
CERN and the International Year of Light: Exploring Light as Luminosity

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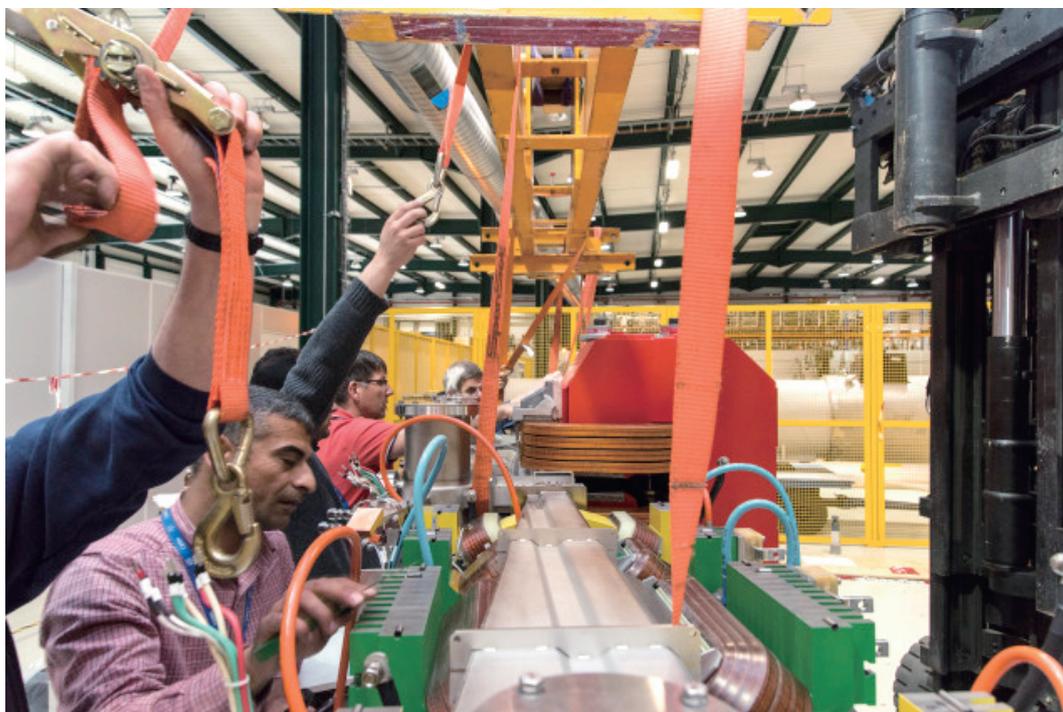
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Illuminated CERN Globe of Science & Innovation.

One hundred years after the publication of Einstein's Theory of General Relativity, the UN General Assembly declared 2015 the International Year of Light and light-based technologies. Around the world, the year is being celebrated with programmes and events showcasing light as the source of life, peace and science. CERN has been joining in the festivities; with events showcasing "light as luminosity" in its High-Luminosity LHC [HL-LHC] upgrade project as well as its involvement in the SESAME synchrotron project in Jordan.

From wave-particle duality to its creation in the earliest synchrotrons, light and luminosity are indelibly linked. So it's no surprise that CERN's kick-off event for the International Year of Light examined "Light and luminosity: the concept of Light in Physics, from Einstein to the LHC". This public talk was given by Lucio Rossi, HL-LHC Project Leader, and featured Giorgio Apollinari, Director for the LHC Accelerator Research Programme, who took part via videoconference from Fermilab (USA).



Sesame vacuum chamber test installation at SMA18.

“In particle accelerators, we provide such a huge amount of energy that the wave associated to each particle becomes a wave with which we can see in finer detail,” said Lucio Rossi. “In this way, particle accelerators can generate the finest ‘light.’” Dr. Rossi went on to discuss CERN’s ambitious HL-LHC project, which will see the Large Hadron Collider’s luminosity increased by a factor of 10, extending the machine’s discovery potential.

While Dr. Rossi addressed his audience inside CERN’s Globe of Science and Innovation, the building itself was “dressed” for the occasion. A light projection illuminated the Globe with LHC collision events, sharing the excitement with the city as it went by. If you missed the event, you can watch the full recording of Dr. Rossi’s talk on the CERN website.

Showcasing light for peace, as well as for science, CERN has also been highlighting its involvement in SESAME synchrotron project. SESAME’s story reads like a page out of CERN’s own history: a scientific collaboration, founded under the auspices of UNESCO, dedicated to peaceful physics research. But instead of post-war Europe, SESAME is being built in Jordan. Uniting nations

from across the Middle East to create a synchrotron light source for physics research, as well as archeological and environmental science applications, SESAME will be the region’s first world-class physics facility.

CERN has had a longstanding involvement in SESAME, from its early support for the project in 2002 to the current work on SESAME’s storage ring magnets and powering system, under the framework of the FP7 CESSAMag project (CERN-EC Support for SESAME Magnets). In April, this CERN-based project met its first big milestone, as SESAME’s first accelerator cell was fully assembled and successfully tested at CERN.

As we reach the midpoint of the International Year of Light, CERN is turning its attention to another source of light in life: our children. In an evening of “Science for Everyone”, CERN will be celebrating this year’s “European Researchers’ Night” with the theme of light in physics... and poetry! The event will see the participation of Nobel Laureate Gao Xinjian, who was awarded the 2000 Nobel Prize for Literature, along with physicists and engineers from across CERN.