
This is an electronic reprint of the original article.
This reprint may differ from the original in pagination and typographic detail.

Miikkulainen, Kukka; Miinalainen, Tuuli; Ott, Jennifer
Finland, the promised land of gender equality? Situation in physics

Published in:
AIP Conference Proceedings

DOI:
[10.1063/5.0176212](https://doi.org/10.1063/5.0176212)

Published: 17/11/2023

Document Version
Publisher's PDF, also known as Version of record

Please cite the original version:
Miikkulainen, K., Miinalainen, T., & Ott, J. (2023). Finland, the promised land of gender equality? Situation in physics. *AIP Conference Proceedings*, (1). <https://doi.org/10.1063/5.0176212>

This material is protected by copyright and other intellectual property rights, and duplication or sale of all or part of any of the repository collections is not permitted, except that material may be duplicated by you for your research use or educational purposes in electronic or print form. You must obtain permission for any other use. Electronic or print copies may not be offered, whether for sale or otherwise to anyone who is not an authorised user.

RESEARCH ARTICLE | NOVEMBER 17 2023

Finland, the promised land of gender equality? Situation in physics

Kukka Miikkulainen ✉; Tuuli Miinalainen; Jennifer Ott

AIP Conf. Proc. 3040, 050015 (2023)

<https://doi.org/10.1063/5.0176212>



View
Online



Export
Citation

Finland, the Promised Land of Gender Equality? Situation in Physics

Kukka Miikkulainen^{1, a)}, Tuuli Miinalainen², and Jennifer Ott^{3, 4, b)}

¹*Oxford Instrument Technologies Oy, Tekniikantie 12, 02150 Espoo, Finland*

²*Department of Applied Physics, University of Eastern Finland, Kuopio Campus, Yliopistonranta 1 F (Melania)
70210 Kuopio, Finland*

³*Helsinki Institute of Physics, Gustaf Hällströmin katu 2, FI-00014, University of Helsinki, Finland*

⁴*Aalto University School of Electrical Engineering, Department of Electronics and Nanoengineering, Otakaari 1,
02150, Espoo, Finland*

^{a)}Corresponding author: Kukka.Miikkulainen@oxinst.com
^{b)}ottjennifer24@gmail.com

Abstract. Women in politics in Finland have received significant international attention recently, with the majority of party leader positions being held by women. The starting point of this study was to determine whether similar developments have also occurred in physics and the natural sciences. The results were mixed. In some areas of academic and working life, progress has been made in the past few years; whereas, in others, the situation remains the same or has even gotten worse.

INTRODUCTION

In 2021, Finland was listed as the second-best country on gender equality, based on a World Economic Forum index [1]. In addition, the current government of Finland has listed gender equality as a top priority, with the aim of pushing the country to the position of being the best country on gender equality [2]. Yet, a detectable gap remains in the Finnish working life between genders, and this gap is also visible in STEM fields including physics. A study by Barthelemy and Knaub [3] showed the presence of gender differences among Finnish physics students in terms of their motivation to study physics, as well as their future career prospects. Furthermore, in this study, female students reported lower self-efficacy than their male counterparts [3]. These differences translate on average to only 20% of physicists in Finnish working life being women [4].

Finland generally has a reputation of being at the forefront for gender equality. However, this reputation in itself can lead to problems, such as holding arrogant attitudes and ignoring real and proven behavioral and structural obstacles around diversity issues, because a majority of people may perceive that these problems are not serious or struggle to take concrete action. Many conclusions and actions may be dismissed as not being very relevant to Finland, even though we could learn and gain a lot from them. Promoting diversity and equality with an intersectional approach, alongside gender-focused efforts, is sometimes perceived as challenging and may suffer from poor implementation, which might, in the worst case, affect the aims of bringing equality to the working life.

SITUATION IN ACADEMIA

For women in physics in academia, development has been quite positive over the last four years. There have been many initiatives around this topic at several universities, resulting in various talks and workshops [5,6]. The number of female professors in physics and closely related fields is finally on the rise, as is the number of women serving as department heads or deans or holding other positions of leadership and responsibility [6]. Even so, many problems still persist for women who are already in the field [3].

At some universities, the proportion of woman students is rising, but it remains stagnant at others. Despite public commitments to diversity and inclusion, obtaining statistics on the gender distribution of students and staff remains difficult, as not all universities organize such data in a useful manner or share the information publicly. The data presented in Fig. 1 and Fig. 2 on the number of woman physics professors and gender distribution of physics staff at different career stages, respectively, has been collected manually and are no statistically sound dataset.

Codes of conduct and comparable documents have been written in many departments, but inappropriate behavior or harassment sometimes goes unsanctioned in practice. Such inaction can send the message that people who report these problems create unnecessary conflict. This is a general issue, but it often especially affects people in less secure positions, such as those in gender-based or other minority groups, and young scientists who perceive a threat to their career if they speak up. The situation seems to have improved, at least in some institutes, but there are no recent studies on this subject.

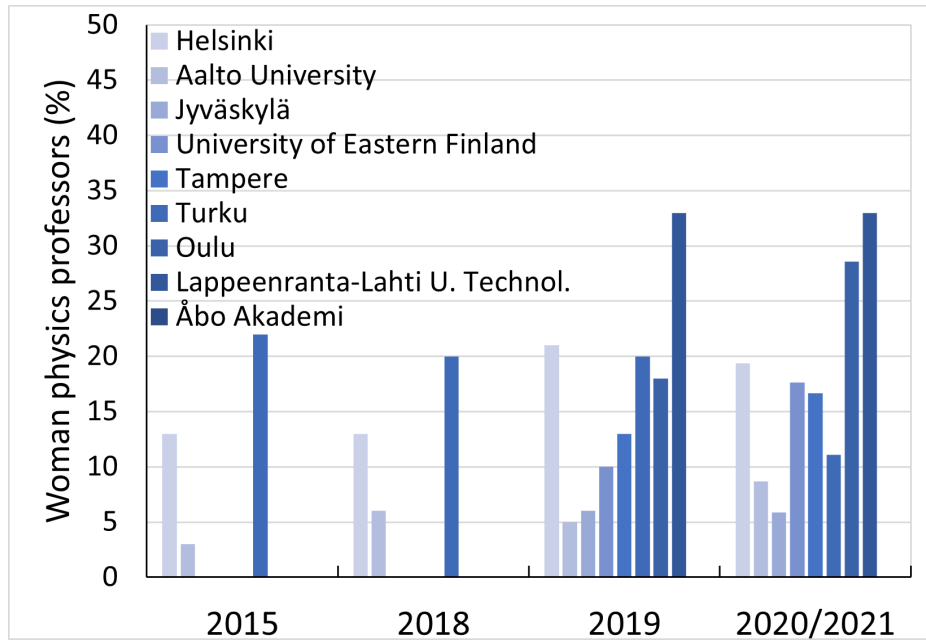


FIGURE 1. Relative percentages of woman professors in the physics departments of Finnish universities. Åbo Akademi and Lappeenranta-Lahti University of Technology have fewer than five physics professors in total.

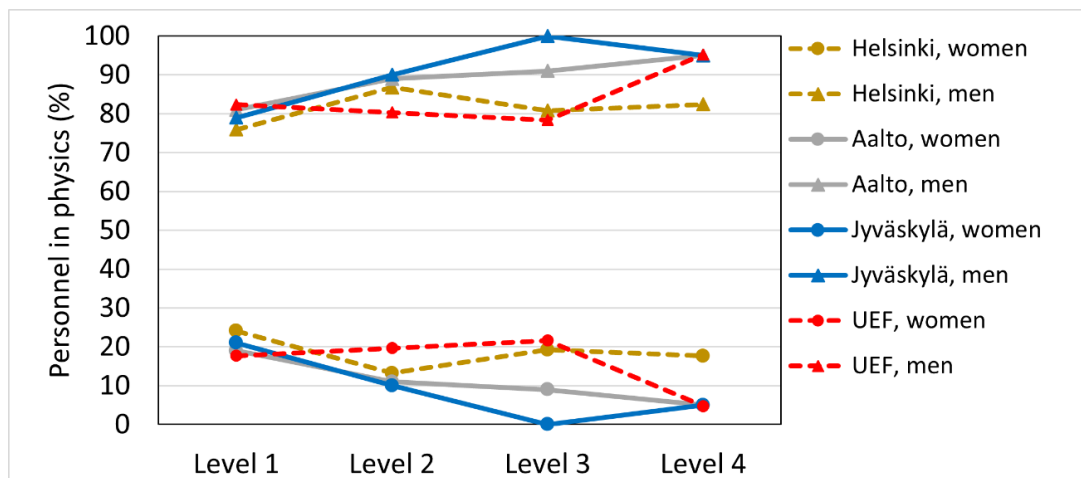


FIGURE 2. Men and women on the physics staff at selected Finnish universities. Career levels: 1 = PhD student; 2 = postdoctoral researcher; 3 = senior researcher, lecturer, or tenure track professor; 4 = tenured professor or research director. At Aalto and Jyväskylä University, associate professors are *registered* on level 4, but at University of Helsinki and Eastern Finland (UEF) on level 3. UEF data include the Department of Applied Physics and Department of Mathematics and Physics staff members.

SITUATION IN INDUSTRY

A recent study by Bairoh [7] looks at women's career progression in STEM in Finland. The mid-career years seem to be the most problematic there too, with salaries being approximately 5–7% lower for female compared with male physicists, as can be seen from a survey sent to members of the biggest trade union in Finland in STEM fields [8]. Men and women start with very similar salaries after graduation, but men tend to advance faster in their careers. In any case the number of respondents with a physics degree was so low that it is quite difficult to draw conclusions, but the differences are similar in a wider set of data including other STEM fields [7]. In industry and in government positions the pay difference decreased over the period from 2008 to 2018, whereas at universities it increased.

Many women also felt that they did not have equal opportunities for promotion, and they reported harassment and belittlement. In contrast, only a small minority of male respondents even acknowledged that these problems existed.

CONCLUSION

Some progress has occurred over the past few years, and almost every university in Finland now has at least one woman physics professor. It remains to be seen, however, whether this will have any effect in the earlier career stages, let alone in attracting more girls into physics.

Other diversity issues have been discussed more than in the past, but Finland has been quite slow to take these up. Statistics are not collected about ethnicity at all (perhaps because Finland was an ethnically homogenous country for such a long time); thus, it will be hard to track progress. The Finnish Women in Physics working group FinWiP has updated its name to FinDiP, Diversity in Physics, Finland, and it has arranged many events to raise awareness [6].

ACKNOWLEDGMENTS

We would like to thank everyone who helped us with data collection, and we especially thank Prof. Hanna Vehkamäki, Dr. Eija Tuominen, Prof. Milica Todorovic, and HR Manager Hanna Nurmela for their continued efforts over the years to advance this cause and keep the university statistics up to date.

REFERENCES

1. World Economic Forum, *Global Gender Gap Report* (World Economic Forum, Geneva, 2021).
2. Finnish Government, *The Equality Program 2020–2023* [in Finnish], Finnish Government, 2021, https://valtioneuvosto.fi/documents/1271139/20825107/Valtioneuvoston_periaatep%C3%A4%C3%A4t%C3%B6s_hallituksen_tasa-arvo-ohjelma_2020-2023+.pdf.
3. R. S. Barthelemy and A. V Knaub, “Gendered motivations and aspirations of university physics students in Finland,” *Phys. Rev. Phys. Educ. Res.* **16**, 010133 (2020), <https://doi.org/10.1103/PhysRevPhysEducRes.16.010133>.
4. Statistics Finland, *Työssäkäyntitilasto*, Statistics Finland, 2021, https://www.stat.fi/til/tyokay/index_en.html.
5. Women in Science network, University of Helsinki, <https://blogs.helsinki.fi/kumpulawomen/>.
6. Diversity in Physics Finland working group, Finnish Physical Society, <https://blogs.helsinki.fi/diversityinphysics/>.
7. S. Bairoh, “Valitaanko pätevä vai nainen? Sukupuolten tasa-arvo ja johtotehtäviin eteneminen tekniikan korkeakoulutettujen työpaikoilla” (Who is selected—the qualified or the woman? Gender equity and advancing to leadership positions at workplaces of academic engineers), *Academic Engineers and Architects in Finland TEK*, 2019, <https://www.tek.fi/fi/palvelut-ja-edut/tutkimus/tek-tutkii-yhdenvertaisuus-ja-tasa-arvo/valitaanko-pateva-vai-nainen-2019>.
8. S. Bairoh, *Fysiikan palkat 2020* (private communication).