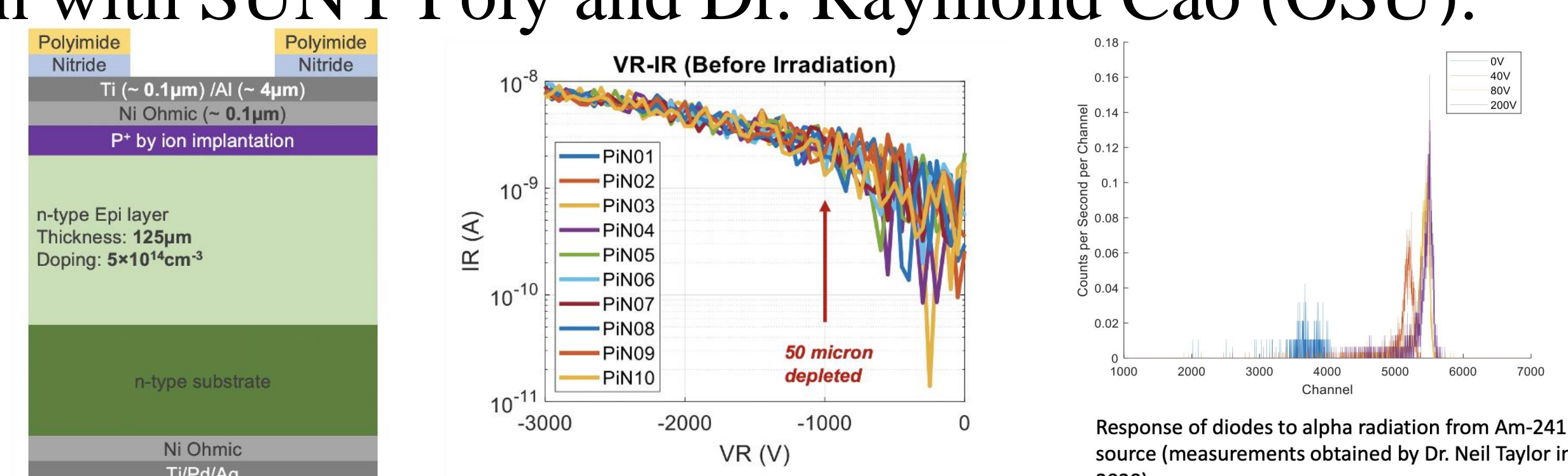


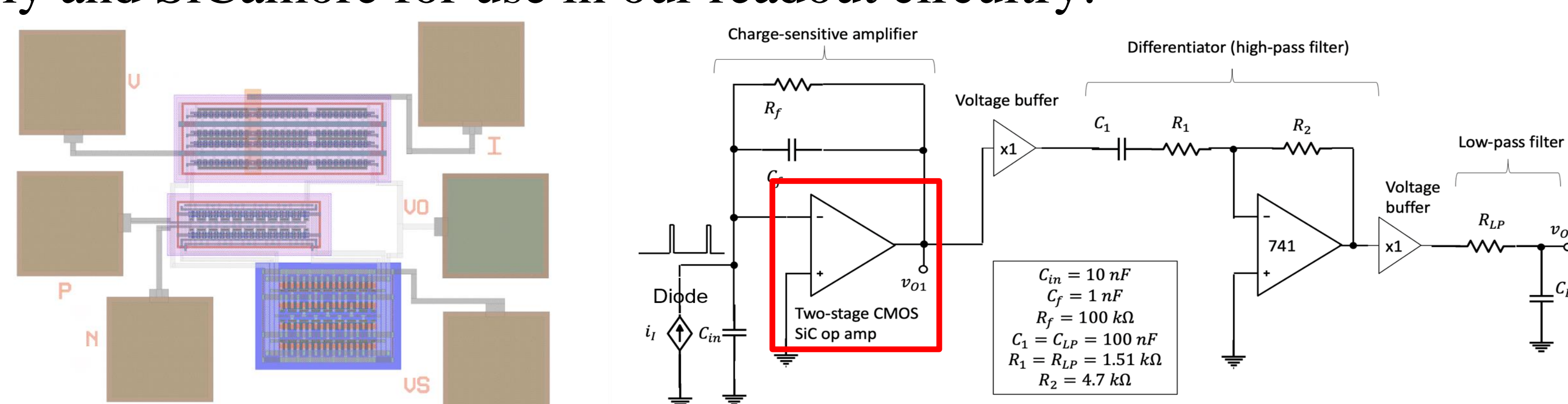
Goal – To design and fabricate an OSU SiC Neutron Detector, complete with a Neutron Sensitive SiC diode and readout circuitry, featuring an OSU SiC Op Amp.

Previous Work and Future Plans:

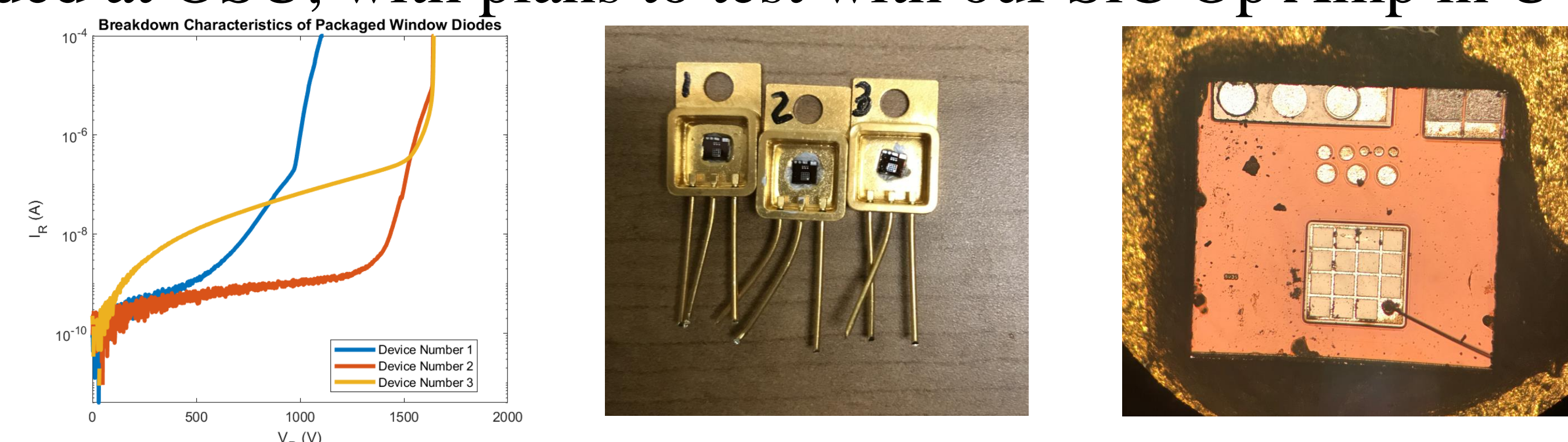
1) OSU designed 10kV SiC diodes have been fabricated and tested with Alpha Radiation in collaboration with SUNY Poly and Dr. Raymond Cao (OSU):



2) An OSU designed 4H-SiC Op Amp is currently being fabricated in collaboration with SUNY Poly and SiCamore for use in our readout circuitry:



3) OSU designed SiC implanted UV-sensitive window diodes have been fabricated, packaged and wirebonded at OSU, with plans to test with our SiC Op Amp in UV radiation:



4) GeneSiC packaged neutron detectors have been ordered to test our complete readout circuit under radiation at OSU's reactor, and provide baseline performance metrics.

5) Preparations are underway to design and fabricate a SiC implanted diode in OSU's cleanroom lab Nanotech West, where we plan to perform a large majority of the processes, such as lithography, contact formation, and passivation creation. Testing will occur in OSU's reactor with the readout circuitry, leading to a complete OSU SiC neutron detector.

6) We also plan to design and fabricate a SiC epitaxial diode as well, which generally boasts lower dark currents when compared to implanted diodes. Like the implanted diode, most process steps will occur at Nanotech West, except when limited by the technology there.

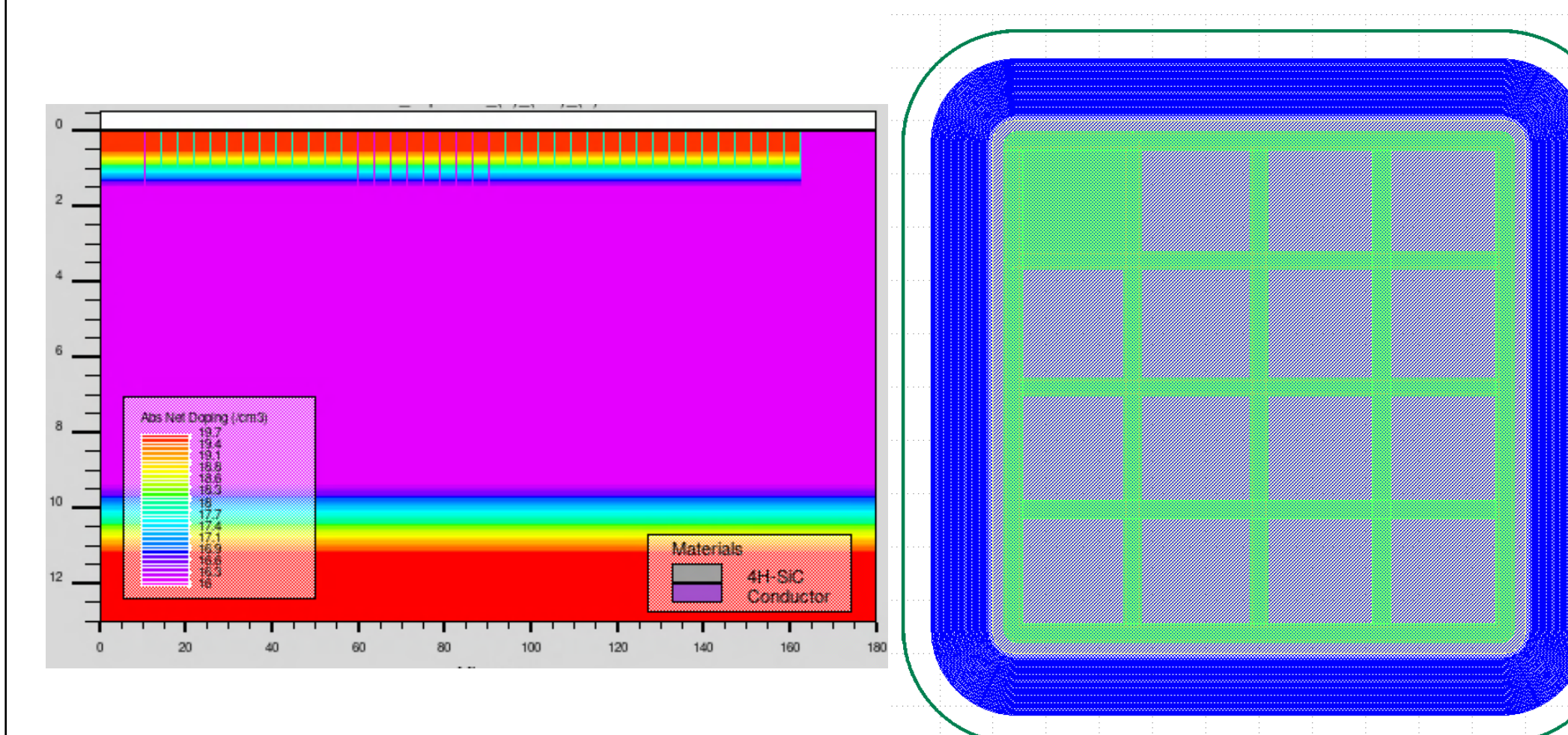
Advisors:

Dr. Anant Agarwal – Expert in SiC device design, fabrication, and testing.

Dr. Raymond Cao – Expert in neutron detection methods and testing.

This material is based upon work supported by the Department of Energy / National Nuclear Security Administration under Award Number(s) DE-NA0003921.

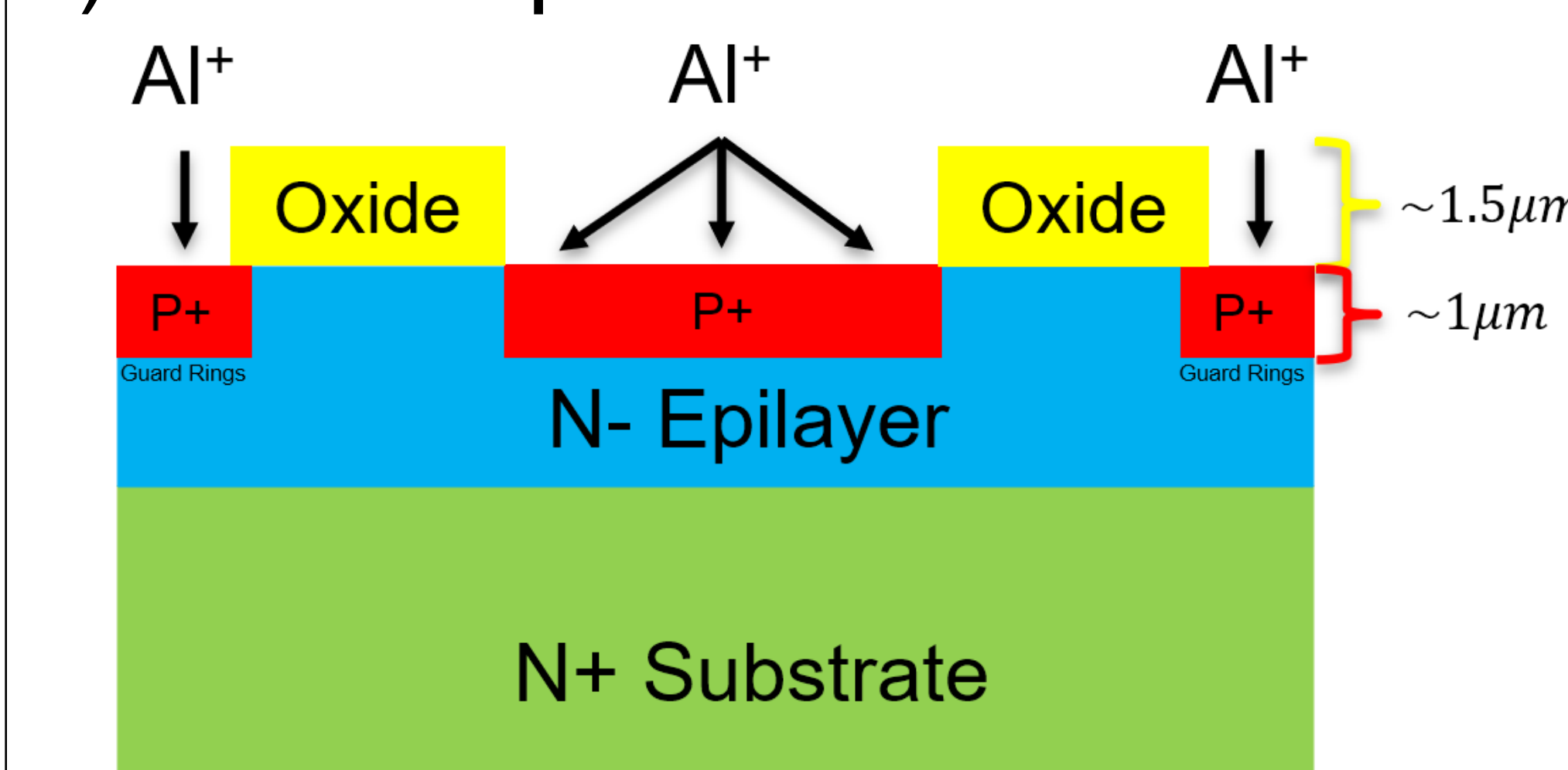
1) Simulation & Layout



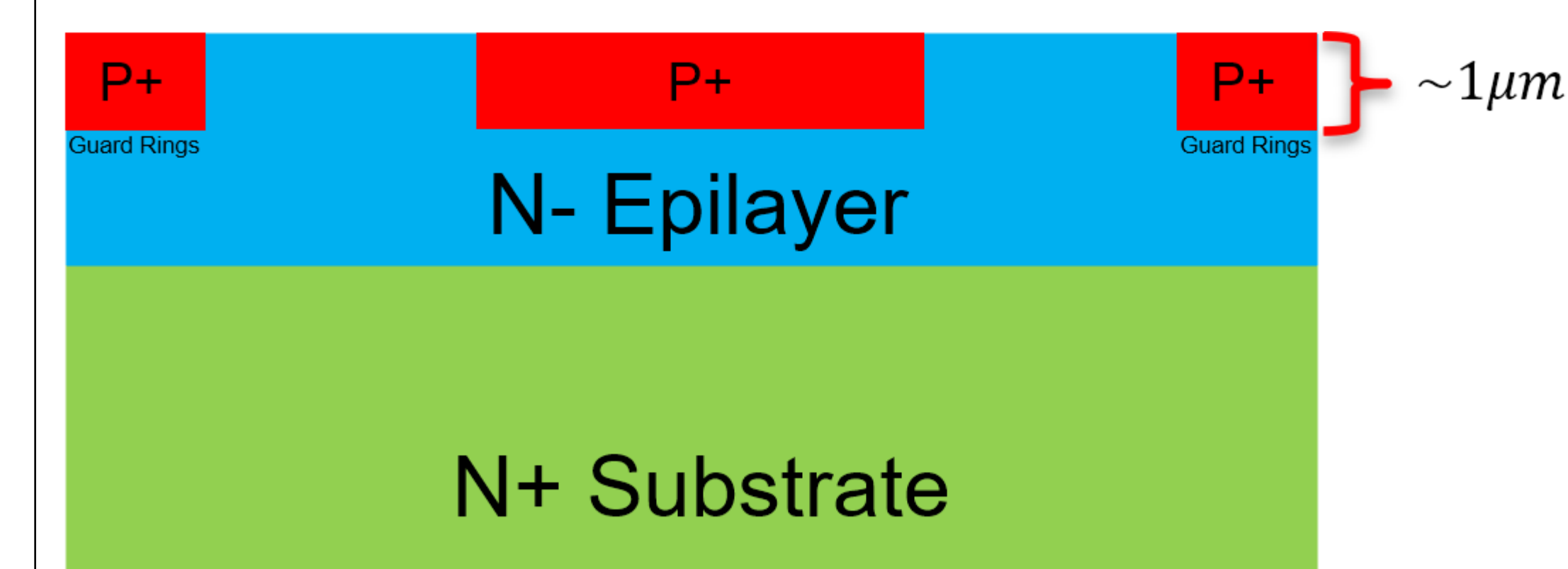
2) Starting Wafer & Alignment Mark



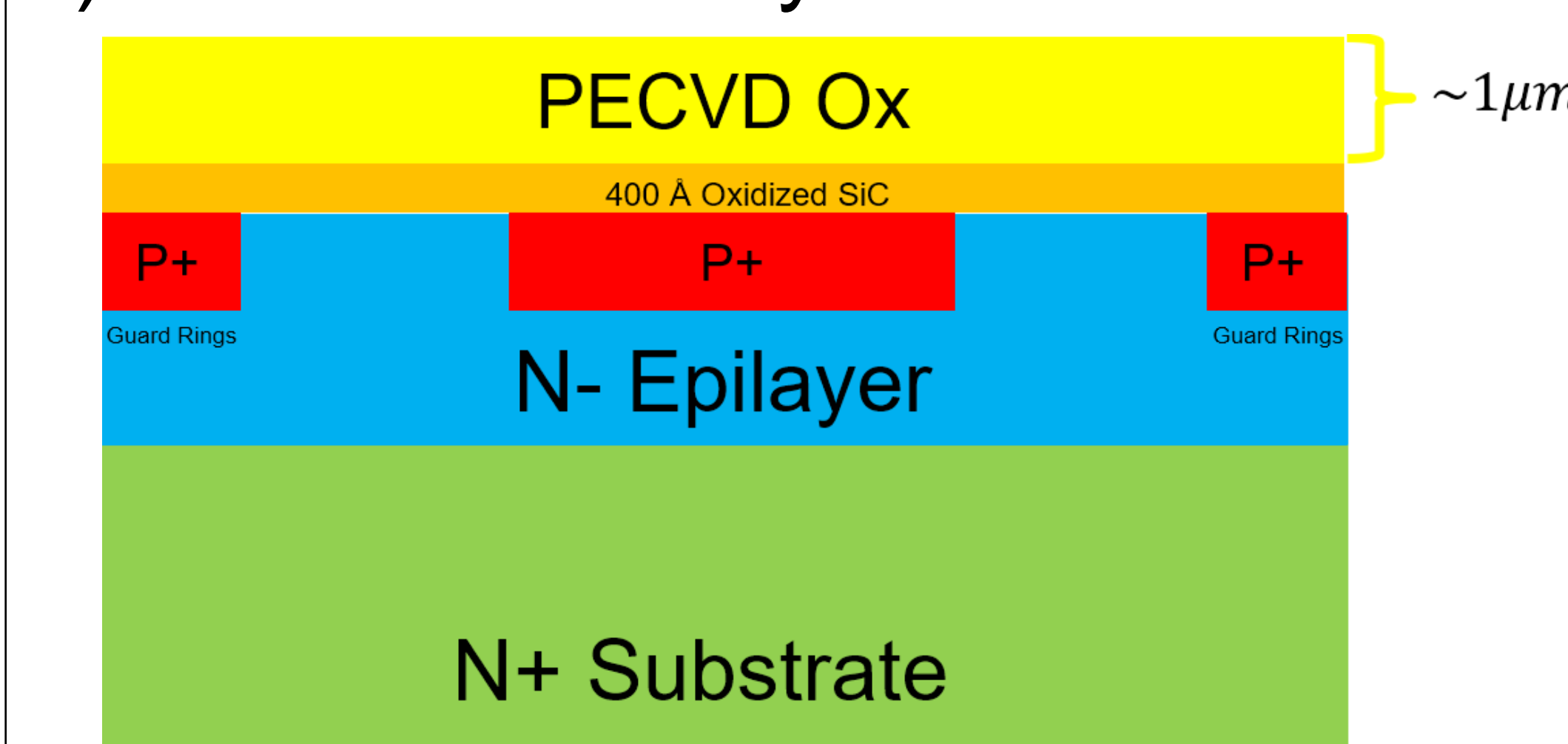
3) P+ Al Implantation



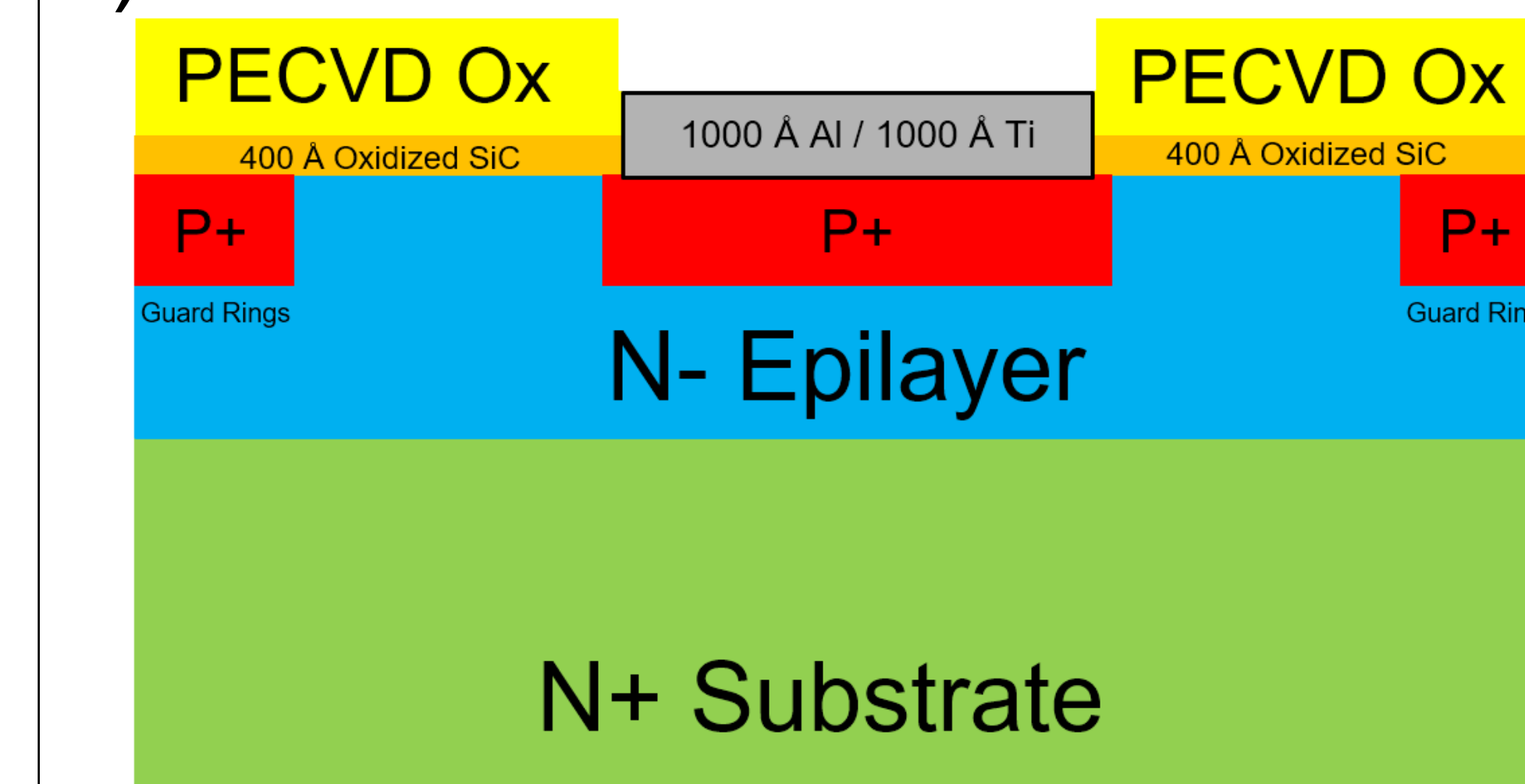
4) Implant Activation



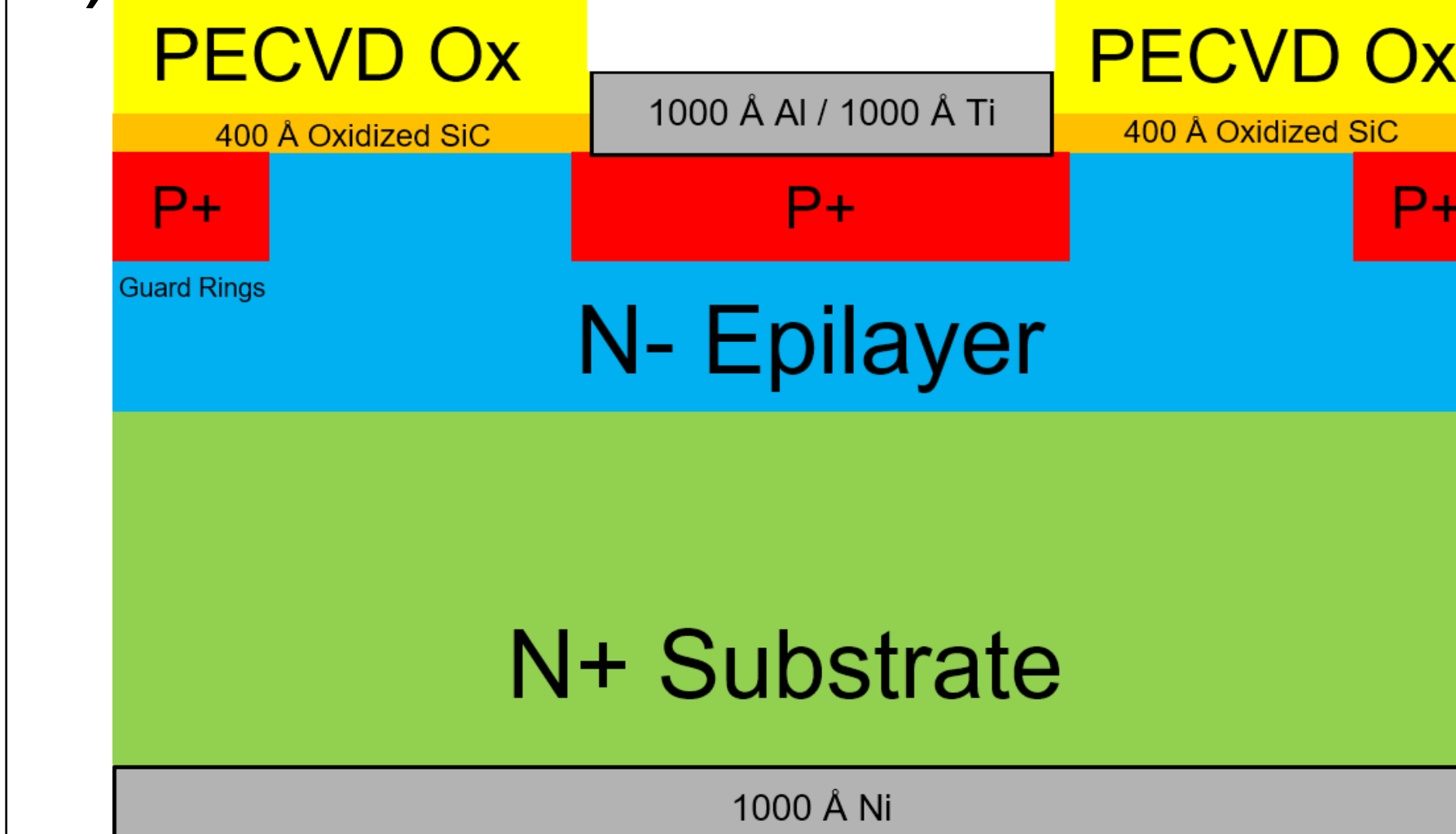
5) Passivation Layer



6) Frontside P+ Contact



7) Backside Contact



8) Front and Back Overlayer

