

ICIAM Dianoia. Volume 8, Issue 1 January 2020

Welcome to the first issue of Volume 8, the 2020 ICIAM Dianoia. This issue introduces incoming members of the Editorial Board, and features important notices to ICIAM members: the annual meeting of the ICIAM Board, and the call for pre-bids to host ICIAM 2027. Look also for reminders to members on how to change your society information - as this is the beginning of a new year, many society presidents and representatives have changed. You will also find articles on funding initiatives, open access publishing, and the activities of the International Science Council. Like it? Hate it? Let us know. As always, we welcome your comments and letters.



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ICIAM DIANOIA

New Editors Join ICIAM Dianoia

The newsletter is assembling a new Editorial Board. Appointments are for four years (following ICIAM's rules for committee structure) and are renewable. We welcome the following new editors, whose terms began January 1, 2020:

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In addition, the Editor-in-Chief remains

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are continuing members of the Editorial Board. More appointments are expected.

SHORT BIOGRAPHIES OF OUR EDITORS

At publication time, we have received the following information from editorial board members; more pictures and biographies will be published as we receive them.



KRYSZTOF BURNECKI

Krzysztof Burnecki received his Ph.D. degree in 1999 in Mathematics from the Wrocław University of Technology. Currently, he is an Associate Professor at the Faculty of Pure and Applied Mathematics at the Wrocław University of Science and Technology, and a Vice-Director of the Hugo Steinhaus Center, which specializes in modeling of random phenomena in natural sciences, economics and engineering. His research interests include self-similar processes, heavy-tailed models and time series analysis, insurance mathematics, mathematical physics and computational statistics. He has written over 80 scientific publications, about 46 of which appeared in peer-reviewed international journals such as Nature, Physical Review Letters, Astrophysical Journal, Scientific Reports, IEEE Transactions on Signal Processing, Biophysical Journal, Physical Chemistry Chemical Physics, and Insurance: Mathematics and Economics. He is Editor-in-Chief of *Mathematica Applicanda* and Associate Editor of *Computational Statistics*. He is a member of the ECMI Council, Polish Society of Actuaries and Polish Mathematical Society.



STEFAN GÜTTEL

Stefan Güttel is a Reader (Assoc. Prof.) in Numerical Analysis at the University of Manchester (UK). He obtained his PhD in Applied Mathematics at TU Bergakademie Freiberg (Germany). His main research interests are in the field of computational mathematics, in particular, in algorithms for high-dimensional linear algebra problems arising with differential equations and in data-driven applications.



KEES VUIJK

Kees Vuijk obtained a masters degree in Applied Mathematics in 1982 at the Delft University of Technology. After a short stay at Philips Research Laboratories he started a PhD in Mathematics at the University of Utrecht. He defended his PhD thesis "The solutions of a class of Stefan problems" in 1988. Thereafter he started as an assistant professor at the Delft University of Technology. In 2007 he became full professor at the chair: Numerical Analysis. He has been Director of TU Delft Institute for Computational Science and Engineering since 2007. During the period 2012-2019 he was Scientific Director of 4TU.AMI Applied Mathematics Institute. This is the Applied Mathematics Institute of the four Universities of Technology in the

Netherlands. He served as a associate editor of *SIAM Journal of Scientific Computing* from 2013 till 2019. He has organised a number of international conferences, was an invited speaker at international conferences, has written more than 200 ISI publications and has a google H-index of 43. Finally he is also a member of the Innovation Committee of the Dutch Platform for Mathematics.

Research topics of the chair Numerical Analysis are: numerical modelling (mesh generation, discretization), fast and robust solvers for large (non)linear systems of equations, and high performance computing. Within numerical modelling, work has been done in grid generation and discretization using Isogeometric Analysis, methods for two phase flow problems and mesh free methods (SPH, MPM, etc.). Solvers are developed for non linear systems as are global techniques for projected Newton-Krylov methods. For linear systems work has been done on analysis of Krylov methods, advanced preconditioners, domain decomposition and deflation methods. HPC research is related to inventing and implementing solvers which are suitable for parallel computing using MPI and CUDA software to implement them on clusters of CPU's or GPU's. Some work has been done on FPGA's and Quantum Computing.

These techniques are applied on (systems) of Partial Differential Equations (Porous media flow, Navier-Stokes, Mechanics, Helmholtz and Maxwell). Recently, these techniques are also applied to network problems which are originating from energy networks.

Homepage: <http://homepage.tudelft.nl/d2b4e/>
 (https://urldefense.com/v3/___http://homepage.tudelft.nl/d2b4e/__;!!KGKeukY!iINSY-pfWfrMmjoHDW0pyipsEI3Vt_IH_IAUEcTv-_DOK8BQVGwPHeE12AMvTXsYcNkf0_EIymNo\$)

GUIYING YAN



Guiying YAN is a professor at the Academy of Mathematics and Systems Science, Chinese Academy of Sciences (CAS). She received her doctoral degree from Shandong University. Her main research interest is graph theory and its applications. Currently, she is a Vice-President of the National Center for Mathematics and Interdisciplinary Sciences, CAS and Secretary-general of China Society for Industrial and Applied Mathematics (CSIAM).



Letter to Member Societies: Call for pre-bids for hosting and organizing ICIAM 2027

Call for pre-bids for hosting and organizing ICIAM 2027

Dear Presidents and Representatives of Member Societies of ICIAM,

Following current rules, the 2020 ICIAM Board meeting (Glasgow, UK, May 23, 2020) will be the place to present and discuss the pre-bids for ICIAM 2027. Only pre-bids approved by the Board will be allowed to present a complete bid in the 2021 Board meeting, where the final decision will be made about who will organize ICIAM 2027.

If your society plans to bid for ICIAM-2027, please read the companion article (Bid Process for ICIAM 2027) describing how to prepare a bid. Note that in a pre-bid details have to be given to the board about location, organizing group, some plans about financial issues, SPC, etc, but the pre-bid document does not need to contain the precise and complete information that a final bid contains. As written in the attached rules, pre-bids should be sent to me no later than 31 March 2020, and it is possible to submit the document by email.

If you plan to prepare a bid I would appreciate that you let me know. And, of course, please feel free to ask me, or any of the Officers, any question or doubt that you might have during the preparation of the pre-bid document.

Best regards, Ya-xiang Yuan, President of ICIAM



Ya-xiang Yuan

Ya-xiang Yuan is the current President of ICIAM (2019-2023). He is a professor at Academy of Mathematics and Systems Sciences, Chinese Academy of Sciences. His research focuses on optimization.



Bid Process for ICIAM 2027

International Council for Industrial and Applied Mathematics (ICIAM)

November 2019

Member societies are invited to apply to hold the Eleventh International Congress of Industrial and Applied Mathematics in 2027.

Rules and resolutions concerning the process

The application process is governed by the "Rules", (reprinted 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 (license fee) 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 Glasgow (UK), on Saturday, 23 May 2020, will set the license fee for the Eleventh Congress in 2027 (as a reminder, the license fee for ICIAM 2023 was set at USD 40,000). 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 Glasgow (UK), on Saturday, 23 May 2020. While applications submitted at the meeting itself will be admitted, the Officers request that if possible, applications should be submitted to the ICIAM President, Ya-xiang Yuan, no later than 31 March 2020. 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.

1. The second of the rules below is expected to be interpreted by the meeting of the Board in Glasgow (UK), on Saturday, 23 May 2020, 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 2020. 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 2027. 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 2020, 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 2021. 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 2027 Congress will be made by the Board at its meeting in 2021.

Approved by ICIAM in Helsinki, May 2001

Distributed to member societies, December 2019.

Ya-xiang Yuan, 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'.



Ya-xiang Yuan

Ya-xiang Yuan is the current President of ICIAM (2019-2023). He is a professor at Academy of Mathematics and Systems Sciences, Chinese Academy of Sciences. His research focuses on optimization.



ICIAM Board Meeting 2020

The next ICIAM Board meeting will take place in Glasgow (UK) on Saturday, 23 May, 2020. As usual, there will be a 2-days workshop for attendants to the Board meeting on May 21-22.

Representatives of member societies in the Board: book those dates in your agendas!

<http://www.iciam.org/board-meetings> (<http://www.iciam.org/board-meetings>)



How to Change Your Society's Membership Information

Update Your Membership Information on icipam.org (<http://icipam.org>)

ICIAM maintains a self-service membership directory at <http://www.iciam.org/members> (<http://www.iciam.org/members>) Please take this opportunity to check your membership information, and update it if appropriate. Instructions on how to update your entry or to add new information can be found in our membership FAQ, <http://www.iciam.org/faq-members> (<http://www.iciam.org/faq-members>)

Sven Leyffer
ICIAM Secretary
secretary@iciam.org (<mailto:secretary@iciam.org>)



The 2020 ICIAM Officers

Ya-xiang Yuan, Maria J. Esteban, Heike Fassbender, Sven Leyffer, Wil Schilders, Luis Vega



CALL FOR APPLICATIONS: Conference Support

ICIAM Conference Support

for

Applied and Industrial Mathematics

in

Developing Countries

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 (<mailto: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 two rolling deadlines per year (30 April and 31 October); the ICIAM Officers decide on which applications to support within a month of each deadline. To allow for orderly budgeting and planning, proposals should be submitted a year in advance of 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

<http://www.iciam.org/iciam-conference-support-applied-and-industrial-mathematics-developing-countries>
 (<http://www.iciam.org/iciam-conference-support-applied-and-industrial-mathematics-developing-countries>)



中国工业与应用数学学会
 China Society for Industrial and Applied Mathematics

17th Annual Conference of CSIAM

17th Annual Conference of CSIAM held

China Society for Industrial and Applied Mathematics (CSIAM) held its 17th annual conference in Foshan, Guangdong province September 20-22, 2019. More than 1000 experts from the field of applied mathematics, industry and young students attended this conference.

There were 8 invited plenary lectures, 330 contributed talks and 28 theme symposia with a wide coverage of topics including Big Data and Artificial Intelligence, Inverse Problem and Imaging, Mathematical Medicine, Computational Geophysics, Financial Mathematics & Engineering and Actuarial Insurance, Uncertainty Quantification and Application, Numerical Methods for Seepage in Porous Media, High Performance Computing, Computer Algebra, Machine Learning and Optimization, Theory and Algorithms in Bioinformatics, and other cutting-edge academic research topics.



Photograph: The Opening Ceremony

The highlights of the conference were 3 special forums: “Women and Mathematics”, “Mathematics and Industries” and “Student Panel”.

Women and Mathematics forum invited several mathematicians to share their learning and research experiences. They encouraged female mathematic researchers to be more confident, and called for a more equitable and tolerant environment for the growth of women in the math research and to show “Women Power”.

Student panel included 37 talks from outstanding young students to show their scientific research achievement. It provided not only a valuable platform for young students to improve their competence, but also a chance to exchange with the experts from various aspects.

Forum on Mathematics and Industries invited mathematicians and entrepreneurs to exchange view on mathematical solutions in industrial applications. In the future, CSIAM will provide a broad platform to benefit for both mathematicians and entrepreneurs aiming to solve mathematical problems in industrial development.

In addition, 6 mathematicians including Prof. Zhang Pingwen, the president of CSIAM and Prof. Yuan Yaxiang, the President of ICIAM made a number of wonderful popular public reports for local teenagers and citizens to inspire public interest in understanding mathematics.



Photograph: Lecture of Professor Zhang Pingwen



Yan Guiying

Guiying YAN is a professor at the Academy of Mathematics and Systems Science, Chinese Academy of Sciences (CAS). She received her PhD from Shandong University. She is a Vice-President of National Center for Mathematics and Interdisciplinary Sciences.



Obituary for Peter Deuflhard

Obituary: Peter Deuflhard

On September 22, 2019, Peter Deuflhard passed away at the age of 75. The Berlin mathematics community lost one of its leaders — a highly respected colleague and overall wonderful person.

After earning a diploma in physics at the Technical University of Munich (TUM) and a doctorate in mathematics (with Roland Bulirsch on Newton methods) at the University of Cologne, Peter habilitated at TUM in 1977 with a thesis on multiple shooting techniques. At age 34, he was appointed as a full professor of numerical mathematics at the Ruprecht-Karls-Universität Heidelberg. He maintained this position until 1986, at which point he became chair of scientific computing at Freie Universität Berlin. Peter authored the pioneering green paper that led to the foundation

of the Zuse Institute Berlin (ZIB) — the first German institute for scientific computing — in 1986. He served as president of ZIB for over 25 years and forged it into a role model for interdisciplinary mathematical research worldwide.

In 2002, Peter co-founded MATHEON, the Berlin-based research center that established ongoing successful cooperation of all Berlin universities and mathematical research institutes. MATHEON operates under the motto “Mathematics for key technologies” and was the forerunner of the Cluster of Excellence MATH+. Peter was also a member of the Berlin-Brandenburg Academy of Sciences and Humanities.

Based on his long and wide-ranging list of monographs, textbooks, and scientific papers, an unaware contemporary might think that “Deuflhard” is the pseudonym for an entire interdisciplinary collaborative group of scientists from the fields of mathematics, physics, chemistry, medicine, engineering, and the humanities. Yet at his heart, Peter was a mathematician. In 2007, he received the Maxwell Prize of the International Council for Industrial and Applied Mathematics (ICIAM), which is awarded to “a mathematician who has demonstrated originality in applied mathematics.” ICIAM’s prize committee published the following laudation: *Professor Peter Deuflhard’s contributions to applied mathematics have a breadth, depth, and originality that is almost without parallel. His contributions to algorithm-oriented numerical analysis are fundamental and range from highly nonlinear algebraic systems through large-scale ordinary and partial differential equations to Markov chains. Within these fields, they cover direct and inverse problems, optimization aspects, and optimal control. Characteristic of his work is that he always lays a firm, often innovative mathematical basis on which he constructs highly efficient algorithms for hard real-life problems in science and technology. His style of research has revolutionized scientific computing, [and] a large number of highly-reputed scholars follow his tracks.*

Peter supervised more than 30 doctoral students in mathematics, many of whom pursued academic careers at ZIB. He collaborated intensively with engineers, physicians, scientists, and practitioners in many different fields. He was also quintessential in the formation of modern scientific computing as a discipline that integrates a wide range of applied mathematicians, computer scientists, and other researchers; combines mathematics and computing technology; and ultimately achieves a fundamental understanding of phenomena and processes.

The variety of application areas in which Peter contributed is stunning. They range from spacecraft mission design, chemical engineering, nano-optics, systems biology, and medicine to bioinformatics, molecular dynamics, drug design, and even the humanities. Peter never dropped a subject; he transformed it by identifying hidden structures and converting them into sources of possible future developments, perhaps in other fields. He thus built bridges between completely different areas. For example, Peter applied ideas from the numerics of partial differential equations to model-supported operation planning in head surgery. This proved to be an intriguing way to connect his results to the study of beautiful faces and contribute to research in the humanities.

Although Peter appreciated his international recognition, he gleaned even more enjoyment from his personal interactions with the many colleagues and students who benefitted both personally and professionally from his guidance.

We are so grateful for Peter’s extraordinary contributions and mourn the loss of an outstanding member of the scientific community.



Photo credit: Sandra Patzelt-Schütte

ICIAM Dianoia thanks *SIAM News* for permission to reprint this article.

Christof Schütte and Ralf Kornhuber

Christof Schütte is professor of scientific computing at Freie Universität Berlin and is president of the Zuse Institute Berlin (ZIB). Ralf Kornhuber is professor of numerical analysis and scientific computing at Freie Universität Berlin.



Announcing the International Day of Mathematics: March 14

The International Day of Mathematics (IDM) is a worldwide celebration. Each year on March 14 all countries will be invited to participate through activities for both students and the general public in schools, museums, libraries and other spaces.

On November 25 2019, the 40th General Conference of UNESCO has proclaimed March 14 (*Pi Day*) as the **International Day of Mathematics** (IDM). The project of International Day of Mathematics is led by the International Mathematical Union. The official launch will be in 2020.

Considering that March 14, 2020 is a Saturday, the launch at the UNESCO Headquarters in Paris will take place on Friday March 13, 2020. A simultaneous African launch will be held at the Next Einstein Forum in Nairobi, Kenya.

Every year we will announce a new theme to flavor the celebration, spark creativity and bring light to connections between mathematics and all sorts of fields, concepts and ideas.

The 2020 theme is

Mathematics is Everywhere

- Mathematics is everywhere in **science and technology**.
- Mathematics is everywhere in the **organization of the civilization**.
- Mathematics is essential to meet the **UN Sustainable Development Goals**.
- Mathematics is everywhere **in whatever you do**.
- Tell me about some activity or area and **I will tell you where mathematics is**.

Beginning December 2019 on the www.idm314.org (<http://www.idm314.org/>) web site you will be able to:

- Find **open source material** related to the theme: **projects, ideas and software** for use in classrooms, large events or in small activities for children and the general public.
- Find instructions on **how to organize an event**.
- **Post your activities** on an interactive map.
- Explore the **activities around the world**.

How will you celebrate?

- Will you **celebrate in your classroom**?
- Do you wish to **organize a small exhibition** and/or **interactive activities** with your local community?
- Will your national mathematical society or mathematics teacher association organize **national activities**?
- Will you **celebrate with a neighbouring country**?

Start thinking on how you will celebrate. **We are here to help**.

Visit www.idm314.org (<http://www.idm314.org/>) for more information.

The International Day of Mathematics is a project led by the **International Mathematical Union** (<https://www.mathunion.org/> (<https://www.mathunion.org/>)).

Christiane Rousseau



IMU Committee for Women in Mathematics Funding Call

CWM funding call for 2020

<http://www.mathunion.org/cwm/> (<http://www.mathunion.org/cwm/>)

The IMU Committee for Women in Mathematics (CWM) invites proposals for funding of up to €3000 for activities or initiatives taking place in 2020, with application deadline 15 January, 2020.

Applications should be sent to applications-for-cwm@mathunion.org (<mailto:applications-for-cwm@mathunion.org>) 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. Help could include, for example, funding meetings, organizing round-tables at mathematical regional events, or support in creating websites. Please note that CWM will fund preferably activities taking place in a different location than one already funded in preceding years (see www.mathunion.org/cwm/ (<http://www.mathunion.org/cwm/>) for the list).
- b) Organizing a mathematical school open to all with all women speakers and mainly women organizers. This type of mathematical school, which should include a significant proportion of time devoted to background and introductory material, can be a very effective way of showcasing the contributions of women mathematicians and creating an opportunity for female students to be in touch with women leaders, without excluding male students. Expenses covered by CWM could include, for example, costs for speakers, women organisers, or for women participants.
- c) Organizing research workshops geared towards establishing research networks for women by fostering research collaborations during the event. Research Collaboration Conferences for Women (RCCWs) demonstrate successful models of such events in developed countries. These are weeklong conferences, held at mathematics institutes or similar places where junior and senior women come together to work on pre-defined research projects. Events taking place in developing or emerging countries will have priority. Events taking place in developed countries may

be considered if they explicitly state in their application that the grant will be used to support the travel or accommodation of participants from developing or emerging countries. We recognize that organizing such an event takes a long time. Therefore, we may consider also events that may take place in 2021 for this category.

d) Other ideas for researching and/or addressing issues encountered by women in mathematics may also be considered. Note that funding for individual research projects is not available.

Proposers should write a short description (no more than two pages) explaining the nature of their activity and how it fulfils one of the above aims, as well as indications on how the CWM money would be spent. Proposals should further include information about other sources of funding if available.

There will be only one call for applications regarding activities in 2020, with deadline 15 January, 2020. Applications should be sent to applications-for-cwm@mathunion.org (mailto:applications-for-cwm@mathunion.org). The authors of successful applications will be informed no later than 29 February 2020. Depending on demand, successful applications may not be funded in full. Successful applicants will be asked to send a short report of the activity with details of how the budget was spent one month after the end of their event.

Note: The application deadline for 2020 applications has passed. Please watch the CWM website for notices about applications for 2021 events.



Activities of the International Science Council

SUMMARY

The organization of which ICIAM was an "Affiliate Member", ICSU (the International Council for Science), merged in 2018 with the International Social Science Council to form a larger council, the International Science Council (ISC). We are one of 30 *Affiliated Members* of ISC (according to the ISC Statutes, "affiliated members pay dues but have no voting rights" (and, it appears from the statutes, are not entitled to present candidates to hold office - that is, we have no part in the governance of ISC). Our somewhat inferior category of membership, not so incidentally, means paying much lower dues than *Member Unions and Associations* (there are 40 of these; the IMU is an example) or *Member Organizations* (numbering 135; these are national academies or national research councils), which, of course, typically have much larger budgets than does ICIAM.

Although ICIAM's ability to influence the overall direction and mission of ISC is thus limited, we are regularly consulted about the activities of ISC, and we are often invited to propose candidates to participate in or review its many activities. It was because of the possibility of engaging more applied mathematicians in these activities, and because of the potential interest of some of our members in the intersection of science and policy that is the focus of ISC's activity that ICIAM initially joined ICSU, and this potential remains. To see what is involved here, and to explore ways of realizing this potential, this document attempts to outline what ISC actually does.

OVERVIEW

The ISC's vision statement (from "*About Us*"):

The vision of the Council is to advance science as a global public good. Scientific knowledge, data and expertise must be universally accessible and its benefits universally shared. The practice of science must be inclusive and equitable, also in opportunities for scientific education and capacity development.

And their mission statement (same section):

The mission of the International Science Council is to be the global voice for science; a trusted voice that speaks for the value of all science by:

- **Promoting international research and scholarship on key global challenges**
- **Increasing evidence-informed understanding and decision making at all levels of public policy, discourse and action**
- **Promoting the continued and equal advancement of scientific rigour, creativity and relevance in all parts of the world**
- **Protecting scientific freedom and advocating principles for the responsible practice of science**

On the page "What we do", ISC gives more detail:

The Council convenes the scientific expertise and resources needed to lead on catalysing, incubating and coordinating impactful international action on issues of major scientific and public importance.

The organization breaks its work into three categories (it is unfortunate that they refer to these as "principle" areas, although this misspelling is corrected on another page):

- **Science-for-policy:** stimulate and support international scientific research and scholarship, and communicate science that is relevant to international policy issues.
- **Policy-for-science:** promote developments that enable science to contribute more effectively to major issues in the international public domain.
- **Scientific freedom and responsibility:** defend the free and responsible practice of science.

The third bullet is clear, and explains ISC's willingness to write letters protesting government suppression of free scientific expression or practice, or to protest statements and actions that demean certain groups of scientists (women, international scholars), as well as to monitor dishonesty and fraud among scientists. The first bullet emphasizes the *international* component of the mission; although it is unclear how a small-budget organization will support scientific research at an international level, it can certainly play a role in bringing an international perspective to ongoing research. The communication mission is also clear: uncovering the science and finding conduits to bring this information to policy makers is a legitimate task. The second bullet is somewhat vague, but might include topics like publication models ("open access" for example) that have implications for the conduct of science worldwide.

The *overview* page (<https://council.science/what-we-do> (<https://council.science/what-we-do>)) does give a list of areas in which ISC is active: *global sustainability, poverty, urban health and wellbeing* and *disaster risk reduction, data, observing systems* and *science advice to governments*.

ISC's annual budget is roughly 8M € (Euros) - they expect to run a deficit of ~400,000 € in 2019. Sources of income are given in the following table (extracted from ISC's budget document, sent to all member organizations):

International Science Council - Revised Budget 2019		(in Euros)
INCOME		2019
		Revised Budget
1	NON-EARMARKED (CORE)	
	Member Dues	
	National Members	2,784,470
	Union Members	195,438
	Associates	16,000
	French Ministry of Research	100,000
	Interest from ISC bank accounts	15,000
2	EARMARKED	
	USA/NSF Contribution to WCRP	
	NSF ISC Grant	340,000
	Dedicated Fund NSF (available at the start of 2019)	280,000
	IRDR Taipei	250,000
	Dedicated Fund Taipei IcoE IRDR	435,531
	IDRC INGSA Grant	406,800
	INGSA Dedicated Fund	-
	Sida Grant for LIRA Program	1,555,830
	Dedicated Fund LIRA	-
	T2S Sida Grant	290,000
	Dedicated Fund T2S Sida Grant (available at the start of 2019)	484,217
	Norface/ T2S EU Grant	426,623
	University of Bergen Stein Rokkan Prize	5,000
	IPBES Review funds	11,400
	TOTAL INCOME	7,596,309

Of this, about 3M € goes to staff and administrative expenses; this is about the amount brought in in member dues. Major activities are funded by grants ("earmarked" funds), and these form the bulk of income. The part of the budget that deals with research projects is reproduced at the end of this article.

The list of programs carried out by ISC is also given under this heading ("What We Do"), and the titles fall into seven groups: **Research Programs, Work at the UN, Freedoms and Responsibilities of Scientists, Funding Programs, INGSA, Science International, and ISC in the News**. Here is the list, with all the subprograms

1. [Research Programmes](#)
 - a. Data and Information
 1. [Committee on Data \(CODATA\)](#)
 2. [World Data System \(WDS\)](#)
 3. [INASP](#)
 - b. Monitoring and Observations
 1. [Global Climate Observing System \(GCOS\)](#)
 2. [Global Ocean Observing System \(GOOS\)](#)
 - c. Thematic Organizations
 1. [Committee on Space Research \(COSPAR\)](#)
 2. [Comparative Research Programme on Poverty \(CROP\)](#)
 3. [Future Earth](#)
 4. [Gender, Globalisation and Democratisation](#)
 5. [Integrated Research on Disaster Risk \(IRDR\)](#)
 6. [Scientific Committee on Antarctic Research \(SCAR\)](#)
 7. [Scientific Committee on Oceanic Research \(SCOR\)](#)
 8. [Scientific Committee on Solar-Terrestrial Physics \(SCOSTEP\)](#)
 - ii. Urban Health and Wellbeing
 - a. [African Working Group on Urban Health](#)
 - b. [World Climate Research Programme \(WCRP\)](#)
2. [Our work at the UN](#)
 - a. Biodiversity
 1. [IPBES Review](#)
 - b. Climate Change
 1. [History: ICSU and climate change](#)
 - c. [Disaster Risk Reduction](#)
 - d. [Sustainable Development Goals](#)
 - e. [Technical Working Group on Sendai Hazard Definitions and Classification to be launched](#)
 - f. [Urbanization](#)

3. [Freedoms & Responsibilities of Scientists](#)
 - a. [Academic freedom](#)
 - b. [Freedom of Movement and Association](#)
 - c. [Research Integrity](#)
 - d. [Science & Human Rights](#)
4. [Funding Programmes](#)
 - a. [ICSU Grants Programme \(Our Gender Gap project is funded here\)](#)
 - b. [Leading Integrated Research for Agenda 2030 in Africa \(LIRA\)](#)
 - i. [Governance & Management](#)
 - ii. [How it works](#)
 - iii. [Projects funded in 2017](#)
 - iv. [Projects funded in 2018](#)
 - v. [Projects funded in 2019](#)
 - c. [Transformations to Sustainability](#)
5. [International Network for Government Science Advice \(INGSA\)](#)
6. [Science International](#)
7. [ISC in the News](#)

Just as a note: These are all hyperlinks on the web page, and some of them are out-of-date. For example, the "ISC in the News" section is just a list of references to ISC (or ICSU or ISSC) in the conventional or online press, but some lead to redirects, and some require a subscription to the journals where the articles appeared. Clicking on the project "Gender, Globalisation and Democratisation" (1.c.4) takes one to a web page that was last updated in December, 2010. This was an ISSC project, and there are many reasons that a project can fail to run to completion (lack of resources, change of direction of the PI, and so on), but one hopes that in time the ISC staff will clean up this list and put projects that are no longer active in an archive.

ISC also operates three regional offices (RO's): Africa (ROA), Asia and the Pacific (ROAP), and Latin America and the Caribbean (ROLAC). They receive funds from ISC for staffing (~225K €). One guesses that these offices exist in part to ensure that ISC's priorities are not dominated by those of Europe and anglophone North America, and that scientists from the regions they represent become involved in ISC activities.

Because ISC is still in the process of reorganizing itself, its website (from which most of this information was obtained) is currently incomplete and changing. However, we were recently sent the 2019 Budget of ISC, and, using this as backbone, I have put together an outline of ISC's principal operations. The relevant pages from the budget document are given in the Appendix.

PRINCIPAL ACTIVITIES

Here is a look at some of the largest projects (by budget).

1. IRDR (Integrated Research on Disaster Risk) ~1M €: This is a decade-long project jointly managed by ISC and a United Nations Office: the UN Office for Disaster Risk Reduction. According to its website it is "a global, multi-disciplinary approach to dealing with the challenges brought by natural disasters, mitigating their impacts, and improving related policy-making mechanisms". Like other ISC projects it has a certain amount of infrastructure, but they also perform and publish detailed studies on specific problems (for example, using early-warning systems to limit cyclone damage in Samoa).
2. INGSA (International Network for Government Science Advice) ~360K €: This program was established fairly recently (2014) by the government of New Zealand. It has headquarters there, and a number of regional offices, and gets funding from various quarters (for example, the Canadian 'International Development Research Center') for its activities in capacity-building to develop 'theoretical and practical approaches to the use of scientific evidence in informing policy at all levels of government'. INGSA runs workshops that (broadly speaking) are intended to build expertise in how to advise governments on a number of urgent scientific topics (for example, biodiversity, non-communicable diseases and so on).
3. LIRA (Leading Integrated Research in Africa for Agenda 2030) ~1.4M €: This large-budget operation is funded by a grant from the Swedish Development Agency (Sida). It is a 5-year program (2105-2020) whose objective is to train early-career scientists in Africa. Its focus is on (roughly) urban futures in Africa - sustainability, poverty reduction, gender equity and so on - and on international collaborations of early-career (less than 10 years past PhD) African scientists.

4. T2S (Transformations to Sustainability) ~850K €: This project is also funded in part by Sida, as well as by an EU grant. It was started as an ISSC project and focuses on topics like environmental justice. It pioneers an "innovative, solution-oriented approach to sustainability research that is framed and led by social scientists and involves natural scientists and societal stakeholders from beginning to end of the research process". T2S supports research, organizes events to share results, and attempts to build a global 'knowledge base'. So far, they have awarded 38 seed grants and 3 major grants for 'Transformative Knowledge Networks'. This program has a distinct social science flavor. The various projects run under their auspices also obtain funding from a number of sources (including universities in the US and Canada).

OTHER ACTIVITIES

As the list of programs given above suggests, there are a large number of projects, committees, and joint programs in which ISC has a part. Some of these, for example the Scientific Committee on Antarctic Research (SCAR) themselves have a good deal of structure, and maintain their own websites that describe their governance, projects, personnel, and subcommittees. It is unclear in many of these projects what is the level of activity, whether there is paid support staff, whether they operate by additional grants, and what their budgets are. Nonetheless, I hope the descriptions above give some indication of the scope and purpose of ICS activities.

BUDGETED EXPENDITURES

The following tables, from ISC's budget document, give some indication of the scope of the different activities carried out under ISC's direction.

EXPENDITURE		2019
		Revised Budget
1	GOVERNANCE MEETINGS	
1.1	General Assemblies annual provision	60,000
1.2	Meetings: GB /Officers/CF	120,000
	Sub-Total	180,000
2	ADVISORY COMMITTEES, FORUM OF PATRONS AND AD HOC COMMITTEES	
2.1	Meetings	35,000
2.2	Review panels IB's & Programmes (NSF funded)	15,000
2.6	CFRS meeting	35,000
	Sub-Total	85,000
3	INTERNATIONAL PROGRAMMES AND INTERDISCIPLINARY BODIES	
3.1	WCRP : Annual contribution (NSF funded)	
3.2	IRDR: SC meeting (NSF funded)	35,000
3.3	IRDR Taipei	365,531
	Dedicated Fund IRDR (end of year)	300,000
3.4	Future Earth: Support for regional activities (NSF funded)	25,000
3.6	Urban Health: SC meeting	30,000
3.7	Urban Health: ED Health insurance	12,000
3.8	WDS: SC meeting (NSF funded)	45,000
3.9	INGSA IDRC Programme	350,000
3.10	INGSA (NSF funded)	10,000
3.11	General Scientific activities ISC Rep.	-
	Dedicated Fund NSF (available at end of year)	240,000
	Sub-Total	1,412,531

EXPENDITURE		2019
		Revised Budget
1	GOVERNANCE MEETINGS	
1.1	General Assemblies annual provision	60,000
1.2	Meetings: GB /Officers/CF	120,000
	Sub-Total	180,000
2	ADVISORY COMMITTEES, FORUM OF PATRONS AND AD HOC COMMITTEES	
2.1	Meetings	35,000
2.2	Review panels IB's & Programmes (NSF funded)	15,000
2.6	CFRS meeting	35,000
	Sub-Total	85,000
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3.1	WCRP : Annual contribution (NSF funded)	
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	Dedicated Fund IRDR (end of year)	300,000
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3.6	Urban Health: SC meeting	30,000
3.7	Urban Health: ED Health insurance	12,000
3.8	WDS: SC meeting (NSF funded)	45,000
3.9	INGSA IDRC Programme	350,000
3.10	INGSA (NSF funded)	10,000
3.11	General Scientific activities ISC Rep.	-
	Dedicated Fund NSF (available at end of year)	240,000
	Sub-Total	1,412,531

EXPENDITURE		2019
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	Revised Budget
TRANSFORMATIONS TO SUSTAINABILITY PROGRAMME	
6.4 Research and Grants	637,630
6.5 Programme Adviser/ Consultants and travel	20,024
6.6 Norface Chile meeting	5,000
Dedicated Funds T2S (available at end of year)	196,606
Sub-Total	859,260
7 OTHER ACTIVITIES AND NEW INITIATIVES	
7.2 TTF/ Strategy team (ISSC-ISC) Implementation	-
7.4 New Initiatives (Partly NSF funded)	50,000
Special Envoy	112,500
Domain 1: THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT	60,000
Domain 2: DIGITAL REVOLUTION	50,000
Domain 3: SCIENCE IN POLICY AND PUBLIC ACTION	30,000
Domain 4: EVOLUTION OF SCIENCE AND SCIENCE SYSTEMS	25,000
Stein Rokkan Prize Award	5,000
Sub-Total	332,500
8 MEMBERSHIP	
8.1 ISC GB members meetings & GAs.	12,500
8.2 Annual Membership Meeting	-
8.3 Grants Programme	300,000
Sub-Total	312,500
9 REGIONAL OFFICES	
9.1 Direct support	225,000
9.2 ISC Paris Travel to RO's & participation in RC's	10,000
Sub-Total	235,000

In Part 2, we will discuss ways in which ICIAM members can participate in ISC activities.



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RESEARCH IS STILL VISIBLE IN THE EUROPEAN GOVERNMENT'S STRUCTURE

RESEARCH IS STILL VISIBLE IN THE EUROPEAN GOVERNMENT'S STRUCTURE

When in September the list of candidates for the new EU commissioners was made public, scientists in Europe noticed with surprise and horror that research was no more visible anywhere. Research would be taken care of by the commissioner on Innovation and Youth. That was a big shock and a campaign of signatures was launched by a group of scientists of different European countries. After weeks of intense lobbying, incoming commission president Ursula von der Leyen gave in to pressure, at the last possible moment.

Von der Leyen's last-minute decision meant that rather than being appointed Innovation and Youth Commissioner, Bulgarian Mariya Gabriel became commissioner for Research, Innovation, Education, Culture & Youth.

Some people could think that this was not so important, since in her initial mission letter to commissioner Gabriel President von der Leyen emphasized that "education, research and innovation would be key for European competitiveness", but still, European scientists felt that this was not acceptable, that symbols are important, and that the importance of science could not disappear from the structure of the European Government.



Maria J. Esteban

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Open Access Publishing in Mathematics

The last few years have borne witness to a number of important changes within the scholarly communications sphere that have the potential to radically disrupt research at large, and mathematics in particular.

Researcher and institutional dissatisfaction with traditional journal subscriptions and so-called "Big Deals" have taken the Open Access movement from grassroots activism to politically mandated regulation. The announcement in 2018 of Plan S (<https://www.coalition-s.org/>), an initiative launched by an international consortium of research funders, including the European Commission and the European Research Council, with the explicit aim of making all publicly funded research Open Access, has rapidly accelerated publisher plans to embrace Open Access models of publication.

The European Mathematical Society, in association with a number of other learned societies in the field of mathematics, supports this transition to Open Research. Indeed mathematics as a discipline has a longstanding culture of liberal Green Open Access policies. We are committed to developing sustainable models for Open Access publishing as we believe these will come to dominate publishing models in the coming years.

However, this is a transition that should not be taken without due caution and consideration. In many countries in the Northern hemisphere there is a tendency to focus on Gold Open Access as the publishing model of choice - a model that requires authors to pay an article processing charge (APC) for publication. This may result in a number of unintended consequences, for example:

- Researchers without funding may be denied access to publish in their journal of choice. This may include researchers from developing economies, or those publishing in underfunded or niche areas of research.
- Journal profitability may become tied to published output, resulting in an inflation in the number of published articles, accompanied by a reduction on the quality of said research.
- APCs are often presented without a breakdown of where costs are incurred in the publication process, which

can leave authors and their institutions unsure of the value a publishing house adds to the finished article.

Society-based publishing houses are not immune to these concerns, nor is the discipline of mathematics as a whole. For this reason, it is important that as the publishing houses of learned societies, we outline a set of guiding principles for our Open Access publishing models to ensure that quality and fairness remain at the heart of our publication programmes. At the same time, publishing houses play an important role in the curation and dissemination of research, so any publishing model must allow for the long term sustainability of the organisation. We therefore propose the following criteria:

- The quality of publications is paramount and beyond compromise.
- Publications shall be accessible and available in perpetuity.
- Pricing models shall be transparent and fair.
- The publishing house serves the mathematics community, and commits surplus funds to community initiatives.
- The publishing house commits to collaborative relationships with other stakeholders within the mathematics community.

It is with these principles in mind that the publishing house of the European Mathematical Society has begun to investigate sustainable Open Access models for its journal and book portfolio. Over the coming months we will be presenting our findings and inviting feedback from our community of editors, as well as librarians and researchers in the field.

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Volker Mehrmann is President of the European Mathematical Society (EMS). André Gaul (PhD Mathematics) is Managing Director of the EMS Publishing House and Laura Simonite (MA Publishing) is Head of Business Development there.

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.

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