

International Study Group on the Relations Between the HISTORY and PEDAGOGY of MATHEMATICS An Affiliate of the International Commission on Mathematical Instruction

No. 88

March 2015

This and earlier issues of the Newsletter can be downloaded from our website

http://www.clab.edc.uoc.gr/hpm/

These and other news of the HPM group are also available on the website

http://grouphpm.wordpress.com/

(the online and on time version of this newsletter).

# A MESSAGE FROM THE CHAIR OF HPM

Dear colleagues,

I would like to take advantage of this newsletter to let you know that the preparation of our 2016 HPM conference is in its way.

As you may know, the 2016 HPM conference will be held in Montpellier France. I have been working very closely with the local organizing committee, headed by Anne Cortella, new director of the IREM de Montpellier, and Thomas Hausberger, a member of the IREM de Montpellier. Thomas' research interests include number theory, history, philosophy and sociology of sciences, and education. Anne's research interests include group theory, rings and algebras, and algebraic geometry.

A scientific committee will be in place very soon. More information on this will be provided in the next HPM Newsletter.

#### 2016 HPM Dates:

The dates of the 2016 HPM conference are 18 - 22 July 2016. Please put the dates on your calendar!

*Luis Radford* Université Laurentienne, Canada

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# Obituary

HPM sadly notes the passing of ...

### **Ivor Grattan-Guinness**

(1941 - 2014)

#### Jim Kiernan

(1949 - 2014)

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Dear colleagues,

As you may know, two scholars well known of our HPM community passed away recently.

Ivor Grattan-Guinness passed away on December 12 2014. Ivor was awarded the Kenneth O. May Medal for services to the History of Mathematics by the International Commission for the History of Mathematics (ICHM) on 31 July 2009, at Budapest, on the occasion of the 23<sup>rd</sup> International Congress for the History of Science. In 2010, he was elected an Honorary Member of the Bertrand Russell Society.

Jim Kiernan, of Brooklyn College, passed away on December 14, 2014, on his 65<sup>th</sup> birthday, after a long illness. He was often encountered at meetings such as HPM, JMM, MathFest, ESU, CSHPM, and ICME; served on the advisory board for *Convergence*  (http://www.maa.org/publications/periodicals/ convergence) during its early years; and participated in the construction and testing of teaching modules that resulted from the Institute on the History of Mathematics and its use in Teaching.

The work of these scholars will certainly continue to inspire us in our own work.

*Luis Radford* Université Laurentienne, Canada



(February 2015)

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#### Announcements of events

# IHOM3 3rd Irish History of Mathematics Conference

# 15 May 2015

Belfast

After the Irish History of Mathematics Conferences at Maynooth (2011) and St. Patrick's Drumcondra (2013), the 3<sup>rd</sup> Irish History of Mathematics Conference (IHOM3) will take place at Ulster University, Belfast on Friday, 15 May 2015. The event will be organised by Dr Ciarán Mac an Bhaird (Maynooth) and Dr Mark McCartney (Ulster).

Abstracts for potential talks (of 30 minutes in length), should be sent to Mark McCartney (<u>m.mccartney@ulster.ac.uk</u>) by Monday, 13 April 2015. See the IHOM1 (<u>http://www.maths.nuim.ie/historyofmathscon</u> <u>f</u>) and IHOM2 (<u>http://staff.spd.dcu.ie/oreillym/ihom2.htm</u>) websites for details of previous talks.

In keeping with the relaxed nature of previous conferences, formality and costs will be kept to a minimum, and as such there will only be a £10 registration fee (payable on the day) to cover the costs of lunch and coffee breaks. Requests to register for the event should also be sent to Mark McCartney, no later than 8 May, 2015.





## Forthcoming BSHM meetings

(The British Society for the History of Mathematics)

http://www.dcs.warwick.ac.uk/bshm/events.ht ml#forthcoming

# 1. The Life and Work of Augustus De Morgan.

The London Mathematical Society, <u>9 May</u> 2015.

There will be a joint celebration with the London Mathematical Society (celebrating its 150th aniversary) of the life and work of its first president, Augustus De Morgan.

#### Speakers:

- Dr Adrian Rice 'An introduction to the life and work of Augustus De Morgan'
- Dr Sloan Despeaux 'De Morgan's Budget of Paradoxes'
- Dr John Heard 'The early history of the London Mathematical Society'
- Professor Ian Stewart 'Augustus De Morgan and George Boole'
- Professor Wilfrid Hodges 'The influence of Augustus De Morgan'

#### 2. Symmetry and Groups.

Birkbeck College, London, 23 May 2015.

This is a one-day BSHM conference on the history of symmetry and groups, supported by the Department of Economics, Mathematics and Statistics at Birkbeck. The aim of the day is to look at the history of symmetry and its study through group theory. For a preliminary timetable, please see:

HPM webpage: <u>http://www.clab.edc.uoc.gr/hpm/</u> HPM Newsletter webpage: <u>http://grouphpm.wordpress.com/</u>

#### http://www.dcs.warwick.ac.uk/bshm/meetings /BirkbeckMay2015.pdf

# 3. The Big Picture: A Celebration of 100 Years of General Relativity.

Oxford, 20 June 2015.

Speakers:

- Professor Dame Jocelyn Bell Burnell General 'Using Pulsars to test Relativity - an Introduction'
- Professor Robert Iliffe 'Newton and Infinity'
- Dr. Michael Hoskin 'William Herschel and the Construction of the Heavens'
- Jeremy – Professor Gray 'Intrinsic geometry: Following Gauss and Riemann from Curvature to the Shape of Space'
- Professor Robert Lambourne 'General Relativity, 1915-1919'
- Professor Malcolm McCallum 'General Relativity: from esoteric theory to everyday tool'

#### For more details:

https://www.conted.ox.ac.uk/courses/details.p hp?id=G100-57&search=Relativity&submitbutton=Search

&multisearch=single&search\_type[]=800

### 4. BSHM/CSHPM Joint Meeting in North America 2015

Washington, DC, USA, 5 - 8 August 2015.

For information, see: http://www.cshpm.org/meeting/ or http://www.maa.org/meetings/mathfest.





# **ICHME 4** Fourth International Conference on the History of Mathematics Education

23 – 26 September 2015 Turin, Italy

#### **1ST ANNOUNCEMENT**

We are calling for papers for this fourth conference to carry on the successful works initiated in Iceland (2009), and continued in Portugal (2011) and Uppsala (2013). Abstracts of proposed contributions (length: about one page with essential bibliography) should be submitted by 10 April 2015. The decision about acceptance will be communicated by 15 May 2015. Submission of abstracts, and later of papers, will be done via the conference website: http://e20.unito.it/ICHME4/

#### The conference

The history of mathematics education has become a well-established research area, since first becoming visible internationally at ICME 10 in 2004, in Copenhagen, as the TSG 29. The first international journal devoted to this field of study, the International Journal for the History of Mathematics Education, has been published since 2006. The history of mathematics education became a subject of interest in various international meetings, for instance at the ESU-5 (Prague, 2007) and ESU-6 (Vienna, 2010), at the CERME meetings, and at ICME 11 (Monterrey, 2008, TSG 38), ICME-12 (Seoul, 2012, TSG 35), and HPM 2012 (Daejong, 2012).

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The first specialized research conference, entitled "On-going Research in the History of Mathematics Education", held in Garðabær near Reykjavík (Iceland) in 2009, led to a series of such specialized conferences. We are now organizing the fourth international conference, this time in Turin, Italy.

Founded in 1404, the University of Turin is one of the oldest and most prestigious Italian universities. Hosting some 70,000 students, 4,000 academic, administrative and technical staff, and 1,800 post-graduate and postdoctoral students, the University of Turin promotes culture and research, innovation, teacher training and entry into employment. The University of Turin has a remarkable research tradition in subjects such as the mathematical, physical and natural sciences, history and philosophy, law, economics and medicine. In the field of mathematics it boasts a long-lasting tradition, including illustrious Maestri such as Carlo Ignazio Giulio, Quintino Sella, Rodolfo Bettazzi, Giuseppe Peano, Corrado Segre, Giovanni Vailati, Alessandro Terracini, Guido Ascoli and Tullio Viola, who were strongly interested in problems pertaining to mathematics education.

The themes treated in the former conferences were in particular: geometry teaching, algebra teaching, teaching of calculus, interdisciplinarity and contexts, the modern mathematics movements, curricula history, development of mathematics education in specific countries, practices of teaching, mathematics textbooks, teacher education and transmission and reception of ideas (see the Proceedings for more details).

Those proposing abstracts will have wide freedom of choice, but in order to stimulate research in areas that are less explored, new topics such as *teacher journals* and *teacher education* are suggested.

The publication of the Proceedings is planned. Papers will be peer-reviewed.

Scientific committee:

- Kristín Bjarnadóttir (Iceland)
- Fulvia Furinghetti (Italy)
- Livia Giacardi (Italy)
- Erika Luciano (Italy)
- Johan Prytz (Sweden)
- Gert Schubring (Brazil/Germany)

With the scientific support of **Ferdinando Arzarello**, president of ICMI.

Further information about the conference and accommodation in Turin will be available on the conference website:

http://e20.unito.it/ICHME4



#### **Registration and conference fees**

Through 15 June 2015, the fees are 160 Euros, after that date the fees will be 190 Euros.

Last day of registration and payment is **29** August 2015.

Registration can be completed via the conference website.

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#### **Proceedings of the ICHMEs**

*Paedagogica Historica*, Special Issue: History of Teaching and Learning Mathematics, ed. by Gert Schubring, 2006, *XLII*: IV&V (Proceedings of TSG 29 at ICME 10).

Bjarnadóttir, K., Furinghetti, F., & Schubring, G. (Eds.) (2009). "Dig where you stand". Proceedings of the conference on On-going research in the History of Mathematics Education. Reykjavik: University of Iceland – School of Education.

Bjarnadóttir, K., Furinghetti, F., Matos, J., & Schubring, G. (Eds.) (2012). "Dig where you stand" 2. Proceedings of the conference on the History of Mathematics Education. Lisbon, Universidade Nova.

Bjarnadóttir, K., Furinghetti, F., Prytz, J.,, & Schubring, G. (Eds.) (2015). "Dig where you stand" 3. Proceedings of the third conference on the History of Mathematics Education. Uppsala: Department of Education, Uppsala University.

#### Contacts

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#### Gert Schubring (Brazil/Germany)





#### 2016 HPM meeting

**18 – 22 July 2016** Montpellier, France

Please put the dates on your calendar!



# *ICME-13 International Congress on Mathematical Education*

#### 24 - 31 July 2016

Hamburg, Germany



#### http://icme13.org/home

#### Topic Study Groups at ICME-13

A Topic Study Group (TSG) is designed to gather a group of congress participants who are interested in a particular topic in mathematics education. A TSG will serve as mini-conference and will display the progress of the discussion in the intervening years since ICME-12. Topic Study Groups will therefore promote the discussion of a variety of perspectives on the theme of the Group. The TSG will consist of high-standard discussions enabling the newcomer to get a broad overview on the state-of-the-art and allowing the experts to lead discussions at a high level. The team will provide the audience of their TSG not with a nationally framed insight into the strands of the discussion of the theme, but will give an overall overview on the international discussion as broadly as possible and allowing for insight into less well-known of the discussion from understrands represented countries. For ICME-13, the TSG

is the major arena for participation. Participants are expected to associate themselves with one TSG and to stay in that group for all sessions.

TARGET GROUPS FOR MATHEMATICS TEACHING, AS REFLECTED IN EDUCATIONAL LEVELS AND SPECIAL CATEGORIES OF STUDENTS

- 1. Early childhood mathematics education (up to age 7)
- 2. Mathematics education at tertiary level
- 3. Mathematics education in and for work
- 4. Activities for, and research on, mathematically gifted students
- 5. Activities for, and research on, students with special needs
- 6. Adult learning of mathematics lifelong learning
- 7. Popularization of mathematics

MATTERS AND ISSUES PERTAINING TO CONTENT-RELATED ASPECTS OF MATHEMATICS CURRICULA, ACROSS EDUCATIONAL LEVELS, AND TO TEACHING AND LEARNING IN RELATION TO THESE ASPECTS

- 8. Teaching and learning of arithmetic and number systems (focus on primary education)
- 9. Teaching and learning of measurement (focus on primary education)
- 10. Teaching and learning of early algebra
- 11. Teaching and learning of algebra
- 12. Teaching and learning of geometry (primary level)
- 13. Teaching and learning of geometry secondary level
- 14. Teaching and learning of probability
- 15. Teaching and learning of statistics
- 16. Teaching and learning of calculus
- 17. Teaching and learning of discrete mathematics (including logic, game theory and algorithms)

- 18. Reasoning and proof in mathematics education
- 19. Problem solving in mathematics education
- 20. Visualisation in the teaching and learning of mathematics
- 21. Mathematical applications and modelling in the teaching and learning of mathematics
- 22. Interdisciplinary mathematics education
- 23. Mathematical literacy

THE OVERARCHING PERSPECTIVES AND FACETS OF MATHEMATICS EDUCATION THAT ARE PRESENT ACROSS DIFFERENT EDUCATIONAL LEVELS AND DIFFERENT CURRICULA

- 24. History of the teaching and learning of mathematics
- 25. The Role of History of Mathematics in Mathematics Education
- 26. Research on teaching and classroom practice
- 27. Learning and cognition in mathematics
- 28. Affect, beliefs and identity in mathematics education
- 29. Mathematics and creativity
- 30. Mathematical competitions
- 31. Language and communication in mathematics education
- 32. Mathematics education in a multilingual and multicultural environment
- 33. Equity in mathematics education (including gender)
- 34. Social and political dimensions of mathematics education
- 35. Role of ethnomathematics in mathematics education
- 36. Task design, analysis and learning environments
- 37. Mathematics curriculum development

- 38. Research on resources (textbooks, learning materials etc.)
- 39. Large scale assessment and testing in mathematics education
- 40. Classroom assessment for mathematics learning
- 41. Uses of technology in primary mathematics education (up to age 10)
- 42. Uses of technology in lower secondary mathematics education (age 10 to 14)
- 43. Uses of technology in upper secondary mathematics education (age 14 to 19)
- 44. Distance learning, e-learning, blended learning

#### TEACHER KNOWLEDGE AND EDUCATION

- 45. Knowledge in/for teaching mathematics at primary level
- 46. Knowledge in/for teaching mathematics at secondary level
- 47. Pre-service mathematics education of primary teachers
- 48. Pre-service mathematics education of secondary teachers
- 49. In-service education and professional development of primary mathematics teachers
- 50. In-service education, and professional development of secondary mathematics teachers

#### META-ISSUES CONCERNING MATHEMATICS EDUCATION ITSELF, AS A FIELD OF PRACTICE, AND AS A DISCIPLINE OF RESEARCH

- 51. Diversity of theories in mathematics education
- 52. Empirical methods and methodologies
- 53. Philosophy of mathematics education
- 54. Semiotics in mathematics education

#### TSG 24 History of the teaching and learning of mathematics

#### **Co-chairs:**

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#### **Team members:**

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#### IPC Liaison person: Alain Kuzniak (France)

The aim of the TSG is to provide a forum for the discussion of findings and unsolved problems in the history of mathematics education as well as of issues in methodology of research in this field. During the last years research in the history of mathematics education has been actively developed important books and articles, specialized conferences, specialized journals, and special issues of some major serials have been devoted to the relevant topics. Still, it is very clear that many themes are not explored sufficiently and sometimes almost nothing is known about some periods and regions. Additionally, the history of mathematics education is often explored from a local (or of view national) point only. Often connections with similar processes happening elsewhere need to be revealed and understood. This TSG is supposed to help researchers in identifying new topics and new techniques for studies and in establishing fruitful collaboration in their work.

Meetings of the TSG will offer presentations on a variety of topics including the following (but not limited to them):

- History of reforms in mathematics education
- History of tools in mathematics education (including textbooks, manipulatives, calculators, etc.)
- Mathematics teachers: history of professionalization
- Local, national, and international dimensions in the history of mathematics education
- History of mathematics education and other directions in mathematics education (for example, teacher education)

In addition, a panel discussion on past and future developments will be organized.

#### References

Karp, A., & Schubring, G. (Eds.) (2014). Handbook on the history of mathematics education. New York: Springer.

Schubring, G., Furinghetti, F., & Siu, M.K. (2012). Turning points in the history of mathematics teaching – Studies of National Policies. *ZDM - The International Journal on Mathematics Education, 44*(4).

#### **TSG 25**

### The Role of History of Mathematics in Mathematics Education

#### **Co-chairs:**

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#### **Team members:**

Kathleen Clark (USA) Tinne Hoff Kjeldsen (Denmark) Sebastian Schorcht (Germany)

#### IPC Liaison person: Alain Kuzniak (France)

#### Aim

TSG 25 aims to provide a forum for participants to share their research interests and results, as well as their teaching ideas and classroom experience in connection with the integration of the History of Mathematics (HM) in Mathematics Education (ME). Special care is taken to present and promote ideas and research results of an as broad as possible international interest, while still focusing due attention to the national aspects of research and teaching experience in this area. Every effort will be made to allow researchers to present their work and to get fruitful feedback from the discussion, and at the same time to stimulate the interest of the newcomers by giving them the opportunity to get a broad overview on the state-of-the-art in this area.

The discussion within this TSG refers to all levels of education–from primary school, to tertiary education, including in-service teachers' training—preferably on work and conclusions based on actual classroom experiments and/or produced teaching & learning materials.

#### Rationale

Putting emphasis on integrating historical and epistemological issues in mathematics teaching and learning constitutes a possible natural way for exposing mathematics in the making that may lead to a better understanding of specific parts of mathematics and to a deeper awareness of what mathematics as a whole really is. This is important for ME, helping to realize that mathematics:

is the result of contributions from many different cultures;

- has been in constant dialogue with other scientific disciplines, philosophy, the
- arts and technology;
- has undergone changes over time; there have been shifting views of what
- mathematics is; and
- has constituted a constant force for stimulating and supporting scientific,
- technical, artistic and social development.

#### Focus

The programme of TSG 25 will be structured around the following main themes:

- 1. Theoretical and/or conceptual frameworks for integrating history in mathematics education;
- History and epistemology implemented in mathematics education: Classroom experiments & teaching materials, considered from either the cognitive or/and affective points of view;
- Surveys on the history of mathematics as it appears in curriculum and/or textbooks (including the history of mathematics in old mathematics textbooks);
- 4. Original sources in the classroom, and their educational effects;
- 5. History and epistemology as a tool for an interdisciplinary approach in the teaching and learning of mathematics and the sciences; unfolding fruitful interrelations; and
- 6. Cultures and mathematics fruitfully interwoven.

# **HPM Administrative Structure**

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#### A note from the Editors

The Newsletter of HPM is primarily a tool for passing along information about forthcoming events, recent activities and publications, and current work and research in the broad field of history and pedagogy of mathematics. The Newsletter also publishes brief articles which they think may be of interest. Contributions from readers are welcome on the understanding that they may be shortened and edited to suit the compass of this publication.