

# Flexible Solar Array Qualification Protocols (FSAP-ACO)

Jeremiah McNatt (GRC), Todd Schneider (MSFC), Bao Hoang (Maxar)



MAXAR

## 5-Junction High Efficiency Solar Cells

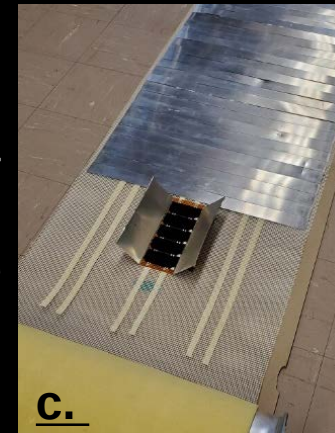
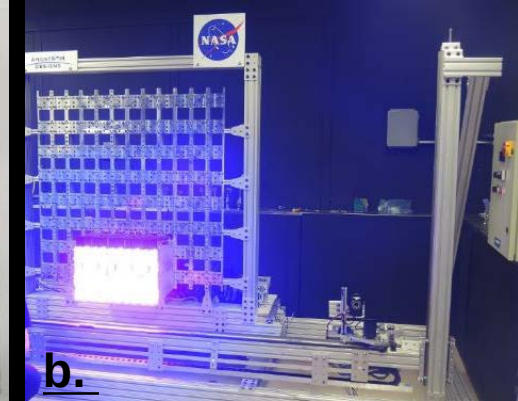
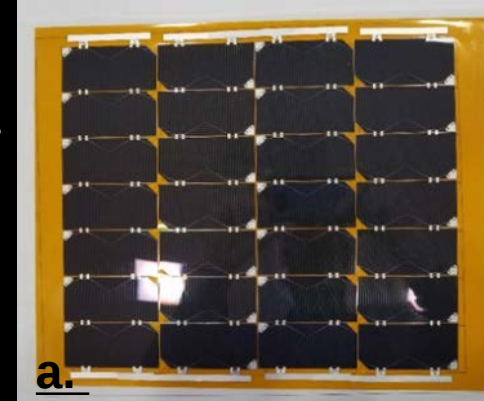
Game Changing Development Program task, Space Act Agreement between Maxar Technologies and NASA (GRC and MSFC) to test 5-junction solar cells on roll out compatible blankets through qualification protocols similar to AIAA Standards S-111/112 to raise TRL to  $\geq 5$ . Will enable future commercial and NASA missions with higher specific power ( $\text{W/m}^2$ ) at a lower mass ( $\text{W/kg}$ ). Enabling additional Solar Electric Propulsion (SEP) and payload capabilities.

## Technical Approach

Maxar, with SolAero, is providing Inverted Metamorphic Multijunction (IMM- $\alpha$ ) coupons in flight-like configurations to GRC and MSFC for performance and environmental testing including electrical performance using LED-based pulsed solar simulators, sine vibe testing, thermal balance testing, electrostatic discharge testing, UV radiation exposure, electron radiation exposure, proton radiation exposure, and thermal cycling

## Current Results

Task currently delayed by lack of facility access due to Covid-19. Maxar has acquired the IMM- $\alpha$  coupons. GRC is in process of purchasing additional LED modules and calibration standards for solar simulator. MSFC has developed test procedures for the planned activities.



- a. IMM- $\alpha$  coupon mounted on Kapton substrate with interconnects
- b. LED solar simulator, illuminated at low intensity. Additional modules will double illumination area
- c. Rolled blanket substrate with STMD EESP TA coupon attached. Blanket will be repurposed for ACO vibe testing
- d. High-Energy Accelerator Lab at MSFC (Electron and Proton Radiation Testing)