

42nd RD50 Workshop on Radiation Hard Semiconductor Devices for Very High Luminosity Colliders (Montenegro)

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Photovoltaics for Space

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Converting light into electricity is one of the key strategies for space exploration. The ultimate solution should be low-cost, low-mass, flexible but rigid which possesses high conversion efficiency, remaining alike operating in harsh radiation environment as outer space easy to integrate with modern deployment systems and scilicet solar arrays.

Silicon solar cells have been the dominant technology for space applications due to their high efficiency, durability, and reliability. This presentation will focus on the use of this type of PV technology in space and the impact of the natural space environment, including the effects of radiation, temperature, and vacuum conditions. These factors cause degradation over time, leading to a decrease in solar cells power output. Strategies for mitigating these effects, such as radiation hardening and thermal management, will be discussed. Finally, the presentation will explore new materials for solar cells in space, such as multi-junction solar cells and perovskite solar cells and directions in emerging technologies.

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