

Rudolf Dimper: High performance computing for synchrotron radiation research

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Abstract

The highly intense X-Rays produced by a third generation light source like the ESRF are used for probing condensed matter in many different ways and in a stunning array of different scientific domains. As a service institute, the ESRF invites more than 5000 scientists per year for carrying out peer reviewed experiments in addition to an internal world-class scientific programme. The ESRF is a typical example in the scientific landscape where science and computing are intimately coupled and interdependent. New experiments are becoming possible because of an enabling high-performance computing environment; other experiments push the computing infrastructure to the limits and encourage us to explore new ways of staying abreast an unprecedented data avalanche.

In this talk I will make a short virtual visit to the ESRF, providing some key figures to situate the laboratory within the international context of synchrotron radiation sources. Based on examples of data intensive experiments in protein crystallography and high-resolution imaging, I will show the current technologies in place and high-light the areas which will require substantial change and investment in the near future. I will conclude my talk by emphasising the need for international collaborations to address challenges like remote experiment control, remote data analysis, data curation, and the creation of a Virtual Organisation to federate the computing needs of the Synchrotron Radiation community.

About the speaker



Rudolf Dimper earned his degree in chemical engineering in 1981 in Hamburg. His diploma work was done in the European Molecular Biology Laboratory (EMBL) on the design of a real-time data acquisition system for X-ray muscle diffraction experiments. After his studies he held a position at the Institute Laue Langevin (ILL), Grenoble, to design assembler programs for real-time data displays of neutron detectors, followed by a position at the Institute for Millimetre Radio Astronomy (IRAM). Here his work focused on software design for a radio wave

correlator and in accompanying the construction of the Plateau de Bure Radio Interferometer (2550m altitude) as the Station Manager. Since 1987 he works at the European Synchrotron Radiation Facility where he held various positions in the Computing Services Division. In 2004 he was appointed Head of

this Division and member of the ESRF management team. This position entails defining the computing policy of the laboratory, managing the associated resources, and representing the laboratory in computing matters on an international level.

In his private life, he devotes most of his time to his family and to marriage and family counselling. Whenever possible he enjoys going for a hike in one of the magnificent Grenoble mountain areas.

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