

The 2010
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Reflections on Copenhagen:
Where does Policy on Climate Change Go from Here?

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The Cyprus INSTITUTE

What is Cyprus's greatest resource?

Sea, sun and sand are certainly up there towards the top of any list but Cyprus also has one of the world's largest proportions of graduates per head of population.

A fact, and a strength, that has been largely under-exploited - until recently.



Now, all those BAs, MAs and Phds have an opportunity to use their extensive – and expensive - knowledge to help not only Cyprus but the entire region, through one of the island's best kept secrets.

For years Cyprus has been criticized for failing to involve itself in research. But it is putting that right through the Cyprus Institute, a non-profit science and technology research and educational institution, that now boasts a collection of the best brains from Cyprus and beyond and a vision that encompasses the entire eastern Mediterranean region and across the Middle East as far as the Gulf States.

It was the vision of a world class institute based in Cyprus that brought Professor Costas Papanicolas back to the island from a distinguished academic and research career in the USA and Europe.

It had to be a bold vision to do that, given the opportunities and funding possibilities that exist there. But Cyprus Institute President Professor Papanicolas is convinced that this project is one that will be massively important to research, not just regionally, but worldwide.

His aim is to make the Institute a source of pride for the entire island.

The Institute was formally set up in 2005 and since then has been working quietly to



Above: Cyprus Institute President, Professor Costas Papanicolas.

Left: Prof. Richard Cooper, Harvard University and board member of the Institute, at his recent public lecture 'Reflections on Copenhagen: Where does Policy go from here?'

establish an excellent reputation with institutions around the world and closer to home.

Its operations started in earnest in September 2007. The following December former President Tassos Papadopoulos inaugurated the Guy Ourisson building in the Athalassa area of Lefkosia and the Institute's first research centre – the Energy, Environment and Water Research Centre (EEWRC) – was launched.

In February 2009, the Science and Technology in Archaeology Research Centre (STARC) and the Computation-based Science and Technology Research Centre (CaSToRC) were also officially launched.

EEWRC, while a relatively young entrant into the field, rapidly became an important research resource for Cyprus, the Eastern Mediterranean, the Middle East, and North Africa and also functioned as a gateway between the European Union and the region.

EEWRC examines science, technology, economic and policy issues related to major challenges in the fields of energy, environment, climate and water for the Eastern Mediterranean. The Institute is working in partnership with the Massachusetts Institute of Technology (MIT) and the Cyprus Research Promotion Foundation (RPF).

Prof. Papanicolas was scathing about the standards of building in Cyprus with regard to use of existing resources such as solar power. He sees a need for better building standards and insulation techniques, adding that entirely new processes are needed for both heating and cooling. Asked if he believed that homes should be built with solar panels on the roofs to provide electricity, he shook his head and said that this would not be practical until more efficient ways of storing the power could be found. Now, it is too expensive and too inefficient.

There are several levels at which EEWRC works, both with internationally-known institutions and in collaboration with world leaders in their respective fields. In addition to this they collaborate with other research and academic institutions, as well as local authorities. So you could say they range from the groves of academia to the grassroots, where the research can have real benefits for real people.





STARC, in collaboration with the Univ. of Sydney, CNR-ITABC, and the Univ. of Naples, set-up a balloon-suspended set of digital cameras – to produce a 3D model of a Hellenistic-Roman theater in Pafos (left).



Left: Prof. Jos Lelieveld, The Cyprus Institute/Max Planck Institute – was the Chairman of the recent Energy, Water and Climate Change in the Mediterranean and the Middle East Conference, organized by the Cyprus Institute in Lefkosia.



Driving with the sun

The Cyprus Institute, in collaboration with the Research Promotion Foundation, is organizing Cyprus's first Solar Vehicle Race. The competition, which will take place this year on June 19th, challenges teams to design, build, manage and race solar-powered vehicles.

This is the first event of its kind to be held in Cyprus, and local and international teams are being invited to take part. The Institute wants to generate an interest and enthusiasm for continued science, technology and engineering studies and to raise public awareness of "clean" transportation. The event intends to promote environmentally friendly renewable energy, electric vehicle technology and foster educational and engineering excellence. The cars will be custom-designed solar vehicles. International attendance includes the Swiss team, Swisspirit. The team has a long history in the Australian World Solar Challenge (WSC), having won the Challenge twice with the 'Spirit of Biel' and broken 9 world records. The CERN (European Organization for Nuclear Research) solar team will also be exhibiting its vehicle which was constructed 20 years ago, illustrating just how far technology has progressed. CERN is one of the world's largest and most respected centres for scientific research, located on the Franco-Swiss border near Geneva.

It has been said that if you dig a hole anywhere in Cyprus you come up with evidence that someone has been there before you, possibly several thousand years before you. Archaeologists may look into the past but they don't live in it and they are always looking for better ways to examine and interpret what they find. This is the aim of STARC, the Science and Technology in Archaeology Research Centre.

The idea behind it is the development, introduction and use of advanced science and technologies in archaeology and research into cultural heritage.

STARC takes a multi-disciplinary approach, through collaboration and joint activities with leading institutions in the region and synergies with other parts of the Cyprus Institute, with the ultimate aim of deepening our knowledge of the region's past, using new methods of reasoning with information technologies, natural and material sciences.

The use of information and communication technologies to create a Digital Heritage allows researchers to look into the past using virtual reality and other high-tech methods.

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The Cyprus Institute's STARC building in Pafos.



Snapshot of a 3D model of the head of an ancient statue (The Cyprus Institute's STARC assisted the artist Theodoulos Gregoriou to produce his sculpture 'Clepsydra' which adorns the new Larnaka airport). This 3D model was used later for preparing a mold from which a cast was made for the sculpture.



Left and right: CaStoRC's powerful high performance computer.



Left: The Institute in collaboration with the National Technical University of Athens at the Archaeological museum working to create 3D digitalization of various artifacts.

Development Research Centre (EDRC), The Centre for Technology Management and Finance (TMFRC) and the Centre for Information, Communication and Computation (ICCRC).

So it seems there are plenty of challenging opportunities on the horizon for the island's high achievers. 🌱

A PALACE FOR THE ENVIRONMENT

A group of Researchers from EEWRc, together with the Building Environment Laboratory of the University of Athens, is attempting to transform the Cyprus Presidential Palace into a model environment-friendly state building.

A study is being carried out under the supervision of Prof. Loukas Kalisperis, of the Cyprus Institute with Prof. Mattheos Santamouris of the University of Athens and the Cyprus Institute and Prof. Ute Poerschke of the Pennsylvania State University. This research project will formally launch the EEWRc's research agenda on Sustainable Built Environment.

The President of the Republic Mr. Demetris Christofias said "this initiative should send a clear message, with actions and not words, that environmental sensitivity is a major concern of the Government. With the completion of the upgrade, the Presidential Palace of Cyprus will become the world's first prime state building, as no other country has attempted such an action."

The President of the Cyprus Institute, Prof. Costas Papanicolas said: "Recognizing the urgent need for action to be taken in order to improve the environmental design of residential areas in Cyprus, the Institute has begun active research in the field of sustainable building environment. The initiative for the 'Green Presidential Palace', which the President of the Republic has requested, honours us and gives us enormous responsibilities. The symbolism of this project will have a global impact."

Chemists and physicists attached to the organisation use their skills to analyse ancient finds and preserve them for the future. The Mediterranean was the crucible of ancient civilisations, so the Cyprus Institute also uses its collective skills to explore better ways of carrying out underwater and maritime archaeological research.

It seems that nothing can be done without the power of computers and the Cyprus Institute is also working hard in this area.

To this end it has formed CaStoRC, the Computation-based Science and Technology Research Centre. This is in cooperation with the University of Illinois and the aim is to set up a computing centre with a Tier-1 high-performance computing facility. This means it will have the capability of hundreds of tera-flops. Don't know what that means? The Institute explains that it is the ability to compute one trillion floating point operations per second. If you're still lost, it basically means an awful lot of sums can be done in the blink of an eye.

Not satisfied with all this, the Cyprus Institute is already looking to new research challenges. Coming up are the Biological Sciences and Human Health Research Centre (BSHHRC), the Economic



The Institute, in collaboration with MIT and the Ministry of Education and Culture, organised local schools to participate in the construction of MIT's Sea Perch underwater robot – the image shows the teachers being trained.

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