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On the cover: the front and back covers together form a panoramic view of the Mercado de Colón located in Valencia, Spain at coordinates $39.4690°$N, $0.3706°$W. Originally opened on December 24, 1916, and renovated in 2003, the Market has become a center of hospitality for the region.

The ICIAM Dianoia
Vol. 4, No. 4, October 2016

ICIAM Announcements

Renewal of ICIAM Membership Committee

The Membership committee has been recently renewed owing to the end of Mario Primicerio's term as officer, and the end of Iain Duff's term, since he has served the maximum number of years allowed by our Bylaws.

ICIAM thanks both Mario Primicerio and Iain Duff for the wonderful job that they have done in recruiting new members and in dealing with the arrival of new members to ICIAM.

The Membership committee now consists of Volker Mehrmann, Officer at Large, and Xiao-Shan Gao, representative of CSIAM. We thank both of them for having agreed to serve on this committee.

Prize Committee for the 2019 ICIAM Prizes

The Prize Committee (PC) is now complete. Its members are, in alphabetical order (with the subcommittee they will chair in parentheses),

  Alexandre Chorin (ICIAM Lagrange Prize)
  Maria J. Esteban (PC Chair)
  Alexander Mielke (ICIAM Maxwell Prize)
  Zuowei Shen (ICIAM Su Buchin Prize)
  Zdeněk Strakoš (ICIAM Collatz Prize)
  Denis Talay (ICIAM Pioneer Prize)
  Margaret H. Wright

The next step is to form the subcommittees. The composition of the subcommittees is secret until the prizes have been announced in September 2018, as stated in the rules. The President and subcommittee chairs will confer on the subcommittee membership.

News from CIMPA

ICIAM is a Scientific Associate of CIMPA. As a consequence of this, we receive periodic notices of opportunities available for mathematicians in developing countries, and for mathematicians who wish to work with mathematicians in developing countries. A recent call for applications to a program at the Institut Henri Poincaré appears elsewhere in this issue. For a complete list of CIMPA programs and opportunities, please consult the CIMPA website, `www.cimpa-icpam.org`, (it can also be reached from the ICIAM website home page).

News from ICSU

As mentioned in the July issue of DIANOIA, ICSU has called an "extraordinary assembly" for October 24 in Oslo, to discuss a potential merger with ISSC (the International Social Science Council). Members of ICIAM's ICSU Committee who are familiar with the issue have expressed enthusiasm for this merger. We will report in the next issue on the outcome of the assembly, and on what changes, if any, a merger will mean for ICIAM's membership in ICSU.

A new initiative, announced in the latest ICSU Newsletter, is a move in the direction of using ICSU's expertise to influence government policy around the world on topics where science can make a contribution. This takes the form of an agreement with UNESCO to form a partnership for "the provision of science advice for public policy."

In addition, ICIAM has just signed on as a Supporting Applicant in an application to ICSU for a major grant. The lead applicants are the IMU and IUPAC (the International Union of Pure and Applied Chemistry). The overall objective of the project is to work in the direction of reducing the gender gap in mathematics and science. If the planned three-year project is funded, then the project directors will (1) make a global survey of the gender ratio, (2) undertake a data-backed study of publication patterns, and (3) set up a database of good practice. ICIAM has specifically agreed to help with the last two topics. We are hoping to identify volunteers who are willing to put some energy into this important effort.

The ICSU Newsletter is published electronically four times a year, and any individual can subscribe, at `icsu.org`.

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.

EDITORIAL: Future Plans for DIANOIA

by Barbara Lee Keyfitz

With this issue, the ICIAM newsletter completes its fourth year of publication. Since the natural cycle at ICIAM is four years, this seems like a good time to reflect on what DIANOIA has achieved and what future directions it might take. More than that: according to the ICIAM bylaws, members of ICIAM committees have four-year terms, renewable once. Although the Editorial Board of DIANOIA has not been formally approved by the ICIAM Board as a committee, it would be wise for us to consider that that is effectively how we function, and to govern ourselves accordingly.

The ICIAM officers trust that the editors of DIANOIA, who have been so instrumental in starting this newsletter, are willing to continue for another four-year term, and will be communicating with each editor to confirm this.

As readers know, DIANOIA has both "editors" and "reporters." These groups have different but overlapping functions. Members of the Editorial Board have been excellent sources of news and articles, and also serve as the conscience of the newsletter. Collectively, they make policy and determine the direction we should take. The editorial you are reading is a public appeal for input from this board, as well as from subscribers at large. The size of the Editorial Board is about right, although it seems clear that we should add a few members soon, so as to avoid a problem when, at the end of four more years, the ICIAM rules suggest that we all must change our roles.

The main function of the reporters, on the other hand, is to provide a supply of articles for DIANOIA. The ideal size of the newsletter is about 32 pages – twice as long as a typical issue is now, so there is definitely space for more contributions. The ambition of the editors is that every reporter write or solicit articles periodically. Of course, serving as a reporter is a volunteer task, but we are now recommending that every member society nominate a reporter. This gives a chance for all voices to be heard. It is also clear that ICIAM members know much more about some societies, and about applied mathematics in some parts of the world, than others. Thus there is a particular need for contributions about smaller and more recently formed societies.

The editors, in trying to encourage contributions, have faced a situation that may be common among the quantitatively talented. As a friend said to me, "I hate to write. That's why I became a mathematician." We would like to counter that with advice that we all meet when we leave the academic world to interact with people in industry, or even when we leave our departments to interact with researchers in other disciplines. And that is that we must

be able to communicate, and to teach our students to communicate, as carefully as we teach them mathematics. With that as an incentive, we hope to encourage the members of ICIAM to see DIANOIA as both a challenge and an opportunity.

Here are some incentives. Our subscription list grows with every issue. Your words will be read. Your thoughts have the potential to influence how other mathematicians do their research, train their students, and approach their careers. Some of our articles have been reprinted in the newsletters of our member societies; some have even been translated for other periodicals so that a wider readership can enjoy them. DIANOIA also now employs a part-time copy-editor, who is an expert at putting any attempt to communicate into stylish English.

With the experience of putting together 16 issues, we now have a better sense of how DIANOIA might be organized, and, going forward, we will plan to divide our publication into "departments." The pieces we publish fall into several classes:

- Information about ICIAM: list of current members and representatives, found in every issue.

- ICIAM Announcements: a brief summary of Council activities; notices of important deadlines, for nominations and proposals; and news summaries from organizations (CIMPA, ICSU) to which ICIAM belongs.

- Announcements by member societies of important events (we cannot publish every poster for an upcoming meeting, but we are eager to advertise opportunities of particular international interest), and posters for major international meetings.

- Reports on workshops to which ICIAM provided funding through the DCS (developing countries support) program. This program represents a significant proportion of ICIAM's annual budget, and the reports give members a way to see what their contributions have achieved. Many of the workshop reports also provide a fascinating picture of an area of applied mathematics and of a mathematical community.

- "Biographies" of member societies: their history, achievements and challenges.

- Reviews of books and reports of interest to the community.

- Articles about trends in applied and industrial mathematics, or about people in the community. The new "interviews with young mathematicians series" is an example of this.

- Editorials, opinion pieces, and letters to the editor.

DIANOIA is particularly interested in getting more articles in the categories listed at the end, as they are what people (including the editors and officers) particularly like to read. As well as a report on the health of the newsletter, this editorial is an invitation to all newcomers to contribute. The editors look forward to hearing from you!

Barbara Lee Keyfitz is the Dr. Charles Saltzer Professor of Mathematics at the Ohio State University. She has a PhD from New York University, and works in partial differential equations. She is the Past-President of ICIAM.

Announcement

International Workshop on Industrial Mathematics. Valencia, May 18–19, 2017.
Organized by Association ICIAM2019-Valencia

Following tradition, the ICIAM Board meeting for 2017 will be preceded by a two-day workshop. Both will take place on the campus of Valencia University.

The workshop will deal with both scientific and management/funding aspects of Industrial Mathematics. Interested speakers are welcome, and are invited to contact any of the committee members below.

Scientific Committee:

María J. Esteban

Tomás Chacón

Barbara Keyfitz

Taketomo Mitsui

Volker Mehrmann

Peregrina Quintela

Local Committee:

Rosa Donat

Pep Mulet

Jose Mas

Sergio Blanes

Francisco G. Morillas

Administrative contact: Teresa Ayuga, `iciam2019-admin@us.es`

The IMU's Committee on Women: Call for Applications

The International Mathematical Union (IMU) recently established a "Committee on Women" (CWM). As part of their initiative to encourage women mathematicians, they have established some grant programs, and have asked other organizations to draw attention to them. Further details and more information about the CWM can be found on the IMU website at `mathunion.org`

Call 2017

CWM invites proposals for funding of up to €3000 for activities or initiatives taking place in 2017, aimed at either: (a) Establishing or supporting networks for women in mathematics, preferably at the continental or regional level, and with priority given to networks in developing or emerging countries; or (b) Organizing a mathematical school open to all with all women speakers and mainly women organisers; or (c) Other ideas for researching and/or addressing issues encountered by women in mathematics. The application deadline is 15 December, 2016. For more details see `mathunion.org`. (The list of developing countries used by the IMU is found on their website.)

Supplementary Grants 2017

CWM invites applications for supplementary grants of up to €500 to help women from developing countries or regions to attend scientific events taking place from March 2017 to February 2018. The grants are intended to help women who already have funding to attend a conference or meeting or for scientific collaboration, but who need extra funds to make it possible (for example, for child care, separate accommodation, or more appropriate travel). Applicants should write a short account of not more than two pages explaining the scientific benefit to themselves of the travel, together with brief details of funding already secured and the reason why extra funds are needed. This together with an up-to-date CV should be sent before 28 February 2017 to Marie Françoise Ouedraogo `omfrancoise@yahoo.fr` with a copy to Sunsook Noh `noh@ewha.ac.kr` and with the subject header CWM Supplementary Grants. If the grant is approved, a report will be required after the event has taken place. Priority will be given to early career applicants. The list of developing countries used by the IMU can be found on the IMU website.

An interview of Patrice Hauret, winner of the Felix Klein Prize 2016

by Maria J. Esteban

Patrice Hauret received this year the EMS Felix Klein Prize 2016. This Prize is awarded every four years to a young scientist or a small group of young scientists (normally under the age of 38) for using sophisticated methods to give an outstanding solution, which meets with the complete satisfaction of industry, to a concrete and difficult industrial problem. The prize is funded by the Fraunhofer Institute for Industrial Mathematics in Kaiserslautern (Germany).

Patrice works at Michelin (France), one of the world's largest tire manufacturers. He completed his PhD at Ecole Polytechnique (Palaiseau, near Paris) under the supervision of Patrick Le Tallec. After a post-doc at Caltech with Michael Ortiz, he joined Michelin's R&D. Patrice is a mathematician, and has continued being one in his commitments to his company. Not only has he held various responsibilities, but he has also pursued the publication of several research articles and defended a habilitation. His experience and views are very rich and interesting; talking to him, I realized how a company maintains its high technological leadership by investing in research and development, by staying updated about the latest mathematical, computational and mechanical technologies.

MJE: *What positions have you occupied at Michelin?*

PH: Until recently, and for several years, I have been in charge of the Computational Solid Mechanics (and HPC) Group within our Technology Center in Clermont-Ferrand; this is our largest research facility which comprises 3300 persons working on R&D related topics at the core of Michelin's technological leadership. The simulation group I have been leading provides the company with in-house software implementing advanced mathematical techniques to solve the dedicated models co-developed with physicists, material scientists and engineers. Of course, computer scientists also constitute a key asset in writing such codes. This results in a deeply multi-disciplinary work, a demanding but extremely exciting experience. I have also been in charge of Michelin's corporate and academic relations in the field of scientific

computing. It has helped me develop a network to stay updated on the latest research, so as to stimulate our own ideas.

Solving a real problem in an adequate way requires work with other scientists and writing satisfactory models, i.e models where the various viewpoints are accommodated. On the mathematical side, considerations of well-posedness and the ability to design sufficiently accurate approximations of the solution are key, though most models exceed in complexity what can be rigorously proven. The mathematician certainly requires advanced knowledge in mechanics in order to participate in the discussion on models, and to explain the implications of the various mathematical considerations. The codes we write must also remain accessible to contributors possessing different backgrounds while retaining high computational performance, quite a challenge in teamwork implementation which relies on several computer scientists with specialty in High Performance Computing. The ultimate goal of this collective adventure is to accelerate the design process, to stimulate new ideas, and to assess the technical potential of specific tire designs. Of course, doing that at the highest level requires multiple connections, especially with the scientific community.

—Image used with permission.

MJE: *How open is Michelin's R&D policy? How does it apply to simulation?*
PH: We conduct an ambitious policy of open innovation relying on various and complementary corporate and academic partnerships. This is an extraordinary opportunity from the human, scientific and technological viewpoints. At the same time, we develop a strong expertise in all the fields at the core of the performance of our products.

Simulation creates a link between the virtual conception of products and their real and technical conception and production. Developing simulation approaches boosts your understanding and your efficiency. In this regard, I am convinced that mastering models, their analysis and the quality of computations is a key asset in a R&D process. Moreover, our expertise makes our numerous collaborations even richer and more productive.

As a member of the scientific board of AMIES (French excellence initiative on corporate-academic cooperation in mathematics), I am thrilled by the increasing role mathematics plays in the development of small and large firms.

MJE: *By the description of your job, I have the impression that you have had a large freedom to decide what to do, with whom to collaborate, how to learn from the academic world.*
PH: I have had the privilege to be trusted by our Scientific Directors and the successive directors of my Department over the years. Deserving that trust certainly requires that I explain and update a long-term strategy, and to commit yourself to reach the level of results you announced. Risk management is also part of scientific coordination. This is undoubtedly the price of freedom.

MJE: *If I have understood well, you are going to change positions at Michelin soon. Which kind of job are you going to occupy ?*
PH: After 10 years in the Simulation group of the company, I have been offered to spend some time in a tire conception department. There, we rely on the various expertises within the company, from material scientists, physicists, to marketing and industrial manufacturing in order to conceive new products.

MJE: *What will you bring to this new job, and what will you learn?*
PH: This is an opportunity to participate more directly with Michelin's success. I sincerely hope my new team will benefit from my experience in simulation, and maybe from a different way of thinking. On my side, it is a necessary step to get a finer understanding of the design process, especially regarding marketing and industrial aspects, and to approach more closely the core of Michelin's business. It will also be the occasion to learn how to make the right decisions based on a wider variety of expertises.

MJE: *Have you continued publishing in research journals during your work at Michelin?*
PH: Yes, I have. Some of these publications have been co-authored with our academic collaborators when my contribution was significant, some others are more personal and written during my spare time. The most significant part of my contributions remains of course unpublished to protect Michelin's assets. On the other side, I have always been convinced publishing has a value, because it stimulates external scientific exchange, attracts new

talents and confronts your expertise with broader viewpoints. Beyond that, I admit it is something I have had a great pleasure doing.

SOME THOUGHTS ABOUT THE COLLABORATION BETWEEN ACADEMIA AND COMPANIES

MJE: *Can you detail a little bit about how you see the collaboration of mathematicians with companies in general?*
PH: I believe that nowadays, academic and industrial challenges strongly benefit from each other. In particular, mathematicians should never under-estimate the possibility for real-life problems to drive them into uncharted scientific territories. Conversely, engineers should be open to the possibility that abstract perspectives shed a new light on their problems and solutions. In this context, it is very important to bring mutual curiosity into collaborations, from which comes unexpected value, more than just trading results for money. I have been lucky enough to experience such two-way collaborations, with much satisfaction on both sides and often groundbreaking results. This is, for instance, the model underlying the Fraunhofer Institutes in Germany, or the Carnot Institutes in France.

MJE: *Some academic researchers do not know how to price their work, they are afraid that the company is going to use them for a low price.*
PH: I have been working with academia for a long time, and in terms of efficiency and mutual understanding, I clearly favour long standing collaborations. Why would I take the risk to compromise a valuable relationship that took a decade to develop ? Playing this game would surely benefit our competitors, in the end. The kind of situation you are describing surely happens in some places, but it cannot last for long. Again, efficient scientific collaborations must make room for mutual trust in everybody's interest.

MJE: *Apart from your academic collaborators, do you often speak with people who are working in other companies?*
PH: Sure. Applied mathematics is a small world and many scientists working in various companies are actually connected. Without disclosing confidential information, we like to benefit from each other's experiences in terms of problems, methods and tools. Sometimes even, we organize collaborations between our companies to get the most out of such a complementarity.

MJE: *Thank you very much Patrice for sharing with us your vision and your experience. Congratulations for the Felix Klein prize, and good luck in your new job!*

Maria J. Esteban is a research director at CNRS and works at the University Paris-Dauphine. Her research themes include the study of nonlinear partial differential equations, especially by variational methods; relativistic and nonrelativistic quantum mechanics, with applications to quantum chemistry; fluid-structure interactions, symmetry issues for extremal functions in functional inequalities, etc. After having been the President of SMAI (Société de Mathématiques Appliquées et Industrielles) and the Chair of the Applied Mathematics Committee of the EMS, she is currently the President of ICIAM, for the period 2015-2019.

ICIAM Conference Support for Applied and Industrial Mathematics in Developing Countries

CALL FOR APPLICATIONS

ICIAM has a small budget (up to USD 10,500 per year) that is available to help organizers of conferences, workshops and research schools to include additional delegates from developing countries. Organizers of meetings, who wish to take advantage of this support, are encouraged to apply by sending an e-mail to the ICIAM Secretary (secretary@iciam.org). The level of support is USD 3,500 per conference, to be used to provide ICIAM Fellowships to selected participants from developing countries.
Applications may be submitted at any time. There are three deadlines per year (31 March, 31 July and 30 November); the ICIAM Officers decide on which applications to support within a month of each deadline. To allow for orderly budgeting and planning, proposals for events in a given year should be submitted no later than the year before the event. Preference is given to events held in developing countries, and applicants should indicate how they plan to use the fellowship funds.

Full details can be found on the ICIAM website, at www.iciam.org/iciam-conference-support-applied-and-industrial-mathematics-developing-countries

Report on AIMS workshop, Cape Town, May 2–6 2016: Global change impact on diseases and alien species expansion

by Christiane Rousseau & Jacek Banasiak

General description

This workshop took place at the African Institute for Mathematical Sciences (AIMS), in Muizenberg, South Africa on May 2–6 2016. Supported by the International Council of Science (ICSU), the workshop was a joint venture between several international partners: International Mathematical Union (IMU), International Union of Biological Sciences (IUBS), International Union of Immunological Societies (IUIS), International Union of Microbiological Societies (IUMS), International Social Science Council (ISSC), International Council of Industrial and Applied Mathematics (ICIAM), International Council of Science Regional Office for Africa (ICSU ROA), International Society of Biometeorology (ISB), UNESCO, EcoHealth Alliance of Future Earth and Mathematics of Planet Earth: MPE.

AIMS African Institute for Mathematical Science —Image used with permission.

The organizing committee consisted of Prof. Christiane Rousseau, University of Montreal, Prof. Jacek Banasiak, University of Pretoria (organiser) and Prof. Barry Green, AIMS, with administrative and logistic support provided by Rene January (AIMS). The scientific programme was coordinated by the Scientific Committee consisting of Prof. Christiane Rousseau (Chair), Prof. Jacek Banasiak, Prof. Yury Dgebuadze, Severtsov Institute of Ecology and Evolution (representing IUBS), Charles Ebikeme (representing ISSC), Prof. Jorge Kalil, University of Sao Paulo (representing IUIS), Prof. Mark Lewis, University of Alberta, Prof. Jean Lubuma, University of Pretoria, Dr. Mariagrazia Pizza, Novartis, Siena (representing IUMS), Prof. Mario Primicerio, University

of Firenze (representing ICIAM) and Prof. Daya Reddy, University of Cape Town (AIMS Council and President elect of ICSU).

This was an international, interdisciplinary, educational and capacity building workshop with 40 participants coming from 15 different African countries, China, Cuba, and the Philippines, 13 lecturers, organizers and representatives of the partner organizations and 18 students of AIMS. The aim of the workshop was to bring together young and senior researchers with diverse backgrounds, ranging from mathematical sciences (modeling or statistics) to biology, medicine, climate, forestry, environmental economy in order to create a common scientific foundation and to develop common interests and projects that will result in joint research. To facilitate achieving this goal, the main focus of the workshop was education, training and networking. The workshop consisted of several mini-courses with laboratory sessions on the spreading and control of infectious diseases and invasive species, with a mixture of courses on mathematical modelling and on biological research of these phenomena, thus emphasizing the interdisciplinary nature of the field. Owing to its nature, the workshop did not directly generate new research or publications, but, because of the contacts initiated, new projects and collaborations have already begun. In particular, some lab projects dealt with open problems and the teams who worked on these problems have continued their joint work after the workshop. Thanks to the combination of two major topics relevant to Africa; that is, infectious diseases and species invasion, both in the context of climate change, the workshop broadened and deepened research capacity in fields that are particularly relevant to Africa. Also, the format of the workshop with its emphasis on laboratory work with real data allowed for sharing the methods from diverse fields, especially as many students and young scientists for the first time worked on mathematically formulated problems relevant to their field of study, with real data, and are taking this experience back to their institutions and countries.

The impact of the workshop was enhanced by a public lecture by a world leading specialist on species invasion, Professor Mark Lewis from the University of Alberta, entitled *How to Understand Territories with Mathematics*. The lecture is freely available online at www.youtube.com/user/AIMSacza.

Over the course of the week participants were exposed to a number of techniques for mathematical modeling. In addition to learning these methods, various practical applications were illustrated. A round table at the conclusion involved all participants of the workshop. They reflected on their skill levels before and at the end of the workshop, and indicated possible problems they will be working on as a result of the workshop, and anticipated collaborations resulting from it.

AIMS African Institute for Mathematical Science   —Image used with permission.

Participation

The main aim of the workshop was education, training and networking. With this in mind, the main activities during the workshop were several mini courses that included labs and modelling with real data and even working on open problems. The participants were carefully selected from young researchers and postgraduate students from many countries and, in particular, from Africa. Also 17 South African students from AIMS and 5 South African students from other South African universities took part in the workshop. There were 21 female participants.

The four ICIAM Fellows were:

Richard M'Bra (Ivory Coast): winner of the prize for the best poster presentation

Isabella Moraa Ondiba (Kenya): honourable mention for the poster presentation

Raymond Katebaka (Uganda): started work with Abba Gumel

Folaranmi Dapo Babalola (Nigeria): started work with Abba Gumel

Summary

This was a unique event supported and sponsored by several international scientific unions under the umbrella of the International Council of Science (ICSU). Members from several unions were actively present at the workshop and gave lectures. These included Dr. Y. Degbuadze (IUBS), Dr. R. Glover (ICSU regional representative), Dr. Pablo Hernaez (ISB), Dr. C. Morin (NASA) and Professor Christiane Rousseau (IMU). We also had representatives from SA Centres of Excellence such as SACEMA (Prof. J. Hargrove), Centre for Invasive Biology (Prof. D. Richardson and his team), MaSS (Prof. J. Banasiak). The round table discussion organized at the conclusion of the workshop showed an interest in sharing ideas and a decision to make submission to governmental agencies to ease access to data, the lack of which creates considerable delays and frustrations in conducting relevant research in Africa. The presence of so many diverse scientific unions ensures that the problems discussed at the workshop will reach decision-making bodies in many countries and will have an impact on their policies. The main outcome of the workshop has been the formation of new international collaborations and prospective continuation of the work that has begun at the workshop. This will take place in part at conferences, workshops and research schools that have been planned for the next couple of years. A lasting legacy of the workshop is the videotaped mini-courses and lectures that are freely available on the web.

Christiane Rousseau has her PhD from the University of Montreal, where she is now a professor. She was President of the Canadian Mathematical Society from 2002 to 2004. Since 2011, she has been on the Executive Committee of the International Mathematical Union and she was vice-president for 2011–2014. As Director of the Centre de Recherches Mathématiques in 2013, she initiated "Mathematics of Planet Earth 2013," which became a UNESCO International Year. Throughout her career, she has combined research, in dynamical systems, with leadership in outreach activities.

South African Committee for the International Mathematical Union.

Jacek Banasiak is the DST/NRF Chair in Mathematical Models and Methods in Biosciences and Bioengineering at the University of Pretoria. His research interests lie in non-local, integro-differential models in kinetic theory, mathematical biology and fragmentation-coagulation, asymptotic analysis of multiple scale problems. He has been Vice-president of the South African Mathematical Society and Chair of the

MSC2020
Announcement of the plan
to revise the Mathematics Subject Classification

Mathematical Reviews (MR) and zbMATH cooperate in maintaining the Mathematics Subject Classification (MSC), used by these reviewing services, publishers, and others to categorize items in the mathematical sciences literature. The current version, MSC2010, consists of 63 areas classified with two digits refined into over 5000 three- and five-digit classifications. Details of MSC2010 can be found at **www.msc2010.org** or **www.ams.org/msc/msc2010.html** and **zbmath.org/classification/**.

MSC2010 was a revision of the 2000 subject classification scheme developed through the collaborative efforts of the editors of zbMATH and MR with considerable input from the community. zbMATH and MR have initiated the process of revising MSC2010 with an expectation that the revision will be used beginning in 2020. From the perspective of MR and zbMATH, the five-digit subject classification scheme is an extremely important device that allows editors and reviewers to process the literature. Users of the publications of zbMATH and MR employ the MSC to search the literature by subject area. In the decade since the last revision, keyword searching has become increasingly prevalent, with remarkable improvements in searchable databases. Yet the classification scheme remains important. Many publishers use the subject classes at either the time of submission of an article as an aid to the editors or at the time of publication as an aid to readers. The arXiv uses author-supplied MSC codes to classify submissions and as an option in creating alerts for the daily listings. Browsing the MR or zbMATH database using a two- or three-digit classification search is an effective method of keeping up with research in specific areas.

Based in part on some thoughtful suggestions from members of the community, the editors of MR and zbMATH have given preliminary consideration to the scope of the revision of the MSC. We do not foresee any changes at the two-digit level; however, it is anticipated that there will be refinement of the three- and five-digit levels.

At this point, zbMATH and MR welcome additional community input into the process. Comments should be submitted through the Web at **msc2020.org**. You may also send email to **feedback@msc2020.org**. All information about the MSC revision is jointly shared by MR and zbMATH. This input will be of great value as the process moves forward.

Edward Dunne
Executive Editor
Mathematical Reviews

Klaus Hulek
Editor-in-Chief
zbMATH

Call for Nominations for President-Elect of ICIAM

The ICIAM Board meeting in Valencia, Spain (May 20, 2017) will include the election of the next ICIAM President. According to the ICIAM bylaws:

> The President-Elect is elected for a two-year term on years congruent to 1 mod 4. The President-Elect takes over as President and the President becomes Past-President (for two years) in years congruent to 3 mod 4.

The President-Elect's term will begin on October 1, 2017. The duties of the president are stated in the bylaws:

> The President directs the activities of the organization; she/he is the official representative of the organization and should take an active role in promoting the goals of ICIAM internationally.

Nominations for this position are solicited. Nominations may be made by any member society. While nominations may be made at the Board meeting itself, nominators are encouraged to send material to any of the current Officers before April 20, 2017, so that information may be circulated to the Board in advance. While there is no specific form for a nomination, Board members (who vote by secret ballot) will be interested in seeing a brief biographical sketch and a statement that the candidate is willing to serve. Questions about possible nominations may be addressed in confidence to any of the current Officers.

ICIAM Officers serve without remuneration; however, reasonable Officer expenses in carrying out their duties are reimbursed from ICIAM funds. A list of the current Officers and their countries may be found at `www.iciam.org/iciam-officers`; a complete list of past Officers is at `www.iciam.org/early-history-iciam`.

Series: Brief Interviews with Young Mathematicians: #3

by ROBERTO NATALINI

DIANOIA is publishing a series of interviews with young applied mathematicians. Here Roberto Natalini interviews Sara Zahedi who is an assistant professor in numerical analysis at the Royal Institute of Technology (KTH) in Sweden. Sara Zahed is one of ten winners and the only female winner of the European Mathematical Society Prize for 2016.

Q: How did you decide to become a mathematician?
A: My interest and my teacher's encouragement made me choose this path.

Q: You were born in Teheran, but from the mathematical point of view you grew up in Sweden. How have these two countries influenced your education? Are you still in contact with your country of birth?
A: I came to Sweden when I was 10 years old and have since then studied in Sweden. We had to flee from Iran because people were killed, executed only because they had other political opinions than the regime. Unfortunately, not much has changed so I have never been back.

Q: Could you mention some people who have been important for your mathematical education?
A: First of all my high school teacher in math and physics, Maj Bodin. She really inspired me. She always said I would either work as a mathematician or physicist. When I started at the University several of my teachers encouraged me, in particular Prof. Boris Shapiro. My PhD advisor Prof. Gunilla Kreiss introduced me to the world of computational methods for multiphase flow problems. Later I met Prof. Mats Larson from whom I have learned very much and he has been able to push me to achieve a lot. Last but not least I have been inspired, learned, and enjoyed a lot from discussing math with my husband.

Q: What is your main focus in mathematics, the main direction in your research?
A: Development, analysis, and implementation of numerical methods for partial differential equations. In particular finite element methods for PDEs in complex and moving domains.

Q: Is there one of your results which is really important to you?
A: The space-time Cut Finite Element Method (CutFEM) we have developed for PDEs in complex and evolving geometries. With the space-time CutFEM we propose solving PDEs in complex and evolving geometries has become much easier. I believe these methods will be cornerstones in future FEM software.

Q: You have a strong focus on applications. Was this your principal interest in research, or you found it along the way?
A: I found it along the way. My PhD advisor Prof. Gunilla Kreiss introduced me to the world of multiphase flow problems and the challenges there motivated me a lot.

Q: This summer, during the European Congress of Mathematics, you received one of the ten EMS prizes 2016. The citation reads: "For her outstanding research regarding the development and analysis of numerical algorithms for partial differential equations with a focus on applications to problems with dynamically changing geometry." These prizes are very prestigious. Could you explain better the contributions you have made to deserve the prize? What are in your opinion the original ideas that most impressed the Committee of the Prize?

A: You have to ask the committee about this! I am proud that I have been able to develop computational methods that efficiently address the challenges computer simulations of phenomena with dynamically changing geometries pose. These methods are simple to implement and of great importance in applications where PDEs need to be solved in complex and evolving geometries where the remeshing process which standard finite element methods require is both complicated and expensive.

Q: Is it difficult to balance working life with your family life?

A: Yes. I have two young kids, one and three years old, so right now it is really difficult. But I get enormous help and support from both my husband and mother.

Q: How do you spend your time when you are not working?

A: I spend my time with my family.

Q: What is your favorite non-mathematical activity?

A: Me and my husband used to play a lot of board games. Nowadays there is not much time left to do that but I like to swim and I have a lot of fun when we dance and sing with the kids.

Q: Finally, a last general question, which is of interest for our Community: what do you imagine for Applied Mathematics in 2017?

A: I hope in 2017 we can reach out more to young people and our society and attract much more students, especially female students.

Roberto Natalini received his PhD in Mathematics from the University of Bordeaux (France) in 1986. He is director of the Istituto per le Applicazioni del Calcolo "Mauro Picone" of the National Research Council of Italy since 2014. His research themes include: fluid dynamics, road traffic, semiconductors, chemical damage of monuments, and biomathematics. He is on the Board of the Italian Society of Industrial and Applied Mathematics and is Chair of the Raising Awareness Committee of the European Mathematical Society.

Funding available from CIMPA

Opportunity for young scientists from developing countries to participate in programs at IHP

Dear Colleagues,

Every year, the Institut Henri Poincaré (`www.ihp.fr`) features three focused trimester programs attended by many researchers (professors and students) from France and abroad. These trimesters provide the ideal environment, through conferences, workshops and courses, to interchange ideas and techniques on a specific research area in mathematics or theoretical physics. The organizers of the IHP trimester *Combinatorics and Interactions: interface between mathematical physics, representation theory and probabilities*, to be held from January to March 2017, wish to fund, with the support of the Labex CARMIN and the CIMPA, the participation of several young mathematicians from scientifically developing countries to the activities of the trimester. Young scientists (master students soon looking for a PhD, PhD students, postdocs) meeting these criteria and interested in the topics of the trimester are much encouraged to apply for support (including airfare, accommodation, and local expenses) for one to three months to participate in the trimester.

More information on the scientific program can be found here `combi17.math.cnrs.fr`. Applications, including a CV, a motivation letter and a letter of recommendation, should be sent to `combi17@ihp.fr` by November 1st, 2016.

Ludovic Rifford
Director of CIMPA

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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 and Larry Forbes

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

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

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AMS (American Mathematical Society): Don McClure

AWM (Association for Women in Mathematics): Barbara Lee Keyfitz

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DMV (Deutsche Mathematiker-Vereinigung): Günther Leugering

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SingMS (Singapore Mathematical Society): Weizhu Bao

SMF (Société Mathématique de France): Bernard Helffer

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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