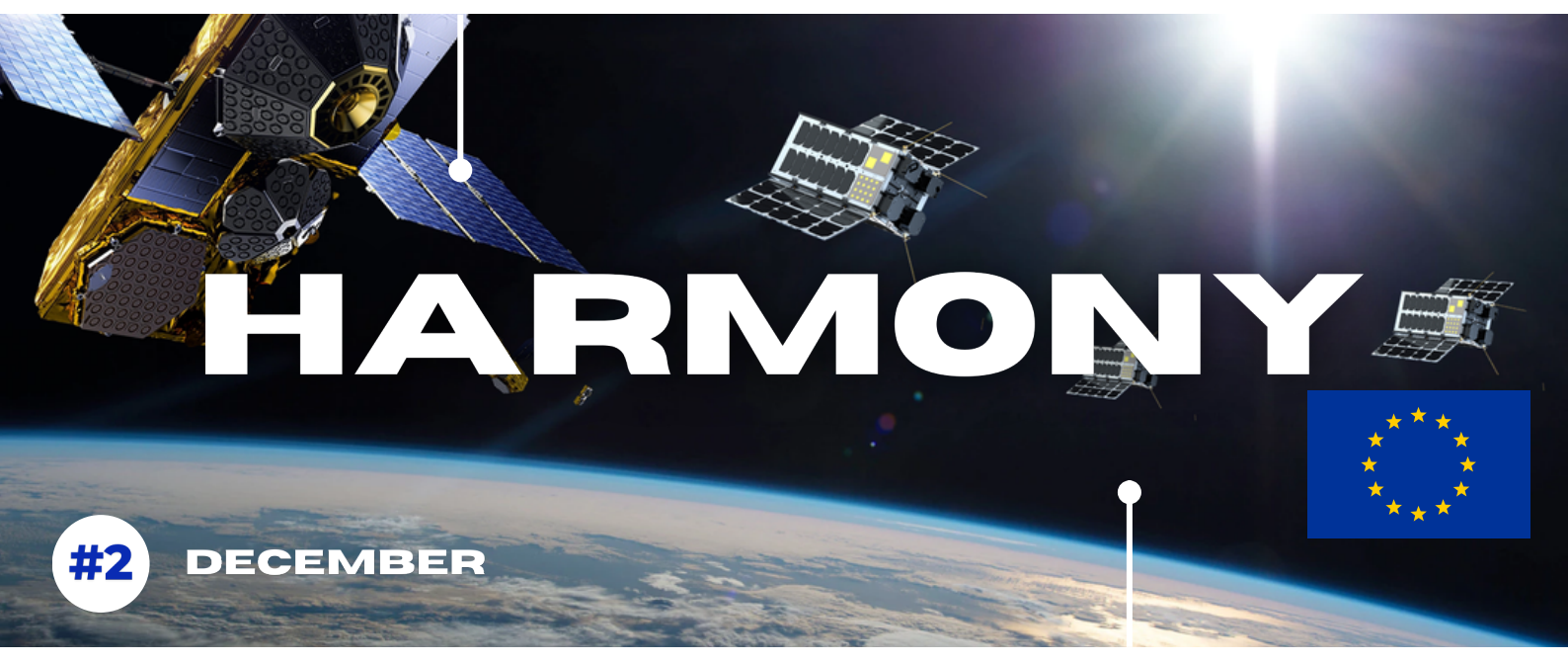
HARMONY has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement N°101072798

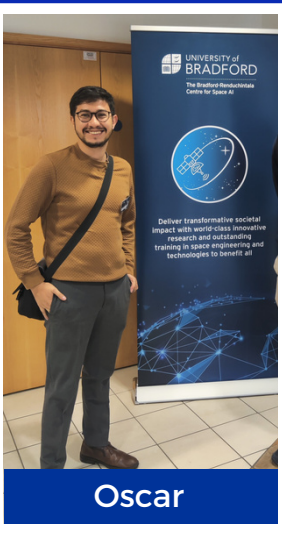



Dear colleagues, partners, and satellite innovation enthusiasts,
Welcome to the second edition of our HARMONY project newsletter. Since our first release in September 2023, new exciting experiences took place. Four HARMONY PhD students started their journey respectively at Nanoavionics in Vilnius, University of Bundeswehr in Munich, Heriot-Watt University in Edinburgh and MBI in Pisa. Furthermore, two more students will join their recruiting institution at the beginning of 2024.
**The networking is taking off!**

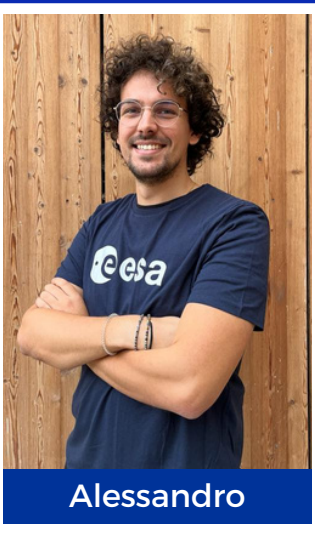
**Visit our website to know more about the HARMONY PhDs!**

## Retrospective

During these past 3 months, HARMONY PhD students attended several workshops and training sessions to improve their knowledge around their research topic. A first interaction came from the **AMLE Summer School** attended in September by Dorian that you had already met in our first release of the newsletter. AI and Edge computing were the pilot topics of the conference since they are becoming a red-hot discussion points for new satellite technologies. Another interesting event was the **SatNEx School V & 40th ICSSC Colloquium** hosted by the University of Bradford



Oscar



Alessandro

to which Oscar Martinez attended. Centered on the forthcoming 6G frameworks for satellite communication and leveraging innovations for embedded AI, trends and forecasts on upcomming breakthroughs were discussed. Additionally, the future integration of 3D satellite constellations with terrestrial networks was debated. The focal point of these discussions was the high-interest industry case of direct-to-cell (D2C) applications. Meanwhile, two stimulating events involved 3 PhD candidates with the **ESA Academy**. Alessandro Mastropietro actively participated in a **concurrent engineering session**, collaborating with peers and researchers under the supervision of ESA system engineers. This simulated exercise closely mirrored the processes conducted at the ESA Concurrent Design Facility (CDF). Utilizing COMET as a centralized data hub for mission design, Alessandro acquired practical skills in space mission analysis and concurrent engineering.

Meanwhile, Giulio Orlando and Aymeric Cailleux attended the **Satellite Communication Systems Training Course 2023**. The course covers diverse topics, including system engineering, SatCom link budgets, payloads, platforms, ground segments, antennas, operations, 5G/6G integration, applications, telecom market trends, secure SatCom systems, optical systems. The HARMONY project is increasingly involving its PhD students in gaining insights on the dynamic field of satellite communications, exploring its evolution, applications and future breakthroughs. Wait for the next newsletter to know more about their future. Let Aymeric and Giulio report about their own impression on the ESA training.

Giulio (Left) and Aymeric (Right)

## Voices of HARMONY

"The 4 days spent at ESA Academy were very intensive. we had the privilege to join 30 engineers from Master to PhD levels, not only related to the space field but also other science background creating very stimulating discussions. All of us covered 13 different European countries so the cultural exchange was also something to remember.

For what concern the contents of the course, it was oriented towards a basic understanding of the satellite communication, from the beginning of the first TV transmission towards the new concept of Mega-constellation. The future trend part was investigating all the cutting-edge technologies, and so closely linked to our PhD topics. That's why the following discussion with the ESA experts were very useful and formative.

Aymeric Cailleux and Giulio Orlando - PhD Candidates"

## Commitment

**In alignment with the EU Space Programme Policy's vision of creating a "Europe fit for the digital age," the HARMONY project is an important milestone to push Europe to the forefront of digital innovation in space technologies. HARMONY's primary objective is to foster innovation in a digitally-driven era, advocating a paradigm shift from traditional monolithic satellites to a network of multi-orbit spaceborne nodes. This approach positions Europe at the cutting edge of digital space exploration. The project's commitment to reducing barriers to entry and operational expenditure directly contributes to creating a Europe that is digitally adaptive and economically transformative.**



**In addressing the EU's digital ambitions, HARMONY places significant focus on direct-to-handheld and IoT connectivity via satellite. This aligns with the EU's mission to bridge digital divides, ensuring that even remote areas have access to ubiquitous broadband connectivity.**
**The HARMONY project, with its emphasis on technical innovation, connectivity and sustainable practices, brings solutions to realize Europe's vision of a connected future. HARMONY is a step towards further cooperation between european aerospace companies and academies to consolidate Europe's sovereignty and competitivity in aerospace engineering.**

**It is a privilege to be part of the endeavor reinforcing the strong position of Europe as a key player for digital innovation and technological leadership.**

## Looking Ahead

We trust that our second newsletter has provided you with valuable insights and an overview of our ongoing initiatives. Anticipating future updates, a convened session involving HARMONY partners will take place in March 24 during the EUCAP'24 so stay tuned for further update in the next newsletter.

Together, we can found the pilars of a new era.

Kind regards,

The HARMONY Team

# Thank you!

www