

年會專題演講摘要

立方衛星之研究發展 Research and Development of Cube Satellites

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摘要

近年來，可重複火箭技術之發展、在軌衛星之急速增加、多國探月計畫之啟動、太空商業之興起以及新一波太空競賽之逐漸成形，讓太空領域有相當幅度之發展也受到高度重視。衛星通訊同時也被視為我國建構數位韌性網路之重要一環。促成此一發展趨勢與培育相關人才之一項因素為立方衛星。立方衛星採用立方體或長方體之構型以有效容納與整合不同功能電路板於一有限之空間並充分利用電子資通產業強調輕薄短小之優勢以及標準化之思維。立方體之構型可利用彈射莢艙與發射載具整合，增加發射之機會與降低發射之複雜度。設計與程序上之標準化大幅降低立方衛星研發成本與縮短研發時程，促使許多大學、研究單位與廠商投入，一方面導入創新之技術與思維，另一方面培育可投入產業之即戰人力。因此，目前立方衛星已一定程度地翻轉太空產業，也逐漸成為一項商業衛星服務之利器。此次報告將分享立方衛星之發展趨勢並說明成功大學於過去數年於立方衛星之研製與操作成果。

Abstract

In recent years, the development of reusable rocket technology, the rapid increase in satellites in orbit, the launch of lunar exploration programs by multiple countries, the rise of space commerce, and the gradual formation of a new wave of space competition have significantly advanced the space sector and drawn considerable attention. Satellite communications are also regarded as a crucial component in building our nation's digitally resilient networks. One key factor driving this trend and cultivating relevant talent is the CubeSat. CubeSats adopt a cube or rectangular configuration to efficiently house and integrate various functional circuit boards within a limited space, leveraging the electronics and information industry's emphasis on compactness and standardization. The cube-shaped design allows integration with deployable pods and launch vehicles, increasing launch opportunities and reducing launch integration complexity. As a result, universities, research institutions, and companies have actively participated in the development of CubeSats. Indeed, CubeSats have to some extent transformed the space industry and are gradually becoming a powerful tool in commercial satellite services. This report will share the development trends of CubeSats and present the development and operational achievements of National Cheng Kung University in CubeSat development over the past few years.