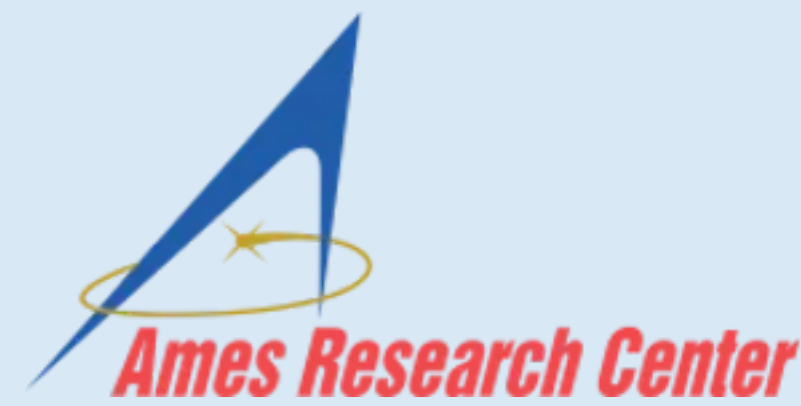


Trends in Small Satellite Presentations from 2017-2019



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Trends in Small Satellite Presentations from 2017-2019

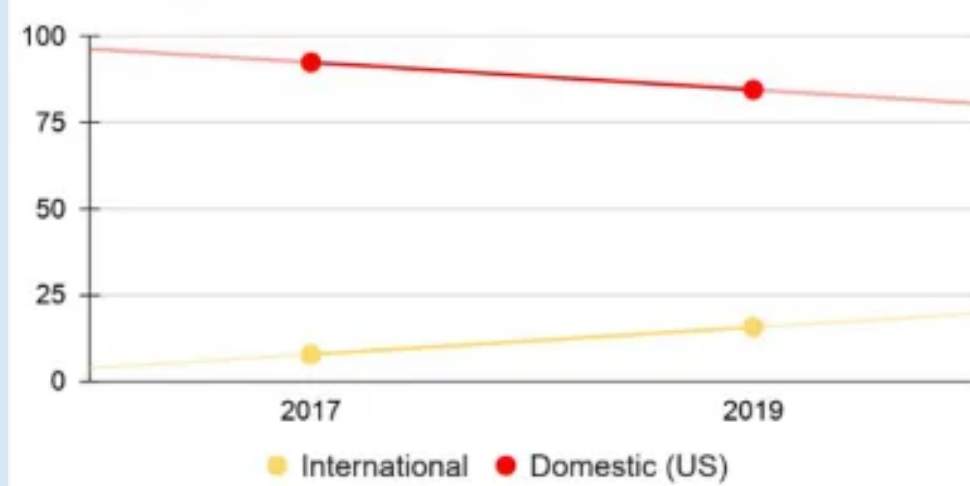
Introduction

Our study aimed to identify trends amongst the small satellite mission presentations from the CubeSat Developers Workshop (CDW), Interplanetary Small Satellite Conference (ISSC), and the Small Satellite Conference (SSC) from 2017-2019.

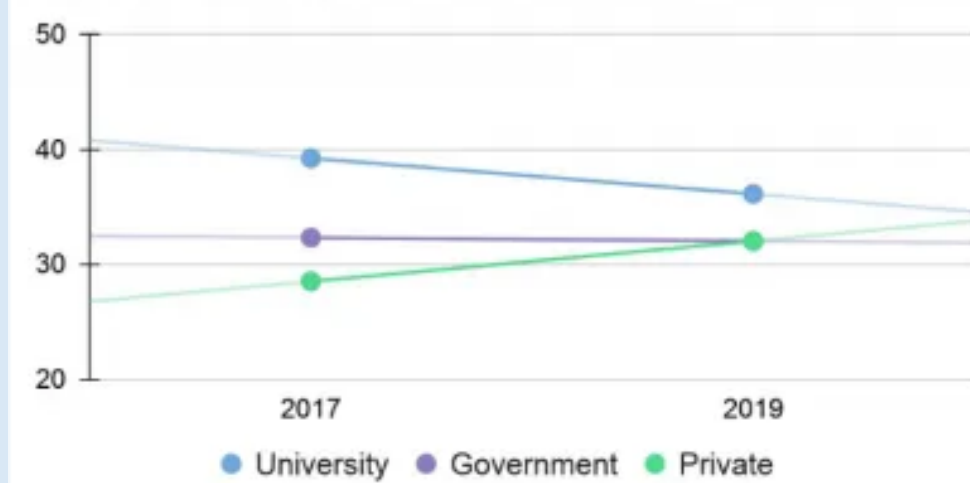
Mission Developers

We divided each organization responsible for leading small satellite missions by government agencies, private organizations, and universities, while also evaluating domestic (US) developers versus international developers.

Change in Percentage of SmallSat Developers: International vs Domestic (US)



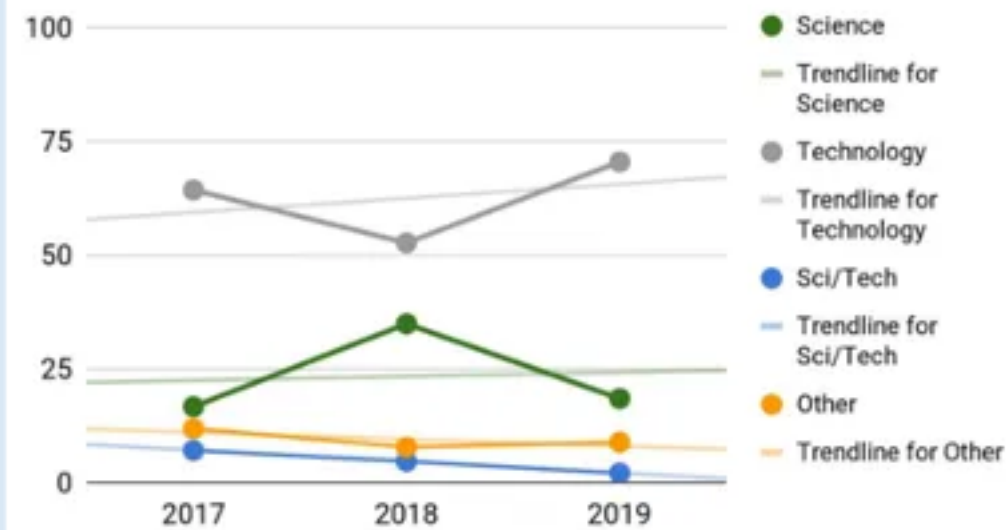
Change in Percentage of SmallSat Developers: University vs Government vs Private



Presentation Content

We categorized the subjects of SmallSat presentations into: Technology, Science, Sci/Tech, and Other. Presentations falling in "other" were those describing educational opportunity or the work an organization was doing to contribute to the SmallSat community.

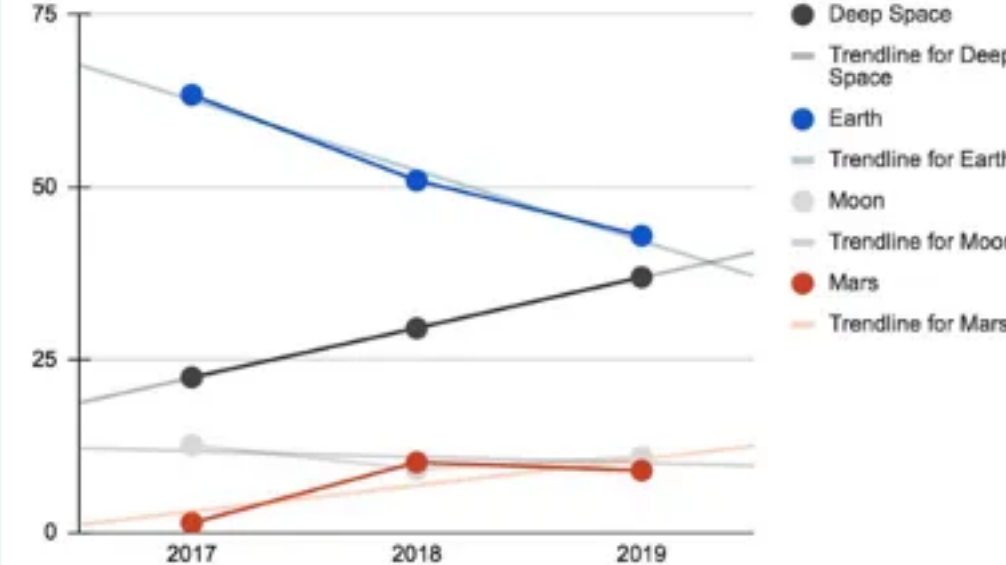
Change in Percentage of SmallSat Subject Matter



SmallSat Destinations

We sorted each mission into four categories, satellites developed to: LEO, orbit around Earth's Moon, orbit around Mars, and travel into deep space. We found a statistically significant decrease in LEO SmallSat missions and statistically significant increases in Mars and deep space missions.

Changes in Percentage of SmallSat Destinations



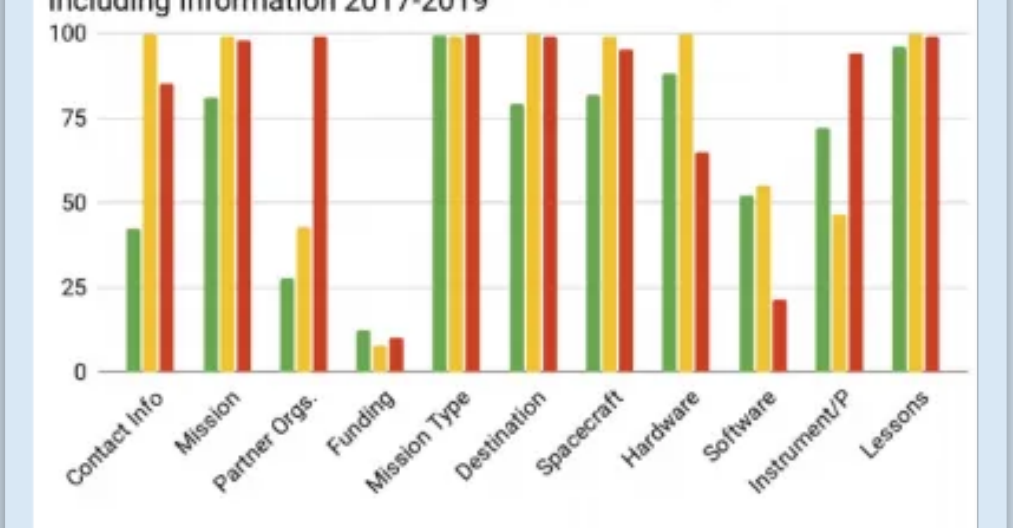
Subsystem Developments

We cataloged technological developments for four SmallSat subsystems over three years, studying significant technological developments and determining how they addressed broader industry demands. The four major subsystems highlighted were: telecommunications, propulsion, power, and thermal management systems.

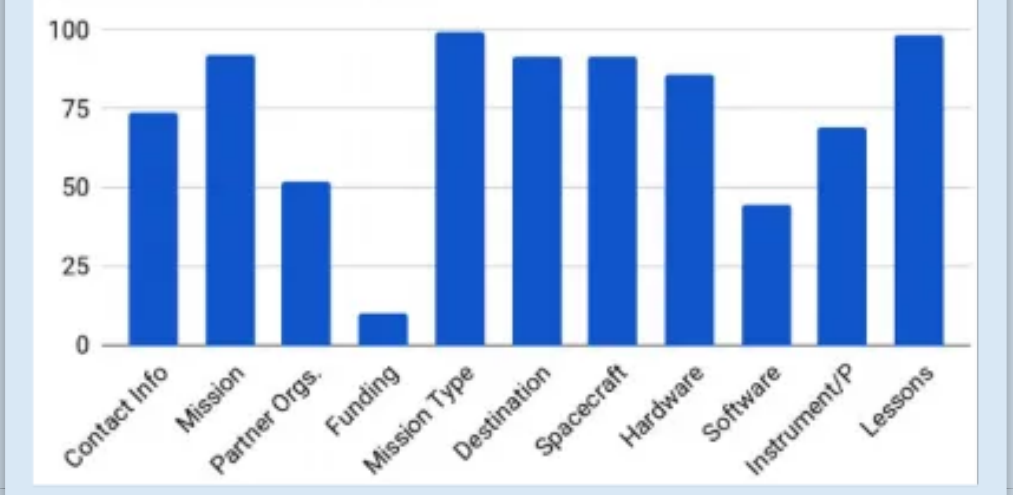
Included Content

We focused on twelve aspects of presentation content: contact info, project status, partner organizations, funding sources, mission objective, destination, focus area, spacecraft, hardware, software, instrument or payload, and lessons learned.

CDW (Green), SSC (Yellow), and ISSC (Red) Percent of Presentations Including Information 2017-2019



Averaged Percent of Presentations Including Information 2017-2019 (ISSC, SSC, and CDW together)



Conclusion & Future Work

In this work, we analyzed trends in innovations and developments in the small satellite community from 2017-2019. To collect our sample data, we researched 401 presentations from the SSC, ISSC, and CDW. We discovered topics covering technology demonstration missions and science objectives dominated the majority of SmallSat presentations. Moreover, we recognized that specific information was often absent from presentations, and provided recommendations on which topics to include more frequently. Most notably, our project outlines the correlation between the growth of SmallSat development internationally; advancements in SmallSat subsystem technology; and the expanded scope for SmallSat destinations.

In future work, we aspire to supplement our sample size by collecting data from years before 2017, further enhancing our understanding of the SmallSat industry's growth in the twenty-first century.

Acknowledgements

We would like to thank Craig Burkhard and Sally Cahill for their continuous support as our internship mentors, everyone at NASA ARC associated with the internship program for offering us this opportunity, and the hundreds of organizations that presented at small satellite conferences from 2017-2019, enabling us to research and evaluate their projects.

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