

# Diversity at ESO: Paranal Observatory.

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## ABSTRACT

As diversity continues to grow in astronomy, creating working environments that are equally beneficial to all employees is imperative. Diversity in astronomical observatories is evident in a number of employee characteristics, including gender, race/ethnicity, age.

Since June 2017, ESO has created its Diversity and Inclusion Committee gathering a variety of employees from the different sites, with different backgrounds.

We will focus here on the status of the diversity and the strategies to develop a skilled and diverse operational workforce in the ESO observatories.

**Keywords:** Paranal Observatory, Diversity, Inclusion, Science Operations, European Southern Observatory

## 1. INTRODUCTION

All forms of diversity are increasingly present in our everyday life, inside and outside of work. While outside we have the freedom to choose our individual way to handle diversity, at the workplace there should be some common rules, for the benefit of all. Its increasingly important to be informed about workplace diversity, and what it means.

Diversity can be conceptualized in different ways depending on the context. When it comes to the ESO observatories, we conceptualize diversity as understanding that each colleague brings in unique experiences, strengths, and ideas to our classroom. These differences can be along dimensions of race, ethnicity, nationality, sexual orientation, gender, socio-economic status, age, ability, religious or political beliefs, or other different ideologies and values. Diversity is the exploration and incorporation of these differences to enrich learning in our facilities. The goal of a diversity initiative is to increase awareness, ensure respect and enforce inclusion, in that order. Everyone should be aware of differences. Everyone should respect differences. Everyone, as individual/group/workplace, should actively enforce inclusiveness. Inclusion means welcoming all people, from all diversity dimensions. It also means welcoming people with disabilities including mental and cognitive.

As awareness around diversity and inclusion grows, diversity and inclusion is becoming more and more important for talent acquisition. Many organizations operate in an environment of high transparency, which employees demand. For younger workers, inclusion is not just about assembling diverse teams but also about connecting team members actively, so that everyone is heard and respected.

If one considers the fact that observatories and other organizations operate as networks, it becomes even clearer that diversity and inclusion can reinforce organizational performance. New research demonstrates that diverse and inclusive teams are more innovative, engaged, and creative in their work.

Diversity is a given at the European Southern Observatory (ESO), being an international organisation welcoming scientists, engineers, students and administrators from all over the world. Diversity even grows with time at ESO, as we welcome new Member States in our ESO family. But ESO is not alone in this, many astronomical observatories cherish the possibility of integrating a very diverse workforce and serve a very diverse community. Diversity in astronomical observatories might be evident in many ways, including gender, race/ethnicity, age, disability. Others might be less evident nevertheless equally important, including nationality, religion, sexual

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orientation, education, values. Diversity is a blessing and a curse at the same time, as it brings in great benefits, but also requires WORK to make the diverse environment equally beneficial to all employees. But it is imperative to do that work.

ESO operates three observatory sites, one of them is the Paranal Observatory. Although in this paper we are focusing only on the diversity and inclusion actions at Paranal Observatory, we do not want to take it out from the context of the whole Organisation, as the strategic plan and the actions of Paranal can be applied at all the other ESO sites, and will no doubt impact the other sites too.

## 2. ACTUAL SITUATION

The most recent statistics at ESO, dated from 2017, are focusing on the gender distribution as shown in all the following histograms. Figure 1 shows the evolution during the past 10 years of the gender distribution at ESO, all sites included. We can remark that the number of female employees is stable at ~23%.

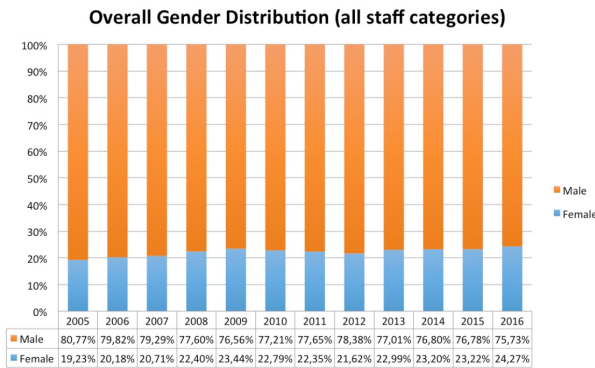


Figure 1. Overall gender distribution.

The next figures, Figures 2, 3, 4, 6 present the 2017 statistics for different categories of ESO personnel, all sites. Whereas the international female staff percentage has kept stable around 23% (see Fig. 2), we can positively remark that the number of local female staff has continued to grow (or improve), gaining +10% in 10 years.

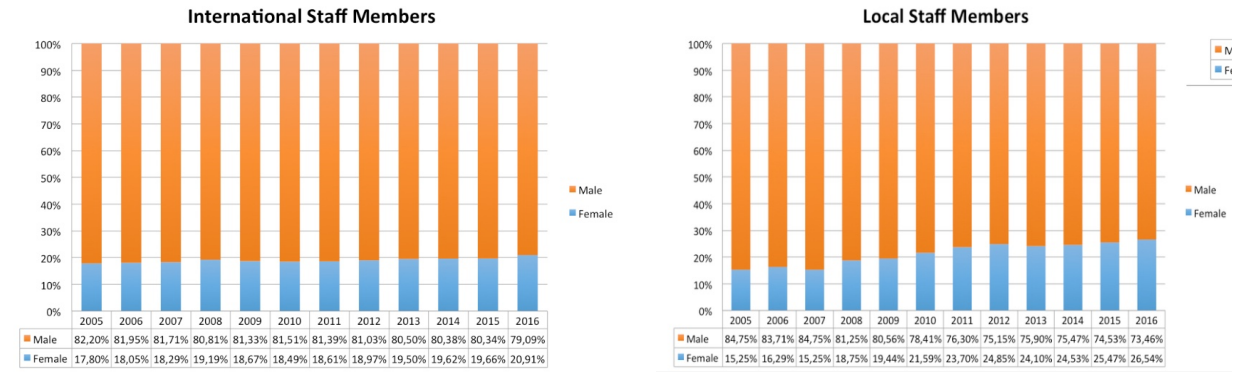


Figure 2. Local Staff members : : Gender Statistics evolution from 2005 to 2016.

When specifically looking at the astronomer and fellow female percentage (see Fig. 3), the same conclusion can be made. Other figures that show a positive, although milder trend, are those referring to the female astronomers (about +3-4% over the past 10 years). For the ESO Fellows, instead, figures have always been way

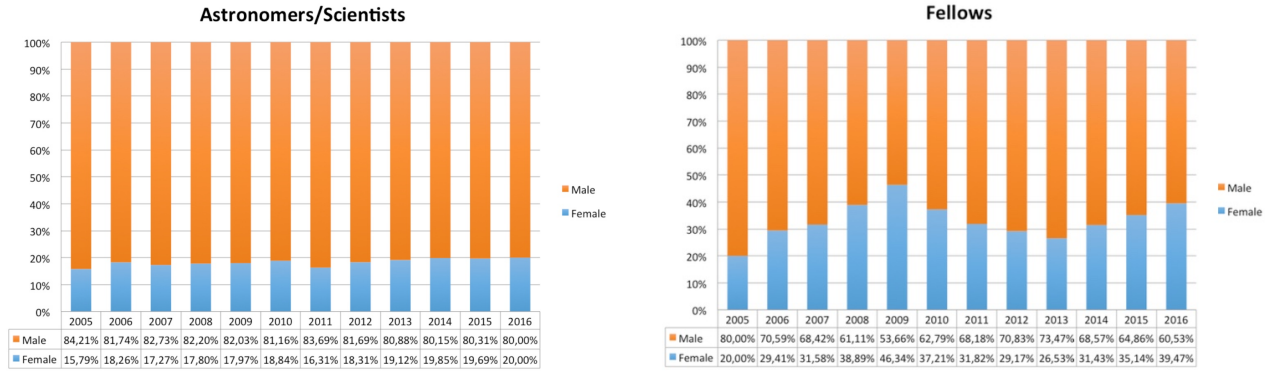


Figure 3. Fellows : Gender Statistics evolution from 2005 to 2016.

above the 20% fraction, reaching peaks of 40-50%. Here, however, the trend is characterised by highs and lows, something that may be worth investigating further.

More of a concern is instead Figure 4, which shows a constant 10% fraction of female staff among ESO engineers, for both international and local staff members (see Figure 4) and Figure 6, which shows a fraction between 10% and 14% of female among the ESO line managers.

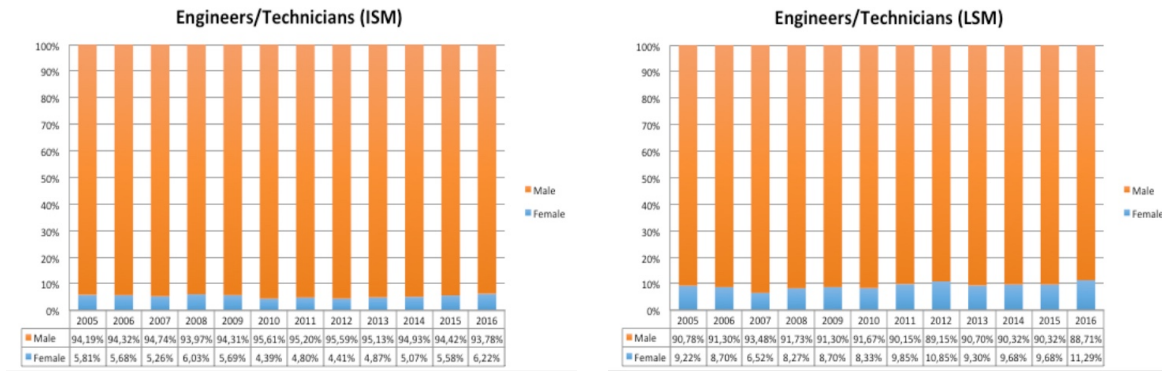


Figure 4. Local and International Engineers: Gender Statistics evolution from 2005 to 2016.

When comparing these figures to the average numbers of female engineers employed in different European countries (see Fig. 5), one sees that ESO is in a significantly weaker position.

Finally, Figure 7 provides a breakdown of all female employees at ESO per staff category.

To attempt to explain the different trends seen in the previous figures, we looked at the gender distribution among the applications and selected candidates for the different positions. Overall positive developments can be recorded for the gender distribution of candidates applying to International and Local Staff Member positions: Whereas in 2015 the ratio was 20.5% female candidates to 79.5% male candidates, it improved in 2016 reaching a ratio of 25.9% female candidates to 74.1% male candidates. This year the ratio of female and male candidates has further moved towards a more balanced distribution reaching a ratio of 29.0% female candidates to 69.7% male candidates. It should be noted that not only the gender ratio of candidates has improved over the last years but also the gender ratio of the candidates selected: While in 2015 the ratio of female and male recruitments was 23.5% female to 76.5% male, it changed to 24.3% female to 75.7% male in 2016. In 2017 the ratio has further improved with 37.1% female recruitments to 62.9% male recruitments. It was also noted that in 2017 an average of 1.3% of the candidates applying to International and Local Staff Member positions, and 4.7% of the candidates applying to the ESO fellowship programme, did not provide information regarding their gender. The following figures : Fig 8, Fig 9, Fig 10, shows in details the gender statistics of applicants and selected candidates

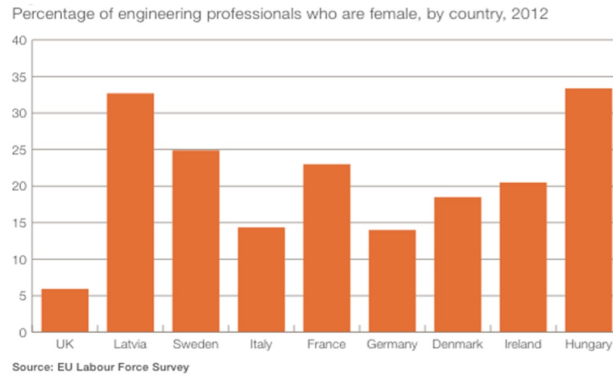


Figure 5. Gender Statistics in European countries for STEM positions.



Figure 6. Line Managers : Gender Statistics evolution from 2005 to 2016.

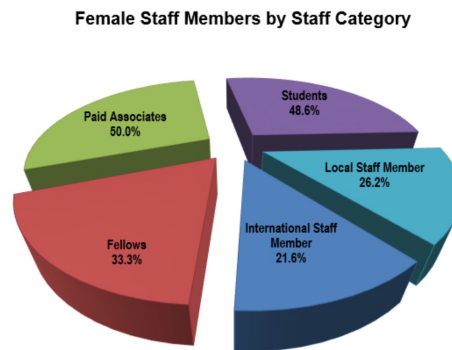


Figure 7. Breakdown of all female employees at ESO per staff category.

for 2017 for the International, Local Staff and Fellowship positions. There is no evident gender bias between the applicants and selected candidates. In the engineer recruitment, local and international staff, there is an obvious unbalance of female applicants comparing to the overall gender distribution.

### 3. ACTIONS - DISCUSSION

Since several years, ESO participates to networks and gender equality initiatives. The Staff Rules and Regulations have been continuously improved and efforts have been made to raise gender awareness. Diversity and Inclusion will be included in the ESO mission as well as in the yearly objectives.

International Staff Member positions		Applications				Succesfully closed position	Selected candidates		
		Female	Male	Not Provided	Total		Female	Male	Total
Engineers	13	41	272	5	318	10	2	8	10
Technicians	2	4	30		34	2		2	2
Scientists	2		16	1	17	1		1	1
Astronomers	3	17	49		66	3	1	2	3
Administrators	3	9	20		29	1	1		1
Administrative Assistants	2	54	19	1	74	2	2		2
Managers	1	20	47		67	1	1		1
<b>TOTAL</b>	<b>26</b>	<b>145</b>	<b>453</b>	<b>7</b>	<b>605</b>	<b>20</b>	<b>7</b>	<b>13</b>	<b>20</b>
<b>TOTAL %</b>		<b>24.0%</b>	<b>74.9%</b>	<b>1.2%</b>	<b>100.0%</b>		<b>35.0%</b>	<b>65.0%</b>	<b>100.0%</b>

Figure 8. Gender Statistics for International Staff Positions in terms of Applications and Selected Candidates.

Local Staff positions		Applications				Succesfully closed position	Selected candidates		
		Female	Male	Not Provided	Total		Female	Male	Total
Engineers	5	28	257	4	289	3		3	3
Technicians									
Scientists									
Astronomers									
Administrators	3	74	76	1	151	3	2	1	3
Administrative Assistants	1	82	3	3	88	1	1		1
<b>TOTAL</b>	<b>9</b>	<b>184</b>	<b>336</b>	<b>8</b>	<b>528</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>7</b>
<b>TOTAL %</b>		<b>34.8%</b>	<b>63.6%</b>	<b>1.5%</b>	<b>100.0%</b>		<b>42.9%</b>	<b>57.1%</b>	<b>100.0%</b>

Figure 9. Gender Statistics for Local Staff Positions in terms of Applications and Selected Candidates.

	Fellowships 2016/2017						Fellowships 2017/2018			
	Applications			Selected Candidates			Applications			
	Female	Male	TOTAL	Female	Male	Total	Female	Male	Not Provided	TOTAL
Austria		1	1							
Belgium										
Czech Republic		1	1							
Denmark	1	1	2				1			1
Finland		1	1					1		1
France	4	8	12		2	2	1	14		15
Germany	6	10	16	1	1	2	5	10		15
Italy	11	19	30	2	1	3	14	18	3	35
Poland		1	1					3		3
Portugal	1	1	2							
Spain	6	9	15				6	13		19
Sweden							1		1	2
Switzerland	1	1	2				1	1		2
The Netherlands		2	2		1	1		5	1	6
United Kingdom	9	13	22				5	15	1	21
Member Countries	39	68	107	3	5	8	34	80	6	120
Other Countries	25	63	88	1	4	5	33	74	5	112
<b>Total</b>	<b>64</b>	<b>131</b>	<b>195</b>	<b>4</b>	<b>9</b>	<b>13</b>	<b>67</b>	<b>154</b>	<b>11</b>	<b>232</b>
<b>Total %</b>	<b>32.8%</b>	<b>67.2%</b>	<b>100%</b>	<b>30.8%</b>	<b>69.2%</b>	<b>100%</b>	<b>28.9%</b>	<b>66.4%</b>	<b>4.7%</b>	<b>100%</b>

Figure 10. Gender and Nationality Statistics for Fellowship Positions in terms of Applications and Selected Candidates.

Except for engineering, ESO already benefits from a quite diverse workforce. Therefore, efforts shall be put to make it a more inclusive environment.

ESO will continue to improve the recruitment and career development process, and will organise for its staff training on unconscious bias. We will develop unconscious bias & inclusion awareness among staff and management by organizing seminars in Garching, Santiago and the sites. We will ensure that contact people and escalation guidelines in case of issues related to diversity will be identified and known by everyone. Additional attention will be paid to the composition of boards and an analysis of career progression at ESO with the goal of identifying discrepancies between women and men will be prepared.

We are confident that this will improve the work conditions.

### **3.1 Milestones**

ESO, since June 2017, consciously tries to look into diversity and inclusion, via its Diversity and Inclusion Committee that gathers a diverse group of employees from the different sites, with different backgrounds, representing the whole of ESO.

But it has been a long road for ESO to achieve the current stage, when we can actually report about diversity and inclusion actions at ESO.

It all dates back to 2004, when discussions on gender equity started to take place at ESO with a report written by Primas, F. et al. (2007).<sup>1</sup> The report fell on a fertile soil, and the astronomers of ESO picked up the discussion, which is basically ongoing since that time. ESO being observer or participating in several networks (e.g Gender Equality Network in European Research Area (GENERA), International Astronomical Union (IAU) WG on Women in Astronomy, EIROforum AWG on Diversity & Inclusiveness.) Actions have been taken to improve gender equity during the hiring process and implement family friendly working conditions. Discussions among engineers started only in 2016 due to the lack of critical mass of women in engineering.

#### **3.1.1 The first milestone: ESO suggests a gender equity project to its governing bodies.**

A proposal for implementing a gender diversity plan around the following three pillars was presented to the Finance Committee in 2016 :

- Recruitment and career development process,
- Enabling environment for women
- Improvement of the working conditions

The Finance Committee and the Committee of Council welcomed the initiative and ask ESO to put efforts in advancing on gender equality/diversity matters.

#### **3.1.2 The second milestone: ESO establishes a Diversity and Inclusion Committee.**

With the aim to advise on diversity and inclusion for the whole Organisation, the ESO Director General in January 2017 set up the Diversity and Inclusion Committee of ESO. The Committee consists of Members of Personnel representing all Directorates and all sites of the Organisation. The Committee already started working, based on a three-year (2017-2020) Diversity and Inclusion Plan, drawing up the action items on the most burning areas where the Committee will focus its work. To start with, the Plan defines the basic definitions for the work of the Committee: By diversity, the Diversity and Inclusion Committee understand any dimension that can be used to differentiate groups and people from one another. Diversity and inclusion mean respect and appreciation of differences including, but not limited to, age, gender, ethnicity, religion, disability, sexual orientation, education, national origin, values, or any other human attribute or background; recognizing and understanding that each individual is unique and has value in his own right. Diversity is about strength through difference. Inclusion is about leveraging all our differences and using them to solve problems better and perform more effectively.

As the definitions already signal, the Committee transformed, or more precisely extended the areas that were

originally presented to ESOs Governing Bodies: instead of just gender diversity, the Committee works with many other forms of diversity; and instead of working on an enabling environment for women, the Committee will advise on how to establish an inclusive environment for all. The plan defines the three major areas already mentioned above but now with actions.

To set the ground-work, the Committee assessed the status of some diversity areas at ESO:

- Gender
- Age
- Nationality/culture/race/ethnicity
- Sexual orientation
- Disability
- Religion

The Committee, based on these assessments, will draw up strategic action plans to ensure diversity and inclusion in these areas, will recommends policies, procedures or other actions.

In June 2018, ESO Council also approved a set of measures for promoting a family-friendly environment (extension of the parental leave, support for childcare). In addition mobile working will be deployed at the latest in January 2019. This added flexibility should indeed help facilitate the combination of work and family and make ESO a more attractive working place. For the more demanding work at the sites, ESO has already implemented and is testing an interface that allows some staff to work remotely from Santiago.

### 3.2 Code of Conduct

A code of conduct exists for ESO staff with a well defined process for raising issues related to harrassment. This Code of Conduct was first applied to the ESO science workshops and it is applicable also to the visiting scientists. Inclusion is even more important on Paranal than in Garching and Vitacura because of its isolated location which creates a micro-society, impossible to escape during the shifts. The shift work which makes difficult to combine with family life, harrassment situations which are worse than normal because the victims cannot escape the premisces, the lack of women to create a critical mass to change the culture generated the need for having a code of conduct for ESO staff but also visitors. Since March 2018, it has come into place the rule that LPO visitors must read this paragraph and acknowledge their understanding to their astronomer point of contact when arriving to Paranal.

The Code of Conduct at ESO sites is the following : *ESO is committed to creating a work environment that is safe, professional and of mutual trust where diversity and inclusion are valued, and where everyone is entitled to be treated with courtesy and respect. Please help us in maintaining such a professional working environment at all times. ESO will not tolerate harrassment of any form. Sexist, racist, or exclusionary comments or jokes are not appropriate. Harrassment includes inappropriate physical contact, sexual attention or innuendo, deliberate intimidation, stalking, and photography or recording of an individual without consent. It also includes offensive comments related to individual characteristics, for example: age, gender, sexual orientation, disability, physical appearance, race, nationality or religion.*

*Thanks for your help in this important matter, and we hope you enjoy your stay on Paranal!*

Simultaneously with the establishing of this Code of Conduct for the visiting scientists at Paranal Observatory, resolution and escalation guidelines had to be defined clearly. A three level escalation process was developed as followed. The first contact persons for the affected person are the day and night shift coordinator (D/NSC) or the Head of Science Operations and his deputies if present on the mountain.

- The D/NSC should ideally be able to clarify the situation, by talking to the offending visitor who then is asked to apologise to the person who was offended. Once settled, the Head of Science Operations is informed if not already the case
- If the situation is severe or the visitor does not recognise any wrongdoing, the day and nighttime shift coordinator have the delegated authority from the director to ask the harasser to leave the control building for their room in the Residencia. The Director and the Head of Science Operations are informed of the incident
- If the situation can still not be resolved at this level (the harasser does still not recognise wrongdoing and/or does not apologise), the director or the expressedly delegated authority may decide to remove the person from the site.

The term 'severe' would typically be blatant racist or xenophobic attack toward an individual or any form of sexual harassment that goes toward unwanted physical contact. Also, incidents that severely affect a staff emotionally and/or physically (knowing that sensitivities can be different between people). The effect is more relevant than the intent.

### 3.3 Training

A method of introducing diversity into the workplace is a cultural education and training program by seeking the assistance of diversity training professionals. Cultural education and training programs improve employee communication and allow workers to view their jobs from a different perspective. It can also help alert department members to such potentially unconscious biases and signals, provide a forum about best practices, and offer an opportunity for discussion regarding inclusivity.

Education and training initiatives focus on best practices for working in a multi-cultural environment as well as how to interact with one another despite cultural differences.

To favour a diverse and inclusive environment, training the staff on unconscious bias, inclusion and multi-cultural environments is the very first step. Several talks are being planned in the ESO sites.

To accommodate the schedule of the Paranal staff, it has been decided, in agreement with the Head of Science Operations and the Head of Maintenance-Service-Engineering to schedule most of these presentations during the week ends and to have them offered at least twice.

Observatories should consider making structural changes, implementing transparent, data-driven solutions, to provide to all its employees a visceral understanding of how bias impacts decision making, talent decisions, and business outcomes.

### 3.4 Planned Actions

Not everyone goes by the pronouns which their colleagues typically assume. Some people are frequently misgendered (called by the incorrect pronouns). Just as the use of male pronouns as a default has a negative impact on women's motivation, and their sense of belonging and identification with an organization, assumptions in language can leave people feeling excluded. This is often a deeply negative experience, and difficult to handle in a professional context, as it requires either correcting a colleague or allowing the error to persist indefinitely. It can also lead to awkwardness for the person who made the mistake. Many instances of misgendering could be avoided by simply making one's pronouns known up front. But this, too, is more difficult than it appears. Unlike names, there are few existing socially accepted opportunities for a person to specify their pronouns to colleagues. These opportunities need to be created and normalized (used by many people, so that it is not considered startling or unusual) in order to be accessible to all members of the community.

The Committee also started writing guidelines on the usage of gender inclusive pronouns for all ESO documentation, and discussed on the strategy ESO should apply to enable/become an inclusive environment.

Regardless of the approach to this training, it is critical to set guidelines for professional behavior around pronouns.



The future actions were organised to follow three different timescales. At relatively short- and mid-term, several actions were identified, as seen below.

- Continue to improve the recruitment and career development process : Composition of the boards, Positive discrimination in the shortlisting of candidates for all types of positions, Prepare an analysis of career development at ESO with the goal of identifying discrepancies between women and men
- Enable an inclusive environment : Training on unconscious bias, Develop unconscious bias & inclusion awareness among staff and management by organizing seminars, Provide support to HR in the implementation of new rules and regulations
- Identify contact people and escalation process in case of issues related to diversity Improve the working conditions

In the long-term, the Diversity & Inclusion Committee will prepare a detailed diversity and inclusion plan for one of the dimension of diversity (e.g. age). This will allow us to pave the road for the implementation of such plan for all the dimensions of diversity.

#### 4. CONCLUSION

Diversity and Inclusion are both an enrichment for ESO/Paranal Observatory. It is critical for any institution to develop a climate that welcomes a diverse staff, where tolerance and inclusion are set as a strategic goal, and a priority, at the highest institutional levels. Except the engineering department, ESO is already a diverse working place. Efforts should therefore be made on becoming an inclusive environment while improving the diversity. ESO could also play a leading role in aggressively identifying and participating in exceptionally effective outreach programs and work to see them adopted widely, particularly in under-served communities. The Observatory could commit to support and participate to education initiatives for local minorities, to encourage interest in and appreciation of math and science, and in astronomy. The first actions applied at Paranal and presented in this paper are tracing the path into a diverse and inclusive environment for all ESO present and future facilities.

#### ACKNOWLEDGMENTS

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