First Plasma Generated in the ESS Ion Source

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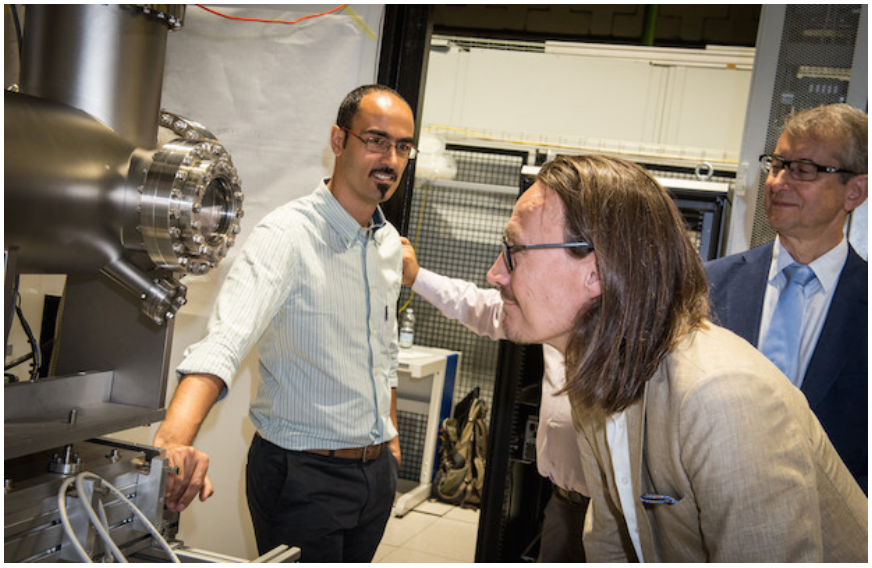
Ion Source. A first test of the ESS ion source in Italy delivers promising results to advance the ESS project.

CATANIA — The ESS partner Laboratori Nazionali del Sud (LNS) of the Italian National Institute of Nuclear Physics (INFN) successfully created plasma in the ion source this June. The highly-ionised plasma will produce the proton beam essential to run the ESS accelerator.



INFN researcher Lorenzo Neri shows ESS Technical Director Roland Garoby and Head of the Accelerator Division Mats Lindroos the ion source. PHOTO: ESS / Roger Eriksson

"This is a really large milestone for the accelerator project," says Mats Lindroos, Head of the ESS Accelerator Division. "The ion source and the warm linac are the first major parts that will be installed in the facility, and it is important that we can do that on time. The fact that we have now seen the first plasma makes me confident that we will meet the schedule."

The LNS facility has assumed the lead role for the construction of the warm linac, the first section of the ESS accelerator. The work is part of the Italian In-Kind contribution to ESS, which includes delivery of the so-called Drift Tube Linac (DTL). The DTL is a crucial Linac sub-

system for controlling the acceleration of the beam from the radio frequency quadrupole (RFQ) to the first superconducting spoke section of the ESS accelerator.

“We had everything ready and thought we should try to start the source,” says physicist Santo Gammino, who is responsible for the work package involving the ion source and the warm linac at LNS. “This is the result of the investment made in what it one of the most important resources: the quality of our technicians, physicists and engineers.”

To produce the ESS source beam, strong magnets draw out protons from the plasma and energise them. The proton beam enters the warm linac, or low energy section of the accelerator, and continues at increasing speed through to the superconducting section.

The Sicily-based laboratory LNS will continue to work on the beam diagnostics and the low energy section to complete the first part of the ESS accelerator in 2017.

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