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*In association with*



**NETWORK  
GENDER  
& STEM**  
educational and  
occupational pathways  
and participation

## **2021 Network Gender & STEM Conference Report**

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### **ABSTRACT**

The Network Gender & STEM 2021 Conference co-Convenors, Professors Helen Watt and Judy Anderson, report on the conference theme, structure and highlight contents.

### **KEYWORDS**

Network Gender & STEM conference; journal special issue

### **2021 NETWORK GENDER & STEM CONFERENCE REPORT**

Deferred one year due to the COVID-19 global pandemic, the 2021 Network Gender & STEM conference was finally possible via an online format, involving 170 participating delegates from 20 countries. This conference brought together researchers, scientists, educators, policymakers, industry representatives and the public to interrogate person-in-context influences towards, or away from, diverse STEM pathways across stages and settings.

Our 2021 overarching theme “*STEM Education for the New Work Order: Policy, Practice and Partnerships*” considered needs of the future STEM workforce as new, interdisciplinary drivers are transforming work and education policy and practice in response to social and environmental challenges and technological advancement. What is the role of STEM for this new work order, and how can we engage and prepare all young people including girls and women? By drawing together international researchers from diverse disciplinary perspectives, alongside policymakers and practitioners, our aim was to stimulate new research and findings to shape future inquiry.

Themes for the conference included:

- individual, family, teacher and peer processes which impact STEM engagement and participation;

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- key factors and practices to promote vs. deter STEM engagement and learning within school, university and workplaces;
- positive action measures: STEM initiatives, schemes, networks and organisations;
- developments in STEM & preparing workers for the future; and
- the role of higher education institutes, government, industry, public policy and career development policies to enhance women's and men's participation in STEM research, commercialisation and public impact.

Professor Renae Ryan, Academic Director of the Science in Australia Gender Equity (SAGE) Program at the University of Sydney, opened our conference. The aim of SAGE is to increase participation of women and minorities in Science, Technology, Engineering, Mathematics and Medicine (STEMM). Herself a Professor of Biochemical Pharmacology, Professor Ryan is passionate about improving equity, diversity, and inclusion in STEMM.

Keynote speakers were leaders in diverse fields, of

- education policy: Professor Sue Thomson, Deputy CEO Research, Australian Council for Educational Research;
- psychology: Professor Jacquelynne S. Eccles, University of California-Irvine;
- educational practice: Ms. Sarah Chapman, Townsville State High School, Queensland, Australia;
- sociology and organisational behaviour: Professor Mustafa F. Özbilgin, Brunel Business School, Brunel University, UK; and
- engineering: Professor Ana Deletic, Queensland University of Technology, Australia.

Stimulating messages from Keynote speakers provided evidence for continued gender differences in particular fields of STEM, highlighted best practice for engaging and sustaining young people, dilemmas of female leadership in STEM, and actions needed to overcome barriers and stereotypes in girls' and women's participation in STEM domains such as engineering in university faculties. A feature panel of Science and Technology Australia's 'Superstars of STEM' presented an inspiring discussion moderated by the program's creator, Ms. Kylie Walker (CEO, Australian Academy of Technology and Engineering). Panelists included Dr. Kalinda Griffiths, (University of New South Wales), Dr. Melanie Macgregor (University of South Australia), Dr. Madeline Mitchell (Royal Melbourne Institute of Technology), and Dr. Katie Sizeland (Australian Nuclear Science and Technology Organisation, ANSTO). The panel discussed the challenges, opportunities and triumphs of building a growing public profile as a woman in STEM where deliberate visibility is a key lever to acknowledge and promote women.

The scientific program included five Keynote addresses and the 'Superstars of STEM' feature panel, 66 individual paper presentations, 16 papers within four paper symposia, and 11 posters with an award for the best student poster presentation. The paper themes highlighted research foci including the role of STEM expectancies and values in educational and career choices, STEM leadership in schools, mentoring women through the STEM career pipeline, STEM outreach programs, gendered STEM career trajectories, influences on students' STEM motivations, and STEM stereotypes and identities. Four workshops provided practical advice about designing engaging STEM programs including the

importance of mathematics as an enabling discipline for STEM in schools. For academic participants, workshops included structured advice on writing and publishing in peer-reviewed journals, as well as engaging with the media for research impact.

Some sessions were presented live while others were pre-recorded with structured opportunities for interactive discussion with authors. A pre-conference event encouraged networking for PhD and early career researchers. Offered in two time-zones, the event attracted 13 participants who shared information about their current research projects and formed connections with one another.

As co-Convenors, we are grateful to the other members of our Scientific Program Committee: Professor Janette Bobis (University of Sydney), Professor Kathryn Holmes (Western Sydney University), Dr Tracy Durksen (University of New South Wales), and Professor Dr Rebecca Lazarides (University of Potsdam). Local organisation was assisted by our dedicated team: Liam Dacosta, Bronwyn Reid O'Connor, Maggie Feng and Debbie Tully, ably assisted by student volunteers Maggie Feng, Jake Little and Lili Toh, with expert technical assistance from Bec Plumbe.

The program recordings may be browsed at the below weblinks:

- Keynotes: <https://www.youtube.com/playlist?list=PLAkWe-ytltpyieV-09nUZHIzddFN6Yxgm>
- Symposia: [https://www.youtube.com/playlist?list=PLAkWe-ytltpxQJn4zCzH213sQRc\\_PBVsg](https://www.youtube.com/playlist?list=PLAkWe-ytltpxQJn4zCzH213sQRc_PBVsg)
- Papers: <https://www.youtube.com/playlist?list=PLAkWe-ytlpzvrb6tvmAJHMYG7arHn9xK>
- Posters: <https://www.youtube.com/playlist?list=PLAkWe-ytltpxVxAj-uW5bK2P9xP2EWZeH>