

Space Market and Taiwan's Opportunities

太空市場與台灣的機會

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Abstract

Dr. Peter C. Lai (賴常青博士) is currently working for the NASA Jet Propulsion Laboratory (JPL). He is an expert of the satellite and spacecraft system engineering specialized in guidance, navigation, and control (GNC) with over 20-year industrial experience. Dr. Lai used to work for Globalstar (the first US satellite phone company) as the Manager of Satellite Operation Center and other major aerospace companies in US, e.g., Boeing and Northrop Grumman. When he was employed by The Aerospace Corporation, Dr. Lai took a different role of representing US government to oversee the progress and correctness of government contract execution by major aerospace companies.

Dr. Lai has 4 US patents and 3 Trade Secret Awards. His engineering designs and process work can be found in over 40 technical publications as well as over one hundred internal reports. In particular, he participated in the creation of the first Joint Military and Civilian Space Operation Manual in the world led by US Air Force and provided report to be used by the US Air Force General as testimony in the US Congressional Hearing on the deteriorating US star tracker business. Dr. Lai's major award records include NASA Voyager Award in 2017, AIAA Associate Fellow in 2012, and recognition of contribution to an on-orbit anomaly investigation by US Air Force Safety Investigation Board in 2009. He got his Bachelor degree in Mechanical Engineering from National Taiwan University and both Master and Ph.D. degrees from Purdue.

In his career, Dr. Lai has involved in the development of communication satellites, weather satellite, remote sensing satellites, space telescope, GPS satellites, CubeSat, and Deep Space spacecrafts for exploring Moon, Jupiter, and Asteroid. Currently, he focuses on the spacecraft development for the Psyche (16) asteroid exploration. His future interest falls on the commercialization of space unmanned artificial intelligence technologies. Dr. Lai has been active in the industry by hosting international conferences as chairman and serving as AIAA Astrodynamics Technical Committee Member since 2007. He was also invited to share his experience in US with Taiwan's aerospace industry and academia several times in the past when he was back to Taiwan for vacations. In this talk, Dr. Lai will share his unique career of working on various types of satellite programs in major US companies and seeing different corporate operations in the past 20 years to predict the future market of unmanned space artificial intelligence technologies as well as Taiwan's opportunities in his view. He is hoping his advice can benefit the advancement of Taiwan's aerospace industry.

摘 要

賴常青博士現任職於美國太空總署噴射推進實驗室，是人造衛星及太空船系統工程及姿態導航控制的資深專家，有著 20 多年的實務經驗，過去曾任全球星（Globalstar，美國第一家衛星電話公司）衛星控制中心經理擔任管理層工作，及任職於波音（Boeing）和諾思諾普（Northrop Grumman）等美國著名航太公司，在太空顧問公司（The Aerospace Corporation，美國政府的智庫）任職期間，更以監工身分代表美國政府去督導各航太承包商的工程進度及成果。

賴博士的航太產品設計曾獲得四項美國專利及三項商業機密獎，研發成果散見於超過四十篇對外公開的論文及上百篇不對外的內部報告，其中包括共同創作了美國空軍主導的全世界第一個聯合軍事及民用衛星操作手冊以及美國空軍上將在國會聽證美國追星器市場窘況所使用的證詞。重要獲獎紀錄包括 2017 年獲頒美國太空總署航海家獎(Voyager Award)、2012 年獲頒美國航太航空學會(AIAA)副院士(Associate Fellow)、及 2009 年獲美國空軍安全調查委員會表揚對在軌衛星事故調查的貢獻。賴博士是台大機械系的畢業生，在美國普渡大學拿到碩士及博士學位。

賴博士曾參與不同領域的研發團隊：通訊衛星、氣象衛星、遙感衛星、太空望遠鏡、全球定位系統衛星、小型衛星（CubeSat）、及探測月球、木星、小行星等的深空太空船。他目前專注在探測靈王星(Psyche)小行星的太空船研發工作，未來的興趣在於將人造衛星及太空船的無人人工智能技術商業化。賴博士在美國的航太業相當活躍，經常擔任國際會議的主持人，從 2007 年起並擔任美國航太航空學會的天體動力學技術委員會委員。過去利用返台度假也數度受邀和台灣的航太業及學術界分享他在美國的經驗。此次他將根據過去 20 多年來在美國各大航太公司參與過的各種衛星計劃及看過不同形態公司運作的獨特經驗，來分析未來太空無人技術的市場及他對台灣航太業未來機會的看法，希望能為台灣的太空產業發展提供有效的建言。