



eScience across the Mediterranean: making it a reality

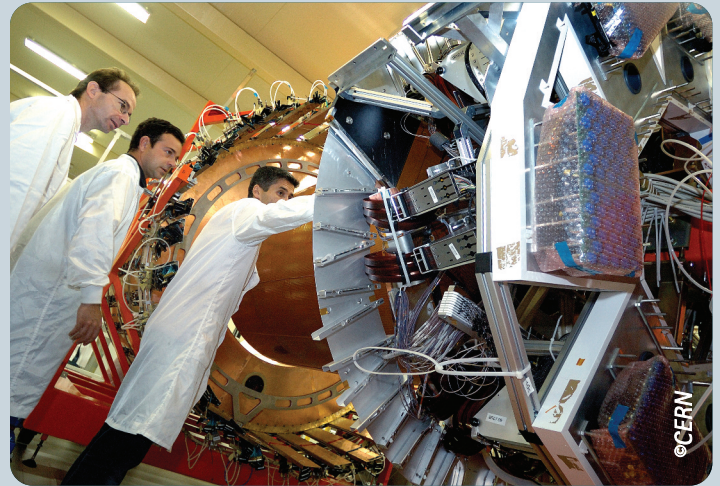
More and more researchers across North Africa and the Middle East are insisting on access to the best modern communications technologies. They are part of a spectacular growth of eScience – international scientific collaborations requiring substantial bandwidth to transfer large amounts of data for geographically dispersed researchers to work on. EUMEDCONNECT2 is the only regional Internet network dedicated to research and education capable of satisfying the intensive computational needs of these demanding users. With its direct link to GÉANT, its pan-European counterpart, EUMEDCONNECT2 is a gateway for Mediterranean scientists to participation in world-class research.

Vital to today's eScience

EUMEDCONNECT2 is making eScience in the region a concrete possibility. Thanks to its standards of reliability, capacity and stability – unique in the region – scientists from across the Mediterranean can work closely together, sharing computer power, data storage capacity and remote instrumentation – all without the expense and disruption of travel. Many collaborative science projects already rely totally on it. Many more are in the pipeline that require a world-class e-Infrastructure in the years to come.

• ATLAS: probing the origins of the universe

A team of Moroccan particle physicists are among such demanding users already benefiting from advanced connectivity provided by the regional network. Deeply involved in the cutting-edge work of the Large Hadron Collider (LHC) at CERN, they are responsible for Morocco's participation in ATLAS, one of the four key LHC experiments. Morocco's involvement in the ground-breaking work of CERN relies on the ability of EUMEDCONNECT2 to provide high-capacity, secure data communications.



Working on the ATLAS experiment

• SESAME: opening the door to high-energy physics collaboration

The first synchrotron radiation facility in the Middle East, SESAME will provide a vital resource for a wide variety of physics applications – developing new materials, probing the structure of DNA, studying archeological artefacts, penetrating the secrets of chemical compounds and much else besides.

Due to go live in 2013, SESAME will produce thousands of gigabytes of data every day, which will be transferred for analysis to its partner, the Computation-based Science and Technology Research Center (CaSToRC) of the Cyprus Institute.

“ We would quite simply be excluded from taking part in the stimulating work of investigating the origins of the universe. EUMEDCONNECT2 means that we can continue to be at the forefront of the most exciting scientific work of this generation. ”

Rajaa Cherkaoui El Moursli, Professor of Physics at University Mohammed V-Agdal, Rabat, Morocco

Securing the future

Many exciting projects in planning demand reliable, high-capacity e-Infrastructures as an integral part of their strategy. We take a look at some initiatives due to go live in the near future.

“ Synchrotron applications such as those supported by SESAME produce huge quantities of data and this volume will increase over time as the facility reaches full working capacity. The success of the enterprise will heavily depend on our ability to distribute data at high speed with predictable accuracy to the scientists who use it for their research. e-Infrastructures are absolutely vital to our long-term plans. EUMEDCONNECT2 is the only reliable, high-capacity network in the region that can offer speedy and secure transfer of this quantity of data – the public Internet is simply not designed for this sort of work. ”

Hafeez Hoorani, Scientific Director of SESAME



LinkSCEEM (Linking Scientific Computing in Europe and the Eastern Mediterranean) is a networking project funded by the EU's FP7 programme and coordinated by the Cyprus Institute. It is designed to integrate the Institute's high-performance computing (HPC) centre with the broader European HPC environment and to bring eastern Mediterranean scientific communities closer to Europe.

The first phase of LinkSCEEM, focussing on networking, prospective and incubation activities, ended in January 2010. LinkSCEEM-2, focussing on concrete implementation and the integration of e-resources, has just been awarded substantial funding by the EC. It will include a connectivity component allowing it to work closely with EUMEDCONNECT2 and DANTE. It sets out to create an integrated eScience platform for the eastern Mediterranean, helping build strong scientific and technical links between Europe and the Middle East.

• *Virtual School: training the next generation of researchers*
Bringing together teachers and students from Cyprus and the eastern Mediterranean via an online school, the Virtual School of Computational Science is a major objective of the Cyprus Institute. Its aim is to create a virtual academic environment in which to educate and train the region's next generation of researchers. The school will offer a wide variety of courses in topics of relevance and interest to the scientific community in the region, all broadcast online and direct from both regional and international participating institutions.

• *Climate modelling: stabilising regional ecology*
The Cyprus Institute's Energy, Environment and Water Research Center (EEWRC) addresses major challenges in the related fields of energy, environment, climate, and water management. In conjunction with leading European and US institutions, it sets out to become a significant climatology research facility for the whole eastern Mediterranean and the Middle East.

“ We need stable, reliable and high-capacity connectivity if the school is to be of real value to the region. We have to be absolutely certain of good quality, uninterrupted voice and high definition video. Unfortunately, the public Internet is just not capable of delivering this level of service and we have to look to a research and education network to make the school a reality. ”

Loukas Kalisperis, Interim Vice President for Research at the Cyprus Institute

“ Climate modelling produces enormous volumes of data, often reaching many gigabytes per study. Our future networking activities require reliable high-bandwidth connectivity for the transfer of this data to our partners across the world. The only alternative is to mail disks, which causes fundamental problems with data security and availability. ”

Jos Lelieveld, Head of EEWRC's Atmospheric and Climate Modelling Group



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About 30km from Amman, Jordan, this building will house SESAME, the Middle East's first particle accelerator

Meeting the needs of eScience: today and tomorrow
EUMEDCONNECT2 has provided the Mediterranean with a powerful new opportunity for science collaboration. For regional scientists it is a gateway to participation in world-class research, enabling a varied array of innovative eScience projects and bringing a broad range of benefits to the people of the region.

The future relies on the continued existence of a reliable, stable, high-capacity network. The widely acknowledged success of existing projects in the region has raised expectations in the science community and underlines the continuing importance of EUMEDCONNECT2 to the future; without it, much of the current expansion of possibility will come to an end.

EUMEDCONNECT2 – the research and education network for the Mediterranean

- dedicated high-capacity Internet connectivity for academic and scientific collaborations across the region
- separate from the public Internet for guaranteed high speeds, stability and reliability – essential for time-critical and bandwidth-hungry applications
- connecting partners in Algeria, Egypt, Jordan, Morocco, the Palestinian Territories, Syria and Tunisia
- direct connectivity to Europe and the rest of the world via GÉANT
- gateway for global collaboration for more than 2 million users in 700 Mediterranean institutions
- jointly funded by the European Commission and partner countries

For more information:

EUMEDCONNECT2: www.eumedconnect2.net

GÉANT: www.geant.net

LinkSCEEM: www.linksceem.eu

The Cyprus Institute: www.cyi.ac.cy

DANTE: www.dante.net

EC: http://ec.europa.eu/europeaid/index_en.htm

