

**CALL FOR PROJECT SUBMISSIONS for a  
artists-in-labs residency**

**KAUST-Swiss Residency Exchange 2020**

**at the**

King Abdullah University of Science and Technology KAUST, Thuwal, KSA



Marie Griesmar, *Beneath the Red Sea, A New Form of Reef*, 2016

**The artists-in-labs KAUST-Swiss Residency Exchange 2020 offers a 3-months residency providing a framework for artists to investigate relations among contemporary art practice, science and society in Saudi Arabia**

**Applications for this residency are open for:**

- Artists of all disciplines, who have a Swiss passport or who have been living in Switzerland for the past 2 years or more

**RESIDENCY PERIOD: October – December 2020**

**APPLICATION DEADLINE: 30<sup>th</sup> of April 2020**

**PLEASE SEND YOUR APPLICATIONS INKL. PORTFOLIO (MAX. 8 MB) TO: [ail.program@zhdk.ch](mailto:ail.program@zhdk.ch) (or via [wetransfer.com](https://wetransfer.com))**

If you have any questions, you are welcome to contact the AIL-team via [ail.program@zhdk.ch](mailto:ail.program@zhdk.ch)

**The artists-in-labs residency *KAUST – Swiss Residency Exchange* offers the unique opportunity for Swiss artists to exchange and work for 3 months with researchers from King Abdullah University of Science and Technology KAUST and to develop an artistic project.**

- The residency's unique setting opens up the possibility for a transdisciplinary dialogue that extends scientific processes, discoveries and applications that have been developed at KAUST in Saudi Arabia
- The residency offers significant time and space to reflect upon ideas enhance the understanding of each other's cultural background and develop greater intercultural networks
- During the residency the artist will be immersed in the research and working alongside the scientists of the respective research group
- There will also be a coordinator at the research group available to the artist, helping with administrative questions and organization of the daily life at the KAUST campus

### **On the subject of residency**

Initiated in 2016, the *artists-in-labs KAUST-Swiss Residency Exchange* established a sustainable and long-term collaboration between artists and scientists as well as scientific and cultural institutions in Switzerland and Saudi Arabia.

The residency at the King Abdullah University of Science and Technology KAUST, located on its own campus at the shores of the Red Sea near Thuwal, Saudi Arabia, provides artists with the opportunity to engage with scientists for three months and to explore a range of scientific topics, methods and technologies as well as the site of the laboratory. This remarkable institutional and cultural setting contributes to the sciences and the arts as well.

The transcultural and transdisciplinary dialog and by juxtaposing concepts and procedures of different countries and knowledge cultures, the residency offers a significant room to reflect on ideas and ideologies of the other, the foreign or the unfamiliar.

### **Applicants can choose between three research groups:**

- **Sensors Lab (Plug and Play)**
- **Reef Ecology Lab**
- **Habitat and Benthic Biodiversity Lab**

**Please read the research abstracts carefully; it is recommended to seek out for additional information about the research groups and their topics and methods.**

**The application has to clearly relate to the research of one of these three groups.**

## Background - The artists-in-labs program

This art-science residency is conducted and monitored by the **artists-in-labs program (AIL)** research group at the Zurich University of the Arts (ZHdK). The ZHdK is the leading institution for this project and responsible for its **conception, curation and management**.

- Since 2003, the AIL has been facilitating artistic research by way of long-term residencies for 54 artists in 21 scientific laboratories and research institutes in Switzerland and worldwide (as of 2020)
- It is part of the Zurich University of the Arts (ZHdK) and promotes sustainable transdisciplinary and cross-border collaborations as well as the development of new knowledge by providing artists with an opportunity to critically engage with the sciences and their experimental and aesthetic dimensions
- This includes explorations of the site of the laboratory, as well as a range of scientific topics, methods and technologies. Publications and short documentary films record the processes and results of these collaborations and offer reflections on them
- All the collaborations the AIL produces are presented at various national and international exhibitions, symposia and workshops, making it possible to share findings and ideas, and to provide accessible discussions and aesthetic experiences to our students, peers and to the public.

The AIL will coordinate and document the residency. As case studies and part of their own research, the AIL will monitor and evaluate the experiences of the artist and scientists through interviews and will compare procedures, processes and methodologies of the projects. Towards the end of the residency period a video documentary of each residency will be produced including interviews with the artist and the scientists at the laboratory.

[www.artistsinlabs.ch/en](http://www.artistsinlabs.ch/en)

[www.zhdk.ch](http://www.zhdk.ch)

The *artists-in-labs KAUST – Swiss Residency Exchange 2020* is supported by Pro Helvetia and KAUST, Office of Enrichment.

## ***Sensors Lab (Plug and Play) at***

## **King Abdullah University of Science and Technology KAUST**

**Prof. Khaled Salama** - <https://cemse.kaust.edu.sa/sensors/people/person/khaled-nabil-salama>



*When placed on a leaf, this sensor can detect temperature, humidity and growth, which can help farmers to farm smart*

As an independent and merit-based institution, and one of the best-endowed universities in the world, KAUST intends to become a significant new contributor to the global network of collaborative research. In line with this mission, we emphasize research in science and technology applications to solve problems that impact social advancement, economic development and the quality of everyday life worldwide.

Electrical Engineering (EE) plays an essential role in the fields of engineering, applied physics, and computational sciences. A significant portion of advancement in technology originates from innovative research performed in the field of EE with spill-over effects in many domains.

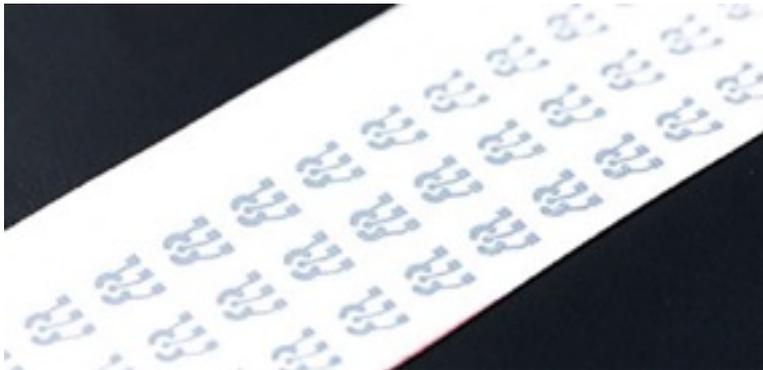
The ability to track minuscule but important changes across a range of systems—from the body to the borough and beyond—seems limitless with the emerging array of novel sensors that are tiny, self-powering and wirelessly connected. KAUST’s Sensor Initiative comprises a broad range of experts, from marine scientists to electrical engineers, who are innovating solutions to some of the most challenging obstacles in sensor technology. Together, they are powering up to transform the exciting intersection between small interconnected devices and the world around us.

For instance, the capacity to monitor our surroundings reveals new potential in environmental and community protection. A sensor that can detect a flood or a fire can save lives; a sensor that can track animals could help to better manage an ecosystem; and a sensor that can read plant conditions could promote sustainable farming.

“Some can stick to your skin and monitor your vital signs through changes in your sweat while others can be placed in petroleum installations to monitor hazardous gases,” says Prof. Khaled Salama. “We’re

not bound to one specific application, and each new development gives us a chance to answer some fundamental scientific questions along the way.” Networked systems

of tiny wireless and sensing-enabled sensors continue to give rise to a host of new applications that range from medical sensors for image-guided surgery, to distributed image-based surveillance of remote areas for security or environmental reasons. Extreme requirements for small size packaging of the devices are obvious for many applications including environmental and biomedical ones.



As an example: diagnostics become more important in developing countries as people have limited access to medical care systems and have less awareness of healthy lifestyles. There is certainly a need for on-site detection in the life science fields; and for point-of-care diagnostics in rural areas of

*A page of sensors made from conducting plastics and living enzymes*

underdeveloped countries so that even an unskilled person can use the device to determine the presence of disease-causing markers. Currently, diagnostics commonly employ long assay time, trained personnel, sophisticated instruments, and require financial support. A good approach to overcome this current situation would be the use of flexible and paper-based point-of-care devices to detect specific biomarkers. Biomarkers provide insight into normal biological processes, pathogenic processes, and pharmacological therapeutic interventions.



*Sensing data in harsh marine environments is challenging, and researchers are aiming to produce electronic tracking tags that are smaller, lighter and less power hungry*

Hence, the development of more compatible, reliable, convenient, simple and easy to use systems would be of great use to a person less skilled in medical diagnostic procedures. In addition to the development of chips for sensor systems, there continues to be a need for improved implementations of micro-scale detection and processing systems for further convenience, scaling and portability overcoming issues such as compatibility of substrates, adhesion problems, very small resolution detection.

**Videos:**

<https://www.youtube.com/watch?v=UFX1f4TTn8I>

<https://youtu.be/cX8FOy2-n4A>

**Further readings:**

<https://discovery.kaust.edu.sa/en/article/800/putting-the-sense-in-materials>

<https://discovery.kaust.edu.sa/en/article/171/miniature-flexible-sensor-to-detect-heart-disease>

<https://discovery.kaust.edu.sa/en/article/873/using-electronics-to-solve-common-biological-problems>

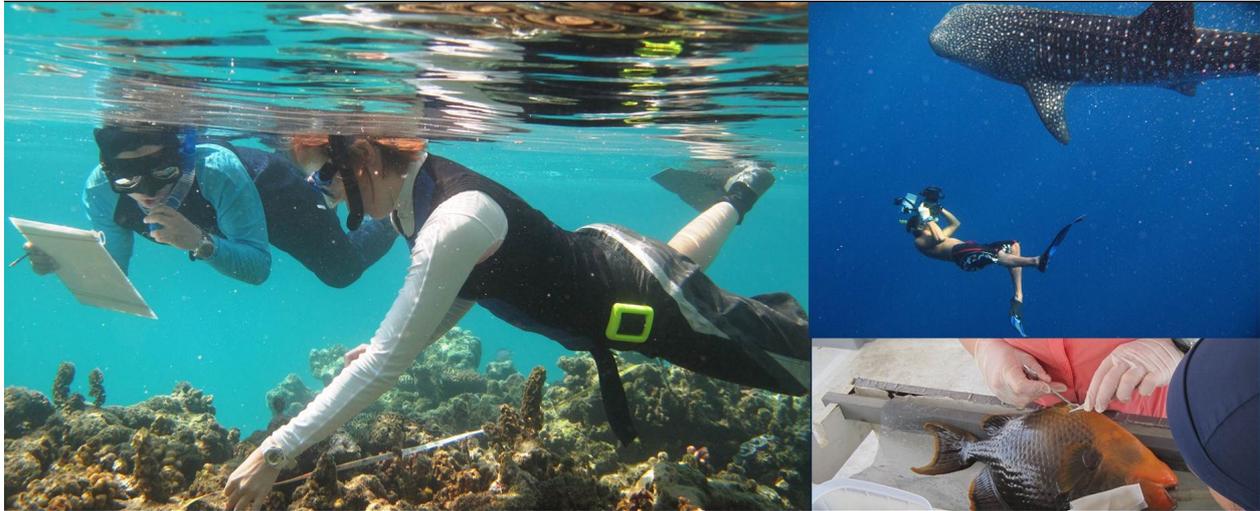
<https://discovery.kaust.edu.sa/en/article/785/paper-sensors-remove-the-sting-of-diabetic-testing>

<https://discovery.kaust.edu.sa/en/article/331/a-simple-nose-for-noxious-gases>

## Reef Ecology Lab at

## King Abdullah University of Science and Technology KAUST

Prof. Michael Berumen - <https://rsrc.kaust.edu.sa/Pages/Berumen.aspx>



### Red Sea Research Center – Research on Coral Reef Biodiversity

KAUST, located on the shore of the Red Sea, offers a unique combination of access to coral reefs and world-class research laboratories. Much of the research effort in the Red Sea Research Center (RSRC) is focused on the under-studied Red Sea system on our doorstep, but we also maintain projects based at a range of field sites around the world. Biodiversity refers to the variety of living things in any environment, including variety at the genetic, species, and ecosystem levels. Coral reefs are well-known for their rich and diverse communities, although RSRC work on Red Sea reef systems aims to fill some of the gaps in our knowledge.

### Coral reef fishes and mobile animals

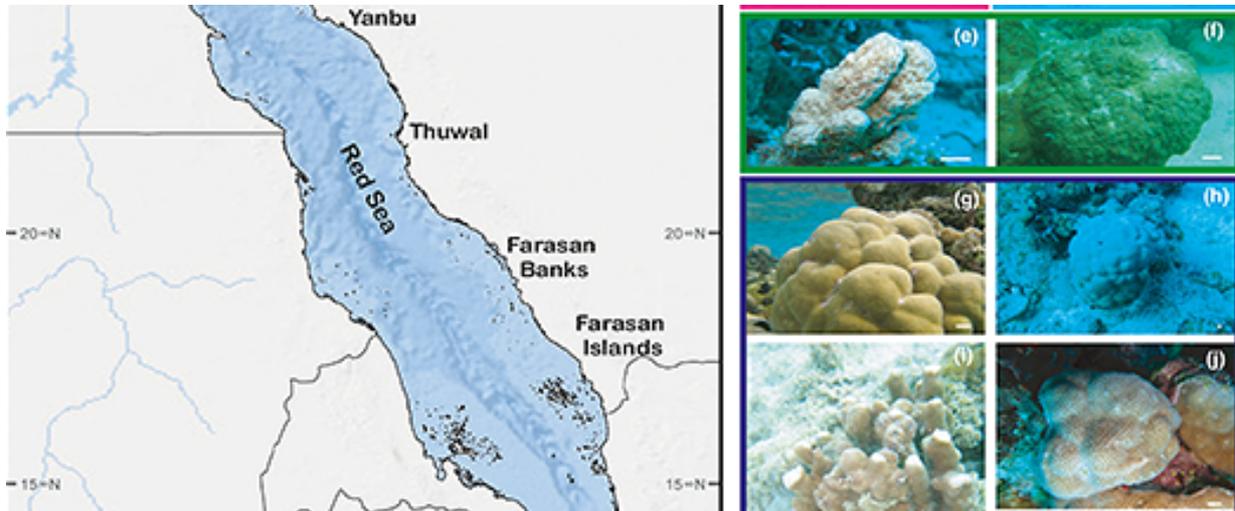
Our lab is engaged in several interdisciplinary projects addressing numerous aspects of coral reef ecology. One of the primary unifying themes of these projects is movement ecology, with studies ranging from larval fish dispersal to whale shark movements. Biodiversity of fishes and other mobile organisms (such as turtles) has immediate management implications and will ultimately be used to guide the design and implementation of marine protected areas (MPAs) within Saudi Arabia and other study areas.

Other major research themes include life history studies, food web ecology, as well as evolutionary ecology and biology. Life history studies are fundamental for conservation and management of any species, and target knowledge gaps such as growth rates, age or size of reproductive maturity, population demographics, and other characters. Our food web ecology studies employ novel techniques we have developed and are revealing critical energy pathways that traditional food web studies have not been able to detect. Understanding these food webs will help to more accurately assess the function of complex reef systems and predict how reef fishes will be affected by climate change. Evolutionary studies, including phylogeny and phylogeography, are primarily focused on reef organisms endemic to the Red Sea, including the poorly understood non-coral invertebrate groups.

## *Habitat and Benthic Biodiversity Lab at*

## **King Abdullah University of Science and Technology KAUST**

Prof. Francesca Benzoni - <https://rsrc.kaust.edu.sa/Pages/Benzoni.aspx>



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### Coral reef benthos

Marine organisms spending most of their life cycles attached, within or physically closely associated to the coral reef are commonly referred to as benthos. Scientific research projects in the *Habitat and Benthic Biodiversity Lab (HaBB Lab)* involve in exploring and describing the diversity of reef benthos and characterize and understand the associations among the benthic organisms and their interactions with the environment. We are also addressing how species diversity and community composition change along depth and geographic gradients. This means that our research questions span from the organism to the community level and go from the centimeter to the kilometer scale. Field and lab work are equally important to understand multiscale biodiversity patterns, and the strength of our approach lies in its multidisciplinary nature.