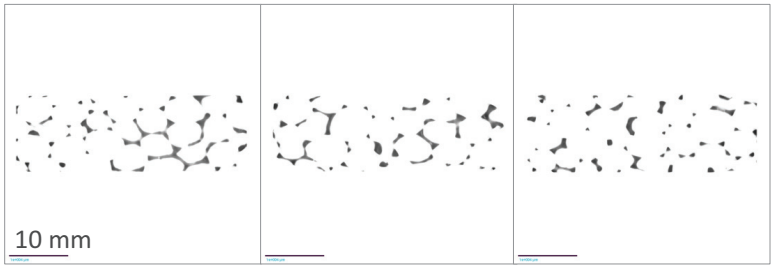
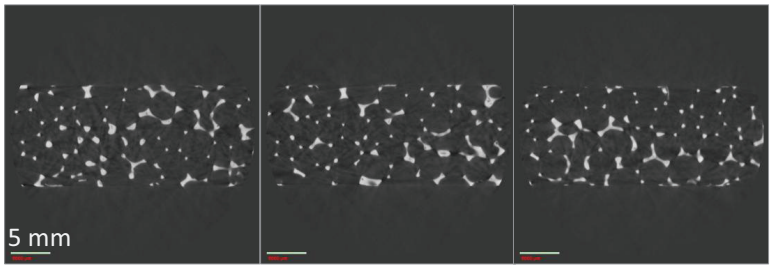
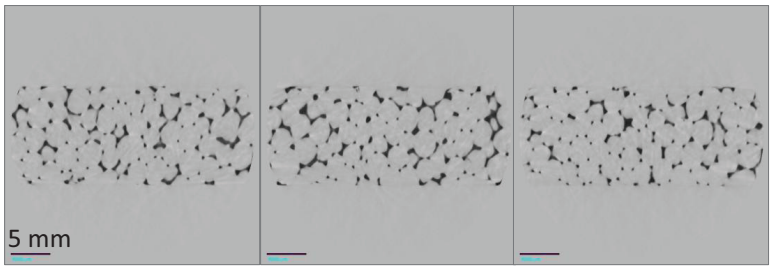
µCT slices of metal foam at various cross-sections



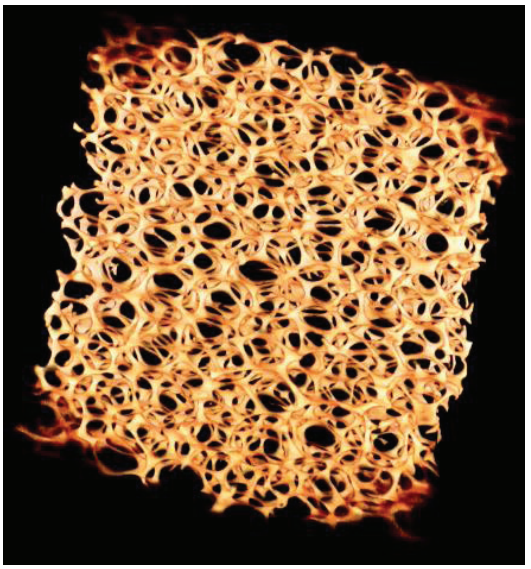
Sample 2D radiographs of 5 PPI open-cell metal foam.
Thresholded images with the metal shown as black.
3D reconstruction from the full set of images →



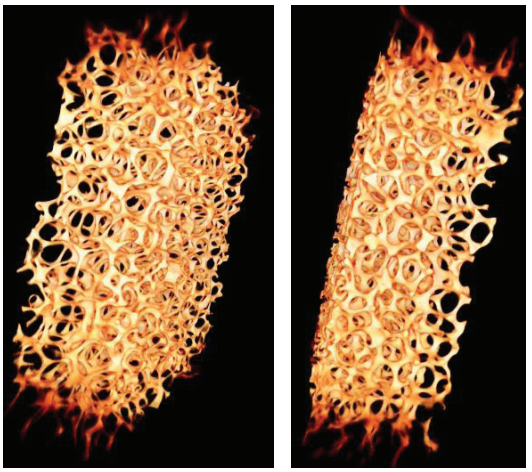
Sample 2D radiographs of 10 PPI open-cell metal foam.
Raw images with the metal shown as white.



Sample 2D radiographs of 20 PPI open-cell metal foam.
Inverted images with the metal shown as black.



3D reconstruction of µCT images
5 PPI metal foam



various views shown to highlight structure

X-ray Micro-Computed Tomography Imaging of Open-Cell Metal Foams

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High porosity, open-cell metal foams show promise in a variety of heat transfer applications. The high surface-area-to-volume ratio and irregular structure are appealing for compact heat exchanger design. However, the irregular structure presents a challenge when attempting to model transport within or around the metal foams. One method for obtaining highly accurate geometric information is X-ray Micro-Computed Tomography (µCT). These images were obtained using the Xradia MicroXCT-400 apparatus at the Microscopy Suite at the Beckman Institute for Advanced Science and Technology at the University of Illinois at Urbana-Champaign. Image analysis yields information on ligament length, diameter, orientation and cell geometry. The Al-6101-T6 metal foam samples in this study had porosities designated by the manufacturer as 5, 10, and 20 PPI (pores per inch), with pore sizes ranging from about 1.25 mm to 5 mm.