

## Diversity and inclusion activities in Belle II

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**H. M. Wakeling,<sup>a,b,\*</sup> S. A. De La Motte,<sup>a,c</sup> M. Barrett<sup>a,d</sup> and K. Kinoshita<sup>a,e</sup>**

<sup>a</sup>*The Belle II Collaboration,  
Street number, City, Japan*

<sup>b</sup>*Department of Physics, McGill University,  
3600 rue University, Montréal, Canada*

<sup>c</sup>*School of Physical Sciences, University of Adelaide,  
Adelaide SA 5005, Australia*

<sup>d</sup>

<sup>e</sup>

*E-mail:* [hannah.wakeling@mail.mcgill.ca](mailto:hannah.wakeling@mail.mcgill.ca)

These proceedings accompany the Belle II talk in the diversity and inclusion parallel session delivered during ICHEP 2020. This marks the first external diversity and inclusion presentation by the Belle II Collaboration, in which we present the first Belle II collected data and self-reported statistics regarding diversity and inclusion. We also present Belle II's current and planned activities to aid and improve diversity and inclusion. Belle II finds that there is still a lot to be done to improve the social working environment and population representation within our collaboration and within High Energy Physics.

*40th International Conference on High Energy physics - ICHEP2020  
July 28 - August 6, 2020  
Prague, Czech Republic (virtual meeting)*

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\*Speaker

## Introduction

Belle II is a High Energy Physics (HEP) collaboration based in Tsukuba, Japan. The Belle II experiment itself is a particle detector at an electron-positron collider, SuperKEKB. The institutions that contribute to the collaboration span 4 continents. At the end of the 2019 Japanese fiscal year (JFYear) Belle II had 1041 members registered. This paper will introduce the Belle II collaboration and our efforts to research and improve on diversity and inclusion within the collaboration and outside of it. Section 1 will present the statistics taken from the collaboration's membership registrations and will discuss results from a membership survey taken in 2018. Section 2 will exhibit some of the actions Belle II has been taking, and will take, to promote diversity and inclusion.

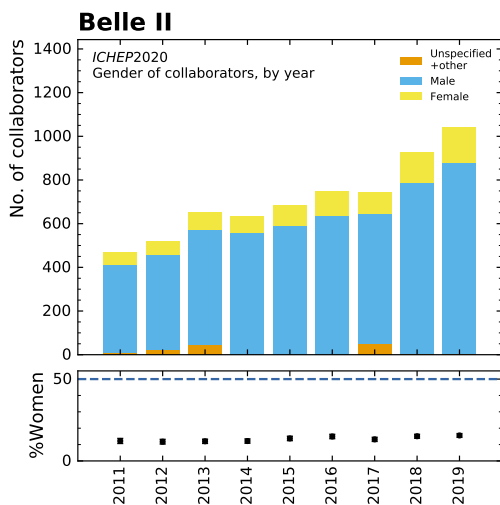
## 1. The current climate at Belle II

### 1.1 Belle II collaboration demographics

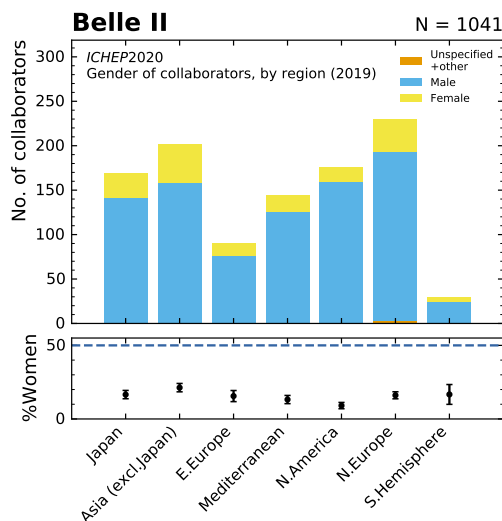
This section analyses the demographics of Belle II registration data from the Belle II member registration platforms from 2011 - 2019. In 2017, due to the migration of Belle II's registration system from an internal record (kept by the Belle II secretaries) to the Belle II Membership Management System (B2MMS), the year 2017 will appear as an anomaly in the following results. Within the B2MMS, it is compulsory for a member to submit their name, title, gender, email, institution and membership category (i.e. Ph.D. student, faculty, etc.). The possible selections available for gender are: 'Male', 'Female', 'Other', 'Not set'. Here we acknowledge the issues often perpetuated in this form of data taking with respect to a gender binary. Additionally, in the following figures it is necessary to combine 'other' and 'unspecified' into one category as underrepresented persons are easily identifiable due to low statistics. We as a collaboration wish to maintain and pursue true anonymity of our membership data.

In recent years Belle II has seen a distinct membership increase, approximately doubling members between the years 2011 to 2019. Within this, the percentage of female identifying members increased from approximately 12.2% to 15.6%, shown in Figure 1. Though statistically significant, the average from these two numbers shows the increase in the percentage of women members to be approximately 0.4% every year. At this rate and using a target of 50% as an example of population representation (displayed as a dashed line in the percentage plot of Figure 1), it would take 86 years to reach proportional gender representation within the collaboration, by which time the Belle II experiment will have completed and there will likely exist a 'Belle V' or equivalent.

We next compare the gender of collaborators by region they work in, based on their registered institution. One particularly interesting takeaway from this Figure 2 is the comparison between two regions or countries with similar representation within the collaboration. Comparing Japan, which represents 16.23% of the collaboration, to Northern America which represents 16.91% of the collaboration, we can see that Japan has a higher representation of women than Northern America, 16.57% compared to 9.09% respectively. Within Belle II, the representation of women as a percentage drops as their career progresses from postgraduate to permanent faculty, shown in Figure 3. This is indicative that we as a collaboration are not exempt from the coined 'leaky pipeline' effect.



**Figure 1:** The number and gender of Belle II Collaborators, from years 2011 to 2019. Data taken from Belle II membership declaration, where ‘other’ refers to non-binary gender identity and ‘unspecified’ refers to undeclared gender information.



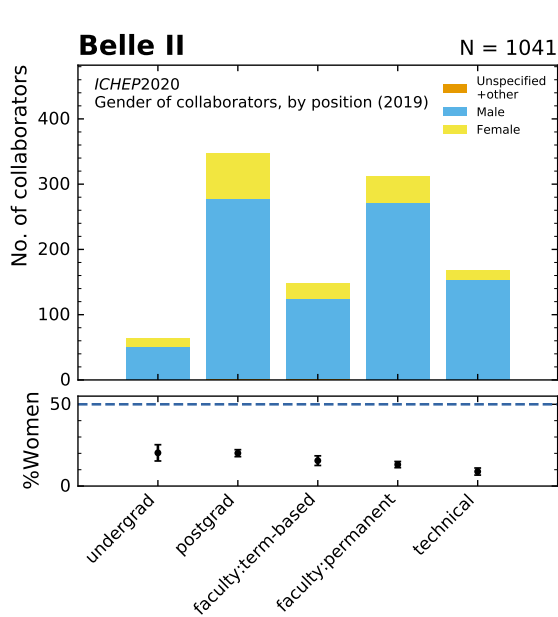
**Figure 2:** The number of collaborators of the Belle II Collaboration by region and gender. When compared to similar graphs produced by the ATLAS Collaboration [2] we see that we have a much larger proportion of collaborators from Asian institution ATLAS. Japan alone contributes 16% of the collaboration, so is separated from the ‘Asia’ region for clearer presentation.

Figure 4 shows the percentage of women in recognized involvement in the collaboration by year. The trend in this figure shows, again, a small improvement over the last 8 years of data collection, but leaves a lot of room for improvement. Internal talks are often given by those in leadership roles such as group chairs. These positions have a low percentage of female representation, therefore the fact that there are even fewer women doing internal talks is not surprising. This figure does show that overall there is an upwards trend, but again this trend is not enough to reach proportional gender representation of our collaboration in the near future.

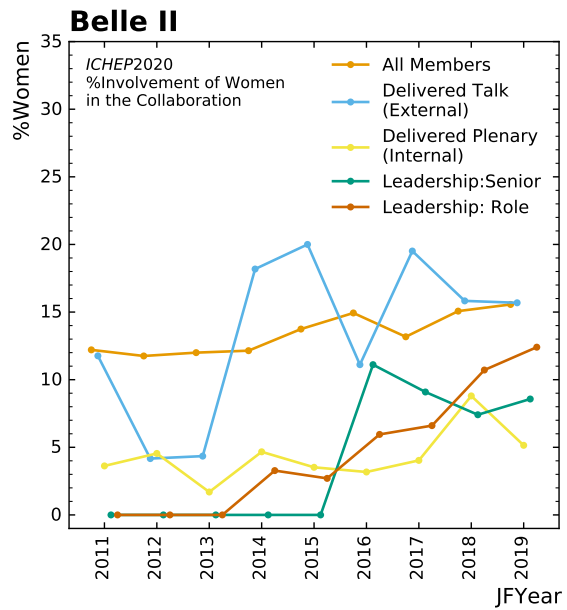
## 1.2 Belle II membership survey 2018

A Belle II membership survey was conducted in 2018. This survey was inspired by a survey done by LHCb and is a climate survey asking participants for qualitative and quantitative data. The survey was emailed out to the entire collaboration. It took approximately 6 months to get 244 responses from the collaboration, less than 25% of registered 2018 members. As a result of this the data is implicitly biased. The phrasing of the questions also biases the results. Figure 5 shows the position representations for the 2018 membership survey, compared to the B2MMS FY2019.

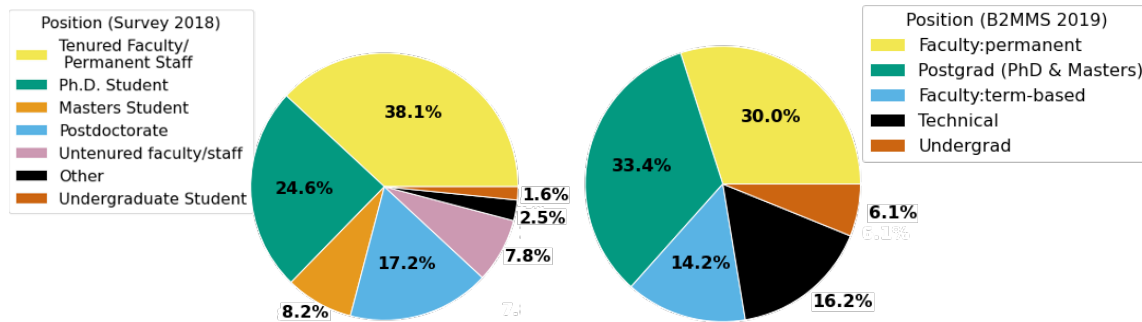
Belle II learned a lot from the climate survey, including the fact that approximately 25% of those that took this survey have, at some point in their career, withdrawn from consideration for a leadership role at Belle II (implicitly or explicitly) because of the impact it would have on their family life. This leads to the conclusion that the Belle II collaboration should work on being more inclusive towards family life.



**Figure 3:** The number of collaborators of the Belle II Collaboration by position and gender.



**Figure 4:** The percentage of female collaborators of the Belle II Collaboration by type of recognised involvement within the collaboration.



**Figure 5:** The collaborators who replied to the Belle II membership survey (left) and the B2MMS 2019 membership (right) by position. The categories recorded are not parallel between the records, therefore there is overlap between some categories.

## 2. Belle II diversity and inclusion actions

Being such a large, culturally diverse collaboration encourages Belle II to have a code of conduct in which we describe how we expect our members to conduct themselves. Belle II included the first iteration of the code of conduct in the Belle II bylaws in October 2017 and the updated them in 2018. The code of conduct enshrines principles related to research practice and also fostering a diverse and inclusive collaboration and it reads as follows:

"The Belle II collaboration is committed to fostering an open, diverse, and inclusive working environment that nurtures growth and development of all, and believes that an array of values, interests, experiences, and cultural viewpoints enriches our learning

and our workplace. Thus, members shall not engage in violent, harassing, sexist, racist, or discriminatory behaviour."

The code of conduct is reiterated at the tri-annual Belle II collaboration meetings during a Diversity plenary and any diversity meetings. Alongside the code of conduct, two positions of diversity officer were created in October 2018. Their positions exist:

- To promote an inclusive environment within the collaboration;
- To provide a safe and confidential point of contact for any collaborator to report any issues, particularly those related to discrimination, bullying, or harassment within the collaboration;
- To ensure that persons from marginalised groups are appropriately considered for positions of responsibility in the collaboration and are supported in their careers;
- To encourage and publicize the collaboration's events and efforts promoting equity.

Belle II uses its active social media platforms to raise awareness of diversity and inclusion events such as International Women's Day, LGBTSTEM Day, and Colour Blind Awareness Day. The posts are always published in both Japanese and English. Belle II aims to always post images that show the diversity that we have within the collaboration and in future plans to publish a series of posts on our collaborators: their position, passions, and experiences. In 2019, Belle II became an official supporter of LGBTSTEM Day, through unanimous endorsement of our Institutional Board. Belle II changed its profile picture for the day to a logo with an LGBTQ+ rainbow flag background, and also made a skin available for profile pictures on Facebook. We encourage other research institutions to support each LGBTSTEM day.

In our quest to improve diversity and inclusion in our collaboration, we must always consider the safety of our members. A collaborator voiced a legitimate concern about having a photo of members alongside the LGBTQ+ rainbow logo in the same post which could be understood as promoting LGBTQ+. This could be detrimental for the safety or situation of participants originating from countries with laws against LGBTQ+ actions. Now Belle II does not post faces with logos without explicit consent that it is safe for them to do so on social media.

Belle II has been working to improve certain language used in computing and physics. In general, we wish to avoid anything that might cause distress or feelings of exclusion to our collaborators. In particular we are considering words used with severe racial overtones. Our computing and software groups have taken steps to remove and/or phase out the use of the words 'slave' and 'master' from our code. This has not been straightforward due to external software use, but we have been able to remove 'slave' for our build machines for new operating systems from e18 onwards, and we are revisiting 'master' now that GitHub are replacing their use of this word. It is now possible for anyone to change personal repositories to use more inclusive language[1]. Belle II are also encouraging alternatives for the terms 'blacklist/whitelist'.

The planned procedure to record collision data between February and July 2020 at Belle II changed rapidly due to the impact of COVID-19 pandemic. We were able to continue collecting data and still broke the worlds' instantaneous luminosity record thanks to the hard work of the local and remote workers [3]. Belle II tried to alleviate some stress caused by the pandemic, the extra

work hours and the isolation in the form of snacks and ready meals to show appreciation for shifters and to also increase safety by mitigating the need to go to supermarkets between shifts. We also held some remote social events for example an end of run party on Zoom to celebrate our work and boost moral.

Other important actions worth noting:

- Implemented colour blind friendly screens in our control room. Encourage analysts and users to use colour blind friendly colours in plots. All plots in this conference note have used colour blind friendly colour schemes.
- The Belle II Secretariat worked to make childcare easier to find as it has been historically difficult to find in Japan.
- KEK is working on improving bathroom accessibility. It has improved the bathroom provision for women in the dormitory and is working on improving the situation in experimental areas. There has been a request submitted by the International Board of Belle II for gender neutral bathrooms by our control room; COVID-19 has delayed the progress of this.
- Belle II members help proofread Japanese to English translations. Often translations or cultural connotations evolve quicker than KEK document revisions and there may be archaic or outdated terms used.
- Belle II has asked external food providers for more inclusive food options for dietary restrictions and requirements during collaboration meetings. There is pushback there as these meals generally do not sell as well.

Belle II would like to continue raising awareness within the collaboration through more social posts and emails. In particular we wish to normalise making things accessible, for example by encouraging colour blind friendly plots, or recommending to turn cameras on *when speaking* in video conference calls; more of us are experiencing zoom fatigue but video confereing is particularly difficult without facial cues for some with, for example, dyslexia, autism and ADHD. Finally, we'd like to encourage and normalise putting self care first.

## References

- [1] Renaming the default branch from master. <https://github.com/github/renaming>. Accessed: 19.10.2020.
- [2] Studies related to gender and geographic diversity in the ATLAS Collaboration. Technical Report ATL-GEN-PUB-2016-001, CERN, Geneva, Jul 2016.
- [3] Matthew Chalmers. Kek reclaims luminosity record. <https://cerncourier.com/a/kek-reclaims-luminosity-record/>. Accessed: 19.10.2020.