

IAF SPACE POWER SYMPOSIUM (C3)
Solar Power Satellite (1)

Author: Ms. Amanda Michelle Simran Sathiaraj
Illinois Institute of Technology, United States

LIGHTWEIGHT SOLAR PANELS: SPACE BASED SOLAR POWER

Abstract

The main aim of the technical paper is to fabricate highly efficient solar cells that are of light weight and that will use $(\text{CH}_3\text{NH}_3)\text{PbI}_3$ nanocrystal.

These lightweight solar panels are fabricated to suit the power generation in a space-based solar power. On earth, solar energy is greatly reduced by night, bad weather, atmosphere and seasonality. Some thirty percent of all incoming radiation does not make it to the ground level. In space the sun is shining, the tilt of the globe doesn't hinder the storage of power and there's no atmosphere to scale back the intensity of the sun's rays. This makes employing solar panels in space a tempting possibility. Additionally, it may be utilized to get reliable and clean energy to individuals in remote communities around the world. The possibility of making such power systems would create a major impact and a vast leap on the existing energy models.

However, using a nano coated solar panel, new goals and records can be created. It increases the efficiency and decreases the size and weight of the panels. An overview of my approach would be to integrate nanotechnology with the design of the satellite, the nanoparticle fabricated from $(\text{CH}_3\text{NH}_3)\text{PbI}_3$ nano crystal is able to reduce the weight of the solar panel in a nano perspective.

Research have been carried out on the topic efficient perovskite quantum-dot-sensitized solar cell, where, it is clear that the solar panels that use nanotechnology can be fabricated. With solar power, not limited to daylight hours equipment with any supplemental electrical energy system for night time flight is not required.

The effective outcome of the project is - light weight solar panels that can be fabricated in the nanolab with higher efficiency and that decreases the power consumption as it runs on solar energy. As the efficiency of the solar panel is increased by the addition of the nano coating, a solar panel with a small cross sectional area can produce and store more energy. Thus, an energy sustainable means of powering not only space based solar power systems but a means of powering all types of systems and machines can be formed.

Keywords: Solar Panels; Space-Based Solar Power; Nanotechnology; Lightweight.