# Saxet SBIR

Bias effect can be seen only if the following conditions are satisfied,

- Schottky contact that survives the heat-cleaning
- $5x10^{16}$ active layer doping
- Thick metal layer (≥ 1 um)

The Schottky contact condition is the most difficult to achieve.

- As deposited W has a Schottky contact but the inter-diffusion of Ga, As and W during heat-cleaning destroys the contact.
- High surface doping also promotes dopant diffusion.
- An oxide layer is used as a barrier (oxygen plasma etch) but the layer thickness must be optimum. If it is too thick, the Schottky barrier is too large to deliver bias voltage.

We now know what is necessary but we don't have the recipe to obtain stable Schottky contact.

# Saxet SBIR comes to a close at the end of August.

Still to be done.

- Grow GaAsP/GaAs superlattice (paid by Saxet)
  - SVT is still unable to grow this structure.
  - Trying to grow at Canadian Photonic Fabrication Center
- Try Ruthenium and Rhenium
  - Greg is testing Ruthenium now.

# SVT SBIR Phase-I Wafers

Three wafers have been grown.

I) Strained wells – **SVT-3039**

1) 5 nm GaAs cap  Be: 1x10^19
2) 4 nm In(0.31)Ga(0.69)P  Be: 1x10^17
3) 4 nm GaAs  Be: 1x10^17

repeat 2) and 3) 12 times

4) 2.5 um In(0.31)Ga(0.69)P  Be: 5x10^18
5) 2.5 um In(x)Ga(1-x)P x=0.48 -> 0.31  Be: 5x10^18
6) In(0.48)Ga(0.52)P buffer lattice-matched to GaAs
7) GaAs substrate

II) Strained barrier – **SVT-3031**

1) 5 nm GaAs cap  Be: 1x10^19
2) 4 nm In(0.65)Ga(0.35)P  Be: 1x10^17
3) 1.5 nm GaAs  Be:  1x10^17

repeat 2) and 3) 18 times

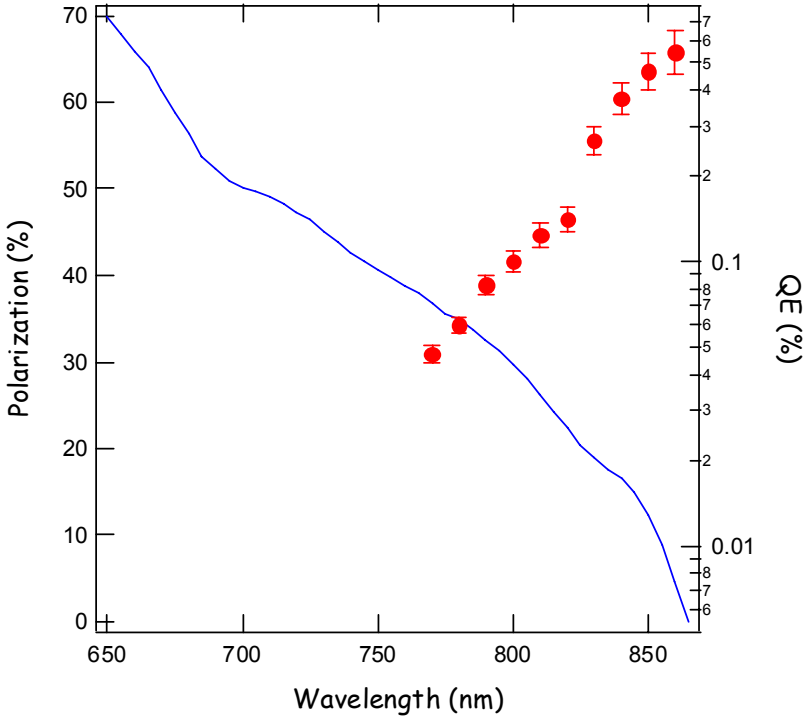
4) 1 um Al(0.3)Ga(0.7)As  Be: 5x10^18
5) GaAs buffer
6) GaAs substrate

**SVT-3017**

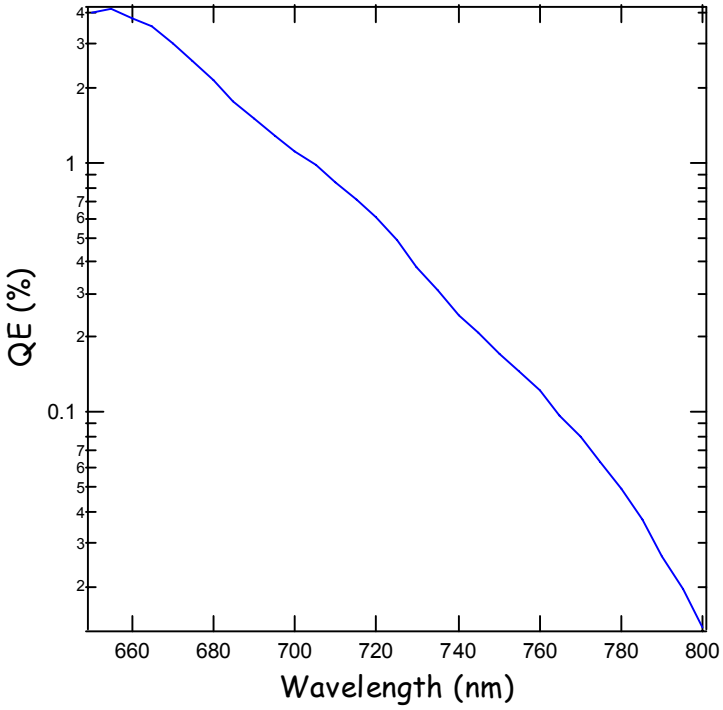
1.5 nm In(0.65)Ga(0.35)P
4 nm GaAs

# Polarization and QE

**SVT-3017**

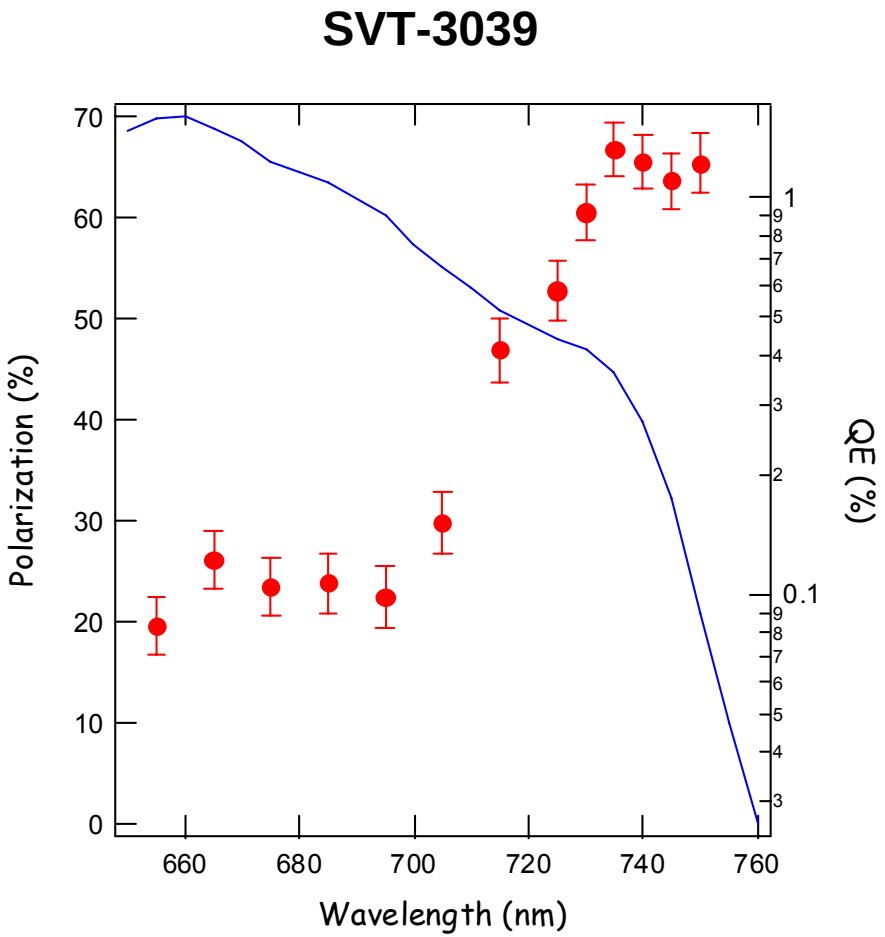



**SVT-3031**




Polarization was not measured due to low QE.

# Polarization and QE




Will re-measure all three samples.
Will X-ray all three samples.

# Status of Faraday rotation system

- Femtosec laser to be delivered to Wisconsin on Sep. 1. The laser will be tested at Wisconsin.
- 480 V power and AC crash buttons installed. Argon Ion laser can be operated.
- Fieguth, Bower, and Schmerge came to the lab on Aug. 10 to go over the SOP and laser safety issues.
  - Interlock switches need to be installed.
  - New goggles to be purchased.
  - SOP to be revised.
- Shooting for a laser safety approval in mid September.