6G FLAGSHIP
UNIVERSITY OF OULU

Research Council of Finland

FLAGSHIP PROGRAMME

6G FLAGSHIP

Story and beyond

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6G Summit 2026 | October 28, 2026 | Finlandia Hall, Helsinki

Intro – Where it all started

- In 2017, government of Finland launched a Flagship program and mandated Research Council of (RCoF) Finland to execute the program. All fields of science were offered an opportunity to submit a proposal to the competition. University of Oulu submitted a program targeting mobile cellular 6G system – 6G Flagship.
- Our proposal was evaluated the best in scientific excellence and third in possible impact and was among the first two flagships chosen for implementation.
- One of the early achievements of the 6G Flagship was changing the paradigm how wireless networks are developed. In 2018, when 5G was just being introduced to commercial use, industry experts as well as public telecom organizations and other invested institutions were largely saying that there will be no 6G.
- Instead, target was to have SNS [Smart Networks and Services] and that basically meant software updates to existing 5G technology.
- As the first research program on 6G, the flagship arranged a conference - the 6G Summit in Levi 2019, invited all the big names, and launched the first white paper for the sixth generation of mobile telecommunications.
- This changed the thinking. After the Levi Summit and launch of the white paper, it started to look like that 6G is indeed going to be the next thing. The earlier software mindset was realigned. Since its' inception during the last eight years, the 6G Flagship has been the global opinion leader of 6G research.

Facts of 6G Flagship

- National research flagship for 2018 – 2026 with a total target volume of 250 M€.
- 2nd phase started May 2022 – plan to continue until the end of 2030
- Operated by University of Oulu.
- Currently involves more than 500 researchers from 46 nationalities.
- Steered the first 6G visions work via 15 6G White Papers (downloaded over 1M times).
- Published 4,875 peer-reviewed papers and 188 doctoral theses.
- Over 500 company collaborators and more than 600 research projects so far.



Research Agenda for 2018-2026

6G Flagship Vision for 2030

Data-driven sustainable future society enabled by near-instant, unlimited wireless connectivity

Strategic Research Areas (SRAs)

- Wireless connectivity solutions
- Device and circuit technologies
- Distributed intelligent wireless computing
- Sustainable human-centric services and applications

Flagship Goals

1. 6G technology enablers
2. 6GTN development
3. 6G vertical applications
4. 6G vision leadership

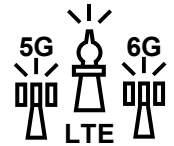
Impact Actions

A 6G-enabled Sustainable Society

B Strategic Vertical Areas (SVAs)
- Health
- Industry
- Vehicular
- Energy
- Security & Defence

C Global 6G Collaboration

D Research infra-structures – 6G Test Network (6GTN)



Beyond 6G Flagship

- 6GTN as the core of 6G Radio Park
- Training 6G experts for industry
- Influence on 6G standard
- Expertise building beyond 6G

2027 2028 2029 2030

Experimental test network

A tool for building a research-based, resilient digital society

Achieved Outlook



Eight years in numbers

6G Flagship, May 2018 – June 2026

Science

4,875

Peer-reviewed publications

24.8% in the world's top 10% most cited

- **130,711** Total citations
- **2.16** Field-weighted citation impact (FWCI)
- **3,552** (72.9%) Joint with collaborators
- **3,234** (66.3%) Joint international publications
- **4,495** (92.2%) Open access / self-archived
- **1,794** (36.8%) Jufo level 2–3 publications
- **188** Doctoral degrees
  - **450,525** Doctoral thesis downloads
- **3** New ERC grants

ARWU 2025, University of Oulu

- **41** Telecommunication engineering
- **76–100** Electrical and electronic engineering
- **201–300** Computer science and engineering

Co-creation and business

145

Companies investing in the research portfolio

- **597** Research projects, external funding
- **527** Company collaborators
  - **48%** International
- **566** (11.6%) Joint publications with companies
- **25,121** Registrations in co-creation forums

Societal impact

902

Jobs created

- **21,325** Social media followers
  - **14,959** LinkedIn followers
  - **1,665,846** X (Twitter) post views
- **12,497** Media features
- **348,287** 6G Waves downloads
- **1,114,338** 6G White Paper downloads
- **195,000** '6G vision for 2030' video views

People

525

Staff in 2026

from 46 nationalities

- **21.7%** Female
- **34.1%** Finns
- **43** Professors and tenure-track staff

Building Competence for Finland – Our Graduates

Organisation Type	Field	Oulu – Finland	Elsewhere in Finland	International	Affiliation/ Location Unknown	Total
University		56	13	22	0	91
Other research institutions		6	1	4	0	11
Company	Telecommunications & Connectivity	20	17	3	0	40
Company	Software, AI & Digital	8	3	1	0	12
Company	Semiconductors & Electronics	4	1	5	0	10
Company	Industrial & Engineering Technology	1	3	3	0	7
Company	Business & Professional Services	1	1	2	0	4
Company	Energy & Environment	0	0	2	0	2
Company	Health & Medical Technology	1	0	2	0	3
Not relevant		3	0	0	0	3
Affiliation unknown		0	0	0	5	5
Total		100	39	44	5	188
Share%		**53.2%**	**20.7%**	**23.4%**	**2.7%**	**100.0%**

6G Flagship Ecosystem – Globally Impressive Network

Academia

800+ partners from **87** countries, including

Scientific excellence

Fundamental technology innovations

NYU
Columbia University
Technische Universität Dresden
Chalmers
Fraunhofer
ETRI 한국전자통신연구원
東京大学 The University of Tokyo
NICT
Northeastern University
University of Surrey

Governments, regulation and standardisation

Strategic partner country cooperation

Policy level impact

Standardisation

European Commission
ITU International Telecommunication Union
ETSI
3GPP A GLOBAL INITIATIVE
IEEE
TRAFICOM

Japan
United States
South Korea
Germany
Singapore

Strategic core partners

6G Flagship University of Oulu
Oulu | BusinessOulu
Aalto University
OAMK Oulu University of Applied Sciences
VTT
AIF
5GTN
Nokia
Bittium
interdigital
Keysight Technologies
NVIDIA

Collaboration networks and other public actors

Public private partnerships

Research infrastructures and trials

6G potential and promotion

6G SNS IA
6GSNS
esa
Business Finland
Networld Europe

Industry

500+ partners from **34** countries, including

Co-creation with ICT companies

Economic growth through verticals

Ericsson
elisa
Siemens
TIM
MediaTek
GlobalFoundries
intel
DNA
DEKRA
posti
ABB
CGI
Geely Auto
Port Oulu

6G Flagship – A Massive Research Endeavour

- Total cash value of the whole 6G Flagship program is **238 M€**
- Total volume with external in-kind (donations, sweat equity etc. reported by partners) is over **281 M€**
- RCoF Flagship funding is just over 8% of total funding – which means more than ten times leverage
- Almost 60% of the funding is competitive funding
- **145** companies investing in research portfolio

19 708 407 €	**RCoF Flagship Funding**
Funding 1.5.2018-30.06.2026	
Total(s)	
19 708 407 €	8,28 % RCoF Flagship Funding
43 906 144 €	18,45 % other RCoF funding
98 656 177 €	41,45 % University of Oulu funding
26 691 689 €	11,21 % Business Finland Funding
30 855 521 €	12,96 % European Union Funding
9 421 671 €	3,96 % Company Funding
7 939 138 €	3,34 % Other Finnish Funding
848 699 €	0,36 % Other Foreign Funding
238 027 447 €	**Total Flagship Cash Funding**
281 212 661 €	**Total with external In-kind**
139 386 589 €	**58,56 % Competitive Funding**
145	**Companies Investing**

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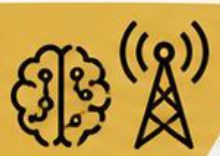
… the 6G Flagship is not ending …

Research Council of Finland

FLAGSHIP PROGRAMME

6G Flagship 2027 onwards: Five integrated research areas

1 AI-Native 6G and Agentic AI-RAN



- AI-native PHY/MAC and RAN control for autonomous networks
- Agentic AI for network optimisation and service orchestration
- Digital twins for data-driven decision making

2 Multimodal Sensing, Grounded World Models and Digital Twins



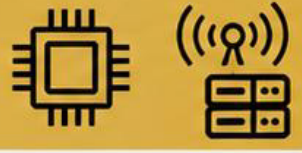
- Multimodal perception (RF, vision, LiDAR, etc.) and sensor fusion
- Grounded world models and real-time digital twins
- Ray tracing and synthetic data for AI-RAN

3 Resilient and Dual-Use 6G Systems



- Resilience from distributed and dual-use hardware
- Situational awareness and autonomous recovery
- Jamming resistance and low-power operation

4 Reconfigurable Intelligent RF, Sensing and Edge Hardware



- Reconfigurable antennas, transceivers and RF platforms
- Ultra-low-power AI and embedded inference
- AI-assisted hardware–algorithm co-design

5 Integrated 6G Experimentation, Digital Engineering and PoC Platforms



- Shared simulation–digital twin–hardware test network
- Integrated 6GTN, AI-RAN, multimodal sensing, ray tracing
- Cross-SRA demonstrations in AI-RAN, digital twins, resilience and TN/NTN

Shared Flagship logic: sense → connect → compute → orchestrate → validate



Thank you!

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