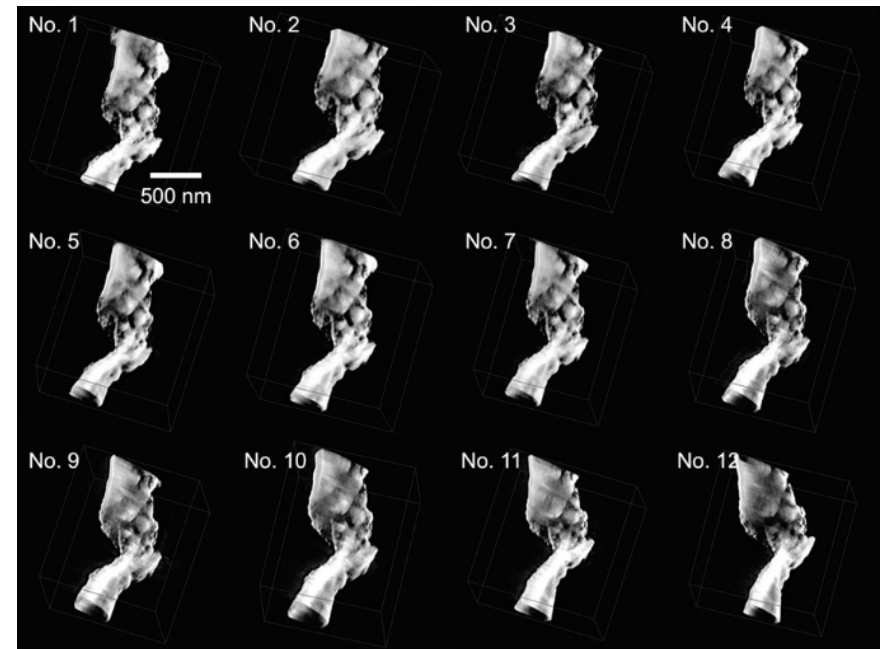


# Developing a new in-situ 3D TEM imaging system for probing nanoscale deformation behavior

This project was sponsored by a Japanese government fund, “Development of advanced measurement and analysis systems”, focused on transforming scientific ideas into marketable products based on academic – industry collaborative team efforts. The paper (see Figure caption for reference) summarizes the functionality of a new in-situ three-dimensional (3D) imaging system for observing plastic deformation behavior in a TEM. The authors designed an integrated system using a uniquely developed sample holder and image-acquisition software suite for in-situ deformation and time-resolved electron tomography data acquisition. They achieved time-resolved 3D visualization of nanometer-scale plastic deformation behavior in a Pb–Sn solder alloy sample, thus demonstrating the capability of this system for new applications. It also demonstrates an inter-network collaboration between NNCI (NanoEarth) and Japan’s Nanotechnology Platform (Kyushu University node).



*3D volumes reconstructed from 12 tilt-series data sets from a Pb-Sn solder alloy sample using state-of-the-art TEM 3D imaging system described in the journal *Miscroscopy* (2016) doi: 10.1093/jmicro/dfw109*

S. Hata (Kyushu U., Japan); S. Miyazaki, T. Gondo, H. Miyazaki (FEI Company Japan, and Mel-Build Co., Japan); K. Kawamoto, N. Horii, H. Furukawa (System in Frontier, Inc., Japan), H. Kudo (U. Tsukuba, Japan); M. Murayama (Virginia Tech)