

# **Status update of the ESRF's Extremely Brilliant Source project**

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The ESRF – the European Synchrotron Radiation Facility – is a user facility in Grenoble, France, and the source of the most intense high-energy (6 GeV) X-rays in the world. It was the very first ‘third-generation’ synchrotron to be built and its light provides opportunities for scientists all over the world in the exploration of materials and living matter ranging from the chemistry and physics of materials to archaeology and cultural heritage, together with structural biology and medical applications, the sciences of the environment and the sciences of information and nanotechnologies. In 2019, the existing storage ring will be removed and a first-of-a-kind new lattice, based on an innovative arrangement of magnets, will be installed in its place, dramatically reducing the equilibrium emittance. This ‘fourth-generation’ synchrotron will produce an X-ray beam 100 times more brilliant and coherent than the ESRF source today, allowing imaging down from the micrometre to the nanometre scale and – in parallel with upgraded beamlines, instrumentation and data infrastructure – providing previously unimaginable opportunities for applications as varied as nanoscopy, science at extreme conditions and structural biology. The ESRF – Extremely Brilliant Source (EBS) project was launched in 2015 and its current status, two years into the project, will be presented, alongside the expected performance of the accelerator, the technical challenges confronted and its future potential fields of applications.