SESAME A PERSONAL VIEW FROM CERN
ELIEZER RABINOVICI
VICE PRESIDENT SESAME

RACAH INSTITUTE OF PHYSICS
HEBREW UNIVERSITY, JERUSALEM
ISRAEL

Madrid 15th April 2015

Paco Yndurain colloquium
Reality or a parallel Universe?
A personal view
Unique

- Robust
- High quality scientists
- High quality science
- Dedication
Israeli scientists:

- Prof. M. Duetsch
- Prof. Paz-Pasternak
- Prof. E. Rabinovici
- Prof. Jacob Klein
- Dr. Uri Raviv
- Prof. I. Sagi
- Prof. Y. Sussman
- Prof. D. Tawfik
- Prof. A. Yonat
Small Science?
Good Science!
Compromise
Big Science?
SYMmetry
&
SIMPLICITY
IN PHYSICS

A SYMPOSIUM
ON THE OCCASION
OF
SERGIO FUBINI'S 65th BIRTHDAY

Editors
W M ALBERICO & S SCIUTO
Dipartimento di Fisica Teorica, Università di Torino
via Giuria, Torino, 10125, Italy

World Scientific
Singapore • New Jersey • London • Hong Kong
MINIREVIEW OF SEVERAL NEW ASPECTS OF STRING THEORY
UNCOVERED SINCE 1986

Eliezer RABINOVI
Racah Institute of Physics
The Hebrew University of Jerusalem
Givat Ram, Jerusalem 91904, Israel

The first time I have seen Sergio Fubini was while listening to a seminar he gave at Cern in 1979. He was describing ideas on how to view the gravitational constant as a vacuum expectation value of some field. At the beginning of the talk he issued a warning to those he called “young people”. He stated that any one of them who will start studying quantum gravity will continue to do it as long as he does research. As you see he had left an escape clause for himself. The others could not claim they were not forewarned and maybe the warning should be put in writing. My first actual meeting with Sergio was in a Cern corridor, I was, as I am now, willing to consider any idea which would teach us about the spontaneous breakdown of symmetry between “micro” and “macro” dimensions. I told him about a recent preprint by D’Hoker and Jackiw in which they describe a mechanism for the spontaneous breaking of translational invariance and of the ideas C. Bernard and B. Lautrup and myself had on the subject. He very gently suggested that ideas he had had in the past may be useful in setting the context of the particular problem at hand. Needless to say that his paper on the possibility of spontaneous breaking of Lorentz invariance in a conformal system made available a whole new set of his original ideas.

I would like to take advantage of Sergio’s patience to listen to questions and include in this mini review a set of questions pertaining to our attitudes in string theory.

It is about ten years since a large part of the particle physics community has reexamined the possibility that the elementary constituents of matter are string like rather than particle like. An impressive amount of new information was obtained on string theory, many issues are yet to be understood. Below follows a partial list of such aspects.

<table>
<thead>
<tr>
<th>WHY</th>
<th>WHAT, HOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>why string</td>
<td>what strings, what particles</td>
</tr>
<tr>
<td>why only strings</td>
<td>what stringy symmetries</td>
</tr>
<tr>
<td>why a scale</td>
<td>what else is possible</td>
</tr>
<tr>
<td>why four macroscopic dimensions</td>
<td>how to break supersymmetry</td>
</tr>
<tr>
<td>why supersymmetry</td>
<td></td>
</tr>
</tbody>
</table>
ARAB-ISRAELI SCIENTIFIC COLLABORATION: FIRST BUDS

Eliezer RABINOVICI
Racah Institute of Physics
The Hebrew University of Jerusalem
Givat Ram, Jerusalem 91904, Israel

It is a great pleasure and honor to attend this Symposium on the Occasion of Sergio's Fubini 65th birthday, here at the Accademia della Scienze in Torino. I have been asked to give a survey on aspects of Arab-Israeli scientific collaboration. I have collected a few pieces of information which I will present to you; it should be realized, however, that I am not an expert on the subject and I do not know how complete the information is (Figure 1).

To set the perspective let us first consider the regional map which includes many Arab states and Israel.

Next are presented some statistics concerning the number of students in some Arab states and Israel and the number of faculty members in the corresponding countries (the statistics on the Arab states are from “The Development of Higher Education In Seven Arab Countries, 1965-1988” by Prof. G. Gilbar).

The first Arab-Israeli scientific relations were established between Egypt and Israel. The Egypt-Israel peace accord contains among its many complex annexes a short one in which both sides take upon themselves to establish cultural relations. This serves as the basis for the Scientific Relations. The spirit in which both sides view such relations can be exemplified by the section in a memo of understanding regarding collaborative research in marine sciences presented below.

This is so evident and yet it took so long to state.

These noble principles cannot be implemented without funding. The main source of funding has been the USA; I have obtained an estimate that 7 million dollars have been directed to foster scientific collaboration through AID (Agency for International Development). There has also been available a much smaller amount of support from Egyptian and Israeli sources. The areas of research to which this funding has been directed include: Agriculture, Marine Sciences, Health, Energy, Arab and Hebrew Literature and Languages. On a more applied science basis there have been contacts between Arab states and Israel regarding computer software, seeds for agriculture and irrigation methods. The output of such efforts consists of solutions of concrete scientific problems, the enrichment of knowledge of human relations and of course scientific papers. An example of a page of such a paper on a problem in agriculture is presented below.

* boarders according to Oxford Atlas.

(1) in these projects it is planned the Palestinian scientists join as well.
Memorandum of Understanding
to establish:
Condensed Matter, Environmental and High Energy Physics
Collaborative Research
in the Middle East

1. Introduction

Under the auspices of Prof. Dr. Venice K. Gouda, Minister of State for Scientific Research of the Arab Republic of Egypt, and as a continuation of the correspondence between representatives of the National Research Centre (Cairo), the Racah Institute of Physics, Hebrew University of Jerusalem and the Physics Departments of the Universities of Cagliari and Torino, a working visit of Prof. Alberto Devote (University of Cagliari), Prof. Sergio Fabini (University of Torino), and Prof. Eliezer Rabinovici (Hebrew University, Jerusalem) was held in Cairo on January 7 and 8, 1995. The Egyptian participants in these meetings were:

1. Prof. Dr. M.M. El Halwagi, First Under-Secretary, Ministry of State for Scientific Research of the Arab Republic of Egypt
2. Prof. Dr. Naiel Barakat, Professor of Experimental Physics, Ain Shams University
3. Prof. Dr. Sawsan Abdel Zaher, Head of Physics Division, NRC
4. Prof. Dr. Ahmed Fakhr, Research Professor, Atomic Spectroscopy, NRC
5. Prof. Dr. Mohamed Tag Eldin, Head, Theoretical Physics Dept., NRC
6. Mr. A.I. El-Ibiary, Legal Advisor for NIOF

The purpose of the meetings was to outline practical ways for collaboration in the fields of Condensed Matter, Environmental and High Energy Physics within the context of the above-mentioned parties.

It was agreed that:

i) It is of great importance to strengthen the scientific relationships between the above-mentioned parties in the various fields of Condensed Matter, Environmental and High Energy Physics for the benefit of common human knowledge.

ii) The parties recognize that important scientific achievements in Condensed Matter, Environmental and High Energy Physics can only be achieved through meaningful and sincere collaboration between experts, independently of their nationalities.

iii) Training of young scientists and researchers is of major importance and all the involved institutions have the responsibility of contributing to their training in Condensed Matter, Environmental and High Energy Physics.

For these reasons the above-mentioned institutions will take the initiative in developing a fruitful collaboration both in research and training.
IV. Finance

In order to develop a long-term collaboration, the parties agree to prepare joint research projects to be submitted in the near future to International funding agencies and World Organizations. The parties agree not to delay the actual collaborative activities until the approval of the above-mentioned research projects and agree to start the collaborative work with the available funds.

To this end:

a) Travel expenses, accommodation and per diem of Egyptian and Israeli scientists invited to courses and scientific activities in the Italian Institutions will be taken care of by the Italian Institutions.

b) The Egyptian side will provide accommodation for Israeli and Italian Scientists invited to stay at Egyptian Institutions, within the scope of joint research collaboration (this does not include the International meeting mentioned under item III(c), for which special funding arrangements will be sought).

c) Travel expenses, accommodation and per diem of Egyptian and Italian scientists and students invited to courses and scientific activities at the Racah Institute will be taken care of by the Israeli Institute.

In summary, the above-mentioned Institutions consider this agreement as a sound base for collaboration in both research and training.

Signed in Cairo on January 8, 1995, in three originals in English.

Prof. Dr. Mohamed Mokhtar El Halwagi  
First Under-Secretary of State  
Ministry of Scientific Research  
of the Arab Republic of Egypt  
Cairo, Egypt

Prof. Sergio Fubini  
Representative of the  
Scientific Committee  
for the Middle East  
Workshop  
Torino, Italy

Eliezer Rabinovici  
Prof. Eliezer Rabinovici  
Chairman  
Racah Institute of Physics  
Jerusalem, Israel
Trieste, July 20, 1995

Prof. S. Fubini
Chairman of the
Scientific Committee for the Sinai School of Physics,
Universita di Torino
Torino, Italy

cc: Prof. G. Denardo
    Prof. A. Devoto
    Prof. E. Rabinovici

Dear Prof. Fubini,

I'm happy to let you know that the ICTP has decided to grant a special contribution of 22,000 $ for the organization of the “Sinai Meeting on High Energy Physics, Condensed Matter and Environmental Physics” to be held in Dahab (Egypt) from 19 to 26 November 1995.

This contribution will be given to the Organizing Committee at its address in Israel.

Yours sincerely,

Miguel A. Virasoro
ICTP Director
SINAI MEETING ON
HIGH ENERGY, CONDENSED MATTER
AND ENVIRONMENTAL PHYSICS

19-26 November 1995
Dahab, Sinai Peninsula, Egypt

Under the auspices of:

CEC
UNESCO
Egyptian Ministry of Scientific Research
The Israel Academy of Sciences and Humanities
Istituto Nazionale per gli Studi Fisici
Istituto Nazionale di Fisica Nucleare (INFN)
The Higher Council for Science and Technology, Amman
International Research Centre, Cairo
Rabban Hormizd University
The Hebrew University, Jerusalem
Bar-Ilan University
International School for Advanced Studies (SISSA), Trieste
University of Cagliari, University of Naples, University of Turin

This International Meeting has been planned with the aim of bringing together experts in these very active fields of research and putting them in contact with young researchers from the Middle East and from the whole Mediterranean area in a spirit of co-operation and friendship. The meeting is going to be a starting point for further similar encounters in this area. A limited number of young researchers from each country will be admitted. The participation of senior researchers is very important, so the only limitation on their number will be the available room at the meeting site.

The meeting will consist of a series of lectures, a set of seminars and demonstrations, and there will be ample time for discussions and for sessions of questions and answers.

Following is the list of the topics of the mini-courses and their organizers:

1) Particle- and Astroparticle, M. Jacob and G. Versaci;
2) Superconductivity (Physics and Applied Technology), A. Barone and F. Bonanni;
3) Spontaneous Symmetry Breaking, R. Jackiw;
4) Non-Abelian Gauge Theories, E. Brahmavindya;
5) Environmental Physics, G. Fulco.

There will be seminars by:

L. Alvarez-Gaumé: Anomalies; M. Amsel Abdel Rauf: Theory of Four-body Systems; Rigorous and Variational Proofs of the Possible Coexistence of Atoms and Antimatter; M. Berry, Geometric Phases; E. Brezin, I/N Expanders; J. B. Gasser, Gauge Theoretical Description of Superconductivity; R. H. Laflamme, Particle Physics in Miniature: the Simulation of Quarks and Gluons by Quantum Antiferromagnets; K. Rabinovici, dualities in Physics; M. Visser (to be announced); W. Witten, (to be announced).

International Scientific Advisory Committee
Abdus Salam and Victor F. Weisskopf (Honorary Chairmen)


Local Organizing Committee
M.M. El Haddouci (Ministry of Scientific Research, Cairo, M. El Pikash (NIS, Cairo, M. El Ray (U. of Alexandria), M.S. Shaba (NIS, Cairo, M. Fakhoury (NRC, Cairo, M.S. El Vahab (Unimibra U., M.A. Sadik (NIS, Cairo, A.S. El Shiekh (Ministry of Scientific Research, Cairo, M. Tag El-Deen (Unimibra U., Cairo)

For further information please write to:
A. Deveo
Dipartimento di Scienze Fisiche
Via Dodecaneso, 72
00124 CAGLIA (Italy)
FAX: 003 (702) 59010
E-mail: DIRECTOR@ictp.trieste.IT

August 1995

OR E-mail: DIRECTOR@ictp.trieste.IT
Action plan for a collaborative programme in physics in the Middle East.

As part of the implementation of the collaboration agreement signed in Cairo on January 8th, 1995 under the auspices of H.E. Prof. Dr. Venice K. Gouda, Minister of State for Scientific Research of the Arab Republic of Egypt;

In the spirit of the agreement to promote co-operative work in fields that have impact on peoples' lives and standards of living, facilitating the use of equipment and expertise to support and collaborate in the ongoing peace process;

As a consequence of fruitful discussions among scientists of the Middle East held during a successful meeting in Dahab, Sinai from November 19 to November 26, 1995 under the chairmanship of Professor Sergio Fubini, acting also as delegate of the Minister of University and Scientific and Technological Research of Italy, attended by 125 scientists: American, Argentinian, British, Egyptian, French, German, Israeli, Italian, Japanese, Jordanian, Moroccan, Palestinian, Spanish, and honoured by the presence of Prof. Dr. Venice K. Gouda, Minister of State for Scientific Research of the Arab Republic of Egypt, Prof. Jacob Ziv, President of the Israel Academy of Science and Humanities, Prof. Miguel A. Virasoro, Director of ICTP and Dr. Adnan Badran, Deputy Director-General of UNESCO;

It was decided:

- To create a “Steering Committee for International Collaboration in the Middle East on Basic and Applied Physics” under the auspices of UNESCO, ICTP and the Italian government.

The tasks of this committee will be:

1. To promote collaboration between scientists in Egypt, Israel, Italy and other scientists in the region; to identify research groups with common interests and to facilitate research collaboration and the exchange of scientists and students;

2. The committee will initiate, promote and support other meetings and regional Schools of Physics. The next School is planned to take place in Jerusalem and Bethlehem in May 1996, on the subject of the Physics of Detectors.

3. The establishment of a computerized data base of regional scientific and educational activities for the benefit of all students and researchers in the area, with a view to connecting the institutions and groups active in research and education.

R. Dubini
G.B. E. Rabamarco
First Bulletin

Seminar on Experimental Techniques in High-Energy and Synchroton Radiation Physics

Villa Gualino, Torino, Italy
31 October - 5 November 1996

1. PURPOSE

The aim of the present Seminar is to review modern experimental techniques in accelerator-based physics research. Even though research objectives in the various fields of science that use accelerators can be very different, the problems encountered when employing and developing particle and radiation detectors for experimental work have many aspects in common. This condition leads to cross-fertilization in the area of instrumentation research between these fields. Furthermore, the development of new particle detection and accelerating methods is continuously leading to new technical applications outside the area of pure physics research, like in medicine, biology and industry, eventually having a positive impact on peoples' lives and standard of living.

Owing to their large size and cost, new accelerators tend to become unique facilities within large regions or even within the world. Utilization of these facilities by researchers from different parts of the world should be facilitated. Application to participate in the present seminar is open to Ph.D. students and researchers from any country. The procedure to apply for an invitation is indicated below. There is no fee for participation in the Seminar.

For Egyptian, Israeli, Jordanian and Palestinian participants a limited amount of financial support has been made available by the sponsors of this Seminar to cover travel and board costs in connection with the Seminar. It is hoped that this special support will stimulate further scientific collaboration with and between Middle East countries and, furthermore, that it will thereby also contribute to the promotion of the peace process in this part of the world.

2. PROGRAMME

A preliminary list of the different sessions and talks is given below. All talks will be plenary.

*Base Facilities*
Particle Colliders; Synchroton Radiation Sources.

*Research Programmes*
Synchroton Radiation Physics: Diffraction in Materials; Diffraction in Macromolecules; Scattering; Spectroscopy; Imaging.

Instrumentation
Detectors for High-Energy Physics: Tracking; Calorimetry; Particle Identification; Electronics and Calibration; Data Acquisition and Transmission.
Beam Lines and Detectors for Synchrotron Radiation: Insertion Devices; Beam Optics for X-Rays; Beam Optics for UV and Soft X-Rays; CCD and Solid State Detectors; Gaseous Detectors; Electron Detectors.

Particle Detector and Accelerator Applications
Medical and Biological Detectors; Medical Treatment; Energy Amplifier.

Participation and Impact in International Physics Collaboration
Overview of Middle East Activities
Panel Discussion: Participation and Impact in International Physics Collaboration.

There will be about seven 45-minute talks per day during five days. The lecture days are Thursday, Friday, Saturday, Monday and Tuesday, 31.10 - 5.11.1996, and the session hours are 900 - 1200 and 1400 - 1800. There will be time for questions and discussions after each talk. One afternoon a special session will be organised with a panel discussion including representatives from the Middle East.

It is intended to offer participants the possibility to visit the CERN laboratory in Geneva or the ESRF laboratory in Grenoble. There are also plans to have one or two detector demonstration set-ups at the conference site to demonstrate some basic principles of radiation detectors.

3. SITE AND ACCOMMODATION
To serve Fundamental, Applied and Industrial Research

PHYSICS

CHEMISTRY

BIOLOGY

GEOPHYSICS

ENVIRONMENTAL SCIENCE

MATERIAL SCIENCE

MEDICINE
Uppsala
1999

- SEARCHING FOR $$$, STILL NEEDED
- DESIGN OF 1 GEV
- TO PARIS
1999

UNESCO - PARIS
WHERE?

FORMALISM- EMULATE CERN’S UP TO “DETAILS” SUCH AS STATUS OF NON-STATES.
2000

AMMAN: 15TH MARCH
Egypt’s antisemitic press

Today the Anti-Defamation League will present the Knesset with a just-released report documenting virulent antisemitism in the Egyptian press. When asked about this distressing phenomenon, President Hosni Mubarak is fond of (a) comparing press freedom in Egypt to that of the United States and (b) attacking this newspaper for what he perceives is an anti-Egyptian bias.

"Don’t ask me to control the press here—I simply can’t," our media relations officer the American media. Mubarak told the Jerusalem Post, adding that, “The Jerusalem Post frequently offends me with its awful and terrible cartoons and its most [impolite] articles." Not so fast, President Mubarak. We hate to be impolite, but as far as we know, the US government does not own stock in the major newspapers, and appoint their editors and the chairmen of their boards. Nor does the US government enjoy a monopoly on the printing and distribution of newspapers, or use that monopoly (according to the US State Department) to limit output of opposition publications.

The prestigious international writers’ association PEN reports that, "Although Egypt’s press is one of the least restricted in the Arab world, serious problems exist, and they are worsening in the face of civil conflict." According to PEN, "In 1995, already restrictive press laws were amended to include what has been called the 'press assassination law,' supposedly enacted to help combat terrorism, but which in fact narrows the scope for freedom of expression."

This includes the "precautionary detentions" of journalists, in other words, detention of journalists without any charges. In any case, even if the press were as free as a bird, as Mubarak would have us believe, that would not absolve the Egyptian society as a whole from addressing the hatred that is being fomented on an almost daily basis against Jews, Judaism, and Israel.

Jews, according to the ADL study, are consistently portrayed as a "satanic force trying to undermine Islam," as "seeking domination of the Middle East and the world," and as equivalent to Nazis. The report continues, "The most common depiction of Jews is the stooped, bearded man wearing a black robe with a long, crooked nose—the same distorted stereotype of a European Jew used by the Nazis and later found in Communist Russia."

Prime Minister Binyamin Netanyahu, like other Israeli leaders before him, is routinely depicted as a Nazi, complete with swastikas on his uniform. Last October, Mustafa Amin wrote in Al-Ahram, "If he continues Hitler’s policies, he will end like Hitler." As if this were not enough, Jews are seen as "the origin of evil and corruption, spreading AIDS, prostitution, and the inidious destruction of Egyptian society," the ADL reports. Blood libels from the Middle Ages are alive and well in Egypt, where Al-Ahram published an article claiming that Jews sacrifice Christian and Moslem children.

Though the vitriol has been stepped up notch since Netanyahu’s election, the pattern is consistent, according to the ADL, since Israel’s founding in 1948, through the peace with Egypt in 1979, and after the signing of the Oslo Accords in 1993.

To this Mubarak says, "Don’t ask us to ‘educate’ our people for peace with Israel—they’ll tell me to go to hell." Is this what Mubarak really wants us to believe? That Egyptians are more anti-Israel than Jordanians, whose king is fervently calling for peace between "all of the children of Abraham?" Mubarak is saying, in effect, do not ask me to lead my people—they do not want peace with Israel and I understand them.

Egypt wants and expects to be treated as the leader of the Arab world, particularly with respect to the peace process. Yet it is impossible for Egypt to lead the Arab world toward a real lasting peace with Israel if it does not also lead on the front of cultural acceptance and normalization.

The sad part about Egypt’s backward form of leadership is that it permeates and suffocates the culture as a whole. Restrictions on press freedom, the epidemic of press antisemitism, and the spoiler role in the peace process are all symptoms of a larger, even more troubling phenomenon: the shift in Egyptian culture toward extremism.

As Egyptian author Karim Alrawi wrote in Index on Censorship in May 1994, "It is hard to describe what it is like to be living in a society whose culture is dying. It is not just a question of the persecution of writers and academics, nor of the tightening of restrictions on publications and the increased censorship of theaters and films... It is a little like watching a large and lumbering animal slowly being sucked into the mire; it is the knowledge that what was won by past generations so painfully is being lost, possibly forever."

Ultimately, it is Egypt that is the victim of its descent into a Nasserist pan-Arabism which thumbs its nose at modernity and modernity’s representative in the Middle East, Israel. Antisemitism is an example of such backwardness in its raw form; it will take real leadership to begin the hard task of uprooting it.
Within easy reach of Jordan, Israel, Palestinian Authority.

Samples/equipment/people can in principle be transported by car.
Location of SESAME(II): Allaan, north of A-Salt

- Currently a college of Al-Balqa University.
- SESAME to replace the olive grove, the only flat place on site.
Location of SESAME(III): The view is magnificent!
2000

- CERN: 11TH APRIL JORDAN CHOSEN AS A SITE.
- COUNCIL: JUNE, APPROVES JORDAN AS SITE.
September 2000, 18 scientists selected to receive advanced training at ANKA, Daresbury, DESY, Elettra, ESRF, LURE, MAXLAB, and the SLS.
March 2001, Jordan agrees to fund the construction.

September 2001, Prof. Dieter Einfeld appointed Technical Director.

October 2001, SESAME accepted officially by UNESCO as a fully autonomous entity.
April 2002, 2nd conceptual design (2 GeV) submitted to Council and the EU.

June 2002, Bessy I shipped to Jordan.
Members

- BAHRAIN
- CYPRUS
- EGYPT
- ISRAEL
- JORDAN
- PAKISTAN
- PALESTINIAN AUTHORITY
- TURKEY
- IRAN

Observers

- France
- Germany
- Greece
- Italy
- Japan
- Kuwait
- Portugal
- Russia
- Sweden
- Switzerland
- UK
- USA

Governing Body

Council

Each Member one vote

Two delegates
**SESAME** is a 3rd generation light-source (‘very powerful flash lamp → microscope’) under construction near Amman

**SESAME will foster:**

- science and technology in the Middle East and neighbouring countries (from biology and medical sciences through materials science and physics to archaeology)
- cooperation across political divides

**Observers:** Brazil, China, EU, France, Germany, Greece, Italy, Japan, Kuwait, Portugal,
Inside the SESAME Experimental Hall - Schematic

Shielding houses electron accelerator and storage ring

Intense beams of light (infra-red to X-rays) generated by circulating electrons exit through ports in the shielding

Shielding houses electron source, pre-accelerator and
First beamlines:
Protein Crystallography
Infra Red Spectroscopy
Powder Diffraction
Photoelectron spectroscopy
Small Angle X-ray scattering
EXAFS
Bahrain, Cyprus, Egypt, Iran, Israel, Jordan, Pakistan, Palestinian Authority, Turkey

www.sesame.org.jo
Sir Chris Llewellyn-Smith
коло פיזה המנהרה?
- קolo פיזה המנהרה.
Prof. Manuel Trajtenberg  
Chairman  

February 22, 2010

Professor Khaled Toukan  
SESAME Director  
Jordan  

Dear Professor Toukan,

It is a pleasure to inform you that the Planning and Budgeting Committee (PBC hereafter) of the Israeli Council for Higher Education, which I Chair, shares your view as to the importance of the SESAME project, and is ready to participate in financing it. In fact, the Israeli Ministry of Finance and us agree that the PBC will be in charge of overseeing the project and dealing with the authorities of Sesame regarding all aspects of Israeli involvement with the project.

As to the financial aspects, the Israeli Ministry of Finance and the PBC agreed that we will be ready to participate in funding SESAME at the rate of up to 1 million dollars per year for 5 years, provided that the following conditions are met:
1. That at least four out of the other major participating countries do as much (among them Egypt, Jordan, Turkey and Cyprus);
2. That the SESAME project is able to show a balanced budget, taking into account the financial participation of the above mentioned countries and other members and that of the international contributors and benefactors to the project.
3. That a resolution of the annual member fees will be achieved within the following year.

Hoping that the project will indeed come to fruition,

With Best Regards,

Professor Manuel Trajtenberg  
Chair, Planning and Budgeting Committee  
Council for Higher Education  

Copies:  
Mr. Yonatan Regev, Manager of Higher Education and R&D Sector, Ministry of Finance
CERN-EC support to SESAME
Report to SESAME Council
May 2014

J.-P. Koutchouk
Coordinator for CERN support to SESAME
SESAME Power Supplies development: prototype tests starting

Miguel Bastos & Evrim Ari

for TE-EPC-HPM

SESAME PS control electronics chassis

SESAME PS control electronics backplane

SESAME PS DAC and interface board

SESAME PS dipole interface board

Work ongoing on...

• Controller firmware
• Quadrupole and Corrector rack design
• Development of test equipment
Conclusion

• **FP7 CESSAMag is on track; most of the EC funding is committed.**

• **The policy of involving industry and institutes of SESAME members (SOMNEZ, Turkey; CNE, Cyprus; HMC3, Pakistan; soon TDK, Israel) has been very positive: extra workload for CERN but rewarded by a strong motivation towards excellence.**

• **The training aspect, important per se and for the EC in the perspective of Euro-Mediterranean cooperation works very well by mostly informal but dense collaborative work between CERN and SESAME.**
1st industry sextupole for SESAME at CERN

- Manufactured by CNE Technology Center (Cyprus), with coils produced by SEF (France)
- 1st accelerator magnet for this company & 1st made in Cyprus
- transfer function within 1% of OPERA 3D simulations
- excellent allowed harmonics
  - $f b_9 < 1$ unit without end pole chamfers, with a 3D magnetic design that uses a biased $b_9$ in 2D (12.8 units) canceled off by the end effects
- very good not-allowed harmonics
  - good alignment of laminations within single sextants
  - good symmetric assembly of the six sextants

multiplies in $10^{-4}$, $R_{ref} = 24$ mm, $R_{pole} = 37.5$ mm (I = 200 A)

comparison measured / simulated transfer function (averages ramps up / down)
Pre-series QF quadrupole for SESAME at CERN

- manufactured by Elytt (Spain), with coils produced by Sönmez Transformatör (Turkey)
- transfer functions within 1% of OPERA 3D simulations
- allowed harmonics < 1 unit, as expected from 3D simulations
  - pole tip (circular arc instead of hyperbolic branch) confirmed, green light for lamination punching
  - values of end pole chamfers ok with no needs of iterations
- not-allowed harmonics to be improved
  - 5.9 units of sextupole
  - 4.0 units of octupole

multipoles in $10^{-4}$, $R_{\text{ref}} = 24$ mm, $R_{\text{pole}} = 35$ mm ($I = 200$ A)
Pre-series QD quadrupole for SESAME at CERN

- manufactured by Elytt (Spain), with coils produced by Sönmez Transformatör (Turkey)
- transfer functions within 1% of OPERA 3D simulations
- allowed harmonics < 1 unit, as expected from 3D simulations
  - pole tip (circular arc instead of hyperbolic branch) confirmed, green light for lamination punching
  - values of end pole chamfers ok with no needs of iterations
- not-allowed harmonics to be improved
  - 2.3 units of sextupole
  - 8.3 units of octupole

Pre-series QD quadrupole

multipoles in $10^{-4}$, $R_{\text{ref}} = 24$ mm, $R_{\text{pole}} = 35$ mm ($I = 200$ A)
SESAME magnets: made in ... a wide effort

FRANCE
420 sextupole coils

SPAIN
66 quadrupoles

PAKISTAN
33 sextupoles

UK
17 dipoles

CYPRUS
33 sextupoles

TURKEY
280 quadrupole coils

Attilio Milanese & Davide Tommasini for TE-MSC-MNC
Collaboration between SESAME Members and Observers

Spain: quadrupoles
France: sextupole coils
UK: dipoles
Germany: vacuum chambers
Turkey: quadrupole coils

In Addition

Italy: Dipoles power supply
Switzerland: controllers + correctors power supplies
Israel: power supplies for quadrupole and sextupole

First of 16 sectors of the main storage ring at CERN 31 March 2015
Italy Donates 2-5 Million Euro
Microtron Installed at SESAME
Components of BESSY 1 installed to form (part of) the SESAME Booster
November 2008
Shielding for the Booster and Main Ring under construction May 2010
Shielding under construction November 2010
### Contributions

<table>
<thead>
<tr>
<th>Country</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jordan</td>
<td>2,030,725.00</td>
</tr>
<tr>
<td>Israel</td>
<td>2,500,000.00</td>
</tr>
<tr>
<td>Egypt</td>
<td>0.00</td>
</tr>
<tr>
<td>Iran</td>
<td>0.00</td>
</tr>
<tr>
<td>Turkey</td>
<td>2,500,000.00</td>
</tr>
<tr>
<td>Pakistan</td>
<td>0.00</td>
</tr>
<tr>
<td>Cyprus</td>
<td>0.00</td>
</tr>
<tr>
<td>Bahrain</td>
<td>0.00</td>
</tr>
<tr>
<td>Palestinian Authority</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Total Contributions:** 7,030,725.00

### Expenses

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>590,840.30</td>
</tr>
<tr>
<td>2013</td>
<td>543,955.16</td>
</tr>
<tr>
<td>2012</td>
<td>311,498.67</td>
</tr>
<tr>
<td>2011</td>
<td>324,399.53</td>
</tr>
<tr>
<td>Advance Payment (CERN)</td>
<td>100,000.00</td>
</tr>
</tbody>
</table>

**Total Expenses & Debts:** 1,870,693.66

### Other Income

<table>
<thead>
<tr>
<th>Income Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Book Balance</td>
<td>5,160,031.34</td>
</tr>
<tr>
<td>Actual Balance</td>
<td>5,162,227.61</td>
</tr>
</tbody>
</table>

**2196.27**
## Proposed Budget Distribution for 2015

<table>
<thead>
<tr>
<th></th>
<th>Approved 2014 Budget</th>
<th>Proposed 2015 increase (29.67%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$ 4,425,188</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Limit</td>
<td>$ 301,739.18</td>
<td>$ 391,279.29</td>
</tr>
<tr>
<td>Upper limit</td>
<td>$ 531,060.96</td>
<td>$ 688,651.54</td>
</tr>
<tr>
<td><strong>Member</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bahrain</td>
<td>$ 301,739.18</td>
<td>$ 391,279.29</td>
</tr>
<tr>
<td>Cyprus</td>
<td>$ 301,739.18</td>
<td>$ 391,279.29</td>
</tr>
<tr>
<td>Egypt</td>
<td>$ 311,032.75</td>
<td>$ 403,330.68</td>
</tr>
<tr>
<td>Iran</td>
<td>$ 531,060.96</td>
<td>$ 688,651.54</td>
</tr>
<tr>
<td>Israel</td>
<td>$ 531,060.96</td>
<td>$ 688,651.54</td>
</tr>
<tr>
<td>Jordan</td>
<td>$ 301,739.18</td>
<td>$ 391,279.29</td>
</tr>
<tr>
<td>Pakistan</td>
<td>$ 531,060.96</td>
<td>$ 688,651.54</td>
</tr>
<tr>
<td>Palestinian Authority</td>
<td>$ 72,081.99</td>
<td>$ 93,472.09</td>
</tr>
<tr>
<td>Turkey</td>
<td>$ 531,060.96</td>
<td>$ 688,651.54</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$ 3,412,576.12</td>
<td>$ 4,425,246.80</td>
</tr>
</tbody>
</table>
SESAME roof on 15/12/2013
Aerial view of the roof ready for final stage of dismantling in 5 pieces each about 20 tons (using 250-ton crane)
Towards a new Roof

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec. 2013:</td>
<td>Roof deflected by heavy snow load</td>
</tr>
<tr>
<td></td>
<td>Equipment protected from water</td>
</tr>
<tr>
<td></td>
<td>Roof supported by jacks and scaffolds</td>
</tr>
<tr>
<td>Jan. 2014:</td>
<td>Jordanian and International Expert-Commission assigned to investigate the accident</td>
</tr>
<tr>
<td>Apr. 2014:</td>
<td>Agreement SESAME – Constructor to reconstruct the roof</td>
</tr>
<tr>
<td></td>
<td>SESAME (Royal court) : 350 k JD fixed</td>
</tr>
<tr>
<td></td>
<td>Constructor remaining: ~ 700 k JD</td>
</tr>
<tr>
<td></td>
<td>Schedule: 6-8 months</td>
</tr>
<tr>
<td>August 2014</td>
<td>Design approved by two experts from Europe. Shop drawings are underway.</td>
</tr>
<tr>
<td>September 2014</td>
<td>Repair (or new construction) of concrete columns is completed. Installation of steel roof is expected to start.</td>
</tr>
</tbody>
</table>
Storage-Ring-Vacuum-Chamber

Jun. 2014: Invitation to Bid
Aug. 2014: 3 bids received (FMB, CECOM, FZJ)
Oct. 2014: Evaluation internal and external
Feb. 2014: FMB contracted Design-review
Storage-Ring-RF-Cavities

Sep. 2013: Invitation to Bid
Nov. 2013: 3 bids received (RI, ELETTRA, TOSHIBA)
Oct. 2013: Tender cancelled (in favor of collaboration with ELETTRA based on 1 M € contribution from Italy)
Feb. 2014: Visit ELETTRA (Technical Clarification)
May 2014: Collaboration agreement signed
Delivery till mid 2016
Jan. 2014: Invitation to Bid
Apr. 2014: 7 bids received (China, France, Iran, Israel, Pakistan, Russia, Spain)
July 2014: Contract signed with Nortemecanica (Spain)
**SR Solid State Amplifier (SSA)**

SOLEIL had developed 150 kW 350 MHz solid state amplifier for SOLEIL storage-ring has developed 500 MHz solid state amplifier for SESAMA and THOMX has licensed technology to SIGMA-PHI Electron

**Collaboration Agreement between SOLEIL and SESAME:**
To built for SESAME one 80 kW 500 MHz Solid State Amplifier

Additional three 80 kW towers needed for storage-ring operation
Should be identical to first tower

Further three towers to be purchased commercially
Single Source Provider approved by finance committee
# Booster-Commissioning

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
</table>
| Feb. 2014    | Start of commissioning (delayed due to roof accident)  
Beam passed first two magnets                      |
| Mar. 2014    | Additional diagnostics installed  
Beam passed half the Booster                         |
| Apr. 2014    | Additional diagnostics installed  
One turn achieved (should be the easier part)        |
| July 2014    | 20 MeV beam was stored in the booster                                                            |
| September 2014 | 800 MeV beam was achieved in the booster              |
BOOSTER STATUS
Image of the beam at 800 MeV using dipole photons
RF Cavity Voltage
800 MeV Booster Beam Achieved on September 3, 2014
SESAME staff in the control room at the moment of achieving 800 MeV
Magnet for Sesame at Cern 200315
Sesame Girdle from Spain at Cern
200315
The Sesame Team at Cern 300315
Together
Aerial view of the roof ready for final stage of dismantling in 5 pieces each about 20 tons (using 250-ton crane)
THE SCIENTISTS AND THEIR DRIVE BROKE BOUNDARIES AND TOOK THE PROJECT TO WHERE NO ONE HAD THE RIGHT TO EXPECT
Science Beginning with Infra-Red Microscope

11 proposals approved. First experiments in 2014

e.g. Study of breast cancer by Fatemeh Elmi, Assistant Professor, University of Mazandaran, North Iran + Randa Mansour and Nisreen Dahshan, PhD students in the Faculty of Pharmacy, University of Jordan.

Programme with synchrotron-radiation will begin in 2017
X-RAY ABSORPTION FINE STRUCTURE AND FLUORESCENCE BEAMLINE

Picture of the pre-aligned Beamline Components in the Test Area

VCM: Vertical Collimating Mirror
BPM: Beam Position Monitor
DCM: Double crystal Monochromator
M-Slt: Monochromatic Slits
VFM: Vertical Focusing Mirror
“As a string theorist, I work on parallel universes. I was always curious about what a parallel universe was like, and now I know. I’m living in one when I go to SESAME meetings”

Eliezer Rabinovici; Hebrew University and Israeli representative to the SESAME Council
Initial Scientific Programme of SESAME

- Structural Molecular Biology
- Atomic and Molecular Sciences
- Surface and Interface Science
- Environmental Science
- Material Science
- Archaeological Science
- Medical Applications (demanded by the users community at the 3rd Users Meeting)
<table>
<thead>
<tr>
<th>No.</th>
<th>Beamline</th>
<th>Energy</th>
<th>Source</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Multi-wavelength Anomalous Dispersion (MAD) Protein Crystallography</td>
<td>5 - 14 keV</td>
<td>In-vacuum undulator</td>
<td>Structural Molecular Biology (SMB)</td>
</tr>
<tr>
<td>2</td>
<td>Soft X-ray, Vacuum Ultra Violet (VUV)</td>
<td>0.05 - 2 keV</td>
<td>Elliptically Polarizing Undulator</td>
<td>Atomic, Molecular and Condensed Matter Physics</td>
</tr>
<tr>
<td>3</td>
<td>Small and Wide Angle X-ray Scattering (SAXS/WAXS)</td>
<td>8 - 12 keV</td>
<td>Undulator</td>
<td>SMB, Material Science</td>
</tr>
<tr>
<td>4</td>
<td>X-ray Fluorescence XRF/X-ray Absorption Fine Structure XAFS</td>
<td>3 - 30 keV</td>
<td>Multi-pole Wiggler</td>
<td>Material Science, Archaeology</td>
</tr>
<tr>
<td>5</td>
<td>Powder Diffraction</td>
<td>3 - 25 keV</td>
<td>Multi-pole Wiggler</td>
<td>Material science</td>
</tr>
<tr>
<td>6</td>
<td>IR Spectro-microscopy</td>
<td>0.01 - 1 eV</td>
<td>Bending Magnet</td>
<td>Environmental, Materials and Archaeological Science</td>
</tr>
<tr>
<td>7</td>
<td>Atomic, Molecular &amp; Optics</td>
<td>5 - 250 eV</td>
<td>Bending Magnet</td>
<td>Atomic and Molecular Physics</td>
</tr>
</tbody>
</table>
Training Programme (thanks to external support listed later)
- Users’ Meetings, Schools, Workshops, Fellowships, visits to operating light-sources,.. - is building technical and scientific capacity in the region
Some SESAME People, including Users of Day One Beamlines
Mohammad Yousef, shown here inspecting a microchamber at the Japanese Photon Factory, is a biophysical and structural biologist from Cairo University who works on analyzing proteins, peptides, DNA and protein-DNA complexes. The use of X-ray crystallography to determine the three-dimensional structures of biological macromolecules at atomic resolution is central to his work. The results of such studies provide the basis for understanding biological functions and guide the rational design of new therapeutics.

Mohammad, who has attended and spoken at many SESAME meetings, says, “My research requires X-ray synchrotron beamlines, which are currently unavailable in the Middle East. Therefore, I do most of my research abroad. SESAME, when operational, will bring me home.”

Sumeria Javed, who attended the 8th SESAME Users’ Meeting in 2019, is interested in studying the growth of carbon nanotubes and their de-alignment using different techniques. She says, “For most of the experiments of interest to us, the diagnostics can be most effectively carried out using the soft X-ray beamlines of SESAME. The broad spectrum of research programmes of SESAME will cater for the synchrotron radiation needs of the region, including specifically those of Pakistan. There are definitely cultural benefits involved in having scientists from different countries working close together.”

Sumeria, pictured working on a tabletop cathodic DC magnetron sputtering setup for coating film deposition, is based at the Accelerator and Carbon Based for Catalysts Thin Deposits, in Pakistan Institute of Nuclear Science & Technology, Harapur, Pakistan. The 8th SESAME Users’ meeting was held in Harapur. Sumeria is currently working on the formation of carbon thin films on metal substrates using a wide range of techniques.

Maheer Attal attended the first SESAME workshop in Jordan (at Al-Balqa’ University) in 2000, was subsequently a SESAME trainee at the French synchrotron LCLS, and has attended all the SESAME technical meetings and several of the Users’ Meetings. He says that for the 3rd synchrotron light source in the Middle East, SESAME is a valuable and challenging experience through which I learned a completely new scientific field and obtained my PhD in accelerator physics. I think it will be a vital scientific research center which will activate, and make it much easier to carry out, scientific research in the region.

Sumeer, pictured working on a tabletop cathodic DC magnetron sputtering setup for coating film deposition, is based at the Accelerator and Carbon Based for Catalysts Thin Deposits, in Pakistan Institute of Nuclear Science & Technology, Harapur, Pakistan. The 8th SESAME Users’ meeting was held in Harapur. Sumeer is currently working on the formation of carbon thin films on metal substrates using a wide range of techniques.

Itt Sagi is a professor of biophysics at the Weizmann Institute of Science in Rehovot. She is opening a unique, multidisciplinary approach to investigating enzymes, the complex macromolecules that regulate the chemistry of cells and organisms. Using synchrotron radiation in the X-ray regime, she has advanced a method for precisely tracking, in real time, changes taking place in active enzymes at the level of single atoms. This method is currently employed by her research team to decipher the enzymes’ mechanisms of action and to develop a new generation of safe and effective drugs.

Itt, who has been a member of the SESAME Scientific Advisory Committee since its establishment, says, “There is an opportunity in our area to create a unique opportunity. SESAME is designed to promote regional scientific excellence and additional training for emerging researchers with modern technology.”

SESAME
How SESAME works and what it can do

In SESAME, bunches of electrons will circulate at nearly the speed of light for several hours inside a long narrow evacuated pipe bent into the form of a closed ring, 133 metres in circumference. As magnets surrounding the pipe steer electrons around such a ring, the electrons emit synchrotron light, with wavelengths that range from infrared radiation to X-rays. This light is collected by different 'beamslines' (optical systems) connected to the ring, and focused on experimental samples. Thus, many experiments can be carried out simultaneously. SESAME will be able to support up to 25 independent beamslines, each of which can serve several experiments. It will incorporate special devices called 'undulators' and ' wigglers' which enhance the emission of synchrotron light, making it a competitive 'third generation' facility.

People

Vasilis Promponas, who is interested in predicting the structure, function and evolution of biological macromolecules using information encoded in amino acid sequences, says that "Our research so far is complementing current experimental approaches to exploit experimental data. SESAME will provide unique opportunities for enriching our research with custom made computed experimental data, and the possibility for joint computational-experimental high-impact research activities. By predicting lacing features of important classes of protein molecules (e.g. bacterial membrane proteins), we hope to open new directions for combating diseases."

Zebra Sayers, pictured here with her students while collecting data at the synchrotron (DESY) in Hamburg, Germany, is a bioinformatician. She worked for several years at the European Molecular Biology Laboratory Outstation at DESY before joining Sabanci University in Istanbul to establish the Biologica Sciences and Biotechnology Programme. Her research, which combines molecular biology with structural analysis, is directed towards investigating stress responses in plants, and the effects of X-rays from a synchrotron light source. SESAME will provide enough beamtime to perform extended experiments on samples prepared on site.

Vesil, seen here preparing a sample for a yeast protein expression microarray experiment at the European Laboratory for Molecular Biology, is a lecturer in bioinformatics at the Technical University of Crete, and head of the Molecular Informatics Research Laboratory, where he works on large-scale genome sequence analysis and protein structure and function prediction.
**Sesame**

Mulkites Sawwan, pictured here in his laboratory (3rd from left) with Nobel Laureate Torestes Wessels (7th from left) and a number of his current and previous group members, is a Director of the Nanotechnology Research Laboratory and the Vice Dean at the Faculty of Engineering at Al-Quds University, the Arab Palestinian University in East Jerusalem. His work focuses on the fabrication, synthesis and characterization of multifunctional organic/inorganic nanoparticles for different applications from drug delivery through molecular electronics to energy applications.

Seadat Varnasseri, shown here carrying out measurements on the SESAME beamline, became involved in accelerator technology at the Daresbury Laboratory in the UK in 2001 and then worked on linear accelerators in his native Iran. He worked at SESAME from 2003 to 2010 on the finalisation of the design, with the help of colleagues at European light sources especially SOLEIL in France, which he visited with support from UNESCO and the Canon Foundation.

**People**

Adam Baig, shown here aligning the laser system of an experiment designed to study multi-step laser excitation of atoms, founded the Atomic and Molecular Physics Laboratory at the Quaid-I-Azam University, Islamabad, after having worked for more than a decade of the Beam Synchronization Radiation Facility, Germany. After having been Pakistan’s representative on the Interim SESAME Council and then on the Council, and as a UNESCO consultant for SESAME, he worked as SESAME’s founding Science Director until 2007.

Adam, who organized the first SESAME Users’ Meetings and activity participated in, and contributed to, the first physical and scientific meetings that began the development of SESAME, says that SESAME is on SESAME’s scientific program which has brought scientists from different fields and countries to work on scientific topics from various interests. As soon as SESAME is complete we would like to set up an experiment to operate, and the ongoing research on excited states of atoms, which uses lasers.

**Who Will Use SESAME?**

The scientists who will use SESAME will mostly be based in universities and research institutes in the region. Typically, they will visit SESAME two or three times a year for periods of up to a week to carry out experiments after working in collaboration with scientists from other countries. While at SESAME, they will be exposed to the highest scientific standards in a stimulating environment for international cooperation. When they return home to analyze the data they have obtained, they will take with them scientific expertise and knowledge to share with their colleagues and students.

During his time at SESAME, Seadat tried to present one or two technical papers at a year of International conferences, which he attended with support from the University of technology, in order to promote and introduce the project to colleagues in Europe, organizers, in order to promote new and promising ideas in the field. He says SESAME, from my point of view, is an excellent idea and the UK. He says SESAME, from my point of view, is an excellent idea and the UK.
Azadeh Shahsavari, pictured at the 8th SESAME Users’ Meeting in Petra Jordan in 2009 (which she attended with support from a fund to support potential SESAME users established by the American, British, European and German Physical Societies), is an Iranian PhD student at the Faculty of Pharmaceutical Sciences, University of Copenhagen. Her passion for science led her to work on structural biology.

Hamed Tarawneh, seen here with a radio frequency cavity for the SESAME booster, is a Jordanian accelerator physicist. He attended the fist SESAME Workshop in Jordan in 2000 and then worked for a PhD in accelerator physics at the M4K Lab, Lund University, Sweden, which he obtained in 2006. Since then he has worked as a staff member at SESAME where he coordinates work on the SESAME booster synchrotron and is also involved in many aspects of the design of the main storage ring.

Azadeh needed an X-ray source for her work; none was available in the Middle East but she was able to use the Diamond synchrotron light source in the UK. She says “SESAME will provide me with a great opportunity to access a synchrotron light source nearer home. I support SESAME to support a broad range of sciences and technology in the Middle East and bring together bright scientific minds.”

Golan Tanami is a PhD student in Professors Gad Marom’s laboratory at the Hebrew University of Jerusalem, where he is pictured. His research focuses on combining inorganic nanofillers in a polymer matrix with reinforcing fibers, with the aim of achieving improved material properties by forming a judicious multiphase combination. The final outcome should be a lightweight yet strong material.

Maged Al-Sherbiny is an immunologist and biotechnologist from Cairo University. He is currently the President of the Academy of Scientific Research and Technology and the Assistant Minister for Scientific Research of Egypt.

Maged says that “Synchrotron X-rays, from a source such as SESAME, are necessary for us to be able to investigate the morphology (crystalinity) of the material, as well as the interface between the matrix and the fiber.”

Maged has also been a member of the Scientific Advisory Committee of SESAME for the past four years and since he joined the SESAME family has been very active in promoting SESAME activities through users’ meetings and lectures for the scientific community. He says that “Sisyphus is an excellent model to promote peace and development through the science and technology which will be provided by the state-of-the-art facility now being built in Jordan. I wish that one day SESAME will be as successful as CERN in joining scientists from all over the globe for the benefit of humankind.”
**CONSTANTIA ALEXANDRIS**

Constantia Alexandrou is Professor of Physics at the University of Cyprus and the Cyprus Institute. She is a theoretical and computational physicist, who leads work that will provide computational resources and knowledge to scientists and engineers in Cyprus and the Eastern Mediterranean. She coordinates a European Union project, which will fund a leased Internet line connecting SESAME to the Cyprus Institute. The latter will provide computational resources and expertise for the analysis of SESAME data. Joint work on this project is building strong links between the Cyprus Institute, SESAME and Jordan University.

“Constantia, who has represented Cyprus on the SESAME Council, says I am a strong supporter of SESAME because of the excellence and opportunities it brings to the region.”

**ZUEHRI EL-BASYANI**

Zuehir El-Basyani, pictured here when visiting the Synchrotron Radiation Center at the University of Wisconsin-Madison, is currently receiving training through one of the numerous fellowships put at the disposal of SESAME. He is working mainly on early breast cancer detection using infrared microspectroscopy. When he gets home to Jordan he will work on the SESAME infra-red beamline.

“Zuehir, who has attended several SESAME User Meetings and Workshops, says I have to grasp technological gaps and perhaps some investors in the Middle East for bringing back to Jordan the knowledge I gained overseas.”

**ENGIN OZDAS**

Engin Ozdas, seen here aligning a sample capillary tube in an X-ray diffractometer in his laboratory, leads the Advanced Materials Research Group in the Physics Department, Hacettepe University, Turkey, where he works on superconducting materials, nanocarbon and layered intercalation compounds, which are commonly used for battery applications. His group is responsible for the design of SESAME’s powder diffraction beamline. This beamline, which incorporates some donated components from the Swiss Light Source, will be used to carry out experiments aimed at developing and characterising advanced materials.

“Engin, who has attended many SESAME User Meetings and Workshops and is a member of the SESAME Beamline Advisory Committee, says ‘SESAME makes possible collaborative research between scientists from different countries (particularly those of the Members of SESAME) and with other superconducting radiation centres, which have already welcomed several students from my group as well. This project has created trust and personal friendships between researchers in the Members of SESAME and developed countries, which may help to solve regional and global political problems.’”
**Message**

SESAME will be a pivotal pole for science in the region. It will offer state-of-the-art facilities where scientists can come together to carry out advanced scientific work which will contribute to promoting research and technologies in their respective countries. The numerous training opportunities that SESAME can provide are already helping to build the region’s scientific capacity.

In the long run, SESAME will have far-reaching effect on the development of national capacities; it will contribute to improving the standards of teaching and research of national universities and help to make industries more competitive. While the opportunity to work at the Centre will motivate leading scientists and technologists to stay in the region, or to return if they have moved elsewhere.

Scientists wishing to join the SESAME fold are invited to write to me at:

saroa@sesame.org.jo

---

A photograph of the SESAME team taken in 2006.
SESAME benefits from the advice of leading scientists from around the world who serve on the Scientific & Beamlines Advisory Committee (seen here in November 2010) and the Technical Advisory Committee.

1- SESAME (Jordan)  2- CLS (Canada)  3- Stanford Univ. (USA)  4- ALBA (Spain)  5- Soleil (France)  6- Sabanci Univ. (Turkey)  7- Eletrra (Italy)  8- ALS (USA)  9- Soleil (France)  10- SESAME (Jordan)  11- Oxford Univ. (UK)  12- CERN (Switzerland)  13- Al-Quds Univ. (Palestinian Authority)  14- LBNL (USA)  15- PSI (Switzerland)  16- Hacettepe Univ. (Turkey)
## Donated Equipment

- **From LURE, France**
  - Beamline, undulator
- **From SLS, Switzerland**
  - Beamline, wiggler
- **From Daresbury Lab & University of Liverpool, UK**
  - **Five** beamlines → day 1 Proton crystallography and XAFS/X-ray fluorescence beamlines
- **From SLAC, Stanford University, USA**
  - Undulator,…
- **From ALS, Berkeley, USA**
  - Wiggler
- **From LBNL, USA**
  - Wiggler
- **From Elettra, Italy**
  - Cavities
Preaching

...except ye repent, ye shall all likewise perish!

Luke 13:3
Nobel Laureates visit SESAME site in June, 2008

45 Laureates have endorsed SESAME “as a beacon, demonstrating how shared scientific initiatives can help light the way towards peace”
SESAME

• A world class competitive synchrotron radiation laboratory

• Providing non-discriminating scientific environment for working together

• Interdisciplinary research; an environment for collaborations as well as individual development

• Exploiting local advantages

• An advanced facility for training

• A place to which expatriate scientists can return

Conclusion: science can help building political bridges, for which strong scientific foundations are essential
MUCHAS GRACIAS

תודה רבה