Faces of ICME-12

Mathematical Carnival

What is your CODE?

Seon Ok Rhew was immersed in 'writing secret messages', the title of one particular booth at the carnival. She was trying to devise her own secret code, fashioning a circle divided into 24 slices. Rhew is participating in the ICME-12 as a member of the Incheon Math Education Society, Saem-sarang. The society joined the congression to learn about mathematical education in other parts of the world, and to exchange opinions on the lifelong question of how to make mathematics fun for kids. Rhew hopes to learn and share ideas that will help students develop interest in math from the various carnival booths.

Top photo: This is a workshop conducted by the Association of Mathematical Instruction-Japan; the professor is giving a presentation on Japan's innovative teaching methods.
Bottom photo: A professor from the University of New England conducts a live video conference with a local Korean classroom, teaching them mathematics in English.

Origami + Math = ☺

Holding up a square-shaped piece of paper, Patsy asked, "If you fold this in half, what does it become?" "A triangle that is exactly the half of the square." On and on went the questions on basic fractions, as she kept folding and folding, until it transformed into a shape of a butterfly! Patsy Wang-Iverson, the vice president for special projects in Gabriella & Paul Rosenbaum Foundation, had been demonstrating the relationship between origami and mathematics. She is the very person who helped the Korean Origami Association create and organize a booth for the carnival, and has her own piece on display along with works done by other mathematics learners. Patsy has high hopes that the booth would aid math teachers everywhere in using origami as a way of capturing students' interest in math.

Announcement

· For Excursion Course 0 (Visit a school) participants are required to select one school out of one elementary, two middle, and one high school, please visit Tour desk (Foyer of Hall D) by Wednesday.

· Participants on Excursion Course 0 should gather by 08:30 am, please come at least 30 minutes earlier than assigned meeting time.

· All TSG sessions on Friday starts at 15:00!!– Refer to the ICME-12 Programme

· Those who want a certificate of attendance are required to visit 311B (Local Organizing Committee office) on Wednesday, Friday, and Saturday from 13:00 to 17:00

· (Survey Teams) ST-1: ICME 12- Panel on Textbooks, Curriculum, Technology, Students Placement, Support for Teachers and the Role of Research – See *Corrections* paper

· Changes of Schedule

 1. WSG Programme
    WSG 11: July 11 Wed, 17:00-18:30, Room 320
    WSG 16: July 13 Fri, 11:00-12:00, Room 323 » Room 320
    WSG 12: July 11 Wed, 17:00-18:30, Room 321 » Room 322
    WSG 14, July 13 Fri, 11:00-12:00, Room 322
    WSG 20: July 13 Fri, 11:00-12:00, Room 319
    WSG 21: July 11 Wed, 17:00-18:30, Room 326 » Room 319
    WSG 13: July 11 Wed, 17:00-18:30, July 13 Fri, 11:00-12:00, Room 307A

 2. TSG Programme
    TSG 5: Room 303 » Room 402
    TSG 35: Room 322 » Room 403

 3. Encore lecture of Alan Schoenfeld: July 13, Friday from 13:30-14:30 at Hall E6

 4. Affiliated Organizations – WFNMC: Room E4 » Room 327A

ICME-12 Daily Newsletter

The 12th International Congress on Mathematical Education

Today's Highlight

· Plenary Lecture: The Butterfly Effect (Etienne Ghys, France), 09:00~10:00, Hall D2
· Plenary Panel Discussion: Teacher Education and Development Study - Learning to Teach Mathematics (Konrad Krainer, Austria; Feng-Jui Hsieh, Taiwan; Ray Peck, Australia; Maria Teresa Tatto, USA), 15:00~16:30, Hall D2

Announcement

See page 4

Key Speakers of Today

Étienne Ghys

Étienne Ghys is a French mathematician working as a "CNRS senior scientist" in École Normale Supérieure in Lyon (France). His research focuses mainly on geometry and the qualitative theory dynamical systems, around the theory of group actions and chaos theory. After graduating in France, he held postdoc positions in Rio de Janeiro and New York. He lectured in many mathematical research institutes around the world. He was awarded the CNRS silver medal, is a member of the French Academy of Sciences, and was invited twice as a speaker at the International Congress of Mathematicians. He is member of many editorial boards.

He expresses much interest in the historical development of mathematical ideas, especially the contribution of Henri Poincaré. More recently he has been concerned with the communication of mathematics to the society at large which he considers a crucial issue for the future development of mathematical research. He co-authored the computer graphics mathematical movie "Dimensions: A walk through mathematics" and is the editor in chief of the online journal "Images des Mathématiques".

Lecture Title: The butterfly effect
When & Where to find: Hall D2 from 09:00~10:00

Konrad Krainer

Konrad Krainer is a Full Professor, Member of the Senate and designated Director of the School of Education at the Alpen-Adria-Universität Klagenfurt in Austria (Europe). For several years, he worked part time as a mathematics teacher at a secondary school as well as a teacher educator and researcher at the university. He started his research in the field of geometry education. For his doctoral thesis "Geometry Alive" (published in German, 1990), he won an Austrian award for outstanding scientific work. In the "Gesellschaft für Didaktik der Mathematik" (GDM, Society for mathematics education in German speaking countries), he was elected twice as the first speaker of the working group "Geometry". At ICME-7 in Quebec (1992), he co-organized the Working group "Geometry". Due to his prolonged engagement in professional development programmes for teachers (e.g. the Austrian PFL-programme), his research interests developed into the areas of mathematics teacher education, school development and educational system development. Konrad Krainer had been invited as guest professor or visiting scholar to the Universities of Athens and Iowa (US), Duisburg (Germany), and recently to the Monash University (Melbourne, Australia). He co-edited nine books, among others, "European Research in Mathematics Education", "On Research in Mathematics Teacher Education" (2009, CERME-1-Proceedings, Vol. I.III) and "Participants in Mathematics Teacher Education" as Volume 3 of the International Handbook of Mathematics Teacher Education (2008). From 1994 to 2011, he led the Austrian Educational Competence Centre for Instructional and School Development situated in Klagenfurt and Vienna. He is the leader of the nation-wide IMST project (Innovations Make Schools Top, 1998-2012) and co-leads the Austrian part of the EU project FIBONACCI. Konrad Krainer was Associate Editor of JMTE (1998-2009), a founding and board member of the European Society for Research in Mathematics Education and a member of the Education Committee of the European Mathematical Society. Among others, he gave an invited lecture at ICME-8 in Seville (1996), was a co-presenter of a plenary lecture at ICME-10 in Copenhagen (2008) and gave a plenary lecture at PME 35 in Ankara (2011).

Lecture Title: Teacher education and development study - Learning to teach mathematics (TEDS-M)
When & Where to find: Hall D2 from 15:00 to 16:30

Luis Radford

Luis Radford was born in Guatemala. After graduating from Universidad de San Carlos, he moved to France where he studied mathematics at the University Louis Pasteur of Strasbourg. He received his PhD in mathematics education from the same institution. In the 1990s he moved to Canada and is currently full professor at Laurentian University, in Sudbury, Ontario. He teaches at École des sciences de l'éducation, in the pre-service teachers' training program and conducts classroom research with teachers from Kindergarten to Grade 12. His research interests include the development of algebraic thinking, the relationship between culture and thought, the epistemology of mathematics, and semiotics. He has conducted two major research projects for the Ontario Ministry of Education, resulting in two books for teachers and researchers: Communication et Apprentissage (2004; Italian translation, 2006) and Processus d'Abstraction en Mathématiques (2009), and numerous workshops for teachers, principals, superintendents and policy makers. He has been co-editor of three special issues of Educational Studies in Mathematics— one on the history of mathematics and mathematics education (2007), one on gestures and multimodality (2009), and one on semiotics (2011). He also co-edited a special issue of Revista Latinoamericana de Matemática Educativa on semiotics, culture, and mathematical thinking (2006). He co-edited the book Semiotics in mathematics education: epistemology, history, classroom, and culture (Sense Publishers, 2008) and co-authored the book A Cultural-Historical Perspective on Mathematics Teaching and Learning (2011, Sense Publishers). He is past associate editor of For the Learning of Mathematics and current associate editor of Educational Studies in Mathematics. He is also member of the editorial board of several international journals, such as Mathematical Thinking and Learning, Recherches en Didactique des Mathématiques, Revista Latinoamericana de Matemática Educativa, PNA, Avances de Investigación en Educación Matemática. He received the Laurentian University Research Excellence Award for 2004-05 and the 2011 ICMI Hans Freudenthal Medal.

Lecture Title: Early algebraic thinking: Epistemological, semiotic, and developmental issues
When & Where to find: Room 401 from 13:30 to 14:30

Chronis Kynigos

Chronis Kynigos is Professor of Educational Technology and Mathematics Education, Director of the Educational Technology Lab http://etl.ppp.uoa.gr. He teaches at undergraduate and postgraduate level. He has supervised 10 successful PhD theses so far. His research has illuminated the generation of mathematical meanings as students engage in experiential, discursive and collaborative activity based on the use of constructionist digital media. These meanings involve concepts such as spatial orientation, curvature, periodicity and co-variation, not necessarily bound to curriculum structures which have been established in a context based on the use of static representational media. It is based on a fallible epistemology for mathematics which resulted in the coining of the term 'half-baked microworlds' to denote questionable, malleable and taken as faulty or wanting artefacts given to students to tinker with. He has shown how teachers are productively challenged when put in the role of designers of artefacts which themselves play the role of boundary objects between practice and academia. His strategic pursuits involve the design of constructionist media and the infusion of a constructionist paradigm for engagement with mathematics in the educational system. For the latter, he has been involved as consultant to the Ministry of Education's initiatives for the use of digital media in the school system ('Odysseia', 1996-200, Large-scale Teacher Education, 2005-2012, Digital School, 2010-12). He has been active in eight EC funded competitive research projects in collaboration with other research teams. He has so far been engaged in the co-design and development of three exploratory digital systems: a) E-slate, a programmable authoring system for exploratory software, b) MachineLab, a programmable 3D simulator and c) Cruislet, a programmable GIS system for navigational mathematics. He is the author of a book titled 'The Investigations course: classroom uses of digital media for mathematics education' (in Greek) and has published around 40 articles in refereed journals and research books and over 150 in refereed conference proceedings. He is a member of the editorial board of the International Journal for Technology, Knowledge and Learning and a founder of the Greek Association for Research in Mathematics Education.

Lecture Title: Constructionism : Theory of learning or theory of design?
When & Where to find: Room 317 from 13:30 to 14:30

Mathematics Education All Around the World

Australia

Background

In Australia the responsibility for delivery of school education is held by the eight states. Those governments have constitutional responsibility for curriculum and assessment, and for teacher standards. These responsibilities lead to differences in the actual provision of education between the states and territories. For example, in five states, Year 7 of schooling is in secondary schools; in the others it is part of primary schools.

The federal (national government) does play a role in schooling. This is because the majority of taxes are collected nationally, and the national government distributes funding to the states for such areas as education (and health, roads etc.). Since the election of the current government in 2007, their approach in education has been to get national agreements with the state governments for programs and focus areas in schooling.

Curriculum revision

Typically each of the states has undertaken a major revision of curriculum every 5 to10 years. Sometimes that has been politically driven (new government elected), but mostly it has been on a known program.

Of more interest in this area of curriculum is the change we are currently having in Australia. One of the first national agreements after the 2007 election (mentioned above) was that all the states and the national government agreed to develop a national curriculum and, from 2013, to implement it progressively . Mathematics was one of the first subjects developed and is currently being trialed and/or implemented in different states. Note that whilst there was agreement around the content of the curriculum, the states retain control of implementation – in particular, of how the curriculum is formally assessed at year 12 level.

For most informed educators, this move to a national curriculum is welcomed. It means that we have the opportunity to reduce arbitrary and unhelpful differences between the states. In the past, text books have needed to be state-specific because of the small but significant differences in curriculum – now the effort can go into better, nationally useable textbooks. Teachers will not have barriers to communication.

The move to a national curriculum will take time – already, essentially political considerations have moved the timelines beyond the original 2013. However, the change seems to be irreversible; maybe in two ICMEs time we will be able to report a fully coherent operation that reaches the hoped for potential.

Differentiated Class

The new Australian Curriculum (the national curriculum) seeks to support differentiation of learning within the class, rather than establishing differentiated classes. That said, this cannot be mandated as it is generally a school-based decision. Hence, at this time, and for the next few years and maybe longer, the majority of schools will have differentiated classes at year 8 level. These may be 'standard' and 'advanced' (i.e. two levels) or the three. Performance in tests will be the main (often sole) determinant of a student's placement in class. Movement between levels is seen as theoretically possible, but seldom occurs in practice, due to standard level students not having access to the full curriculum at the same depth as the advanced classes, etc.

The reality of these arrangements is that only the 'advanced' students will have a realistic preparation for the higher level mathematics classes in the senior years. Hence the pool for these subjects is already significantly reduced.

There is a national report that recommends 4 hours (240 minutes) per week. However the actual time allocation for mathematics in Year 8 varies greatly, with the average likely to be around 200-210 minutes. Please note that the time allocation is a school-based decision. However, it is ironic that, at a time when the whole country seems to be expressing concern about falling standards in mathematics, providing extra time for its learning has not yet become a widespread response.

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<BRAZIL>
Prof. Maria Bicudo – UNESP
Madalena Dullius – Univates
Rubia Amaral – Unicamp

Maria Bicudo is a professor in mathematics education, and Madelena Dullius and Rubia Amaral are PhD students, come to ICME-12 to research their field. Unlike her colleagues, for Bicudo, this is not her first time as she had attended every ICME since 1988. However, for all three, it is their first time in Asia and were all too glad and curious of ICME-12 being held in Korea this year, in anticipation of meeting and discussing with diversely cultured people on connected fields of mathematics education. Korea is the furthest place they have ever been! They commented that the food is different here-very hot and spicy.

<SPAIN>
Blanca Suoto Rubio – Universidad Complutense de Madrid
Laura Morera Ubeda –Universitat Autònoma de Barcelona
Carlos Fernandez Gonzalez – Universidad Nacional de Educación a Distancia

Meet Blanca, Laura, and Carlos. Blanca participated earlier on, having spoken at the General Assembly of what all "new, young researchers" of the mathematical field can do to make a difference. She, along with the rest of her friends, first came to ICME-12 for research on their PhD. It being the first ICME they have ever attended, the group was pleasantly surprised by how friendly and casual their senior researchers and educators were. Excited and open to meeting new and different people in the days to follow, they had high hopes for what ICME-12 would bring them.

<THAILAND>
Nisakorn Boonsena – Khon Kaen Univ.
Julaluk Jai-On – Khon Kaen Univ.
Somkuan Saichompoo – Khon Kaen Univ.
Kanjana Wetbunpet – Khon Kaen Univ.

The four students came to ICME-12 in a large group all hailing from the same university, under direction by their professor. He believed it to be a great opportunity for his students to learn and practice various topics of mathematical education, as well as to discover what other countries are doing—and at what other place to attain all this than at the ICME? The four did believe the congression to offer a chance for them to discover mathematics education outside of the limits of their country, as well as learn from a wealth of programs unavailable to them. They further expressed their devotion for the field, as they will be attending EARCOME-6 that is to be held next year, back in their home country. Being a big group, they even had a placard prepared, as shown in the picture.

Excursion Guide

The excursion is scheduled at from 09:00 to 16:00 on Thursday, July 12th, and basically there is no additional charge for it except some programs. The excursion aims at showing congress participants and their accompanying persons the dynamics metropolitan Seoul, with its natural beauty and cultural abundance.

Excursion Program Meeting Place

* Gather at assigned meeting place by 09:00 am (For course 13: 08:00 am). Once participants for each course are all gathered, the tour programme will begin and depart in order.

Course	Meeting Place
Course 0	325 – Elementary school
	326 – Middle school
	327A – High school
Course 1	307A or 307B or 307C
Course 2	317A or 317B or 317C
Course 3	E1
Course 4	318
Course 5	308A or 308B or 308C or 309
Course 6	320
Course 7	E5
Course 8	E2
Course 9	E3
Course 10	301A or 301B
Course 11	327B or 327C
Course 12	E4
Course 13	321
Course 14	E6

Important Notice

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* Participants on Excursion Course 0 should gather by 08:30 am, please come at least 30 minutes earlier than assigned meeting time.

*Only course 14 registration is available on-site.

*All programs include transportation, a lunch and a tour guide except Course 13.

*Course 13 is not free and has to be paid at the registration site.

*Passport is required to participate Course 5 and 6.

*JSA & DMZ tour is organized and controlled by Korean military, so, every tourist should use authorized bus & Guide and follow the time & photo regulation.

*Participants must bring their name tag to excursion.

*In case of rain, participants are asked to bring his/her own umbrella. (In case of heavy rain, courses will be re-designed to inside activities)

* There are several souvenir shops at each excursion place and they normally accept only Won, the Korean currency. Thus, participants are required to exchange the currency in advance if you want to buy souvenirs.

Korea Travel Information

YEOSU EXPO 2012

The Expo 2012 Yeosu Korea is Korea's second expo to be recognized by the BIE(Bureau of International Exhibition). The expo's seaside Yeosu City venue highlights the main focus of the expo: the ocean and its value as a natural resource. Exhibition centers of the Expo 2012 Yeosu Korea include the Theme center, Korea Center, Sub-theme Center (Climate Change & Environment, Ocean Industry & Technology, Ocean Civilization, Ocean City and Ocean Creatures), International Center, and Aquarium. Each center has its own unique color and contents that expand upon the grand theme of the expo, "The Living Ocean and Coast."

* Period: May 12 - August 12, 2012
* Opening Hours

Expo Site	09:00 ~ 23:00 (last entry by 22:00)
Ticket Office	08:00 ~ 20:00
Pavilions	09:00 ~ 21:00 (last entry by 20:30 pm)
Outdoor Exhibition	09:00 ~ 18:00

Adults (19-64)	33,000 won
Youths (13-18)	25,000 won
Children (4-12)	19,000 won

* For further information, please visit the website (http://eng.expo2012.kr)

Other Recommended Destinations

Seoul City Tour

Seoul, the capital of Korea, is one of the most popular tourist destinations in all of Korea. Packed with countless sights to see and places to visit from traditional royal palaces to trendy shopping districts Seoul is a city with so much to offer that you might not know where to start. To get the most out of your stay, visit some of Seoul's most famous attractions by taking a trip aboard the Seoul City Tour. As you ride around the city on the Seoul City Tour bus, an onboard multilingual audio guide will give you a detailed description of each point of interest, making sure that you don't miss a thing!

Information: Tourist Information Center: +82-2-777-6090 (Korean, English, Japanese, Chinese)/1330 call center: +82-2-1330 (Korean, English, Japanese, Chinese)
Website: http://en.seoulcitybus.com/ (Korean, English, Japanese, Chinese)

Jeonju: Hanok and Bibimbap Aplenty in Korea's Cultural Heartland
Jeonju may be known around Korea for its excellent food, and specifically its famous mixed rice dish of bibimbap, but the city also has an illustrious past and has played its part in helping to shape the Korea we know today. Jeonju is indeed located in a beautiful area of the country, with four national parks a short bus ride away. History abounds here too, and Jeonju's hanok village is the place to experience the traditions of old Korea, learn about Jeonju's place in history and sip tea in a traditional teahouse.

Jeju-do Island: Korea's remarkable semi-tropical, volcanic island.
Located southwest of the Korean Peninsula, Jejudo Island is a volcanic island in the shape of an oval that measures 73km from west to east, and 31km from north to south. Jejudo Island is sometimes referred to as "Samdado Island" (meaning the "three many") because of its abundance of rocks, women, and wind. Wind from the ocean blows steadily throughout the year and past volcanic activity has endowed the island with an assortment of beautiful and unusually-shaped black rocks. The island's reputation of having a higher percentage of women than men comes from the time when many men were lost at sea due to fishing, which was the primary means of income.

* For further information, please visit the website (http://english.visitkorea.or.kr/enu/index.kto)