



# Short Scientific Visit to ESRF

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Short Report  
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by  
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## Preamble

The European Synchrotron Radiation Facility (ESRF), located in Grenoble, France, operates the most powerful synchrotron radiation source in Europe at 6 GeV. Visiting ESRF is an opportunity to be in touch with cutting-edge science with photons.



## Objectives

The objectives of this short visit were to get acquainted with the heart of the light source (the accelerator and source division) and the scientific computing at ESRF, in addition to visiting and "sightseeing" some high throughput beamlines at the experimental hall. Further, the visit sought to provide an engaging environment for future cooperation between young SESAME users and senior scientists in sowing seeds of science and innovation by using synchrotron light source. This theme was in accordance with the aspirations of SESAME as an international research centre in the Middle East.

## Methodology: Meetings and Activities Carried out during this Visit

### **\*\* 1st Day: 8th October 2013.**

1- A very general introduction about ESRF as the most powerful synchrotron radiation source in Europe was presented.

2- Virtual tour in ESRF Visitor Centre.

3- Visiting the Accelerator and Source division.

This division is responsible for the operation, development and maintenance of the accelerator complex. Its main task is to deliver a high quality, stable beam to the scientists working at the ESRF.

In his presentation, Boaz Nash explained the physics of electron beam source, what a synchrotron is, and how it works.

4- Visiting X-ray Optics Group.

According to Christian Morawe (Deputy Group Leader), this group provides assistance to ESRF and Collaborating Research Group (CRG) scientists and engineers in the conception of the beamlines by designing, fabricating and testing optical elements.

5- Visiting the computer centre.

- Presentation about the System and Communication group.
- R. Wicke gave a presentation about resource management and parallel programming for high-throughput computing at ESRF.

**\*\* 2nd Day: 9th October 2013.**

- 1- A round tour in detector and electronic units with Kocsis and T. Martin. This unit provides hardware support in the areas of electronics, detectors and control equipment.
- 2- Visiting several high throughput beamlines, such as ID19 (X-ray imaging), ID11 (Materials Science Beamline), & ID01 (Microdiffraction Imaging). In such "sightseeing" tour, how the beamline is run and how to combine beamlines with computing programs were demonstrated. I noticed that most of beamline users perform their data offline analysis from their home institutes.

**\*\* 3rd & 4th Days: 10th-11th October 2013.**

- 1- Attending the "Advanced X-Ray Tomography Workshop: Experiment, Modelling, and Algorithms" jointed the Scientific Kick-off Meeting of the EXTREMA COST Action.

This workshop aims to get together mathematicians and experimentalists in X-ray tomography.

- 2- As The ESRF shares its site of the "epn science campus" with several other institutions, a side visit to ILL (the Institut Laue-Langevin) was organized by Dr. Giuseppe Zaccai. The ILL provides one of the most intense neutron sources in the world and the most intense continuous neutron flux in the world in the moderator region.



**Recommendations**

- 1- SESAME needs to strengthen strategic links and partnerships with European synchrotron light sources in order to build an active cooperation and collaboration between the senior and the younger synchrotron users.
- 2- There is a need for a well-funded long-term visit to ESRF, based on a specific proposal and dedicated to conduct real research. Such a visit will open new horizons

in scientific research for the young SESAME user as well as giving him/her an opportunity for using SESAME facility once it comes into full operation.

### **Future Collaboration**

It was a great experience for me to visit an international synchrotron light source such as ESRF. This experience would be more constructive and fruitful if followed by a longer training visit in which one can conduct real research and at the same time learn new scientific tools and approaches.

During this visit, I initiated contact with many postdocs and beamline scientists. However, next steps of any future collaboration require a financial fund within the framework of the on-going cooperation between SESAME and other research institutes.

### **Acknowledgement and Appreciation**

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At ESRF From right to left, Hanan Sa'adeh, Mostafa Zoubi, Claudio Ferrero, and Zubair Nawaz.