OFF CAMPUS VISIT TO EUROPEAN SPACE AGENCY (United Space in Europe)

On April 7th the first year's students of Global Governance visited the **European Space Agency** located in Frascati, Italy. After having lunch in the canteen where all workers gather during lunch time, we started our visit and attended the presentations by three experts working in different fields.

- **Sergio Benetti**, Head of Operations and Ground Segment Procurement Division illustrated all the aspects that compose this Agency through a very detailed presentation. **ESA** has a 50 years long experience in the field, it is composed by 22 Member States and it has eight different facilities located in Europe.
They claim for their purpose to be "To provide for and promote, for exclusively peaceful purposes, cooperation among European States in **space research** and **technology** and their **space applications**."

Space can then be considered as one of the last remaining "places" where international cooperation can still happen, especially this agency was not created and its unable to use the spacial territory for offensive purposes .

ESA Member States: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, The Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland and the United Kingdom. **Associated states**: Norway and Switzerland as European countries. Canada is a part too because the cooperation is smoother than with the American space agency.

Cooperation and expansion of the member states is an hard task since these must respect the interests of all of them

The **activities** that the agency carries out are:
1) Space Science : interplanetary missions to discover the systems of the Universe.
2) Human Spaceflight: astronauts taking active part into space missions.
3) Exploration: cooperation with other entities (USA, Russia) to explore other planets.
4) Earth Observation : what the ESA is specialized in. Taking datas sent from Satellites and using them for useful applications such as
5) Launchers: construction of machinery directing satellites to orbits, which grants the agency independence for their launches
6) Navigation: map and object positioning (Galileo project : the new generation GPS)
7) Operations: the act of data collection from the Satellites
8) Technology: fundamental for these kind of operations.
9) Telecommunications: only area where space is beyond the "terrestrial market".

The various **Stations** situated all over the world create the "deep space network" and have specific locations ,the most important ones are New Norcia,Australia; Madrid,Spain. and Malargüe,Argentina. The launching station is in French Guyana because of its ideal position of closeness to the Equator which allows a flight requiring less energy and granting to lift more weight.

The **budget** of ESA, currently 5.75 Billons Euros, gets the biggest share from France, Germany, Italy and UK. The member states are not the only funders but other institutions such as the European Union. The expenditure of this budget is mainly spent on observation, followed by navigations and launchers. The **Staff Nationality** reflect the monetary contribution of the Country, hence the more the country gives ESA, the more workers it will have employed. The ESA uses both English and French as official languages. The general **director** since 2016 is Jan Woerner, who is accompanied by other ten covering the areas of the ESA activities. The weight of ESA in Europe consist in 35000 jobs; one of the main sources of international cooperation and it is considered to be the most successful space operator in the world.

Clearly ESA follows an **industrial policy** based on four main principles:
1) Fair returns to Member States for their investments.
2) Improve competitiveness of European industry
3) Maintain and develop space technology.
4) Exploit the advantage of free competitive bidding, except where incompatible with objectives of the industrial policy.

There is a sort of contradiction between the fair redistribution and the competitiveness, but an equilibrium is found through the limits imposed by the member states.
The governing organ of ESA is the **Council**, providing policies for the activities. All the member states are represented equally through a single vote. Every 2/3 years the Council meets at ministerial level and that is when members declare in which and to what amount they are going to spend on a project. The fixed budget ESA receive is just a small participation contribution of members, so the convincing campaign addressed to the member states is fundamental in order to receive funds.
Space 4.0 is the new "behavior" adopted in the space sector based on **innovation**, **inspiration**, **information** and **interaction** values was agreed last year's council in Lucerne, Switzerland. This overcomes last century's idea of a space competition to demonstrate States power, substituting with a mission of creating something that has a use in the daily life of people.

The most important mission to recall is the **Rosetta** satellite, launched 16 years ago, which took 10 years to attach to a comet, orbiting around it, becoming the first spacecraft to do so. The idea behind it is to verify the theory stating that the Earth was born from a comet, which seems to being confirmed because onto it there are all the components of the planet.
The **Copernicus** project is financed by the European Commission and it consists in creating a map of satellites that will be floating around Europe to understand the future development in climate change. Europe is the leading country in space earth observation and that is due to the collaboration of European Commission and ESA.

Another key component of ESA is the European Space Operations Centre where the preparation for the out space operation is made through simulations, tests and attentive care to all the aspects.
The **Galileo Program**, still partially operational, is the European GPS proved to be more effective than the American one. The service it grants consists in tracking object and people on earth.
The cooperation with the European Union is sealed by the "Joint Statement on Shared Vision and Goals for Future of European Space" in order to maximize the integration of space into European society and economy.

- **Stephen Coulson**, Head of Industry Section, Directorate of Earth Observation talked about the work the ESA has been doing in the area of Sustainable Development in cooperation with international stakeholders, who finance economically developing countries with International Developing Banks. The missions satellites are carrying out are **meteorology** (METSATELLITES); **earth exploration** in collaboration with the European Scientific Community deals with measurements of environmental parameters and the **Copernicus project** in which more than 20 satellites monitor the environment.

The space observation is an actual promoter of **Sustainable Development Goals**, in particular it gives direct help in pursuing zero hunger, health and wellbeing, clean water and energy, climate action, life below water and on land and finally sustainable cities and communities.
An example of the usage of space environmental data was the project on the West African coast: satellite tracking of boats committing illegal fishing.

-**Thomas Beer**, Policy Coordinator, Directorate of Earth Observation further explained the Galileo and the Copernicus projects, both sustained and financed by the EU. The satellites of Copernicus are completely projected, launched and controlled by ESA. Everyone can enjoy for free from this project because it gives a great help to agricultural forecasting of land. Having two satellites, it is possible to collect data of the whole analyzed area in only 5 days.

What the satellites actually do is measuring the altimetry (height of waves) on earth then sending data to the benefiters that can use them for developing strategies for climate change, security, and atmosphere. The cooperation between ESA and EU is agreed on a legal document where all the parties' interests and contributions are stated, the mechanisms for the implementation of the tasks. The difference between Copernicus and Galileo is that on the first one ESA has the major authority with respect to EU, hence ESA is the one dictating the rules.

In conclusion, The European Space Agency is Europe's gateway to space. Space is a key asset for Europe, therefore, providing essential information needed by decision makers to respond to global challenges. ESA is prime example of what can be achieved together and develop fascinating projects that would not be possible for individual countries. ESA undertakes programmes and activities far beyond the scope of any single European Country, by developing the launchers, spacecraft's and ground facilities need to keep Europe at the forefront of global space activities.

The ESA launches satellites for Earth Observation, navigation, telecommunications and astronomy, sends probes to the far reaches of the solar system, and cooperates in human exploration space. They guide the development of Europe's space capability and carry out pioneering research in all areas of space activity. They have been ensuring that investment in space delivers benefits to the citizens of Europe and the world, from jobs and economic growth, to public services efficient communications security.

The results of this cooperation are world class industry, outstanding scientific discoveries and stronger, richer European identity. Space provides indispensable technologies and services, and increases our understanding of our planet and universe. Since 1975, the European Space Agency has been shaping the development of this pace capability over marking a series of firsts in the exploration of the solar system and our universe, from encounter with comet Halley in 1986, parachuting a probe on to Saturn's moon Titan in 2005 landing on a Comet in 2014, to study our sun in unprecedented detail and photographing the fastest galaxies.

Indeed Space for planet Earth is our home because from space, ESA is able to monitor many natural and manmade events, from floods and forest fires, to changes in ice cover, rising sea levels and oil slicks.