

**International Study Group for Mathematical Modelling and Applications**  
**ASG Report for ICMI 13 \_ Hamburg**

The International Conference on the Teaching of Mathematical Modelling and Applications has been in existence since 1983. It meets biennially, in odd numbered years, and has visited a variety of countries - Brazil, England, Germany, Denmark, The Netherlands, USA, Northern Ireland, Australia, Portugal, and China. The two conferences held in the period 2012 to 2016 were ICTMA 16 in Blumenau, Brazil (July 2013) and ICTMA 17 in Nottingham, UK (2015). Our next conference ICTMA18 is planned to take place in Stellenbosch, South Africa in 2017. The traditional acronym ICTMA, is also used for the *community* that has been responsible for the conference series, and whose website situated at [www.ictma15.edu.au](http://www.ictma15.edu.au), provides information about the organisation and its operation.

Following the business meeting of ICTMA members held at ICTMA 17 in Nottingham, England, on July 24, 2015, the ICTMA Executive for 2015-2017 was confirmed as follows:

**President**

A/Prof Gloria Stillman (Australia) – *Newsletter Editor* [Email: [gloria.stillman@acu.edu.au](mailto:gloria.stillman@acu.edu.au)]

**Elected Members**

Dr Jill Brown (Australia) – *Secretary, Webmaster & List Serve Moderator* [Email: [Jill.Brown@acu.edu.au](mailto:Jill.Brown@acu.edu.au)]

A/Prof Susana Carreira (Portugal) – [Email: [scarrei@ualg.pt](mailto:scarrei@ualg.pt)]

Prof Dr Gabriele Kaiser (Germany) [Email: [gabriele.kaiser@uni-hamburg.de](mailto:gabriele.kaiser@uni-hamburg.de)]

**Co-opted Members**

A/Prof Angeles Dominguez (Mexico) [Email: [angeles.dominguez@itesm.mx](mailto:angeles.dominguez@itesm.mx)]

Prof Toshikazu Ikeda (Japan) – *Registrar* [Email: [ikedata@ynu.ac.jp](mailto:ikedata@ynu.ac.jp)]

Prof Jinxing Xie (China) [Email: [jxie@math.tsinghua.edu.cn](mailto:jxie@math.tsinghua.edu.cn)]

**Conference Organisers**

Prof Maria Salett Biembengut (Brazil) [Email: [mariasalett@gmail.com](mailto:mariasalett@gmail.com)]

A/Prof Geoff Wake (UK) [Email: [Geoffrey.Wake@nottingham.ac.uk](mailto:Geoffrey.Wake@nottingham.ac.uk)]

Dr Helena Wessels (South Africa) [Email: [hwessels@sun.ac.za](mailto:hwessels@sun.ac.za)]

The mission of the ICTMA is to promote Applications and Modelling (A&M) in all areas of mathematics education – primary and secondary schools, colleges and universities. The history of ICTMA tells a story that began from concerns about the undergraduate preparation of students who would be required to solve real problems, often collaboratively, when employed as graduates. The early conferences had a special emphasis on sharing challenges involved in designing and delivering courses to address the identified absence of suitable preparatory coursework in tertiary institutions. Since that time the focus has enlarged to include all levels of schooling and teacher education. The academic focus encompasses themes such as the design and delivery of programs, analysis of modelling competencies and student performance, and the development and improvement of effective methods of assessment. A developing focus on research has recognised the importance of establishing a robust knowledge base from which to address problems that continue to emerge.

It is clear that different countries have different needs and priorities in developing successful programs to foster abilities to apply and model with mathematics, as well as sharing common challenges that appear in all national contexts. These needs and challenges are addressed through the biennial meetings, publications in a book series, twice yearly newsletters, a website, listserve and the participation of members in other national and international forums. For example the Chief Organisers of the Topic Study Groups on Applications and Modelling at ICME13 are members of ICTMA, and members serve on the Editorial Board of *Teaching Mathematics and Applications*, an international journal of the Institute of Mathematics and Applications (UK) as well as several other international journals not so exclusively targetted towards the ICTMA community's area of specialisation.

Decisions regarding the activities of ICTMA are taken by an International Executive Committee, which has elected members and members appointed by the International Executive Committee to organise the meetings of the conference.

From the outset ICTMA adopted the position that it should maintain the integrity of its focus, which is about the teaching of mathematical modelling and applications, where teaching is interpreted broadly to incorporate related educational matters such as curriculum, assessment, and evaluation. Following each conference an edited book of selected refereed chapters is published. These books form part of the Springer series, *International Perspectives on the Teaching and Learning of Mathematical Modelling*. The series editors have both been (or currently are) ICTMA presidents: Gabriele Kaiser of Germany and Gloria Stillman, Australia. Strict refereeing applies to all chapters for publication in our book series with Springer. Potential chapters need to contain clear application/modelling content, contextualised within an educational framework appropriate to the issue being addressed. This makes a distinction from a purely mathematical problem focus on the one hand, and a mathematics education context in which the mathematics need have no connection with applications and modelling. At every conference the intention is to have at least one plenary address given by a respected individual who is heavily involved with solving real world problems from a modelling perspective. A distinctive aspect of ICTMA is the interface it provides for collaboration between those whose main activity lies within mathematics, but who have an informed interest in educational issues, and those whose institutional affiliations are within education, but who have a commitment to promoting the application of quality mathematics.

### **Activities since ICME 12**

The main recent work of ICTMA is summarised in the following publications. The first of these contains a comprehensive account of some of the material presented at ICTMA 16, held in Brazil in 2013, and published in book form in 2015. The other publication derives from the conference held in 2011 in Melbourne, Australia.

Stillman, G.A. (2015). *Mathematical modelling in education research and practice: Cultural, social and cognitive influences*. Cham, Switzerland: Springer. 613 pp. [ISBN: 978-3-319-18271-1]

Stillman, G.A., Kaiser, G., Blum, W., & Brown, J.P. (2013). *Teaching mathematical modelling: Connecting to research and practice*. Dordrecht, The Netherlands: Springer. 627 pp. [ISBN 978-94-007-6539-9]

The University of Nottingham hosted the 17<sup>th</sup> biennial conference of ICTMA between the 19<sup>th</sup> and 24<sup>th</sup> July. It brought together approximately 150 researchers in education from across the world, resulting in over 100 presentations of their work. Modelling and applications are clearly of increasing importance in mathematics curricula across the world with almost 30 countries being represented at the conference.

The key note plenary presentations were thought provoking and stimulating with a focus on the development of modelling in the curriculum in Japan (Keiichi Nishimura), the development of ICTMA over the years (David Burghes – the grandfather of ICTMA), mathematical modelling as a professional activity (Peter Frejd) and the design of materials to support modelling (Malcolm Swan and Hugh Burkhardt). A plenary panel also explored the nature of modelling across the world. These focal points of the conference provided much to think about – as did the contributions from the many delegates throughout the week of the conference. The plenary presentations are all available to download at the conference website: <http://www.nottingham.ac.uk/conference/fac-socsci/ictma-17/index.aspx>

The Sixteenth ICTMA Conference (ICTMA16) was hosted by the Universidade Regional de Blumenau, Blumenau, Brazil. It was chaired by Maria Salett Biembengut. The conference ran for 14-19, July 2013. The conference brought together international experts in a variety of fields as well as local and regional teachers, post-graduate students and academics. Eighty-one parallel lecture presentations addressed various sub-themes: Modelling and applications with respect to environmental issues, health, industry, business, and the workplace; Pedagogical issues for teaching and learning; Applicability at different levels of schooling and in tertiary education; Research into teaching and practice; Innovative practices in research, teaching and practice; and Influences of technology and assessment in schools and universities. In addition there were 30 presentations in two Brazilian sessions. Participants came from 19 different countries.

Keynote plenaries were given by several international experts: Ubi D'Ambrosio (Brazil), Mathematical modelling as a strategy for building up knowledge in different cultural environments; Henry Pollak (USA), The place of mathematical modelling in the system of mathematics education; Mogens Niss (Denmark), Prescriptive models - Opportunities and challenges; Rodney Bazzanezi (Brazil), Teaching and learning with mathematical modelling and Gabriele Kaiser (Germany) Modelling competencies. A plenary panel addressed the theme: *Mathematical modelling: History and future prospects*. In addition to paper presentations related to research, theory, and practice, there was a Mathfair, and poster presentation session.

### **Upcoming events**

The 18<sup>th</sup> International Conference on the Teaching of Mathematical Modelling and Applications, on the theme of Mathematical modelling and sense making, will be held at Stellenbosch, South Africa, 23-28 July 2017.

Gloria Stillman (Ballarat, Australia), ICTMA President