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Lab to Launch

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Progress in satellite technologies is ongoing and eventually finds applications back on Earth. The global space industry is expecting significant growth based on cheaper launch capabilities and standardised satellite platforms. Thousands of small satellites (such as CubeSats) are expected to be launched over the next decade: a disruptive space revolution boosting Earth imaging, internet, global positioning and space weather forecast capabilities. Electric propulsion (EP) has been an innovative solution in a number of space missions but its scalability remains a challenge. Many mature or under development space propulsion systems could also benefit from more compact and efficient power supplies. Pocket Rocket is an Australian-born miniaturised electrothermal radio frequency plasma thruster which uses environmentally friendly propellant such as argon. A complete end-to-end small satellite industry — “Lab to Launch” — is now available wholly within the Trans Australasian Pacific region, thanks to the recent demonstration of Rocket Lab’s access to orbit. Groups at the Australian National University, Stanford University and the University of Auckland have joined forces to pave a path to space heritage for Pocket Rocket via the CubeSat platform. The aim is to improve the efficiency of a cold gas thruster in a single and effective manner by improving miniaturized power supplies and gas handling systems while training the next generation of students on radiofrequency, vacuum, power and plasma technologies. These innovations will help the future development of nano-satellite orbit control, attitude control, formation flying and docking capabilities. Most importantly, a lot of interesting physics is left to be uncovered.

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