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Societal and Economic Impact of a Synchrotron Light Source

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Synchrotron light sources have been developing rapidly since the 1980's when first dedicated light source facilities started operations. These light sources essentially extend our human vision and allow us to see and investigate tiny things from microstructures to molecules and atoms, in many cases in-situ and under operating conditions. Such research activities have made substantial scientific and technological impacts in such critical areas as clean energy, microelectronics, quantum information, synthesis and manufacturing, human health, and the environment. In addition to direct scientific impacts, the light sources also provide significant indirect broader impacts to our society. These impacts are reflected in business and economic impact to the local community, promoting high-quality education and workforce training and development, and encouraging people working together in a naturally diverse and inclusive light source environment.
National Synchrotron Light Source II (NSLS-II) is a bright synchrotron facility at Brookhaven National Laboratory on Long Island, NY. It provides stable and intense photon beams, from infrared to hard X-rays, experimental capabilities, and data infrastructure to enable multiscale, multimodal, high-resolution studies on diverse systems of materials. In this presentation, I will quickly go through a few research and activity examples from NSLS-II to illustrate their scientific and technological impacts. I will then illustrate on how, in many ways, the local community may benefit from the socioeconomic activities around a light source facility.
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