Inside the SESAME International Research Centre

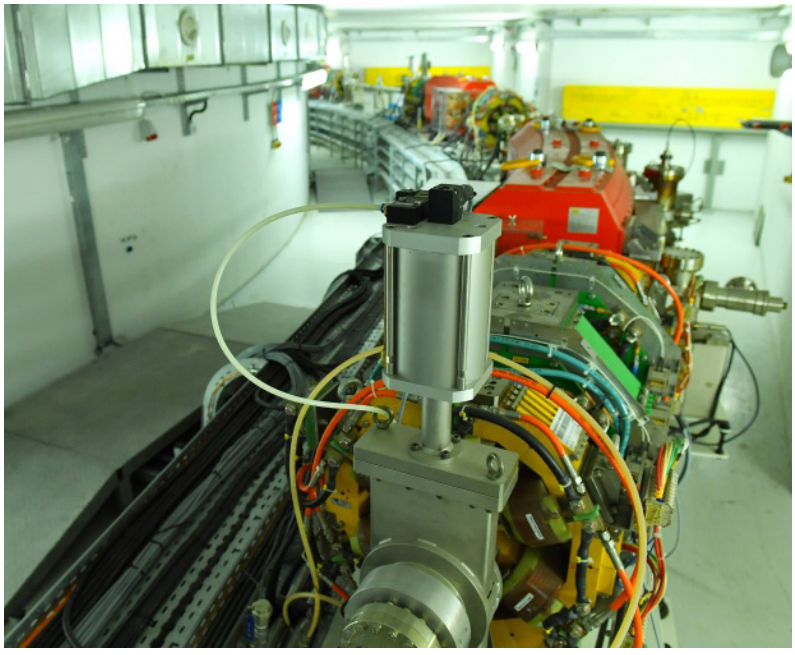
By Aabha Dixit (text) and Dean Calma (photos)

1 The Synchrotron-Light for Experimental Science and Applications in the Middle East — or SESAME — Centre, a nuclear research facility inaugurated in May 2017, is a regional initiative, developed with the help of the United Nations Educational, Scientific and Cultural Organization (UNESCO). The IAEA provided advice and technical support during the development of the facility through its Technical Cooperation programme.

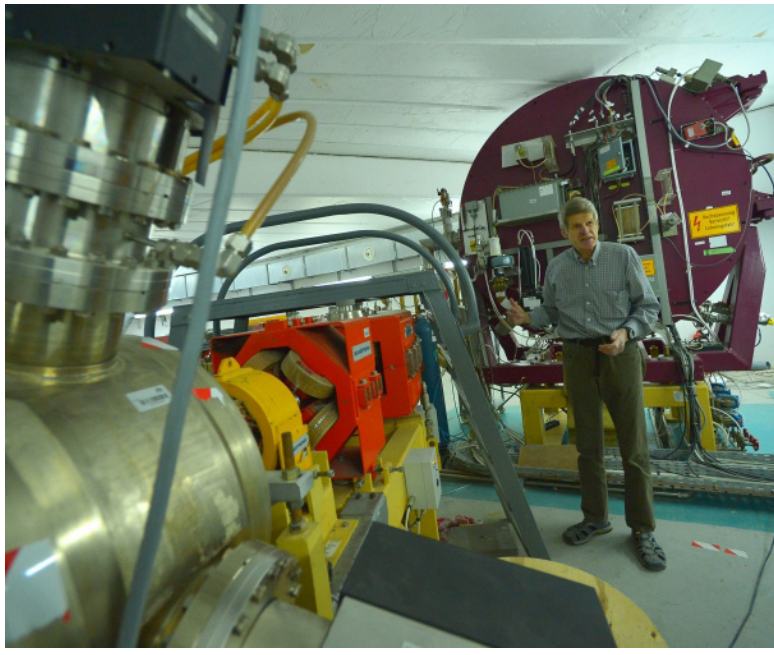
2 "SESAME is an achievement both in terms of science and international relations and its success is due to the interest and confidence of all involved," says Khaled Toukan, Chairman of the Jordan Atomic Energy Commission. SESAME lists as members: Cyprus, Egypt, Iran, Israel, Jordan, Pakistan, the Palestinian Authority and Turkey.

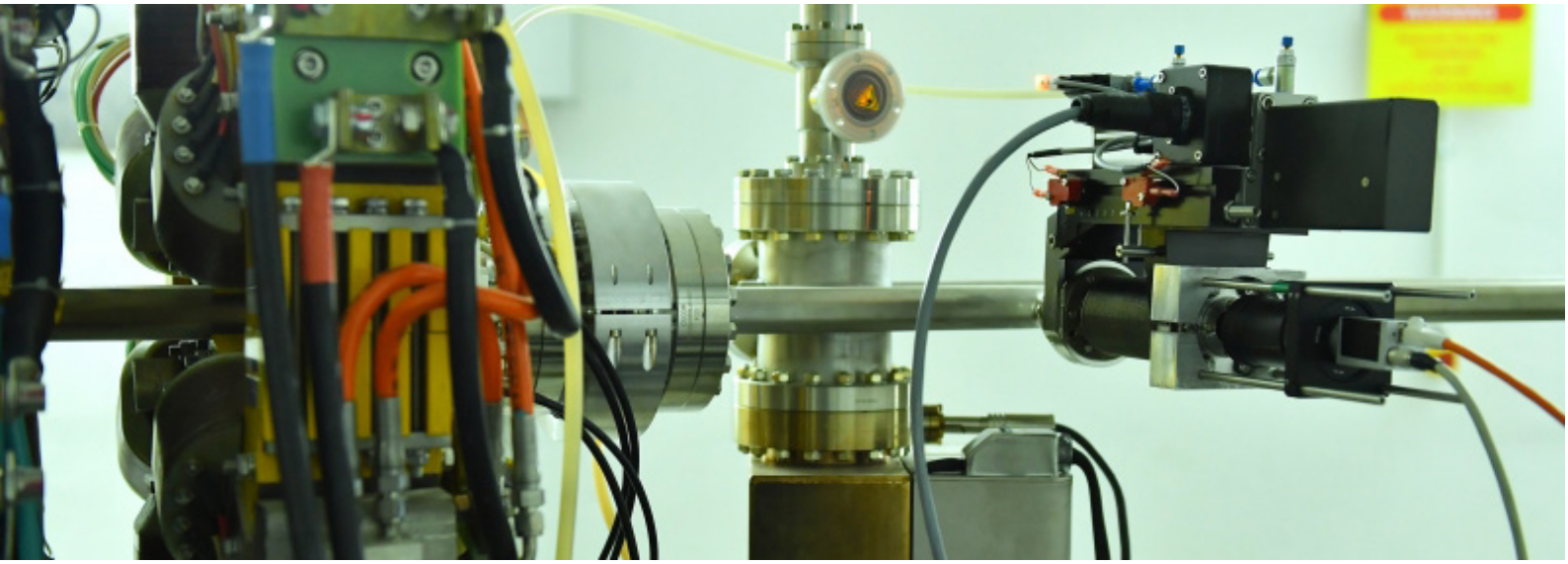
3 This is the inner storage ring of the facility, where electrons start to circulate to build up the required energy of 2.5 GeV. The inner storage ring, or booster, with deflection and focused magnets, will enable the electron beams to circulate as they accelerate. The precise beams of light produced include microwave, infrared, visible, ultraviolet, X-ray and gamma-ray light.

4 The IAEA has helped in the successful commissioning of the SESAME magnets, offering training in areas such as beamline technology, as well as in installation, mounting and testing of the equipment.



5 SESAME's Technical Director Erhard Huttel explains the process of how pre-accelerated electron beams are injected into the synchrotron. Synchrotrons are sources of electromagnetic radiation generated by electrons moving almost at the speed of light.

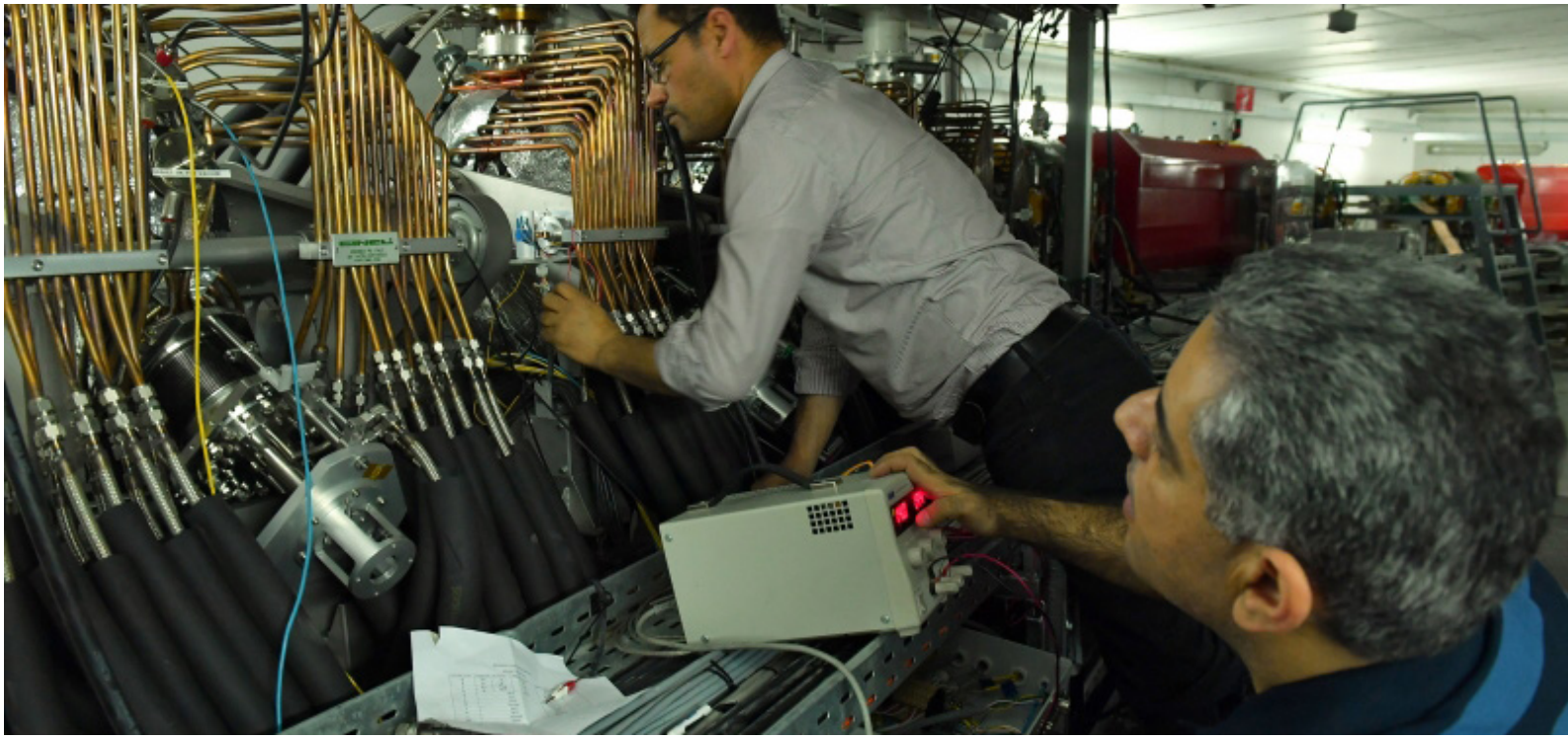




6 These are sealed vacuum pipes through which the electromagnetic beams pass to reach the experimental hubs.

7 The SESAME Centre enables visiting scientists, including university students and researchers, to participate in experiments with synchrotron radiation and analyse the data obtained in a diverse set of disciplines, such as biology, archaeology, physics, chemistry and medical sciences, as well as in research concerning the basic properties of materials.

8 To ensure safety, the specially designed roof shield provides radiation protection and protects the storage rings through which the electromagnetic beamlines circulate.



9 Staff checking the power supplies in the outer storage ring of the facility.

10 Messaoud Harfouche, XRF/XAFS beamline scientist, checking the reactor's XRF equipment. The XRF beamline hub uses the synchrotron light for research and training in a wide range of applications.

11 Gihan Kamel, an infrared beamline scientist from Egypt, working in the infrared beam laboratory. The research and training on the infrared beamline at the SESAME Centre is helping the scientific community in the region to gain a better understanding of its use and applications.