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The "Collaboratory" System at the Photon Factory

The Photon Factory beamline BL-1A was constructed as a joint project based on the following two proposals: "Study on correlated electron systems by a new research network" and "Precise crystal structure analysis of strongly correlated electron system". The former proposal is being conducted by five institutes: Institute for Molecular Science (IMS), Institute for Materials Research, Tohoku University (IMR), Institute for Chemical Research, Kyoto University (ICR), Institute for Solid State Physics, University of Tokyo (ISSP), and Institute of Materials Structure Science, KEK (IMSS). The beamline is also used by researchers from the other institutes which belong to this project. Because of the current expansion of the material science fields it was planned that this special beamline should be equipped with facilities to enable video conferencing and in some cases remote operation (Fig.1), to facilitate experiments performed by large research teams belonging to several different institutes. It is possible for one or two members of the research team to be present at the beamline while communicating in real time with the remainder of the research team or members of other institutes while running the experiments.

High-quality video conferencing has become possible with the very high bandwidth data transmission (up to 10 Gbps) available using SuperSINET, which connects the principal universities and institutes throughout Japan. In order to ensure a secure network environment, we also use a Virtual Private Network system. Using Multi Connected Unit servers, which realize connections over multiple points, we can discuss and allow remote access with a number of researchers at the same time.

The "Collaboratory" system is currently used for collaboration using synchrotron radiation. However, "Collaboratory" is not just for remote control, but also facilitates communication between researchers from many different fields. For the study of materials science, we need much primary data such as electronic transport properties, magnetic behavior, and optical characters. Of course, a theoretical approach is important, too. The most detailed information can be revealed using advanced probes such as synchrotron radiation, neutron beams, and ultra high-pressure experiments, although the most important field is material synthesis. The "Collaboratory" system is a new style of connection among these scientific fields.

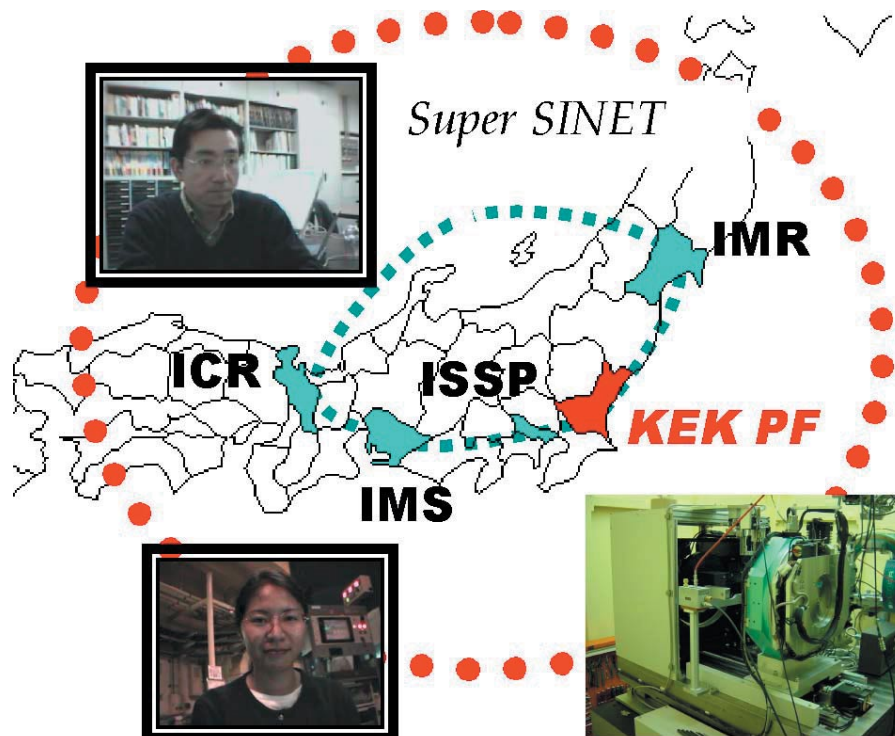


Figure 1
Image of Multi-point video net-meeting and remote operation.