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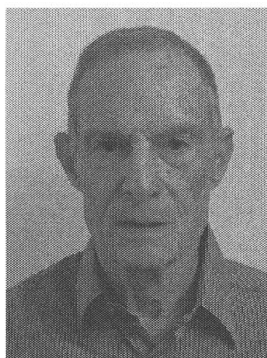
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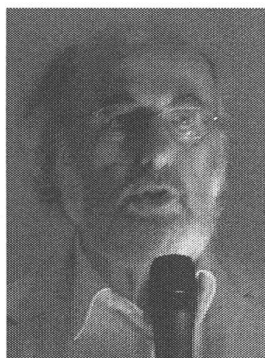
**The 2019 Felix Klein, Hans Freudenthal
and Emma Castelnuovo ICMI Awards**

ICMI is proud to announce the ninth recipients of the Klein and Freudenthal Awards and the second Emma Castelnuovo.

- The *Felix Klein Medal* for 2019 is awarded to Tommy DREYFUS, Professor Emeritus at Tel Aviv University, Israel.
- The *Hans Freudenthal Medal* for 2019 is awarded to Gert SCHUBRING, a long-time member of the Institut für Didaktik der Mathematik at Bielefeld University, Germany, and an extended visiting professor at the Universidade Federal do Rio de Janeiro, Brazil.
- The *2020 Emma Castelnuovo Award* for Outstanding Achievements in the Practice of Mathematics Education goes to the NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS (NCTM), United States of America



Tommy DREYFUS



Gert SCHUBRING



NATIONAL COUNCIL OF
TEACHERS OF MATHEMATICS

NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS (NCTM), UNITED STATES OF AMERICA

The *Felix Klein* and *Hans Freudenthal* Awards, given in each of the odd-numbered year since 2003, are two prizes created by ICMI for recognizing outstanding achievement in mathematics education research. They respectively honour a lifetime achievement (Felix Klein Award, named after the first president of ICMI – 1908 until 1920) and a major cumulative program of research (Hans Freudenthal Award, named after the eighth president of ICMI – 1967 until 1970). By paying tribute to outstanding scholarship in mathematics education, these Awards serve not only to encourage the efforts of others, but also to contribute to the development of high standards for the field through the public recognition of exemplars. Each award consist of a medal and a certificate, accompanied by a citation. They have a character similar to that of a university honorary degree. At the International Congress on Mathematical Education (ICME), the awardees are honored during the Opening Ceremony. Furthermore, the awardees are invited to present special lectures (ICMI Award Lectures) at the Congress. The Felix Klein and Hans Freudenthal Awards are selected by an anonymous award committee of distinguished international scholars. The jury for the 2019 Awards was chaired by Professor Anna Sfard, Haifa University, Israel. The Emma Castelnuovo award committee was chaired by Professor Konrad Krainer, Klagenfurt University, Austria.

We give some key biographical elements below, and full citations of the work of the three 2019 medallists can be found at www.mathunion.org/icmi/awards/icmi-awards.

The following table gives a list of all the previous awardees since the creation of the medals in 2003:

Recipients of ICMI Awards since the creation of the medals in 2003

	<i>Felix Klein medal</i>	<i>Hans Freudenthal medal</i>
2003	Guy BROUSSEAU	Celia HOYLES
2005	Ubiratan D'AMBROSIO	Paul COBB
2007	Jeremy KILPATRICK	Anna SFARD
2009	Gilah LEDER	YVES CHEVALLARD
2011	Alan SCHOENFELD	Luis RADFORD
2013	Michèle ARTIGUE	Frederick LEUNG
2015	Alan BISHOP	Jill ADLER
2017	Deborah LOEWENBERG BALL	Terezinha NUNES

CITATION FOR FELIX KLEIN AWARD 2019 TO PROF. TOMMY DREYFUS

The *Felix Klein Award 2019* is awarded to *Professor Tommy Dreyfus* in recognition of his outstanding contributions to research as well as his leading role in shaping and consolidating the research community and in fostering communication between researchers.

For four decades, Tommy Dreyfus's research has been systematically deepening our understanding of mathematics learning. Trained as a mathematical physicist, Tommy has been drawing in this work on his deep understanding of mathematics and his first-hand familiarity with ways in which mathematical ideas come into being and evolve. Since the late 1970ies and for the next two decades his research has been focusing on students' conceptualization of mathematical objects such as function, and on the role of intuition, visualization and aesthetics in mathematical thinking. These efforts resulted in the theory known as AiC – Abstraction in Context, which he developed with Baruch Schwarz and Rina Hershkowitz. Conceived in the late 1990ies, the AiC framework has become increasingly influential. Since its inception, it has generated much empirical research

all over the world. The theory has been found to be useful also to teachers, whom it provides with tools for monitoring student learning.

Another outstanding part of his work is his ongoing project of shaping and consolidating the international community of research in mathematics education, a goal that he tries to attain in multiple ways. First and foremost, through his extensive editorial work he has been setting standards and giving directions for research in mathematics education. Particularly influential has been his 30-year long association with Educational Studies in Mathematics, which included his three-year long term as the editor-in-chief. Professor Dreyfus has also been serving in, and shaping, numerous professional organizations, with PME (the international group for the Psychology of Mathematics Education) and ERME (the European Society for Research in Mathematics Education) among them. In addition, he played key roles in numerous professional committees in Israel, Europe and America. His influence on research and on policy directly affecting mathematics teaching is keenly felt over the world.

Moreover, Professor Dreyfus has contributed to changing the dominant narratives about theoretical diversity. With his help, the multiplicity of research discourses is now seen less as a problem to solve than as an opportunity to embrace.

To sum up, over the 40 years of his career, Professor Dreyfus has been contributing to our collective endeavour of promoting mathematics education in great many ways: as a researcher, as an editor, as an organizer and policy adviser, and as a teacher and mentor. For all this and his many other contributions to our community, Tommy Dreyfus is an eminently worthy candidate for the Felix Klein Award.

CITATION FOR HANS FREUDENTHAL AWARD 2019 TO PROF. GERT SCHUBRING

The *Hans Freudenthal Award 2019* is awarded to *Professor Gert Schubring*, in recognition of his outstanding contribution to research on the history of mathematics education.

Gert Schubring's research of over four decades has opened new, important avenues of research into the phenomenon of mathematics education. Trained as a mathematician, Gert has been a member of the Institut für Didaktik der Mathematik (IDM) since 1973, when this interdisciplinary research institute for mathematics education was founded. In his doctoral dissertation, defended in 1977, Gert Schubring wrote on the genetic principle in approaching historical research in mathematics. Afterwards, he extended his interests, producing wide-ranging writings on the history of mathematics education within and across countries, and publishing on the history of mathematics.

Another, related but separate, strand of Gert's pioneering work was the study of textbooks, which he began in his investigations on the evolution of mathematics teaching in Latin America. This is yet another area of research that he helped to recognize as worth attention. In 2017 he also chaired the International Program Committee for the Second International Conference on Mathematics Textbook Research and Development held in Rio de Janeiro, Brazil.

Gert Schubring has also laid out the formal structures that helped in turning the study of the history of mathematics education into an academic field. He was the founding co-organiser of the International Conference on the History of Mathematics Education (ICHME), a forum that since 2009 has already met six times.

For decades, Gert Schubring has been actively promoting the study of the history of the field of mathematics education, while simultaneously conducting significant historical studies of his own. No other researcher has had a greater impact on establishing the social history of mathematics education as a dynamic field of scholarly endeavour. His work has not only made us aware of the past of mathematics education but has also provided important insights into mathematics education as it stands today and sets directions for its future. It informs current teaching by

showing ways in which historical mathematical texts can inspire pedagogy. It makes us aware of future possibilities and of the fact that they do not have to be merely determined by the past, but rather can be moulded by new understandings of past practices, values and ways of thinking. All these important contributions make Professor Gert Schubring an eminently deserving recipient of the Hans Freudenthal Medal for 2019.

CITATION FOR 2020 EMMA CASTELNUOVO AWARD TO THE NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS (NCTM), UNITED STATES OF AMERICA

The *2020 Emma Castelnuovo Award* for Outstanding Achievements in the Practice of Mathematics Education goes to the *National Council of Teachers of Mathematics (NCTM), United States of America*, in recognition of 100 years of development and implementation of exceptionally excellent and influential work in the practice of mathematics education.

Founded in 1920, NCTM is the world's largest mathematics education organization, with 40,000 members and more than 230 affiliates. In their nomination of NCTM, the chair of the United States National Commission on Mathematics Instruction, John W. Staley, gave four reasons for nominating NCTM:

- NCTM has served the mathematics education community (nationally and internationally) for almost 100 years by providing leadership, publications and resources, professional development, and networking opportunities.
- NCTM has served its membership by supporting and growing educators and involving them in many of the organization's initiatives and projects, and providing various opportunities to develop members' leadership skills.
- NCTM continues to advocate for high-quality mathematics teaching and learning for each and every student. This advocacy extends to the work that helps educators who choose to advocate with their elected officials and policymakers.
- NCTM continues to build and value collaborative relationships with educators throughout the world.

The Award Committee found much evidence in support of the reasons mentioned above, and more was necessary to fulfil all criteria related to the Emma Castelnuovo Award. In the following, some exemplary activities of NCTM's past 30 years are highlighted. These activities fall into a wide range of domains – in particular, principles and standards as foundations for policy and practice, publications including research journals, professional development, legislative and policy leadership, and international collaboration.