Talk 1:

Speaker: Keith Hodgson, Stanford University and SLAC, Professor and Chairperson, Stanford Chemistry

Title: Imaging of Biological Systems with X-rays and Electrons: Tools and Scientific Discovery at Stanford and the SLAC National Accelerator Laboratory

Abstract: Synchrotron radiation has enabled major discoveries in chemical and biological structure over the past 4 decades. Technology developments and innovations have been essential in making this possible, most notably in source characteristics, robotics, software control and detectors. SSRL's structural biology program continues to pioneer new developments in technologies, methodologies and applications to enable new discoveries. This talk will highlight both synchrotron light and x-ray laser based developments made over the past few years.

At SSRL, there is a focus on macromolecular crystallography (MC), advanced x-ray spectroscopy and imaging and small angle x-ray scattering (SAXS). Developments and applications on in-vacuum undulator based MC beam lines enabling remote access, study of microcrystals and technology developments related to XFEL MC applications will be highlighted, as well as recent developments in advanced x-ray spectroscopy and SAXS.

The revolutionary x-ray light source, the LCLS x-ray free electron laser at SLAC in its 10^{th} year of operation, has opened completely new and potentially transformational new lines of research where the unique properties of the LCLS x-rays (fsec pulses, extraordinary peak brightness and coherence) are enabling experiments not feasible with 'conventional' synchrotron sources. This talk will also briefly introduce the XFELs and LCLS, and provide an overview of recent developments and pioneering research in the area of structural biology.

Lastly, the emerging technique of Cryo-EM is providing a complementary imaging tool that is becoming increasingly widespread in its use. SLAC and SSRL have developed a Cryo-EM platform that operates in synergy with the x-ray ones. This will be briefly described and representative recent scientific results highlighted.

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Talk 2:

Speaker: Keith Hodgson, Stanford University and SLAC, Professor and Chairperson, Stanford Chemistry

Title: Stanford and the SLAC National Accelerator Laboratory: A perspective of research and education innovation in the context of the Bay Area

Abstract: Stanford University excels in both education and research. The faculty in its multiple schools, including Humanities and Sciences, Engineering, Medicine and Earth, Energy and Environmental Sciences have a diverse and deep research agenda. Interdisciplinary research is a hallmark, facilitated and enabled by a group of 18 independent laboratories (Centers and Institutes). There is a strong focus on education at the graduate, postdoctoral and undergraduate levels and Stanford seeks to push the boundaries of teaching with approaches like group learning (also known as active learning). Stanford also operates the SLAC National Accelerator Laboratory for the US Department of Energy which is located on a part of the Stanford campus. The close relationship between Stanford and SLAC provides unique opportunities for research and training. Located within Silicon Valley, SLAC and Stanford both draw from and contribute to the innovative environment. Aspects of these features will be highlighted in this talk.