

Overview and alignment with CERN/CMS priorities

The Compact Muon Solenoid (CMS) is a general-purpose detector at the CERN's Large Hadron Collider (LHC). The CMS experiment is one of the largest international scientific collaborations in history, involving 5000 particle physicists, engineers, technicians, students and support staff from 200 institutes in 50 countries.

The CMS collaboration has been engaging extensively with countries in the Middle East and North Africa region, furthering their research capacities with tangible tools, leadership skills and competences of value to their socio-economic development and welfare. Some of Lebanon's top universities have joined CMS since 2016 and many of their students have contributed to scientific projects during placements and PhDs at CERN.

On 3 December 2015, CERN signed an International Cooperation Agreement (ICA) with the Lebanese National Council for Scientific Research, CNRSL, enabling research cooperation and knowledge sharing with Lebanese higher education institutions.

With a demonstrated record for working on CMS projects, Lebanese researchers continue to reaffirm their commitment to deliver on their contributions and ramp up their ambitions despite the multiple challenges Lebanon has been facing, particularly since October 2019. CMS, with the assistance of the Sharing Knowledge Foundation, have launched a fundraising campaign to support higher education in Lebanon. This call for help intends to salvage a technology transfer project called High-Performance Computing for Lebanon (HPC4L) that started in 2017 and was about to be implemented only a few months before the country underwent several severe successive challenges.

Objectives

Immediate objectives

- Protecting the capacities of Lebanese researchers and training them to take the leadership of the first national HPC center in Lebanon with government support and the participation of both public and private institutions.

Development objectives

- Supporting catalytic action in helping the country to recover from the financial and economic crises it has been dealing with amid the COVID-19 pandemic and public unrest.
- Endorsing the multiplier effect to transfer knowledge and skills to the entire body of Lebanese students and academics as they actively engage in addressing ongoing challenges and look ahead to emerging ones.

Main activities and work plan

The project makes use of a CERN donation of repurposed servers and disks. CMS knowledge and expertise will be transferred to train a dedicated support team in Lebanon that will be in charge of the HPC facility there. This HPC centre will benefit research activities in a wide range of disciplines and be available to partner universities. For now, the four Lebanese institutions contributing to CMS (LU, AUB, LAU, USJ) in addition to USEK and BAU have joined the project. But despite the opportunities that it will bring to their research communities, these institutions are no longer able to absorb the cost of the programme. This is why we need your help.

Timeline

Considering the many uncertainties in Lebanon now, the following is only a tentative timeline for moving forward with the work plan for HPC4L implementation. We hope to have collected enough funds to be able to afford shipping the CERN donated hardware to Lebanon in Spring 2021.

COVID allowing, the training of the Lebanese experts at CERN could then begin during the summer.

Monitoring and evaluation

CERN/CMS will assist the Lebanese stakeholders until the HPC4L facility is fully operational in Lebanon. Once the transfer of CERN/CMS's technology and know-how is completed, the facility will be 100% Lebanese run and be part of Lebanon's digital infrastructure. CERN/CMS will remain available to provide advice and support when needed. We aim to regularly update donors on the progress of the project and the impact of their donations.