

### The Gender Gap in Chemistry – Building on the ISC Gender Gap Project

The gender gap in STEM is a persistent problem, with women underrepresented in all fields, including chemistry. Women chemists face a number of challenges, including slower career progression, harassment, and lack of recognition. To address this issue, there have been a number of activities and strategies developed all over the world intended to close the gender gap in science.

#### Global Gender Equality Initiatives in Chemistry

The IUPAC project, “The Gender Gap in Chemistry – Building on the ISC Gender Gap Project,” (2020-016-3-020) was proposed to cover work specific to the field of chemistry to use the results of the International Science Council (ISC) project (<https://gender-gap-in-science.org>) to elucidate the situation with respect to gender in chemistry and to identify possible actions to improve the situation. In the IUPAC project, the task group, with members across five countries, conducted searches on existing programs and initiatives globally that advocate and promote gender equity and inclusion in chemistry. From our search, it was found that there are a number of programs and initiatives designed to support women in STEM. Among these programs are professional development workshops, awards, and policies on gender equity.

Readers of *Chemistry International* will be well aware of The IUPAC Distinguished Women in Chemistry or Chemical Engineering Awards, which

recognize and promote the work of women chemists and chemical engineers worldwide. The awardees also serve as role models for young scholars in the field. Additionally, the IUPAC Working Group on Women in Physics has a number of initiatives to promote diversity and inclusion in physics, including a resolution stating that conferences should have a session on diversity and inclusion and a requirement that meetings have at least 10 % women speakers and committee members.

#### Current Findings

The task group has developed indicators to assess the effectiveness and impact of initiatives that support women in chemistry. These indicators include the number of women who participate in the program, the number of women who advance in their careers, and the number of women who are recognized for their achievements, as a result of these initiatives.

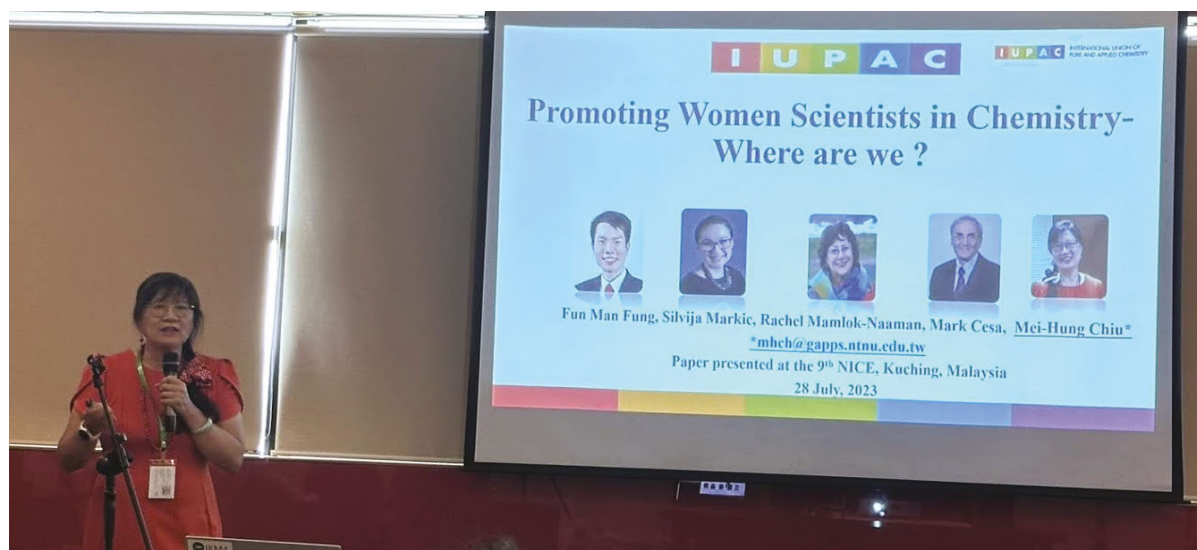
By identifying the most effective practices for supporting women scientists in their careers or studies, we can help to close the gender gap in chemistry and create a more inclusive and equitable scientific community.

The most common activities and strategies used were:

- Providing mentorship and sponsorship opportunities
- Organizing networking events
- Offering training and development programs
- Raising awareness of gender equity and inclusion issues

The most common goals of the initiatives were:

- Increasing the number of women in chemistry
- Supporting the advancement of women in



Mei-Hung Chiu presented the research at the 9th Network of Inter-Asian Chemistry Educators (9NICE) Conference 2023 in Kuching, Sarawak, Malaysia held in July 2023.

chemistry careers

- Promoting gender equity and inclusion in the chemistry community

The task group also found that the initiatives had a range of potential impacts, including:

- Increasing the number of women who pursue careers in chemistry
- Helping women to advance in their careers
- Creating a more inclusive and equitable chemistry community

### Challenges and Opportunities

While there are a number of successful programs and initiatives, there are still challenges that need to be addressed. One challenge is the sustainability of initiatives that rely on finite funding. Another challenge is the difficulty in uncovering evidence of the effectiveness and impact of these initiatives.

### Implications for the Future

Our current findings suggest that there is a need for sustainable and impactful initiatives to support women in chemistry. The emphasis on the importance of institutional support and policies, as well as the need to challenge gender stereotype threats, cannot be understated.

From our search, it was found that most initiatives are based on the work of university educators and scientists, with little input from industry or from policy makers. We argue that the participation of policy makers is paramount to the long-term sustainability of initiatives. Another important finding is that the initiatives use a variety of strategies, including mentorship, networking, training, and awareness raising. However, we are unsure whether one-day workshops and conferences are sufficient to achieve the desired goals. We suggest that more research is needed to evaluate the effectiveness of different initiatives.

In addition, there is an urgent need to overcome gender stereotypes. We posit that chemical and scientific career orientations are associated with stereotypes on ethnicity and social class. As a result, young women from disadvantaged social backgrounds and from non-dominant ethnicities are less likely to have career aspirations in science.

Finally, an immediate action to start would be to change in the mindset of social and educational expectations on gender. Therefore, it is crucial to have institutional policies that promote gender equity, as well as alterations to existing criteria to reduce unfair biases. Organizations should recognize the importance

of identifying role models and representatives for girls or women scientists at various levels of the education systems.

### Recommendations

Based on our findings, the team recommends the following:

- Invest in sustainable and impactful initiatives that support women in chemistry.
- Engage policymakers to ensure gender diversity and inclusion.

The project findings were presented at the 9th Network of Inter-Asian Chemistry Educators (9NICE) Conference 2023 in Kuching, Sarawak, Malaysia held in July 2023 and at the American Chemical Society Women Chemists Committee symposium held in August 2023.

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<https://iupac.org/project/2020-016-3-020/>

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## Global Framework on Chemicals

The International Conference on Chemicals Management (ICCM5) was held in Bonn, Germany from 25-29 September, 2023. It was organized by United Nations Environment Program (UNEP) and hosted by the Government of Germany. Mr. Jean Pelin, Titular member on the Committee on Chemistry and Industry (COCI) and Dr. Bipul Saha, COCI and Bureau member, represented IUPAC in the Conference.

Delegates from more than 150 countries, representatives from United Nations, OECD, World Bank, World Economic Forum, WHO, Pure Earth, IUPAC, IPEN (International Pollutants Elimination Network), IOMC (Inter-Organization Programme for the Sound Management of Chemicals), German NGO Forum for Environment and Development, Friends of the Earth, International Labour organization, CEOs of Chemical Companies and many others participated in the discussion.

During the Conference several groups had their internal meetings. This included regional meetings of EU, Africa, GRULAC (Group of Latin America and the Caribbean), Asia and the Pacific, and also meetings of