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Pushing the limits of nanolithography outside the box[1]

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The Center for Nanoscale Materials (CNM) at Argonne National Laboratory was constructed in 2006, and opened its doors to serve the user community in 2007 with the objective to provide research opportunities in Nanoscience for the scientific community worldwide. Currently, the CNM hosts over 400 user proposals a year. There are six research groups at the CNM that do work in nanophotonics, electronic and magnetic materials and devices, nanobio interfaces, nanofabrication and devices, x-ray nanoscale microscopy and theory and modeling. At the CNM Nanofabrication and Devices Group we have been able to push the limits of electron beam lithography to make plasmonic nanostructures obtain sharp corners with less than 6 nm radius of curvature and expand the use of ion beams to 3D large area nanofabrication in microfluidics by novel design methodologies, among other accomplishments. None of these accomplishments are possible without detailed understanding of the physics and chemistry mechanisms involved during fabrication. During my talk I will discuss a few clear cases where lithography and fabrication are used in ways not commonly found in current nanofabrication facilities and what make our facility unique.

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