

SESAME

Introduction to SESAME

**by Herwig Schopper
President
SESAME Interim Council**

JASS'02, Amman 26.10.2002

The beginning of SESAME

1. 1997 – 1999 Initial steps

- **Middle East Scientific Cooperation MESC founded by Sergio Fubini, CERN and Torino (H.Schopper chairman of Planning Committee)**
- **During MESC seminar idea to establish SR centre in Middle East (1997) by H.Winick (SLAC) and G.-A. Voss (DESY)**
- **propose to use BESSY I components; made contacts with scientists in the region (April 1997)**
- **Receptive reaction from BESSY and German government (but open to other parties)**
- **International Workshop at University of Uppsala (Tord Ekelöf), April 1998.**
- **Request by Fubini and Schopper to UNESCO Director General F.Mayor**
- **F.Mayor invites governments to Consultative Meeting at Paris, 15 June 1999**
Decision to go ahead
Establishment of Interim Council

Objectives of SESAME

- 1. Promote science and technology in the region (capacity building)**
- 2. Training of scientists, technicians, administrators and others**
At various levels
- 3. Contribute to better understanding of people of different traditions, religions, races, political systems**
Interaction between scientists, administrations, politicians

Follow dream of CERN

International Interim Council

Established 15 June 1999 by UNESCO DG

Chairman Herwig Schopper

Secretary UNESCO: S.Raither, now M.Nalecz

11 Members: Armenia, Cyprus, Egypt, Greece, Iran, Israel, Jordan, Morocco, Oman, Palestinian Authority, Turkey

6 Observers: Germany, Italy, Japan, Russia, Sweden, USA

2 delegates from each Member

1 government representative,

1 scientist

advisers

➤ **4 international Advisory Committees**

Co-chairs : 1 from region, 1 outside

1. Scientific: E.Alp, H.Winick

2. Technical: G.-A.Voss, C.Papanicolas

3. Training: M.Virasoro

4. Finance: S.Assaf, J.Vary

In total more than 50 members

Steps after establishment of IC

1. Presentation to World Conference on Science, Budapest 26 June 1999

2. BESSY workshop

Berlin 18/20 August 1999

Bottom-up approach

Meeting of Technical and Scientific Committee

- a. discussion of design, energy 1 GeV*
- b. possible programme*
- c. name SESAME chosen*
- d. financing issues*
- e. site criteria*

3. Technical Proposal (Green Book)

October 1999 (see also NIM A 467, 55,2001)

- a. Energy from 0.8 to 1 GeV**
- b. SC wiggler with 7.5 T to obtain photon energies of 20 to 25 keV**
- c. Circumference from 64 m to 100 m**
- d. 6-fold symmetry, 4 insertions**
- e. possible programme**
- f. round building like BESSY I**
- g. cost \$ 20 million without beams**

**4.DG informs German Government
that SESAME goes ahead,
confirms request for BESSY I (January 2000)
dismantling and packing \$ 600.000
Financed by UNESCO and Members
Transport to Jordan May 2002**

5.Site Selection

Site Committee visits proposed sites

Criteria:

- a. Accessible to all scientists from world
- b. Central geographical location
- c. Political commitment by authorities
- d. Special contribution by host
- e. Technical infrastructure (water, electricity, soil, airport)

Restricted meeting of IC

10/11 April 2000, CERN

Decision by secrete vote:

Al-Balqa Applied University, Jordan
Strong support by H.M.Abdullah II
Funds for building

Training Programme

1. Accelerator experts

**Call for applications
about 100 young people from region applied,
20 selected
Spend from several months to > 1 year
at 8 European SR labs
support from host labs, ICTP, IAEA,
Sweden, France
Helped with design
Will be core of machine crew**

2. Scientists

**8 scientists from region at 6 US labs
Supported by DOE**

3. Staff for beamlines

**Training of staff for setting up
and operation of beamlines**

**Repeat fellowship programme
for technical trainees?**

Offers from labs ?!

Funds can be found

4. Training of future users

Introductory schools

Specialised workshops

Fellowships

SESAME Scientific Workshops and Seminars

Purpose:

- assess present level of research in various domains in the region,
- to explore and raise interest in SR beam lines,
- but not to decide already on initial beam lines

For these aims representatives of SESAME countries and outside experts are invited. Several hundred scientists expressed interest to work at SESAME

Organisation of workshops essentially by H.Winick and E.Alp (co-chairs first Scient.- Com.) with local organiser

Reports of all workshops can be found at

www.sesame.org.jo

Financial support from ICTP, UNESCO, IAEA, US (DOE and State Dep.)

Athens Workshop on Structural Molecular Biology,

6-7 April 2000, Athens

(Emphasis on Macromolecular Crystallography PX)

(M.Vlassi, Greece)

Ankara Workshop on Material Research,

21-22 September 2000 (E.Ozdas, Hacettepe Univ.)

**(powder diffraction, Absorption spectroscopy XAFS,
photoemission PE, LIGA)**

Cyprus Workshop on Structural Molecular Biology,

6-7 December 2000 in Nicosia

**(small angle scattering SAXS, Absorption spectra XAS,
Infra-red radiation IR, PX)**

**Istanbul Workshop/School on Bioinformatics and
Structural Modelling,**

3-8 September 2001(Z.Sayers, Turkey)

**Japan Asian Science Seminar about Synchrotron
Radiation Science,**

19-28 October 2002, at Al-Balqa University (Jordan)

**(give overview of SESAME, discuss scientific programme,
define first beams, identify potential users)**

(Shin-ichi Kurokawa,KEK and I.Khubeis,AlBalqqa)

**sponsored by Japan Society for the Promotion of
Science**

Planned Workshops:

Workshop on Structural Molecular Biology, in Morocco, late 2002 (organised by A.Soukri and A.Hoummada)

Workshop/School on Techniques and Applications with Infrared Light, time and location open, organiser Lisa Miller (National SR Light Source)

Workshop on first generation of beam lines proposed by APS

Technical Workshops

Technical Review Committee meeting,

10 July 2001, Amman

(Review energy, beam layout, building)

Machine Workshop

1/18 April 2002, Grenoble, France

(Trainees, design)

Planned

Machine Workshop

7/13 December 2002, Elettra, Trieste

New Design of SESAME

Proposition D.Einfeld
(Technical Director)

quadratic building ('copy' of ANKA)

Energy 2 GeV, circumference 116 m,

Wavelengths much shorter from bending magnets.

Cheap normal wiggler if needed.

**Discussed in technical workshop
at Amman, 10 July 2001**

**Concept in principle approved by IC
at Amman, 17 December 2001**

**Definitely approved by IC
at Paris, 16/17 July 2002**

Details in **White Book**

SESAME very competitive

Final formal steps to establish SESAME as independent Centre

UNESCO feasibility study including **Statutes**

Approved by

UNESCO **Executive Board**, May 2002

authorised by General Assembly

UNESCO procedure finished

UNESCO assumes depository function

Interim Council, July 2002

Approved

Statutes and Rules of Procedure of Council

To be done:

Site Agreement,

Financial Rules

Staff Rules

Necessary to employ staff!!!!

Letter of invitation by DG Matsuura
to Ministers of all UNESCO Members
quoting **Executive Board**:

”SESAME received enthusiastic and
unanimous support,....
model project for other regions....
Qintessential UNESCO project
combining capacity building with vital
peace-building through science.

**At least 6 countries must inform DG
to accept the Statutes**

⇒ **then SESAME is established
as independent laboratory**

List of **SESAME MEMBERS**

+Bahrain
Egypt
Greece
+Iran
Israel
+Jordan
Kuwait

Morocco
(+) Oman
Pakistan
(+) Palestine
+Turkey
United Arab Emirates

OBSERVERS

Armenia -
Cyprus -
France
Germany
Italy

Japan
Russian Federation
Sudan
United Kingdom
USA

New : Brazil (fellowship), Libya

Tasks for scientists

2 kinds of Members:

- a) a) well advanced,
being able to use facility
- b) have to learn and
create scientific basis

**To bring them to the front
a quantum jump is needed**

**Scientists from the region
who have gained experience
in SR labs should help to integrate
colleagues from the region in groups**

SESAME Advisory Committees

Appointed by IC July 2002 on proposals by delegates and chairpersons (to be confirmed)

Technical Committee:

give advice on the machine.

Chairperson: Constantinos Papanicolas (Greece)

F.Asfour (Egypt), C.Bocchetta (Italy, ELLETRA), M.Hadizadeh (Iran), A.Nadji (Alger, LURE) S.Salman(Palestine), E.Weihreter (Germany, BESSY)

Beam-Lines Committee:

form collaborations for beam-lines, organize the first generation of beams including funding and obtaining used equipment from other laboratories; (later for evaluating individual proposals);

Chairperson: Samar Hasnain (Pakistan, Daresbury)

J.Bordas (Spain), N.Hamdan (UAE), E.Ozdas (Turkey), J.Sussman (Israel), S.Wakatsuki(Japan), H.Winick (USA)

Scientific Committee:

give advice on the overall long-term scientific programme of the project;

Chairperson: Zehra Sayers (Turkey)

J.-P.Connerade (Pres.Euroscience), A.Hoummada (Morocco), A.Mahmoud (Jordan), P.J.Rizkallah(UK), M Vlassi (Greece)

Training Committee:

to coordinate workshops, seminars, fellowships, etc., including fund-raising.

Chairperson: Reza Mansouri (Iran)

S.I. Kurokawa (Japan), G.M.Farijah (Bahrain), A.El-Gazzar (Kuwait), S. Ahmad (Pakistan), I. Khubais (Jordan).

Appointments of Senior Staff

1. Technical Director

**Dieter Einfeld from 1 September 2001
(as UNESCO Adviser, funded by Members)**

2. Administrative Director

**Post published, immediate appointment
(approved by IC)**

3. Scientific Director

next urgent appointment

4. Director of Centre

**urgent, after formal establishment
of SESAME**

Future Steps (tentatively)

2003 – 2004 Construction of Building

(accelerator hall and annexes)

Planning well advanced

Groundbreaking 5/6 January 2003

2004 – 2005

Installation of machine

in parallel with finishing of building

start of installation of beam lines >2004

increase of staff number to full initial complement, about 50 man.years (operating machine and serving 2 or 3 beam lines)

Experiments 2006 - 2010

first phase of exploitation,

number of beam lines at turn -on
depending on interest of user and resources

gradual installation of additional beams

Initial Estimates for Investments

Machine

(all figures in thousand US\$)

Estimate in the *Green Book*

Building and infrastructure

1. Experimental hall	6400
2. Laboratory, office buildings, control room	3800
3. Road, car parks, electrical substations	<u>1352</u>
<i>Total of building and infrastructure</i>	<i>11552</i>

4. Installation and upgrading of SESAME	6047
5. Shipping of BESSY I to the Middle-East	200
6. Cooling facilities	1085
7. Reinstallation in the new place	
Material (cables, connectors, etc)	435
Outside contracts, travel, labour to install SESAME	1000

GRAND TOTAL **US\$ 20,319**

Not taken into account:

Dismantling and documentation of BESSY I	600
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Updated Estimates of Investment

1. Cost of dismantling and shipping already paid from current budgets **US\$ 800**
2. The Jordanian Government agreed to finance the building as now proposed (copy of ANKA), including control room, offices, labs, meeting rooms, workshops, auditorium, etc. Hence the amounts for building and infrastructure are being taken care of **US\$ 11552**
3. New proposal by the Technical Director the installation and upgrading of the machine **US\$ 7.5** million instead of **US\$ 6.047** million
4. Cooling more expensive **US\$ 1800** instead of **US\$ 1085**.
5. Installation by trained staff whose salaries will be paid from the operating budget. Outside contracts can be reduced.
6. Materials etc. will be paid by operation budget

Still needed

1. Installation/upgrading of the machine	7500
2. Cooling	1800
Total	US\$ 9300

Most of it requested from EU

But some components could be delivered in kind !

Note: No expensive and complicated SC wigglers needed, Saving about US\$ 1.2 million per wiggler

Investments for beam lines

Original policy adopted by IC:

Beam lines not covered by the SESAME budget but special projects financed by

- outside sponsors (SR labs, IAEA, Observers, USA)**
- two or a few Members of SESAME join to establish a beam project**

Now 'public beams ??

How many initial beams ?

Most laboratories started with 1 to 4 beam lines.

**SESAME: 2 or 3 initial beams
but depending on interest and resources**

**Period to build up full capacity
between 5 and 10 years
depending on the interest of the users.**

Crude estimate for 2 kinds of beams:

- (a) beam lines derived from bending magnets (less expensive);
Green Book: average US\$ 600k
- (b) beam lines derived from special insertions(costly); *Green Book*: average US\$ 1.8 million, without wiggler; normal wiggler and in addition some laboratory equipment, about US\$1500k.

**Total initial investment
for 2 beam lines about US\$ 3,900k**

But

- components might be made available from other laboratories. SLAC has offered already beam components not used anymore
- in the USA, APS started initiative to request from DOE funds for SESAME beams (several US\$ million).
- Funds requested from IAEA . EU, (Japan?)

***Most urgent:
proposals for initial beams***

How to achieve it?

**Obtain suggestions from this meeting,
e.g.**

Consensus on type of beams, how many?

Appoint coordinators for individual beams

**Work out detailed design (with cost)
*If possible until end 2002, beginning 2003***

Use existing sources:

- Find available equipment**
- Use existing designs**
- any other**

National contributions

Accepted by IC for planning of national budgets (following UN scheme)

	2000- 2002	2003	2004
Budget		710 in 1000 \$	790 in 1000 \$
Upper Limit		8,733 %	9,8
Lower limit	50.000 \$	7,042 %	6,329

	UN %	% with limits	Contribution in 1000 \$	% with limits	Contribution in 1000 \$
	scaled			scaled	
Bahrain	50,00	7,04	50,00	6,33	50,00
Egypt	50,00	7,04	50,00	6,33	50,00
Greece	50,00	8,73	62,00	9,80	77,42
Iran	50,00	8,73	62,00	9,80	77,42
Israel	50,00	8,73	62,00	9,80	77,42
Jordan	50,00	7,04	50,00	6,33	50,00
Kuwait	50,00	7,04	50,00	6,94	54,79
Morocco	50,00	7,04	50,00	6,33	50,00
Oman	50,00	7,04	50,00	6,33	50,00
Pakistan	50,00	7,04	50,00	6,33	50,00
Turkey	50,00	8,73	62,00	9,80	77,42
UAE	50,00	8,73	62,00	9,56	75,53
Palest. Auth.	50,00	7,04	50,00	6,33	50,00
Sums	2,284	100,00	710,02	100,00	790,00

Contributions in kind possible (e.g. detachment of staff)

For period after 2004 a new scheme will be decided upon depending on needs and Members and Observers contributing.

JASS'02, Amman 26.10.2002

SESAME is on its way!
**Many hurdles have
been taken**

**Everybody should
help to pass the final
(small ?) thresholds !!**
**Users should convince
their governments**