

Box 17.3: SESAME: a ray of unity

The Synchrotron-light for Experimental Science and Applications in the Middle East (SESAME) is the first major international research centre in the Middle East and neighbouring countries.

Situated in Allam, Jordan, it has eight members: Cyprus, Egypt, Iran, Israel, Jordan, Pakistan, Palestine and Turkey. UNESCO has worked with these members to bring this project to fruition since the first stone was laid in 2002.

As a user facility, SESAME hosts visiting scientists who use synchrotron technology for advanced research.

Since SESAME was officially inaugurated in May 2017, six beamlines have been commissioned, with plans for a seventh. The absorption spectroscopy and infrared beamlines became available to users in 2018, followed by that for powder diffraction in mid-2020. In January 2020, construction began of the

tomography and soft X-ray beamlines. Funding is being sought to construct the sixth for macromolecular crystallography.

Demand is high. The number of proposals almost tripled to 151 between the first call in December 2016 and the third in November 2019. One particularly encouraging proposal in the third call emanated from Palestine for a joint project with Cyprus, Greece and Turkey.

Between July 2018 and February 2020, experiments were conducted for 62 proposals from 12 different countries, many of them collaborative projects. Experiments have centred on, for example, novel materials for batteries, shock features in Martian and lunar meteorites, the possible use of herbs for treating Alzheimer's disease, ancient manuscripts from the Qur'an and the presence of arsenic in rice grains and rice farm soils in Iran. Since 2018, experiments undertaken at SESAME have spawned the publication of several papers in quality scientific journals.

SESAME is now in a position to support others: on 19 January 2020, it hosted another organization's workshop on its premises for the first time, that of the Association of Arab Universities.

SESAME's solar power plant was inaugurated in February 2019, making SESAME the world's first large accelerator complex to be fully powered by renewable energy and the world's first carbon-neutral accelerator laboratory. This makes SESAME economically as well as environmentally sustainable.

SESAME is a signatory of the United Nation's Climate Neutral Now pledge.

In November 2018, SESAME became the first Associate of the League of European Accelerator-Based Photon Sources.

Source: Clarissa Formosa-Gauci, UNESCO; see: <https://www.sesame.org.jo/>

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