

Abstract Submitted  
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**Solar Cells for High Temperature Environments in Space** GEOFFREY LANDIS, NASA John Glenn Research Center — Future NASA missions into regions close to the sun will require power systems to operate in high temperature, high light-intensity environments. Some of the missions are:

- Solar Probe Plus
- Mercury probes
- Venus probes

Approaches to solar array design include developing improved high-temperature solar cells, reducing incident intensity to limit temperature, and use of cooling to minimize the temperature. Each of these missions has different challenges. Solar Probe Plus, a mission to the outer corona of the sun, will operate from 1 AU inward to 9.5 solar radii from the sun, nearly three orders of magnitude in incident intensity. Probes to the surface of Mercury experience a solar intensity of  $10 \text{ kW/m}^2$  with temperature ranging from  $425^\circ\text{C}$  at noon to  $-175^\circ\text{C}$  at night; while Mercury orbital missions are subject to incident solar radiation, reflected sunlight, and thermal IR radiated from the planet's surface. Venus presents the greatest challenge to photovoltaic operation, with surface temperature of  $450^\circ\text{C}$ , low intensity sunlight, and a corrosive environment.

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