MEDNIGHT

Program of Activities

Samos, Friday, September 26, 2025

ACTIVITIES FOR SCHOOLS

LYMPERI BUILDING

Department of Product and Systems Design Engineering (Robotics Laboratory)

10:00 - 13:00 | WORKSHOP | *Underwater Robotics* - Erina Kavallieratou

Presentation of underwater robotics and fish farm cage control.

ACTIVITIES FOR THE GENERAL PUBLIC

PROVATARI BUILDING

18:00 - 21:00 | EXHIBITION | *The Marie Curies of the Mediterranean*

18:00 - 21:00 | EXHIBITION | *European Corner*, Europe Direct Northern Aegean

18:00 - 21:00 | DEMONSTRATION EXPERIMENTS | *Mind The Lab*

***18:00 - 21:00* | DOCUMENTARY |** *Mednight Expedition: the Ports of Science*

20:15 - 20:30 | TALK | *Welcome to MEDNIGHT*

Department of Product and Systems Design Engineering

18:00 - 21:00 | WORKSHOP | *Underwater Robotics: Challenges & Solutions* – Nikolaos Manos

Underwater vehicles can play an essential role in aquaculture and their construction can be a challenging aspect of their development due to the necessity of waterproofing electronic components. This paper describes the construction, the basic framework of a robotic vehicle named "Kalypso", which was developed to inspect nets in fish farms as well as the problems that arose and how they were addressed. Kalypso can distinguish between clean areas in the net and areas that are either torn or covered with algae, based on an algorithm. It is also equipped with sensors for estimating position, depth, temperature and leakage, which can detect water in the waterproof housing. The watertight part of the robot includes cable connectors, some of which are detachable to facilitate the connection of various devices, such as sensors and lights. The robotic vehicle has two cameras, one in front and one at the bottom. In addition, the robot has underwater ultrasonic sensors, which measure the distance to the environment and LED lights on the front for increased visibility in low-light environments. Several tests were carried out, both inside fish farming nets and in the open sea.

Department of Statistics and Actuarial - Financial Mathematics

18:00 - 21:00 | WORKSHOP | *Mathematical Models in Seismic Research: Simulations in Samos* – Kostas Smaragdakis, Eirini Kasotaki

"How does a hypothetical earthquake affect the buildings on the Island? This activity focuses on presenting the scientific methodology for studying seismic phenomena through the use of mathematical models and numerical simulations. The island of Samos, an area of high seismicity and one of the home islands of the University of the Aegean, is used as a case study. The objective is to demonstrate how the propagation of seismic waves from the seismic source to the surface is simulated. The influence of critical parameters is examined, such as:

- The geometric characteristics and location of the seismic source.
- Local ground conditions and the potential amplification of the seismic motion.

Through this analysis, the aim is to understand how the significant factors shape the distribution and intensity of the ground motion, elements which are essential for seismic hazard assessment.

Department of Mathematics

18:00 - 21:00 | WORKSHOP | *Research and education for the art of woodenboatbuilding* – Andreas Papasalouros, Antonios Kontogiannis

As part of the event marking the completion of the Museum of Aegean boatbuilding and Maritime crafts at Heraion, Samos, on October 11, educational and research initiatives linked to the Museum will be presented.

Organization

21 Sci 27 Co science communication

UNIVERSITY OF THE AEGEAN

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