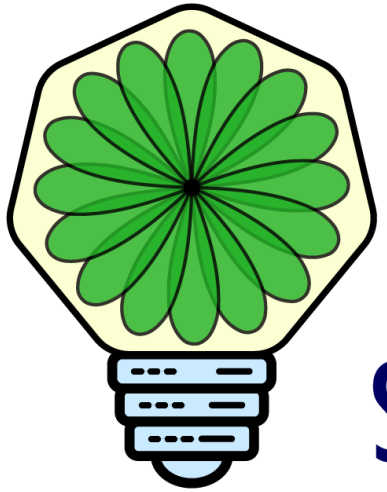
Welcome to the

Workshop on Artificial Intelligence and Communication Systems

VINNOVA

Avancerad Digitalisering



SweWIN

Swedish Wireless Innovation Network

Director: Emil Björnson, Professor of Wireless Communication, KTH

KTH VETENSKAP OCH KONST

RI.SE Research Institutes of Sweden

ERICSSON

SAAB TECHNOLOGIES SAAB

ABB

CellMax

NW Northern Waves

BeammWave

SweWIN is a **Competence Center**: What is that?

10

year

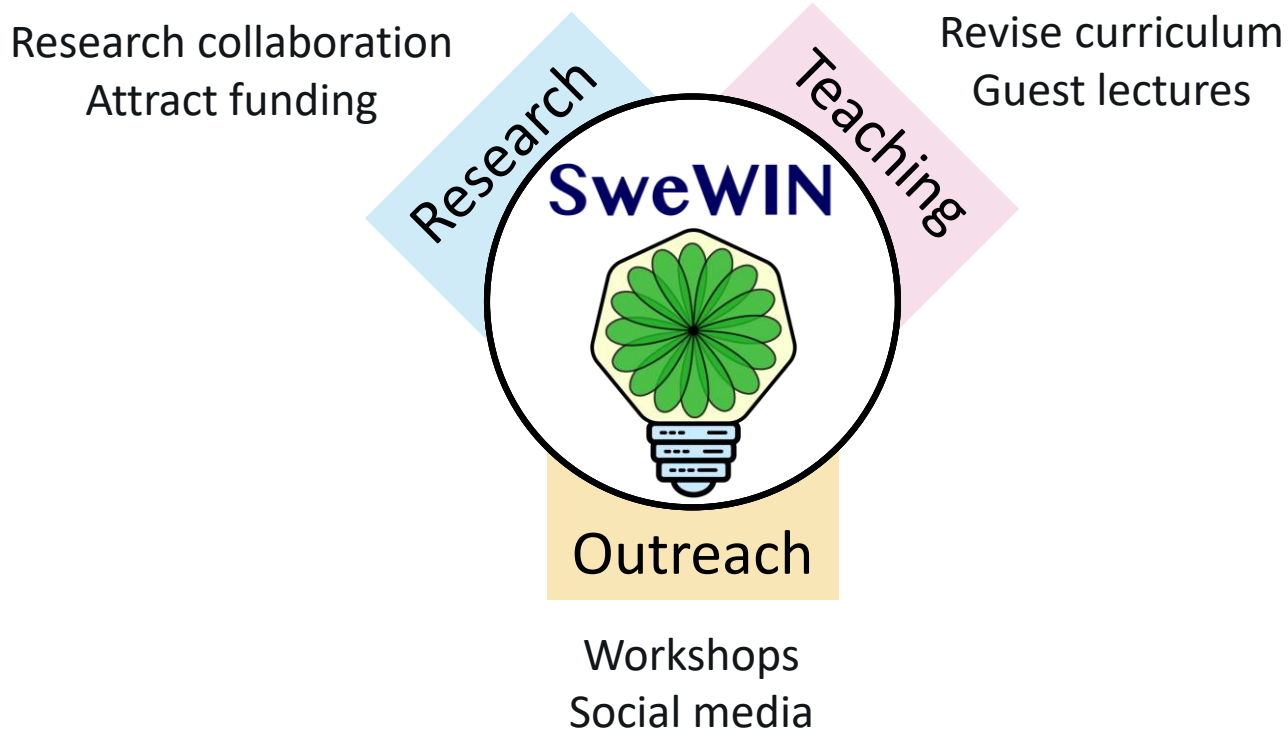
effort

Academia

+

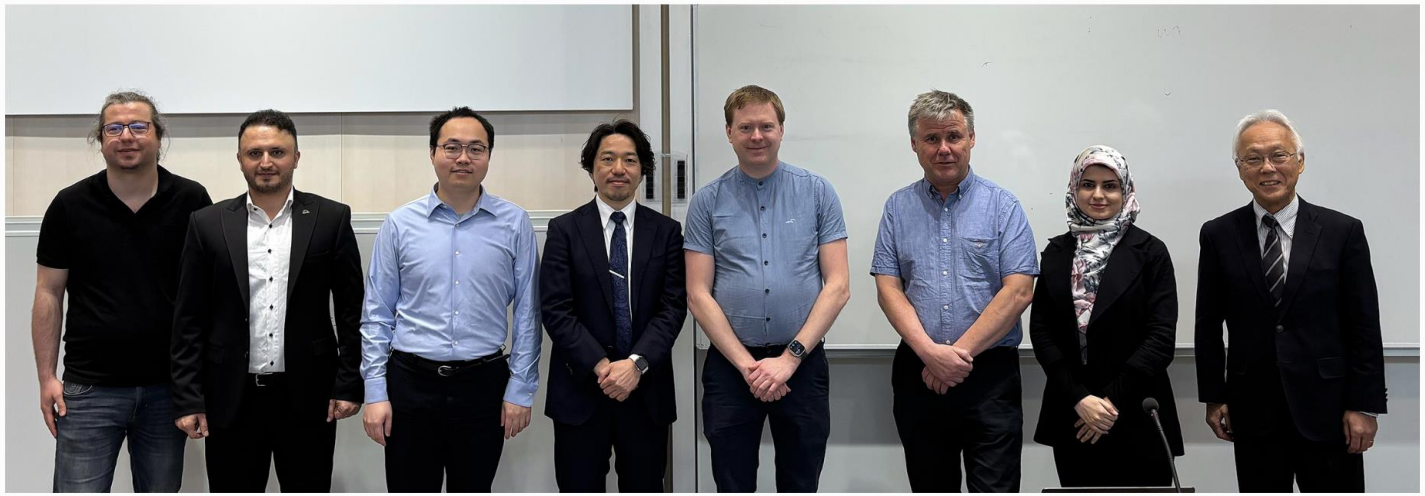
Industry

2024-2033

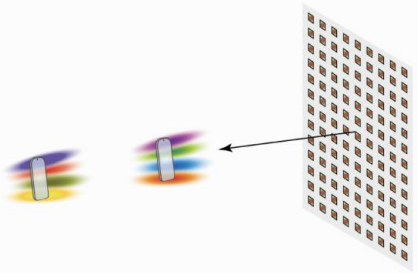


Second Wireless Innovation Workshop: May 19, 2025

SweWIN hosted a distinguished KVA-JSPS Seminar on near-field communications and sensing by Prof. Koji Ishibashi with 55 attendees, followed by a workshop discussing recent research and future prospects of the topic.



On May 19, the SweWIN center hosted a distinguished **KVA-JSPS Seminar** on near-field communications, sponsored by the **Japan Society for the Promotion of Science (JSPS)** and the **Royal Swedish Academy of Sciences (KVA).** After the seminar and fika, the SweWIN center showcased research on the same topic conducted in Stockholm, and the workshop ended with a panel discussion.



Details

Date: May 19, 2025, 9:00-12:00.

Place: Lecture hall Ka-Sal A, KTH Kista, Kistagången 16, 164 40 Kista

JSPS STOCKHOLM OFFICE

Agenda

9:00: **Welcome address**, Emil Björnson, SweWIN Center Director.
Welcome slides (pdf 1.2 MB)

9:05: Presentation on JSPS international programs, Prof. Tetsuya Mizumoto, Executive Director, JSPS Tokyo HQ. JSPS International Programs (pdf 2.9 MB)

9:15: **KVA-JSPS Seminar** by **Prof. Koji Ishibashi**, University of Electro-Communications, Tokyo, Japan. **Title:**
Enabling Near-Field Communications: Beam Shaping, Optimization, and Channel/Data Estimation (pdf 8.5 MB)

10:15: Coffee break

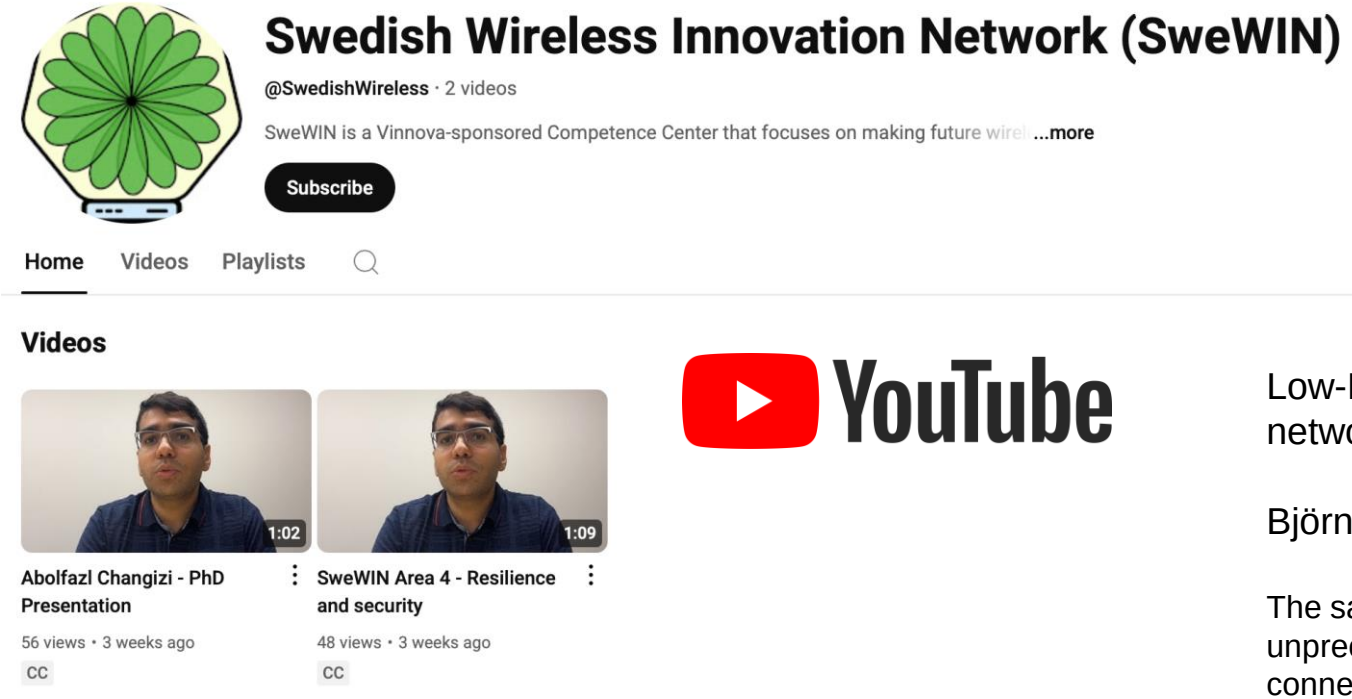
10:45: Mingzheng Chen: Generation of Wideband Quasi-Nondiffracting Beams Using Radial GRIN Lenses for Near-Field Applications

11:00: Parisa Ramezani: Near-field Communication and Localization in the Upper Mid-Band Spectrum (pdf 830 kB)

11:15: Sajad Daei: When Near Becomes Super Far: From Rayleigh to Optimal NF–FF Boundaries (pdf 760 kB)

11:30: Panel discussion. Panelists: Koji Ishibashi, Erik Dahlman, Emil Björnson. Moderator: Ferdi Kara.

More Online Activities



YouTube

First monthly webinar: Oct 15, 15:00

Low-Earth orbit satellite constellations towards global communication network connectivity

Björn Ottersten – Professor, University of Luxembourg and KTH

The satellite communications sector is experiencing a revolution pushed by the unprecedented deployment of satellites in low-Earth orbit (LEO) constellations for connectivity solutions. Lower launch costs have encouraged private ventures to deploy broadband LEO networks targeting market opportunities like internet services for remote or under-served areas, mobile connectivity, governmental services, and communication services for emergency response and disaster relief. However, LEO satellite operators face several technical challenges which need to be addressed to unleash the full potential of this promising technology. We discuss broad trends that are changing the design of satellite communication networks fundamentally and the challenges to establish a LEO-based extension to current 5G and coming 6G cellular networks. Specifically, signal processing advances will be addressed with focus on multi-antenna transmit precoding techniques to improve coverage and spectral/energy efficiency, as well as link reliability and security. Recent activities related to standardization, experimental validations and demonstrations will also be presented.

Third Workshop:
Artificial Intelligence and Communication Systems

AI for communications

+

Communication for AI

Agenda prepared by
Anass Sedrati,
Vice-director of SweWIN

1. Radio electronics and antennas

Leader: Oscar Quevedo-Teruel

2. Physical layer and network architecture

Leader: Emil Björnson

3. Resource management and orchestration

Leader: Cicek Cavdar

4. Resilience and security

Leader: Mikael Skoglund

5. Learning and optimisation

Leader: Carlo Fischione

6. Wireless functional safety

Leader: Zhibo Pang

Today's Agenda

SweWIN
Swedish Wireless Innovation Network

9.00: Registration
9.20: **Welcome address**, Emil Björnson, SweWIN Center Director.
9.30: **SMART6GSAT center presentation**, Cicek Cavdar (KTH)
9.40: **Keynote - "6G - the first cellular generation with an AI air interface?"**, Mårten Sundberg (Ericsson)

10.30: Coffee Break

11.00: **AI in Wireless Networks: From Learning to Over-the-Air Computation**, Carlo Fischione (KTH)
11.15: **Personal Reflections on AI Use Cases in Microwave and Antenna Simulations**, Oscar Quevedo-Teruel (KTH)
11.30: **Towards Resilient, Secure, and Private Distributed Learning: A Coding-Theoretic Approach**, Abolfazl Changizi
11.45: **Energy Saving for Cell-Free Massive MIMO Networks: A Multi-Agent Deep Reinforcement Learning Approach**, Qichen Wang (KTH)