

Face to Face



This section features conversations with personalities related to science, highlighting the factors and circumstances that guided them in making the career choice to be a scientist.

Face to Face with Dr Fabiola Gianotti*

Prof K Indulekha talks to Dr Fabiola Gianotti

Dr Fabiola Gianotti is a renowned particle physicist, and the first woman Director-General of CERN, the European Organisation for Nuclear Research. She also holds the rare distinction of being the first Director-General to be appointed for a full second term.

A specialist in particle physics, Gianotti has worked on several CERN experiments, being involved in detector R&D and construction, software development and data analysis. She has served as the elected project leader and spokesperson of the ATLAS experiment that famously resulted in the discovery of the Higgs Boson.

Apart from the many honors and awards including the Special Breakthrough Prize in Fundamental Physics of the Milner Foundation (2012), the Enrico Fermi Prize of the Italian Physical Society (2013), and the Medal of Honour of the Niels Bohr Institute of Copenhagen (2013), Gianotti has been included among the ‘Top 100 most inspirational women’ by *The Guardian* newspaper (UK, 2011). She was ranked 5th in *Time* magazine’s Personality of the Year (USA, 2012), included among the ‘Top 100 most influential women’ by *Forbes* magazine (USA, 2013) and considered among the ‘Leading Global Thinkers of 2013’ by *Foreign Policy* magazine (USA, 2013).

Members from the Editorial Board and the Editorial Office of Resonance had attended the special programs arranged at the Vigyan Samagam (Viswevsaraya Museum, Bengaluru, 30th August 2019) in connection with the visit of Dr Fabiola Gianotti, Director-General CERN. We bring excerpts from our interview with Dr Fabiola Gianotti and also pictures from the day.

K Indulekha: Thank you very much, Dr Gianotti, for sparing some time for the young readers

*Vo.25, No.3, DOI: <https://doi.org/10.1007/s12045-020-0956-4>



of *Resonance*. CERN is a prime example of the kind of extraordinary feats that nations can achieve when united. Please tell us something about how CERN achieves the synergy?



Dr Fabiola Gianotti (Director-General, CERN).

Fabiola Gianotti: CERN was born, was founded with two goals – one of them was to bring back scientific excellence to Europe. The other goal in the mind, in the vision, of the founding fathers, was to foster peaceful collaboration between European countries. Why European countries? Because, CERN was founded in the early fifties, this was just after the war which of course, had cut the links and created a lot of problems and conflicts within Europe. Those politicians in science understood that science can be the glue. Science is a common language. The laws of science are the same for everyone – like in India, like in China, like in Europe. That is the common language and the common laws of Nature. And that has worked so well that nowadays, sixty-five years later, the model has been exported globally; in the sense that CERN attracts 18,000 scientists from all over the world, not just from Europe; from hundred and ten different nationalities. We have 400 scientists from India. And so this model of peaceful collaboration, which was originally conceived with the goal of uniting Europe is now uniting the world. So, that is something that works very well. It has become part of our tradition, it is in our genes, it is very natural for all of us to work together. And for all the scientists who come to CERN to work together, across borders, regardless of their political or religious beliefs or whether their countries of origin are in conflict or in very nice relations. And that is very good. This is a great message we share.

K Indulekha: Rather than using all your time in advancing your own enquiries in science, a large fraction is devoted to ensuring the health of the ecosystem that is CERN so that a very large number of scientists can advance both individually as well as collectively. How fulfilling



do you find each of these two roles – scientist, Director-General?

Fabiola Gianotti: Thank you for the very nice question. I am a scientist by origin. I am a particle physicist and of course, science and physics are in my heart, and research is what I like most. Also, it is very good that in this role, I can still devote time; not to doing research with my hands, but to think about the strategic challenges in the future of the next project (at CERN). So, I am still very much involved in scientific and technical problems. At the same time, as Director-General, of course, I have to take care of other aspects of the organization – address human resources, as I mentioned, and the worldwide participation of countries and people. That is why I am here. And of course, this part of my role is also very exciting. It is very challenging but also very exciting and very pleasant, like when I get an opportunity to come to India.



Prof Rohini Godbole, eminent particle physicist and recipient of the Padma Shri award, presenting a copy of *Resonance* to Dr Fabiola Gianotti (Director-General, CERN), on behalf of the Chief Editor.

K Indulekha: While the timeline of the history of science is more than 4500 years long, it is only barely 250 years or so since society started permitting women to enroll for higher



degrees. What does it feel like – being a particularly significant and elegant proof of a concept that society has been slow in accepting – that women’s capabilities do not begin and end with the bearing and rearing of humanity but only begins with it. What do you feel?

Fabiola Gianotti: Well, I feel that there is still a long way to go to really have gender parity and equal opportunity. Of course, for me, diversity and parity means giving equal opportunities to everybody – men, women, people with different geographical origin. It is still a long way to go. But on the other hand, there has been a lot of progress over the past years, and now I see many young women taking up very important roles and responsibilities at CERN in all kinds of projects – like responsibilities for safety, coordinating physics working groups, etc. So I hope that little by little, with all these role models of the new generation of female scientists coming up, we can make plenty of progress.

K Indulekha: Would CERN think, as part of outreach, to start something like ‘Particle Hunters’, where with the help of a manual, you know, those interested can identify which particle created a particular track?

Fabiola Gianotti: We do have something like that already. We have Masterclasses where students from high schools are given the data recorded by the Large Hadron Collider and the (software) tools, and they can do the analysis, and they can construct and discover – rediscover!

K Indulekha: I was thinking of something that is online, that anybody anywhere can try their hands at.

Fabiola Gianotti: Well this is offline. Because the data online, as it comes out of the detector is not addressable. It cannot be used by everybody. It must be first processed and calibrated to give data that make sense for any user. So we first have to treat the data in such a way that we calibrate them, we fix possible detector problems and then give it to the public, to the young students, to the schools – the information that they can use then to extract the interesting physics. OK, it requires a little bit of time but this data is made available right from the beginning of the LHC, in particular, for the Masterclasses. Every year, we have fourteen thousand students selected from all over the world taking part in these Masterclasses.

K Indulekha: There was a time when seekers of knowledge had to go to knowledgeable people. Then they had to go to higher educational institutions, and now with this revolution started by CERN – the world-wide-web – everything is in the hands of youngsters. They can access knowledge anywhere, anytime. The ocean of knowledge is theirs to navigate. In this context, what message do you have, to give to those youngsters who seek to make science their life’s work?

Fabiola Gianotti: I will say that for me personally, there is nothing more rewarding than



contributing a little bit every day to advancing the knowledge of humanity. That is extremely rewarding. So, I will encourage everyone, anyone to study science. It is really exciting, it is really beautiful to try and understand how the universe works! Where the universe will go! How it will evolve! That is very nice. Yet, the other message I would give of course, is that science requires a lot of sacrifices. It requires a lot of patience, it requires a lot of motivation and determination and so, never give in. The path of science and research is a beautiful one, but one with many challenges and obstacles; there are many steps forward, and also steps backward. Never give in. Pursue dreams and goals with humility but also with a lot of determination.

K Indulekha: Thank you very much Dr Gianotti for sparing some of your time for *Resonance*.

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