FAIR: The universe in the laboratory, Paolo Giubellino

On the 28th of March, the students from GG1 and GG2 had the great pleasure and honor to listen to a prestigious speaker: Paolo Giubellino. Since January 2017 he is Scientific Managing Director of GSI Helmholtzzentrum für Schwerionenforschung GmbH (GSI Helmholtz Centre for Heavy Ion Research) and the Facility for Antiproton and Ion Research in Europe GmbH (FAIR GmbH). The research of Paolo Giubellino is focused on the physics of high-energy heavy ion collisions and the matter produced in them. After having completed his studies at Turin University and the University of California in Santa Cruz, he took part in many heavy-ion experiments at the European Organization for Nuclear Research CERN in Switzerland. Paolo Giubellino has held several senior positions at CERN's ALICE experiment and in 2011 he was appointed Spokesperson of ALICE. He has also worked at the Torino section of the Italian National Institute for Nuclear Physics (Istituto Nazionale di Fisica Nucleare, INFN) since 1985.

For his research he has received numerous awards, for example the Lise Meitner Prize of the European Physical Society in 2014. Physics, with its specificities and technicalities, is obviously a highly difficult subject to be understood by who does not work or study in the same field; therefore the great talent of Paolo Giubellino was shown also in its ability of structuring the speech he had for the students of Global Governance in a comprehensible and interesting way. The Professor insisted on an essential characteristic of working in the field of physics: the reality of discovering and creating something that did not exist before, or something that no one else has ever seen, even if it has always existed. He highlighted the importance of adventure and curiosity, as things that are rooted deeply in our nature of human beings. As in all kinds of adventures, what is of vital importance is the unconditional belief in curiosity, hard work and a great effort in persevering in the research, no matter what happens. He reminded to the students the unique role played by something too often seen as negative or neglected: failure, a fundamental aspect for research. No discovery can be made without failing, especially in science. "Safe research is boring, our duty is to innovate".

The path towards discoveries is not a direct and easy one, cooperation with others is essential as it is not possible to reach a distant goal alone and that is why the professor insisted on the importance of developing the capacity of convincing and persuading others to participate or start a project together. In order to make other people work in your research , you are the first one that has to believe in it and establishing a relationship of

trust and honesty is key for the success of a joint research. He highlighted the importance of building a constructive dialogue among those who work together, creating an environment driven by decisions taken with consensus and working with a sense of inexhaustible curiosity. These are the driving factors that lead to the successful partnership between the European Space Agency (ESA) and the the international accelerator center FAIR (Facility for Antiproton and Ion Research GmbH). A cooperation that enables to carry out amazing research in the area of cosmic radiation and its effects. About the partnership, in an interview, the Scientific Managing Director, Paolo Giubellino said: “FAIR will be an institute that is unique in the world. It will enable researchers to reproduce the diversity of the universe in the laboratory, so to speak, in order to investigate fundamental questions such as how the chemical elements came into existence in the cosmos, gain knowledge about the effect of radiation on cells and solid objects, and forge ahead with practical applications in areas such as biophysics and materials research. We are eagerly looking forward to closer cooperation with the ESA.” Among other things, the new partnership will provide information also for life on earth. For example, data from the experiments can provide more details about radiation risks on earth. The gathering of informations and data will also optimize radiation protection measures and improve radiation therapies in the treatment of cancer. GSI is the birthplace of a new form of cancer treatment: the ion beam radiotherapy, which selectively damages tumor tissues while sparing the surrounding healthy tissues. This technique is “precise like a scalpel”, extremely efficient in destroying the tumor cells. To date, ion-beam radiotherapy has been used to treat more than 440 patients for tumors in the head or neck region.This is a great result but Paolo Giubellino made the students reflect on the expensiveness of cures and how they are a burden for the society. The societal aspect of cost of the therapy is controversial because when matters of health come in the way it does not matter what the cost is as people will be willing to pay anything if someone really close is involved, it is no a fair competitive approach. A balance between effectivity and efficiency of the cures and the cost of it should be found, as it cannot become a unsustainable weight for society.

During the questions’ time Paolo Giubellino was asked about an issue that is again connected to money and its management: the scarcity of funds for research. A fundamental problem of awareness is at the base of this problem. He highlighted how Germany is a model in this field .What should be remembered when allocating money for science is that advanced research makes a good country, not the other way around. Unfortunately, being scientific research a long run project, politicians often neglect to talk about it during elections’ time as they prefer to focus on what they can promise in the short run.

The guest speaker was also asked about the challenges of working in an international environment rather than a national one. Answering, he focused on how research in science is nowadays always lead by groups that are international, people from everywhere and from different institutions and different universities. Different legislations are a sort of limit,

because differences in legislations slow down the process of research. Large projects cannot depend on a single government because the projects are created with a long run approach, twenty or thirty years plans; being international the projects are free from the single will of a single government. Science can truly be a vehicle of peace, it is not just a slogan, the priority when innovating is to do things together, no matter the political relationship that exist between different countries. Physics and science in general unite people and countries, as innovation is one of the common goals for humanity.

The last reflection about this particular talk with Paolo Giubellino is that the difficult topic was not that incomprehensible after all, the guest speaker had the ability to talk to the students in an human and emphatic way, leaving space not only for the technicalities of the subjects. Thanks to this conversation is possible to notice how successfully concepts of nuclear physics can be presented to students of Global Governance, a great example of how the path of interdisciplinarity works.

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