



**SESAME will be the first accelerator in the world to be powered solely by renewable energy**

## **SESAME**

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**SESAME**

**Synchrotron-light for Experimental Science  
and Applications in the Middle East**





**Rolf Heuer**

**President, SESAME Council**



**Khaled Toukan**

**Director of SESAME**

Through SESAME, we strive to bring scientific excellence to the Middle East and neighbouring countries so that science institutions in this region may stand as equal players with laboratories in the scientifically more advanced countries. We also endeavour to promote networking between scientists that stretches beyond national borders and to encourage other countries to join SESAME.

## WHAT IS SESAME?

SESAME is a third generation 2.5 GeV synchrotron light source in Allan (Jordan) that will ultimately be exploited in experiments at up to 25 beamlines.

It belongs to, and is governed by, its Members: Cyprus, Egypt, Iran, Israel, Jordan, Pakistan, the Palestinian Authority, and Turkey. The Observers are: Brazil, Canada, China, the European Union, France, Germany, Greece, Italy, Japan, Kuwait, Portugal, the Russian Federation, Spain, Sweden, Switzerland, the UK and the USA.

## SESAME'S OBJECTIVES

To foster scientific and technological capacities and excellence in the Middle East and neighbouring countries (and prevent or reverse the brain drain) by enabling world-class research in fields ranging from biology and medicine, through materials science, physics and chemistry to healthcare, the environment, agriculture and archaeology, and to build cross-border collaboration, dialogue and understanding between scientists with diverse cultural, political and religious backgrounds.

## SESAME'S BEAMLINES

### The first 4:

#### **XAFS/XRF (X-ray Absorption Fine Structure / X-ray Fluorescence) spectroscopy beamline**

for use in materials and environmental science, in designing new materials and improving catalysts (e.g. for the petrochemical industries), and for identifying the chemical composition of fossils and valuable paintings in a non-invasive manner.

#### **Infrared (IR) Beamline**

for applications that will cover a wide range of research fields, including surface and materials science (e.g. characterization of new nano-materials for solar cell fabrication and for drug delivery mechanisms), biochemistry, microanalysis, archaeology, cultural heritage, art restoration, geology, cell biology, biomedical diagnostics and environmental science (e.g. air and water pollution).

#### **Materials Science (MS) Beamline**

particularly powerful for studying microcrystalline or disordered/amorphous material on the atomic scale, evolution of nano-scale structures and materials in extreme conditions of pressure and temperature, and for developing and characterizing new smart materials.

#### **Macromolecular Crystallography (MX) Beamline**

for use in structural molecular biology. This beamline will help to elucidate the mechanisms of proteins at molecular level and provide guidelines for developing new drugs.

## SESAME USERS

SESAME is open to scientists from all of its Members and beyond. They will visit the laboratory periodically to carry out experiments, often in collaboration with scientists from other countries, where they will be exposed to the highest scientific standards in a stimulating environment for international collaboration.

## CAPACITY BUILDING AND TRAINING

Capacity building and training have always been high on the agenda of SESAME. This has borne its fruit since the potential user community in the region already numbers some 300. With on-going support for training from the IAEA, and international and national organizations and laboratories, as well as the recently-approved OPEN SESAME project funded by the European Union, SESAME will further foster capacity building in the region and the development of a user community.

## PARTNERSHIPS

SESAME has developed partnerships with a great number of international organizations (UNESCO, IAEA, CERN, ICTP...), the European Union, organizations and professional scientific societies in many countries, particularly in the Observer countries, and synchrotron light facilities (ALBA, ANKA, DESY, Elettra, ESRF, SLS/PSI, Soleil...) thereby making it an integral part of the international community and allowing it to benefit from forefront scientific expertise.