## **European Conference on Neutron Scattering 2023**



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## The SORGENTINA-RF project: fusion neutrons for medical radioisotopes and beyond

Tuesday, 21 March 2023 16:00 (2 hours)

The SORGENTINA-RF project is presented in terms of general structure and description of the main tasks and activities to be carried out. It is devoted to the design and development of a medium power 14 MeV fusion neutron source relying on a rotating target and a deuterium/tritium ion accelerator. The main focus of the neutron facility is the production of radiopharmaceutical precursors, in particular  $^{99}$ Mo as precursor of  $^{99m}$ Tc, a radio-tracer used in single photon emission computed tomography. The nuclear reaction involved in the production of  $^{99}$ Mo is the inelastic reaction  $^{100}$ Mo(n,2n) $^{99}$ Mo. The facility will assess the chain that starts with the irradiation of the natural molybdenum (where  $^{100}$ Mo has an isotopic abundance of about 10\%) up to the production of the so-called mother solution, a liquid solution named sodium molybdate. The facility will also make available fast and thermal neutrons beams for studies on innovative medical radioisotopes as well as materials.

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