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651031: Copernicus Hubs and Institutions – Excursion Report

1. Locations Visited and People I Met

On May 26, 2026, as part of the Copernicus Hubs and Institutions course, we visited various institutions in Vienna. The first part of the trip involved visiting the Earth Observation Data Centre, where we learned about its activities, the processing of Copernicus data and its high-performance computing infrastructure. EODC experts explained the institution's structure, its projects, and the European Union's role in managing Earth Observation data.

Afterwards, we visited the United Nations Office for Outer Space Affairs in Vienna. Here, we listened to presentations on how space technologies are used in sustainable development, disaster management and the fight against climate change. We learned particularly detailed information about UNOOSA's Programme on Space Applications and UN-SPIDER initiatives.

2. What Did I Learn

This trip helped me better understand that the Copernicus ecosystem is not just about satellite imagery, but also about big data management, cloud computing, high-performance computing systems and collaboration between international organizations. During my visit to EODC, I first learned about the organization's structure. I learned that EODC is a public-private partnership. The organization's main goal is to make Earth Observation data accessible to researchers, public institutions, and the private sector and to generate knowledge from this data. The "Translating Data into Knowledge" approach, frequently emphasized in the presentations, caught my attention. This approach states that simply storing data is not enough; data must be transformed into meaningful information.

At EODC, I was particularly interested in the Austrian Data Cube platform. This system combines data from various sources, such as satellite imagery, meteorological data, aerial photographs and land surveys, into a single

platform. This allows researchers to analyze large amounts of data without downloading it and to utilize cloud-based computing systems. During the visit, we also received detailed information about Copernicus services. I learned that operational services such as the Copernicus Land Monitoring Service, Copernicus Climate Change Service, and Copernicus Emergency Management Service are used for environmental monitoring, climate studies, and disaster management across Europe and the world. It was emphasized that these services play a significant role, especially in flood monitoring, land-use change, and climate analysis.

One of the most impressive parts of my EODC visit was seeing the Vienna Scientific Cluster supercomputer infrastructure. I learned that the VSC-5 system is one of the most powerful supercomputers in Austria. We also received information about the Quantum Austria and MUSICA projects. These projects demonstrate how high-performance computing and quantum technologies will be used in scientific research in the future. In addition, information was provided about the AI Factory Austria initiative. It was explained how artificial intelligence applications will be used with big data and Earth Observation data, and that the system will become actively used in the coming years. Another important topic was the Earth Observation Processing Framework developed by ESA and the new Zarr data format. It was explained that traditional data storage methods are insufficient because the volume of satellite data is constantly increasing, and therefore cloud-compatible data formats are being developed. This was particularly useful for me, as someone who will be working with large volumes of Sentinel data in the future.

The second part of our trip involved a visit to UNOOSA, which provided me with valuable insights into transforming space technologies into societal benefits. Here, the Vision and Strategy 2024–2030 framework was presented. Key aspects of this strategy include the sustainable use of space, combating climate change, contributing to sustainable development goals, and supporting developing countries.

The information provided about the Programme on Space Applications was particularly noteworthy. This program includes training, workshops, technical consultancy services and international collaborations. The aim is to enable the use of space technologies not only by developed countries but also by developing countries.

One of the topics that interested me most during my visit to UNOOSA was the UN-SPIDER program. The main goal of this program is to expand the use of space-based technologies in disaster risk management. The presentations explained the disaster management cycle in detail. Examples were given of how satellite imagery and geographic information systems are used in the preparation, response, recovery and mitigation phases. Information was also provided about UN-SPIDER's technical advisory roles, capacity-building activities, and projects carried out in various countries.

3. Personal Reflections and Conclusion

This trip was not only a technical visit that supported my theoretical knowledge, but also a significant experience that shaped my future career goals. Seeing the technical infrastructure behind the Copernicus data, understanding big data management processes and learning how international organizations use this data were incredibly beneficial. In particular, seeing the data processing and high-performance computing infrastructure at EODC showed me that Earth Observation studies are not limited to image analysis. Furthermore, learning at UNOOSA about how space technologies are used in disaster management, climate change and sustainable development broadened my perspective. As a student studying Digital Earth, this visit allowed me to see the technical, scientific and social dimensions of the Copernicus ecosystem together. At the end of the trip, I concluded that space technologies and Earth Observation data will play a much more important role in disaster management, environmental monitoring and sustainable development studies in the future.