

# Seminar - Networks in the Sky (2024)

For several years significant effort has been placed in the investigation of mechanisms for the development of Flying Ad-hoc Networks in distinct scenarios, from rescue and surveillance, environmental sensing as well as logistics. In parallel, other types of networks in the sky are gaining significant attention, namely Low Earth Orbit (LEO) satellite constellations, aiming to provide truly global Internet access, as well as to leverage advances in technologies such as Internet-of-Things (IoT). The topic to be exploited in this seminar, **Networks in the Sky**, is related to any fourth dimensional network encompassing flying vehicles, from drones to aircraft, as well as satellites.

The 2024 seminar on Networks in the Sky is dedicated to **future satellite networks** encompassing the exploitation of regenerative payloads for the creation of satellite constellations, their integration with terrestrial systems, including future Quantum Networks, as well as their usages to support future demanding applications, such as the Metaverse.

In this seminar, we will explore seminal papers in the field of network architectures and protocols in the context of future satellite networks, from a **Network Layer perspective**. These papers will help us to understand challenges in different topics such as *routing, dynamic traffic engineering, active queue management, scheduling, Software Defined Networking (SDN), Information Centric Networking (ICN), and integration in 5G/6G networks*.

This seminar will be conducted in collaboration with **Airbus Central Research and Technology** in Ottobrunn, including the possibility of a visit to a relevant research lab.

## Requirements

This seminar is for students in the Informatics Master program. Prerequisites are a Bachelor's degree in computer science or related field.

## Registration

Registration is done using the [Matching System](#) of the department (mandatory). You can also submit to paulo.mendes@tum.de a short motivation statement (max. 150 words) about your participation in this seminar. Sending a motivation statement is optional, but may increase your chances of getting a place.

## Learning outcomes (study goals)

Participants will learn how to critically analyse and discuss scientific papers. This will be achieved by reviewing papers, summarising the essentials in a written essay, and by actively participating in group discussions during the seminar presentations. Students will have the opportunity to advance their soft skills through presentation in a conference-style setting with session moderation. Presentations will involve learning to stay within time limits and to contribute to the Q/A session at the end of a talk.

## General information

- The seminar will be conducted in English.
- Students are expected to:
  - Review 2 articles from any seminar topic (e.g. routing, 6G, SDN, ICN, Metaverse).
  - Write a paper/essay about the selected topic, based on the analysed articles.
  - Present the written essay at the end of the seminar.
  - Read and review two other papers/essays written by college students.
- Paper/essay format:
  - Max 6 pages (including references) in English.
  - You can either use the LaTeX or Word, but the usage of Overleaf is recommended.
  - [ACM](#) or [IEEE](#) formats. For overleaf use [ACM template](#) or [IEEE template](#).
  - State your name, affiliation and email address.
  - References need to be in the correct format (usage of a LaTeX BIB file is suggested).
- Presentation format:
  - Duration is 20 minutes, plus 5 to 10 minutes of questions & answers.
  - You should prepare 7 to 10 slides.
  - Slides aim to guide you during the presentation and not to be read.
  - You should present slides electronically in Powerpoint or PDF.
  - You can use the TUM powerpoint template or your own format for the slides.
- Reviewing format:
  - Highlight the advantages and disadvantages of the presented technology.
  - Verify if the paper is technically sound.
  - Verify if the subject matter is presented in a comprehensive manner.
- Grading will be based on:
  - Written scientific paper/essay (50% of final grade)
  - Presentation of the written paper/essay (40% of final grade)
  - Discussion over other presented papers (10% of final grade)
- It is expected that all students attend all presentations given in this seminar and participate in the questions & answers sessions.

## Schedule

- Meeting on [22.04.2024](#) (room 01.07.023), from 09:00 - 10:00, aiming to present the seminar, including a list of suggested topics as well as relevant papers.
- Submit up to 3 selected papers to the contact email address until [03.05.2024](#).
- Meeting on [13.05.2024](#) (room 01.07.023), from 09:00 - 10:00, aiming to provide support in the preparation of the essays.
- Meeting on [03.06.2024](#) (room 01.07.023), from 09:00 - 10:00, aiming to provide support in the preparation of the essays.
- Submit your essay (PDF and source files) in the correct format until [14.06.2024](#), 23:59 (no extensions!) to the contact email address.
- Each student receives per email, until [21.06.2024](#), two submitted papers for reviewing.
- Meeting on [24.06.2024](#) (room 01.07.023), from 09:00 - 10:00, aiming to provide support in the preparation of the presentations and reviews.

- Meeting on 01.07.2024 (room 01.07.023), from 09:00 - 10:00, aiming to provide support in the preparation of the presentations and reviews.
- Submit the review of your two papers until 05.07.2024 to [paulo.mendes@tum.de](mailto:paulo.mendes@tum.de) (in the format to be provided).
- Presentations will be held on 15.07.2024 (room 01.07.023) from 09:00 - 11:30 (time can be adjusted depending on the number of presentations).

*All topics are advised by Paulo Mendes. Please send an Email to [paulo.mendes@tum.de](mailto:paulo.mendes@tum.de) for support or to request an appointment (possibly as Google Meet call).*

## Relevant Conferences and Journals

- ACM SIGCOMM Computer Communication Review
- ACM SIGCOMM
- ACM Conext
- ACM ICN
- ACM/IEEE Transactions on Networking
- IEEE INFOCOM
- IEEE Globecom
- IEEE ICC
- IEEE Access

## Further Reading

- S. Keshav. "[How to read a paper](#)"
- William G. Griswold, "[How to Read an Engineering Research Paper](#)"

## Contact

- Paulo Mendes <[paulo.mendes@tum.de](mailto:paulo.mendes@tum.de)>