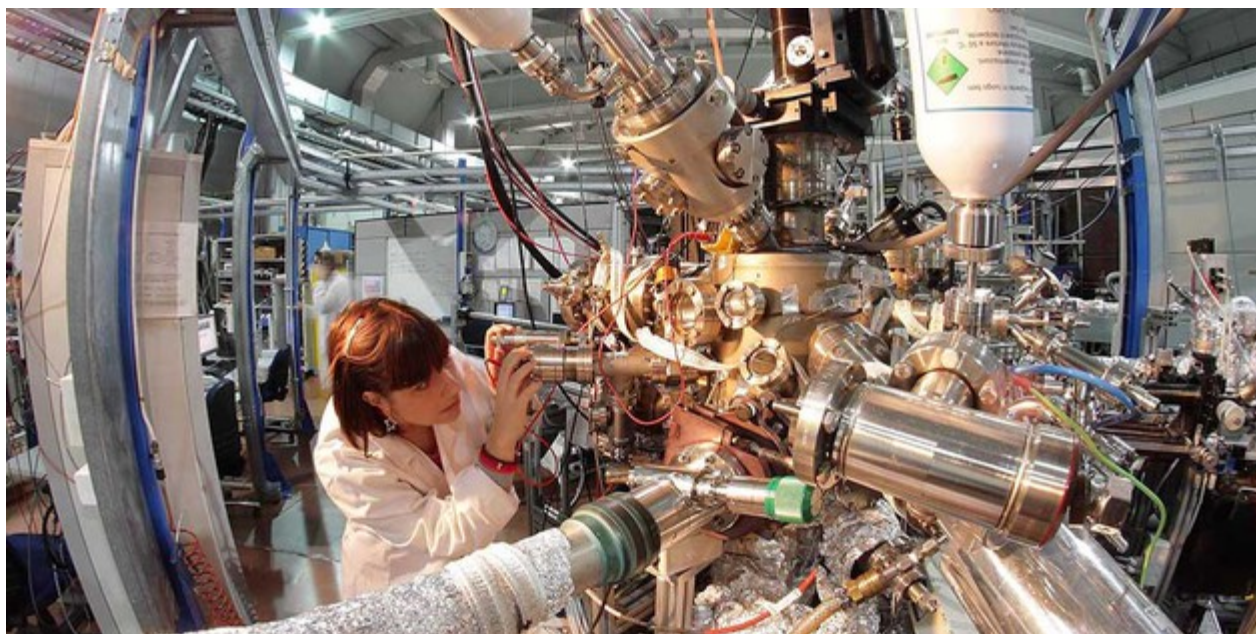


Accelerator facilities support COVID-19-related research

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✍️ W. BARLETTA **📅** 27-05-2020 **📄** LEGGI IN PDF (/PDFS/OUT.1118.PDF)



The present global effort to fight the global COVID-19 pandemic has enlisted facilities that are most commonly associated with the physical sciences, *i.e.*, synchrotron light sources. Their high brilliance X-ray beams permit researchers to create maps at the scale of molecules and atoms of the 3-dimensional structure of proteins that

are relevant to diseases. Similar to facilities, two light sources initially designed to provide powerful beams of soft X-rays, Trieste's Elettra ring ([ElettraSincrotrone \(http://www.elettra.trieste.it/\)](http://www.elettra.trieste.it/)) and Berkeley's Advanced Light Source ([ALS \(https://als.lbl.gov/\)](https://als.lbl.gov/)) have been committed to experiments aimed at identifying anti-viral drugs, potential vaccines and diagnostic methods to tackle the current pandemic.

In Trieste the experimental stations of Elettra synchrotron light source and of FERMI free electron laser are now open to researchers worldwide, who can request access to the beam lines through a special priority procedure to perform remote measurements. Using highly sophisticated techniques in collaboration with the external users, Elettra research staff can perform urgent studies aimed at understanding the biological macromolecules that make up the SARS-CoV-2 viral particle that is responsible for COVID-19. Further experiments on Elettra are aimed at studying the effectiveness of known antiviral drugs.

ElettraSincrotrone Trieste is also an active partner in the European project EXSCALATE4CoV (E4C), coordinated by Dompé Farmaceutici, and funded by Horizon 2020 through a special procedure needed for a fast launch of research activities. The main goal of the project is to identify small molecules, safe in man, drugs active against COVID-19.

Similarly at the Berkeley Laboratory in the U.S., a small team of ALS staff members have several experiments for other scientists who controlled the work remotely. At this time, only COVID-19-related experiments approved by ALS and Berkeley Lab leadership are allowed at the ALS. Berkeley leadership has noted that *“None of the work involves any live samples of the SARS-CoV-2 virus that causes COVID-19. The samples include crystallized viral proteins that cannot cause infection. Additional samples to be analyzed include host-cell proteins required for infection by the virus.”*

The earliest experiments at the ALS have used beam lines that have been expressly designed to perform macromolecular crystallography. These experiments include work led by university research groups from the U.S., Canada, and Europe. The ALS is also performing proprietary experiments that are supported by major pharmaceutical corporations such as Novartis, Vir Biotechnology, and InXium. Macromolecular crystallography has long been a vital part of the research portfolio at the world's major synchrotron light sources. It is gratifying that these capabilities can be deployed rapidly in the fight against SARS-Cov-2 thanks to the many advances in beamline technology, precision robotics, and effective and secure telecommunication links between user researchers and the operations and experimental support staff at the synchrotron light source laboratories.

This article is based on information provided by Alfonso Franciosi, president of ElettraSincrotrone Trieste, and from Glenn Roberts Jr. via an article in the Berkeley Lab daily report ELEMENTS.



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