

Diagnostic

A look into front and back end-of-the-line

Introduction:

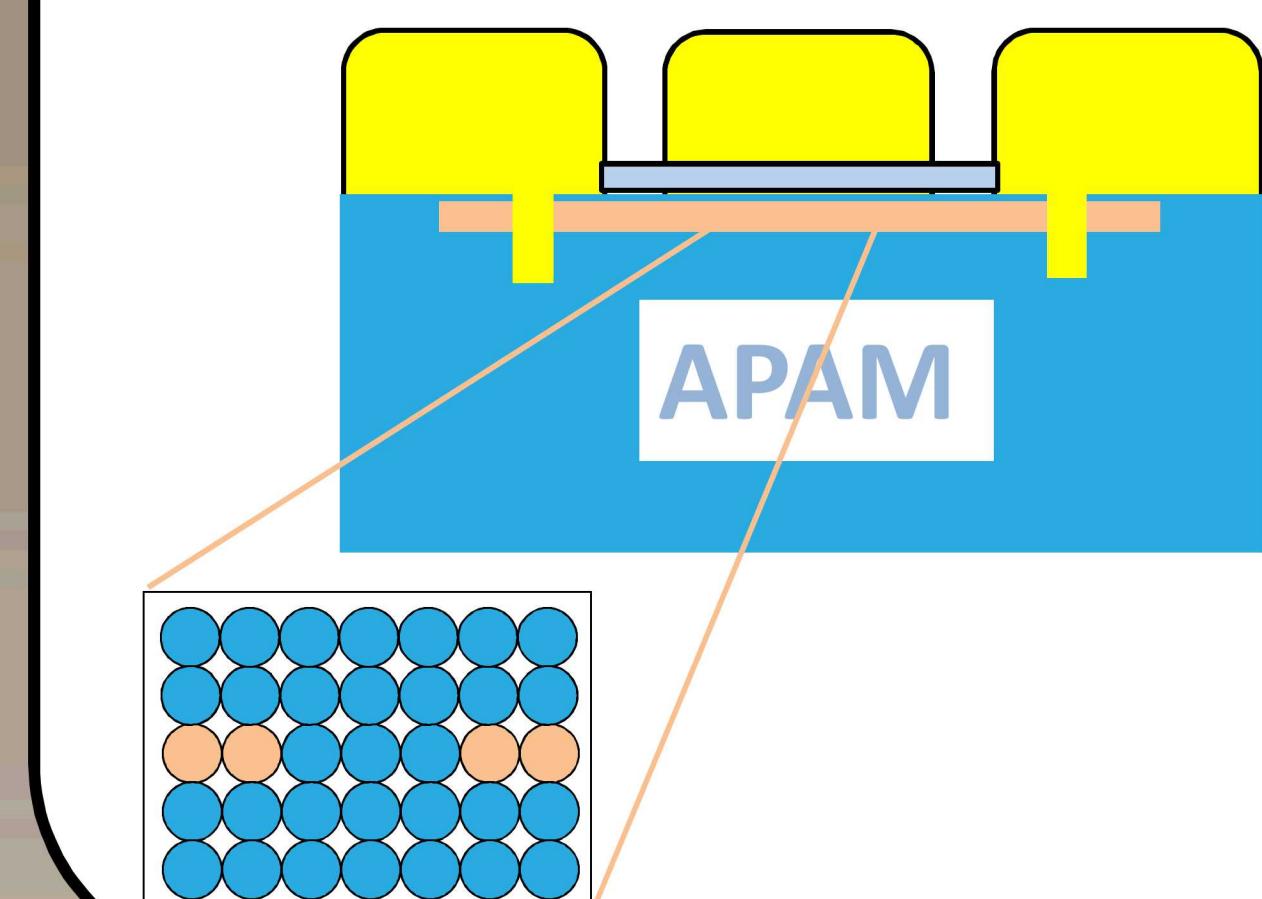
The FAIR DEAL fabrication team designs and fabricates devices for all experimental thrusts. We perform all the fabrication except the addition of the atomically-precise, advanced manufactured (APAM) device itself. Here we present a subset of the devices that have been designed to address specific thrust challenges.

Impact:

Our design team combines a shared knowledge of STM operation, cryogenic measurement, and device fabrication to create designs that meet the requirements of all these capabilities. This enables the rest of the team to request designs to address specific topics without having to understand the tooling limitations for any of the capabilities (STM, measurement, fab). Our team also provides guidance on the feasibility of integrating new fabrication processes into the APAM process flow. Leveraging the MESA fab facility, devices are typically built on-site in a few days.

Micro Fab Team: DeAnna Campbell, Mark Gunter

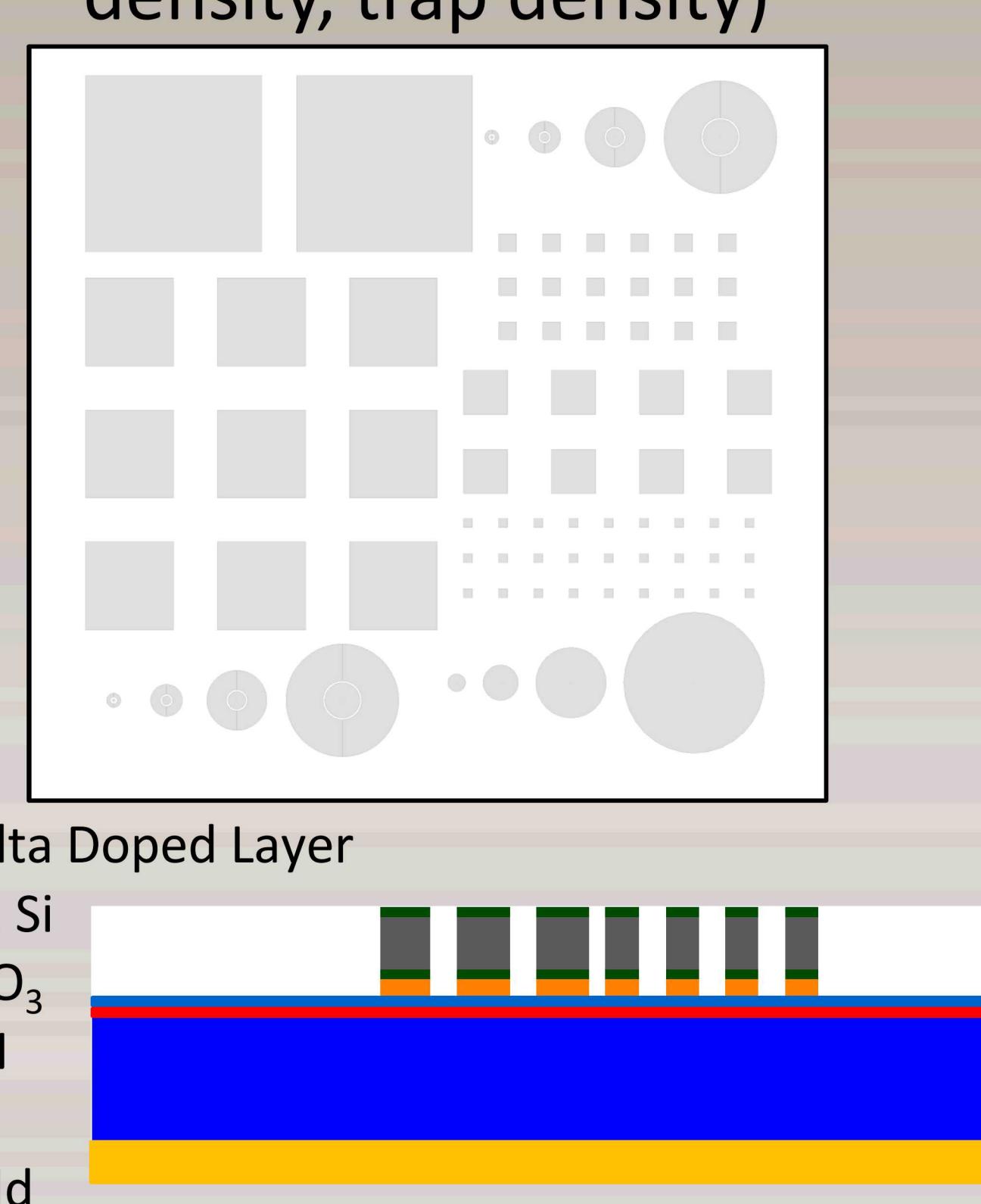
Thrust 1: APAM-enabled Devices



Capacitors

CV measurements to evaluate APAM compatible gate stacks

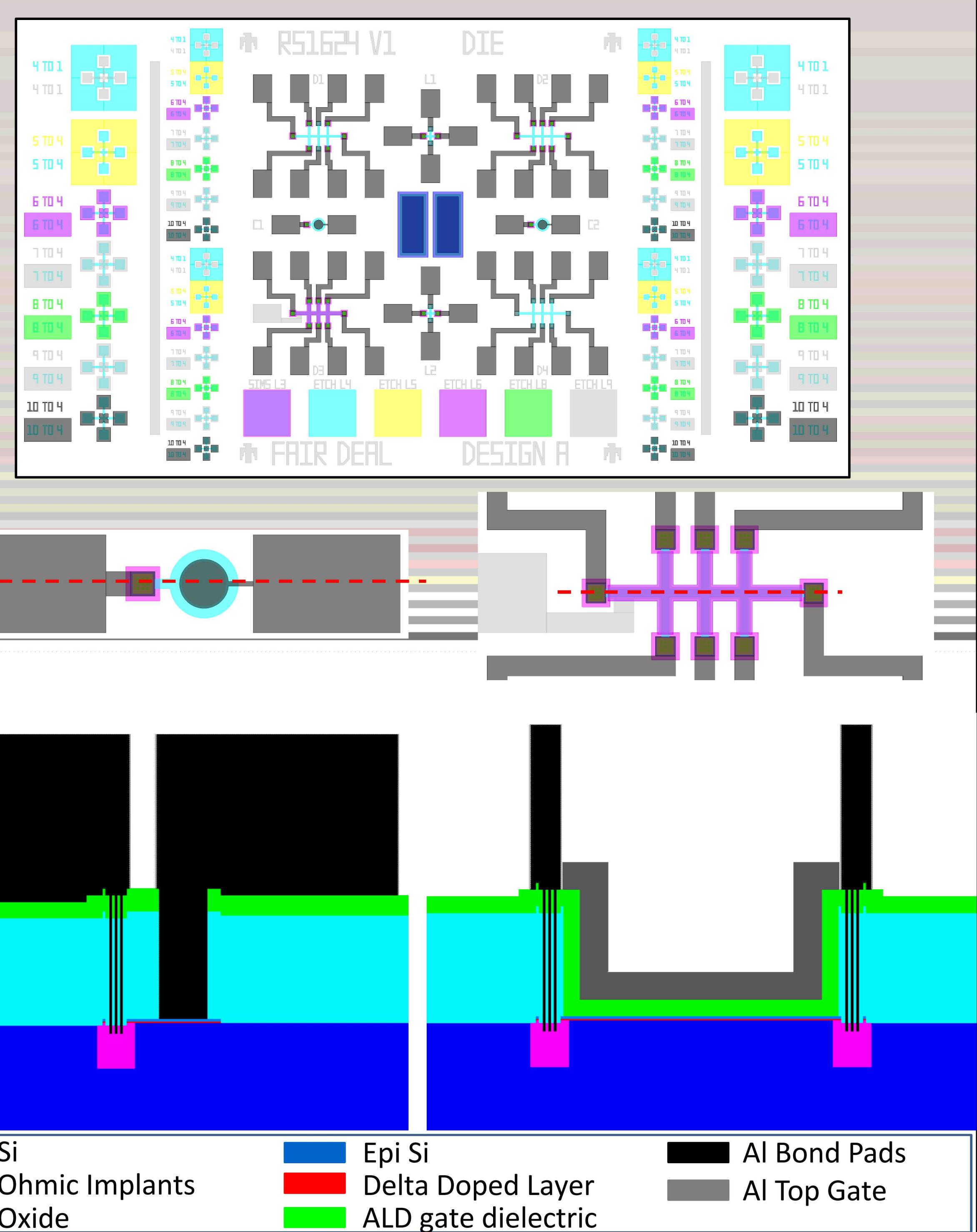
Measurements: CV (thresholds, defect density, trap density)



Room Temperature Hall Bars

Room temperature evaluation platform

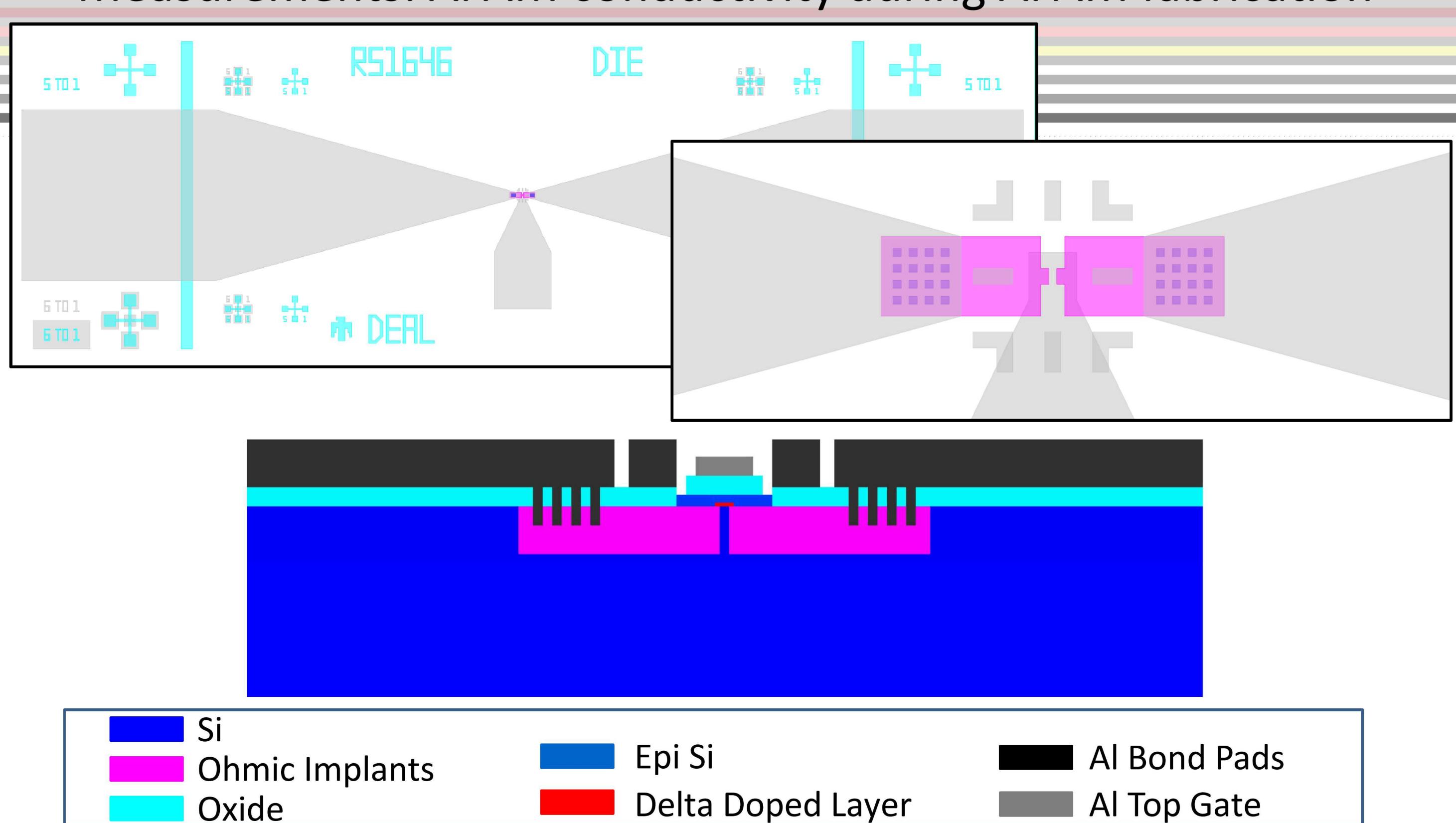
Measurements: Mobility, Leakage, Gating



In-Situ Electrical Test Die

APAM diagnostic to electrically characterize device throughout the APAM process

Measurements: APAM conductivity during APAM fabrication



Device Physics

FAIR

Micro

Fabrication

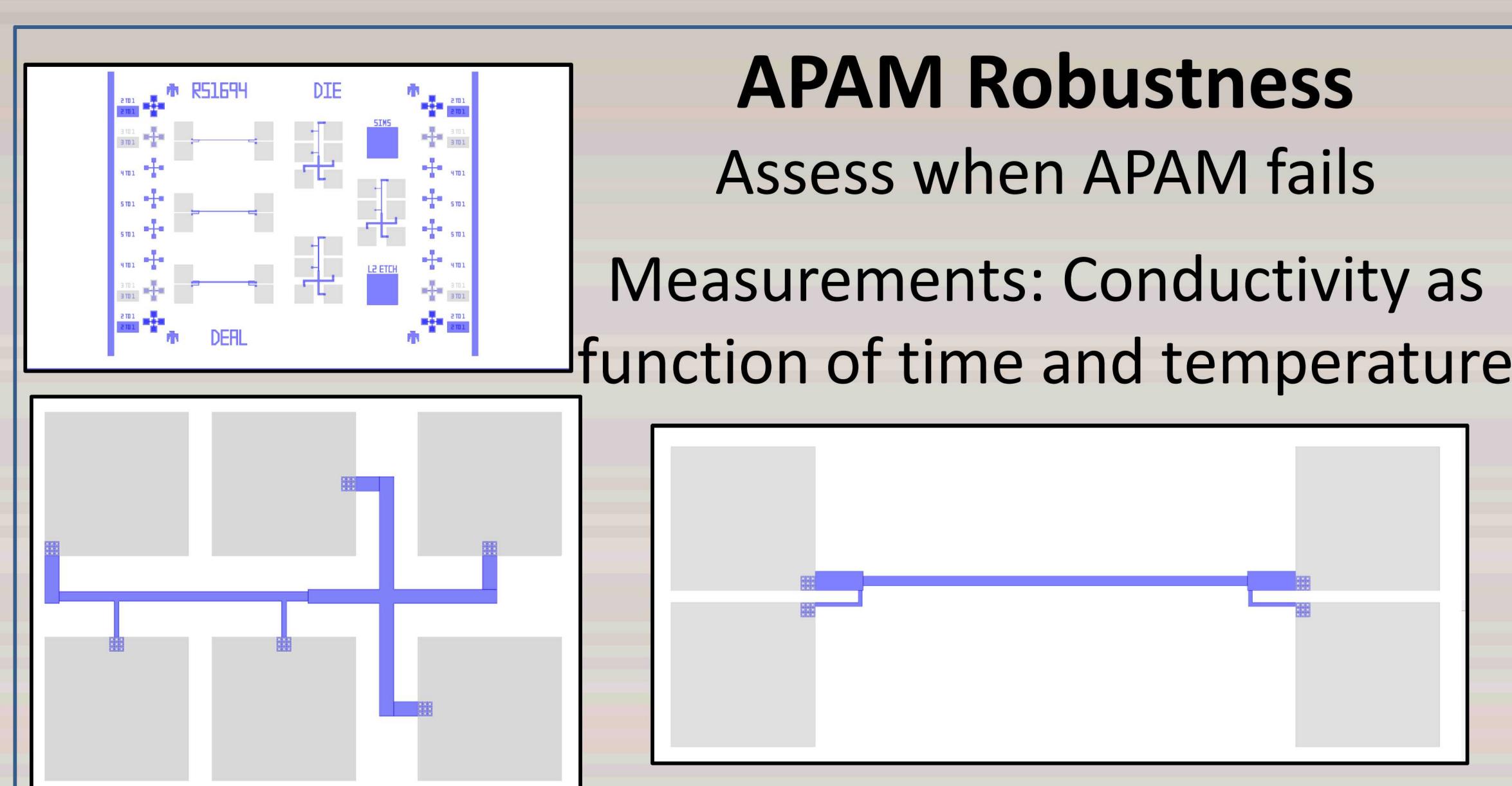
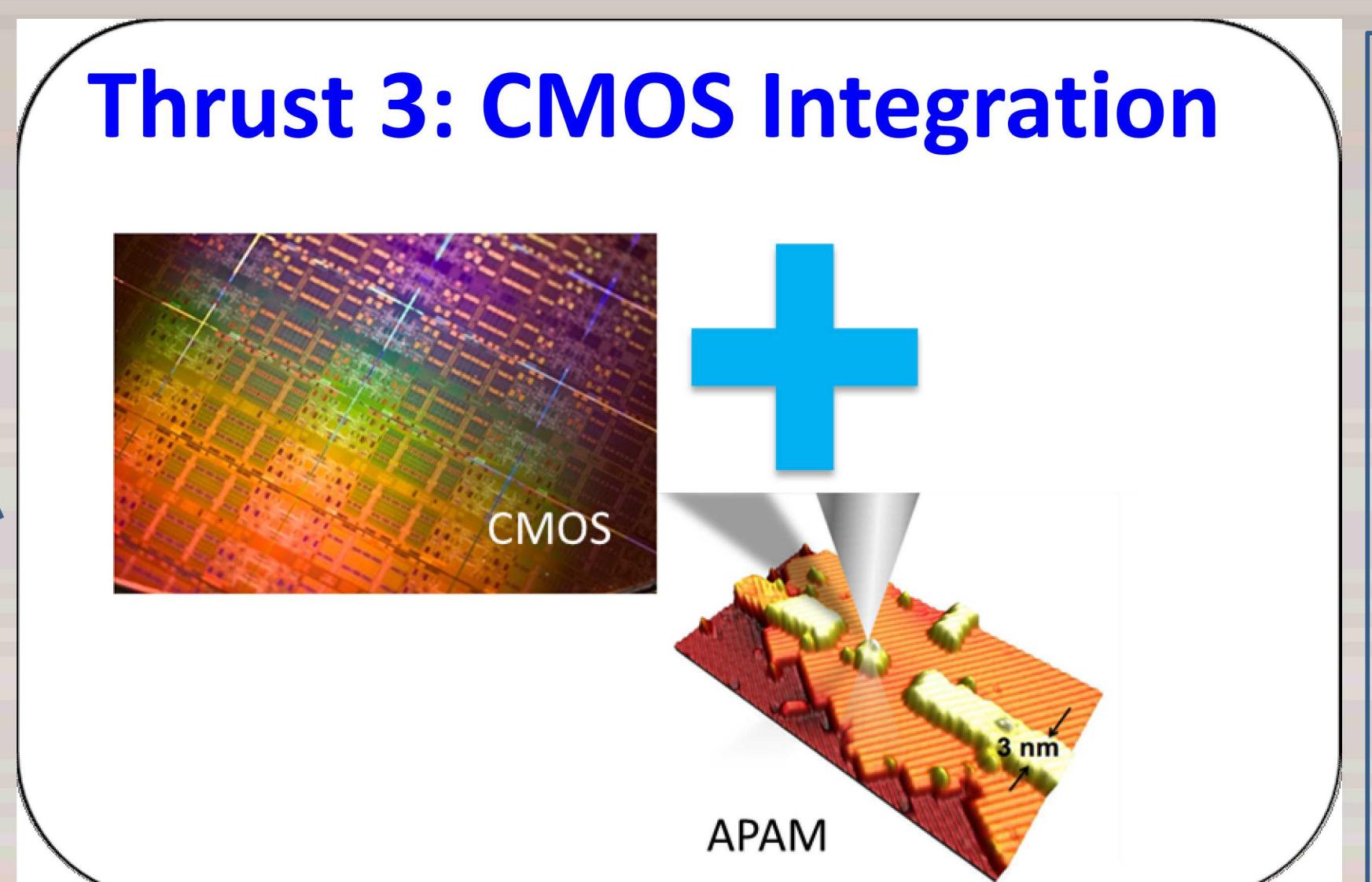
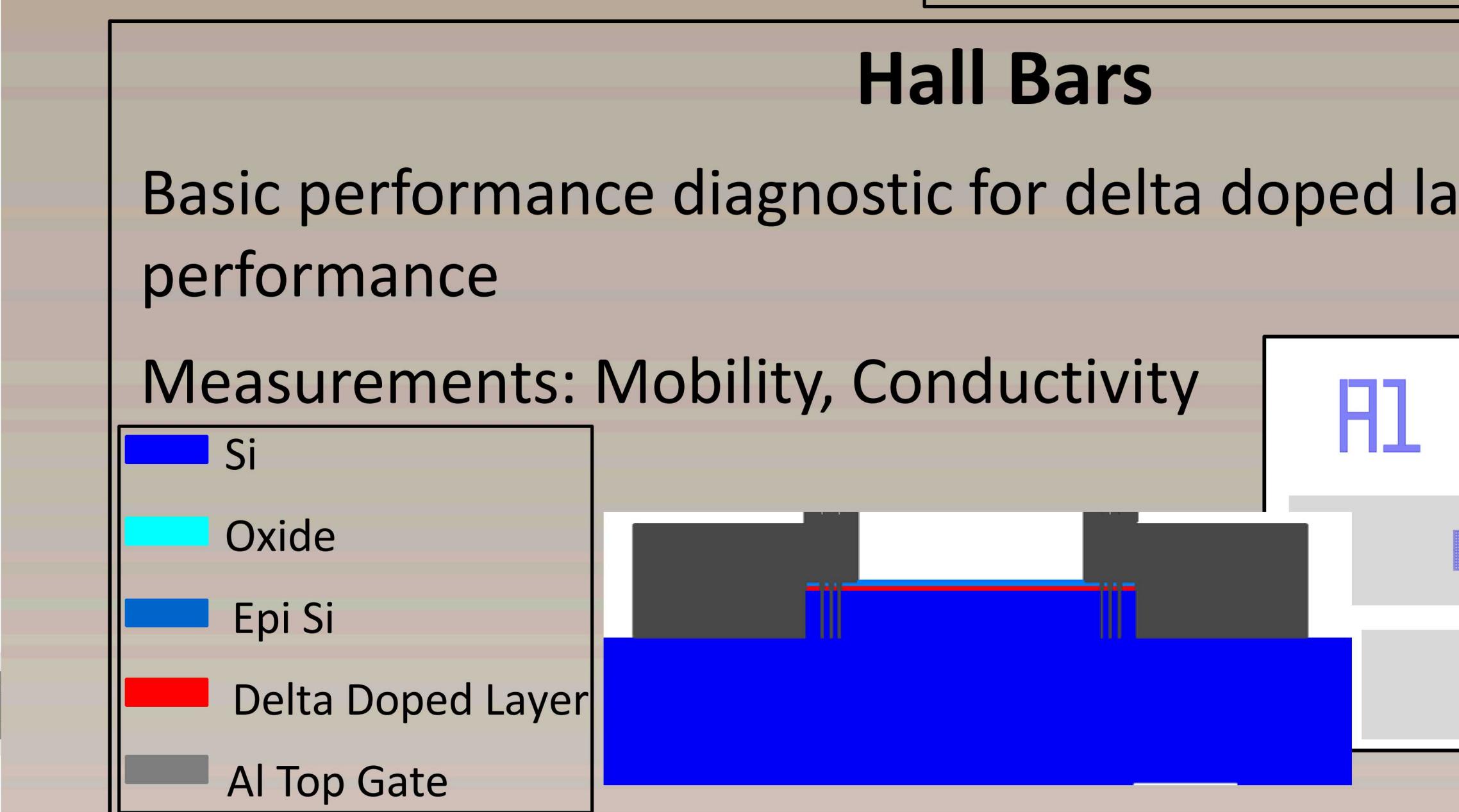
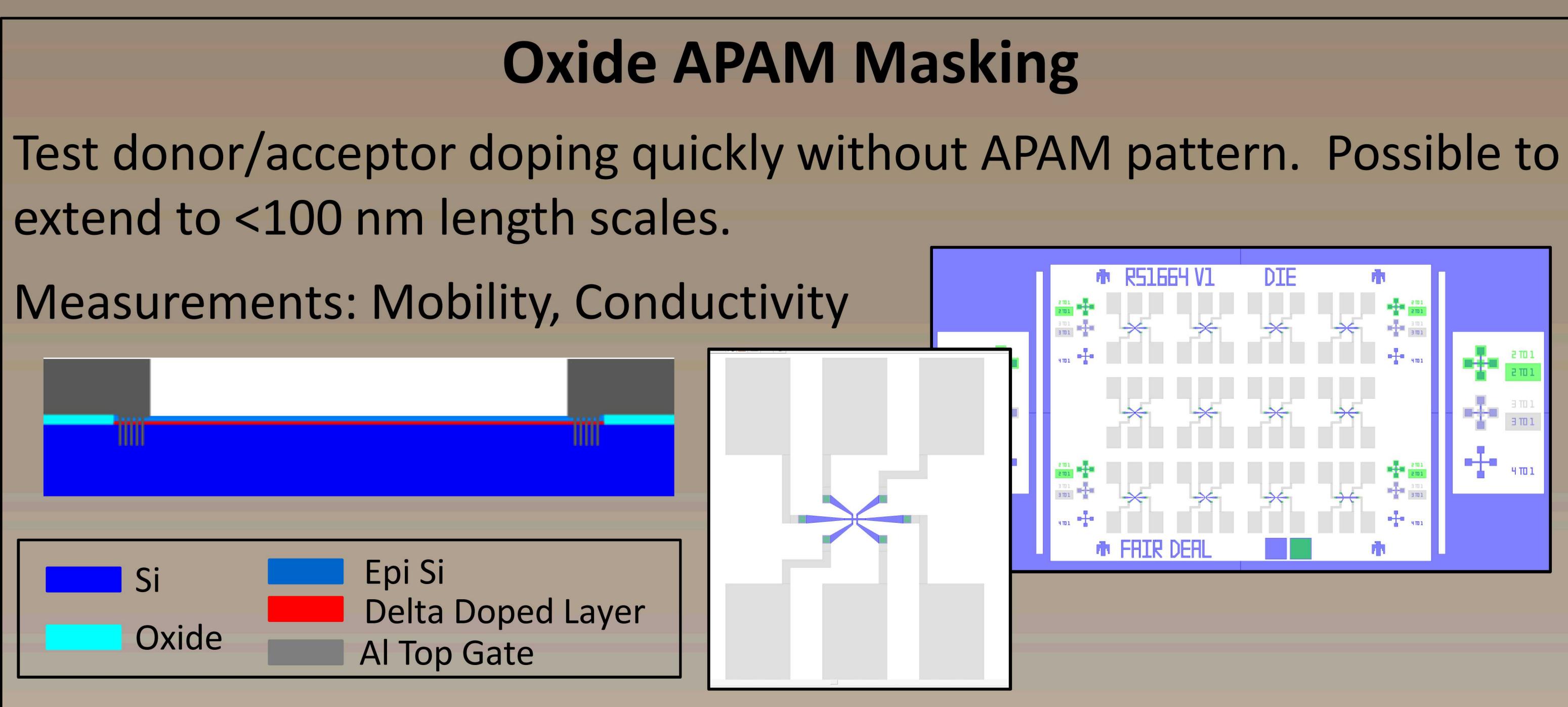
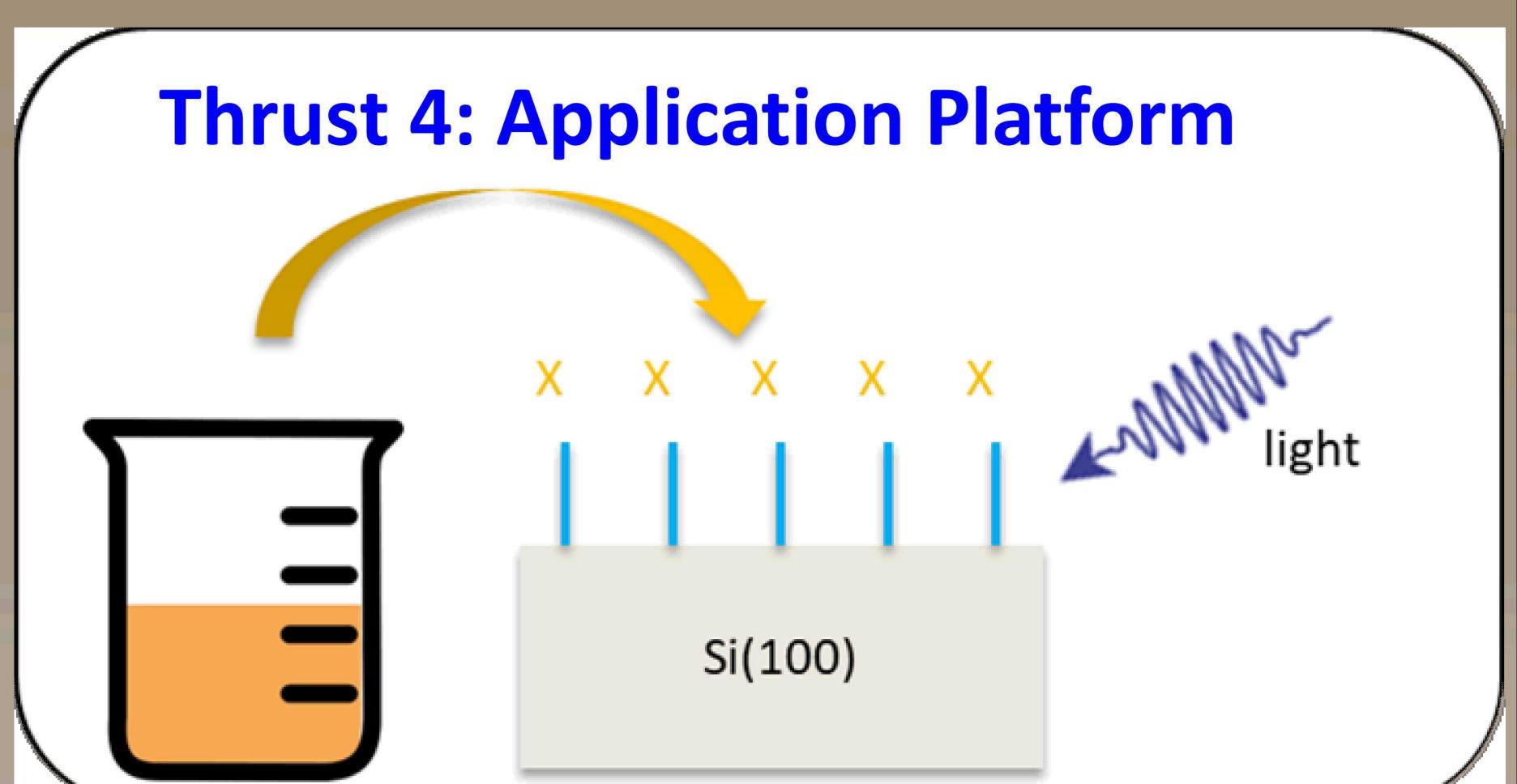
fabriction of diagnostic devices to evaluate APAM process.

Phillip Gamache, Sean Smith, Dan Ward

Surface Chemistry

Electronics

Going Forward.....



Direct CMOS Integration

Measurements: CMOS/APAM functionality

