

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



Rolf Heuer
President, SESAME Council



Khaled Toukan
Director of SESAME

What is SESAME?

SESAME is a third generation 2.5 GeV synchrotron light source in Allan, Jordan, that will ultimately be exploited in up to 20 or more experiments operating simultaneously on independent beamlines.

It belongs to, and is governed by, its Members: Cyprus, Egypt, Iran, Israel, Jordan, Pakistan, Palestine, and Turkey. Observers are: Brazil, Canada, China, the European Organization for Nuclear Research (CERN), the European Union (EU), France, Germany, Greece, Italy, Japan, Kuwait, Portugal, Russian Federation, Spain, Sweden, Switzerland, the United Kingdom, and the United States of America.

SESAME's OBJECTIVES

SESAME's principal objectives are to foster scientific and technological excellence in the Middle East and neighbouring countries, and prevent or reverse the brain drain from the region. These goals are achieved by enabling world-class scientific research in subjects ranging from biology, archaeology and medical sciences through to materials science, physics, chemistry and life sciences. SESAME builds scientific and cultural bridges between diverse societies, and contributes to a culture of peace through international cooperation in science.

SESAME currently has two operational beamlines

X-ray Absorption Fine Structure / X-ray Fluorescence Spectroscopy Beamline (XAFS/XRF)

The XAFS/XRF beamline is used in materials and environmental science, in designing new materials and improving catalysts, and for identifying the chemical composition of objects, including fossils and valuable paintings, in a non-invasive manner.

Infrared Beamline (IR)

The IR beamline is used in a wide range of research fields, including surface and materials science, for example the characterization of new nano-materials for solar cell fabrication and for drug delivery mechanisms. It has capacity in biochemistry, microanalysis, polymers, archaeology, geology, cell biology, biomedical diagnostics, pharmaceuticals and drug design, environmental science and forensic investigations.

The following beamlines are under development

Materials Science Beamline (MS)

The MS beamline will be a powerful tool for studying microcrystalline or disordered/amorphous material on the atomic scale. It will study the evolution of nano-scale structures and materials in extreme conditions of pressure and temperature, and it will be used to develop and characterize new smart materials.

Tomography Beamline (BEATS)

Many areas of research involving material samples can benefit from high-resolution tomography. This makes BEATS particularly versatile. It will be used for studies ranging from archaeology, cultural heritage and palaeontology to health and biomedical research, geology, chemical and industrial engineering, fuel cells and battery research, materials and nano-science.

Soft X-ray Beamline (HESEB)

Soft X-rays offer the possibility to investigate scientific issues in disciplines ranging from solid state, interface and surface physics, to physical chemistry, biological systems, earth and environmental sciences. The HESEB beamline will also be valuable for cultural heritage applications by investigating the distribution of oxygen and transition metals in the kind of archaeological samples in which the Middle East is rich.

SESAME USERS

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



CAPACITY BUILDING AND TRAINING

Capacity building and training have always been high on SESAME's agenda. Over the years, the organisation's efforts have borne fruit, and the potential user community in the region already very nearly numbers more than 600 people.

On-going support for training and mobility from the IAEA, the European Union, international and national organisations and laboratories, as well as the Richard Lounsbery Foundation further foster capacity building and the development of a vibrant user community.

PARTNERSHIPS

SESAME has strong partnerships with several international organizations, including the IAEA, UNESCO, CERN, ICTP, and national institutions, such as The Cyprus Institute. The organization also enjoys support from the European Union, along with organizations and professional scientific societies in many countries, particularly the Observers. SESAME has links with many synchrotron light facilities, including ALBA, ALS, CLS, DESY, Diamond, Elettra, ESRF, KIT-ANKA, SLS and SOLEIL, and it is an associate of LEAPS, making it an integral part of the international light source community and allowing it to benefit from forefront scientific expertise.



**CLIMATE
NEUTRAL**
MEASURE
REDUCE
OFFSET

SESAME is the first accelerator in the world to be powered by renewable energy



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

