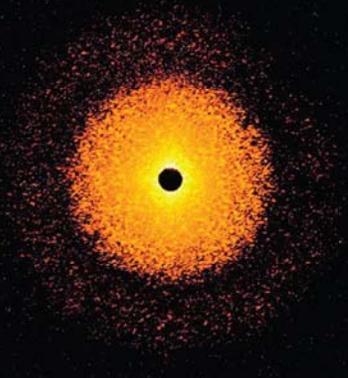


Sunil K. Sinha

“Dynamical Studies Using Coherent X-rays: A Short Review and Prospects for the Future”

The use of coherent x-ray beams for studying the structure and dynamics of both surfaces and bulk materials is rapidly increasing due to the advent of new high-brilliance x-ray sources. The field of x-ray photon correlation spectroscopy (XPCS) has steadily grown from “demonstration” experiments carried out some 15 years ago, to studies addressing real problems at the forefront of condensed matter and has attracted increasing numbers of users. The principal applications have been in the fields of soft condensed matter and nanoscience, but extension to the study of slow fluctuations in magnetic systems will undoubtedly grow. This talk will attempt to survey some of the recent applications at the limits of currently existing instruments, and present a wish list for XPCS-capable beamlines of the future for attacking certain important problems in condensed matter and materials science. This talk will also present a new formulation of the scattering of partially coherent radiation by condensed matter, which will enable us to go beyond the simple kinematic approximation that is usually made, but which breaks down for grazing incidence small-angle x-ray scattering geometry.



Sunil Sinha has the title of Distinguished Professor of Physics at the University of California, San Diego. He received his Ph.D. in Physics from Cambridge University and has also served as Group Leader for Neutron Scattering at Argonne National Laboratory, Group Leader of X-ray Scattering at Brookhaven National Laboratory, Senior Research Associate at Exxon Corporate Research Laboratories, and Associate Division Director at Argonne's Advanced Photon Source. His research interests have centered on the use of synchrotron x-ray scattering and neutron scattering techniques to study the structure and dynamics of various condensed matter systems. His most recent work has been concerned with scattering from surfaces and thin films, including polymeric films, biomembranes, and magnetic films.

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