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# Big Data Science Center at the Shanghai Synchrotron Radiation Facility - The first Superfacility Platform in China

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The rapid development of synchrotron facilities has massively increased the speed with which experiments can be performed, while new methods and techniques have increased the amount of raw data collected during each experiment. Traditionally, users collect data during their assigned and limited beamtime and then spend many months analysing them. With the huge increase in data volume, this is no longer possible. As a consequence, only a small fraction of this multidisciplinary and scientifically complex Big Data are fully analysed and, ultimately, used in scientific publications. This is unfortunate because synchrotron beam-time is an expensive resource with respect to money as well as time. Secondly, a lack of appropriate data analysis approach limits the realisation of experiments that generate a large amount of data in a very short period of time, and thirdly, the current lack of automatized data analysis pipelines prevents the fine-tuning of an experimental run during a beamtime, thereby further reducing the efficiency of the beamtime potential usage. This effect, commonly known as the “data deluge”, affects the light sources worldwide in several different ways.

In order to address these crucial Big Data challenges, Prof. Alessandro Sepe is leading the deployment of a novel Big Data Science Infrastructure at the Shanghai Synchrotron Radiation Facility (SSRF), Chinese Academy of Sciences, Zhangjiang Laboratory. The Big Data Science Center (BDSC) at SSRF aims, in fact, at fully integrating Synchrotron Big Data with Artificial Intelligence, High Performance Cloud Supercomputing and Real-time remote robotic experiments, in order to create a World-Class User-Friendly Superfacility, aimed at accelerating scientific discoveries and technological advancements. Here, also non-experts can obtain scientifically meaningful results in real-time from the multidisciplinary science carried-on at Large National Scientific Facilities like SSRF and Zhangjiang Laboratory. This will effectively extend the use of synchrotron facilities to the largest plethora of scientific disciplines ever, thus dramatically increasing the scientific outcome of the Users at Large Facilities like SSRF, while aiming at supporting all the key national scientific needs nationally and internationally.

This seminar will focus on the solution that the BDSC is architecting at SSRF and Zhangjiang Laboratory to address this Big Data deluge issue indeed, which poses a serious challenge to the scientific future of all the Synchrotron, Neutron and XFEL large facilities worldwide.

**Presenter:** Dr SEPE, Alessandro (SSRF)

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