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A NEW LIGHT IN THE MIDDLE EAST IS ON

Interview with Gihan Kamel, researcher at the international laboratory SESAME, Jordan

Palestinian National Authority, Cyprus, Egypt, Iran, Israel, Jordan, Pakistan and Turkey met on May the 16th in Allan, Jordan, to inaugurate SESAME (Synchrotron Light for Experimental Science and Applications in Middle East), the multidisciplinary international laboratory that they have founded and built as a common project. In addition to the members of SESAME, the ceremony was attended by the Observatory Countries - Brazil, Canada, China, European Union, France, Germany, Greece, Italy, Japan, Kuwait, Portugal, Russia, Spain, Sweden, Switzerland, United Kingdom and the United States - including Italy, which stands out for being the only one that devoted an ad hoc contribution to the project, which has been allocated through the Ministry of Education, University and Research (MIUR) and managed by INFN. The Italian contribution was used to realize the four radio frequency chambers, which are fundamental parts of the electron accelerator, and the detector for one of the machine's light lines. This was possible thanks to the collaboration of INFN and Elettra Sincrotrone Trieste. Thanks to the national contribution, moreover, the reception and supporting facilities for scientists are being finalized.
At the opening ceremony we met Gihan Kamel, a SESAME researcher of Egyptian origins, who completed her training in Italy, first at Sapienza University in Rome and then at the INFN National Laboratories of Frascati (LNF), where she worked at the Dafne Sincrotron. Today Gihan Kamel is responsible for the SESAME's infrared light line.

What's SESAME?
SESAME is the 3rd generation accelerator of the Middle East built in Jordan following the model of CERN. This unique facility is approaching the completion after a long journey that started in 1997 when SESAME was founded. The project aims to not only foster the scientific capabilities and excellence in the Middle East and the neighbouring regions and reverse the brain-drain

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issue for many countries in the region, but also to build bridges between people living in this hot zone. As any other Synchrotron-light sources, SESAME is a super microscope allowing different experimental techniques, thanks to beamlines, powerful enough to reveal vital details about physics, chemistry, biology, pharmaceuticals and biomedicine, as well as, materials science, archaeology and cultural heritage. Being in the Middle East, SESAME has to be competent enough to attract the scientists to come back to the region. The accelerator scientific value is so high that it has stimulated conflicting Members to collaborate in producing science for the benefit of their societies.

Whom does SESAME represent a resource for? And Why?
SESAME is a wonderful opportunity for the scientists of the Middle East and also of the neighbouring regions, since it gives them the chance to advance their professional career, at the same time that it allows them to stay in or close to their home countries. Having it this way, an important fraction of the brain-drain problem can be solved, bringing us back for the benefit of our home countries. This in turn, will foster the collaboration between different scientific groups in the region, and will definitely strengthen the relationships between societies. Moreover, this may also create some space for the European or elsewhere scientists. Nevertheless, the interaction between all the scientists should be always maintained and coming back to the Middle East should not, by any means, lead to segregation or cutting the links with the rest of the world, because this is what will keep us moving on the right way. When nations rely on diplomatic relations to overcome their economic or political issues, scientists and academics can contribute in their own way to decision-making and can create a more peaceful and equal world. SESAME is a good start and a huge source of motivation for us, the scientists, to contribute effectively in solving various problems facing our region through a high-level scientific research. At a certain level of our scientific career, we need to feel that we are really participating and offering practical solutions to our societies, in the different fields. This is because synchrotron radiation is opening up new scientific opportunities that have a direct influence on public health issues - including pollution, food and agriculture, not only focusing on the present and the future, but also helping us to understand the historical past of the region, shedding light on the archaeological and the cultural heritage treasures, for instance.
In addition to that, we should always keep fighting for women rights in the region to have a better education and a remarkable future. SESAME proved to be a major push for female scientists to enhance their professions. We can not deny that the overall situation is much better than years ago, but we have also to admit that it is not the best yet. We have to face our problems in order to be able to solve them. While female Arab scientists are bravely fighting for their dreams, many are still constrained as, unfortunately, they cannot travel abroad or they can only travel to Arab countries. I experienced this in some cases and this is why I strongly believe that SESAME

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will open the door for them and for many other women, giving them a priceless opportunity to accomplish their goals and to serve their societies with an equal and hard capacity.

Who will be the future SESAME users?
SESAME is open not only for the Middle East and neighbouring regions' scientists, but also to European scientists through basic collaboration schemes or the facility call for proposals. So far, collaborations are presented either as individual researchers' category or as national teams of researchers. However, because of the complementarities between the different research groups in the region that appear because of the mutual discussions of the SESAME annual Users' Meetings, they are foreseen to set joint project. Research areas constituting SESAME scientific programme are covering a wide range, from life to materials' sciences, biomedicine and diseases' diagnosis aided by drug design characterization, to archaeology, cultural heritage and environmental issues. Other users are also focusing on nanotechnology and electronics. The staff number is still limited, but with the operation that is ongoing, this number is expected to increase, as there is a growing need to cope with the upcoming stage of scheduled experiments. We had many users who were able to conduct many scientific projects in other synchrotron light sources via the coordination of SESAME. Many were also trained abroad, and the number is increasing according to the annual statistics.

How did you get involved in the project?
I visited SESAME in 2005 for the first time just to attend its annual Users' Meeting out of curiosity. Then, starting from that time, I had a passion about SESAME that was mixed with a doubt, just like anyone who follows the news every day! In the following years, it was worthy to see where the scepticism would take me, but eventually, year-by-year, I saw that wonderful things could happen in the region by having such a facility. In 2012, I was nominated by the Egyptian Academy of Scientific Research and Technology to represent Egypt in the SESAME Users' Committee. In 2014 I was appointed as a researcher for one year on the Infrared beamline at Dafne synchrotron facility, at the INFN National laboratories of Frascati, where I was exposed to the practical uses of the synchrotron radiation and mastered the handling of the infrared microspectroscopy technique. This opportunity was my gate to apply for the infrared beamline position at SESAME, and I was selected to start the job in late 2015. On the scientific level, I loved the fact that with this unique radiation, it is possible to do almost anything: you can jump from medical applications to electronic devices, to plants studies to Egyptian papyri or Iranian parchments, something that gives you an exciting motivation and feeds your curiosity!

What do you work on at SESAME?
I am responsible for the construction and operation of the Infrared beamline, that is the first

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completely new beamline at SESAME in collaboration with the French Synchrotron, SOLEIL. I also assist SESAME users to conduct their experimental projects using the infrared micro-spectroscopy technique starting from the measurements' stage and ending up with the data analysis and interpretation.
In parallel, launching and coordinating some regional long and short-term projects as well as different in house research activities.

Which are SESAME next steps?
SESAME is undergoing the commissioning stage. It will start with two beamlines: the infrared micro-spectroscopy beamline (IR), dealing with life and materials sciences together with cultural heritage experiments, and the X-ray Spectroscopic based beamline (XAFS/XRF), with a research program focusing on material science and environmental studies. The installation of the beamlines is progressing significantly with expected operation in 2017 upon coupling with synchrotron radiation. The scientific programme with the synchrotron radiation is to start by the end of 2017 with full operation of those two beamlines.

How does the collaboration on such a project involve people coming from many countries and different cultures?
Science in its essence should level up our beliefs, it should unite us and it should take us to a common destination for the benefit of others and ourselves. It is challenging to work at SESAME, but if we think of SESAME as an international scientific research facility, things will move on in the right direction. Who cares about the nationality or the religion of Galileo, Newton, Einstein, Fermi, Raman, Abdus Salam, Ibn Al Haytham? I hope no one does! Inside SESAME, there are no borders. You can see differences, nevertheless you don't really feel them, unless you intend to do so. Something brings us together. We, scientists, engineers, technicians, administrators, are all working everyday for our facility, and we are waiting impatiently to make it operating. We have no time and no space for contrasts. ■