

Major Capital Funding Agreed for SESAME (Synchrotron-light for Experimental Science and Applications in the Middle East)

At a meeting in Amman on 8 March 2012, representatives of four SESAME Members (Iran, Israel, Jordan and Turkey) agreed to make voluntary contributions of US\$5 million each towards the construction of SESAME over the four years 2012-15.

Construction of SESAME is progressing well, on a schedule which will allow commissioning with four 'day-one' beamlines in 2015. The remaining sum of some \$15 million that is still required for procurement is being sought from other SESAME Members (Egypt was preparing to join this initiative, and is still expressing great interest, but this has so far proved difficult due to changes in the government; Pakistan and the Palestinian Authority have offered to provide up to \$5 million and \$2 million respectively in-kind) and from outside sources, including the EU (which has already contributed \$4.5 million), the USA (which has recognised SESAME as 'an initiative that supports the diplomatic interests of the USA'), and major charitable foundations. The manpower costs will be provided collectively by the SESAME Members.

Following the first of the newly-agreed voluntary contributions (totalling US\$5 million) in 2012, Iran, Israel, Jordan and Turkey will review their commitments if another SESAME member does not join this initiative later this year.

The representatives of Iran, Israel, Jordan and Turkey present at the meeting expressed their satisfaction at this major step forward for the SESAME project and for scientific cooperation in the region. The Director of SESAME, H.E. Dr Khaled Toukan, stated that "*The agreement on voluntary contributions will allow us to move ahead rapidly with the construction of SESAME and prepare for the first experiments in 2015/16*". The President of the SESAME Council, Professor Sir Chris Llewellyn Smith FRS, added "*The extensive SESAME training programme is already contributing to building scientific and technical capacity in the SESAME Members. The completion of SESAME will provide the region's growing scientific community with a tool which will enable world-class research in a wide range of scientific disciplines*".

Notes

SESAME (Synchrotron-light for Experimental Science and Applications in the Middle East) is a major science facility under construction near Amman (Jordan), modelled institutionally on CERN. SESAME will both:

- Foster scientific and technological excellence in the Middle East and neighbouring countries (and prevent or reverse the brain drain) by enabling world-class research in subjects ranging from biology and medical sciences through materials science, physics and chemistry to archaeology, and
- Build scientific and cultural bridges between neighbouring countries and foster mutual understanding and tolerance through international cooperation.

The Members of SESAME are currently Bahrain, Cyprus, Egypt, Iran, Israel, Jordan, Pakistan, the Palestinian Authority and Turkey. SESAME, with the help of UNESCO, is actively seeking additional Members from across the Middle East and neighbouring countries. France, Germany, Greece, Italy, Japan, Kuwait, Portugal, Russia, Sweden, Switzerland, the UK and the USA are Observers. SESAME was created under the auspices of UNESCO, which is the depository of the Statutes of the Centre and is represented on the Council of SESAME. The IAEA (International Atomic Energy Agency) also sends a representative to Council meetings.

The heart of SESAME is a 2.5 GeV electron storage ring (133m in circumference), which can accommodate up to 12 wigglers and undulators, making SESAME a third generation light source. There are some 60 synchrotron light sources in the world, including a few in developing countries, but none in the Middle East, although a need for this was recognized by the Nobel Laureate Professor Abdus Salam (Pakistan), founder of the Abdus Salam International Centre for Theoretical Physics in Trieste (which fosters advanced studies and research, especially in developing countries), and other eminent scientists more than 25 years ago.

Jordan has provided the land and building that will house the accelerator complex and associated infrastructure (e.g. the dedicated new power line). The Members, which have always covered the annual recurrent budget, are committed to providing the operating cost, which will rise to some \$(6-8) million pa when SESAME comes into operation. Germany generously donated components of a decommissioned light source (BESSY1), which are being upgraded to form the booster that will inject electrons into a completely new 133m main storage ring. Components that have become surplus to requirements have been donated by various synchrotron laboratories in the USA and Europe, including in particular the UK, which has donated five 'beamlines'. The value of the investments made so far (by Jordan, the other Members, and the European Union), plus the donated equipment that will be used from the beginning of operation is some \$55 million. The total cost of SESAME with four day-one beam lines (including the value of the site provided by Jordan and donated equipment, and funding for manpower and procurement over the remaining construction period) will be some \$110 million.

The users of SESAME will be based in universities and research institutes in the region. They will visit the laboratory periodically to carry out experiments, generally in collaboration, where they will be exposed to the highest scientific standards. The potential user community, which already numbers some

300, has been fostered by a series of Users' Meetings and by excellent training opportunities supported by the IAEA, national agencies (such as the US Department of Energy) and many of the world's synchrotron laboratories in Europe, North America, Asia and Latin America, which have created special training fellowships for SESAME. The training programme (whose monetary value is currently some \$1M pa) is already bringing significant benefits to the Members of SESAME (e.g. through capacity building, the creation of collaborations both within the region and with countries beyond it, etc.), and will ensure that SESAME will be fully exploited by scientists from across the region.

Resolutions/endorsements in support of SESAME have been issued by the Executive Board of UNESCO, IUPAP (International Union of Pure and Applied Physics), IUBMB (International Union of Biochemistry and Molecular Biology), IUPAC (International Union of Pure and Applied Chemistry), the US National Commission for UNESCO and 45 Nobel laureates in a joint statement.

Further information about SESAME can be found at <http://www.sesame.org.jo> which provides news of progress and (under 'Information Material') a detailed description of the project and profiles of scientists and engineers who will use and are building SESAME.

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