Preface

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The Gender Gap in Science – A *PAC* Special Topics Issue

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The term **gender gap,** as defined by the World Economic Forum ("The Global Gender Gap Index, 2020" (http://reports.weforum.org/global-gender-gap-report-2020/the-global-gender-gap-index-2020/), denotes differences "between women and men in terms of their levels of participation, access, rights, remuneration or benefits." That a gender gap exists in the sciences is clearly evident; according to the UNESCO Institute for Statistics, fewer than 30% of the world's researchers are women (*Women in Science*, http://uis.unesco.org/en/topic/women-science.) Numerous studies have investigated the gender gap in professional fields.

In 2017 IUPAC joined ten other international unions and organizations in the natural sciences, computing, and mathematics to begin a three-year project, funded by the International Science Council, ISC (formerly ICSU), to examine the gender gap in science and to recommend actions to reduce the gap between men and women in these fields. The project, entitled, "A Global Approach to the Gender Gap in Mathematical, Computing, and Natural Sciences: How to Measure It, How to Reduce It?" (https://gender-gap-in-science.org/), was co-led by IUPAC and the International Mathematical Union, IMU. Project work was divided into three main tasks: a Global Survey of women and men in the sciences, mathematics and computing to measure differences between women's and men's experiences in their education, employment, and personal lives; a study of publication patterns to measure differences between women's and men's rate of publication of their research, including trends over time; and development of a database of good practices for encouraging girls and young women to consider careers in the scientific, mathematical and computing fields and for supporting women in these fields.

Results of the work on these tasks (Chiu and Cesa, *Chem. Int.* 2020, 42(3), 16-21; https://doi.org/10.1515/ci-2020-0306) clearly showed that women continue to have less positive experiences than men in education and employment across scientific disciplines, geographic regions, and levels of economic development (https://gender-gap-in-science.org/2020/06/25/gender-gap-in-science-book/). At the end of the three-year project, a final conference was organized at the International Center for Theoretical Physics, ICTP, in Trieste, Italy, at which results of the project were shared with an audience of approximately 100 international leaders in advancing gender equality in their scientific unions, universities, and organizations. At the conference a series of recommendations for improving gender awareness for international unions, local organizations, and instructors and parents was prepared and disseminated (https://gender-gap-in-science.org/project-book-booklet/).

We have invited sixteen persons from a range of scientific, mathematical and computing disciplines who contributed to the Gender Gap Project and participated in the final project conference to prepare articles for this special topics issue of *Pure and Applied Chemistry*. Their contributions to this issue describe their initiatives and advances to improve gender equity and balance in schools, universities, research institutions and industry. This issue of *PAC* includes articles that describe the findings of the Global Survey; initiatives by international scientific, mathematical and computing unions to reduce the gender gap in their fields, including physics, astronomy, biology, ocean science, computing machinery, and mathematics; regional and geographical approaches to reducing the gender gap, particularly in the developing world; and new and

innovative approaches toward gender equity, including networking initiatives, and good practices around the world for encouraging girls and young women to pursue careers in science.

Following on the Gender Gap Project, IUPAC and other international organizations are building on the project's findings to advance gender equity in their disciplines. In 2020 the Standing Committee for Gender Equality in Science, SCGES (https://gender-equality-in-science.org/), was instituted. IUPAC is a founding member of SCGES along with fifteen other international partners. IUPAC is currently working on a project to extend the Gender Gap project: https://iupac.org/project/2020-016-3-020. The Global Survey data is being analyzed with a specific focus on responses from persons in the chemical sciences. IUPAC is collaborating with an initiative by several scientific publishers to examine gender trends, and the project is also assembling a list of good practices for encouraging women and girls to explore chemistry-related careers.

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