SESAME

Synchrotron-light for Experimental Science and Applications in the Middle East

# SESAME as International Research Lab

Salman Matalgah

# Outline:

- SESAME in Brief
- Computing @ SESAME
- IMAN1 (Jordan's National supercomputing Center)
- Open Source and Research (Synchrotron Radiation Case study )
- Open source challenges to be addressed from the Scientific point of view

# SESAME in Brief :

**S**ynchrotron-light for **E**xperimental **S**cience and **A**pplications in the **M**iddle **E**ast

## SESAME machine:

**SESAME accelerator facility consists of three major parts: Microtron, Booster and Storage-ring**

- The **Microtron**, pre-accelerates electrons, which are produced from electron source, to an energy of 22 MeV. **(Ready/ Commissioned)**
- The **Booster**, accelerates the electrons, coming from the Microtron, to the intermediate energy of 800 MeV. **(light is ON)**
- After extraction from the booster the electrons injected into the **Storage-ring** to reach the final Energy of 2.5GeV. **(To be Commissioned by August 2016)**

## SESAME Beamlines:

day-one (under development)

1. **Protein crystallography**
2. **X-ray Absorption Fine Structure (XAFS) and X-ray Fluorescence (XRF)**
3. **Infrared Spectro-microscopy**
4. **Powder Diffraction/Material Science**
5. Small Angle-resolved X-Ray Scattering and Wide Angle-resolved X-ray Scattering (SAXS/WAXS)
6. Soft X-ray Photo-emission and Photo-absorption
7. Extreme Ultra-Violet (EUV)

# Who we are!

**Salman Matalgah**
**System & Network Admin ( leader)**

**Mustafa Alzu'bi**
**Computing System Engineer.**

# Computing @ SESAME

- SESAME has state-of-the-art infrastructure which designed to enable the Scientific Research in the region.
- Computational resources @ SESAME:
  - Local Computing nodes, small scale clusters and scientific tools.
  - Regional Computational resources and High performance Computing (HPC) via:
    - ✓ **IMAN1 ( Jordan's National supercomputing Center )**
    - ✓ **Cy-Tera, Continuation of LinkSCEEM (Linking Scientific Computing in Europe and the Eastern Mediterranean)**
    - ✓ **VI-SEEM:** VRE (Virtual Research Environment) for regional Interdisciplinary communities in Southeast Europe and the Eastern Mediterranean) Coming soon Oct. 2015

# IMAN1: Jordan's National Supercomputing Center

http://www.iman1.jo


## IMAN1

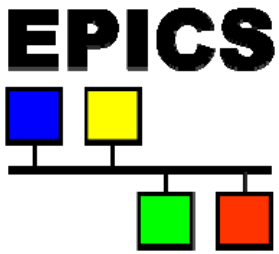
**Operated & Funded by SESAME & JAEC**

- **Converged to be the National HPC Center of Jordan**
- **Multiple HPC Clusters** with Diversity in CPU/GPU Architectures
- Open, Public and Available to All Research Communities
- **Remote, Secure and Easy Access from Anywhere** ( public/Private keys)
- Providing Extensive User Support **(1st+2nd Level )** ,Training and Outreach Activities to Strengthen the HPC Community in Jordan
- Comprehensive Library of **Open Source Scientific Software Packages**
- Offer a **continues training program** on parallel programing and HPC subjects
- Establish the first Jordanian HPC Users' Database, **200+ HPC Users** (Jordanians), **25** potential Users on IMAN1 resources
- (Proposal submission /request for computing system time via online submission system - Open Calls for Proposals started on Jan. 2014 )
- Establish strategic and strong collaboration partnerships with regional HPC centers like Cy-Tera and BA.

# Open Source and Research (Synchrotron Radiation Case study )

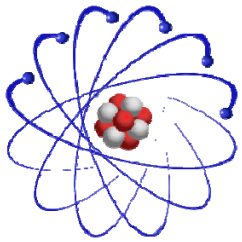
## Open Source @ SESAME :

- EPICS - Experimental Physics and Industrial Control System
- SHADOW3: a synchrotron X-ray optics modelling package
- HPC tools: Yellow Dog Linux , OpenCL, OpenMP, GCC
- IT infrastructure:
  - Scientific Linux as main distribution
  - CAELinux as CAD
  - Joomla, Plone





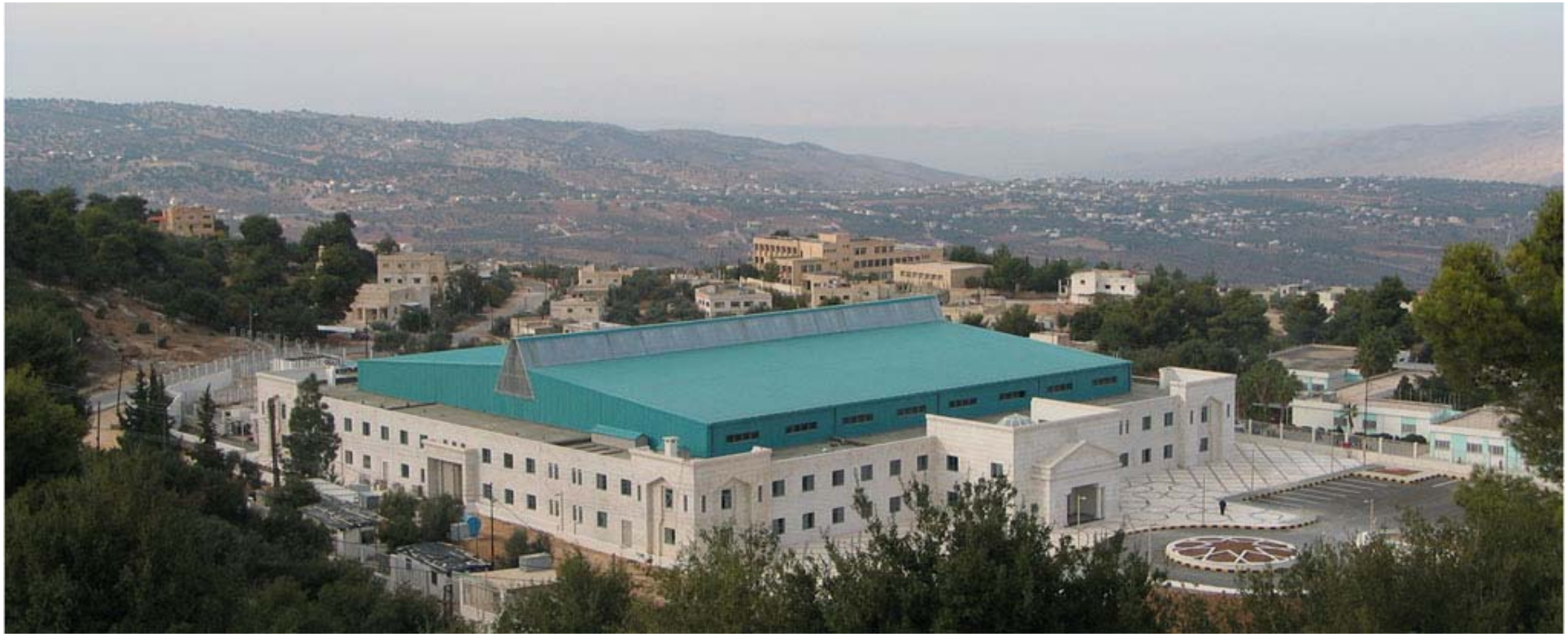


## Open source challenges to be addressed from the Scientific point of view:

- Weakness and lack on the knowledge-base of the open source portfolio on the scientific research environment

- Limitation on capacity building and qualifying the required resources



# Thanks

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