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On the cover: Two of the most iconic buildings in Valencia are El Museu de les Ciències Príncipe Felipe on the left and L'Hemisfèric, on the right. The former is an interactive museum of science that resembles the skeleton of a whale and the latter, a planetarium, has been designed to resemble an eye.

ICIAM



**The ICIAM Dianoia
Vol. 4, No. 1, January 2016**

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The ICIAM newsletter was created to express the interests of our membership and partner organizations and the views expressed in this newsletter are those of the authors and do not necessarily represent those of ICIAM or the Editorial team. We welcome articles and letters from members and associations, announcing events, on-site reports from events and industry news. www.iciam.org
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Recent activities of the ICSU

by TOM MITSUI

ICIAM is an International Scientific Associate of the International Council for Science, ICSU. The ICSU has recently announced several new activities it is developing, which are summarized below.

Open Data: This issue has attracted much attention and interest not only in scientific communities but also in other public sectors. The digital revolution has created an unprecedented explosion in the data available for analysis by scientists, policymakers and others. Extremely large data sets, or ‘big data,’ are the engine of this revolution. They help researchers to recognize subtle but powerful patterns in areas ranging across the sciences, from security to genetic research and human behaviour. Such data will be critical to analyzing and achieving the UN’s new Sustainable Development Goals.

The “privatization of knowledge,” however, could constrain this research. From this point of view, four major international science organizations, ICSU, the Inter Academy Partnership (IAP), the International Social Science Council (ISSC) and The World Academy of Sciences for the advancement of science in developing countries (TWAS), gathered for the ‘Science Forum South Africa’ in Pretoria, South Africa, in December last year. They launched a campaign for “Open Data in a Big Data World,” an accord including a set of guiding principles on open access to big data. For more details, please visit www.icsu.org/news-centre/news/top-news/

Disaster Risk Reduction: As you may recall, the UN World Conference on Disaster Risk Reduction was held in Sendai, Japan in March last year. It adopted a 15-year global agreement, The Sendai Framework for Disaster Risk Reduction 2015–2030, to curb deaths and economic losses from natural and human-made hazards. Then, hundreds of scientists and policymakers pledged to step up action on the Sendai Framework in gathering at the UNISDR (UN International Strategy for Disaster Reduction) Science & Technology (S&T) conference held in Geneva on 27-29 January, 2016. The conference identified needs and knowledge gaps, launched the UNISDR S&T Partnership for Disaster Risk Reduction, DRR to address those gaps, and discussed the S&T roadmap to support the implementation of the Sendai Framework. ICSU took part in the organization of the conference alongside other

partners. For more details, visit www.icsu.org/news-centre/news/top-news/

ICIAM believes that mathematical approaches are essential in this issue and is trying to strengthen its involvement with various stages of international activities.

AIMS Workshop: AIMS (African Institute of Mathematical Sciences), a pan-African network of centres of excellence for postgraduate education, research and outreach in mathematical sciences, hosts the international workshop entitled the Global change impact on diseases and alien species expansion in May in Cape Town, South Africa. It is supported by ICSU. The AIMS workshop approached the ICSU and IMU as well as other international scientific organizations for support. The main objectives of the workshop are to network communities coming from different backgrounds (biology, mathematical sciences, medicine, social sciences and global environment change) and different parts of the world, who have an interest in the study and control of epidemic diseases and invasive species, and to contribute to the training of young researchers. The ICSU has previously contributed to the workshop by sending Mario Primicerio, former Officer-in-Large, as a member of its Scientific Committee. Those who are interested in the workshop can find further information on the AIMS website www.aims.ac.za/en/research-centre/workshops-conferences/currentfuture/

Taketomo (Tom) Mitsui is Professor Emeritus of ICIAM as Officer at large.

Nagoya University, Nagoya, Japan. He received his doctoral degree from Kyoto University and has been engaged with several universities, the last one was Doshisha University, Kyoto, Japan. His main research interest is numerical analysis of ordinary differential equations and related topics. He is a Fellow of the Japan Society for Industrial and Applied Mathemat-



Global change impact on diseases and alien species expansion

A capacity building workshop supported by



AIMS, Cape Town, May 2-6 2016

INTRODUCTION

This international, interdisciplinary, educational and capacity building workshop will bring together the two subjects of infectious diseases and invasive species and the context of climate change, thus allowing sharing the methods and building partnerships. The workshop will address the whole range of topics, from field-work and collecting of data to the building and validating of models, to the adjustment of models to take into account the changing environment and the social characteristics, and to the design and implementation of strategies to fight infectious diseases and invasive species. This will be done through lectures, practical training and round table discussions. Special emphasis will be put on African diseases and invasive species, as well as the characteristics of changing environment in Africa.

The workshop is mostly aimed to young researchers and postgraduate students, with a majority coming from Africa. International experts from around the world will give the mini-courses and lectures and will lead the working groups. There will be a limited number of contributed talks and a poster session.

GOALS OF THE CONFERENCE

The main objectives of the workshop are to network communities coming from different backgrounds (biology, mathematical sciences, medicine, social sciences and global environment change) and different parts of the world, and having an interest in the study and control of epidemic diseases and invasive species, and to contribute to the training of young researchers.

An important feature of the workshop is its location in Africa, which unfortunately, is the centre of several pandemic diseases threatening not only the economy and social cohesion of the continent but also seriously affecting other parts of the world. Thus, central to the workshop is the participation of this new generation of young African scientists from different backgrounds, including doctoral students and female scientists, to expose them to modern cutting edge scientific techniques and methods in the field, to put them in contact with world leading experts in different relevant fields, and have them taking part in the interdisciplinary discussions.

This workshop, the first activity bringing together IMU, IUBS, IUIS, IUMS, ICIAM, ISSC, ecoHEALTH Alliance (Future Earth), ICSU ROA, ISB and UNESCO has the important objective of building a lasting collaboration and enriching expertise in the different organizations.

MAIN THEMES

- *Epidemic diseases in the context of changing environment*
- *Invasive species in the context of changing environment*
- *Socio-economic adaptation to new epidemic diseases and invasive species*

APPLICATION

Website: <http://www.aims.ac.za/en/research-centre/workshops-conferences/currentfuture/global-change-impact-on-diseases-and-alien-species-expansion>

Applications: the website will be open for applications in October 2015. The workshop is planned for 50 participants. The participants from Africa will receive full funding.

Scientific Committee

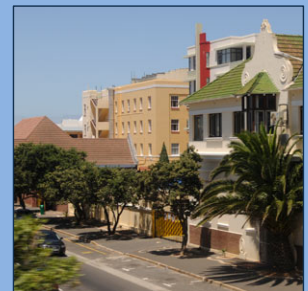
Pablo Fernandez de ArroyabeHernaiz (Spain, ISB), JacekBanasiaak (South Africa, AIMS), YuryDgebuadze (Russia, IUBS), Charles Ebikeme (ISSC), Jorge Kalil (Brazil, IUMS), Mark Lewis (Canada), Jean Lubuma (South Africa), Alberto Martinelli (Italy, ISSC), Mariagrazia Pizza (Italy, IUMS), Mario Primicerio (Italy, ICIAM), Daya Reddy (South Africa, ICSU), Christiane Rousseau (Canada, IMU)

Organizers

JacekBanasiaak (South Africa) banasiak@ukn.ac.za
Christiane Rousseau (Canada) rousseac@dms.umontreal.ca

Confirmed speakers and leaders of working groups

- [Peter Daszak](#) (medicine and disease ecology), University of Columbia, USA
- [Kristie Ebi](#) (environmental health), University of Washington, USA
- [Abba Gumel](#) (mathematics), Arizona State University, USA
- [John Hargrove](#) (biomathematics, epidemiology, insect physiology), Center of Excellence in Epidemiological Modelling and Analysis (SACEMA), South Africa
- [Mark Lewis](#) (mathematics), University of Alberta, Canada
- [Andrea Pugliese](#) (mathematical and theoretical population biology), University of Trento, Italy
- [Judith Omumbo](#) (epidemiology), African Academy of Science
- [David Richardson](#) (botany and zoology), University of Stellenbosch and Director of Centre for Invasion Biology, South Africa



ICIAM Board meeting in Brazil, May 2016

**The 2016 ICIAM Board meeting in Brazil will be
on May 7th at Unicamp, Campinas.**

**Together with the Board meeting, SBMAC is organizing
the workshop: International Workshop on Industrial
Mathematics to be held on May 05 and 06.**

CEMEAI

**Register now!
Call for presentations**

website: www.cemeai.icmc.usp.br/IWIMath16/index.html

All ICIAM representatives are invited to submit a talk to the workshop, please see the site.
Hotel accommodation will be covered for those presenting a talk at the workshop.



SBMAC



UNICAMP





CENTRE INTERNATIONAL DE MATHÉMATIQUES PURES ET APPLIQUÉES
INTERNATIONAL CENTRE FOR PURE AND APPLIED MATHEMATICS

News from CIMPA

The following is a call for Administrative Council candidates from the membership of CIMPA.

Nice, December 3, 2015

Dear members of CIMPA,

The administrative Council (CA) will be renewed in a little more than one year. It seems to us appropriate to hold the election for the members of the CA during the General Assembly (AG) of 2016, to be held on 10 June (to be confirmed), at the Institut Henri Poincaré in Paris.

According to the Statutes and the By-laws of CIMPA, the CA consists of, in addition to the 7 ex-officio institutional members, 7 individual members who are elected by the AG. Among these 7 members are the members of the Bureau. The Bureau is composed of the President, possibly one or two Vice-Presidents, a General Secretary and a Treasurer.

In view of the dates of these meetings, we suggest the following calendar:

- The AG elects 7 individual members during its meeting which should be on 10 June, 2016.
- The new CA (the ex-officio members whose number is fixed by the Statutes, plus the 7 individual members elected previously), shall meet in a special session in January 2017, to elect the Bureau.
- After this meeting, the new CA and the new Bureau shall assume their function.

By this letter we launch a call for candidates for these 7 individual members of the next CA. We shall reflect carefully together on this crucial election, and we shall be happy to receive your comments on possible candidates. The term of office for members of the Bureau being four years, renewable once, three of the four members of the present Bureau (the President, the Vice-President, the Secretary) are not eligible for re-election.

It was decided by the AG of 2014 that all CIMPA actions must be preceded by an open call. This implies that, in order to be submitted to a vote, all declaration of candidacy must be made after sending out this message, whose aim is precisely this call for candidacy. Furthermore, any member of CIMPA can present his or her candidacy during the AG until the election itself.

We remind you equally that the Statutes of CIMPA require that an individual member of the CA must be a member of CIMPA. If you wish to propose a colleague who is not a member of CIMPA, then he or she must seek to become a member (according to the usual procedure advertised on our website), and he or she must be presented by the CA and approved by the AG. His or her candidacy can then be considered during the election.

The Bureau shall consult widely in order to enlist the best candidates. Before the meeting of the AG in June 2016, it shall communicate to you the names of the candidates for the new CA which it has so far received after this call for candidacy.

Sincerely,

TSOU Sheung Tsun, President
 Alian DAMLAMIAN, Vice-President
 Jean-Marc BARDET, General Secretary
 Marc AUBRY, Treasurer.





Bid Process for ICIAM 2023

International Council for Industrial and Applied Mathematics (ICIAM) — December 2015

Member societies are invited to apply to hold the Tenth International Congress of Industrial and Applied Mathematics in 2023.

Rules and resolutions concerning the process

The application process is governed by the “Rules,” given below, and by the following resolution of the ICIAM Board at its meeting in Helsinki in May 2001.

- a) Prior to deciding about the location of each ICIAM Congress, the Council, at its Annual Board meeting, will decide on the amount of a financial compensation for the use of ICIAM’s name.
- b) The amount has to be decided for each Congress.
- c) The payment must be transferred at the latest by the end of the Congress.
- d) Should there be other smaller conferences where ICIAM’s name is to be used, a similar policy will be implemented.

The ICIAM Board, at its next meeting in São Paulo (Campinas), Brazil on Saturday, 7 May, 2016, will set the license fee for the Tenth Congress in 2023 (as a reminder, the license fee for ICIAM 2019 was set at USD 37,000). In addition the local expenses, including registration fee and travel expenses, of the five prize winners and the Olga Taussky-Todd lecturer, are to be covered by the Congress organizers.

Timetable for applications

- §1. The first of the rules below specifies that the pre-proposal should be submitted, in written form, to the ICIAM Board seven years in advance. In the present circumstances this is interpreted to mean that the pre-proposal should be submitted to the meeting of the Board in São Paulo (Campinas), Brazil on Saturday, 7 May, 2016. While applications submitted at the meeting itself will be admitted, the Officers request that if possible applications should be submitted to the ICIAM President, Maria J. Esteban, no later than 31 March, 2016. In this respect

“written form” will be considered to allow submissions to be made via email.

At this stage the required amount of documentation is small, but do please note the requirement to specify both the location and a preliminary budget.

- §2. The second of the rules below is expected to be interpreted by the meeting of the Board in São Paulo (Campinas), Brazil on Saturday, 7 May, 2016 in the following way:

Some of those who submit an application as above will be invited to submit a more detailed application by 31 October, 2016. At this second stage it is important that a more detailed budget be presented, and that a Congress Director be nominated. This is a person who is willing and able to devote considerable time and effort to the project until the Congress in 2023. Past precedent suggests that the Board will also be expecting to see detailed consideration given to the question of how the expected high scientific level is to be achieved.

The early date for the detailed submission, namely the end of October, 2016, is to allow the Officers to arrange site visits to each of the remaining candidate sites, and for the reports of the site visits to be consolidated, before the Board meeting anticipated to be held in 2017. Of course no Officer who may be perceived to have a conflict of interest will take any part in the selection process.

The final decision on the site of the 2023 Congress will be made by the Board at its meeting in 2017.

*Approved by ICIAM in Helsinki, May 2001
Distributed to member societies, December 2015.
Maria J. Esteban
President, ICIAM*

Rules concerning the application for an ICIAM congress

- §1. An application for hosting and organizing an ICIAM congress should be submitted to the ICIAM Board seven years in advance. This application is to

be submitted in written form and should propose a location and a budget outline.

- §2. Six years in advance a Congress Director should be nominated and a more detailed budget submitted. On the basis of this information the ICIAM Board will make its decision on the applicants.
- §3. Five years in advance the hosting society makes a proposal for the chair of the Scientific Program Committee (SPC) to the ICIAM Board which has the final say and appoints the SPC Chair at this time.
- §4. Four years in advance the SPC Chair submits to the ICIAM Board a proposal concerning the SPC members. Again, the final decision on the composition of the SPC is made by the ICIAM Board (four years in advance). Members of the SPC are individual members and cannot delegate this membership to other representatives. The SPC should be of reasonable size (15–20 members) and of exceptional scientific qualification. The member societies should be involved in the selection of SPC members.
- §5. Two and a quarter years in advance the ICIAM Board will approve/disapprove (not modify) the list of invited speakers submitted by the SPC. The invitations of the invited speakers should be signed by the Congress Director and the SPC Chair.

§6. The organizers of ICIAM Congresses are urged to stick to the successful structure of previous ICIAM Congresses. At all these Congresses the scientific programme consisted of:

- invited lectures;
- minisymposia;
- contributed presentations in lecture form; and
- contributed presentations in poster form.

All types of presentations have to be included, all being weighted equally. Contributed papers have to be accepted to the extent practically possible (a factor to be considered in the choice of a conference venue).

In the composition of the minisymposia program the member societies, invited by the ICIAM President, are asked to take an active role. The SPC should make sure that all fields, especially those not covered by invited speakers, are represented at the ICIAM Congress and are of highest possible quality.

Approved by CICIAM in Sydney, 29 July 1997.

Revised December 2003 to change ‘CICIAM’ to ‘the ICIAM Board’, and ‘CICIAM Chair’ to ‘ICIAM President’.

*Reinhard Mennicken
ICIAM Board*



Subscribing to the ICIAM Newsletter

The ICIAM Newsletter appears quarterly, in electronic form, in January, April, July and October. Issues are posted on the ICIAM Web Page at iciam.org/dianoia. If you would like to be notified by e-mail when a new

issue is available, please subscribe to the Newsletter. There is no charge for subscriptions. To subscribe or unsubscribe, visit the webpage given above.

A Global Perspective of Industrial Mathematics

by C. SEAN BOHUN

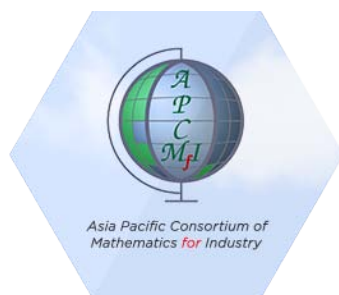
The following is an accounting of a variety of the sessions of the Industrial Minisymposium Series on Industrial Mathematics Around the World held at the 8th International Congress on Industrial and Applied Mathematics on August 13, 2015 in Beijing, China.

Wednesday Activity

On Wednesday afternoon the focus was on Industrial Mathematics (IM) activities in East Asia and the West Pacific Region (besides China). Collectively, this region is covered by the Asia Pacific Consortium (APC) of Mathematics for Industry (MfI). There is strong support for this group across the Asian Pacific region and encouragement from colleagues in China, Hawaii, Korea, Malaysia and Singapore as well as Australia, New Zealand and Japan. Presented during this session were summaries on the initiatives in Australia, New Zealand, Malaysia and Japan. This was an interesting discussion and contrasted the traditional cooperative environment of the Australian and New Zealand efforts with the relatively new initiatives in Japan and Malaysia. Graeme Wake (Massey University) pointed out that there is still much opportunity in the region for growth especially in regions even further to the east.

The session opened with Masato Wakayama from Kyushu University with a talk entitled “Mathematics-for-Industry and Industry-for-Mathematics.” There was a bit of discussion about the use of the word ‘for’ rather than ‘in,’ which is preferred by many of the other participants. One of the challenges to having a sustainable presence of IM within any given country is tangible support with industry and with the local mathematics community. It was clear from the discussion that Japanese industry is monetarily supporting these efforts but work still needs to be done within the mathematics community.

The emphasis then shifted south to Australia where Mark McGuinness (Victoria University of Wellington) substituted for Troy Farrell (Queensland University), presenting “The Mathematics in Industry Study Group - Problems Solved” which summarized a number of problems considered by the Australian industrial camps. Also included was a history of the Australian effort which began in 1998 and has continued develop over the years, be-



coming a vibrant nexus for IM workshops in this global region.

A report from Malaysia entitled “The Dawn of Malaysian Mathematics in Industry” was next and the representative, Zainal Abdul Aziz, gave a run down of the recent problems and their history. The Malaysian initiative is very integrated and the style of the workshop has been tuned to the needs of this particular region and the unique funding constraints in which they find themselves.

The final report from this particular session was given by Graeme Wake substituting for Winston Sweatman (Massey) and presenting “Mathematics-in-industry projects from New Zealand.” New Zealand has recently begun to organize their own independent IM workshop and as well as detailing these efforts, it was revealed that the New Zealand and Australian annual workshops will continue to be six months out of phase with each other. This cooperation is seen as an integral part of success of the whole APC activity.



John Ockendon (Oxford), Graeme Wake (Massey) and Masato Wakayama (Kyushu).

—Image used with permission.

More information on the Asian Pacific global region can be found at apcmfi.org and a much more detailed account of the activity in New Zealand can be found in the December 2015 issue of the ICIAM Dianoia iciam.org/newsletter/15/12/15.

Thursday Morning Activity

The next session, held early Thursday morning, shifted the emphasis to the North American efforts and the effective blending of graduate training with the workshop activity. Also briefly mentioned was the use of internships

and how particularly dedicated graduate students at a workshop can be identified and supported by the industrial participants.

The session opened with Activities on Industrial-Mathematics in North America and was hosted by Huaxiong Huang (York University). Both the USA and Canada have been strong supporters of IM and this formed much of the backdrop of the discussions. The first talk by C. Sean Bohun (UOIT) was entitled “Limitations of the Rotating Disk Reaction Vessel.” It illustrated the global reach of IM with a particular workshop problem initiated in Saudi Arabia and finding its way to Spain and eventually Canada, at every stop training and inspiring a new cohort of students. Many of the problems that begin at workshops can take on a life of their own and one such example was given in the second talk given by Odile Marcotte (HEC Montreal) with her presentation of “Modelling and Optimizing a System for Testing Electronic Circuit Boards.”

The next two talks were from Peter Kramer (RPI) with “Enhanced Training in the Mathematical Sciences: The GSMM Camp” and Richard Moore (NJIT) offering “The Year of Light in Industrial Mathematics: Case Studies from MPI” respectively. Peter and Richard spoke about the graduate training camp (GMMC in the USA) held at RPI and how this blended with the full workshop (MPI in the USA). This latter event moves annually between Delaware, WPI, RPI and NJIT. In 2016 a new participant, Duke, will host the event. It was identified during this discussion that one of the remaining significant challenges is finding sources of sustainable funding, both for the graduate training component and for the IM workshop itself. The current technique is to treat these issues as they arise in an ad hoc way that takes advantage of the varying political environment for this activity. Current information for the upcoming MPI workshop at Duke and the graduate camp at RPI can be found at math.duke.edu/conferences/mpi2016 and homepages.rpi.edu/~schwed/Workshop respectively.

To close the session Huaxiong reflected on contrasting Canadian experiences of graduate training and workshop activity. The first Canadian IM workshop (IPSW in Canada) was held in Vancouver in 1997 and the premier graduate training workshop (GIMMC in Canada) began the following year in 1998. Over the following 20 years, the proponents of these two activities separated geographically. As a result, these two activities drifted apart but some recent funding from NSERC (Innovation Platform) may allow them to be coordinated together once again. Other activities to promote interaction between industrialists and academics were also identified and include lunch activities at the Fields Institute and leveraging the intern program which began with MITACS and continues with the formation of MPrime. More information on the upcoming Canadian workshop is found at www.fields.utoronto.ca/activities/workshops.

Thursday Afternoon Activity

To conclude the Thursday activity, issues concerning other regional groups were presented.

The first of the presentations was given by Jose Alberto Cuminato (Poti) (São Paulo) where he spoke about the next Brazilian study group to be held three weeks after the ICIAM conference. The organization CeMEAI (Centro de Ciências Matemáticas Aplicadas à Indústria) was created in 2011 to help fund this activity and in the last 12 months they have produced in excess of 100 papers.

A common difficulty when organizing an industrial problem solving workshop concerns the serendipity of finding appropriate problems. One of the most challenging aspects of any such event is the timely procurement of just enough appropriate problems to satisfy the budgetary restrictions. Many problems arrive just weeks before the event and this can cause significant stress. The Brazilian study group experienced this as well, and in the end, six problems were chosen. The rationale for choosing the problems was strategic in that each of them could act as an initiator for the group activities of each of the ongoing research programs. At the time of the presentation, 100 people had applied to attend, and since money was allocated to pay for the workshop itself, the industry participants were not charged for their participation.

Next to present was Karina Piwarska, speaking about the Polish Centre for Industrial Applications of Mathematics and Systems Engineering. With the motto ‘We solve problems,’ this initiative was started more than ten years ago with Kamil Kulesza. The activity is based on the Oxford model blended with high-tech entrepreneurship with an emphasis on industrial mathematics. With respect to summer

research, the format is similar to the European Study Groups with Industry (ESGI) but with a few twists. The centre started modestly, but has built itself up quickly, as evidenced by it handling 12 projects with a total of 20 participants by its second year (2006). To date, spanning 2005–2014, there have been 10 years of Summer Research Practicums, corresponding to 40 commercial projects and 50 academic projects.

Over the last ten years, the centre has been spreading the spirit of industrial mathematics and developing a robust flexible organizational structure. The intern-



ships have been used in numerous instances as an effective icebreaker for relations between companies and institutions of higher learning. With this success, the diversity of topics and problems has dramatically increased and the centre is expecting to continue to build on this strong foundation of the previous 10 years. This IM activity provides unique opportunities for intellectual stimulation and in this success, building a new model of research/problem solving as a lifestyle.



students come for 8 weeks with some choosing to stay longer and that a few of the students are selected for intern-

In the question period that followed, Hilary Ockendon (Oxford) asked for specific details of the program and Poul Hjorth (DTU) inquired if there were any plans to extend this activity into other regions of Poland. Karina explained that the stu-

ships with participating companies. Also, depending on their level of interest, a student may just work on a single problem or multiple problems. With respect to expansion, the centre sends postdocs to many of the other regions of Poland, but they can still work with the centre in Warsaw.

What followed was an extended panel discussion on the global initiatives and the details of this discussion is being prepared for the next issue of the *Dianoia*. Stay tuned!

C. Sean Bohun is a Professor of Mathematics at the University of Ontario Institute of Technology. He received his PhD from the University of Victoria (Canada), and works in Industrial and Applied Mathematics with a particular interest in partial differential equations that arise in natural processes. His research themes include:

semianalytical techniques, chemical processes and crystal growth.



News from the Council

- **THE NEW ICIAM WEBSITE**

You can update the information concerning your society online!

The big development in ICIAM's infrastructure in Autumn 2015 has been the launch of a renovated website. The website has the same address, but everything else is new.

As previously detailed by the President, Maria J. Esteban, in a message sent to all presidents and representatives of member societies, each society can now name an "editor" who is authorized to make all changes concerning his/her society on the website. These changes include:

- Names and contact information of the president and of the representative(s)
- Pictures of the same
- Contact information for the society itself.

At the launch of the website, the president of each society was nominated as "editor," but this can of course change. Please see all details of how to proceed at the address iciam.org/faq-members.

- **SECOND ANNOUNCEMENT OF MAY BOARD MEETING**

Further information about this meeting appears elsewhere in this issue. Representatives who anticipate that they will need a letter of invitation to obtain a visa for travel to Brazil should contact Jose Cuminato (jacumina@icmc.usp.br).

- **CALL FOR PRE-BIDS FOR ICIAM 2023**

This is a reminder to societies that are considering making a bid for ICIAM 2023 that the Council will make a decision about site visit candidates at the Board meeting in May 2016. A full description of the bid process can be found in this edition of the *DIANOIA*.

A N N O U N C E M E N T

MATHEMATICAL CONGRESS OF THE AMERICAS

JULY 24-28 2017 MONTREAL



The Mathematical Council of the Americas, which federates the Mathematical Societies of the Americas, invites you to join us in Montreal for the 2017 Mathematical Congress of the Americas, from July 24th to July 28th 2017

PLENARY SPEAKERS

Shafira Goldwasser (MIT) • Andrew Granville (Université de Montréal)
Manuel del Pino (Universidad de Chile) • Peter Ozsvath (Princeton University) • Yuval Peres (Microsoft Seattle)

INVITED SPEAKERS

Nicolas Andruskiewitsch (Universidad Nacional de Córdoba) • Lia Bronsard (McMaster University)
Krzysztof Burdzy (University of Washington) • Rustum Choksi (McGill University)
Maria Chudnovsky (Columbia University) • Juan Davila (Universidad de Chile)
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There will be a large number of special sessions. Proposals to organise are being accepted until July 2016.
For details, plus information on financial support of participants,
please see the web page. <https://mca2017.org/>

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About ICIAM

The International Council for Industrial and Applied Mathematics (ICIAM) is a worldwide organization for professional applied mathematics societies. Its members are national and regional societies dedicated to applied and industrial mathematics, and other societies with a significant interest in industrial or applied mathematics.

ICIAM is governed by a Board comprising representatives of its member societies. Programs run by ICIAM, and the By-Laws of the organization, can be found on the ICIAM web page, www.iciam.org.

The Full Members and their representatives

ANZIAM (Australia and New Zealand Industrial and Applied Mathematics): Ian H. Sloan

ASAMACI (Asociación Argentina de Matemática Aplicada Computacional e Industrial): Rubén Daniel Spies

CAIMS-SCMAI (Canadian Applied and Industrial Mathematics Society, Société Canadienne de Mathématiques Appliquées et Industrielles): Raymond Spiteri

CSCM (Chinese Society for Computational Mathematics): Xuejun Xu

CSIAM (China Society for Industrial and Applied Mathematics): Pingwen Zhang and Guiying Yan

ECMI (European Consortium for Mathematics in Industry): Michael Günther

ESMTB (European Society for Mathematical and Theoretical Biology): Andrea De Gaetano

GAMM (Gesellschaft für Angewandte Mathematik und Mechanik): Peter Benner and Sergio Conti

IMA (Institute of Mathematics and its Applications): Iain S. Duff and David Abrahams

ISIAM (Indian Society of Industrial and Applied Mathematics): Abul Hasan Siddiqi and Pammy Manchanda

JSIAM (Japan Society for Industrial and Applied Mathematics): Shin'ichi Oishi and Hiroshi Kokubu

KSIAM (Korean Society for Industrial and Applied Mathematics): Chang Ock Lee

MOS (Mathematical Optimization Society): William (Bill) Cook

ROMAI (Societatea Română de Matematică Aplicată și Industrială): Costica Morosanu

SBMAC (Sociedade Brasileira de Matemática Aplicada e Computacional): Paulo Fernando de Arruda Mancera

SEMA (Sociedad Española de Matemática Aplicada): Tomás Chacón Rebollo

SIAM (Society for Industrial and Applied Mathematics): Pam Cook and Cynthia Phillips

SIMAI (Società Italiana di Matematica Applicata e Industriale): Alessandro Speranza and Giovanni Russo

SMAI (Société de Mathématiques Appliquées et Industrielles): Fatiha Alabau-Boussouira and Alain Damlamian

SPMAC (Sociedad Peruana de Matemática Aplicada y Computacional): Obidio Rubio Mercedes

VSAM (Vietnamese Society for Applications of Mathematics): Lê Hùng Són

The Associate Members and their representatives

AIRO (Associazione Italiana di Ricerca Operativa): Anna Sciomachen

AMS (American Mathematical Society): Don McClure

AWM (Association for Women in Mathematics): Jill Pipher

ChinaMS (Chinese Mathematical Society): Xiaoshan Gao

CMS-SMC (Canadian Mathematical Society, Société Canadienne de Mathématiques): Elena Braverman

CzechMS (Czech Mathematical Society): Zdeněk Strakoš

DMV (Deutsche Mathematiker-Vereinigung): Günther Leugering

EMS (European Mathematical Society): Franco Brezzi

ENBIS (European Network for Business and Industrial Statistics): Rainer Göb

FMS-SMY-FMF (Finnish Mathematical Society, Suomen matemaattinen yhdistys, Finlands matematiska förening): Samuli Siltanen

IMS (Institute of Mathematical Statistics): Hans Rudolf Künsch

IMU (Israel Mathematical Union): Amy Novick-Cohen

KMS (Korean Mathematical Society): Yong Hoon Lee

LMS (London Mathematical Society): Stephen Huggett

MSJ (Mathematical Society of Japan): Yoichi Miyaoka

NMF (Norwegian Mathematical Society): Elena Celledoni

ÖMG (Österreichische Mathematische Gesellschaft): Alexander Ostermann

PTM (Polskie Towarzystwo Matematyczne (Polish Mathematical Society)): Łukasz Stettner

RSME (Real Sociedad Matemática Española): María Elena Vázquez-Cendón

SingMS (Singapore Mathematical Society): Weizhu Bao

SMF (Société Mathématique de France): Bernard Helffer

SMG-SMS (Schweizerische Mathematische Gesellschaft - Société Mathématique Suisse - Swiss Mathematical Society): Jean-Paul Berrut

SMM (Sociedad Matemática Mexicana): Mayra Nuñez-Lopez

SPM (Sociedade Portuguesa de Matemática): Fernando Pestaña da Costa

SvMS (Swedish Mathematical Society, Svenska matematikersamfundet): Åke Brännström

UMI (Unione Matematica Italiana): Pierangelo Marcati

The current officers of ICIAM

President: Maria J. Esteban, France

Past President: Barbara Lee Keyfitz, USA

Secretary: Sven Leyffer, USA

Treasurer: Jose Alberto Cuminato, Brazil

Members-at-Large: Taketomo (Tom) Mitsui, Japan and Volker Mehrmann, Germany

Suppose that for some $z \in M$, $\|z - z\| = 0$.

$$\begin{aligned} \|z\|^2 &= \|(y - x) + (x - z)\|^2 \\ &= 2(\|y - x\|^2 + \|x - z\|^2) - \|y + z\|^2 \\ &= 4\delta^2 - 4\left\|\frac{y + z}{2} - x\right\|^2 \\ &\leq 4\delta^2 - 4\delta^2 = 0. \end{aligned}$$

Suppose $(H, (\cdot, \cdot))$ is an IPS and M is a subspace. If y is an approximation to x in M , then

$$x - y \perp M.$$

Let $m \in M$, $m \neq 0$. For any $\lambda \in \mathbb{F}$, by the Pythagorean theorem,

$$\|x - y + \lambda m\|^2 = \|x - y\|^2 + \lambda \bar{\lambda} \|m\|^2.$$

Since y is an approximation to x in M , we have

$$0 \leq -\bar{\lambda} \lambda \|m\|^2 - \lambda \bar{\lambda} \|m\|^2 +$$

$$\|x - y\|^2.$$

That is, $x - y \perp M$.

Given an IPS H and M a subspace, the orthogonal complement of M is

$$M^\perp = \{x \in H \mid x \perp M\}$$

referred to as “ M -perpendicular”.

Proposition 3.9. Suppose H is an IPS and M is a subspace. Then $M \cap M^\perp = \{0\}$ and $M \cup M^\perp$ is either a subspace or a linear manifold.

the

