

Seminar Agenda

Guardians of the Galaxy: Protecting Space Systems from Cyber Threats

Mar 02 – Mar 07, 2025

Schedule Overview

This seminar gathers academic researchers and industry professionals to discuss security challenges in the space ecosystem. The goal is to define key research areas in space cybersecurity and foster collaboration. The following is the agenda for the week. Group talks are talks in which all Dagstuhl participants engage. Breakout Groups are when we divide all participants into smaller focus groups.

Monday

Time	Activity
09:00 - 09:15	Introduction and Welcome to Dagstuhl
09:15 - 10:00	ESA Presentation (Daniel Fischer, Knut Eckstein, Markus Rückert, Marcus Wallum, Lars Baumgärtner): Insights from ESA: Security challenges in space and ground segments, cybersecurity monitoring, and Solar-System Internet/DTN
10:15 - 10:45	Coffee Break
10:45 - 11:15	ESA Presentation Part 2
11:15 - 12:15	Kevin Gilbert (NASA): NASA Mission Resilience & Protection Approach
12:15 - 13:15	Lunch Break
13:15 - 15:30	Group Talk - on problems and foundational issues
15:30 - 15:45	Coffee Break
15:45 - 17:30	Breakout Groups: Divided teams discussion on top 3 problems
17:30 - 18:00	Lightning Talk

Tuesday

Time	Activity
09:00 - 09:30	Arne Grenzebach (OHB System): Security Units for Satellite Communication
09:30 - 10:15	Vincent Lenders (armasuisse): Six Years of Satellite Security Research at the Cyber-Defence Campus
10:15 - 10:45	Coffee Break
10:45 - 12:15	Group Talk – Selection of Top 3 Problems
12:15 - 13:15	Lunch Break
13:15 - 15:30	Breakout Groups – Solutions for Problem #1 (Data)
15:30 - 16:00	Coffee Break
16:00 - 17:30	Group Talk – Suggested Solutions for Problem #1 (Data)
17:30 - 18:00	Lightning Talk

Wednesday

Time	Activity
09:00 - 09:30	Brandon Bailey (The Aerospace Corp): Space Attack Research and Tactic Analysis Overview
09:30 - 10:00	Florian Göhler (Federal Office for Information Security, BSI): A Joint Effort: Stakeholder Cooperation for Better Space Security
10:00 - 10:30	Coffee Break and Photo Shooting
10:30 - 12:15	Breakout Group – Solutions for Problem #2 (Cyber Range)
12:15 - 13:15	Lunch Break
13:15 - 15:30	Group Discussion – Solutions for Problem #2 (Cyber Range)
15:30 - 17:30	Coffee Break and Hiking

Thursday

Time	Activity
09:00 - 10:00	Breakout Groups – Solutions for Problem 3, Emerging Topics and Future Directions
10:00 - 10:30	Coffee Break
10:30 - 11:15	Continuation of Breakout Groups – Problem 3 and Emerging Topics and Future Directions
11:15 - 12:15	Group Talk – Results of Emerging Topics
12:15 - 13:15	Lunch Break
13:15 - 15:30	Group Talk – Summary of Problems and Solutions, Wrap-up
15:30 - 16:00	Coffee Break
16:00 - 16:45	Mattias Wallen (Swedish Space Corporation): Migrating Legacy Ground Stations to Cloud-Based Systems
16:45 - 17:15	Gunes Karabulut Kurt (Polytechnique Montréal): Security of Non-Terrestrial Networks
17:15 - 17:45	Steven Arzt (Fraunhofer SIT – ATHENE): Security in Space - The Next Frontier?
17:45 - 18:00	Lightning Talk

Friday

Time	Activity
09:00 - 09:30	Nesrine Benchoubane (Polytechnique Montréal): Beyond the Color Spectrum: Uniting Expertise to Advance Space Security
09:30 - 10:00	Efrén López-Morales (Texas A&M University): HoneySat - A Satellite Honeypot
10:00 - 10:30	Coffee Break
10:30 - 11:15	Stephen Schwab (USC Information Sciences Institute): Merge/Space: A Security Testbed for Satellite Systems
11:15 - 12:00	Rosa Sosa Szurgot (Embry-Riddle Aeronautical University): Exploring the Future of Space-Based Quantum Networks
12:00 - 13:00	Lunch

Structure

The five-day seminar includes interactive discussions, breakout sessions, and expert talks.

Phase 1: Foundations (Day 1 - Half of Day 2)

- Opening keynote on space cybersecurity and major unsolved issues.
- Breakout groups analyze pressing cybersecurity challenges.
- Plenary discussion to refine key challenges.
- Groups define foundational requirements for security solutions.

Problem-Solution Discussions (Day 2 Afternoon – Day 4)

- Focused discussions suggestion:
 - Threat landscape
 - Resilient space systems
 - Intrusion detection
 - Secure-by-design principles
 - Autonomous system security
 - Standardization efforts
- Brainstorming sessions for innovative solutions.
- Spontaneous discussions on emerging topics.
- Evening informal discussions.

Wrap-Up (Day 5)

- Consolidation of findings.
- Documentation of space cybersecurity challenges and solutions.
- Defining future research directions.

Suggested Topics

- Space vehicle resilience
- Cyber threats to ground systems
- Secure satellite communication
- Autonomous security mechanisms
- Cybersecurity standardization

Flexibility

Discussions are open to additional topics proposed by participants.

Expected Outcomes

- Identification of key open research questions.
- New academic and industry collaborations.
- A published article summarizing the seminar findings.