

Small Satellite Systems Engineering Webinar Series: A Collaboration Between the United Nations Office for Outer Space Affairs and the National Aeronautics and Space Administration

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Small Spacecraft Systems Virtual Institute Products & Activities

The S3VI provides the SmallSat research community with access to mission enabling information and maintains engagement with small spacecraft stakeholders in industry, government and academia. The S3VI resources listed below are available to all at:

<https://www.nasa.gov/smallsat-institute/>

Community of Practice Webinar Series

Small Spacecraft Reliability Initiative Knowledge Base Tool

LaunchPortal

Small Spacecraft Guidebooks

United Nations Office of Outer Space (UNOOSA) Systems Engineering Webinar Series

NASA Small Spacecraft State of the Art Report

S3VI WebPortal

Quarterly S3VI Newsletter

Small Spacecraft Information Search

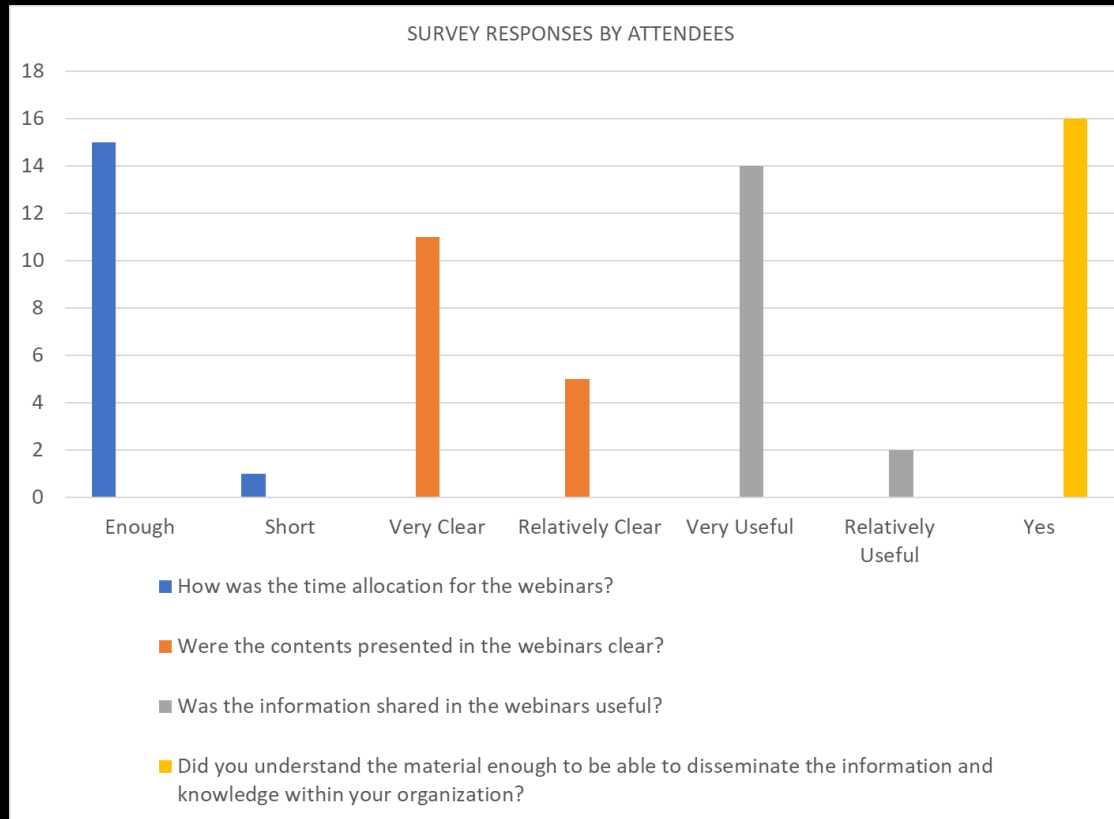
Space Mission Design Tool Catalog

S3VI is sponsored by NASA's Space Technology Mission Directorate

The webinar series were segmented into 90-minute webinars covering topics related to:

- **The Fundamentals of Systems Engineering**
What is Systems Engineering and what does a systems engineer do? What are the elements of managing a small spacecraft project? Why does NASA use systems engineering? What are the roles and responsibilities of a systems engineer? What are the elements of a project's life cycle phases?
- **Requirements and Systems Engineering**
How do you define requirements for a small spacecraft? Why are requirements important to space missions? How are trade studies used to determine parts selection and why it is important?
- **Systems Assembly, Integration and Test, and Spacecraft Handling**
What are the elements of system assembly, integration and test, and spacecraft handling? What are the various steps involved for each? Why is it important to a space mission?
- **Introduction to the Small Spacecraft Systems Virtual Institute (S3VI)**
This presentation provided the attendees with information and knowledge of available resources and where to find it to support the design and development of their own small satellite missions.

Webinar Series Attendee Feedback



Positive Feedback Received Based on Attendees Survey Responses



- The Small Satellite Systems Engineering Webinar Series presentations were recorded and posted as well as the presentation charts for the community to view.
- Since November 1, 2023, and as of April 30, there have been a total of 243 content views.
- The archived webinar series content is open to the public. For more information see the links below.
 - <https://www.nasa.gov/smallsat-institute/systems-engineering-series/>
 - <https://www.unoosa.org/oosa/en/ourwork/access2space4all/NASA.html>

Webinar Content is Archived and Available for Viewing

Other Recent NASA Contributions to UNOOSA, Including



Capacity Building Program:

Provides workforce development, training activities and collaborative projects for Earth observations

Summit of the Future:

Plans to highlight the importance of NASA's space-based activities and how they contribute to Sustainable Development Goals

Space4Youth:

Partners with UNOOSA and U.S. Mission to International Organizations in Vienna to provide opportunities to the winners

■ STEM-Focus Activities

Pale Blue Dot:

Visualization Challenge – Competition: Collaboration with UNOOSA and U.S. Mission to the International Organizations in Vienna to promote visualization using Earth observation data that advances the UN Sustainable Development Goals of zero hunger, clean water, and climate action.

UN Space4Women:

Provides mentors to this project that encourages women and girls to pursue STEM education in the space sector

Systems Engineering Webinars:

Provides small satellite systems engineering content for developing countries to have knowledge of developing missions

Planetary Defense: NASA and UNOOSA provide experts for discovering, monitoring, and physically characterizing the potentially hazardous near-Earth objects

UN Space for Water Project:

Promotes the use of space-based technologies for increased access to water

Climate:

Provides the world with science and space-based data required to understand, mitigate, and adapt to the changing planet

UN-SPIDER

Provides disaster management and resilience through Space-based Information for Disaster Management and Emergency Response

■ Technology-Focus Activities

Fall Webinar Series Topics:

- **Requirements and Testing:** Why are requirements needed? What are some examples for a good and bad requirement? What makes for a good requirement? How to develop and write clear, concise and well-defined requirements? How are requirements evaluated? What testing is required for a small satellite mission? What are the various testing parameters evaluated and what type of apparatus are used? What are the testing required for the various Project Lifecycle Phases?
- **Project Lifecycle Reviews:** What are the elements of project life cycle phases? Which elements are required for each phase? What are the key milestones for the various phases? How is it determined to transition to the next phase? How does systems engineering and project management play a role in the different phases?

Winter Webinar Topics:

- **Model Based Systems Engineering (MBSE):** What is MBSE and why is it important to NASA missions? How do you begin using MBSE to develop a small spacecraft project? What examples of missions that utilized MBSE? How do you relate mission requirements to MBSE?
- **Design and Develop Science Missions:** What is defined as a science mission? What segments make up a science mission? What steps and processes are taken to design and develop a science mission? What are examples of a science mission design?