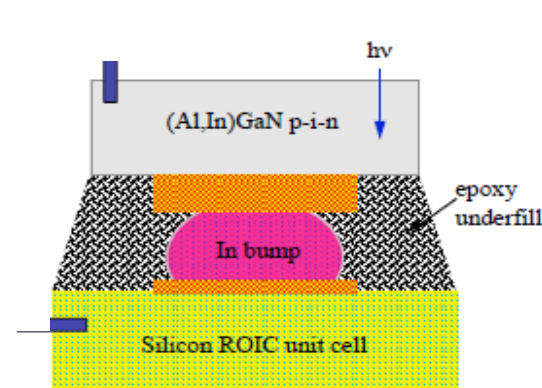


Hybridized Visible-NIR Blind (Al,In)GaN Focal Plane Arrays

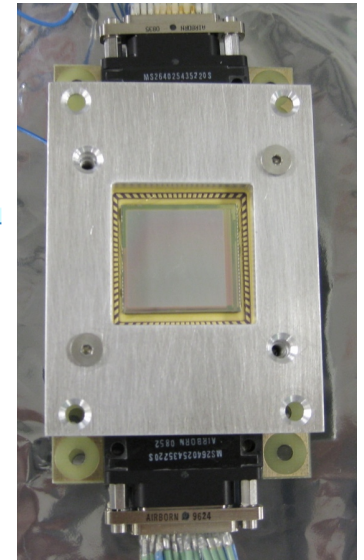
PI: Scott Janz, NASA GSFC

Objective

- Develop solar blind detector arrays that will improve Earth Science atmospheric trace-gas measurement systems.
- Improve UV and near-UV (270-450 nm) trace gas absorption measurements
- Ozone profiling (270-315 nm)
 - Total Ozone, SO₂, HCHO, BrO, NO₂, HCOCHO (310-450 nm)
- Improve sensitivity through confined epitaxy growth technique
 - High quantum efficiency (QE)
 - Low dark current defects
 - High out-of-band rejection



- Unit-cell (18μm pixel) showing the hybridization approach. (above)
- Hybridized 1Kx1K AlGaIn array in test carrier. (right)



Accomplishments

- Fabricated large format AlGaIn and InGaIn PIN photodiode arrays (1Kx1K) using a confined epitaxy growth technique: a first for both configurations.
- Demonstrated diode characteristics of both concepts (a first for InGaIn) and UV sensitive (photodiode) characteristics of AlGaIn with a 280 nm cut-on wavelength.
- Produced a lower resistivity 50% Al content AlGaIn window layer to enable a 270 nm cut-on wavelength for future development.

Co-Is/Partners: Carl Kotecki, Christopher Ray, Shahid Islam, GSFC; Michael Mastro, Jennifer Hite, Chip Eddy, NRL

TRL_{in} = 2 TRL_{out} = 3