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Soapbox Science Brussels: an Outreach Platform for the Promotion of Women in Science in Belgium

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Abstract. Soapbox Science is a public outreach platform whose purpose is to promote the visibility of women and non-binary scientists and their research by bringing them on to the streets to meet the passers-by. Soapbox Science aims at tackling stereotypes about science and scientists by showing, in an interactive way, attractive role models for women and non-binary people, who represent a minority in sciences. This initiative was founded in London, UK, in 2011 and has been spreading worldwide since then. In 2019, the idea to endorse the organisation of Soapbox Science events in Brussels started germinating in the head of a small group of scientists from two Belgian Federal Scientific Institutes. Due to COVID-19 restrictions, the first Brussels event was held online in the fall of 2020, but, since 2021, the team succeeded in organizing Soapbox Science events every June in Brussels.
These proceedings present the development of the Soapbox Science initiative in Belgium and describe the motivations, challenges, issues and opportunities encountered throughout the process, and how Soapbox Science Brussels gradually takes its place in the Belgian context of the promotion of women in sciences.

Key words. Women in sciences, STEM, gender equality

1. The lack of female and non-binary scientists as role models

Even today, women and non-binary scientists remain a minority in STEM research (sciences, technologies, engineering and mathematics), and their relative number dwindles in the course of the scientific career (see Figure 1).

Numerous studies have shown that women leave science at a higher rate than men and achieve less scientific prestige than them (Bot & Buat 2018; Flaherty 2018; Santos & Dang Van Phu 2019; Directorate General for Research and Innovation 2021). Different causes may explain this leakage, including the still-widely held stereotypes linking STEM excellence to men, which are reinforced by the

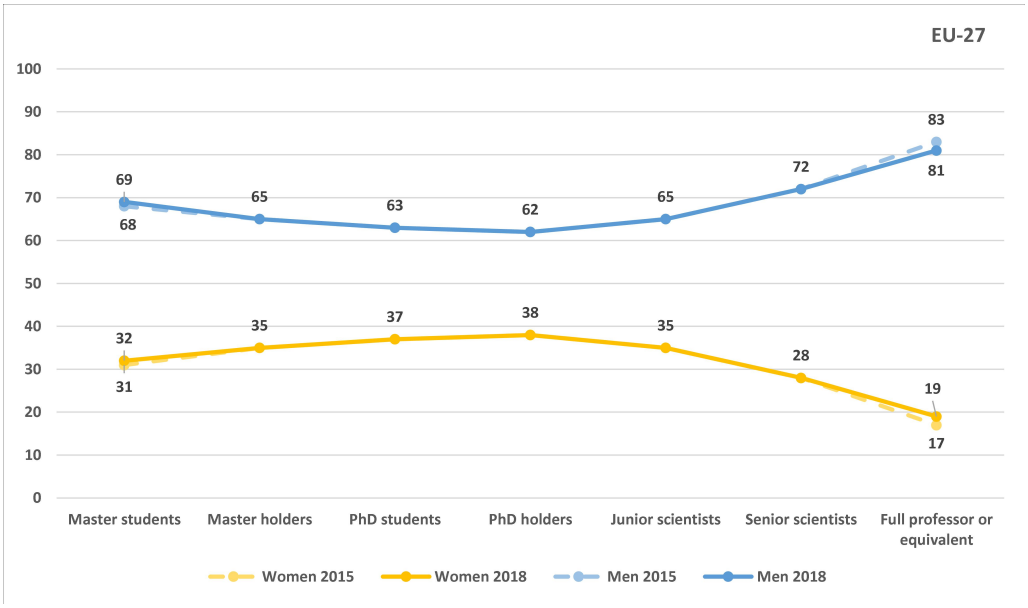

Fig. 1. Proportion (%) of men and women in a typical academic career in science and engineering, students and academic staff, EU-27, 2015-2018. Data taken from She figures 2021, pp 181–182.

fact that female scientists known to the public are very few compared to their male counterparts (Bian et al. 2017; Miller et al. 2018; Starr 2018; Storage et al. 2020). Moreover, even for people who do not consciously adhere to those stereotypes, they can badly (or sometimes positively) influence their performances, under an effect called stereotype threat (Bian et al. 2018; Cheryan & Bodenhausen 2000; Leslie et al. 2015). Those stereotypes could also give implicit bias to recruiters who would unconsciously prefer male over female candidates (Caplar et al. 2017; Dutt et al. 2016; Knezek 2017; Lerback & Hanson 2017; Tuttle 2017; Galos & Coppock 2023).

Although there is a lack of statistics covering the experience of non-binary and gender non-conforming people in science (American Physical Society 2016), some reports highlight that they also face specific discrimination in their work environment (American Physical Society 2016; Institute of Physics et al. 2019). Moreover, in gender studies in sciences, their identities are often erased in a binary between the 'male' and 'female' categories (Rasmussen et al. 2019). Authors like Rasmussen et al. (2023) recommend therefore gender-inclusive methods to get a better overview of discrimination in STEM fields.

The disequilibrium against women and non-binary people in science is of concern, not only in terms of social equality and justice showing here an unequal access to science careers for non male-gender, but also in terms of the excellence of research. Several studies show that more gender-diverse groups are more creative, productive and produce higher quality science (Campbell et al. 2013; Love et al. 2022; Nielsen et al. 2018).

To change the public's perception concerning female and non-binary scientists, an idea is to create more opportunities for those scientists to interact with the public and embody strong, positive, and attractive role models. The Soapbox Science Outreach Platform precisely aims at creating such opportunities.

In the next four sections we will present this initiative, with a special focus on the activities of the Brussels local organisation.

2. The International Soapbox Science Outreach Platform

Soapbox Science[1] is an international outreach initiative that gives to women and non-binary scientists a platform in public spaces. Soapbox Science events transform public areas in discussion forums following the Hyde Park's Speaker's Corner model: female and non-binary scientists talk about their research to the passers-by from their soapboxes. The format of the event consists in three slots of one hour during which four scientists share their enthusiasm and knowledge about science in an informal and interactive manner, meaning 12 scientists in total per event.

By this mean, the Soapbox Science outreach platform intends to:

- Promote the visibility of female and non-binary scientists;
- Achieve a wider participation of society in science.

Soapbox Science was founded in 2011 in London by Dr Seirian Sumner, from the University of Bristol, and Dr Nathalie Pettorelli, from the Zoological Society of London. The concept went on with great international success. Between 2011 and 2020, Soapbox Science events have happened in 59 cities in 14 countries (Watton et al. 2020).

In 2023, there were Soapbox Science Local Organisations in 5 continents (Europe, Africa, Australia, North America and South America) and 56 cities[2].

3. Soapbox Science Events in Brussels

In 2019, a team of researchers and science communication officers from the Royal Observatory of Belgium and the Royal Belgian Institute for Space Aeronomy, located at the Space Pole in Brussels, decided to create a local organisation of Soapbox Science in Brussels[3]. In November 2023, the local organising committee has a total of six members, with a new one from the KU Leuven joining the group and another one leaving it.

Previous initiatives promoting women in sciences or women in STEM already exist in Belgium. There is notably the non-profit association BeWiSe (Belgian Women in Sciences)[4] that supports women at all levels of STEM careers. However, Soapbox Science platforms have different objectives than BeWise, since their events are only addressed to the public for outreach purposes, i.e., presenting science and research topics. Hence, the creation of a Soapbox Science hub in Belgium is a novel way to highlight female scientists' work in the country.

Since its establishment, interest from female and non-binary researchers in Belgium for participating in Soapbox Science Brussels as a speaker was high, with a mean number of applicants of about 40 (see Table 1). By sharing their passion about science, female and non-binary scientist endorse important role models. Moreover, the enthusiasm and interest shown by the public prove how such events are valuable and necessary in Belgium.

To highlight the diversity of scientific topics and of female and non-binary scientists, the organisers thrive to select speakers with the most diverse sciences disciplines and seniority possible. They also try to give a broad representation of the academic world, with their various institutes. Moreover, Brussels is a bilingual city with two official languages, French and Dutch, and, as the capital of Europe, is also a city with a strong international status. Hence, a balance between the English, French and Dutch languages of the selected speakers' talks for Soapbox Science Brussels is an important selection criterion.

The first Soapbox Science Brussels event was held on October 10, 2020. Due to the restrictions to contain the COVID-19 pan-

[1] http://soapboxscience.org/ retrieved on 6 September 2023.

[2] http://soapboxscience.org/meet-our-local-organisers/ retrieved on 10 November 2023.

[3] https://soapboxsciencebrussels.oma.be retrieved on 10 November 2023.

[4] https://bewise.be/ retrieved on 3 November 2023.

Fig. 2. Soapbox Science events in Brussels, which took place at the *Place the la Bourse* in 2021 and 2022 (left) and the *Carrefour de l'Europe* in 2023 (right). Credits: Soapbox Science Brussels.

demic, it was held online and broadcast live on YouTube and Facebook. The views and impact were limited, with about 40 viewers online (see Table 1). However, the videos still hosted in the Soapbox Science Brussels YouTube account[5] constituted a first portfolio material for reaching a larger audience.

Since 2021, Soapbox Science Brussels events were organized in-person on a yearly basis. To this date (November 2023), two events took place at the *Place de la Bourse* of Brussels on June 26, 2021 and on June 25, 2022 and one at the *Carrefour de l'Europe*, in front of the Brussels Central Station on June 24, 2023 (see Figure 2).

4. Impact of the events

In order to assess the impact of the Soapbox Science in-person events, different tools are used: a fast survey to poll the visitors' first impressions, a counting of the number of visitors, observation of the mean time spent to listen to the different speakers, etc. All these tasks are ensured by volunteers who get a briefing just before the event. It should be noted that the outcome of this assessment is mainly indicative. Also, differences in the statistics presented should not be considered as representative for any time trend. Several factors limit the relevance of comparing the year 2023 with the years 2021 and 2022, the most important one being probably the fact that the 2023 event was held at a different place than the two other ones, with a very different configuration and passers-by rate.

A summary of attendance data is shown in Table 1, and a summary of the evaluation surveys for in-person events is shown in Table 2. Over all Soapbox Science events, there was an average attendance of 900 people per event (see Table 1), with an average of 8 minutes of attendance time and 2.78 speakers per visitor. Through the surveys performed in 2021 (with 13 men and 16 women being interviewed), 2022 (with 24 men and 24 women) and 2023 (with 10 women, 6 men and less than 5 respondents who provided different answers), it was established that about 21 % (2021), 26% (2022) and 41% (2023) of the visitors were just passing by and had not intended to go to a science event on that day (see Table 2). This is still a bit less than the mean attendance of Soapbox Science events in the world (about 1500 visitors (Watton et al. 2020), and 50% coming unintended). However, from the surveys (see Table 2), the general appreciation of the Brussels visitors to Soapbox Science events seems to be very high, with 79% (2021), 75% (2022) and 88% (2023) of the respondents declaring they are 'quite likely' or 'definitely' going to attend Soapbox Science events in the future, and with 93% (2021), 85% (2022) and

[5] `https://bit.ly/SoapboxScienceYouTube` retrieved on 3 November 2023.

Table 1. Soapbox Science Brussels events at a glance

	2020	**2021**	**2022**	**2023**
Format	Online	In-person	In-person	In-person
Number of candidate speakers	24	69	40	45
Number of selected speakers	12	12	12	12
Number of actual speakers	7	11	11	12
Number of attendees or viewers (if online)	~ 40	~ 600	~ 1300	~ 700
Average attendance time	NA	~ 6 min	~ 5 min	~ 12 min
Average number of speakers the visitors listened to	NA	2.24	2.83	3.28
Number of represented research institutes	7	9	9	11
Number of represented scientific disciplines	8	10	5	7

89% (2023) declaring they are 'quite likely' or 'definitely' going to recommend Soapbox Science events in the future (see Table 2).

In addition to the public and Belgian universities and research institutes, Soapbox Science Brussels events also caught attention of the Belgian local press, with news coverage for radio, paper and television, both in French (BX1[6], RTBF[7]) and Dutch media (De Standaard[8]). The Ministry of Higher Education and Research of the Belgian French Community also also voiced her support for the Brussels initiative of Soapbox Science[9]. As an initiative promoting sciences and women in sciences, Soapbox Science Brussels also found ways to collaborate with like-minded organizations, such as BeWiSe (see Section 3) and the Planetarium of Brussels. Hence, in September 2021, Soapbox Science Brussels participated, with the Planetarium, in a Researcher's Night event organised by BeWiSe[10]. Further collaborations with BeWiSe and other organisations promoting science and/or women in sciences are within the prospects of the Soapbox Science Brussels organizing team.

Thanks to those events and their impact, Soapbox Science Brussels is gradually finding its place in the Belgian research community. Building a strong network is the key to ensuring a good diversity in research topics, a wide representation of the Belgian institutions and a good balance between the above-mentioned languages.

5. Challenges and Prospects

Soapbox Science events are a way to advocate for more gender-diversity in science. Moreover, it can also serve as a network platform for female researchers, with the organization keeping contact with alumni speakers for at least several years. To spread the Soapbox Science initiative within the scientific community, the Brussels organizers presented in various scientific congresses the events they organized and their impacts (Bingen et al. 2021b,a, 2022; Piccialli et al. 2022).

Soapbox Science Brussels is a young organisation which just started to get notoriety

[6] https://bx1.be/categories/news/soapbox-part-a-la-rencontre-du-public-pour-pousser-les-femmes-a-se-lancer-dans-les-etudes-scientifiques/ retrieved on 4 January 2024.

[7] https://www.rtbf.be/article/soapbox-science-une-initiative-pour-mettre-les-femmes-scientifiques-en-valeur-10792968 retrieved on 4 January 2024.

[8] https://www.standaard.be/cnt/dmf20210627_97774979 retrieved on 4 January 2024

[9] https://www.astro.oma.be/en/soapbox-science-2023-women-scientists-take-the-floor-at-the-heart-of-brussels/, retrieved on January 15, 2024

[10] https://wisenight.eu retrieved on 6 September 2023.

Table 2. Survey results for the Soapbox Science Brussels 2021, 2022 and 2023 events. The 2021 results is based on 29 respondents (13 male, 16 female), the 2022 results on based on 48 respondents (24 male and 24 female) and the 2023 event on 18 respondents (10 female, 6 male and less than 5 people who provided different answers).

2021	2022	2023	Assessment
69%	75%	88%	think that the event was 'effective' or very 'effective' at promoting women in science
21%	26%	41%	were just passing by and had not intended to go to a science event that day
34%	35%	50%	'rarely' or 'never' attended science events
48%	52%	67%	are 'quite likely' or 'definitely' going to find out more about a subject covered at the event
93%	80%	89%	are 'quite likely' or 'definitely' going to tell a friend about what they heard
62%	54%	67%	are 'quite likely' or 'definitely' going to find out more about Soapbox Science events
79%	75%	71%	are 'quite likely' or 'definitely' going to attend Soapbox Science events in the future
76%	74%	61%	are 'quite likely' or 'definitely' going to attend similar events in the future
93%	85%	89%	are quite likely' or 'definitely' going to recommend Soapbox Science events to others

and recognition among Belgian research and outreach institutes but also its potential public. The organisers are mainly volunteers and hence have limited time to devote themselves to the Soapbox Science-related tasks. The main challenge of the Brussels local organisation is to get regular and sufficient funding to sustain durably their activities. Hence, advertising the Soapbox Science initiative and events to potential sponsors is a crucial part for continuing to organize events.

Despite these hurdles, the 2024 event is already in preparation, with the determination to reach a higher audience and continue to advocate for more gender-diversity in science.

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