

LA-UR-21-29992

Approved for public release; distribution is unlimited.

Title: Characterizing Microcracks with an Out-of-focus Camera

Author(s): Leong, Andrew FT

Intended for: Science in 3 (virtual), 2021-06-30 (Los Alamos, New Mexico, United States)

Issued: 2021-10-08

---

**Disclaimer:**

Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by Triad National Security, LLC for the National Nuclear Security Administration of U.S. Department of Energy under contract 89233218CNA000001. By approving this article, the publisher recognizes that the U.S. Government retains nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or to allow others to do so, for U.S. Government purposes. Los Alamos National Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy. Los Alamos National Laboratory strongly supports academic freedom and a researcher's right to publish; as an institution, however, the Laboratory does not endorse the viewpoint of a publication or guarantee its technical correctness.



# Characterizing Microcracks with an Out-of-focus Camera

Presenter: Andrew Leong (P-4)

Mentors:

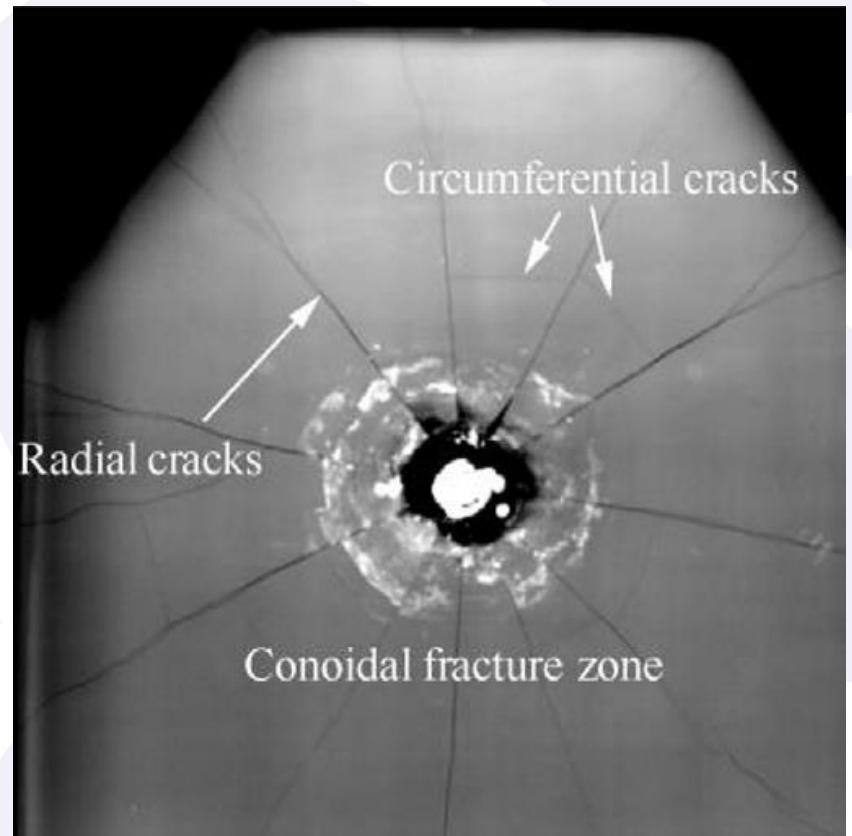
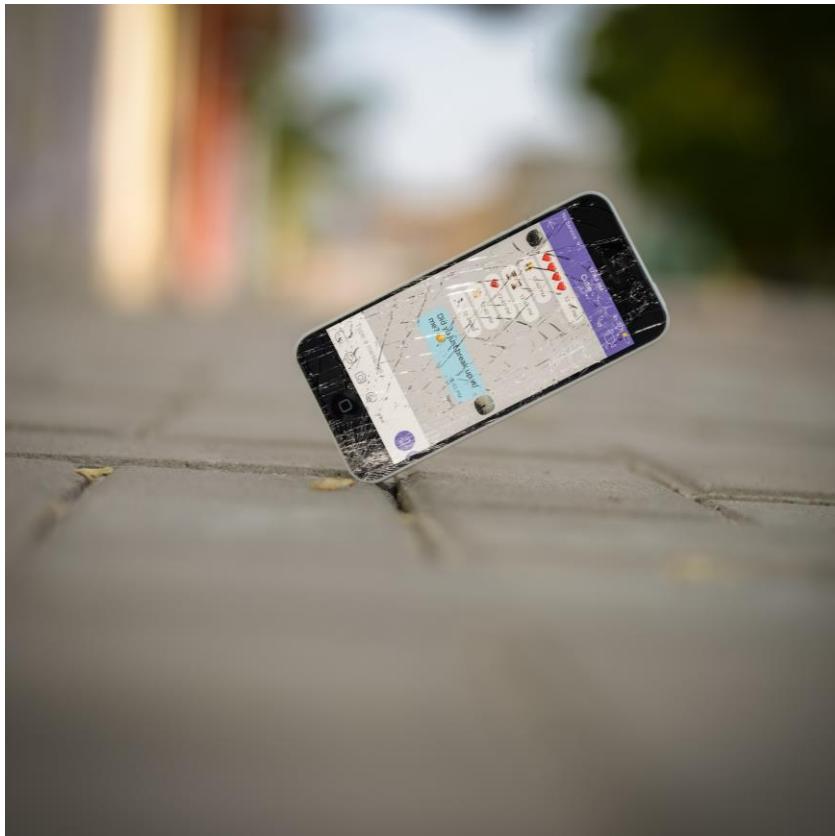
David Montgomery

John Barber

Jon Cawkwell

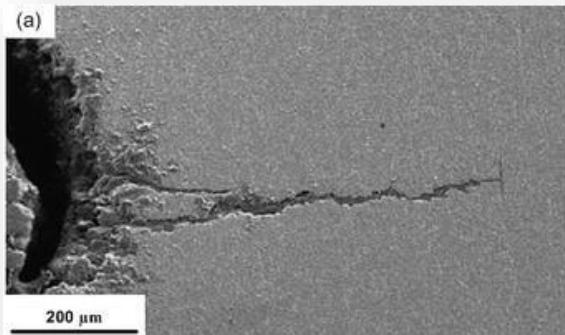
6/30/2021

# Microcracks: Can we avoid it?



# An Impasse in Imaging Microcracks

## Resolution vs. Speed

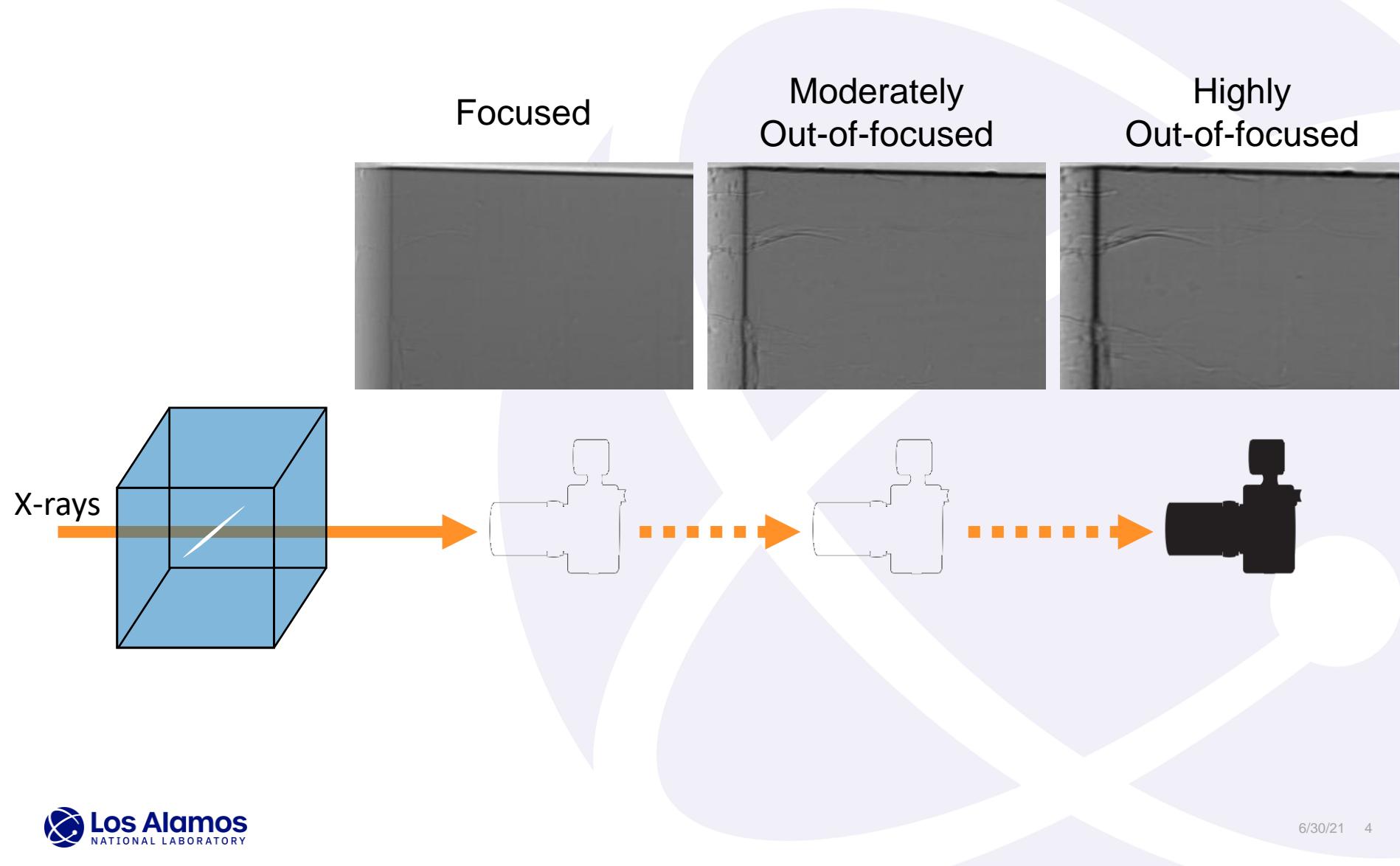


High resolution



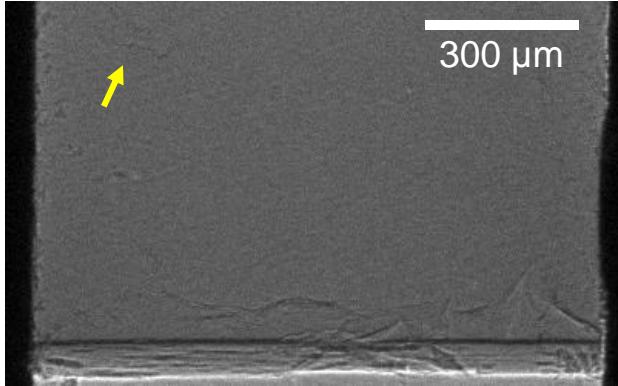
High speed

# Breaking the Impasse: Phase Contrast X-ray Imaging

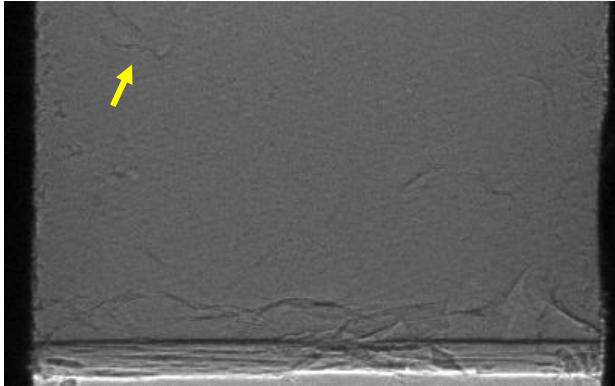


# Phase Contrast X-ray Imaging of Microcracks

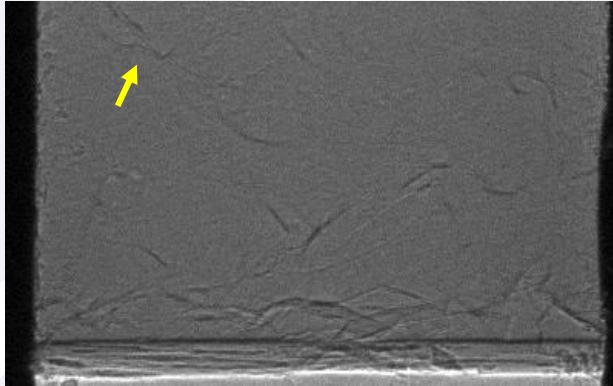
0  $\mu$ s



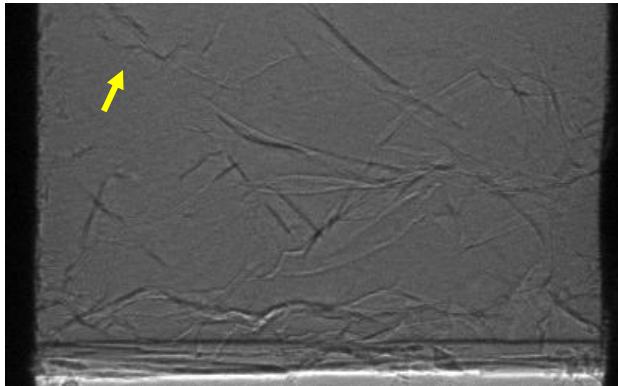
1  $\mu$ s



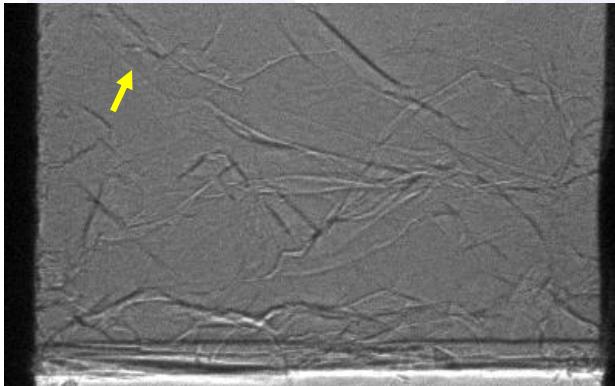
2  $\mu$ s



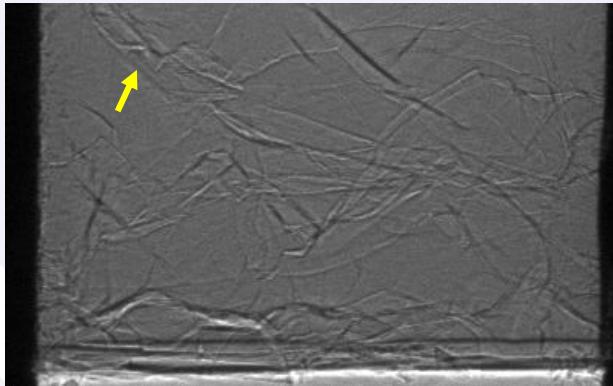
3  $\mu$ s



4  $\mu$ s



5  $\mu$ s



# We now have images, what's next?

