January 28, 2008 - A team of researchers from UCLA, Argonne National Lab and the Australian Synchrotron, led by John Miao, have demonstrated, for the first time, that resonant X-ray diffraction microscopy can be used to image buried structures with nanoscale resolution. With this technique, they were able to image bismuth structures inside a micrometre-sized silicon sample with a pixel resolution of 15 nm. This work was published in Physical Review Letters and highlighted in Nature Nanotechnology, Physorg.com, and Nanotechweb.org. UCLA postdocs and students, Changyong Song, Huaidong Jiang, Raymond Bergstrom and Damien Ramunno-Johnson, have played an important role in the experiment. The samples were fabricated by Kang Wang’s group at UCLA and the research was funded by the DOE BES and the NSF.

http://nanotechweb.org/cws/article/tech/32980

The resonant x-ray diffraction microscope takes two diffraction patterns, above and below the element’s absorption edge. The patterns are phased to obtain high-resolution images, and the difference of the two images represents the spatial distribution of the element. Image credit: Changyoung Song, et al.