

opportunity, we collaborated in co-creating and co-delivering the Cultural Collisions by Origin-Canada program inspired by art@CMS-CERN. The program was a unique collaboration between international scientific research institutions (Origin), the System Planning, Research and Innovation Division at the Ontario Ministry of Education and the Ontario Science Centre. #Cultural\_Collisions @OriginPhysics. It is quite amazing that one conversation with Dr. Michael Hoch art@CMS-CERN, resulted in a project that connected high school art, science and physics students with professional artists, musicians and physicists from across Canada and around the world!

I encourage the physics community to network and collaborate with educators! It is critical that we start to support our youth by working together to create moments that engages our students learn and create opportunities for them to wonder, question, explore and discover the fascinating mysteries that still puzzle physicists today! It truly is an exciting time in science with a wealth of opportunity! Let's inspire students together! We are truly better together! Let's Connect!

I am currently on secondment to the Ministry of Education as an Education Officer on the Innovation Design & Implementation (IDI) Team.

## TAKE ACTION FOR GENDER-BALANCED AND DIVERSE SCIENTIFIC MEETINGS

We are writing to suggest action to enhance “equity, diversity, and inclusion” [1] in physics, particularly representation of women, as well as other under-represented groups (“visible minorities, Indigenous peoples, people with diverse gender identities and people with disabilities” [1]), as invited and keynote speakers at conferences.

At a recent international conference we attended involving 200 participants from around the world, there were 5 keynote and 12 invited speakers. None of the keynote speakers were women, and only 1 of the 12 invited speakers was a woman. At the same time, the conference featured excellent proffered (not invited or keynote) presentations by women at all career stages, as well as men. The lack of women on the keynote and invited speakers list was striking and discouraging, as was the fact that there were few women on the conference organizing

committee. This is certainly not the first conference in recent years to exhibit such disparities in representation amongst invited and keynote speakers.

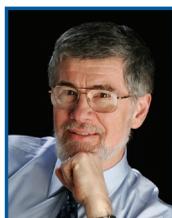
There are plenty of reasons to take action to ensure scientific meetings are both gender-balanced and diverse. In parallel with the three broad “Merit Indicators” considered in NSERC’s Discovery Grant evaluation, consider the following three reasons for seeking gender balance and diversity at meetings.

- i) *To enrich development of highly qualified personnel (HQP):* Making connections is at the heart of scientific meetings, and interactions between trainees and younger investigators may come more easily when there are senior/established researchers that the trainees or younger investigators can relate to. Gender balance and diversity are important for establishing good interactions and connections between generations of researchers. It also provides role models for young women physicists and others from under-represented groups, thereby encouraging them to stay in the field.
- ii) *To enhance researcher career progression:* Not including or under-representing women and individuals from other under-represented groups as keynote and invited speakers hinders the careers of these scientists. In the highly competitive environment for grants and jobs, an invited or keynote speaker entry on a CV is an indication of respect amongst peers and recognition of research excellence and innovation. If one or more groups within the population is under-represented, then the corresponding/associated scientists are also at a disadvantage when it comes to applications for jobs, grants, research chairs, promotions, and so on. If there are unconscious or implicit biases in play resulting in groups not being invited, then these are (hidden) barriers.



Rowan M. Thomson  
<rthomson@physics.carleton.ca>,  
Canada Research Chair and Associate  
Professor,  
Department of Physics, Carleton University,  
1125 Colonel By Drive, Ottawa ON K1S 5B6

and



D.W.O. Rogers  
<drogers@physics.carleton.ca>,  
Distinguished Research Professor,  
Department of Physics, Carleton University,  
1125 Colonel By Drive, Ottawa ON K1S 5B6

iii) *To advance research*: Diversity at meetings enhances interactions, leading to innovative approaches to solving problems as well as new and sometimes unexpected directions in research. Collaboration is at the heart of many new discoveries, and scientific meetings play important roles in initiating, nurturing, and fostering collaborations.

It is clear that action on gender-balanced and diverse scientific meetings aligns with NSERC's framework [1] and 2017 statement on equity, diversity and excellence in natural sciences and engineering research [2]. However, there are no clear guidelines or best practices for action towards achieving gender balance and diversity at scientific meetings. Some major international conferences have actively taken steps to achieve gender balance and diversity with great success [3]: it's time for best practices to be developed and adopted by CAP for the annual meeting and the lecture tour, and put into practice for advancing Canadian science, leading the way for all scientific meetings.

Practices to achieve more diversity include: collecting data on gender balance and diversity in conferences/meetings and reporting the data; developing a speaker policy regarding this issue (e.g., speaker gender/diversity balance must reflect audience or profession) and making it visible; ensuring organizing committees are balanced and informed; building databases of speakers; providing support for speakers and families [4,5].

Relatively simple actions have substantially enhanced diversity at recent meetings of other societies [6]. Martin [4] has proposed and discussed the following 10 rules to achieve conference speaker gender balance:

1. Collect the data
2. Develop a speaker policy
3. Make the policy visible
4. Establish a balanced and informed program committee
5. Report the data
6. Build and use databases (of potential women speakers)
7. Respond to resistance
8. Support women at meetings (child care)
9. Be Family-friendly (at larger conferences especially)
10. Take the pledge (*i.e.*, proactively check on speaker policy before accepting an invitation to speak)

While Martin's rules focus on gender balance, they may be extended to generally encompass inclusion of individuals from other traditionally under-represented groups, and thus promote diversity within Canadian scientific meetings.

By training the next generation of physicists/scientists, by providing opportunities for demonstrating excellence, and by developing new directions in research, we all win with gender balance and diversity at meetings: "diversity leads to better science." [7]

## REFERENCES

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