Materials Science Research at RIKEN SPring-8 via the Northeastern University-RIKEN co-op program

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The Cooperative Education program at Northeastern University provides undergraduate students with an excellent opportunity to experience life in the real work environment and gain valuable experience prior to graduating as well-rounded professionals.

RIKEN, as an affiliate of the co-op program, opens doors for two students from Northeastern University to travel to Japan and work at the Synchrotron Radiation facility at it's SPring-8 campus, for a period of 6 months. This collaboration was made possible by the efforts of Dr. Masaki Takata of RIKEN and Dr. J. Murray Gibson of Northeastern. Students get the opportunity to work alongside and learn from well-qualified specialists, which contributes towards their experiential learning. From analyzing diffraction data to physically working on the beam-line, participating in a co-op at RIKEN SPring-8 campus provides students with a wealth of experience that they likely would not be able to obtain elsewhere.

For a student, such as myself, working towards a B.sc degree in Chemical Engineering, this co-op offers a platform to develop his practical skills and teaches how to employ book-knowledge in real-world applications. This not only contributes to better comprehension of concepts but also helps with developing a professional demeanor, a valuable and desired quality amongst fresh graduates.

Currently at the RIKEN SPring-8 campus, I am expanding on my knowledge of Synchrotron X-ray Powder Diffraction and the MEM/Rietveld analysis[1] to understand the relationship between the structure and properties of various materials. This is indispensible knowledge for developmental research and for the design of novel functional materials in the field of Chemical Engineering. Once I absorb these concepts, under the supervision of the Dr. Jungeun Kim and Dr. Akihiko Fujiwara, I will work on Powder Diffraction at one of the Synchrotron beamlines (BL02B2) at RIKEN SPring-8. I plan to apply my knowledge of the MEM/Rietveld method for precise structure analysis using X-ray Powder Diffraction data. Examples include the structural studies of positive electrodes with spinel structures and materials with nano-sized spaces, along with their applications.

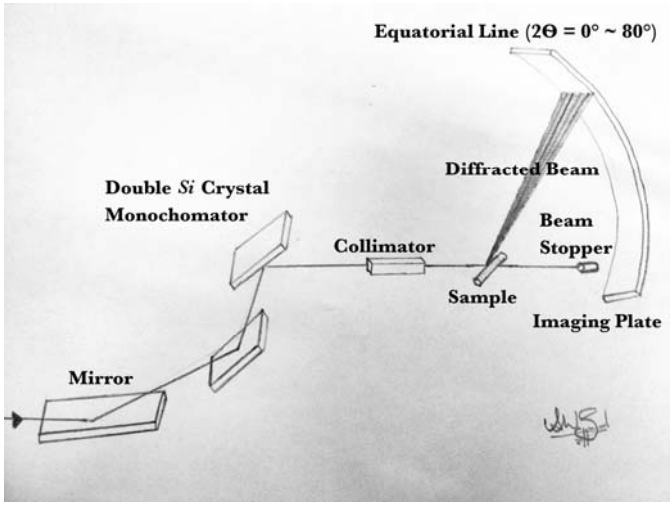

Fig. 1. Schematic diagram of beamline BL02B2, SPring-8.

[1] M. Takata, "The MEM/Rietveld method with nano-applications-accurate charge-density studies of nano-structured materials by synchrotron-radiation powder diffraction", Acta Cryst. **A 64**, 232-245 (2008.)