

# Enabling Defect Detection in Low-Density Materials with X-ray Phase Contrast Imaging (XPCI)

## The Problem

X-rays can't see low-density materials that are used throughout the stockpile.

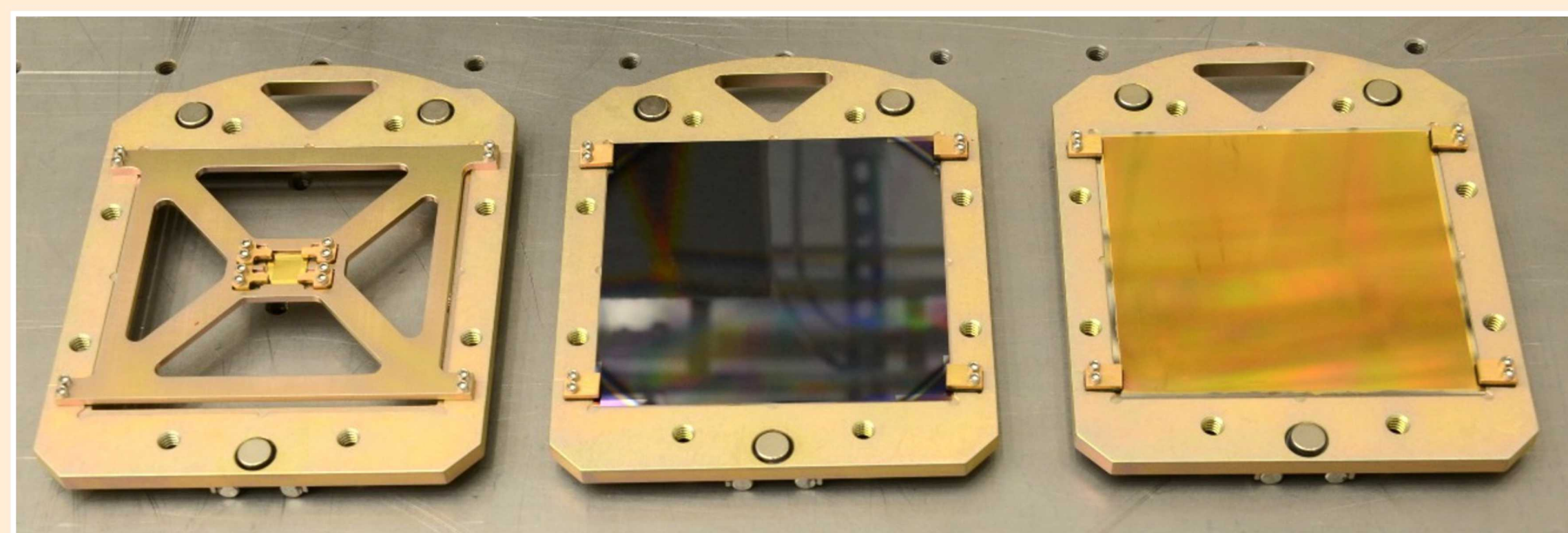


Voids, delamination, inhomogeneities, and cracks can lead to catastrophic failures.

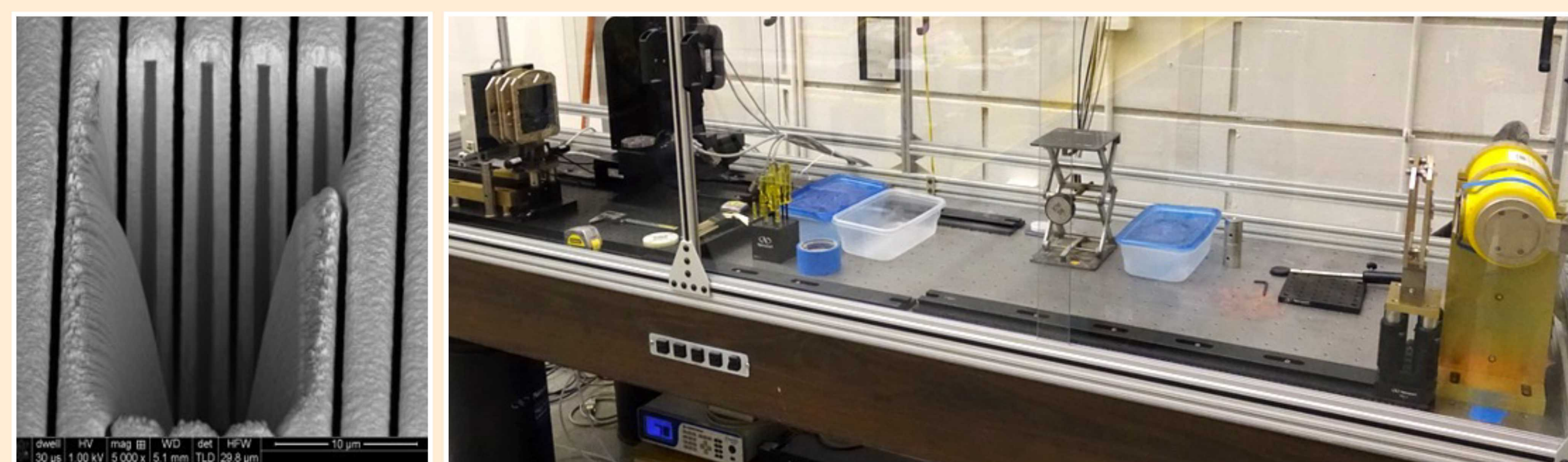
## Why Sandia?



Sandia has advanced x-ray grating fabrication beyond state-of-the-art, enabling the **world's largest** field-of-view benchtop 3D XPCI system.



Large area, high aspect ratio x-ray gratings are the enabling technology for x-ray phase contrast imaging.



High aspect ratio grating features.

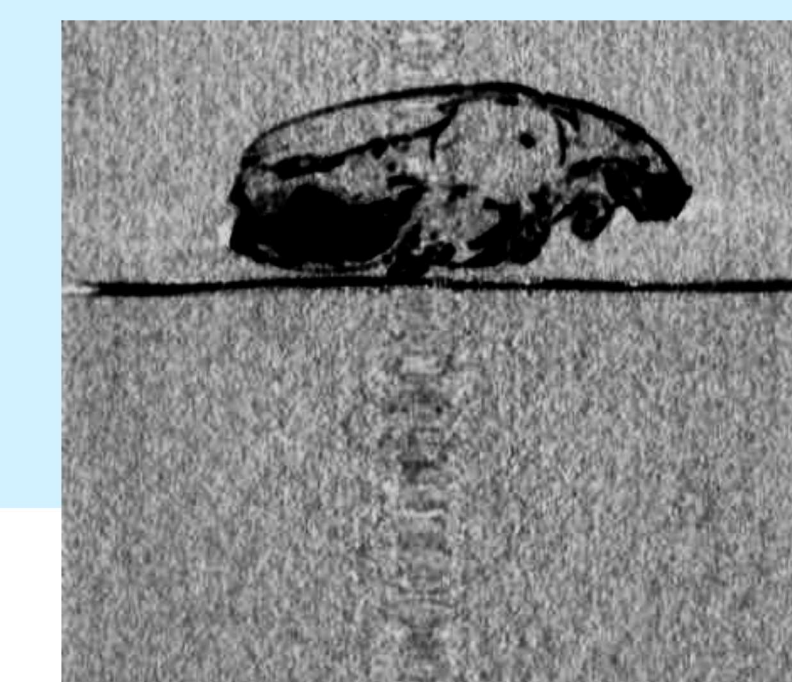
Now available as a failure analysis tool.

## The Solution

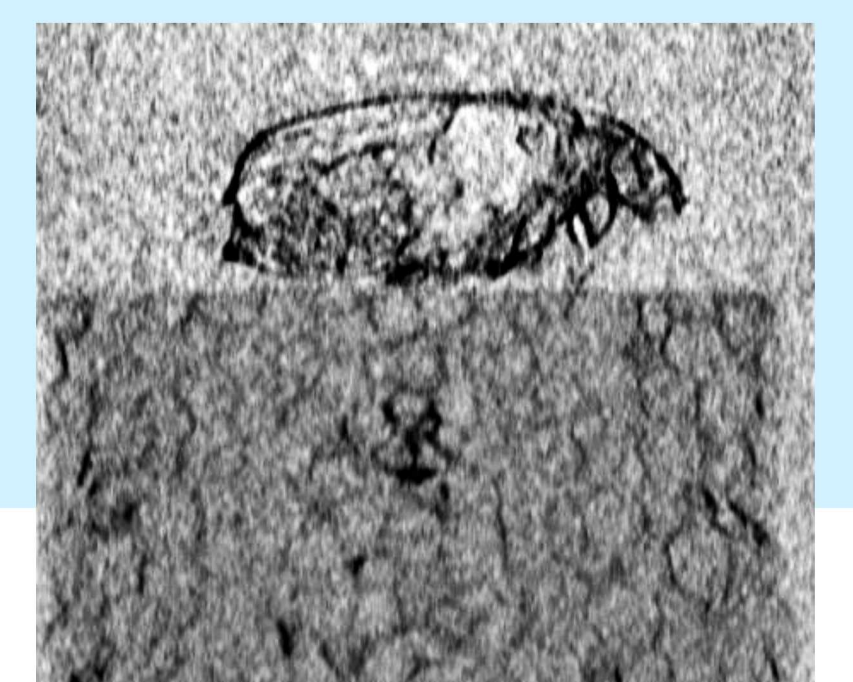
X-ray phase contrast imaging computed tomography (CT)

- Revolutionary improvement in non-destructive imaging of low-density features.

### June bug on Styrofoam

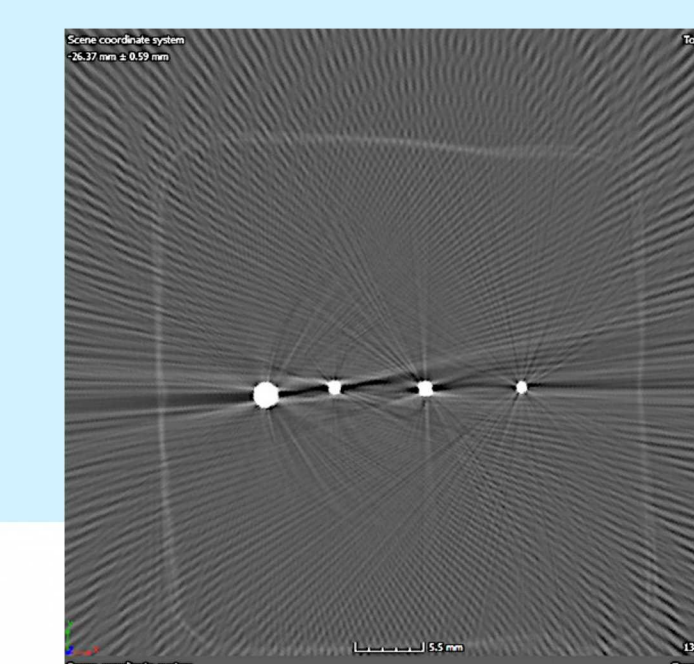


Normal x-ray CT

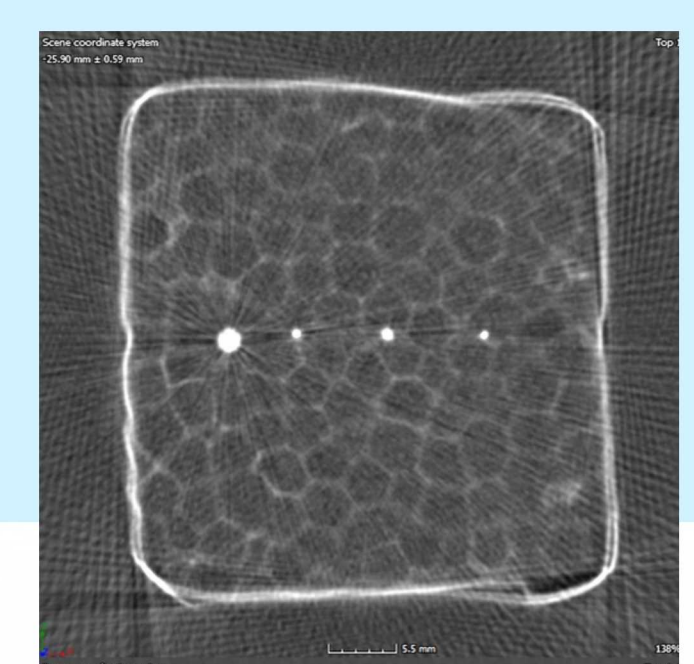


XPCI-CT

### Wire in foam

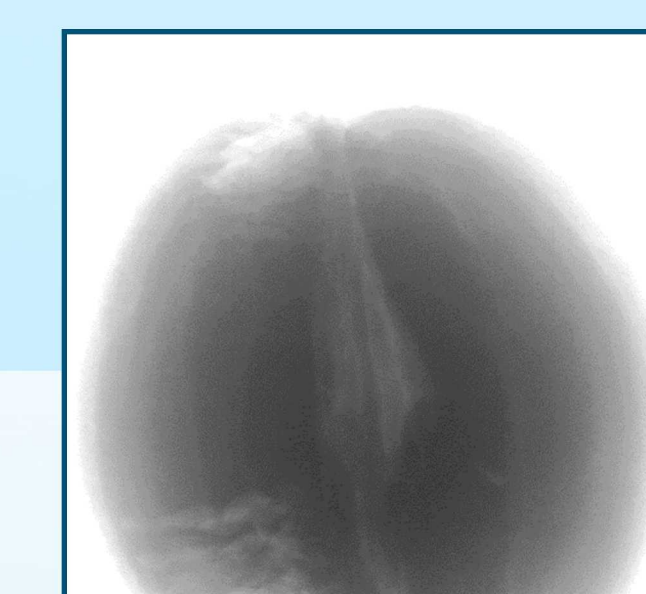


Normal x-ray CT



XPCI-CT

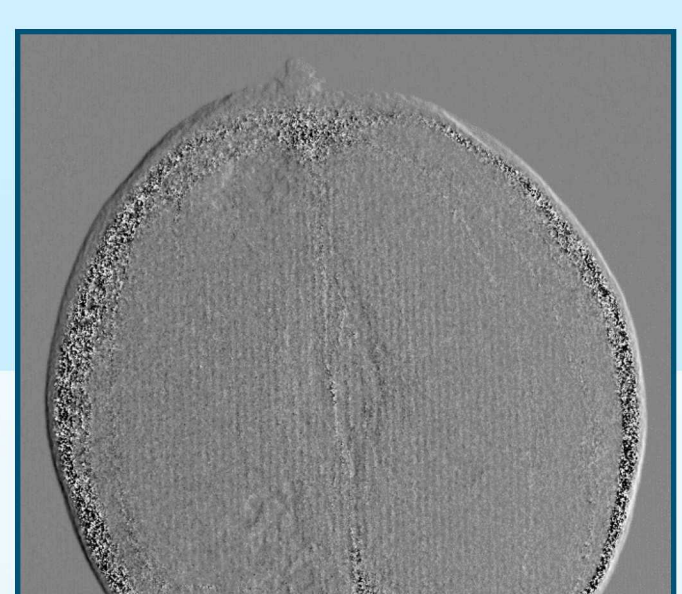
### Orange



Normal x-ray



XPCI dark field



XPCI phase contrast