

then define and conduct the relevant observations.

8. New calibration sources such as Laser Frequency Combs or stable Fabry-Pérot calibration units will soon become operational at ESO: what is their potential for other VLT instruments? Problems with high-purity Thorium-Argon hollow-cathode lamps following recent stricter environmental regulations could be dealt with by a bulk order in collaboration with other observatories.
9. ESO should take a more active role in defining the needs for laboratory data. Archival data may play a crucial role to improve molecular line parameters which are required for accurate, synthetic telluric line correction in tools such as Molecfit.

The participants in the retreat compiled and agreed on a list of action items to further explore these different topics and transform them into specific improvements for their integration into ESO operations. These action items and the corresponding deadlines will be pursued in order to ensure progress towards a timely implementation.

### Conclusions

According to the feedback received, the 2017 ESO Calibration Workshop succeeded in its aim of encouraging discussion of calibration issues, not only for ESO instruments but also at other ground-based observatories. Seeds of potential game changers in improving ESO future

operations were identified and need to be brought to fruition. We encourage everyone interested in the subject to further explore these topics with us through the email account [calibration2017@eso.org](mailto:calibration2017@eso.org).

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### Links

- <sup>1</sup> Zenodo: <http://www.zenodo.org>  
<sup>2</sup> Conference web page: <http://www.eso.org/sci/meetings/2017/calibration2017.html>

Highlights from the CERN/ESO/NordForsk

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## Gender in Physics Day

held at CERN, Geneva, Switzerland, 27 January 2017

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solid networks. The event was very well attended and was declared a success. The main highlights of the meeting are reported.

the GENERA activities very closely. The first meeting of the project was held at ESO's Headquarters in June 2015. The final goal of GENERA is very ambitious, i.e., to propose and create organisational structures allowing physics research in Europe to benefit from a more gender-balanced research community.

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In their role as observers on the EU Gender Equality Network in the European Research Area (GENERA) project, funded under the Horizon 2020 framework, CERN, ESO and NordForsk joined forces and organised a Gender in Physics Day at the CERN Globe of Science and Innovation. The one-day conference aimed to examine innovative activities promoting gender equality, and to discuss gender-oriented policies and best practice in the European Research Area (with special emphasis on intergovernmental organisations), as well as the importance of building

### GENERA and its objectives

The Gender Equality Network in the European Research Area (GENERA) is a Horizon 2020 project that focuses on evaluating, monitoring and improving existing or new gender equality plans of research organisations in the field of physics. The GENERA Consortium includes 13 beneficiary partners, either Research Performing Organisations (RPOs) or Research Funding Organisations (RFOs) scattered across Europe, and a number of associate partners and observers. Among the latter, CERN (the European Organization for Nuclear Research), NordForsk (an organisation that facilitates and provides funding for Nordic research cooperation and research infrastructure) and ESO, follow

Within the GENERA network, one special initiative that looks in more detail at national gender equality plans and at the existence of innovative activities that help with the gender balance, is the organisation of national Gender in Physics Day (GiPD) events. Each of the 13 beneficiary partners is expected to organise one such event in their own country. Each event follows common organisational guidelines that consist of collecting a general overview on the national situation (both in terms of gender statistics and initiatives) and offering topical workshops in the areas most relevant to that country.

### The CERN/ESO/NordForsk GiPD

In this spirit, CERN, NordForsk and ESO decided to organise a Gender in Physics Day, bringing in the perspective of inter-governmental organisations and the challenges that such international research infrastructures and funding agencies face. All eight EIROforum organisations were invited to join the event. The focus of the day was on the recruitment, retention and career development of female professionals in the field of science, engineering and technology (SET).

The event was meant to be an opportunity to discuss with the academic partners within GENERA the issue of a sustainable scientific or engineering career after Masters, PhD or Postdoctoral employment. All the international research organisations were asked ahead of the meeting to share their gender disaggregated data, as well as measures implemented in their infrastructure, with a critical view on their effectiveness. NordForsk has been funding efforts on the issue of gender balance for years and the focus on the field of physics was meant to serve as a case study for other fields. NordForsk therefore brought insight into the situation in the Nordic countries: from how they support collaborations with the large infrastructures in Europe to what is their gender (im)balance in physics.

This GiPD also offered an opportunity to reflect on how gender equality, and more generally diversity, can be embedded in international collaborations or consortia, to look at the situation of women in physics in developing countries, and to listen to the expectations of the younger generation.

The programme alternated panel discussions, talks, interactive sessions and workshops and aimed at targeting a varied audience, ranging from junior and senior researchers to management-level personnel, policy makers and diversity officers. The event was attended by about 100 people. All eight EIROforum organisations were represented at the venue, as well as four Nordic countries (Denmark, Finland, Norway and Sweden) and members of the largest projects and scientific collaborations in the current physics world (for example, the ATLAS experi-



ment and the Compact Muon Solenoid [CMS] experiment, both at CERN).

### Highlights from the plenary sessions

The day opened with welcome speeches by the CERN and ESO Directors General (Fabiola Giannotti and Tim de Zeeuw, respectively) and by the NordForsk Senior Adviser (Lotta Strandberg), wishing all participants a productive meeting and noting their important exchanges on best practice and future collaborations.

After an introduction and progress report on GENERA by its Programme Coordinator, the morning was divided into three main sessions: Gender Equality Plans and Numbers in international RPOs; Efforts in Gender Equality and Results in the Nordic Countries; and Other Perspectives.

The first session focused on a direct comparison of gender statistics among some of the EIROforum institutes. Numbers were collected and assembled beforehand so that the session could be structured as a discussion forum, with representatives of the European Space Agency (ESA), the European Synchrotron Radiation Facility (ESRF), ESO and CERN on stage. Not surprisingly, numbers

Figure 1. The discussion forum on gender statistics and equality plans among the EIROforum organisations. From left to right: Ms Ersilia Vaudo (ESA, Head of Policy Office); Ms Heidi Schmidt (ESO, Head of Human Resources); Mr. James Purvis (CERN, Head of Talent Acquisition); Mr. Thierry Baudoin (ESRF, Head of Human Resources).

turned out to be rather similar, confirming that all four organisations are facing similar challenges, especially as regards hiring and retaining female scientists and promoting them to the top levels. In the field of engineering, where from the start the pool of female candidates is already significantly smaller, numbers appear to be even more challenging.

The second session was dedicated to the Nordic countries. NordForsk was the main host of this part of the programme that included detailed overviews of the gender (im)balance in physics in Denmark, Norway and Sweden. In terms of gender equality, the Nordic countries have rather paved the way over the past several years, with dedicated legislation, special hiring/funding programmes and the setting of quotas (for example, on executive boards). While these measures have certainly had a positive impact in some areas and for some specific positions, all three presentations showed that, even if gender equality seems to have been achieved at college/Masters student

levels, there remains a significant and increasing gap as the female researchers progress into their academic careers, with a persistent lack of senior female professors, similar to other countries (the so-called “Nordic Paradox”).

The third session was a collection of different perspectives: from how to implement gender equality in large scientific collaborations and projects (for example, large high energy physics teams) to the situation in astronomy (noting the efforts the International Astronomical Union is making in this respect) and in the field of biology (with a detailed report from the EIROforum EMBL institute); to a look into the STEM fields (Science, Technology, Engineering and Mathematics) in developing countries. The last of those provided an insight into non-western cultures, where the majority of STEM students are actually female. The speaker presented the results of her investigations in Palestine and South Africa, underlining the cultural and socio-economic differences between those countries. The equal number of male and female STEM students at Bachelor and PhD level was explained as possibly due to the very different approach to advanced education. While in the western world, the young generation chooses College and Master degrees with an eye already on what they would like to do workwise afterwards, in, for example, Arab countries, college and Masters studies are still considered part of the basic education, and hence they choose what they really like to do, rather than what is expedient for a career. Unfortunately, they know from the start that the majority will not continue professionally, as there is a strong social pressure to get married and start a family.

### Highlights from the workshops

After a networking lunch, the afternoon opened with an engaging and provocative talk on diversity, touching upon stereotypes, unconscious bias and work culture, followed by some reflections on gender imbalance in physics in Finland and different proactive measures that could be explored (from mentoring and leadership programmes to diversity and positive discrimination).

Participants then split into four parallel workshops: I. How to make a network; II. Promoting gender equality programmes (GEPs) in international consortia; III. Expectations from early career scientists on GEPs; and IV. Gender equality initiatives aimed at the general public (i.e., how to change the image of physics). A designated Chair moderated each discussion and collected feedback. All four workshops were well attended and discussion was lively and productive.

The day ended with brief reports from the workshop chairs, highlighting the main topics of discussion and conclusions that were reached. Workshop #1 looked into two types of networks, the EU GenPORT community project and the String Theory Universe, a Cost Action programme strictly focusing on the gender gap present in the field of string theory. The audience agreed that networks (especially social networks) represent important tools to raise awareness but they are not enough and they need a critical mass (which depends on goals, expertise and field) in order to be efficient.

Workshop #2 focused on the inclusion (or lack thereof) of GEPs in international consortia and organisations. Part of the discussion was centred on the LHCb collaboration, an international consortium (behind one of the CERN Large Hadron Collider [LHC] experiments) of more than 1200 members, involving 71 institutes in 16 countries. A constant monitoring of gender statistics with no evident improvement led the collaboration to set up an Early Career, Gender and Diversity Office inside LHCb, that now provides advice to the team management on equality and diversity issues. Raising awareness, improving working conditions and offering mentoring were among their final recommendations. EUROfusion, instead, presented the challenge of implementing gender equality guidelines and initiatives when the employment of staff is handled through beneficiaries, with every country having its own statutes, laws and (equality) best practice.

Workshop #3 focused on early-career scientists and touched upon their expectations in terms of gender and work-life balance. It was well attended by young physicists, who expressed concerns

about the lack of transparency in hiring processes (even at postdoctoral levels), and the lack of role models or the existence of the wrong role models, especially in terms of balancing work and private life. Finally, Workshop#4 dealt with how the physics research field is presented to the general public. CERN presented two of its initiatives: one that targets an increase in diversity in CERN’s public face via a variety of actions and public events; the other, gender inclusive teaching in the CERN High School teacher programme. One of the main outcomes here was about attracting and engaging young pupils in science, especially girls, thus breaking through stereotypes and expanding their knowledge.

### Concluding remarks

Based on the feedback received, the day was declared a success, as it covered a variety of themes, some of which were not often covered in this type of event (for example, the challenges faced by inter-governmental organisations and the gender dimension of large scientific collaborations). More importantly, the event created the pre-requisites, especially among international organisations, to foster further exchanges on gender diversity and inclusivity actions.

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### Links

<sup>1</sup> GENERA: <http://genera-project.com>

<sup>2</sup> NordForsk: <https://www.nordforsk.org/>

<sup>3</sup> EIROforum membership: European Organization for Nuclear Research (CERN), European Molecular Biology Laboratory (EMBL), European Space Agency (ESA), ESO, European Synchrotron Radiation Facility (ESRF), European Synchrotron Radiation Facility (XFEL), EUROfusion and Institut Laue-Langevin (ILL)

<sup>4</sup> GenPORT: <http://www.genderportal.eu/>