic Ion exchange Membrane Fuel Cells (ENZIM-FC)**" aims to realize a **miniaturized enzymatic H₂/O₂ fuel cell** using a separating membrane made of an ion-exchange polymer (ionomer) and with a "Membrane Electrode Assembly" structure. The combination of enzymes with high catalytic specificity and high performance ionomers with high ionic conductivity will considerably improve the efficiency of the enzyme cell and the realization of a miniaturized device. The project thus has an environmental objective in the context of the **development of sustainable (non-fossil) energy and high efficiency devices.**

ENZIM-FC associates the Aix-Marseille research laboratories [MADIREL](#) for the study of ionic conductive polymers and electrochemical technologies for energy, and [BIP](#) for the functional study of metalloenzymes and their integration in bioenergy processes. The **Tor Vergata University of Rome** brings its excellence in ionomer synthesis to the **Associated International Laboratory "LIME" (Ionomer materials for Energy)** founded in 2015 by Aix-Marseille University, the CNRS (France) and Tor Vergata University. The ENZIM-FC project will reinforce the joint activities within the consortium.

ENZIM-FC started on 1st October 2019 with a first kick-off meeting to set the research strategies, for a duration of 24 months. Over this period, the project will be supported by the A*Midex Foundation with a 80,000 euros grant. The project is being implemented at the MADIREL laboratory in Aix-Marseille (UMR AMU-CNRS).

Contact: [Luca Pasquini](#)

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A*MIDEX MEDITERRANEAN PROJECT | « BigSF »
COLLABORATIVE PROJECT COORDINATED BY ANNIE
ZAVAGNO WITH ITALY



Credits INAF/ESA Herschel Space Observatory/Hi-GAL Consortium/ASI; Map-Making by UNIMAP (L. Pizzato, Univ. Sapienza Roma); Mosaics by E. Schisano (INAF-IAPS); Process by G. Li Gaudi (INAF-IAPS)

Photo : Image of part of the map of our Galaxy as seen by the European Space Agency's (ESA) infrared satellite, the Herschel satellite. This image is extracted from the results of the [HI-GAL](#) observation program, whose responsible is S. Molinari, collaborator of the BigSF project in Rome. The blue areas are hot regions where already formed stars are radiating. Red areas are the cooler areas where young stars are forming.

The BigSF project, led by Professor Annie Zavagno in collaboration with Dr. François-Xavier Dupé, was labelled by the A*Midex Foundation under the "Mediterranean 2018" call for projects, and started its activities in January 2020. This project strengthens Aix-Marseille's cooperation with the Italian National Institute of Astrophysics (INAF) and its laboratories based in Rome and Naples.

The research project entitled "*Star formation with big data and machine learning (BigSF)*" proposes to use the **very large masses of data** available on our Galaxy in order to build, through **numerical learning methods**, a new empirical model of **stellar formation**.

BigSF combines two disciplines: astrophysics and computer science. These two disciplines must be combined in order to extract, from the large masses of data, the laws that govern the formation of stars. In our Galaxy, the great richness of existing data makes it possible to describe star formation in a very precise way, from very small scales to very large scales describing the structure of the Galaxy. This richness imposes a processing that goes beyond what human research is capable of achieving and therefore requires the use of computers and learning algorithms to **extract the knowledge from the combination of all available data**. This combination has never been achieved before and promises to offer a new vision of stellar formation in our Galaxy, a vision in which our current understanding of this process could be changed.

The BigSF project is based on the complementary expertise of a **Franco-Italian consortium** of four academic partners: two laboratories of Aix-Marseille Université, the [Laboratoire d'Astrophysique de Marseille \(LAM\)](#), which coordinates the project, and the [Laboratoire d'Informatique et Systèmes \(LIS\)](#), as well as two Italian institutions under the supervision of the **Institut National d'Astrophysique (INAF)**: the **Institute of Space Astrophysics and Planetology**, based in Rome under the local

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coordination of Prof. Sergio Molinari, and the **Capodimonte Astronomical Observatory** in Naples, under the local coordination of Prof. Massimo Brescia. The project also associates the company [EURA NOVA](#) (Marseille), a research and consulting company in IT solutions. The links between the partners in the training will also be developed through exchanges of students at master level, for research training.

The project is coordinated at the **Laboratoire d'Astrophysique de Marseille** (UMR Aix-Marseille Université - CNRS), in conjunction with its partners. **BigSF officially started on January 1st, 2020**, with a first kick-off meeting to set the research strategies, **for a duration of 24 months**. Over this period, the project will be supported by the A*Midex Foundation with a grant of **80,000 euros**.

Contact : [Annie Zavagno](#), [François-Xavier Dupé](#)

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**A*MIDEX MEDITERRANEAN PROJECT | "TRIADS-TUNISIA"
COLLABORATIVE PROJECT ON TRAINING AND RESEARCH IN
ARCHEOLOGY, COORDINATED BY MICHEL BONIFAY WITH
TUNISIA**



Photo credits : M. Bonifay and T. Mukai ; AMU-CCI

The TRIADS-Tunisia project, led by Michel Bonifay, Director of research at CNRS, in collaboration with its French and Tunisian partners, was labelled by the A*Midex Foundation as part of the "Mediterranean 2018" call and started its activities in February 2020. The project brings together a consortium of three Tunisian academic and research institutions, together with Aix-Marseille University and its laboratories, to develop Franco-Tunisian cooperation in archaeology.

The project entitled "*Training and Research in Archaeology and Development Strategies in Tunisia (TRIADS-Tunisia)*" aims to develop a Franco-Tunisian training and research programme in archaeology. Tunisia and France have a long tradition of scientific cooperation in the field of archaeology and cultural heritage, notably with the academic site of Aix-Marseille. Partners on both sides of the Mediterranean today share similar requirements for the training of their students and staff, such as the need to update skills, knowledge and resources, and to **further integrate training, research and valorisation.**

Aix-Marseille Université, the Universities of Sfax and Sousse and the National Heritage Institute in Tunis, Tunisia, signed a **letter of intent** on 5 October 2017, during the first meeting of the High Council for the Franco-Tunisian Cooperation, stating their **ambition to build a Franco-Tunisian archaeological field school.** This letter lists common objectives such as the organization of training and research in field documentation in Tunisia, the development of common scientific programs for the training of Tunisian and French actors (executives, operators...), and the strengthening of cooperation for the valorisation of Tunisian archaeological sites.

The four institutions, which include two Earth Sciences and Engineering laboratories (CEREGE at AMU and ENIS at the University of Sfax), are thus creating, through TRIADS-Tunisia, an **innovative training project prefiguring the Tunisian-French archaeological field school,** with a joint team of Tunisian and French students and professionals.

The training will revolve around a set of predefined research tasks ("*learning by doing*") on the **archaeology and environment of the ancient Maghreb.** All disciplines of archaeology and environment are included in the project, but TRIADS-Tunisia covers in particular four key disciplines to start with:

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urban archaeology, funerary archaeology, ceramology and the characterization of geological and chemical materials. These four disciplines were chosen by the three Tunisian institutions to respond to the very specific and urgent challenges faced by research, training and development initiatives in the Sfax and Sousse regions.

The project, on the long-term, should make it possible to **strengthen and structure the Tunisian-French partnership in archaeology** and to **enhance the cultural heritage of the central and southern regions of Tunisia.**

The project is carried out by the [Centre Camille Jullian](#) (Aix-Marseille Université – CNRS - Ministry of culture), in conjunction with another research unit of Aix-Marseille, the [Centre Européen de Recherche et d'Enseignement des Géosciences et de l'Environnement \(CEREGE\)](#) (Aix-Marseille Université - CNRS - INRA - IRD - Collège de France); and with the three Tunisian partners, the [National Heritage Institute](#), the [University of Sfax](#) (Faculty of Letters and Human Sciences and National Engineering School of Sfax), and the [University of Sousse](#) (Faculty of Letters and Human Sciences).

The project coordination team consists of **Dr. Michel Bonifay** (Aix-Marseille Université, Centre Camille Jullian), **Dr. Jean-Paul Ambrosi** (Aix-Marseille Université, CEREGE), **Prof. Slim Abdelkafi** (University of Sfax-ENIS), **Dr. Sofiene Ben Moussa** (University of Sousse-FLSH), **Dr. Salem Mokni** (University of Sfax-FLSH) and **Dr. Ammar Othman and Yamen Sghaier** (National Heritage Institute). It notably involves the collaboration for Aix-Marseille Université of Dr. Solenn de Larminat and Dr. Tomoo Mukai.

TRIADS-Tunisia officially started on 1 February 2020 for a duration of 24 months; kick-off meetings were held in Aix-en-Provence and Tunis in the presence of the international partners in February. Over this period, the project will be supported by the A*Midex Foundation with a grant of 79,800 euros.

Contact : [Michel Bonifay](#)

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FOSPHORA reinforces the collaboration between long-standing partners who have recently worked on the theme of ancient ports, and deepens the work of several ongoing research programmes at each site. The project brings together a large and diverse consortium of French, Italian and British partners: on the French side, the academic partners are the [Centre Camille Jullian](#), in Aix-Marseille, which is the coordinator, and two other laboratories of Aix-Marseille University, the [CEREGE](#) (environmental geosciences) and [TELEMME](#) (multidisciplinary laboratory "Time, Spaces, Languages, Southern Europe - Mediterranean"); as well as the **Ecole française de Rome**, the **French National Institute for Preventive Archaeological Research** (INRAP), the **Department of Underwater and Subaquatic Archaeological Research of the Ministry of Culture** (DRASSM) and **IPSO FACTO**, a private consulting and research firm in oceanography and underwater archaeology. On the Italian and British side, the excellent **Sapienza University of Rome**, particularly recognized in the field of classical studies, is involved, thus deepening the collaboration between Aix-Marseille Université and Sapienza already formalized within the European University CIVIS; and the **University of Southampton** (United Kingdom), whose archaeology department won an ERC (European research council) grant in 2007-2013 on Roman ports during the Imperial period (<https://portuslimen.eu/about/>) completes the academic consortium.

The project associates these academic partners with **actors of the management and enhancement of heritage**, notably in France the *Métropole Aix-Marseille Provence (Territoire Istres Ouest Provence)*, and the Association *les Amis des Marais du Vigueirat*, which manages the protected natural area in the Camargue; and in Italy the *Parco archeologico di Ostia antica*, responsible for the sites of Ostia and Portus. The FOSPHORA project should thus also **encourage dialogue between the French and Italian partners responsible for the safeguarding and promotion of heritage sites and properties in both areas**, since the environment of the two sites presents a series of similar problems.

The project is coordinated by the CCJ (UMR Aix-Marseille Université – CNRS – Ministry of Culture), in collaboration with its partners. **FOSPHORA officially started on 1 February 2020 for a duration of 24 months**; a kick-off meeting, in presence of the international partners was organised in Aix-en-Provence in February. Over this period, the project will be supported by the A*Midex Foundation with a grant of **80 000 euros**.

Contact : [Marie-Brigitte Carre](#)