# Development of far-UV-sensitive silicon imaging arrays for compact UV instrumentation

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**Target:** Planetary atmospheres and surfaces

## Science:

- Will allow observation of bright sources without flux reduction techniques required by MCPs
- Ideal for stellar occultation studies of planetary atmospheres to characterize composition and variability
- Other suitable FUV-bright targets include auroras and surface-reflected Lyman-α
- Low voltage operation and intrinsic radiation hardness will facilitate small instruments for low-cost missions including CubeSats

## Objectives:

- Optimize antimony (Sb) doping technique for n-type silicon detectors
- Produce FUV-sensitive n-type CMOS focal plane array (FPA) using Sb-doped wafers
- Produce FUV-sensitive p-type photodiode using well-established boron doping technique and state-of-the-art CMOS chips from Teledyne e2v
- Fully characterize FPA and photodiode response
- Develop long-wavelength rejection techniques based on multilayer filters

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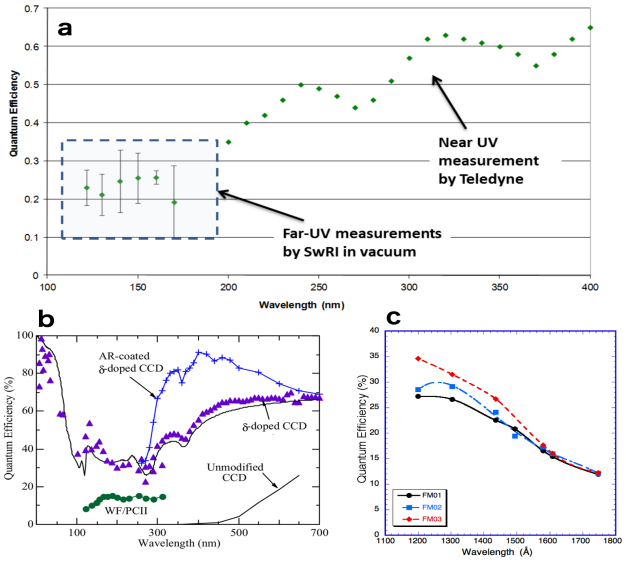


Teledyne CMOS detectors have promising FUV response (a). This program aims to optimize the response to make FUV CMOS detectors competitive with CCDs (b) and MCPs (c).

## Key Milestones:

- Sb-doping optimization completed and implemented (9 months)
- Sb-doped n-type photodiodes packaged and shipped to SwRI (15 m)
- FUV characterization of n-type photodiodes completed (24 m)
- B-doped p-type CMOS chips packaged and shipped to SwRI (24 m)
- FUV characterization of p-type CMOS chips completed (30 m)
- Sb-doped n-type detector arrays hybridized with H-1RG readout, packaged and shipped to SwRI (30 m)
- FUV characterization of H-1RG CMOS FPA completed (36 m)

**TRL 3 to 4**