

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Space Structures - Dynamics and Microdynamics (3)

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SANTINI MEMORIAL LECTURE: SPACE CHALLENGES AND OPPORTUNITIES FOR HUMAN
BENEFIT

Abstract

Since the beginning of the Space Age the general public was fascinated by the great challenges that needed to be overcome, but also inspired by the potential benefits that might arise from the utilization of space systems. The lecture examines the key technological breakthroughs that were necessary for many of the key space programs to succeed and postulates the immediate and future benefits to humanity that became evident as a result of these advances. Although in many instances the initial impetus was driven by military requirements, eventually the technical advances led to significant human benefit. A dozen programs ranging from Sputnik and Apollo to the Global Navigation Satellite System are reviewed in view of the technical challenges in key payload features, propulsion, power, structures, computing, guidance and control, spectrum management, and payloads. Challenges in the cost of space launch, large structures, debris mitigation, humans in space and commercial promise are discussed and opportunities for improvements in the future are postulated.