



Gihan Kamel
SESAME IR Principal Beamline Scientist

Lecturer on leave from: Department of Physics,
Faculty of Science, Helwan University, Cairo, Egypt

“SESAME: the new adventure of the Middle East women scientists”



SOLVAY CONFERENCE 1927

colourized by pastelcolour.com

A. PICARD E. HENRIOT P. EHRENFEST Ed. HERSEN Th. DE DONDER E. SCHRÖDINGER E. VERSCHAFFELT W. PAULI W. HEISENBERG R.H. FOWLER L. BRILLOUIN

P. DEBYE M. KNUDSEN W.L. BRAGG H.A. KRAMERS P.A.M. DIRAC A.H. COMPTON L. de BROGLIE M. BORN N. BOHR

I. LANGMUIR M. PLANCK Mme CURIE H.A. LORENTZ A. EINSTEIN P. LANGEVIN Ch.E. GUYE C.T.R. WILSON O.W. RICHARDSON

Absents : Sir W.H. BRAGG, H. DESLANDRES et E. VAN AUBEL

I am not a Woman in Science. I am a Scientist.

Opinion | Researchers

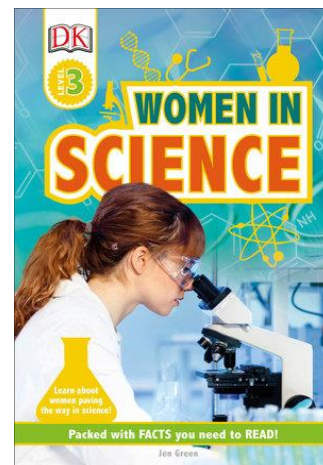
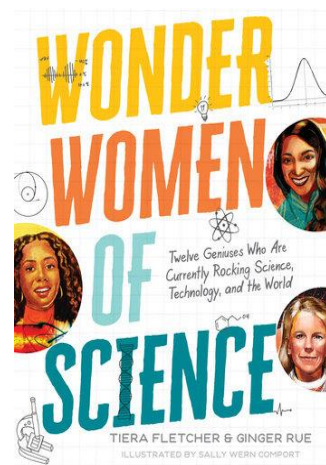
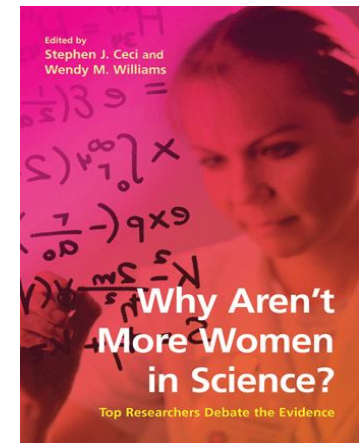
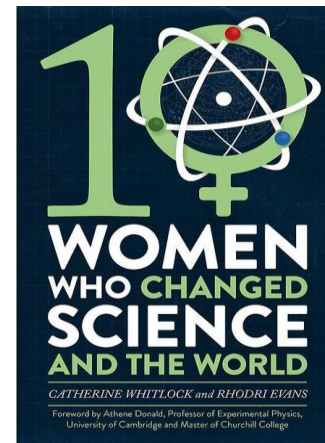
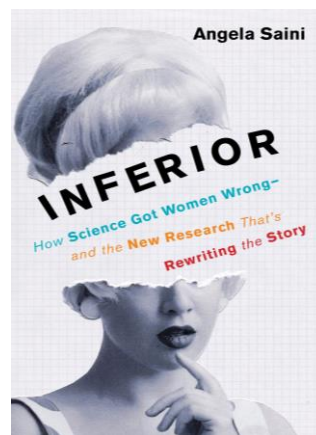
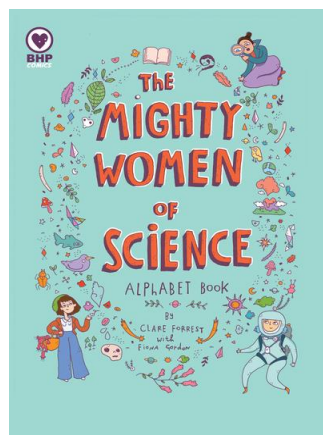
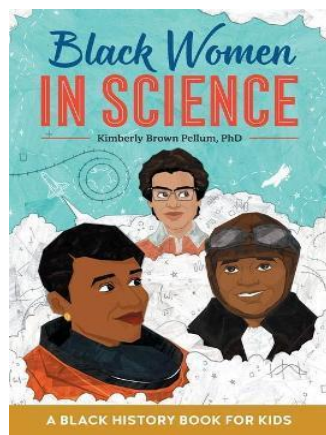
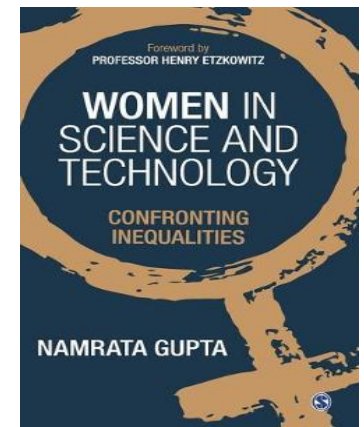
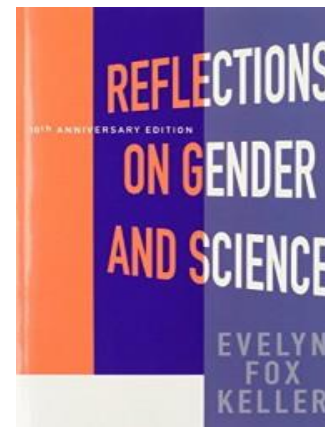
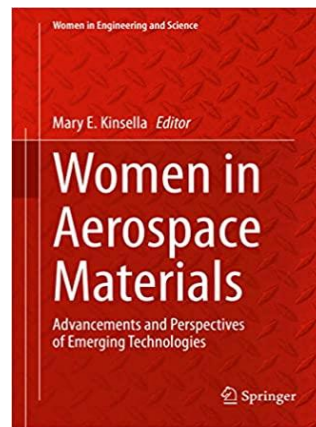
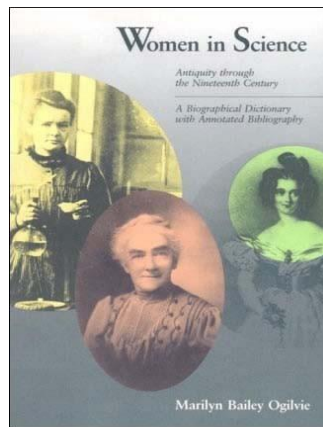
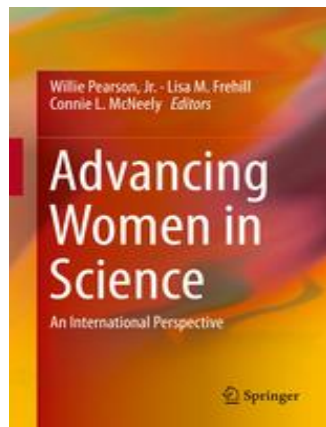


What does it mean to you, being a female scientist? Twenty scientists share their thoughts.

Today, we celebrate the achievements and contributions of women across the world. Women as citizens, mothers, daughters, workers, helpers, leaders, scientists – women, who just like men, are trying to make a difference in this world.



shutterstock.com · 1897942828

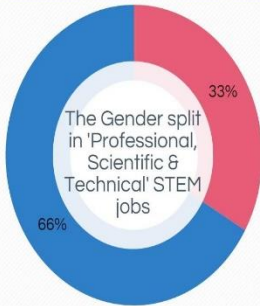


Women in Science: The facts

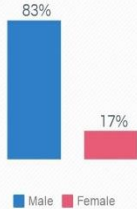


2 in 10

Physics A-Level entries are by female candidates



Undergraduate Computer Science qualifications obtained in the UK

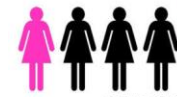
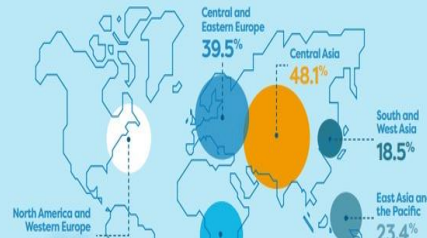


Source: WISE Campaign Statistics 2014

WOMEN IN STEM

A GLOBAL PERSPECTIVE

Of all scientists employed within research and development (R&D) worldwide, only 28.8% are female (as of 2015). A breakdown of the regional averages is shown below:



25% OF IT JOBS ARE HELD BY WOMEN



30% OF COMPUTER PROGRAMMERS ARE WOMEN



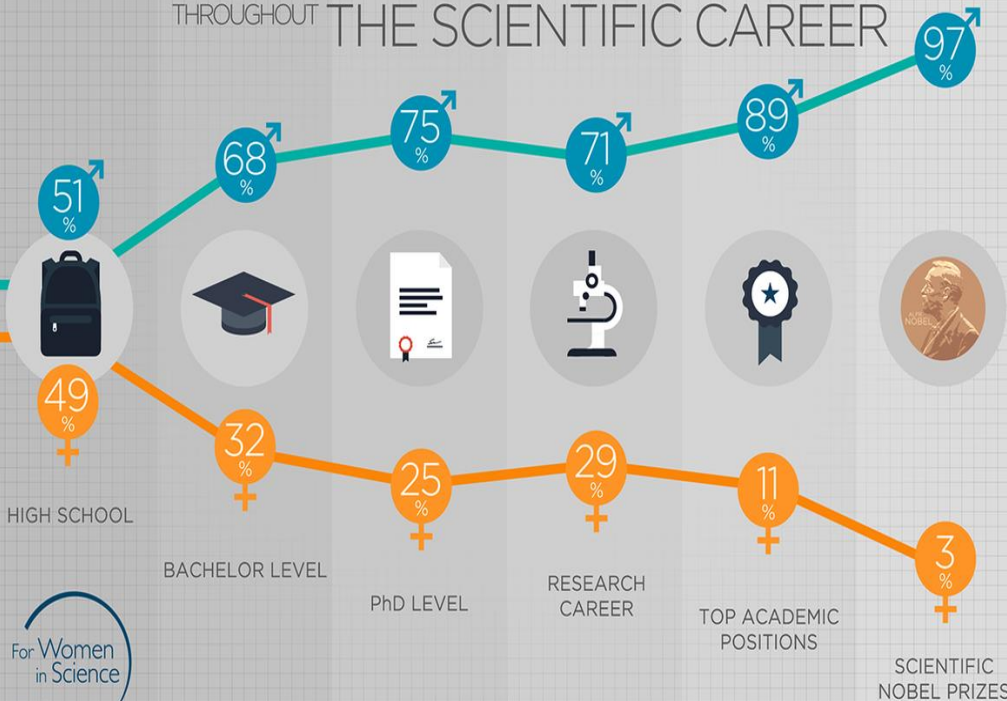
21% OF COMPUTER SOFTWARE ENGINEERS ARE WOMEN



22% OF COMPUTER AND INFORMATION SYSTEM MANAGERS ARE WOMEN

Statistics compiled from IT Manager Daily

THE UNDERREPRESENTATION OF WOMEN THROUGHOUT THE SCIENTIFIC CAREER



For Women in Science
FONDATION L'OREAL

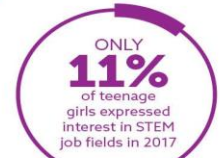
Women in STEM

There are more jobs in STEM available than the number of people qualified to fill them. Women are needed to help fill these jobs and to provide different perspectives and skill sets.

EDUCATION

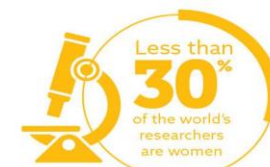


15% of engineering faculty in universities and four-year colleges are women



EMPLOYMENT

1 IN 4 computer and mathematical workers are women



1 IN 10 scientists or engineers is a minority woman

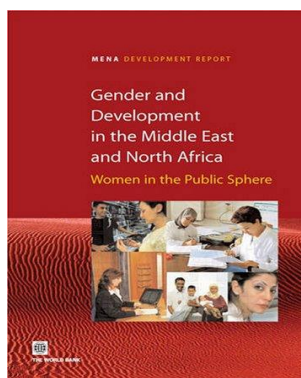
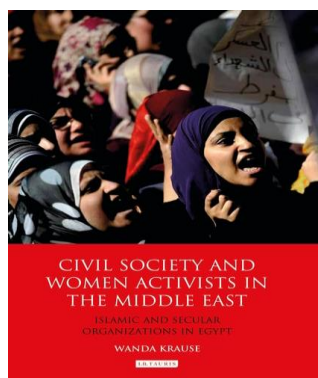
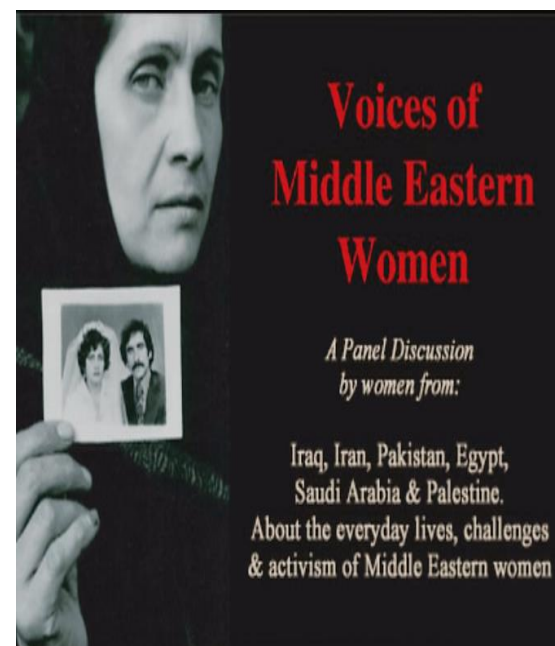
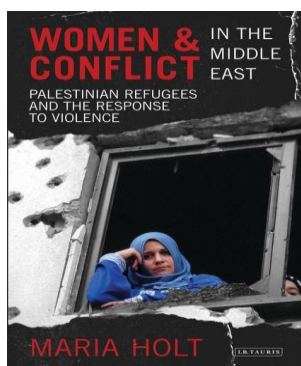
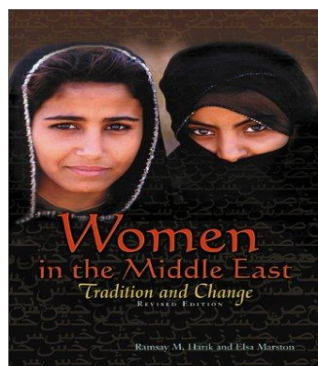
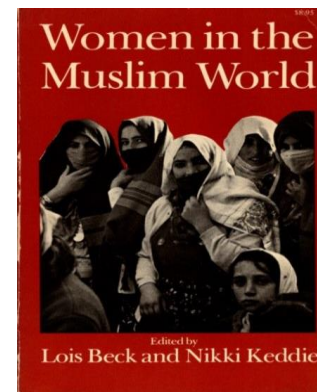
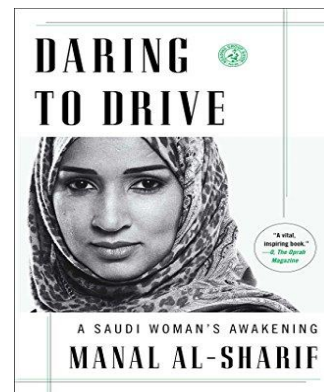
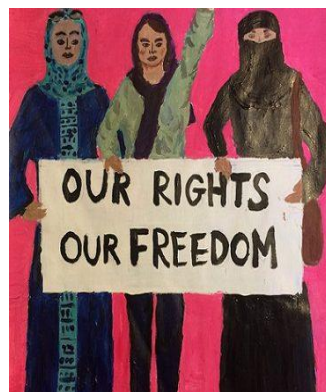
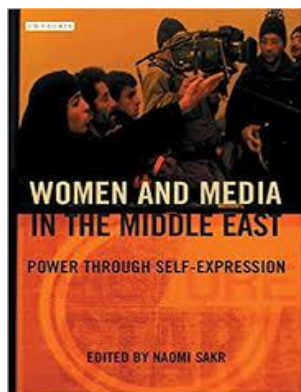
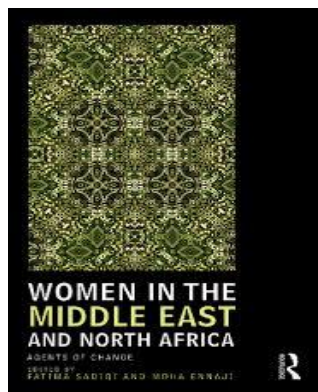
SALARY

Women in STEM make 33% more money than women in non-STEM fields

Women-led tech companies are 35% more profitable

STEM SUPPLIES

stem-supplies.com





Perspective Matters



Stranded on a dessert island, finally a way out of here!



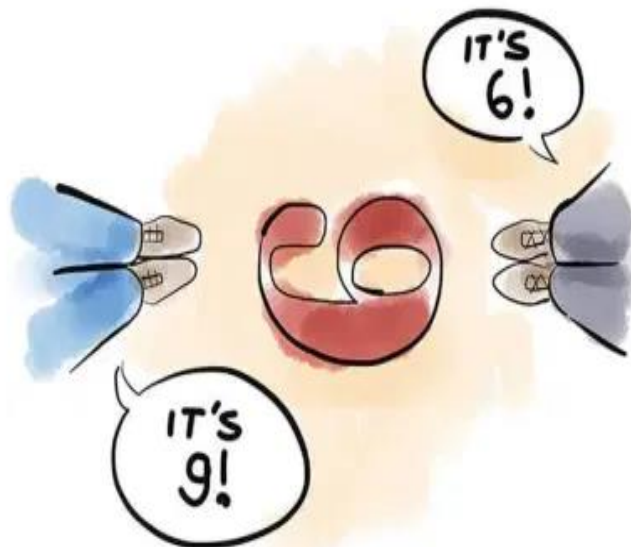
Lost at sea, finally some land!

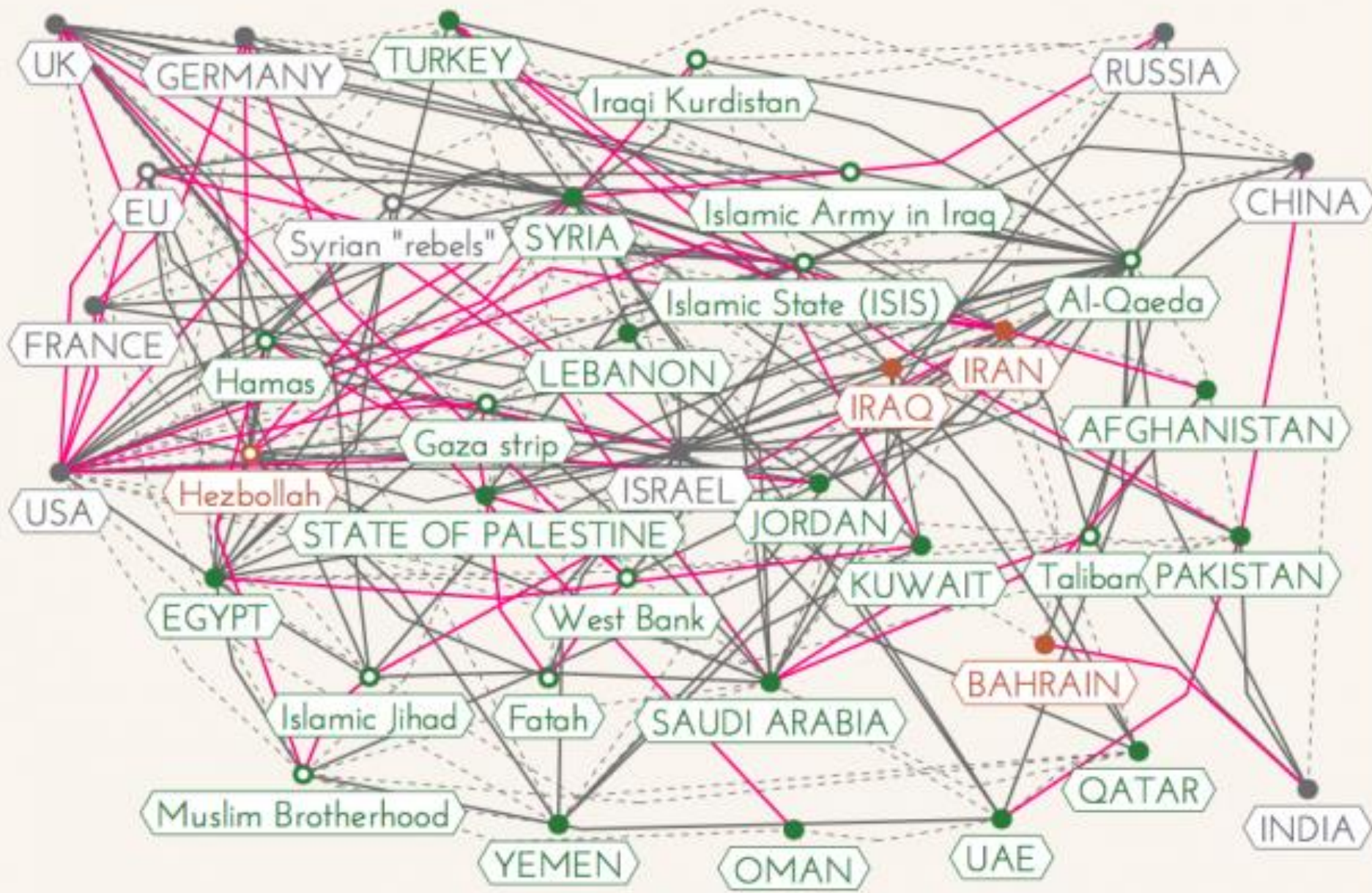
sleepymoose.com

invited



By Frits Ahlefeldt





Roll over to see relationships

Click to find out more

Click background to come back

NATION

Group

SUNNI

SHIA

Non-Muslim

predominantly

FILTER RELATIONSHIPS

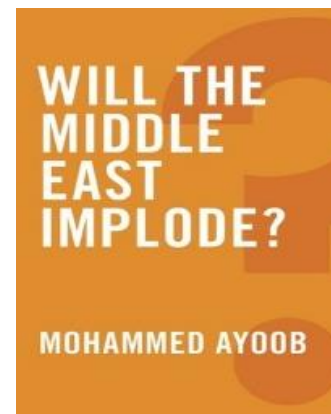
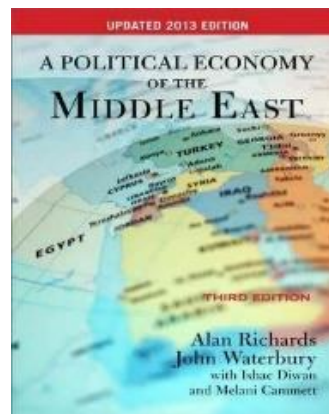
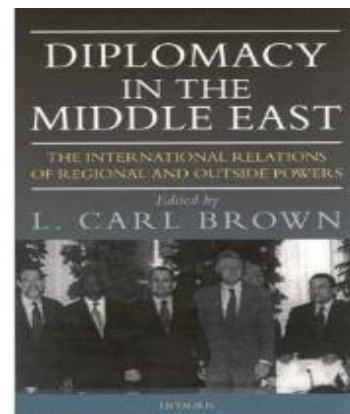
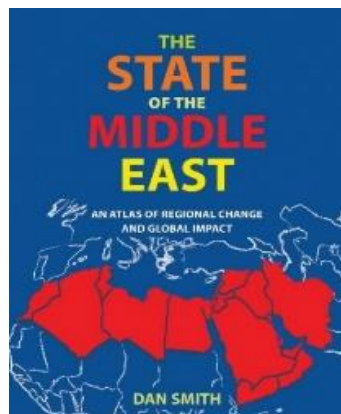
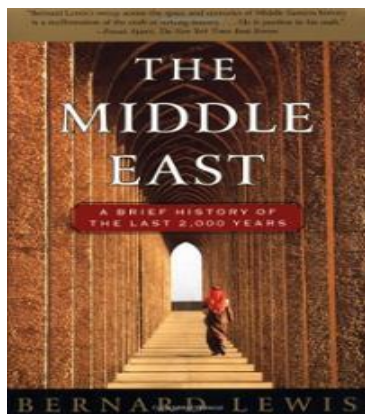
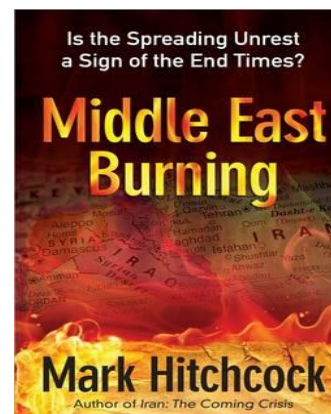
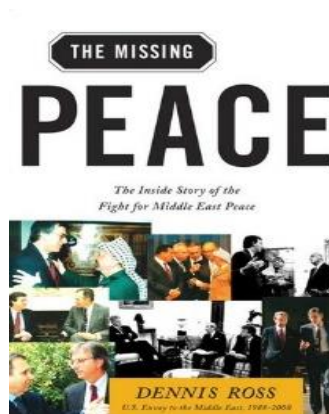
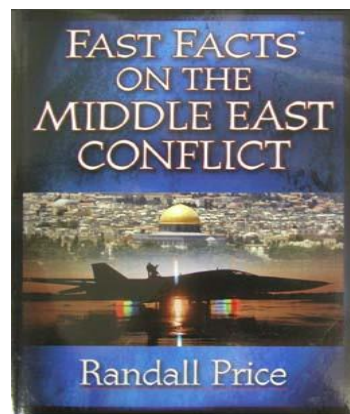
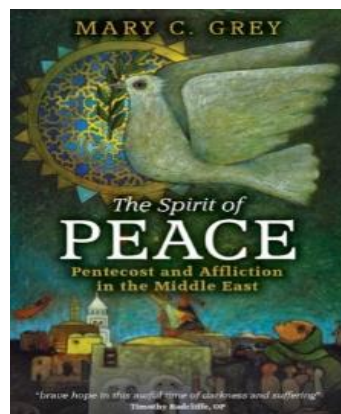
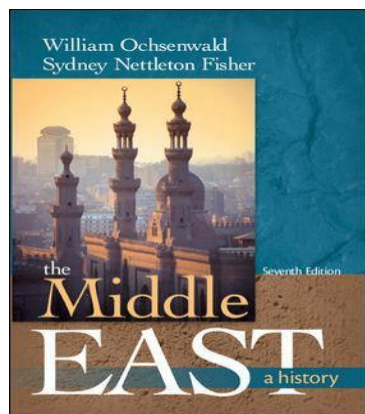
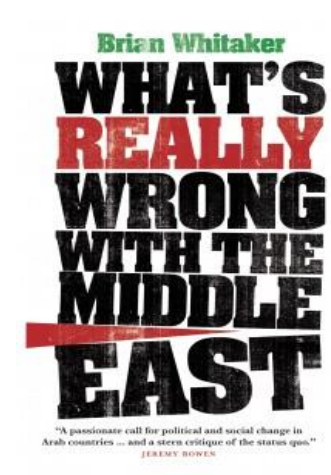
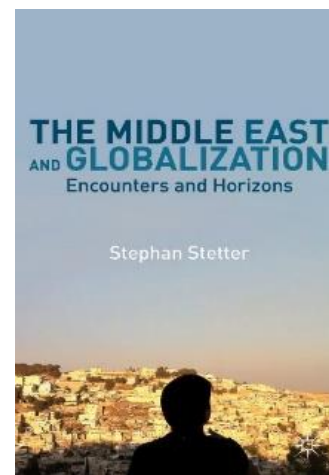
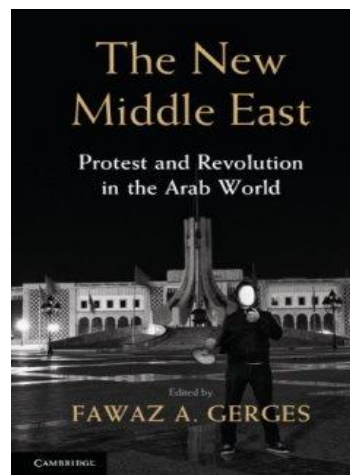
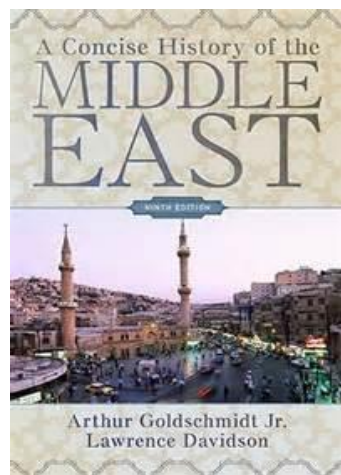
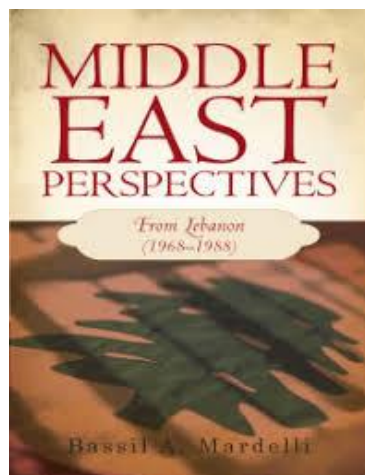
HATE
(enemies)

STRAINED
(complicated)

GOOD
(trade etc)

LOVE
(allies)







SESAME

**CAN A RECYCLED SYNCHROTRON BECOME AN
OASIS OF PEACE IN THE MIDDLE EAST?**

BY MIKE PERRICONE

A New Synchrotron Radiation Research Facility in the Middle East:

Scientific Progress as an International Right

by Erika Williams

A synchrotron from Cold War era that divided Berlin now makes its home in Jordan, fostering cooperation from scientists in the Middle East



“A synchrotron from Cold War era that divided Berlin now makes its home in Jordan, fostering cooperation from scientists in the Middle East”



Successful Examples of Bridge Building Through Scientific Collaboration:

“Diplomatic Science does not work. *Excellent science must be a major driving force, and is a necessary condition for building sound bridges..”*

Sir. Chris L. Smith; President of SESAME Council

CERN formally born 1954, when:

1- *Physicists* realized that no single European country could compete with the US in constructing large accelerators – *collaborating therefore necessary for participation...*

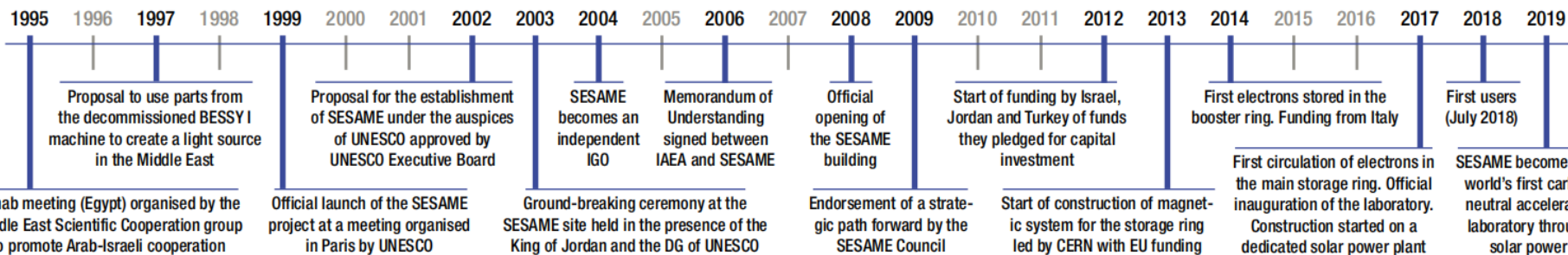
2- A far sighted group of *diplomats and scientific administrators* conceived the idea of a joint European Laboratory as a *contribution to rebuilding bridges between nations recently at war...*

It worked scientifically and more!

“CERN vs. SESAME: In Europe, the war is over. In the Middle East, it is NOT. SESAME machine is smaller than CERN, but the difficulties are much larger than CERN had...”

A symbol of cooperation, solidarity and peace

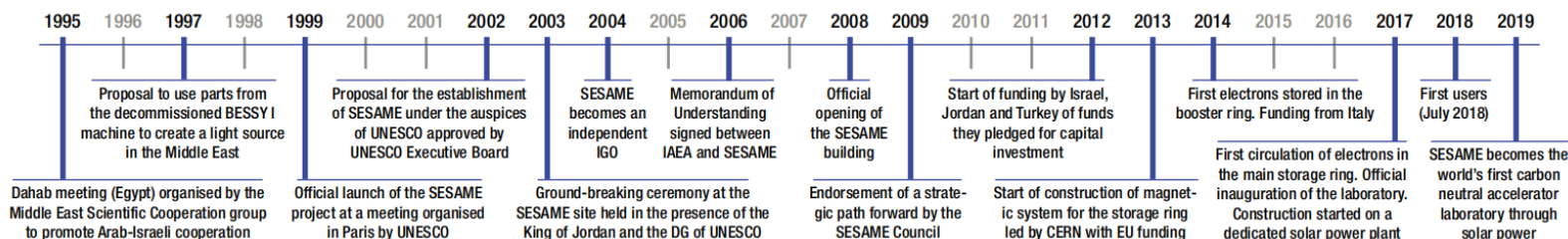
The idea of creating a light source in the Middle East was first proposed by Abdus Salam in the 1980s. Salam, a cowinner of the 1979 Nobel Prize in Physics, recognised that such a facility could promote the cause of science and technology in the region. Today, more than 30 years later, this vision has finally become a reality.



SESAME and International Cooperation

A symbol of cooperation, solidarity and peace

The idea of creating a light source in the Middle East was first proposed by Abdus Salam in the 1980s. Salam, a co-winner of the 1979 Nobel Prize in Physics, recognised that such a facility could promote the cause of science and technology in the region. Today, more than 30 years later, this vision has finally become a reality.

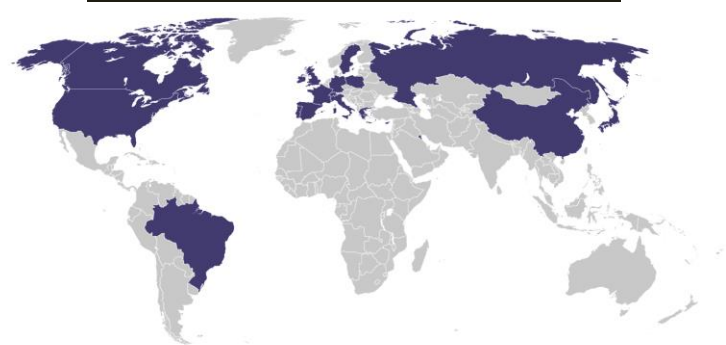


SESAME MEMBERS



Cyprus, Egypt, Iran, Israel, Jordan, Pakistan, Palestine, Turkey

SESAME OBSERVERS



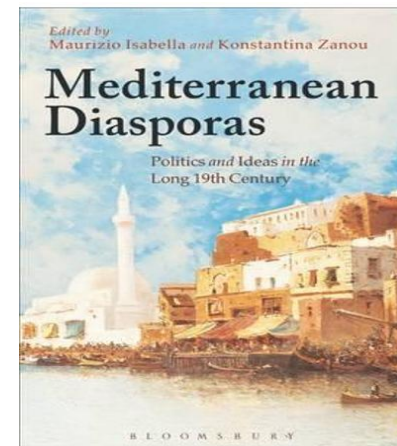
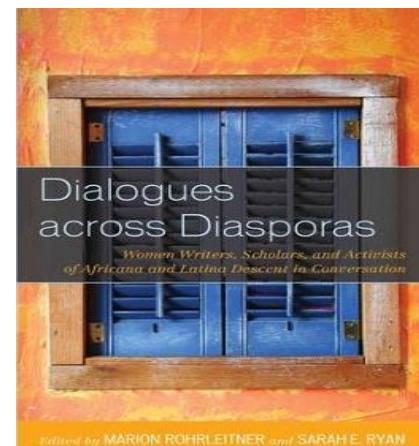
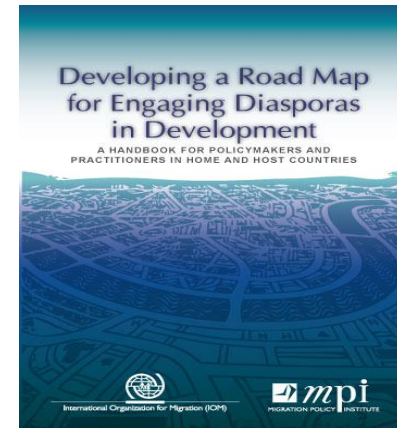
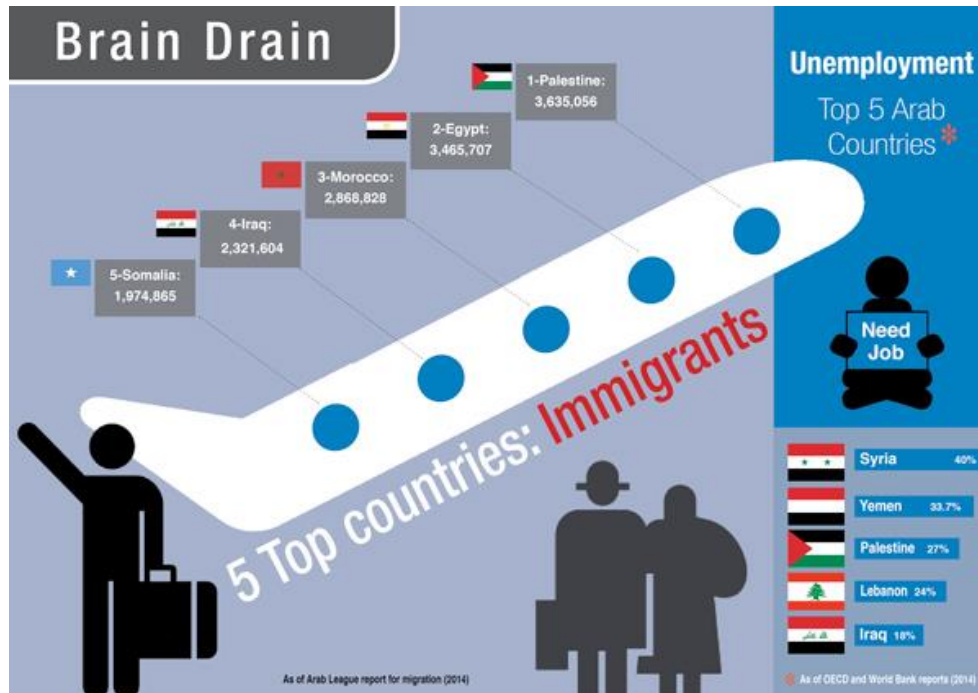
Brazil, Canada, China, the European Organization for Nuclear Research (CERN), the European Union (EU), France, Germany, Greece, Italy, Japan, Kuwait, Portugal, the Russian Federation, Spain, Sweden, Switzerland, the UK and the USA. (UNESCO may serve on SESAME Council).

Why do we need SESAME in our region?

- Foster World-class basic and applied research, and development of high-tech industry.
- Address regional and global concerns: biomedical, environmental, cultural/ human heritage.
- Reverse the brain-drain in the Middle East.
 - It is ours.. it is home.
 - We are the *right* people to realize our *needs*..
(*seek help but do your homework*)
 - Traditional constraints..
 - Tired of wandering everywhere..
 - Peace (what does that word mean in any dictionary?!).



“The map confirms that low and middle income countries are the most severely affected by inventor “brain drain”..”





TECHNOLOGY POLITICS AND DEVELOPMENT

Abdus Salam, the Pakistani physicist and Nobel Laureate has long promoted the effective use of science and technology by Third World nations. He discusses his controversial ideas with Nalaka Gunawardene.

AT: Your theme in recent times has been that science is the key to economic development, especially for developing countries. Critics argue that this drains much needed cash from treasuries in pursuit of esoteric goals.

Salam: The Third World is now slowly waking up to the realization that, in the final analysis, creation, mastery and utilization of modern science and technology are basically what distinguish the developing from developed countries. Nothing else, neither differing systems of economics, governance, nor differing cultural mores nor differing perceptions of religious thought can explain why the developed countries can master this globe of ours. I was recently attacked by an Indian newspaper that claimed I was talking only of science and technology, a "God that failed"—that was their title! They're forgetting that despite setbacks, it is the "failed God" that gave them high-yield rice to feed their millions.

AT: But developing nations are faced with urgent problems. How can basic science solve these problems quickly?

Salam: We have to remember the long-term nature of science and technology as applied to development.

The year 2000 will be a good year to aim at if we start today. A few developing nations—Venezuela, Iran, South Korea—have realized that investments in science and technology produce sufficient returns and are planning to raise their science budgets accordingly. It is the wealth-producing sciences of physics and geophysics and the survival sciences of medicine and molecular biology that less developed countries will have to turn to if they are to surmount their pressing problems.

AT: What is the role of the scientist in development?

Salam: Scientists and technologists have not yet fully played their role in the development process. They have to get involved in the political process. They have to convince politicians that investing in science... is money well spent.

AT: In other words, doing good academic science alone is no longer sufficient?

Salam: Yes. Scientists must ensure that their research does not go to waste (and) should play a far greater role in public affairs. Science and scientific ideas have a great potential for human welfare (but) we have to accept that it is scientists who have created many of the world's problems.

AT: But won't that admission cause laymen in the Third World to lose faith in scientists?

Salam: It is not an admission of guilt, but one of responsibility. Think of the relationship between antibiotics like penicillin and the population explosion—between nuclear physics and nuclear weapons. These problems will not be solved without science. Science gets the blame because scientists and their various organizations have not been sufficiently active in proselytizing on behalf of science.

We have to take science to centre stage by showing how it is directly linked with economic development. Most scientists don't even know the GNP (gross national product) figures of their respective countries. We don't concern ourselves with these things. This has to change!

Abdus Salam is the Director of the International Centre for Theoretical Physics which he founded in Trieste, Italy, and Chairman of the Third World Academy of Sciences. In 1979, he shared the Nobel prize for Physics with Steven Weinberg and Sheldon Lee Glashow.

1- The Third World is now slowly waking up to the realization that, in the final analysis, *creation, mastery and utilization of modern science and technology are basically what distinguish the developing from the developed countries....*

2- Neither differing systems of economy, *nor* cultural mores *nor* differing perceptions of religious thought can explain why the developed countries can master this globe of ours....

3- Remember the *long-term nature of science and technology as applied to development....*

4- The year 2000 will be a good year to aim at *if we start today.. !*

5- Scientists must ensure that their research *does not go into waste and should play a far greater role in public affairs.*

When the journey of a million experiments start with a thought AND a BOAT!



Abdus Salam



Kick-off Meeting!



Sergio Fubini



Herwig Schopper



G. A. Voss (DESY) watching the boat at Hamburg harbor on its way to Aqaba, Jordan with BESSY I on board; June 7, 2002



Herman Winick

Brief History of SESAME

- 1997 – Original idea (Voss, Winick); Upgrade/rebuild **BESSY 1(0.8 GeV)** in the Middle East, as centerpiece for a new international research center. Voss presents the concept to a *MESC* meeting in Turino. Very positive response from Middle East scientists.
- 1998 – Voss presents concept to *MESC* meeting in Uppsala. *MESC* endorses SESAME
- 1999 - 1st meeting at UNESCO; (Interim) Council established – *Herwig Schopper, President; form international advisory committees*
- 2000 – Begin workshops, schools; *Growing community interest*
- 2002 - Decision to build a **new 2.5 GeV ring** (*still using BESSY injector*)
- 2003 - Ground breaking for building; completion in 2008
- 2008 – Chris Llewellyn-Smith takes over as Council President

Vigorous training programme and growing potential user community

First experiments in 2015, *assuming* funding for main ring & beamlines is secured. (*new beamlines plus adapting/upgrading donated beamlines*)

“A synchrotron from Cold War era that divided Berlin now makes its home in Jordan, fostering cooperation from scientists in the Middle East”



SESAME

A Proposal for a Synchrotron Radiation Source in the Middle East

Members of the Study Group

M. Abo-Bakr¹, M. Al-Kofahi², E. Alp³⁰, W. Anders¹, F. Asfour¹⁵, K. Boherschke²⁰,
D. Bolderbach²¹, K. Borkmann¹, C. Christopoulos¹⁹, V. Dürr¹, A.M. El Nadi²⁰, A. Gaupp¹,
W. Gericke¹, W. Gudar¹, M. Hadizadeh⁷, H. Hallak¹⁴, M. v. Harten¹, N. Holtkamp²⁷,
T. Ishii¹⁸, H. Kaiser¹, J. Kopecký², G. Kryger¹⁶, P. Kuhn³, P. Kuske¹, M. Lameli-
Rachti³⁰, C. Limborg³, S. Mahmoud⁶, G. Margaritondo⁴, M. Martin¹, M. Marx¹,
H. Moser²⁸, E.N. Moudrianakis¹⁷, A. Nadi⁵, V. Nikoghosyan¹², G. Meyer², R. Müller¹,
K. On¹, C. Papanicolaou⁸, W. Pestman¹, T. Rabedeau³, I. Rahm³, G. Saffarini²³,
S. Salman¹, M. Scheer¹, T. Schneegans¹, J.L. Sussem¹⁸, S. Suzer¹⁰, A. Tadjeddine⁵,
J.W. Taylor²⁴, A. Thompson¹⁴, G.A. Voss², E. Wehrster¹, H. Winick³, G. Wotasefeld¹,
Y. Yacoby¹², T. Yamazaki²², H. Zygier³

¹DESY, Berlin, Germany

²DESY, Hamburg, Germany

³SLAC, Stanford University, U.S.A.

⁴École Polytechnique Fédérale, Lausanne, Switzerland

⁵CEA, Orsay, France

⁶Tamouk University, Irbid, Jordan

⁷Perdoun University, Mahabad, Iran

⁸AASA, University of Athens, Greece

⁹Nahla University, Nahla, P.A.

¹⁰Bilkent University, Ankara, Turkey

¹¹Atomic Energy Authority, Cairo, Egypt

¹²Hebrew University, Jerusalem, Israel

¹³Yerevan Physics Institute, Armenia

¹⁴Bethlehem University, Bethlehem, P.A.

¹⁵Srinakharinwirot University, Nakhon Phanom, Thailand

¹⁶ABOL, Tel Aviv, Israel

¹⁷Johns Hopkins University, Baltimore, U.S.A.

¹⁸Weizmann Institute of Science, Rehovot, Israel

¹⁹Cyprus University, Cyprus

²⁰Cairo University, Giza, Egypt

²¹Cornell University, Ithaca, U.S.A.

²²Tokyo University, Tokyo, Japan

²³Arizona University, Mesa, P.A.

²⁴Lawrence Berkeley Lab, Berkeley, U.S.A.

²⁵Synchrotron Radiation Center, Songkhro, U.S.A.

²⁶APS, Argonne Nat. Lab, Argonne, U.S.A.

²⁷Fermi Nat. Lab, Chicago, U.S.A.

²⁸FEK Karlsruhe, Germany

²⁹Freie Universität Berlin, Germany

October 1999

SESAME

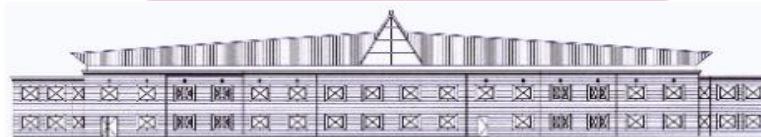
Synchrotron Light for Experimental Science and Applications in the Middle East



NORTH ELEVATION

Conceptual Design for the Upgrading of SESAME to 2GeV

July 2002



WEST ELEVATION

Conceptual Design Report for the Upgrading of SESAME to 2.5GeV



May 2003

UNESCO Amman Office

Jordan

We are all involved.

Science diplomacy works better with the most challenging relationships.

Science diplomacy does NOT work without a true and real scientific exchange.

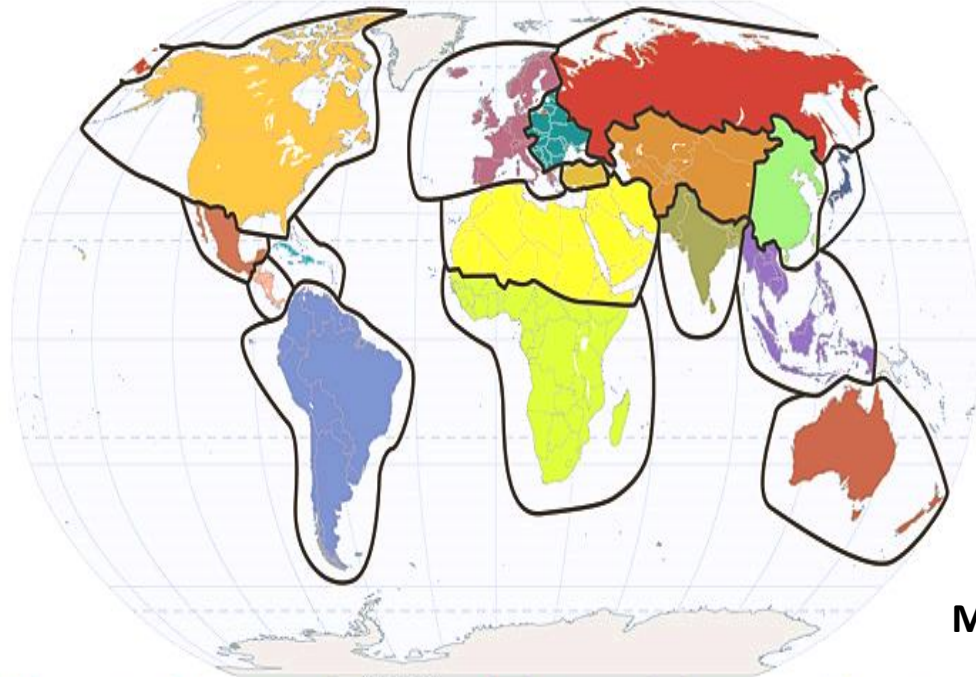
SCIENCE AND PEACE - (but most of all OPTIMISM!)



Map of international scientific collaboration 2008-2012,
Image: Olivier Beauchesne



Plataforma Media



Map of the world as it should be seen by **Scientists**



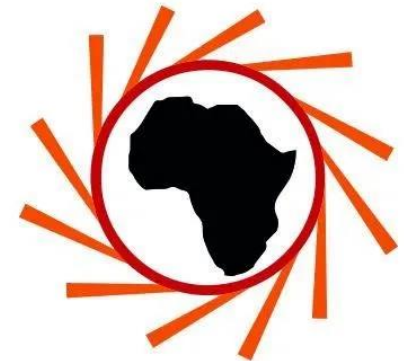
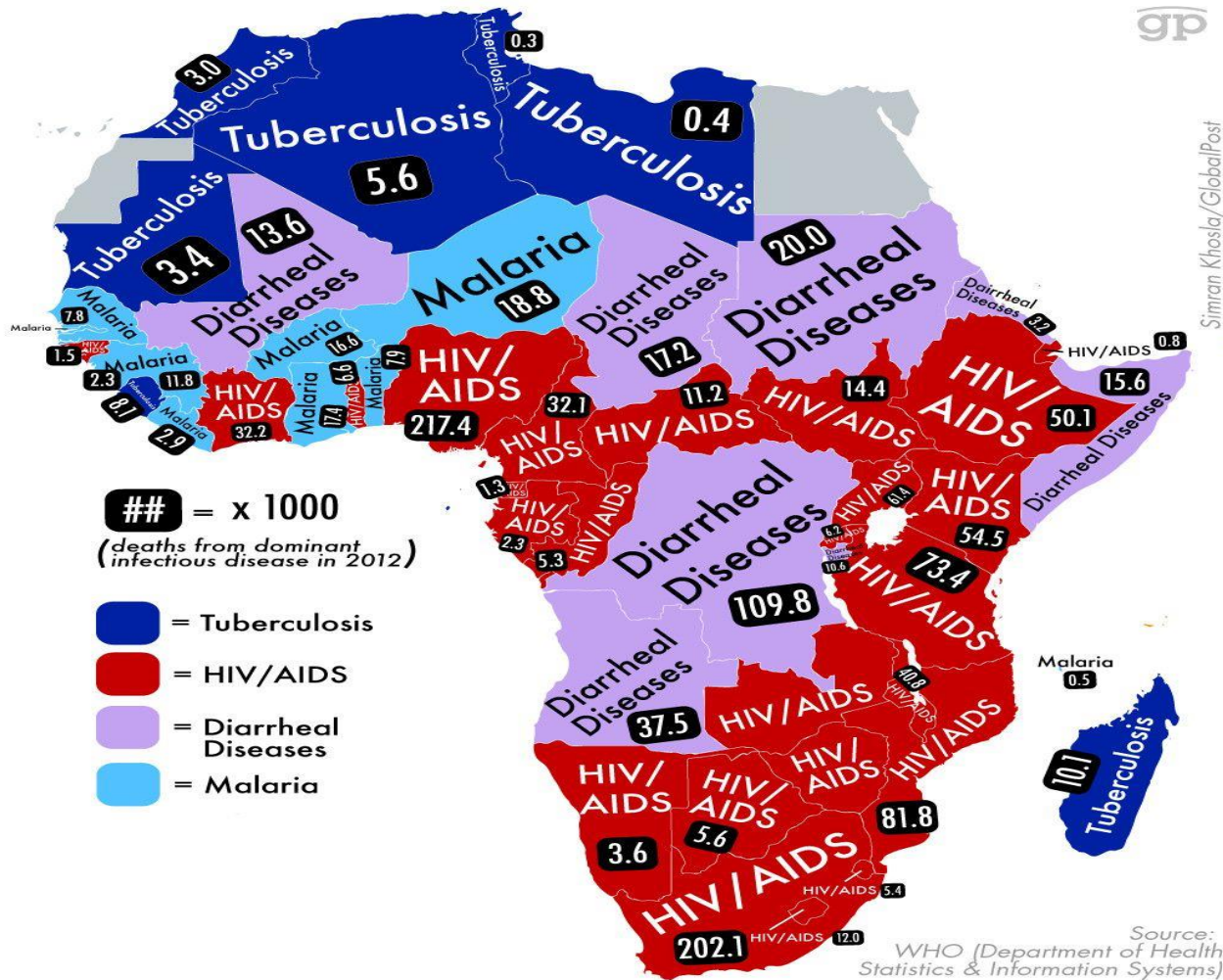
Map of the world as seen by **Politicians**



Science = common purpose + common values



A role model?



Towards an AfLS

SESAME GROUND BREAKING CEREMONY - 6 JANUARY 2003



SESAME'S

[Events](#)

[Training](#)

[Jobs](#)

[Tenders](#)

[Calls for Proposals](#)

[Home](#)

[News](#)

[King Abdullah II opens SESAME](#)

KING ABDULLAH II OPENS SESAME

Allan, Jordan, 16 May 2017. The SESAME light source was today officially opened by His Majesty King Abdullah II. An intergovernmental organization, SESAME is the first regional laboratory for the Middle East and neighbouring regions. The laboratory's official opening ushers in a new era of research covering fields ranging from medicine and biology, through materials science, physics and chemistry to healthcare, the environment, agriculture and archaeology.



**2019: SESAME became the World's
FIRST large accelerator complex to be
fully powered by renewable energy –
EU Support**



COLLABORATION & TRAINING

1. SOLEIL:

- IR beamline – Lot of work and efforts by Paul Dumas
- RF & Alignment

2. Canadian Light Source:

- Control Software and Hardware, Beamline Instrumentation
- Using beamlines for various applications
- MoU already signed between CLS and SESAME

3. ALBA – Spanish Light Source

- Beamline Construction and Commissioning
- Design of Storage Ring components
- Radiation Protection
- Fellowships are offered

4. Swiss Light Source

- Frontends for BLs closely followed by Amor and Albin
- Material Science BL as donation

5. NSRRC – Taiwan Light Source

- Electronics and Instrumentation
- Beamline Science and Techniques
- Fellowships are offered

6. Portugal - SESAME

- Fellowship Program
- Both PhD and Postdoc Level

7. LNLS - Brazilian Light Source

- Beamline Construction and Commissioning
- Beamline Optics and Control
- Fellowships are offered

8. Elettra

- RF Cavities
- Support for Training

• IAEA Support

- TC Project INT-1-055 ended in 2011
- New TC Project INT-0086 covering period 2012 – 15

• UNESCO Support

- SESAME Council Secretariat
- Financial Assistance

• CERN

- Procurement of magnets for the storage ring
- Cost for magnets covered by EU (~ 5 M Euro)

• JSPS

- Organization of SESAME – JSPS School for training

• ICTP

- Training & Dissemination

• Cyprus Institute

- LinkSCEEM Project – Phase II on going
- Focused on HPC and its applications

• APS/IoP/EPS/DPS/ACS/TUPAP

- Various scientific societies contributing
- Travel grants are given under the program

• Canon Foundation

- Financial Assistance
- In-kind contribution – in terms of manpower (Steve Jones)

• Lounsbery Foundation

- Support for young scientists visiting EU and US SR Facilities
- SESAME Technical Team is also supported
- Two year, one time, fixed funding



Training Programme (thanks to external support listed later)

Users' Meetings, Schools, Workshops, Fellowships, visits to operating light-sources,... are building technical and scientific capacity in the region

1st Users' Meeting Amman 2002



SESAME-JSPS School Cairo 2008



10th Users' Meeting Amman 2012

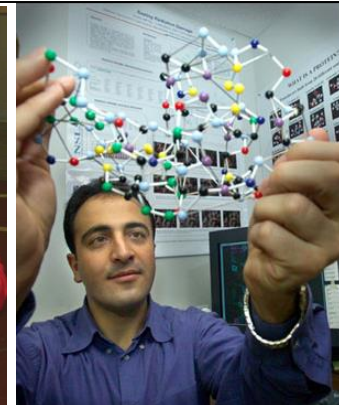


Began training accelerator experts
who returned to the Middle East



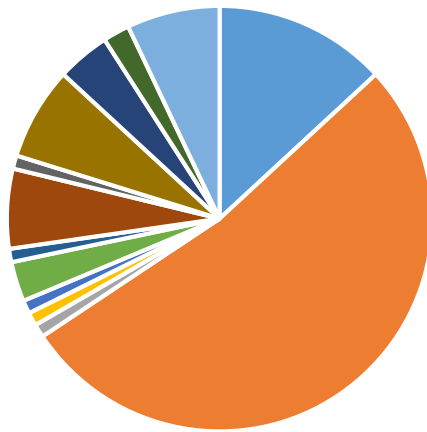
Members of SESAME Accelerator Group, 2007

Now Training Scientists
Left @ Advanced Light Source
Users' Meeting, Right @ NSLS



100 Participants

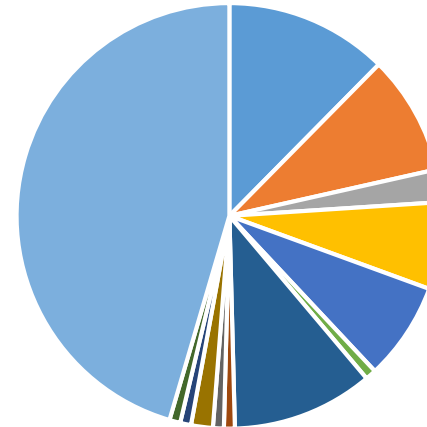
SESAME UM 2013



- Egypt
- Jordan
- Spain
- Canada
- Cyprus
- USA
- France
- Iran
- Israel
- Pakistan
- Turkey
- UK
- Palestinian Authority

117 Participants

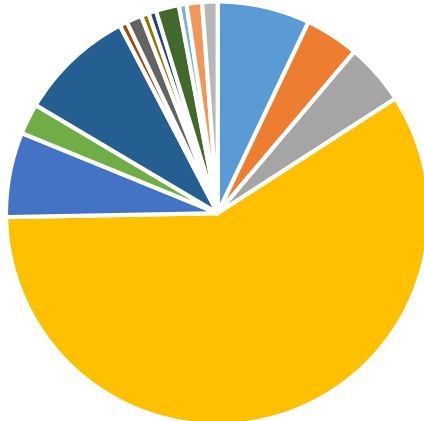
SESAME UM 2014



- Egypt
- Iran
- Israel
- Pakistan
- Palestinian Authority
- Cyprus
- Turkey
- USA
- France
- Spain
- UK
- South Africa
- Jordan

SESAME UM 2015

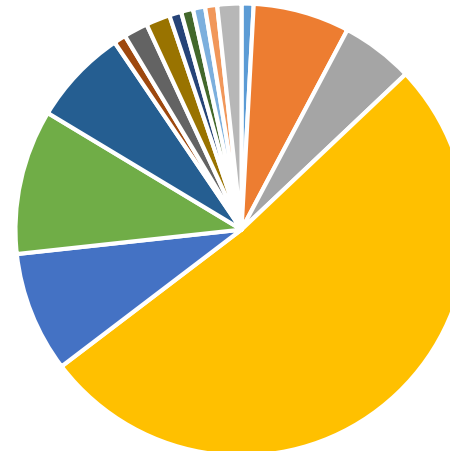
171 Participants



- Egypt
- Pakistan
- Iran
- Jordan
- Palestinian Authority
- Israel
- Turkey
- Canada
- UK
- France
- USA
- Switzerland
- Sweden

SESAME UM 2016

200+ Participants

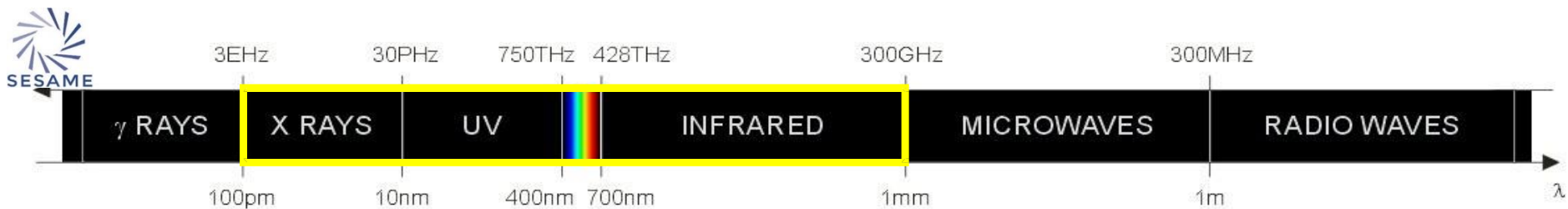


- Croatia
- Pakistan
- Iran
- Jordan
- Palestinian Authority
- Egypt
- Turkey
- Germany
- UK
- France
- Iraq
- Spain
- Saudia Arabia
- Israel

Quiet the *chaos* of the
world around you

 PANACHE DESAI

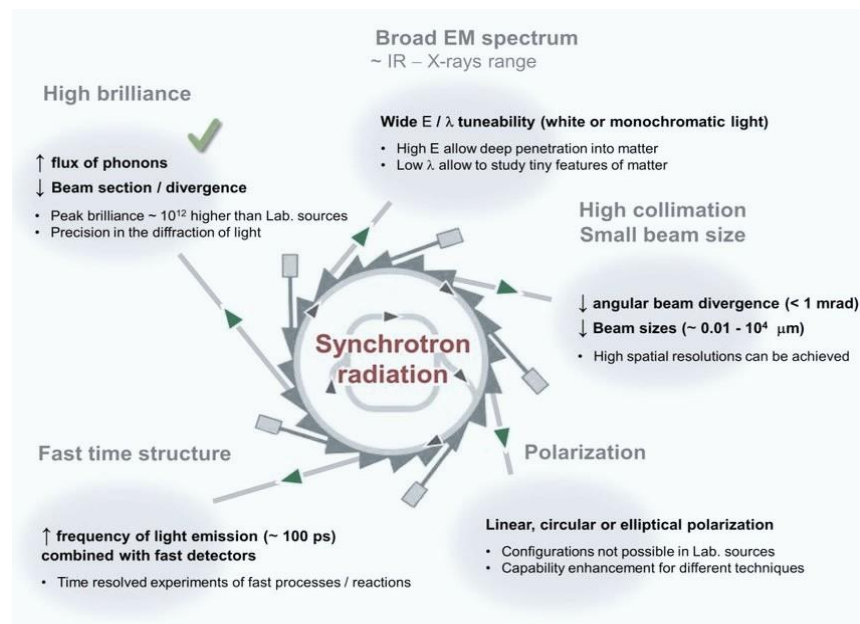




Synchrotron radiation: electromagnetic waves emitted by charged particles that move in a curved trajectory at a speed close to the speed of light.. *Spectrum of opportunities and (complementarity)..*



NASA, ESA, G. Dubner (IAFE, CONICET-University of Buenos Aires) *et al.*; A. Loll *et al.*; T. Temim *et al.*; F. Seward *et al.*; VLA/NRAO/AUI/NSF; Chandra/CXC; Spitzer/JPL-Caltech; XMM-Newton/ESA; and Hubble/STScI.



SCHEMATIC OVERVIEW OF SESAME

SAXS/WAXS - Small Angle and Wide Angle
X-ray Scattering Beamline

MS - Materials Science
Beamline, SUSAM

XAFS/XRF - X-ray Absorption Fine
Structure / X-ray Fluorescence
Spectroscopy Beamline, BASEMA

Soft X-ray Beamline

MX - Macromolecular Crystallography
Beamline

Tomography Beamline

Storage ring:
stores an electron beam. The
beam circulates for many hours.

Booster synchrotron:
accelerates the electrons and
transfers the beam to the storage
ring.

Focusing and defocusing
magnets:
control the characteristics of the
circulating electron beam.

Microtron:
generates and pre-accelerates
the electrons.

Beamlines:
collect the synchrotron light
and convey it to experimental
chambers. Beamlines operate
in parallel, simultaneously
serving tens of user groups.

Synchrotron light is emitted by the circulating electrons as their trajectories are deflected. It can be used to carry out research in fields ranging from medicine and biology, through materials science, physics and chemistry to healthcare, the environment and archaeology.

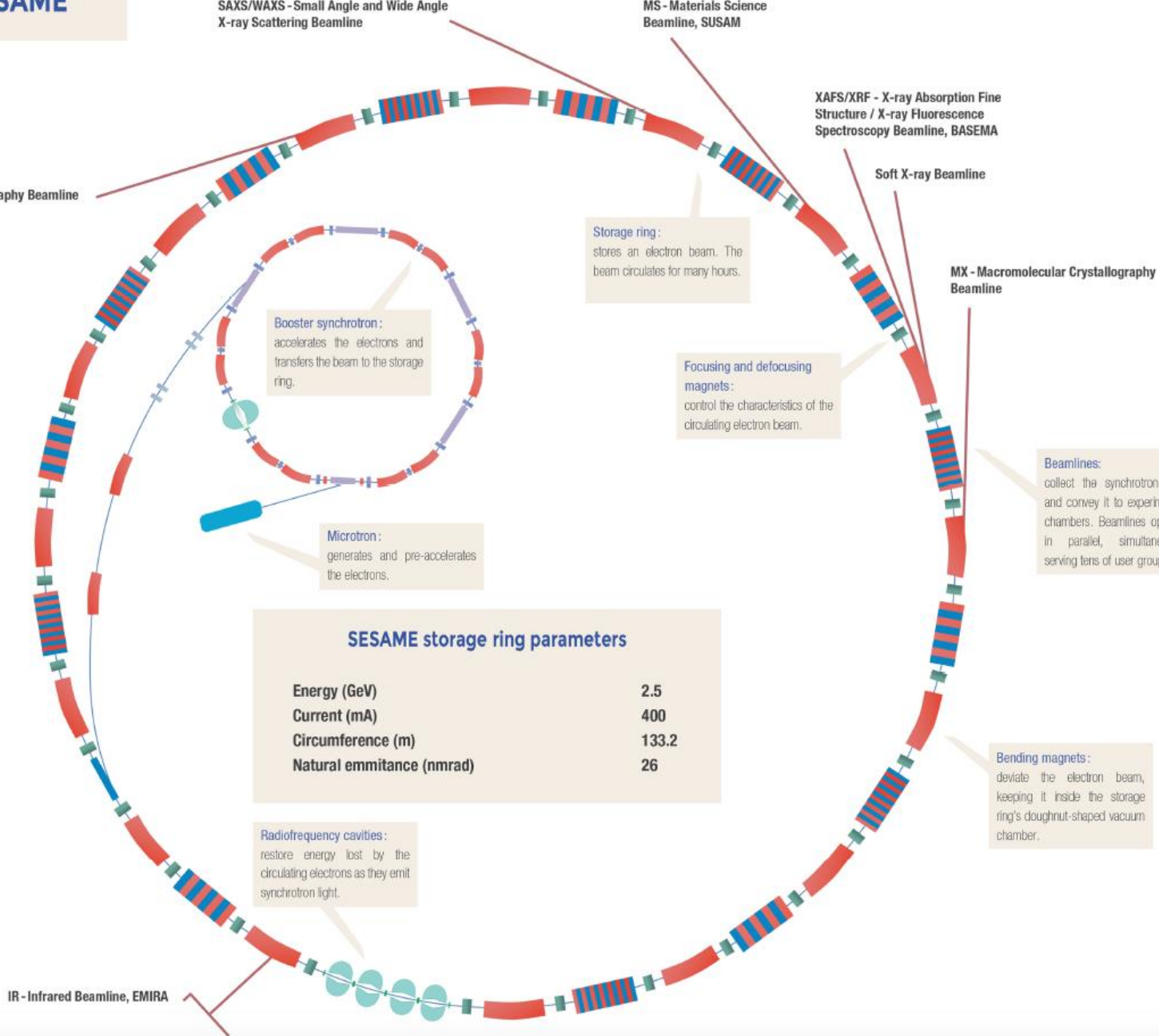
SESAME storage ring parameters

Energy (GeV)	2.5
Current (mA)	400
Circumference (m)	133.2
Natural emittance (nmrad)	26

Radiofrequency cavities:
restore energy lost by the
circulating electrons as they emit
synchrotron light.

Bending magnets:
deviate the electron beam,
keeping it inside the storage
ring's doughnut-shaped vacuum
chamber.

IR - Infrared Beamline, EMIRA



First light for pioneering SESAME light source

22 November, 2017

Allan, Jordan, 22 November 2017. At 10:50 this morning scientists at the pioneering SESAME light source saw First Monochromatic Light through the XAFS/XRF (X-ray absorption fine structure/X-ray fluorescence) spectroscopy beamline, signalling the start of the laboratory's experimental programme. This beamline, SESAME's first to come on stream, delivers X-ray light that will be used to carry out research in areas ranging from solid state physics to environmental science and archaeology.

"After years of preparation, it's great to see light on target," said XAFS/XRF beamline scientist Messaoud Harfouche. "We have a fantastic experimental programme ahead of us, starting with an experiment to investigate heavy metals contaminating soils in the region."

The initial research programme will be carried out at two beamlines, the XAFS/XRF beamline and the Infrared (IR) spectromicroscopy beamline that is scheduled to join the XAFS/XRF beamline this year. Both have specific characteristics that make them appropriate for various areas of research. A third beamline, in this case devoted to materials science, will come on stream in 2018.

"Our first three beamlines already give SESAME a wide range of research options to fulfil the needs of our research community," said SESAME Scientific Director Giorgio Paolucci, "the future for light source research in the Middle East and neighbouring countries is looking very bright!"

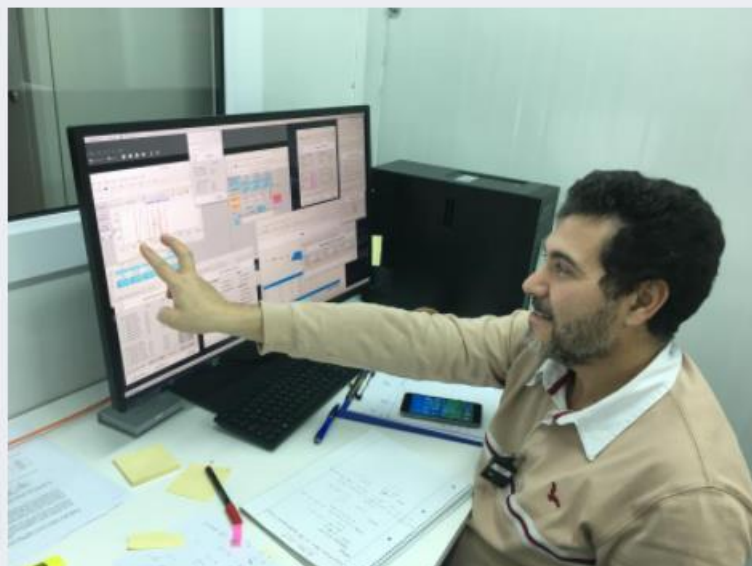
First Light is an important step in the commissioning process of a new synchrotron light source, but it is nevertheless just one step on the way to full operation. The SESAME synchrotron is currently operating with a beam current of just over 80 milliamps, while the design value is 400 milliamps. Over the coming weeks and months as experiments get underway, the current will be gradually increased.

"SESAME is a major scientific and technological addition to research and education in the Middle East and beyond," said Director General of SESAME, Khaled Toukan. "Jordan supported the project financially and politically since its inception in 2004 for the benefit of science and peace in the region. The young scientists, physicists, engineers and administrators who have built SESAME, come for the first time from this part of the world."

Among the subjects likely to be studied in early experiments are environmental pollution with a view to improving public health, as well as studies aimed at identifying new drugs for cancer therapy, and cultural heritage studies ranging from bioarchaeology – the study of our ancestors – to investigations of ancient manuscripts.

"On behalf of the SESAME Council, I'd like to congratulate the SESAME staff on this wonderful milestone," said President of the Council, Rolf Heuer. "SESAME is a great addition to the region's research infrastructure, allowing scientists from the region access to the kind of facility that they previously had to travel to Europe or the US to use."

[read more](#)



SESAME XAFS/XRF beamline scientist, Messaoud Harfouche, points out SESAME's first monochromatic light

SESAME light source brings second beamline into service

Allan, Jordan, 30 April 2018. At 11:21 pm local time (GMT +3) scientists at the SESAME^[1] light source brought the laboratory's infrared (IR) spectromicroscopy beamline into service for the first time.

This beamline is a completely new beamline. It was designed and built in collaboration with the French Soleil Synchrotron. It is SESAME's second operational beamline, and it joins an X-ray beamline that saw first light on 23 November 2017. The addition of the IR beamline will enable the application of infrared microspectroscopy and imaging in a wide range of fields, including surface and materials science (e.g. characterization of new nanomaterials for solar cell fabrication and for drug delivery mechanisms), biochemistry, archaeology, geology, cell biology, biomedical diagnostics and environmental science (e.g. air and water pollution)



cern • Follow

'Allan, Al Balqa', Jordan

cern This photo shows SESAME's infrared beamline scientist, Gihan Kamel, at work on the beamline.

Learn about SESAME light source bringing its second beamline into service:

http://sesame.org.jo/sesame_2018/node/245

Image: ©SESAME

#SESAME #science #physics #womeninscience



4,870 likes

MAY 2

First light for SESAME's MS beamline

31 December, 2019

On Monday, 23rd December 2019, at 13:21, scientists at the SESAME light source successfully delivered the first X-ray monochromatic beam to the experimental station of the Materials Science (MS) beamline, that will be used in applications of the X-ray powder diffraction (XRD) technique in materials science. The beamline will provide a powerful tool for studying microcrystalline or disordered/amorphous material on the atomic scale, the evolution of nano-scale structures and materials in various environmental conditions and for developing and characterising new smart materials.

To have seen the X-ray signal inside the MS experimental station was very exciting said the MS beamline scientist, Mahmoud Abdellatief. It was the realization of four years of hard work, and has given me added stimulus for the new challenges lying ahead before the beamline may host users in some six months.

The MS beamline is the first at SESAME to be equipped with an insertion device (wiggler), a gift from the Swiss Paul Scherrer Institute (PSI) and a device that enhances the brightness of the synchrotron light, thus reducing the time needed to make measurements, and making it possible to follow fast processes.

The major components of the beamline, also donated by PSI, were previously installed at the Swiss Light Source. Modifications were introduced in the beamline design so that these components match the characteristics of the SESAME storage ring. A powerful PILATUS 300K area detector, donated by DECTRIS (Switzerland), which is shortly to be installed, will provide the fast read-out time that is required to investigate the evolution of nano-scale structures and materials in extreme conditions of heating and cooling under gas flows.

SESAME's MS beamline will accommodate XRD experiments in the energy range between 5 and 25 keV. It will provide a powerful tool for studies in many scientific fields among which the environment, energy storage materials, and cultural heritage.

A call for proposals for beam time on SESAME's operational beamlines issued in November includes a call for proposals for beam time on the MS beamline.



© SESAME 2019: The first monochromatic X-ray fluorescence signal at the MS beamline



© SESAME 2019: SESAME scientists just after obtaining the first monochromatic X-ray fluorescence signal (from left to right: Mahmoud Abdellatief, MS beamline scientist, Messaoud Harfouche, XAFS/XRF beamline scientist, and Gihan Kamel, IR beamline scientist)

