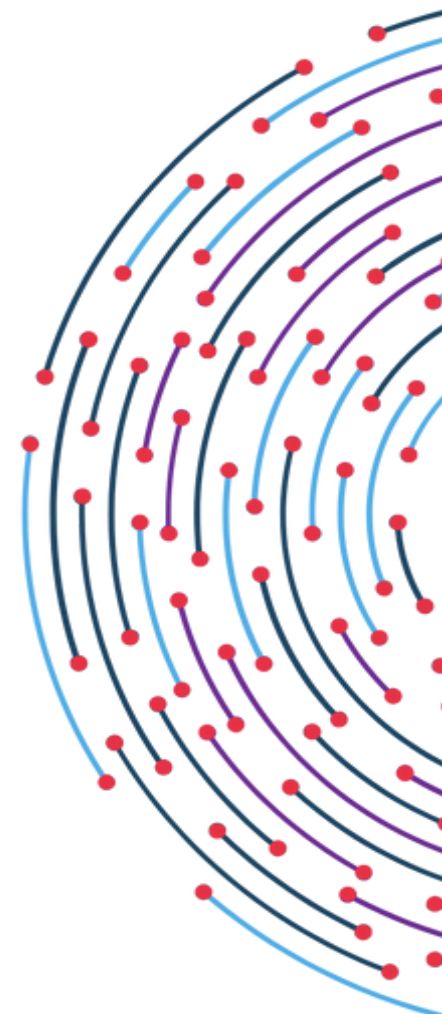


TWINRELECT

Twinning for excellence in reliable electronics



D4.2

DELIVERABLE REPORT

D4.2: 1st Report on Networking Events

WP4: Enhancement of Networking Capacity



Document information

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1. Introduction

1.1 Purpose and Scope of the Deliverable

TWIN-RELECT aims to strengthen UTH's role in reliable electronics by combining joint research with a rich portfolio of networking, training, and dissemination activities that connect it with other European and international organisations. A central element of this strategy is Work Package 4 "Enhancement of Networking Capability", which foresees the organisation of business forums, webinars with related projects, scientific workshops, special conference sessions, a final symposium and visits to leading research centres, involving academic, industrial and institutional stakeholders at local, regional and international level.

Within this framework, the 1st Report on Networking Events (D4.2) provides a structured overview of the networking activities implemented during the first project period and their contribution to the project objectives. It describes the events organised by UTH and the advanced partners, summarises their main scientific and collaborative outcomes, and assesses their impact on UTH's networking capacity, stakeholder engagement, and preparation for long-term collaboration and joint project applications as planned in WP4 and WP5.

1.2 WP4 Objectives and Project Goals

The objectives of Work Package 4 (WP4), titled *Enhancement of Networking Capability*, are centered on establishing sustainable collaborations and strengthening UTH's role within the European and international research landscape. MAN, as the leading partner of WP4, plays a crucial role in guiding and supporting these networking activities.

The key objectives are:

- To strengthen UTH's scientific reputation through active participation in local, regional, and international research networks.
- To establish strategic collaborations with leading partners and stakeholders in academia and industry.
- To enhance UTH's expertise and skillset in developing cross-layer methodologies and tool flows for reliability analysis.
- To communicate project goals and outcomes effectively, fostering visibility and cooperation in the field of reliable electronics.

The project goals include:

- Organizing specialized scientific events (two business forums, workshops, webinars, and a final symposium) jointly with partner institutions.
- Creating opportunities for knowledge exchange through visits to leading research centers such as ESA, CERN, and DLR.

- Hosting business forums to align research outputs with industrial needs and strengthen academia-industry partnerships.
- Conducting scientific workshops and webinars on fault analysis methodologies and reliability-related projects.
- Ensuring long-term networking sustainability through ongoing evaluation, visibility measures, and dissemination of results.

The rest of this document is structured as follows. Section 2 provides an overview of the networking activities and their alignment with the Grant Agreement plan. Section 3 summarises the networking events conducted in 2025. Section 4 evaluates their scientific, collaborative, and stakeholder impact. Finally, Section 5 presents the conclusions and outlines the next steps for the remaining networking actions.

2. Overview of Networking Activities

2.1 Comparison Between Planned and Implemented Activities

The information below provides an overview of the progress of **WP4 networking activities**. To improve clarity, the networking events are divided into two categories:

1. **Events organized by TWIN-RELECT**, which directly contribute to the WP4 KPIs ([Table 1](#)).
2. **Events in which TWIN-RELECT participated**, organized by external partners, which enhance visibility, collaboration, and knowledge exchange, but do not count toward WP4 KPIs ([Table 2](#)).

[Table 1](#) presents the WP4 networking activities organized by TWIN-RELECT that have been implemented so far, including business forums, webinars, scientific workshops, and special conference sessions. Additional events, including remaining workshops, business forums, webinars, visits to research centers, and the final symposium, are scheduled for 2026 and 2027. [Table 2](#) provides an overview of participation-only events. These activities have strengthened collaboration, increased project visibility, and facilitated knowledge exchange within the European and global research community, but they are not included in the WP4 KPI counts. Overall, the tables confirm that WP4 networking activities are progressing broadly according to plan, with no major deviations affecting the achievement of expected WP4 objectives.

Networking event	KPI	Target	Status
Organisation of Business Forums (WP4.2)	Number of 2-day business forums in Volos	2 Business forums over the project duration	1st completed (25–26 September 2025); 2nd pending
Webinars with Related Projects (WP4.3)	Number of webinars with related projects/Twinning initiatives	3 Webinars in total (2 + 1 two-day webinar)	1st completed (7 November 2025); 2nd and 3rd pending
Organization of Scientific Workshops (WP4.4)	Number of 3-day scientific workshops in Volos	3 Workshops on reliable electronics	1st completed; 2nd and 3rd pending
Organization of Special Conference Sessions (WP4.6)	Number of special sessions at renowned international conferences	2 special sessions (e.g. DDECS, RADECS)	1st completed (DFTS 2025); 2nd Special Session proposal submitted to VTS 2026 accepted
Visits to Reputable Research Centers and Labs (WP4.7)	Number of distinct research centres visited	At least 3 centres (e.g., ESA, CERN, DLR)	Planned for 2026
Final Symposium (WP4.5)	Organisation of an international final symposium in Volos	1 final 3-day symposium with proceedings	Planned for final project year (Months 34–36)

Table 1: Networking Events organized by TWIN-RELECT (WP4 KPIs)

Networking event	Organiser	Date/Status	Description / Impact
1st TAICHIP Winter School: "Reliable Hardware Infrastructure for Upcoming AI Chips"	IHP – Leibniz Institute for High Performance Microelectronics	Completed: 10–12 February 2025	TWIN-RELECT participated; the team presented research, engaged with experts, and visited IHP labs, strengthening collaboration and gaining insights on AI chip reliability, performance, and infrastructure.
TUZ Workshop 2025	TUZ Workshop	Completed: 25 February 2025	Prof. Christos Sotiriou represented TWIN-RELECT by presenting the UPSET framework and engaged in technical discussions with experts from the field.
COIN-3D Scientific Workshop and Summer School	COIN-3D	Completed: 30 April 2025	UTH presented TWIN-RELECT and trained on 3D integration, advanced packaging, and reliability.
TAU 2025 Workshop	TAU	Completed: 2 May 2025	Prof. Christos Sotiriou presented UPSET and TWIN-RELECT's framework for analyzing and mitigating SETs in VLSI circuits.
Greek Space Tech Forum 2025	<ul style="list-style-type: none"> - Hellenic Association of Space Industry (HASI) - Hellenic Space Technologies and Applications Cluster (si-Cluster) of Corallia 	Completed: 01-02 July 2025	TWIN-RELECT attended; participants engaged in technical discussions, established contacts with numerous stakeholders from industry, academia, and policy, and promoted innovation in dependable electronics for space and other high-reliability sectors.
Online Twinning Info Day	AIDA4EDGE	Completed: 15 September 2025	TWIN-RELECT participated; the event brought together 11 Twinning initiatives for exchange, collaboration, and sharing best practices. Represented by Prof. Christos Sotiriou.

Table 2: Networking Events participated in by TWIN-RELECT

2.2 Role of Partners and Coordination by UTH

In 2025, the networking activities combined events organized by the University of Thessaly with events hosted by advanced partners, ensuring that all institutions were actively involved both as organizers and as contributors. University of Thessaly took the lead in planning and implementing the [First Scientific Workshop](#), the [First Business Forum](#), and the [First Webinar](#), all held in Volos and coordinated by UTH. In these events led by the University of Thessaly, experts from CNRS, IHP, and the University of Manchester participated on-site or virtually, delivering keynote speeches and technical or administrative presentations tailored to the focus of each event, thereby strengthening links between UTH, the partners, and external stakeholders.

Coordination and Partner Contributions in the First Business Forum

The First Business Forum (25–26 September 2025) served as a flagship networking and dissemination event, with UTH hosting leading industrial partners, entrepreneurs, and stakeholders from the Greek and European technology ecosystems. IHP contributed its expertise in fault-tolerant circuit design for safety-critical applications and showcased advanced radiation testing capabilities. The forum featured keynote presentations on emerging technologies such as CMOS 2.0 scaling paradigms, AI-driven design automation, and advanced system architectures, attracting many companies and organizations, including semiconductor design firms, academic institutions, startup incubators, and government bodies. Prof. Christos Sotiriou and the UTH team coordinated the overall programme, positioning TWIN-RELECT as a key hub for discussions on reliable electronics in the European innovation landscape.

Coordination and Partner Contributions in the First Webinar

The First Webinar (7 November 2025), titled "Bridging EU Innovation in Reliable Electronics Design," was organized by UTH as a forum for cross-project collaboration and knowledge exchange. UTH presented TWIN-RELECT's objectives and progress to an international audience, while coordinating participation from five related European projects and initiatives—two Twinning projects (AIDA4EDGE, COIN-3D), two Horizon research projects (RADNEXT, RESIST), and one Chips JU project (HCCC). This event demonstrated the project's commitment to building synergies within the broader European electronics reliability research community. The webinar facilitated direct dialogue between project leads through presentations and a dedicated round table discussion on research collaboration, best practices in project management, and pathways for long-term institutional cooperation across the EU. UTH also participated actively in the AIDA4EDGE Twinning Info Day (15 September 2025), where Prof. Christos Sotiriou presented TWIN-RELECT alongside five other concurrent Twinning projects, further underscoring UTH's role as a key institution in the Horizon Europe Twinning ecosystem.

Coordination and Partner Contributions in the First Scientific Workshop

The First Scientific Workshop (21–23 July 2025), titled "Fault Modeling and Techniques for Fault Tolerance Analysis," was organized by UTH in Volos and served as a major scientific dissemination and knowledge-transfer event in the first reporting period. UTH coordinated the scientific program and contributed original research through presentations on probabilistic SET analysis using STA principles and demonstrations of the UPSET tool—a UTH-developed SET analysis framework based on Static Timing Analysis.

All three advanced partners made substantial scientific contributions. IHP delivered keynote presentations by Prof. Milos Krstic on AI and Microelectronics Reliability and by Dr. Fabian Luis Vargas on Silicon Lifecycle Management using cross-layer sensing, demonstrating IHP's advanced methodologies for fault tolerance design. CNRS, represented through the University of Montpellier's collaboration, led demonstration sessions showcasing PredicSEE and ECORCE—two critical open-source tools for Single Event Upset (SEU) simulation and TCAD modeling developed by the RADIAC team. The University of Manchester contributed expertise through Prof. Davide Bertozzi's presentation on reliability analysis of hardware accelerators through cycle-based simulation, addressing fault-resilient design for emerging neuromorphic and AI systems. The workshop also featured a dedicated demonstration session for the EMBER tool—a joint development by IHP and the University of Manchester for RTL-level fault injection and resilience analysis—showcasing collaborative tool development among partners.

The workshop attracted leading international experts through keynote presentations from industry and space agencies, including Dr. Issam Nofal (IROC Technologies) on soft error simulation challenges, Dr.

Vasiliki Gogolou (Aristotle University of Thessaloniki) on radiation detection front-ends, Prof. Hussam Amrouch (Technical University of Munich) on algorithm-technology co-optimization for brain-inspired edge AI, and Dr. Thomas Borel (European Space Agency) on ESA's approach to radiation challenges and reliable testing. Through this comprehensive scientific program, UTH established itself as a central venue for advancing fault modeling methodologies and fostering long-term collaboration among European research institutions specializing in reliable electronics design.

2.3 Impact of Networking Activities on UTH's Enhancement

Impact on Scientific and Technical Capacity

The scientific networking activities in 2025—specifically the [First Scientific Workshop at the University of Thessaly](#)—contributed directly to strengthening UTH's scientific skills and research profile in reliable electronics, in alignment with Objectives 2 and 4 of the Grant Agreement. By coordinating and hosting the First Scientific Workshop, UTH staff and doctoral candidates engaged directly with advanced methods for reliability modeling, EDA tools, and experimental techniques for fault analysis and mitigation. UTH also presented original research through presentations on probabilistic SET analysis and demonstrations of the [UPSET tool](#), a UTH-developed framework. This direct engagement with leading international experts and partner institutions strengthened UTH's technical foundation in design-for-reliability methodologies and established a platform for continued collaboration on complex research challenges in reliable electronics. The scientific interactions fostered through this workshop support the planned increase of joint publications with partner institutions and enhanced participation in future EU research projects.

Impact on Management and Administration Capacity

Participation in targeted capacity-building events, including the [Research Staff Conference in Manchester \(“Futureproof your career - Collaboration, Development & Sustainability”\)](#) and the [TAICHIP Winter School \(“Reliable Hardware Infrastructure for Upcoming AI Chips”\)](#), had a direct and measurable impact on the management and administration capacity of UTH. During the Research Staff Conference, UTH staff attended dedicated lectures in Manchester and engaged in focused discussions on proposal preparation, career development, and the management of EU-funded research projects. In parallel, participation in the TAICHIP Winter School enabled UTH staff to exchange experiences and best practices related to the coordination and implementation of European research actions. These interactions strengthened UTH's understanding of effective research management procedures, supported Objective 3, and enhanced institutional capacity to manage complex, multi-partner projects and improve competitiveness in future European funding calls.

Impact on Networking, Visibility, and Stakeholders

From a networking perspective, the [First Business Forum](#) and the [First Webinar](#) organized by UTH, together with participation in webinars with related projects, significantly expanded UTH's contacts with companies, research institutions, and related Horizon Europe projects, as targeted in WP4 and Objective 4. These networking activities increased UTH's visibility at both local and international levels, contributed to the growth of the Stakeholders Network, and supported the strategic KPI that 3 thematic workshops, 2 business events, 3 webinars, 2 special sessions, and a final symposium will collectively raise UTH's

reputation and attractiveness as a centre of excellence in reliable electronics. The positioning of UTH as a host institution for major networking events strengthened its standing within the European research ecosystem and demonstrated its capacity to coordinate high-impact scientific and industrial engagement activities.

3. Summary of Conducted Networking Events

3.1 First Scientific Workshop – UTH

From 21 to 23 July 2025, the first scientific workshop of the TWIN-RELECT project, titled “Fault Modeling and Techniques for Fault Tolerance Analysis”, was held in Volos, hosted by the University of Thessaly. The workshop aimed to advance research in fault modeling and reliability analysis, foster new collaborations among partner institutions and external stakeholders, and strengthen UTH’s scientific and innovation capability in the field of reliable electronics. The program included five keynote lectures, four demonstrations of tools, one roundtable discussion, and interactive sessions with students and early-career researchers. In total, the event gathered over 30 participants and presented 13 key talks.

A variety of presentations from project partners and invited keynote speakers is included in the workshop program, providing a comprehensive approach to the challenges of designing resilient electronic systems. In particular, the talks covered topics such as SET characterization and probabilistic analysis, asynchronous design approaches to mitigate soft errors, reliability of AI circuits, reliability analysis of hardware accelerators, and silicon lifecycle management with on-chip sensors. Furthermore, keynote lectures offered broad insights into the reliability of contemporary systems. Specifically, Dr. Vasiliki Gogolou from Aristotle University of Thessaloniki presented AI-assisted methodologies for radiation-hardening of analog circuits, Prof. Hussam Amrouch from Technical University of Munich provided optimized algorithms for efficient AI chips in edge computing, Prof. Rene Krenz-Baath from UAS TH-Wildau analyzed data structures used in EDA applications for efficient circuit representation, and finally, Dr. Thomas Borel from the European Space Agency outlined ESA’s testing methodologies and strategies to address radiation challenges in space electronics.

Furthermore, a demo session was held, including the presentation and description of the innovative tools developed by the project partners and utilized in the research conducted within the TWIN-RELECT framework.

Specifically, the tools demonstrated were:

- **UPSET**: a SET analysis tool based on STA, developed by UTH
- **EMBER**: a C++-based fault injection framework, designed by University of Manchester and IHP
- **PredicSEE**: A Monte Carlo-based SEU and SET cross-section prediction tool, developed by CNRS
- **ECORCE**: TCAD simulator, developed by CNRS.

Another vital part of the scientific workshop was the roundtable discussion on “Current and Future Status of Space Electronics”, as well as the presentation by UTH’s IEEE Student Branch and the StarBound student team. In the former, the discussion focused on the significance of European independence in space electronics, emphasizing the trade-offs between technologies, cost, and long-term mission requirements. Prof. Krenz-Baath, Dr. Andjelkovic, and Dr. Kuentzer shared valuable insights into the

current situation and prospects of modern systems and space electronics. Both the panel and the audience participated actively, raising critical points regarding supply chain challenges, geopolitical factors, reliability strategies, certification standards, and sustainability in advanced technologies. In the latter part, students presented their projects and initiatives, showcasing the contribution of young researchers to the development of an innovative and sustainable research effort.

The workshop’s opening and closing sessions are captured in the following images. The first picture shows Prof. Christos Sotiriou and Georgios Satmoulis during the opening session, welcoming participants and setting the tone for the event. The second picture features the entire TWIN-RELECT team along with invited speakers at the closing session, highlighting the collaborative spirit and engagement of all attendees.



Picture 1: Opening of the Scientific Workshop



Picture 2: Closing of the Scientific Workshop

3.2 First Business Forum – UTH

The 1st Business Forum “Shaping the Future of Reliable Electronics” was successfully held on September 25-26, 2025, at the University of Thessaly (UTH) in Volos, Greece. The event was jointly organized under the framework of the TWIN-RELECT project and in close collaboration with the COIN-3D project, bringing together academia, research institutions, and industry leaders to discuss technological advancements and collaboration opportunities in the field of reliable electronic systems.

The Business Forum aimed to serve as a dynamic platform for knowledge exchange, policy dialogue, and networking between academic researchers, industrial representatives, and policymakers. It provided an opportunity to explore the intersection of reliability engineering, semiconductor innovation, and emerging AI-driven design methodologies, aligning with the broader objectives of the European Chips Act and the EU’s strategy for technological sovereignty. The two-day event included keynote speeches, industrial presentations, and interactive sessions, focusing on technological developments, reliability challenges in integrated circuits, and the translation of academic research into industrial impact. Participants included members of TWIN-RELECT and COIN-3D consortia, students and faculty from UTH, as well as representatives from major Greek and European companies operating in the semiconductor, space, and electronics sectors.

A key aspect of the Forum was the cooperation between the TWIN-RELECT and COIN-3D projects, which demonstrated how cross-project collaboration can enhance the scope of innovation. The partnership

between the two initiatives extends beyond the organization of the Forum, promoting collaborative dissemination activities, co-authored scientific publications, and shared industrial outreach efforts, boosting Europe’s investigation and industrial ecosystem in advanced electronics. Presentations from academic and industrial experts covered subjects from advanced CMOS scaling and EDA tool innovation to radiation effects in electronic systems, AI-enabled design automation, and next-generation chiplet architectures.

The keynote sessions provided high-level scientific and technological insights:

- Dr. Dimitris Fotakis discussed “Place & Route Flow: Challenges and Opportunities for Parallelism and AI,” outlining how artificial intelligence and parallel computing can revolutionize electronic design automation, especially for large-scale, high-performance systems.
- Dr. Ioannis Katsavounidis offered a comprehensive overview of “Full Reference Video Quality Metrics,” connecting advanced multimedia processing with energy-efficient and reliable hardware architectures.
- Dr. Moritz Brunion showcased the concept of the “CMOS 2.0 scaling paradigm,” highlighting how three-dimensional integration and advanced materials can extend Moore’s Law while ensuring device reliability and manufacturability.

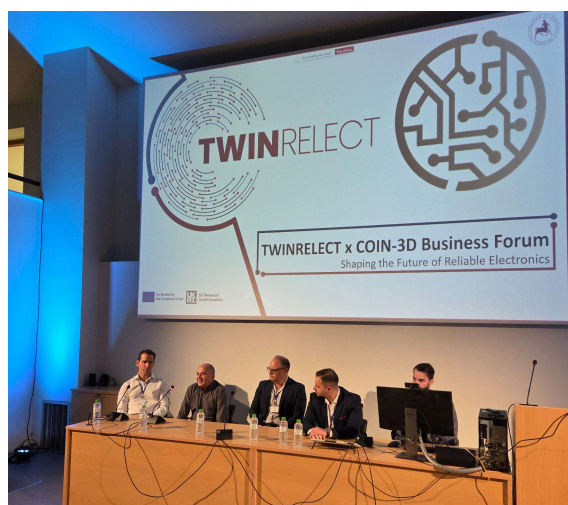
Several industrial and research organizations presented their current work and technological directions, offering valuable perspectives on innovation, reliability, and commercialization in the European semiconductor landscape.

- Ansys, now part of Synopsys, emphasized integrated design and multiphysics simulation solutions for reliability evaluation in modern semiconductor products.
- IHP presented research activities on fault-tolerant circuit design and radiation-hardened technologies, underscoring their relevance to safety-critical applications.
- Trimsignal introduced its advances in dynamic frequency boosting and LiDAR systems, reflecting how high-performance and energy-efficient signal processing supports defense and space applications.
- Thess IC, a leading Greek fabless semiconductor company, presented its progress in RISC-V–based processor design and its contribution to Europe’s technological autonomy and semiconductor independence.
- Space Network Greece showcased the role of new ecosystem hubs in connecting national and international actors in the growing commercial space economy.
- On the second day, HETiA, Kenotom, ArgoSemi, Corallia–ESA BIC Greece, and Smart Silicon delivered in-depth presentations on their R&D strategies, highlighting synergies between academic excellence and industrial innovation.
- The StarBound student team from UTH introduced their aerospace project, showcasing the active participation of students in the innovation ecosystem fostered by TWIN-RELECT and COIN-3D.

These presentations provided a comprehensive view of reliable electronics, providing the power of Greek and European industry in contributing to next-generation systems. Beyond the technical content, the particular event set a strong emphasis on networking and building collaboration. The round table session and the networking coffee breaks enabled participants to exchange experiences and explore

joint research directions, industrial partnerships, and future EU funding opportunities. Representatives from regional authorities and European research organizations examined methods for sharing knowledge from academia to industry, supporting innovation procedures, and supporting Greece's position in the European electronics ecosystem. The participation of students and new researchers was also particularly influential, as it promoted awareness and training in the fields of reliability and hardware design, supporting the long-term sustainability of research excellence within the University of Thessaly.

The 1st Business Forum successfully fulfilled its mission of promoting scientific dialogue and industrial collaboration. It supported the vision of TWIN-RELECT and COIN-3D to build a sustainable ecosystem of excellence in reliable electronic systems, bridging the gap between research, education, and innovation. Overall, the event promoted valuable connections among academia, industry, and collaborative projects, aiming to support European semiconductor research and innovation.



Picture 3: Invited speakers during the panel session of the 1st Business Forum – TWIN-RELECT

The Business Forum's key moments are captured in the following images. The first picture shows the panel of invited speakers during the event, highlighting the expert discussions that shaped the forum's agenda. The second picture features Sotiris Bantas presenting HETiA's activities, highlighting the valuable contributions of industry partners to reliable electronics and innovation. The third picture shows the entire TWIN-RELECT team at the conclusion of the forum, emphasizing the collaborative spirit and engagement of all participants.



Picture 4: Sotiris Bantas presenting HETiA’s R&D the 2nd day of the 1st Business Forum.



Picture 5: The participants at the closing of the activities on the 1st Business Forum, Volos, Greece.

3.3 First Webinar – UTH

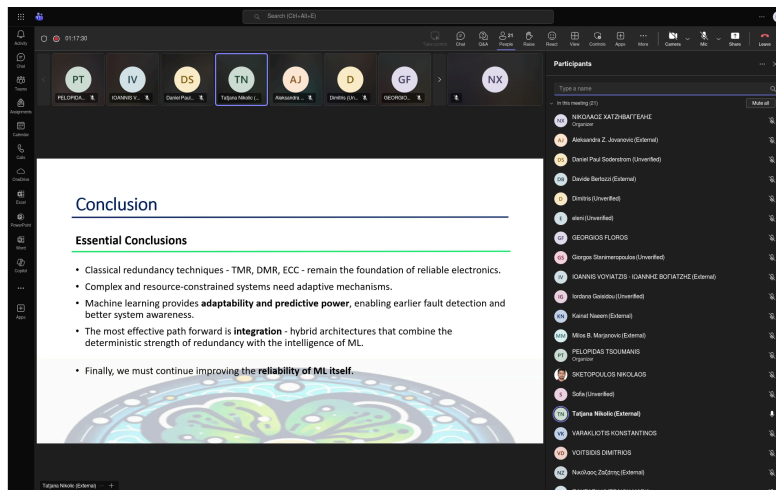
Experts from leading European institutions participate in the first TWIN-RELECT webinar “**Bridging EU Innovation in Reliable Electronics Design**”, providing insights about reliable electronics design, edge AI, 3D integration, and radiation effects to support the semiconductor ecosystem. In other words, the webinar aimed to foster knowledge exchange and innovation within the European research community in microelectronics. The webinar was held on November 7th, 2025, and organized under the TWIN-RELECT project, inviting other EU projects to contribute to this informative event.

- **TWIN-RELECT – Twinning for Excellence in Reliable Electronics**

The primary target of TWIN-RELECT is to support research in reliable electronic systems and to strengthen collaboration among UTH, IHP, CNRS, and the University of Manchester. Its scientific and research goal is to develop a cross-layer reliability EDA flow. This will be achieved by combining device-level SET/SEU modelling, SPICE-based cell characterization, gate-level reliability analysis and optimisation, and system-level fault-injection to evaluate architectural fault propagation and masking. In particular, Prof. Christos Sotiriou described that the analysis performed so far highlights high soft-error susceptibility of clock networks, ML-based SET prediction with ~3% error, and reliability effects in dynamic neural networks. The project also supports the research management, training, and international visibility.

- **AIDA4Edge - Twinning for Excellence in Adaptive Edge AI**

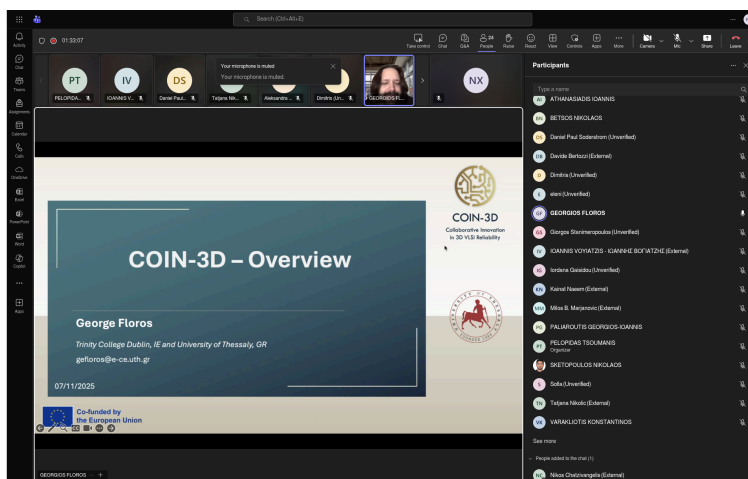
AIDA4EDGE is to strengthen networking between the Coordinator (FEEUNI) and the advanced partners (IHP, UoM and UNIFE) from European institutions in order to enable FEEUNI to reach scientific and innovation excellence in the field of Edge AI. The presentation of Professor Tatjana Nikolić focused on adaptive AI accelerators for edge devices that combine classical redundancy techniques (TMR, parity, ECC) with machine-learning-based detection. In general, ML methods are used to identify abnormal behaviour in hardware blocks, enabling predictive mechanisms and reducing hardware cost compared to full redundancy. The project promotes a hybrid reliability strategy that merges robust classical approaches with intelligent, data-driven monitoring.



Picture 6: Presentation of AIDA4Edge to the TWIN-RELECT Webinar

- **COIN-3D - Collaborative Innovation in 3D VLSI Reliability**

The COIN-3D project investigates reliability challenges in 2.5D/3D chiplet systems, taking into consideration how thermal, electrical, and mechanical factors interact. As Assistant Professor George Floros showcased, the achievements obtained so far include an open-source 3D design-space exploration framework built on OpenROAD, electromigration-aware optimisation using physics-based and ML-based prediction models, as well as a system-level thermal and reliability framework that connects architecture simulators with electromigration analysis. The project also runs summer schools, exchanges, and workshops to build expertise in advanced packaging and 3D VLSI reliability.



Picture 7: Overview Presentation of COIN-3D

- **RADNEXT – RADiation facility Network for the EXploration of effects for indusTry and research**

RADNEXT, led by CERN, provides funded Transnational Access to a wide network of radiation facilities (ions, protons, neutrons, gamma). According to Daniel Paul Soderstrom presentation, the project has processed nearly 500 proposals, delivered many hours of beam time, and

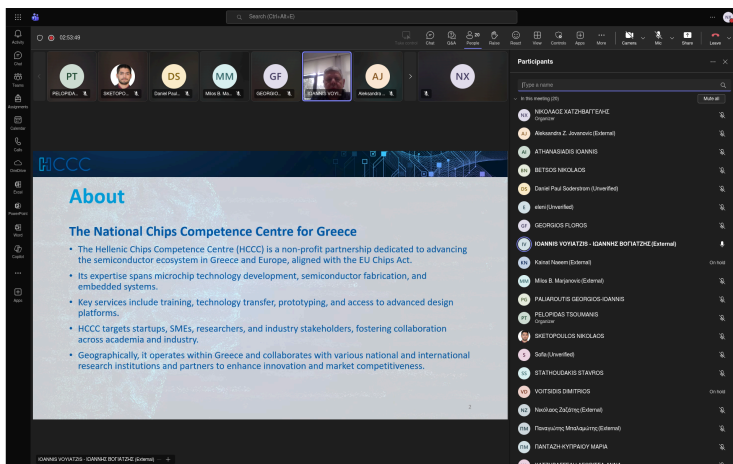
produced publications, open datasets, webinars, and standards-related work. The RAD2030 initiative is the continuation of this project, with the ultimate goal of improving IC functionality by continuing and expanding these activities in the coming years

- **RESIST: A Cross-Layer Approach to Enhancing Electronic System Reliability**

Its primary goal is to establish sustainable collaboration between IHP and ELFAK in the field of electronic system reliability. The project focuses on fault characterization and modeling across device, circuit, and system levels, preparing joint research proposals, and developing a long-term collaboration strategy. RESIST combines experimental studies and simulations to improve the understanding and reliability of electronic components, circuits, and systems. Within the project, two workshops were organised, complemented by research visits and seminars. Scientifically, the team has evaluated different digital multiplier architectures in 130 nm CMOS, analysing delay and power under varying voltage, temperature, and drive strength, with future work targeting approximate multipliers and radiation-induced effects.

- **HCCC – Hellenic Chips Competence Centre**

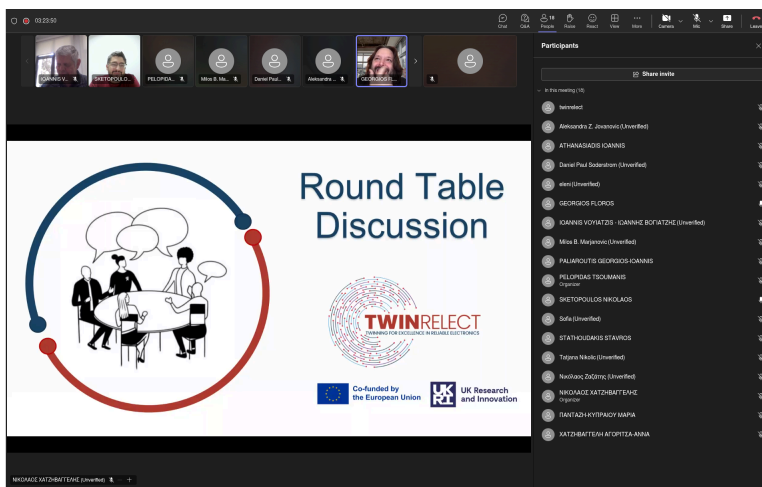
Professor Ioannis Voyiatzis presented the HCCC, a national non-profit partnership coordinated by HETIA and aligned with the EU Chips Act, bringing together 16 partners from Greece. This project plans to strengthen the national semiconductor ecosystem by offering training, prototyping services, knowledge transfer, skills development, and business support activities, while supporting innovation and collaboration between industry and academia. The Professor also provided information about the University of West Attica and its engineering departments, emphasizing the role of the institution within the HCCC consortium.



Picture 8: Prof. Ioannis Voyiatzis presenting the HCCC

This informative event underlined Europe's effort through projects focused on reliable electronics, AI for edge systems, 3D integration, and radiation effects, alongside initiatives that strengthen infrastructure, training, and industry contribution. Finally, in the discussion session, funding challenges, especially for non-EU countries such as Serbia, were discussed, underlining that access and progress of EU projects are challenging but achievable when strong partners are involved. The role of national and European chip competence centres was highlighted as key for strengthening local ecosystems, skills, and cooperation

between industry and academia, while underlining that Europe remains highly competitive in research quality compared to the US and China.

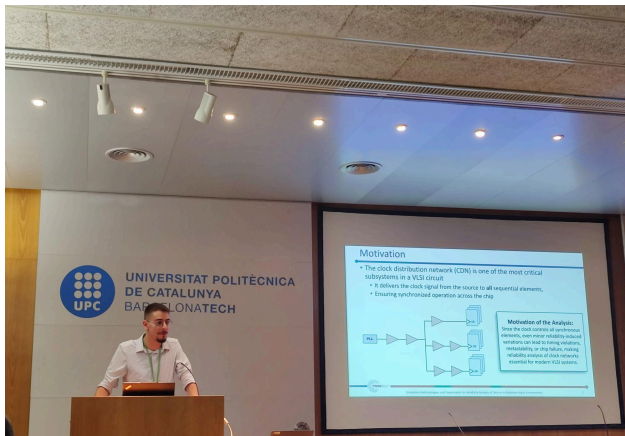


Picture 9: Round Table Discussion at the end of the TWIN-RELECT Webinar

3.4 Special Session in DFT 2025

The TWIN-RELECT project's commitment to advancing reliability research in harsh environments was further demonstrated through the acceptance and organization of a specialized technical session at the [38th IEEE International Symposium on Defect and Fault Tolerance in VLSI and Nanotechnology Systems](#). The special session, titled "Simulation Methodologies and Experiments for Reliability Analysis of Devices in Radiation Harsh Environments," brings together three complementary presentations that showcase the project's multidisciplinary approach to understanding and mitigating radiation-induced faults in modern electronic systems.

The session addresses three critical research areas within the radiation hardening and fault tolerance field. The first presentation, led by Nikolaos Chatzivangelis from the University of Thessaly, introduces a novel simulation-based methodology for analyzing Single Event Transients (SETs) in clock distribution networks. By integrating the PREDICSEE tool—developed at the University of Montpellier for accurate transient waveform generation—with the UPSET SET analysis framework developed at UTH, the work enables precise modeling of SET propagation and its impact on clock network timing behavior and Soft Error Rates. This integrated approach combines fine-grained component characterization with gate-level timing evaluation, providing designers with powerful insights into clock network robustness for aerospace, automotive, and mission-critical applications.



Picture 10: Nikolaos Chatzivangelis presenting at DFT2025

The second presentation, presented by Nikolaos Zazatis from the University of Thessaly, addresses an emerging frontier in AI reliability: the vulnerability of Dynamic Neural Networks (DyNNs) to hardware faults. Unlike conventional static neural network architectures, DyNNs adapt computation to input complexity for energy efficiency in edge AI deployments. The work introduces a cross-layer analysis framework to investigate how MAC-unit level faults in state-of-the-art accelerators such as NVDLA propagate through the network, affecting not only inference accuracy and latency but also prediction confidence. By mapping hardware fault models derived from custom simulators back into PyTorch-based DNN implementations trained on CIFAR-10, the research marks a critical first step toward dependable dynamic AI systems.



Picture 11: Nikolaos Zazatis presenting at DFT2025

The third presentation, presented by Wesley Grignani from the University of Montpellier, presents experimental results from neutron irradiation campaigns of a hardened RISC-V System-on-Chip (HARV-SoC) implemented on an SRAM-based FPGA. The work evaluates radiation effects on both processing logic and configuration memory, offering a comparative analysis with flash-based FPGA implementations. Conducted at the ChipIrr neutron radiation facility, this experimental campaign provides critical empirical data on the impact of memory technology choices on system robustness—a key consideration for avionic and space-grade applications.



Picture 12: Wesley Grignani presenting at DFT2025

The special session is jointly organized by leading researchers from four institutions: Prof. Christos Sotiriou (University of Thessaly), Dr. Luigi Dilillo (University of Montpellier, RADIAC team leader), Dr. Marko Andjelkovic (IHP – Leibniz Institute for High Performance Microelectronics), and Prof. Davide Bertozzi (University of Manchester). This cross-institutional organization reflects the collaborative spirit of TWIN-RELECT and the broader European research community's commitment to addressing reliability challenges in next-generation electronic systems.

4. Evaluation and Impact of Networking Events

4.1 Scientific and Collaborative Outcomes

The networking activities carried out in 2025 enabled systematic sharing of knowledge on reliable electronics between the University of Thessaly and the advanced partners, covering fault modelling, STA-based reliability analysis, experimental techniques, and design-for-reliability methodologies. Joint participation in training weeks, workshops, business forums, and external events helped align the research priorities, identify complementary expertise, and define initial ideas for follow-up joint proposals and long-term scientific collaboration, in line with the project objectives and the planned Scientific Collaboration Strategy and Joint Project Applications in Work Package 5. During the events, extensive discussions took place on how to combine the partners' complementary expertise in fault modelling, experimental characterisation and EDA tools to strengthen the TWIN-RELECT reliability workflow and better align ongoing research activities across institutions.

In terms of scientific outcomes, the partners jointly shaped a publication roadmap that includes conference and journal papers on DyNN reliability, NoC testability, asynchronous NoC reliability, UPSET optimisation, EMBER, and ECORCE/PredicSEE-based radiation simulations, together with a PhD thesis and already-accepted works at ASYNC and IWASI. These outputs consolidate the project's methodology for reliability analysis of accelerators and networks-on-chip and demonstrate how joint experiments, modelling activities and tool developments translate into concrete, peer-reviewed scientific contributions.

On the collaborative side, structured bilateral and multilateral activities were defined with CNRS, Manchester and IHP, including internships, staff visits and shared tasks on irradiation test preparation, ECORCE/PredicSEE simulations, SPICE-based SET and aging analysis, fault-tolerance methods, and ML models for soft-error and aging prediction. These collaborations underpin a joint reliability workflow spanning from device-level characterisation and sensor design to accelerator-level analysis and mitigation, and they also serve as a basis for future joint funding proposals under initiatives such as RADNEXT and related calls.

Networking and collaboration further materialised through mobility and training actions, such as planned internships of UTH students at CNRS and IHP, specialist lecture attendance, participation in RADNEXT training, and inclusion of the 2025 visits to UTH under Task 2.4 for student and staff training. Additional events, including a research-staff conference in Manchester, a training school in MAN, the RADECS 2026 booth, and plans for DFTS 2027 in Greece, extend the project’s community-building impact and reinforce the long-term scientific network around reliable electronics.

Finally, joint experimental campaigns were prepared, notably an irradiation test campaign where RISC-V and NoC demonstrators equipped with multipurpose aging/SEU-masking sensors will be implemented on FPGAs and evaluated under heavy-ion, TID and HTOL conditions within RADNEXT. Comparative experiments (e.g. different RISC-V implementations, neuromorphic versus standard NoCs, synchronous versus asynchronous fabrics, and assessment of aging sensors) are designed as shared endeavours that will yield common datasets, methodologies and publications recognised as project outputs when aligned with EU acknowledgment and open-access requirements

4.2 Participation in Related Events

Participation in related external events has complemented the core TWIN-RELECT networking activities and significantly broadened UTH’s visibility and collaborations in reliable electronics. Attendance and contributions to these events allowed UTH staff and early-stage researchers to present TWIN-RELECT, gain up-to-date knowledge, and establish links with related EU projects and scientific communities.

At the [TAICHIP Scientific Workshop/Winter School 2025](#), organised at IHP within the TAICHIP Twinning Project, UTH participants followed lectures and hands-on sessions on advanced hardware reliability, AI accelerators and design methodologies, and presented the TWIN-RELECT objectives and planned tool-flow for reliable electronics design. This participation strengthened bilateral links with IHP and other TAICJIP partners, and provided a platform to discuss synergies between the two twinning actions in terms of training formats and future joint research.

During the [TUZ Workshop 2025](#) on Test Methods and Reliability of Circuits and Systems in Germany, TWIN-RELECT was represented through a keynote presentation by Prof. Christos Sotiriou, director of the UTH lab ([CASLab](#)). The keynote focused on the challenges posed by Single Event Transients (SETs) in digital circuits and introduced the UPSET SET-analysis engine as a practical tool for analyzing and mitigating SET-related reliability issues, thereby showcasing one of the core technical outcomes of UTH’s research in radiation-tolerant electronics.

At the [TAU 2025 Workshop](#), held on May 1–2, 2025, in Seaside, California, TWIN-RELECT was represented through a presentation by Prof. Christos Sotiriou. The presentation introduced the [UPSET](#)

analysis and optimization framework for VLSI circuits, which enables the study and mitigation of Single Event Transients (SETs) using static timing analysis and in-place optimization techniques. Presented in the session on glitches, soft errors, and asynchronous circuits, the work highlighted ongoing research activities within TWIN-RELECT aimed at improving the reliability and robustness of modern electronic systems.

In the [COIN-3D Scientific Workshop and Summer School](#), held in Volos and linked to the [COIN-3D Project](#), UTH staff and students participated in lectures and tutorials on 3D integration, advanced packaging and reliability of heterogeneous systems, while also presenting TWIN-RELECT. This event directly supported the project's aim to position UTH as a regional hub in reliable electronics by attracting international speakers to Volos and by connecting TWIN-RELECT with a broader microelectronics and packaging community. An additional outcome of the project's participation in this event was the initiation of discussions on co-organising the 1st TWIN-RELECT Business Forum.

TWIN-RELECT also attended the [Greek Space Tech Forum](#), a national-level event bringing together stakeholders from academia, research centres, industry, and public bodies active in space technologies and applications. Participation in the forum enabled UTH to engage with the Greek space technology ecosystem, explore potential application domains for TWIN-RELECT outcomes, and establish contacts with industrial and institutional actors interested in dependable electronics for space and aerospace systems. This presence contributed to strengthening UTH's visibility at the national level and supported the project's broader goal of linking research excellence with innovation and real-world applications.

On 15 September 2025, UTH participated in the [AIDA4EDGE Twinning Info Day](#), an online cross-project networking event hosted as part of the broader Horizon Europe Twinning ecosystem. Prof. Christos Sotiriou presented TWIN-RELECT alongside eleven other Twinning projects spanning electronics, biofilm engineering, materials science, and data systems, showcasing the complementarities between projects and their shared focus on building scientific capacity across European research institutions. The event included a dedicated discussion session on grant management, open science practices, risk management, and reporting requirements, providing UTH with insights into best practices from peer institutions. UTH's participation in this event increased the project's visibility within the wider Horizon Europe Twinning landscape and opened channels for future joint activities and coordinated dissemination on reliable electronics design and innovation across complementary research fields.

5. Conclusions and Next Steps

5.1 Summary of Achievements

The three major networking events organized by UTH in 2025 (shown in [Table 3](#)) collectively strengthened the university's standing as a reliable host and coordinator of high-level scientific and industrial engagement activities. By organizing and coordinating these events, UTH demonstrated its capacity to convene leading international experts, industry stakeholders, and related Horizon Europe projects. These events showcased UTH's scientific capabilities in reliable electronics design, particularly through the presentation of original research tools (UPSET) and methodologies developed. The positive reception and broad participation from advanced research institutions, industry partners, and public

authorities have enhanced UTH's reputation as an emerging center of excellence in electronics reliability and design automation within the European research landscape.

These networking activities directly support the achievement of key performance indicators outlined in the Grant Agreement. The three completed events contribute to the target of organizing "3 thematic workshops, 2 business events, 3 webinars, 2 special sessions and a final symposium" to raise UTH's reputation and attractiveness in the field. The expansion of UTH's stakeholder network—encompassing companies, research institutions, space agencies, industry clusters, and related Twinning projects—aligns with Objective 4 (WP4) to increase visibility and foster long-term collaborations. Furthermore, the scientific outcomes and collaborative pathways established through these events support the broader project goal of boosting UTH's scientific and innovation capacity through strategic networking with advanced European partners, as foreseen in Objectives 1 and 2.

Event	Type	Main Audience/Stakeholders	Contribution to UTH's Reputation	Contribution to Outreach
First Scientific Workshop	Scientific Workshop	International researchers, partners (IHP, CNRS, UMAN), ESA/industry experts	Positioned UTH as a capable host of high-level scientific events in fault modeling and reliability, showcasing in-house tools (UPSET) and original research.	Expanded UTH's scientific network with new contacts from ESA, industry, and universities, opening paths for future joint research and publications.
First Business Forum	Business Forum	Companies, startups, clusters, public authorities, student team	Strengthened UTH's image as a bridge between academia and the semiconductor/space industries and as a regional hub for reliable electronics.	Increased visibility in the Greek and European industrial ecosystem, broadened the stakeholders network, and created contacts for internships, collaborations, and future joint proposals.
First Webinar	Webinar with Related Projects	Related Projects (AIDA4EDGE, COIN-3D, RADNEXT, RESIST, HCCC) and wider research community	Enhanced UTH's profile within the Horizon Europe Twinning community as an active coordinator able to convene multiple related projects.	Opened channels for coordinated dissemination and potential co-organised activities with other Twinning initiatives, extending UTH's reach beyond its immediate consortium.

Table 3: Implemented Networking Events – Reputation and Outreach Impact

5.2 Upcoming Networking Events

In 2026, the WP4 networking agenda will continue with the organisation of the 2nd Scientific Workshop and the 2nd Business Forum in Volos, as well as the 2nd Webinar with related projects, all led by UTH and supported by the partners (see [Table 4](#) for an overview of planned events).

The partners' proposal to organise the “RELECT 2026: International Workshop on Reliable Electronic Systems Design” as an official Fringe Workshop within the [31st European Test Symposium \(ETS 2026\)](#) in Crete, Greece (May 2026) has been accepted. The ETS is a recognised forum in the field of reliable electronics and annually incorporates such Fringe Workshops as an integral component of its programme. Organising the event as part of ETS 2026 will substantially enhance its reach and impact by engaging a larger audience of stakeholders and experts already convened on-site, thereby enabling expanded knowledge exchange and networking opportunities beyond those achievable at a standalone event in Volos. The workshop will include an open Call for Papers, inviting submissions from researchers across Europe and internationally to present and discuss emerging results. Although relocating from Volos requires additional coordination, these advantages strongly support the project's dissemination objectives under TWIN-RELECT.

The 2nd Webinar with related projects will reinforce connections with other European initiatives in reliability, offering a venue for sharing experiences and identifying potential collaborations. The 2nd Business Forum, will conclude the project's business engagement series, marking also the successful completion of milestone 6 (M6) “Last Business Forum”, which is due in November 2026. This final forum will serve a dual purpose: expanding the UTH stakeholder ecosystem and providing the essential industrial feedback and market intelligence required to finalize the post-project commercialization strategy of the developed IPs (D5.6).

Finally, the partners have already submitted a proposal for the second special session of the project at the [44th IEEE VLSI Test Symposium 2026](#) titled “Reliability Analysis and Hardening of Neural Network for Radiation-Critical Systems” and featuring 3 talks:

- *Reliability Evaluation of Vector-Accelerated Neural Network Inference on a Fault-Tolerant RISC-V SoC under Proton Irradiation*
- *Single Event Transient Reliability Analysis & Hardening of NVDLA MAC Unit*
- *Reliability Analysis Framework on NVDLA mapped Dynamic Neural Networks*

The proposal has been accepted, and three scientific papers will be published in formal IEEE proceedings, covering the three topics listed above. This special session presents a great opportunity for the partners to network with experts in the field and share the latest scientific achievements of the project.

In parallel, several training and management events scheduled in WP2 and WP3 will also have a strong networking dimension, even though they are not formally counted as WP4 networking activities. The 4th Training School and 4th Research Management Workshop at UTH, will foster intensive interaction between UTH staff, early-stage researchers and experts from the advanced partners, reinforcing the personal and institutional links that underpin the long-term collaboration strategy of TWIN-RELECT.

Title	Host Institution	WP/Type	Status / Date
4th Research Management Workshop	University of Thessaly	WP3 / Research Management Workshop	<i>Not scheduled yet (planned 2026)</i>
4th Training School	University of Thessaly	WP2 / Training School	<i>Not scheduled yet (planned 2026)</i>
2nd Scientific Workshop (ETS 2026)	University of Thessaly	WP4 / Scientific Workshop	Planned: May 25-29, 2026 <i>(if accepted)</i>
2nd Business Forum	University of Thessaly	WP4 / Business Forum	Planned: September - October 2026
2nd Webinar with related projects	University of Thessaly	WP4 / Webinar	<i>Not scheduled yet (planned 2026)</i>

Table 4: Upcoming Networking Activities

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