HARMONY has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement N°101072798

Dear colleagues, partners, and satellite innovation enthusiasts,

Welcome to the sixth edition of our HARMONY project newsletter! Since September, the HARMONISTS have been advancing their PhD journeys and exploring new horizons in satellite systems engineering. We're excited to welcome Martin Togstad, the newest team member and the voice of this edition. This issue also highlights conferences we attended and key updates from the HARMONY project.

Visit our website to know more about the HARMONY PhDs!

Retrospective

In early November, two of our talented Harmonists, Dany and Oscar, represented the Harmony project at the latest SatNEx School, at the CTTC in Barcelona. This dynamic event brought together experts in space engineering and fellow PhD candidates to discuss cutting-edge topics shaping the future of satellite systems. Highlights included deep dives into 6G Non-Terrestrial Networks (NTN), direct-to-handheld connectivity, AI in orbiting systems, IoT, and deep space communication. We extend our gratitude to the CTTC team for hosting this inspiring event, which aligns perfectly with Harmony's mission to advance innovation in satellite technologies.

Aymeric, Giulio, and Alex attended the ESA Antenna Workshop 2024 in the Netherlands, which focused on innovative antenna systems for future space missions. Key applications included satellite communications, navigation, Earth observation, science missions, and space exploration. The workshop fostered the exchange of knowledge among experts, highlighting advanced technologies and techniques in antenna design. Aymeric presented a modeling approach for hardware imperfections in antenna subsystems. Giulio discussed a comparative analysis of using a single large satellite versus multiple smaller satellites for telecommunications. Alex showcased a system analysis of inter-satellite communication.

In December, Alessandro was invited to I.C. Leonardo da Vinci as an MSCA ambassador, where he presented his research in the space sector.

Azra Batool recently joined MBI in Italy, where she is pursuing her research. Alongside her academic work, she has been actively involved in a mini-series promoting Women in Engineering.

Voices of HARMONY

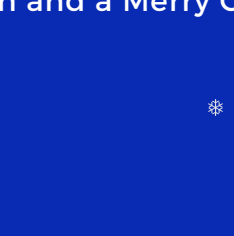
Joining the HARMONY project as a PhD candidate has been an exciting opportunity for me to advance my career and to contribute to European innovation in space technologies. My research, conducted in collaboration with Large Space Structures GmbH and Heriot-Watt University, focuses on optimising the gain of deployable reflector antennas using beamforming from an array feed to compensate for geometric inaccuracies.

With a practical background as an RF technician, the opportunity to research and work on cutting-edge space equipment through the HARMONY project is an ideal fit. It not only allows me to connect with experts across Europe but also enables collaborative work that bridges academic research and industrial applications. I am excited to contribute to HARMONY's vision of advancing space technology and to play a part in Europe's success in the competitive global space sector.

Martin Togstad - PhD Candidate

Commitment

The HARMONY Project is dedicated to training the next generation of research engineers, equipping them with the skills and knowledge to address the evolving challenges of the space industry. A key feature of HARMONY is its emphasis on mobility: each PhD candidate undertakes their research while moving between leading universities and industry partners across Europe. This structure immerses candidates in both academic and industrial environments, enabling them to gain diverse expertise, practical problem-solving skills, and a well-rounded understanding of the space sector. The space industry is at a pivotal moment, demanding innovative solutions to integrate terrestrial and non-terrestrial networks, enable sustainable multi-mission ecosystems, and expand the capabilities of spaceborne systems.



HARMONY's training framework ensures that participants are not only proficient in advanced technical fields, such as system architectures, signal processing, and antenna technologies but also adept at collaborating across disciplines and sectors. HARMONY empowers its researchers to lead transformative innovation by fostering creativity, adaptability, and collaboration. The program prepares them to address critical challenges like advancing global connectivity and supporting societal needs such as navigation, environmental monitoring, and communication services. Through its unique approach to training, HARMONY ensures that the next generation of engineers is ready to shape the future of the space industry, driving progress and unlocking new possibilities in this dynamic field.

Equipping young engineers with interdisciplinary skills and real-world experience is essential to driving innovation and shaping a sustainable future for the space industry.

Looking Ahead

We trust that our sixth newsletter has offered valuable insights and a comprehensive overview of our ongoing initiatives. Stay tuned for more publications and dissemination activities, which will be featured in our next newsletter in March.

Wishing you a delightful winter season and a Merry Christmas!

Kind regards,

The HARMONY Team

Thank you!

www