

CELTIC News 2/2024

The newsletter of EUREKA Cluster CELTIC-NEXT

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Achievements of the CELTIC-NEXT and Ambitions
and Upcoming Goals for 2025

Events
CELTIC 21st Anniversary Celebration at the Berlin
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Three Outstanding Projects in Green Networking,
Applications, and 6G Innovation



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Join the Industry-Driven Research Programme of next-generation communications for a secured, trusted, and sustainable digital society

CELTIC-NEXT Spring Call 2025 for Project Proposals – Deadline: 21 April 2025

Here is the opportunity to participate in CELTIC-NEXT, the industry-driven European ICT and telecommunications research programme under the umbrella of EUREKA. Do not miss the submission deadline for the next call for project proposals, on the 21 April 2025!

CELTIC-NEXT projects are collaborative private-public partnership R&D projects. All EUREKA member countries and associated countries can financially support them. More information on public funding and national contacts per country can be found on the CELTIC-NEXT Public Authorities Website. Please talk to your national contact early in the process.

Easy proposal process

Preparing and submitting a CELTIC-NEXT project proposal is easy. Just register via the CELTIC-NEXT online proposal tool, fill in the Web forms, and upload your proposal in pdf. Access to the proposal tool and to a proposal template is available via our Call Information page (<https://www.celticnext.eu/call-information>).

Benefits of participating in CELTIC-NEXT

- You are free to define your project proposal according to your own research interests and priorities.
- Your proposals are not bound by any call texts, as long as it is within the ICT/ telecommunications area see: CELTIC-NEXT Scope and Research Areas.
- CELTIC-NEXT projects are close to the market and have a track record of exploiting their results soon after the end of the project.
- High-quality proposals have an excellent chance of receiving funding, with an average success rate higher than 50 %.
- The results of the evaluation will already be known in **June 2025**.

If you have any questions or need help, do not hesitate to contact us; we would be pleased to support you.

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Back to the Future—A 21-Year Journey of Collaborative Innovation



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21 years of Innovation through collaboration

21 years in the life of any initiative is significant achievement as it shows that the goals, methods and achievements of the community are maintaining relevance and value for the community.

As a EUREKA cluster, the CELTIC community held their first call for projects in 2003, resulting in selection of 15 projects based on quality and relevance and were supported by the national authorities and launched.

Whilst, the current statistics show that, there have been over 175 CELTIC projects which have generated at least 650 patents and 1500 products and services. Besides, this work resulted in almost 1500 higher level degrees (PhD & MSc) and stimulated more than 4500 scientific publications. This is the power of Collaborative Innovation.

For 21 years the CELTIC-NEXT process has continued to evolve to meet the ever-changing research requirements of the ICT industries, related academics and vertical sector organisations and, more critically, the national interests of the EUREKA Member States. In fact, what the CELTIC-NEXT EUREKA community has learnt over the years is that this marriage of the industry needs with the priorities of national interest can achieve a high return on investment for the supporting parties. This Win-Win type of collaboration presents a sustainable model.



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Innovative Collaboration

However, we cannot assume things will always be the same. As we speak, new challenges in the way we prepare and do collaborative innovation have arisen in more recent times. Some involve the politics of the moment, having faster programs, and others raise security and sovereignty issues. Finding fair and practical ways to address such issues will test the industry players and the national authorities' joint ability to always find the common ground of mutual interest. But having recently participated in exercises where the interested parties sat down around a table to discuss what improvements we can make to increase the value and effectiveness of the EUREKA Cluster programs, I have no doubt solutions can be found. Authorities and Industry have a shared ambition to make the clusters programs better, more relevant and easier to operate for the future. This willingness to evolve innovatively on how we do collaborative innovation is the key to future success for all.

The future vision of CELTIC NEXT

If we look forward in even the next 10 years, we can expect that the communications infrastructure will have become even more pervasive, people will have ceased to notice how they are connected but they will be quite confident that the connectivity of the required quality will always be there when they need it. Similarly, our devices – from our phones to our cars - will have capabilities not just to serve our needs but to anticipate our future needs and make sure the data and communications services are there for us. Industry will be transformed with fully digitised systems modelling and managing just about every industrial process.

Behind all of these visions will be a set of people who will work with their international peers in a collaborative way to advance the technologies, improve the social sciences and ensure a sustainable future for all. CELTIC-NEXT will work on enabling this vision.

Looking forward to the next 21 years !!

Achievements of the CELTIC-NEXT and Ambitions and Upcoming Goals for 2025



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For CELTIC-NEXT, 2024 was a year of celebration and renewed successful innovation support and change.

Let's look together at what was achieved in 2024 and what we plan for 2025.

Looking back to 2024

2024 was a challenging year for many reasons. Joint collaborative innovation and knowledge exchange is one of the best weapons against obscurantism, pandemics and wars. Our ICT community is one of the best positioned to understand and support this. Cybersecurity, Resilience of Critical Infrastructures, and Sustainability... are topics to be fully supported by our ICT technologies and are ranked now as absolute priorities in the new world paradigm. The new flagship SUSTAINET goes along those strategic lines.

2024 was also a year of joyful, proud celebration! CELTIC turned 21 years old! This unique anniversary was celebrated in Berlin on July 2nd, 2024, during the 6G Berlin Conference under the new joint Canadian-German Presidency of Eureka. High-level representatives from our Industry and Ministries and Eureka's new President took the floor to share their support and enthusiasm for CELTIC throughout its history and in the coming years!

The EUREKA Network was under Türkiye's chairmanship from July 2023 to June 2024. Many thanks to Türkiye for the tremendous period, the extraordinary work achieved under its chairmanship, and the fruitful network meetings organised in essential locations in Türkiye. Türkiye is an important stakeholder of CELTIC-NEXT, being at the Public Authority and the ICT community levels, with a vibrant ecosystem and highly appreciated partici-

pants in the various CELTIC projects throughout the years!

On the 2nd of July, on the occasion of the CELTIC-NEXT's 21-year celebration, EUREKA publicly announced its new Presidency: a first in its history, two countries have taken over the Presidency of EUREKA from Türkiye: Germany and Canada!

The dual presidency of Canada and Germany is not only new in EUREKA's history, but it also reflects the overall will of the EUREKA Network to grow outside Europe and give central roles to countries outside of the European continent. This will increasingly open the door to global collaborative innovation projects. Technologies developed within such a framework can better address global challenges, such as the UN SDGs like sustainable development and circular economy.

Status of the Eureka Clusters' Programme

All Eureka Clusters have been brought under the 2021-created Eureka Clusters' Programme (ECP). A Multi-Annual Plan was defined and implemented over the last three years. This plan runs from July 2021 to June 2025. Eureka Public Authorities and the Clusters are currently analysing together the results of this first period of the ECP to derive an improved programme framework for the coming years. CELTIC-NEXT is closely collaborating with the other Clusters and the Public Authorities to represent the interests of our ICT Community best.

This new presidency is essential for the EUREKA Clusters as it is mandated to establish the new ECP public-private partnership framework arrangement between the Eureka Countries and the five Clusters of the Eureka Clusters' Programme. Intensive work has started to establish the new base of the ECP to reach better support for beneficiaries and all stakeholders around the table. The five Clusters have elected CELTIC-NEXT's Director to represent them and lead the work on the Eureka Clusters Programme Partnership Arrangement document and annexes. The target is to sign the final document during the last Eureka Network HLG/HLR meeting in June 2025. This is a challenging task as it will define the Eureka Clusters Public Private Partnership arrangements for the upcoming multi-year period.

We will soon collect our community's feedback on our strategic research and innovation roadmap (SRIA) as we are currently conducting an update process. The target is to provide this new SRIA as input to our participation in the new ECP period starting July 2025. The duration of the new ECP is still under discussion but it is already decided to make it longer than the original four years. We will incorporate this new roadmap in our Launch Events and Proposers' Brokerage Days, starting second half 2025, to allow consortia to propose innovative projects in a more extensive variety of technologies, services, applications, and verticals. This reinforces our traditional bottom-up approach. We will continue to run our Spring and Autumn Calls based on our successful legacy. This is a unique selling point of CELTIC as a Eureka Cluster compared to other international funding schemes.

Running Calls

When this edition of the CELTIC-NEXT's News is published, the Autumn Call 2024 will have closed. Therefore, it is already time to announce the Spring Call 2025! The Spring Call 2025 will be launched in December 2024 with an online event. The Proposers' Brokerage Day will occur in a physical presence at the beginning of February 2025. The precise date and location will be announced via our Newsletter and website. The submission will close on the 25th of April 2025 for a labelling decision before mid-June 2025. Forecasted possible start dates for labelled projects would be the second half of 2025. We can also happily say that more countries support CELTIC-NEXT.

Flagships

Goodbye and thank you AI-NET, hello SUSTAINET!

AI-NET Flagship and its three vertical projects delivered tremendous successes, greatly impacting several fundamental KPIs. Those projects ended in July 2024, except for AI-NET-ANTILLAS, which will still pursue some work until the end of 2025.

A tremendous final Closure Event occurred on July 2nd, 2024, collocated with the 6G Conference Berlin. AI-NET received the CELTIC-NEXT Best Innovation Award. Please check the Events section of the CELTIC-NEXT



Xavier Priem, CELTIC Director, Opening the CELTIC 21st Anniversary Celebration

website (<https://www.celticnext.eu/three-winners-at-the-celtic-21st-anniversary-celebration-at-berlin-6g-conference/>).

“AI-NET achieved outstanding achievements in the area of 6G enabling technologies complementing 5G solutions with a focus on edge-centric compute and AI, shaping new secure services and application platforms. Excellent results for a sustainable computing platform supporting AI on top of the communications system have been successfully demonstrated. AI-NET showed highly competitive solutions, for example, in the area of energy-efficient edge data centres. Data centre solutions are close to the best hyper scaler solution that reached power-aware effectiveness of 1-1.2 PUE. That clearly outlines the competitive edge that the project has achieved to meet global challenges for Europe’s future prosperity and competitiveness.

Scientific excellence in future 6G Technologies and the achievement of ambitious KPIs to secure future markets that can enable 6G Technologies have been shown.

Overall, 316 scientific publications in leading international journals and conferences supported by 184 PhD and Master Thesis have been accepted and successfully finished. High business outcomes are expected due to the 72 IPR, Open Source, and Standards contributions. With 77 Proof of Concepts, 70 keynotes, and 43 hirings, the project underlines its excellence even further.

The project worked on timely solutions concerning security, sustainability, performance and cost reduction of AI in future telecom networks. Energy Metering measuring energy consumption in real industry environments was only one

part of the project next to hybrid IT management solutions and incremental manufacturing. Optimized power distribution in synergy with the network management and the lightweight software layer solutions can be used as a first entry point for the Telecom customer to access a Telco cloud. New AI algorithms that showed federated learning (FL) next to unlearning, analysing overfitting parametrization next to smart clustering solutions promised data saving in large scale once deployed on a computing platform.”

In the meantime, the new flagship called SUSTAINET was labelled for its initial application in June 2024. Its central thematic is focusing on network resilience, energy efficiency, sustainability, high-performing end-to-end networks, and network security.

SUSTAINET high-level description: “In the midst of global crises and geopolitical challenges, Europe is charting its course towards a digital, sustainable future. However, with its share of the global ICT market declining, urgent actions are required to ensure technological sovereignty. This project addresses this multifaceted challenge by focusing on network resilience, energy efficiency, sustainability, high-performing end-to-end networks, and network security.

Achieving seamless interconnection of digital systems, essential for future high-performance communication networks, demands research in ICT hardware and control software. The transition towards a “Digital Society” necessitates increased dependence on ICT for power supply control, emphasising the need for resilient, scal-

able networking technologies combined with the support of new services such as cognitive and complete context awareness.

Network resilience is paramount in such interconnected networking for critical infrastructures and requires new concepts to ensure communication continuity during errors or disasters. Such networking will also call for secure networks with robust cybersecurity measures to combat evolving threats.

Furthermore, network sustainability is vital for realising a climate-neutral future. Telecommunications networks must prioritise connectivity and serve as platforms for a sustainable society. Operators must adapt to fluctuating renewable energy availability, transitioning from consumers to prosumers in the energy market.

Collaborative R&D efforts are imperative to achieve these objectives and regain technological sovereignty. Government support and industry initiatives must converge to drive innovation in key technologies, fostering industrial cooperation and joint R&D initiatives.

This project proposes a holistic approach, integrating research in frictionless network performance, resilience, security, and sustainability to propel Europe towards a sustainable, technologically sovereign future.”

The CELTIC-NEXT office is happy to connect with potential new additional partners interested in joining the flagship during the ramp-up phase. Please contact us at office@celticnext.eu.

Outlook for 2025

2025 will be the year of the new flagship(s) implementation, a strong collaborative effort from all stakeholders, consortia participants, the CELTIC-NEXT Office, and the involved Public Authorities!

2025 should be a year of growth, thanks to the upcoming new ECP framework arrangement, the renewed trust and support of existing partnering Public Authorities, and new incoming funding countries like Brazil and Chile!

➤ Further information

Stay tuned by visiting our Call Calendar page: <https://www.celticnext.eu/call-calendar/> and/or by subscribing to our Newsletter under <https://www.celticnext.eu/news-subscription/>

<https://www.celticnext.eu/celtic-21st-anniversary-celebration-at-the-berlin-6g-conference-2024-2nd-to-4th-july-2024/>

CELTIC 21st Anniversary Celebration at the Berlin 6G Conference 2024 – 2nd to 4th July 2024



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The CELTIC-NEXT 21st Anniversary was co-located with the Berlin 6G Platform Event at BCC in Berlin between the 2nd and 4th of July 2024!

On the morning of the 2nd of July 2024, CELTIC-NEXT celebrated its 21 years of existence on the scene of international cooperation fostering innovation in the ICT domain and its application verticals. During this day, opening keynotes were organised including a welcome keynote by the Chairman David Kennedy, followed by the Eureka Chair Dr Rudolf Haggenueller celebrating Eureka in CELTIC, BMBF Ministry delegate Frau Dr Tina Kluwer.

All these high-level speakers from BMBF, Eureka and the Industry shared the floor of the plenary auditorium and expressed themselves on CELTIC, its great achievements and their vision of its future.

The session was followed by a Panel discussion on "Future Persuasive Networks – and how to build them" moderated by David Kennedy, CELTIC-NEXT Chairman.

This panel discussed the visions shared by 5 panellists:

- > Mr Engelbert Beyer (BMBF, Dept 51),
- > Mikko A. Uusitalo (Coordinator 6G Flagship Hexa-X II),
- > Johannes Springer (DTAG),
- > Maria Guta (ESA), and
- > Hans Schotten (6G Platform Germany)

The context of the discussion was the following:

During the last 5 years, the Communications network, because of Corona and other factors, became recognised as a facilitator for changing not just how we work – but as a core enabler for a whole new structure of our lives. The new era

communications networks will be pervasive, providing everything to everyone at any time – for the traveller, it will be continuous connectivity, for the remote worker, it will be additional processing, for the home entertainment, it will be high quality throughput at a low price and for the professional sectors, it will be a combination of processing, AI, low latency, low power and edge computing as and where they need it.

The question is how will this be provided? Clearly the new network must be highly software based and



Welcome keynote by Rudolf Haggenueller on the Eureka Joint Presidency



Panel discussion on Future Persuasive Networks

infinitely customisable. It must be flexible and easily repurposed and or expandable. In fact, it must be intelligent and capable of learning how to supply what the users want before even they themselves know. And it must be cost/resources and power efficient. And fully automatised while secure and trustable because it remains explainable and controllable.

After that a CELTIC-NEXT Awards Ceremony was organised, rewarding 3 projects in the fields of green networking, applications & services and outstanding innovation.

We wrote a dedicated article on this occasion available on page 8.

CELTIC-NEXT Autumn Call 2024 Proposers' Brokerage Day – 18th September 2024 at Digital Catapult in London



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On Wednesday, 18th September 2024, CELTIC-NEXT held its Proposers' Brokerage Day for the Autumn Call 2024 at Digital Catapult in London. This event brought together innovators and experts to explore opportunities in next-generation communications that contribute to a sustainable digital society. Attendees were invited to engage with the CELTIC-NEXT Cluster and explore funding opportunities for groundbreaking R&D projects. The event featured keynotes, panels, and project pitches.

In the morning, Dr. Dritan Kaleshi from DIGITAL CATAPULT LONDON opened the day with a presentation on "5G and Digital Infrastructure SONIC Labs & UKTIN Founder" followed by Xavier Priem, Director of the CELTIC-NEXT Cluster who introduced the cluster.

These presentations were followed by a keynote from Kostas Katsaros, Head of Technologies at Digital Catapult, on "Towards a sustainable connected world".

The exchange at the event helped participants to gain insights into national funding opportunities, such as presentations from Innovate UK, CDTI Spain, and Bpifrance.

The morning session wrapped up with a panel moderated by Richard Foggie highlighted the business impacts of successful CELTIC projects.



Panel discussion on Business impacts of successful CELTIC projects at the Proposers Brokerage Day 2024

The day engaged the stakeholders with innovative pitching session moderated by Christiane Reinsch, CELTIC-NEXT Project Coordinator, this was the occasion for **11 project proposers to pitch their new project ideas**, offering them visibility and potential future collaboration.

Post pitches, a networking time was organised for attendees to network with national funding authorities and project proposers to foster collaboration.

The event concluded with a guided tour of Future Networks and SONIC Labs, offering a closer look at the innovations driving the future of communications.

Celebrating Innovation: CELTIC Awards Honor Three Outstanding Projects in Green Networking, Applications, and 6G Innovation



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At the CELTIC 21st Anniversary Ceremony co-located with the Berlin 6G Platform Event at BCC in Berlin, Germany on 2nd of July 2024, 3 projects won the CELTIC award for their outstanding work. One of these projects have been awarded for their excellence in the areas of green networking, and another one for excellent achievements in the category of applications and services. The Third was honoured with the Innovation Award for its outstanding innovations and high number of key performance indicators.

The awards were presented to the winners by the CELTIC-NEXT Chairperson Mr. David Kennedy from Eurescom as well as by the representative of the Public Authority Mrs Juana Sanchez (CDTI, Spain).

CELTIC-NEXT Innovation Award: AI-NET – Accelerating digital transformation in Europe by Intelligent NETWORK automation

The Innovation Award 2024
was handed over to the overall project
leader Mr Achim Autenrieth, ADTRAN,
Germany

AI-NET has achieved remarkable progress in 6G enabling technologies, complementing existing 5G solutions with a focus on edge-centric compute and artificial intelligence. These advancements are seen as instrumental in shaping new, secure services and application platforms. Notably, AI-NET has successfully demonstrated excellent results in developing sustainable compute platforms that support AI on top of the communications system. Additionally, AI-NET has introduced highly competitive solutions, particularly in the area of energy-efficient edge data centres. These solutions are nearing the performance of leading hyper-scaler technologies, achieving a power usage effectiveness (PUE) in the range of 1.0 to 1.2 PUE.

This clearly highlights the competitive edge the project has achieved in addressing global challenges, contributing to Europe's future prosperity and competitiveness. The project has demonstrated scientific excellence in the area of future 6G technologies, while also meeting ambitious key performance indicators (KPIs) crucial to securing future markets for 6G deployment.

In total, 316 scientific publications in leading international journals and conferences, supported by 184 PhD and Master's theses, have been successfully accepted and completed. A strong business impact is anticipated from 72 contributions to intellectual property rights (IPR), open-source projects, and standards. The project's excellence is further emphasized by 77 Proof of Concepts, 70 keynote presentations, and the hiring of 43 professionals.

The project focused on timely solutions for enhancing security, sustainability, performance, and cost efficiency of AI in future telecom networks. This included energy metering in real industrial environments, hybrid IT management solutions, and incremental manufacturing processes. Furthermore, optimized power distribution, in synergy with network management, and lightweight software layer solutions offer telecom customers an effective entry point to access telco cloud services. New AI algorithms featuring federated learning (FL) alongside unlearning techniques, coupled with overfitting parameter analysis and smart clustering solutions, have demonstrated significant potential for large-scale data savings when deployed on a computing platform.

CELTIC Excellence Award for Green Networking: AI4Green – Artificial Intelligence for Green networks

The Excellence Award 2024 in the category
green networking
has been handed over to the project leader
Mrs Cicek Cavdar from KTH, Sweden

AI4Green addresses the critical need for energy-efficient and advanced algorithms that span the entire telecommunications ecosystem, from radio access and core networks to data centers and storage. With a focus on adapting to new architectures and integrating smart grid technologies, the project has been pivotal in pushing for sustainable solutions.

It set ambitious energy-saving targets of 30-40%, yet exceeded these goals through AI-driven enhancements in energy savings and fault detection. The outcomes of AI4Green range from pioneering research to tangible products and contributions to standardization efforts.





Awardees of Innovation Awards 2024

High energy savings were consistently achieved through advanced techniques, such as implementing AI-driven sleep modes that adaptively manage network resources. AI4Green's data analysis leveraged vast datasets, including environmental monitoring (radar data and signal propagation), operator network metrics (traffic, deployment, and performance), and mobile user data (crowdsourced insights and usage patterns). Testing on live operator networks provided real-world validation, with a significant pilot conducted in one of Istanbul's busiest areas. Here, AI-assisted sector and carrier shutdowns demonstrated 14% energy savings, with an additional 10% improvement over traditional model-based approaches for selective sector deactivation.

In scenarios with fluctuating demand, such as large gatherings or events, AI-enabled mobility prediction was instrumental in optimizing energy usage. By forecasting crowd movements in real-time, energy-saving modes could be activated selectively across more than 50% of cells for extended periods—achieving substantial savings post-event, such as five hours after a major football game in Istanbul's city center.

AI4Green also advanced novel architectures like cell-free massive MIMO atop virtualized cloud RAN. Here, intelligent access point clustering and selective deactivation with AI reduced energy usage, particularly through 5G base stations with large antenna arrays configured to exploit advanced sleep modes. These methods achieved energy savings surpassing 30%, demonstrating the power of combining AI with deep-sleep functionalities in modern telecom networks.

AI also enabled efficient fault detection, eliminating the need for extensive drive testing by utilizing robust data analytics and predictive algorithms. By integrating AI into core operations, AI4Green has contributed essential solutions to building energy-efficient, sustainable telecommunications networks for the future.

CELTIC-NEXT Excellence Award for Services and Applications: 5GPerfecta – 5G and next-generation mobile Performance compliance testing assurance

The Excellence Award 2024 in the category of applications and services has been handed over to the project coordinator Mr Antonio Cuadra Sánchez, Minsait, Spain

The project made significant contributions to analyzing and supervising 5G network performance, developing technologies for 5G monitoring, and overseeing 5G services, applications, and measurement devices. With 5G deployment under way and ongoing demand for insights and optimizations, the project is of high relevance to real-world business operations for telecom operators and service providers. Its impact is underscored by its early alignment with the practical needs of 5G deployment, making it particularly valuable for operators looking to maximize network efficiency and service quality from the outset.

A balanced consortium drove the project's success, bringing together operators, vendors of 5G equipment, small and medium enterprises, and academic institutions. This diverse

partnership enabled a broad spectrum of use cases relevant to business, covering essential 5G service categories—enhanced broadband, mission-critical applications, remote machine operations, and IoT services.

The project's outcomes reflect high quality, as shown by 86 contributions to the broader 5G technology landscape through 5G PERFECTA, which facilitates the dissemination of key innovations. These contributions include 37 publications in prestigious international journals, conferences, and symposiums, seven currently under review, one PhD thesis, nine MSc theses, 10 contributions to standards bodies (ITU-T, VQEG, and TM Forum), and participation in 22 exhibitions and events.

This high perceived quality has been reinforced by direct feedback from seven major exhibitions and events, including the CELTIC-NEXT Event at EUCNC 2019 in Valencia, the VQEG Meeting in Shenzhen, AfricaCom 2019, 5G Forum Day in May 2021, 5G World London 2020, and the joint workshop between CELTIC-NEXT projects in October 2020. These events provided valuable platforms for industry feedback, demonstrating the project's influence and relevance in advancing 5G standards, innovation, and business applications globally.

Giant Steps Toward 6G: Secure and Lightweight Network Automation at the Telco-Edge

AI-NET Closing event. Co-located with 6G Platform Event Berlin, Germany



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On July 2, 2024, the CELTIC flagship project AI-NET marked a significant milestone in Europe's journey toward secure and autonomous networking at the telco-edge, presenting its achievements at the 6G Platform Event in Berlin, Germany. Hosted at the Berlin Congress Center, the 6G Platform event gathered prominent leaders from research, industry, and government to discuss the future of communications technology in the 6G era. The afternoon session was dedicated to AI-NET's Closing Event, where high-level representatives and project leaders highlighted AI-NET's impact on the European digital landscape and the advancements it has fostered for telco-edge automation.

Opening and moderating the Closing Event, Mr. David Kennedy, CELTIC Chairman from Eurescom, Germany, set the tone by emphasizing AI-NET's pivotal role in future 6G development. Ms. Heike Prasse, Head of Kommunikation und Sicherheit digitaler Systeme at Germany's Federal Ministry of Education and Research (BMBF), welcomed attendees by stressing the importance of network automation within the evolving 6G ecosystem, noting that AI-NET positions Europe as a leader in this field. Representing the UK, Mr. Tom Kirkham, Innovation Lead for Future Network Technologies at Innovate UK, praised the role AI-

NET has played in advancing UK companies and research institutes that joined under the AI-NET ANIARA subproject in 2019, citing its early contributions to edge automation as a cornerstone for the future. From Finland, Mr. Heikki Uusi-Honko, Chief Advisor for Development and International Activities at Business Finland, celebrated the substantial impact Finnish partners have made through their involvement in the AI-NET subproject ANTILLAS. This introductory session was followed by the presentation of success stories from each of the three AI-NET subprojects: AI-NET-PROTECT, AI-NET-ANTILLAS, and AI-NET-ANIARA, highlighting AI-NET's overall influence in enhancing Europe's competitive advantage in networking technology.

Mr. Peter Elbers, CELTIC Core Group Member and Vice President of Advanced Technology at ADTRAN, Germany, underlined the critical role of resilient infrastructure in countering future threats, expressing pride in the AI-NET PROTECT team's achievement of surpassing Key Performance Indicators. Mr. Volker Ziegler, Senior Technology Advisor at Nokia, followed with insights into how these advancements are integral to Nokia's broader strategy. Mr. Paolo Monti elaborated on the competitive edge that AI-NET ANIARA has given its participants, while Mr. Achim Authenrieth, Director of Advanced Technologies at ADTRAN, Germany, highlighted the cooperative success of the flagship project and its subprojects.



AI-NET closure event attendees

The Closing Event concluded with "Spotlight Talks" and an engaging panel discussion led by Mr. David Kennedy, CELTIC-NEXT Chairperson. The panel, featuring prominent voices such as Mr. Petri Jehkonen, Director of Strategic Programs at Xiphera, Finland; Mr. Peer Wichmann, Chief Information Security Officer at Wibu-Systems, Germany; and Mr. Piotr Pawłowski, Vice President and CTO of MedVc, Poland, provided attendees with forward-looking perspectives on AI-driven network automation and security at the telco-edge cloud.

AI-NET's Closing Event highlighted the strides Europe has taken toward secure, autonomous 6G network technologies, solidifying the foundation for future innovations in secure telco-edge cloud architecture.



Ms. Heike Prasse from Germany Federal Ministry of Education and Research (BMBF)



Panel discussion on AI-driven Network Automation and Security

CELTIC-NEXT AI-NET ANIARA Highlights

Compute and AI enablers for an intelligent and sustainable 6G platform



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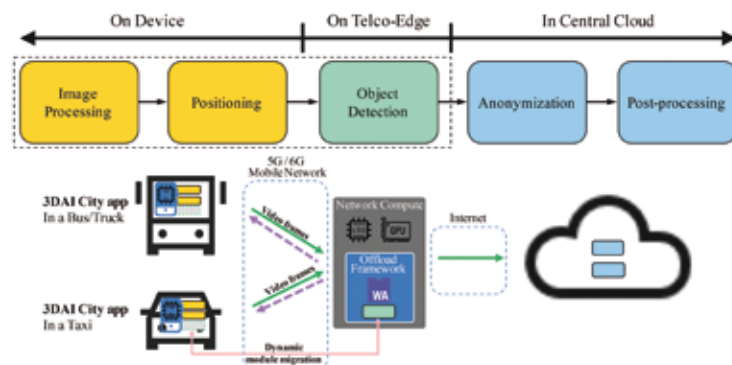


Figure 1: Dynamic device offloading for a SmartCity app



Modern society expects increasingly advanced digital applications to be available anytime and anywhere. To make future mobile networks ready in terms of performance and functionality for use-case scenarios like Smart Cities and Smart Manufacturing, new computation and Artificial Intelligence (AI) enablers need to be provided for future mobile networks to transform them into a communication platform offering services that go beyond communication.

AI-NET-ANIARA is a flagship CELTIC-NEXT project where three EU countries were involved including Sweden, Germany, and UK. The project ended in February 2024. This innovative project provided several technology enablers and showed exciting demonstrations of these technologies that will change the world of communication. The project goal was to complement the evolution of 5G with crucial technical enablers towards an intelligent and sustainable 6G platform, offering services beyond pure communication, including compute & AI.

Project results:

- › Carrier grade AI technologies for telecom edge automation, and intelligent management in support of services with guarantees on performance and energy consumption.
- › Novel AI concepts such as robust and reliable federated learning, reinforcement learning for service mesh, intelligent feature selection, and transfer learning.
- › MLOps infrastructure for AI. ANIARA extended the Feature store solution by ANI-

RA partner Hopsworks to support real-time model serving all the way to the edge.

- › Execution runtime to process edge applications using WebAssembly. A dynamic computational offloading solution was developed and its potential as a future 6G service has successfully been demonstrated on the SmartCity application by ANIARA partner Univrses.
- › A modified Kubernetes scheduler enabling the allocation of workloads based on the energy state of nodes and/or devices. This modification improved the energy efficiency of the system. Furthermore, the project designed a new resource scheduling mechanism for Kubernetes that can closely match the time-varying traffic profile of users. This led to a 30% improvement in resource efficiency.
- › Designed, built, and operated two versions of Aniara Edge node data center demonstrators. These demonstrators include a fresh air cooling approach, where the cooling system is highly integrated in the Edge node design. An intelligent power system ensures that the servers are provided with enough power also during periods of limited external power supply and a photovoltaic system to reduce the amount of power from the grid, improve the sustainability and maximise robustness.
- › Developed new edge processing devices deployed in Stellantis manufacturing sites that monitor energy consumption and machine condition. This data is then transmitted wirelessly to, for example, optimize the energy consumption in the paint shop.

Conclusions:

CELTIC-NEXT project AI-NET ANIARA provides technical enablers for an intelligent and sustainable 6G platform in line with the ITU-R IMT



Figure 2: ANIARA Edge data center



Figure 3: Closer look of the stack

2030 recommendations. AI-NET ANIARA project designs and builds robust and energy efficient mini edge datacenter infrastructure. For efficient use of distributed edge resource, improvements presented the existing resource orchestration methods. Moreover, to support automated operations of 6G networks and their functions, several studies have been performed on scalable distributed intelligence methods. Finally, AI-NET ANIARA contributed with innovative service ideas that go beyond pure communication, increasing future network platforms usage vector by compute & AI services exposed to applications. These include privacy preserving AI/data services, a real-time online features store for edge applications, as well as a dynamic device offloading service to improve the experience of mobile devices and apps.

Overall, AI-NET-ANIARA was successfully living up to its project promises of accelerating digital transformation by the efficient use of a highly integrated and flexible edge infrastructure that is programmable across all its components.

CELTIC-NEXT Spring Call 2025 Opens Soon: A New Opportunity to Drive Next-Generation Communications!



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The CELTIC-NEXT Spring Call 2025 is on the horizon, presenting its bi-annual opportunity for organizations to contribute to ground breaking projects in **next-generation communications** and help build a more sustainable digital society. The Spring Call 2025 will officially open soon, with a proposal deadline set for **25th of April 2025**. Selected proposals will receive notifications by **June 2025**, marking the beginning of a transformative journey in digital innovation.

CELTIC-NEXT bottom-up Calls foster innovation through collaboration by enabling research and development projects with national public funding opportunities across a vast network of partners, including large industries, SMEs, start-ups, research institutions, and academia. With a proposal success rate of around 50-60%, CELTIC-NEXT creates a supportive environment to accelerate impactful digital technologies for the future.

Upcoming Events for the 2025 Spring Call

As in previous years, CELTIC-NEXT will organize events to support organizations in developing innovative proposals and forming international partnerships. Two main events, online and in-person will be organised to maximize the chance to meet potential consortium partners, learn about funding opportunities, and get insights on topics of interest: a **Launch Event** and a **Proposers' Brokerage Day**.

These events are ideal for networking, connecting with Public Authorities, and receiving guidance on using the Proposal Portal and Brokerage Tool.



Attending these events provides a unique window into the CELTIC ecosystem, allowing you to discuss ideas with Public Authorities, the Group of Experts, and established partners in the field.

Why Apply to the CELTIC-NEXT Spring Call 2025?

- › **Access National Public Funding:** CELTIC-NEXT enables funded R&D projects through partnerships across Europe and beyond, aligning with government priorities for digital advancement.
- › **Flexible, Low Overhead Management:** CELTIC projects are designed with adaptable structures that can range from €1M to €70M and from 2 to over 50 partners, with durations of 24 to 36 months.
- › **Collaborative Innovation:** The CELTIC community is open to a variety of stakeholders, including organizations outside EUREKA countries, ensuring a rich, international mix of expertise.

Steps to Join the Call

- › **Register** for the Online Submission Tool to submit or update your proposal until the deadline.
- › **Explore Proposal Ideas** and use CELTIC-NEXT's networking tools to find partners.
- › **Reach Out** to the CELTIC Office for any questions to facilitate your involvement and success in the Call.

Connect with the CELTIC-NEXT Community

CELTIC-NEXT is discussing essential and exciting issues on Twitter and LinkedIn.

The latest interviews with the growing CELTIC-NEXT Community and the latest project videos can be found on our YouTube Channel.

To stay updated on CELTIC-NEXT initiatives, **subscribe to our newsletter** and follow us on social media.

Don't miss out on this chance to drive forward the future of digital communications!



› Further information

<https://www.celticnext.eu/call-information/>



About CELTIC-NEXT

CELTIC-NEXT is the Eureka Cluster for next-generation communications enabling the inclusive digital society. CELTIC-NEXT stimulates and orchestrates international collaborative projects in the Information and Communications Technology (ICT) domain. The CELTIC-NEXT programme includes a wide scope of ICT topics based on new high-performance communications networks supporting data-rich applications and advanced services, both in the ICT sector and across all vertical sectors.

CELTIC-NEXT is an industry-driven initiative, involving all the major ICT industry players as well as many SMEs, service providers, and research institutions. The CELTIC-NEXT activities are open to all organisations that share the CELTIC-NEXT vision of an inclusive digital society and are willing to collaborate to their own benefit, aligned with their national priorities, to advance the development and uptake of advanced ICT solutions.

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