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ICMI News 18 : June 2011

- Extra-muros -

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Mathématiques

ICMI News 18 : June 2011 A Bimonthly Email Newsletter from the ICMI-International Commission on Mathematical Instruction

Editor : Jaime Carvalho e Silva, Dep. Matematica, Universidade de Coimbra, Portugal

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1. Editorial : The greatest calamity in the history of science

The greatest calamity in the history of science was the failure of Archimedes to invent positional notation.
- Carl Friedrich Gauss

Although it has increased in the past 20 years, the number of mathematicians in the United States who devote large amounts of time to thinking about mathematics education below the college level is rather small. As a consequence, there is no standard set of activities that define the occupation. Teacher preparation and professional development are obvious areas for work, but at my university, we don't have an education school, and no courses specifically for training teachers. So, I have had to figure out for myself what I might do to improve mathematics education (besides serving on committees and attending workshops, of course !).   What I have mainly done is, try to think about the mathematics of elementary school : what it involves, and what is needed to develop it robustly - the kinds of ideas that might go into writing a set of standards for mathematics education. I have found this to be a serious intellectual challenge. It is this challenge that has kept me thinking about mathematics education.

After reading the book Knowing and Teaching Elementary Mathematics by Liping Ma, and serving on the committee that produced Adding It Up, I had the sense that place value was a topic that needed more attention in US math instruction. As part of a series of workshops at the Park City Mathematics Institute, whose goal was to have mathematicians attend to and discuss aspects of the elementary curriculum, I undertook to write an essay about place value. Accordingly, I sacrificed a substantial part of a visit to the wonderful Newton Institute in Cambridge, England, to produce Taking Place Value Seriously (joint with Susanna Epp ; available online at http://www.maa.org/pmet/resources/PVHoweEpp-Nov2008.pdf). (Not to complain too much - I also wrote a research paper.)

One of biggest surprises of that project was the realization that there was no standard short name for the basic building blocks of the decimal system, the numbers like 2 and 70 and 300 and 4,000, that have only one non-zero digit. Such a number can be described as a "digit times a power of 10", but this is rather cumbersome ; also, it assumes the concept of "power of a number", while one would like to draw student attention to these numbers before

that concept is available.

So I gave them a name. In the first draft of the essay, I called them "very round number"s. However, some of my Park City colleagues found this insufficiently dignified, so the term that survived to the essay is "single place number".

After writing the essay, I took every opportunity I had to advocate more attention to place value in US math education. (I found that Singapore does a much better job with place value, which reassured me that I was not crazy to emphasize it.) But I gradually realized that I was not communicating what I wanted to, and that the reason was connected to the lack of a name for a "digit times a power of 10". Place value in the US is treated as a vocabulary issue : ones place, tens place, hundreds place. It is described procedurally rather than conceptually. Place value is treated as the rule that tells you how to read a number, not as the idea of expressing any number as a sum numbers of a very special form :"digit times a power of 10".

It is this idea that gives place value notation its amazing power. Not only can we write very large numbers efficiently, we can compute with them by simple algorithms, based on two fundamental principles :
- 1) know how compute the sum or product of two "digit times a power of 10"s (in addition, only worry about the case when the powers of ten are the same) ; and
- 2) combine the results of 1) using the Rules of Arithmetic. Because of the particular nature of the special numbers (they are "digit times a power of 10"s !), step 1) largely boils down to knowing how to compute with digits : the addition facts and the multiplication facts. This small amount of memorization gives one the potential to do an infinite number of computations.

But talking about place value procedurally prevents us from saying this. It takes the focus away from the nature of the special numbers and what we are doing with them, and turns it to the question of how to read numbers. This is of course very important, but it is only the very beginning, the first step in understanding the marvelous conceptual leap that place value embodies.

So my plea to the mathematics education community is : let's talk conceptually about place value, and help teachers think conceptually about place value. And as an enabling first step, let's find a short catchy standard name for "digit times a power of 10" !

Roger Howe, Member-at-large, ICMI-EC, howe@math.yale.edu

2. ICME-12 : 2nd announcement

The LOC has published its 2nd announcement on ICME-12 website. Please distribute it on local mailing lists and distribution lists.

The 2nd announcement includes in particular information on accommodation ; it is important to notice that there will be available 900 beds in university dormitories with prices form 12 to 30 USD per night and a lot of low budget hotels with prices ranging form 50 to 80 USD per night, all accessible by subway.

The registration fee is 400 USD if the registration is made before April 1, 2012.

Starting with ICME-8, a special ICME Solidarity Fund, built by setting aside some 10% of the total amount collected through the registration fees and also some donations, has provided grants in order to support and increase participation from less affluent regions of the world to the ICME congresses. The same will happen with ICME-12.

There will be Workshop and Sharing Groups proposed freely by participants that will not include formal presentations, whose deadline is the 30th of November 2011.

All information is available on the webpages of ICME-12 and ICMI : http://www.icme12.org/ and http://www.mathunion.org/icmi/ respectively.

Jaime Carvalho e Silva, Secretary-General of ICMI, jaimecs@mat.uc.pt

3. ICME-12 : Discussion groups deadline extended

DG Proposal Submission Deadline Extended !

The IPC of ICME-12 has determined to prolong the deadline for the proposal submission of a Discussion Group(DG) until the end of July in order to give ICME-12 potential participants more chance to submit DG proposals. Date of proposal acceptance notification is same as August 30, 2011. If you have any question, please feel free to contact the IPC chair : sungjcho@snu.ac.kr

Hee-chan Lew, Vice Chair of the LOC and Chair of the Congress Subcommittee, hclew@knue.ac.kr

4. ICME-12 : Topic Study Groups are sending Call for papers

The Call for papers of the Topic Study Groups (TSG) for ICME-12 are being announced on the ICME-12 webpage as they are ready. Go to the ICME-12 webpage to see which are already there : http://www.icme12.org/

Almost all of the 37 TSGs have already issued their Call for Papers that can also be found on the ICMI website on a special area on the front page of the ICMI website. All the other Call for Papers and announcements will be posted there. Please visit the ICMI webpage and the ICME-12 webpage to be sure not to miss this and other important information.

If you want to make a widget to put on your own webpage publicizing ICME-12 just put this code into your webpage :

If you want to modify this, you can go to the page

http://developers.facebook.com/docs/reference/plugins/like-box/

and change the parameters there. You should note that the ICME-12 Facebook URL page is http://www.facebook.com/pages/ICME-12/202025416506764

You can do a similar thing for ICMI if you note that the ICMI Facebook URL page is http://www.facebook.com/pages/ICMI-International-Commission-on-Mathematical-Instruction/146491102081123

If you have trouble building this widget you can contact me.

Jaime Carvalho e Silva, Secretary-General of ICMI, jaimecs@mat.uc.pt

5. ICMI Digital Library : The first five ICMI Studies are online

Digital versions of the first five ICMI Study Books, published by Cambridge University Press, are available to download for free to members of the ICMI community. You just need to go the corresponding ICMI webpage and access CUP from there :

http://www.mathunion.org/icmi/digital-library/icmi-study-volumes/

Each link on the ICMI webpage will take you to the corresponding CUP page where you can download the PDF versions of these five Study volumes. We encourage every member of the ICMI community to recommend to their libraries the purchase of the paper version of these volumes. ICMI thanks Cambridge University Press for this service to the community.

Jaime Carvalho e Silva, Secretary-General of ICMI, jaimecs@mat.uc.pt

6. ICMI elections : the Nominating Committee is working

The International Commission on Mathematical Instruction (ICMI) Nominating Committee was formed, according to the present procedures for election, with the purpose of presenting the slate of nominations for the ICMI Executive Committee (EC) in preparation for the ICMI elections done at the ICMI General Assembly (GA).

The Nominating Committee consists of seven people, each with full voting rights. None of its members shall be eligible for nomination for the ICMI EC. The present ICMI Nominating Committee is chaired by Bernard HODGSON (Canada) and includes the President of ICMI William (Bill) BARTON (New Zealand) and the President of IMU Ingrid DAUBECHIES (USA). Two other members were chosen at random from nominees of ICMI/IMU member countries, and they are Shobha MADAN (India) and Dirk SIERSMA (Netherlands). The other two persons were chosen by the IMU EC and by the core members of the ICMI Nominating Committee ; they are Jill ADLER (South Africa) and NGUYEN Chi Thanh (Vietnam).

This Nominating Committee shall analyze the proposals sent by the Adhering Organizations and will produce, by March 2012, a nomination slate, to be called the "ICMI Nominating Committee slate". This slate shall consist of a unique candidate for each of the four ICMI officers (President, Secretary-General, and two Vice-Presidents), plus at least seven nominees for the remaining five members ("Members-at-Large") of the ICMI EC to be elected. When forming this slate, the ICMI Nominating Committee is authorized to nominate any duly qualified person for each position. Two months prior to the ICMI GA, the Secretary-General of ICMI will send to the Adhering Organizations and member representatives to ICMI the ICMI Nominating Committee slate, accompanied by a CV for each of the candidates on the slate, plus a list of all nominations submitted to the ICMI Nominating Committee in due time.

From the floor of the General Assembly, delegates may present additional nominations from the list of previously proposed candidates that satisfy some additional conditions that can be found in the procedures for election.

Jaime Carvalho e Silva, Secretary-General of ICMI, jaimecs@mat.uc.pt

7. XIII CIAEM - Inter-American Conference on Mathematics Education

The 13th meeting of the the CIAEM/IACME, an ICMI Affiliated group that includes all countries of Noth, Central and South America, ended June 30th with the general satisfaction of all the participants. More than 1800 math educators, mathematicians and teachers from 33 countries met for five days (June 26-30) and could follow 5 plenary talks, 4 plenary round tables (one of them dedicated to the work of Ubiratan D'Ambrosio), 30 parallel talks, 6 parallel round tables, and more than 700 contributed papers. At the closing session CIAEM/IACME President Angel Ruiz declared that this Conference was unforgettable. He was clearly satisfied with the organization and the high level of the presentations and discussions. Local organizers Rute Borba and Carlos Monteiro were congratulated by the CIAEM/IACME Executive Committee and all the participants. In this meeting ICMI Study 18 was launched and an update of the Klein Project was presented to the participants.

The CIAEM/IACME General Assembly met during the meeting and elected the Executive Committee that will govern from 2011 to 2015. The new Executive Committee is

- President : Angel Ruiz (Costa Rica)
- 1st Vice-President : Eduardo Mancera (Mexico)
- 2nd Vice-President : Patrick Scott (United States)
- Secretary : Claudia Groenwald (Brazil)
- Members-at-large : Tania Campos (Brazil)
- Eduardo Bassurto (Mexico)
- Hugo Barrantes (Costa Rica)
- Gustavo Bermudes (Uruguay)
- Jhony Villa (Colombia)

The next CIAEM/IACME meeting will be in Mexico in the State of Chiapas from the 23rd to the 27th of June 2015.

Jaime Carvalho e Silva, Secretary-General of ICMI, jaimecs@mat.uc.pt

8. ICMI book for study 18 was launched

For the first time in its history, ICMI launched internationally a Study Book and produced a press release and an Executive Summary. The book resulting from ICMI Study number 18 was launched internationally at the CIAEM meeting in Recife, Brazil.

The Study was organized jointly by ICMI and the International Association for Statistical Education (IASE) and the resulting Study Book is called "Statistics Education in School Mathematics : Challenges for Teaching and Teacher Education" and will be available for purchase at Springer : http://alturl.com/p5sqx

Please be aware that members of the ICMI community can purchase this and other ICMI Study books at a substantial discounted price :

http://www.mathunion.org/icmi/publications/icmi-studies-publications/purchasing-niss-volumes/

The presentation of ICMI Study number 18 in Recife was made by Study co-chair Carmen Batanero, ICMI past-President Michèle Artigue and ICMI Secretary-General Jaime Carvalho e Silva. An Executive Summary of this study was produced ; to get a copy please click here :

http://www.mathunion.org/fileadmin/ICMI/files/News/Executive_summary_English_Final.pdf

Translation of this Summary into several languages was made : German, French, Mandarin, Spanish, Portuguese and Italian. They are available clicking here : http://alturl.com/furx7

ICMI encourages that you distribute these Executive Summaries as widely as possible.

Jaime Carvalho e Silva, Secretary-General of ICMI, jaimecs@mat.uc.pt

International Colloquium - A Hommage to Michèle Artigue

First Announcement — International Colloquium The Didactics of Mathematics : Approaches and Issues. A Hommage to Michèle Artigue (Professor Emeritus of the University Paris Diderot, Past President CIEM/ICMI)

Place : Paris, Dates : May 31 to June 1, 2012, Languages : French, English, Spanish. Provision will be made to facilitate the participation of those expressing themselves in any one of these three languages. Motivation : The scientific contribution of Michèle Artigue is important, both within the didactics of mathematics in a strict sense as well as within research strands in the broader framework of "mathematics education". The colloquium will relate to current work representative of the main themes of her contribution, while also constituting a "memory" of her contribution to these themes over the last forty years.

Scientific activities : The conference will include roundtables, plenary or semi-plenary lectures, workshops and a session of poster communications.

Plenary Lectures The Mathematicians' Viewpoint Daniel Perrin, Benoît Rittaud (in parallel)

Digital representations of mathematical objects Chronis Kynigos, Ivy Kidron International collaborations in mathematics education Jill Adler, Li Shiqi, Angel Ruiz Epistemology, history and didactics Michael Otte, Christine Proust

Round Tables The Evolution of Theoretical Frameworks in Didactical Research Marianna Bosch, Maria Alessandra Mariotti, Marie-Jeanne Perrin, Luc Trouche Theoretical Frameworks in Didactics and Research in « Mathematics Education » Abraham Arcavi, Paolo Boero, Jeremy Kilpatrick, Luis Radford The Researcher in the Wider Community Bill Barton, Celia Hoyles, Jean-Pierre Kahane, Nicolas Saby Becoming Researchers : The « School » of Michèle Artigue

Poster communications : A call for communications will be made on October 15, 2011 with the second announcement, with submission by January 31, 2012. The communications will be related to a workshop and written in one of the languages of the conference. Research contributions, but also other types of experience related to a topic of the workshop, will be welcome. The second announcement will specify the objectives of each workshop and the method of submission.

Scientific Committee co-chairs : Bernard Hodgson (Quebec), Jean-Baptiste Lagrange (France) Organising Committee chair : Alain Kuzniak (France)

Organization : The colloquium is organised by the Laboratoire de Didactique Andre- Revuz Université Paris-Diderot (LDAR), in association with the IREM chief executive assembly (ADIREM).

Web site http://www.lar.univ-paris-diderot.fr/colloque/artigue

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Calendar of Events of Interest to the ICMI Community

PME 35 - CONFERENCE OF THE INTERNATIONAL GROUP FOR THE PSYCHOLOGY OF MATHEMATICS EDUCATION Ankara, Turkey, July 10-15, 2011 http://www.arber.com.tr/pme35.org/

ICTMA 15 : 15th International Conference on the Teaching of Mathematical Modelling and Applications Melbourne, Australia, July 14-19, 2011 http://www.ictma15.edu.au/

FAMA - Family Math for adult learners international conference : "Family and communities in and out of the classroom : ways to improve mathematics' achievement", Barcelona, Spain, July 23, 2011 http://www.mathforlive.net/fama_Conference.php

CIEAEM 63 : "Facilitating access and participation - Mathematical practices inside and outside the classroom" / "Faciliter l'accès et la participation - Les pratiques mathématiques à l'intérieur et à l'extérieur de la classe", University of Barcelona, Spain, July 24 - July 29, 2011 http://www.cieaem.net/

SEMT 11 - SYMPOSIUM ON ELEMENTARY MATHS TEACHING Prague, Czech Republic, August 21-26, 2011 http://kmdm.pedf.cuni.cz/Default.aspx ?PorZobr=7&PolozkaID=-1&ClanekID=267

16e Ecole d'été de didactique des mathématiques - Association pour la Recherche en Didactique des Mathématiques, Carcassonne (Aude), France, August 21-28, 2011 http://www.ardm.eu/contenu/2011-carcassonne

The Mathematics Education into the 21st Century Project 11th International Conference, Turning Dreams into Reality : Transformations and Paradigm Shifts in Mathematics Education, Rhodes University, Grahamstown, South Africa, September 11-17, 2011 http://math.unipa.it/%7Egrim/21project.htm

ECER 2011 - European Conference on Educational Research, Berlin, September 13-16, 2011 http://www.eera-ecer.eu/ecer/ecer-2011-berlin/

ICMI Study 21 Conference São Paulo, Brazil, September 16-20, 2011 http://www.icmi-21.com/

ATCM 2011 - 16th Asian Technology Conference of Mathematics, 'Integration of Technology into Mathematics Education-past, present and future', Abant Izzet Baysal University, Bolu, Turkey, September 19-23, 2011 http://atcm2011.org/

3rd International Realistic Mathematics Education Conference The Design and Use of Learning Progressions in Mathematics Education University of Colorado at Boulder, USA, September 23 - 25, 2011 http://cucs.colorado.edu/confreg/rme2011

MathTED 2011 - the 2011 Biennial Conference of the Philippine Council of Mathematics Teacher Educators, COLUMBAN COLLEGE, Olongapo City, Philippines, October 21-22, 2011 http://mathtedphil.org/conferences.php

ICREM5 - The 5th International Conference on Research and Education in Mathematics Institut Teknologi Bandung,

Indonesia, October 22-24 2011 http://www.math.itb.ac.id/ icrem5

CARN Conference 2011 (Collaborative Action Research Network) Bringing a different world into existence Action research as a trigger for innovations Vienna, Austria, November 4-6, 2011 http://ius.uni-klu.ac.at/misc/carn/

Volcanic DELTA 2011, Eighth Southern Hemisphere Conference on the Teaching and Learning of Undergraduate Mathematics and Statistics, Rotorua, NZ, November 27 - December 2, 2011 http://www.delta2011.co.nz/delta2011/

Creating Balance in an Unjust World Conference on Math Education and Social Justice Mission High School in San Francisco, CA, USA, January 13-15, 2012. http://creatingbalanceconference.org/

Seventh International Conference on Science, Mathematics & Technology Education : Transformations through Science, Mathematics and Technology Education - Towards an Innovative and Sustainable Society, Muscat, Oman, February 12-15, 2012 d.fisher@smec.curtin.edu.au

EMF 2012 - Espace Mathématique Francophone, Genève, 3-7 Février 2012 http://www.emf2012.unige.ch/

ICME-12 - Twelfth International Congress on Mathematical Education Seoul, Korea, July 8-15, 2012 http://www.icme12.org/

HPM 2012 History and Pedagogy of Mathematics The HPM Satellite Meeting of ICME-12 Daejeon (Korea), July 16-20, 2012 http://www.hpm2012.org

EARCOME6 - The Sixth East Asia Regional Conference on Mathematics Education, Thailand, March, 2013

11. Publications of Interest to the ICMI Community : IACME 50 years

The Editorial Board of the Journal of Research and Training in Mathematics Education and the board of the Interamerican Committee on Mathematics Education CIAEM decided to publish a special series of notebooks designed to commemorate 50 years of IACME.

We have titled this special series as IACME 50. This includes 3 issues of the Journal : 7. 8 and 9. In them you will find articles and documents and central protagonists in the history of CIAEM at different times, as well as researchers from Latin America who are starting, more recently, in the tissues of this new scientific and professional discipline is built around Teaching and Learning of Mathematics.

The number 7 in this series consists of two sections : the History of Early Writings of CIAEM and Ubiratan D'Ambrosio. The first section contains articles of intellectuals associated with the conference and especially people who devoted much of their effort to the growth of this discipline in the region : Stone, Fehr, Santaló, D'Ambrosio, Basque and others, some of them pleasant memory. The second section includes three articles written in the 50s of last century by Ubi D'Ambrosio, a leading figure in the American region of major influence in the international community of mathematics education.

The number 8 includes articles on an essential theme : Media and Hypermedia in Mathematics Education. Invoked in a very general work on the participation of technologies, videos, history, art education in different contexts and different approaches. There are implicit assumptions in the selection of these works, as the appreciation of diversity

and integration required of approaches or instruments involved in the mathematics classroom chores.

The number 9 includes other relevant contributions on various aspects of mathematics education, but revolving around one central issue which is the training of educators, curriculum, competencies, evaluation, perception, initial training, training ... The focus is on a convergence imbricated about the Teaching of Mathematics.

http://www.cimm.ucr.ac.cr/ojs/index.php/CIFEM

No. 9 (2011) Curriculum, assessment, teacher training, skills

No. 8 (2011) Media and Hypermedia

No. 7 (2011) History and perspectives. Ubiratan D'Ambrosio : early writings

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