

## Managing the Cosmos: Problems, Solutions, and Future Insights into Space Debris

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**Abstract :** Debris, also called waste or junk, present in orbit of Earth or orbital debris, offers a substantial challenge to space exploration. Satellite operations and other space-based activities. This research paper delves into the causes and effects of space debris accumulation, explores current mitigation techniques, and presents a hopeful outlook on the potential for future sustainable space activities. The paper emphasizes the necessity of addressing planetary fragments to ensure durable sustainability in universe exploration and utilization. It examines various strategies for mitigating space debris, including debris removal technologies, spacecraft design improvements, and international collaboration efforts. Additionally, the paper highlights the importance of space debris monitoring and tracking systems in preventing collisions and minimizing the growth of orbital debris. By comprehending the complexities of space debris and implementing effective mitigation measures, the space industry can work towards a future where sustainable space activities are achievable.

**Keywords :** space shuttle, debris, space junk, satellite, fragments, orbit

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