

Unravelling the machinery of Life with help from X-rays and electrons

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The second generation of the National synchrotron lightsource NSLS-II has been built at Brookhaven National Lab. This lightsource enables new, experiments to study all types of matter due to the high flux, small focal spots, and fast data acquisition rates. For Biological science single crystal data collection will be possible in fractions of a second, from tiny - micron sized - samples. At the new Macromolecular crystallography beamlines at NSLS-II multi-crystal and serial crystallography techniques will be standard. We are developing these techniques to begin to understand the machinery of life at atomic detail and with temporal resolution.

Recently made cryo-electron microscopy Nature's technique of the year, and resulted in the award of the 2017 Nobel prize to three of the proponents of the technique. Recent successes show that the "electron microscopy revolution" is elucidating the structure of extraordinarily complex molecular machinery. The technique and the opportunities it supports are evolving rapidly leading to great excitement in the structural biology community.

At BNL we are developing a plan to allow the complementary nature of the results delivered by X-rays and electrons to be brought together, we aim to establish a center to enable study of biology in action.