

Yongjae Lee Wins Award for High-Pressure Research

June 26, 2002

Yongjae Lee, a postdoctoral fellow in the Physics Department, has won the 2002 Alvin Van Valkenburg Award for his work on a newly discovered class of materials that expand under pressure.

This award is given every second year in the name of physicist Alvin Van Valkenburg, co-inventor of the diamond anvil cell, to honor a young scientist who uses this device in his or her scientific research.

Lee was presented with a prize from the Alvin Van Valkenburg Memorial Fund and gave a short talk on his work at a June 26 awards ceremony hosted by William Bassett, Cornell University, during the biannual Gordon Conference on "Research at High Pressure" in Meriden, New Hampshire, June 23-28. The award news will also be featured in the upcoming issue of Physics Today.

"I am very honored to win this international young scientist award in high-pressure sciences," said Lee. "Most of the discoveries and results would not have been possible without support and creative input from my many mentors and collaborators and the optimal instrumentation available at Brookhaven Lab."

Funded by DOE's Division of Materials Sciences and Division of Chemical Sciences, as well as by BNL's Laboratory Directed Research & Development, Lee's research is on the pressure-induced swelling of zeolites. The phenomenon was discovered by an international collaboration between BNL and the School of

Chemical Sciences at England's University of Birmingham.

When subjected to great pressures in a diamond anvil cell, these zeolites expand as fluid from the surrounding medium is squeezed into their tiny pores.

This unusual result may lead to applications for these materials as "molecular sponges" for soaking up chemical pollutants or even radioactive waste because, when the pressure is released and the material contracts, the fluid and possibly larger molecules or atoms could be trapped inside.

Using a technique called powder diffraction at the NSLS, Lee and his collaborators were the first to decipher one such zeolite's molecular structure last year.

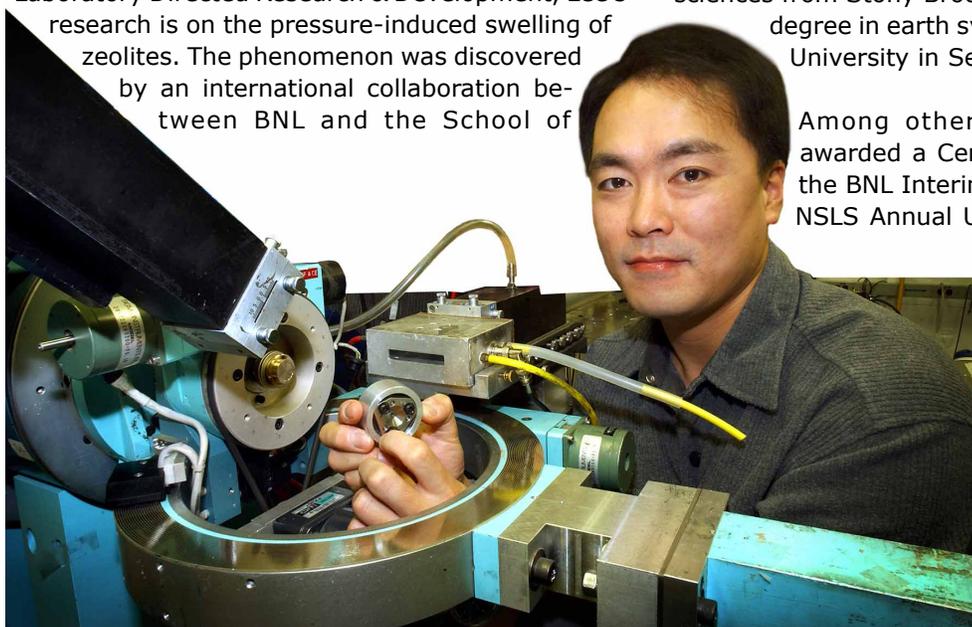
Their findings, published in the *Journal of the American Chemical Society*, for the first time explained the material's unusual ability to absorb excess fluid, and showed where the extra liquid goes.

Lee came to BNL in 2001 as a postdoctoral fellow in the powder diffraction group led by Thomas Vogt of the Physics Department, after completing his doctoral studies in geosciences at Stony Brook University. Lee had received a master's degree in geosciences from Stony Brook in 1998 and a bachelor's degree in earth system sciences from Yonsei University in Seoul, Korea (1996).

Among other honors, Lee has been awarded a Certificate of Excellence from the BNL Interim Director during the 2002 NSLS Annual Users' Meeting, a Sigma Xi Award for Excellence in Research at Stony Brook in 2001, and the Pauling Prize at the 2000 American Crystallographic Association Meeting.

-Karen McNulty

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Yongjae Lee is seen with the diamond anvil cell that he used during the experiments on zeolites that expand at high pressure.