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 first edition of our HARMONY project newsletter. Since our official launch in October 2022, we have embarked on an exciting journey. During this summer, most HARMONY PhD students were able to meet and work together at Thales Alenia Space in Toulouse. HARMONY PhDs are now progressively joining their host institutions or companies all around Europe.

Visit our website to know more about the HARMONY PhDs!

Retrospective

Our first significant event as part of the HARMONY project took place at the European Conference on Antennas and Propagation 2023, held in Florence, Italy, in March. Here, international experts came together to discuss innovative antenna solutions for broadband satellite systems. A dedicated session, organized by HARMONY partners CNRS and Heriot-Watt University, saw riveting talks and exchanges on this topic with engineers and researchers from Thales Alenia Space, ViaSat, NASA/JPL, UCSD, and WaveUp. The shift from relying predominantly on large geostationary platforms to embracing the emergence of LEO and MEO constellations has created an engaging research sphere for the antenna community, and particularly our HARMONY researchers.

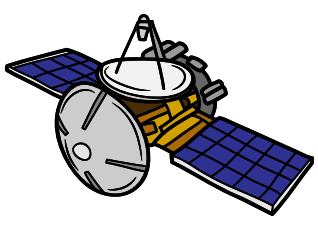
By May, the HARMONY team had the privilege of organizing its first network-wide event. The meeting, hosted at Thales Alenia Space France in Toulouse, involved a significant collaboration with the ANTERRA project, another Marie-Curie industrial doctoral network. The event was a rewarding platform for our "Harmonists" to gain insights from inspiring talks by Thales experts and external speakers. Topics ranged from the flexibilization of satellite platforms with active antennas and advanced digital processors to the design of mega constellations, navigation, and RF sensing services via satellite. To further cultivate the cross-disciplinary skills of our scholars, we held concurrent engineering activities on the final day. These discussions have initiated in-depth dialogues on defining future satellite missions and identifying overlaps among research topics—a practice we will continue to endorse throughout the HARMONY project.

Voices of HARMONY

“In collaboration with Thales Alenia Space and Université de Rennes, my PhD is about exploring Edge Computing technologies for algoritm distribution in satellite systems. Being part of the HARMONY project is a unique experience, allowing me to develop expertise while working with people from different european countries and backgrounds. In a context where Europe has to reclaim its leadership in space technologies against an ever-increasing number of competitors, HARMONY shows that european cooperation is necessary and effective.

Dorian Chenet - PhD Researcher”

Commitment



The HARMONY project is firmly committed to participating in the European Green Deal initiative, aimed at making Europe the first climate-neutral continent. In this context, we align our research and innovation efforts to contribute significantly to this major ambition of the European Union.

In terms of space exploitation, the carbon footprint is not negligible. The production, launch, operation and end of life of satellites are all phases that generate greenhouse gas emissions. Therefore, HARMONY aims to rethink the architecture of space systems to make them more efficient and less resource-consuming.

By introducing the concepts of Fractionation and Federation, where the functions usually fulfilled by a single satellite are distributed among several interconnected modules, we optimize the use of our resources and reduce the ecological impact. These innovations make it possible to share unused resources and improve the overall performance of the system without the need to launch new satellites, thus contributing to a more sustainable exploitation of space.

Additionally, HARMONY is committed to supporting climate monitoring efforts. Our technologies enable more accurate and efficient data collection, thereby facilitating environmental decision-making and contributing to a better understanding of climate change.

Finally, our research on terrestrial infrastructures seeks to make these systems less energy-intensive and more respectful of the environment, without compromising their performance.

We are proud to contribute to this goal of a carbon neutral Europe, while innovating for the new frontiers of space. Together, we are taking another step towards a sustainable future for all.

Looking Ahead

We hope this first edition of our newsletter has given you an insightful glimpse into our activities and goals. We look forward to sharing more of our work and discussing the latest advancements in multi-layered satellite systems.
Together, we can shape the future of this fascinating technology.

Kind regards,

The HARMONY Team

Thank You