

Professor Ada Yonath and KEK Photon Factory

Professor Ada Yonath of the Weizmann Institute of Science received 2009 Nobel Prize in Chemistry for conducting the groundbreaking research on the structure and function of ribosome, one of the most important complex nano-machines, responsible for synthesis of proteins. Her heroic efforts to obtain high-quality crystallographic images of ribosome using light source facilities took more than two decades.

Ribosome is one of the most complex protein-RNA molecules that are difficult to analyze. In the 1980s, obtaining high quality crystals of ribosome was thought to be an impossible task. Prof. Yonath worked diligently and tirelessly to try every possible technique and light source facilities around the world, including Photon Factory.

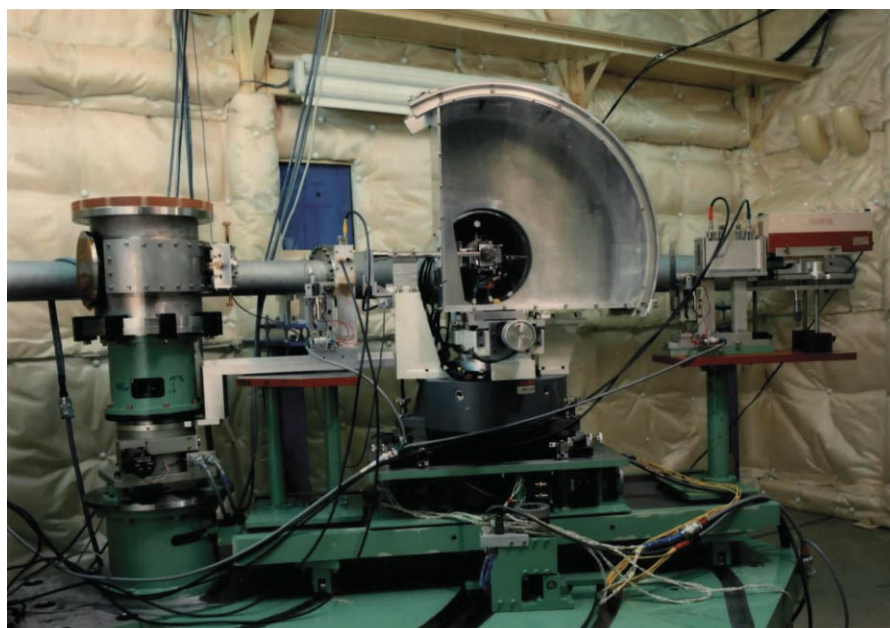
In 1987, professor emeritus of KEK, Noriyoshi Sakabe, developed a wide-angle Weissenberg camera at Photon Factory. He was surprised to see Prof. Yonath's proposal among the first group of applicants to the new facility. "I was amazed how Ada obtained the information on our beamline," explains Sakabe. "She was always very keen to know what kind of apparatuses were available and made efforts to explore every possible technique that might help determining the ribosome structure. Our young staff were deeply impressed and influenced by her cheerful and energetic character."



Professor Ada Yonath

Prof. Yonath and her colleague had developed a revolutionary freezing technique using Photon Factory. For the first time, she successfully reduced the temperature of a sample to that of liquid nitrogen to avoid the formation of ice crystals during freezing and preserve the molecular structure of the ribosome during X-ray beam exposure. This cryo-freezing technique became the worldwide standard for protein crystallographic data collection at low temperature.

KEK awarded Prof. Yonath the title of "Honorary Professor Emeritus" on March 4, 2010, second only to another Nobel laureate Makoto Kobayashi, for her significant scientific contribution. The award ceremony was held on March 9, 2010, in Tsukuba.



Weissenberg camera No. 2 around 1990.