Pakistan Mathematical Society

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Editorial

Scientists and Engineers now work on problems for more complex then ever dreamt possible a few decades ago. Today linear algebra has more potential value in many scientific and business fields than any other under graduate mathematics subject. Harvard Professors, Wassily Leontief, in 1949 had written a linear equation after distilling a system of five hundred equations in five hundred unknowns into a system of forty two equation and forty tow unknowns by using a computer Mark II, one of the largest computer of its day. After several months of hectic efforts on his computer he finally produced the solution. He was awarded Noble Prize in 1973 and opened the door to new era in mathematics modeling. The models are usually linear and they are described by the system of linear equations. Computer Science is thus intricately linked with linear algebra through the explosive growth of parallel processing and large-scale computations.

Realizing the importance of the subject there is a major breakthrough here in Pakistan. The scholars and researchers are continuously engaged in creativity and contributing in the form of research compatible with the work being carried out in any part of the world. Pakistan Mathematical Society is constantly pursuing the mathematical activities in the form of seminars at the local level. Society was also able to hold a series of international pure mathematics conferences offering a forum for promoting, reflection, collaboration, exchange and dissemination of ideas to local researchers. It is a matter of great pleasure and honour for Pakistan that new institutes and centers of excellence being set up in different prestigious institutions to provide incentive and impetus to all those who are engaged in mathematical activities.

Since extensive mathematical activities are going on in the country, need to establish a link between local and international mathematicians has been felt. Therefore by getting the membership of different international mathematical forums Pakistan is gradually occupying the position in the main stream of international mathematical community.

Editors

Pakistan has rejoined IMU

Pakistan has rejoined International Union of Mathematicians (IMU) after a hectic struggle. Pakistan has become member through the Pakistan Academy of Sciences. Due to this, Pakistan will now appear on the mathematical world map.

Pakistan was a member once before. It became member when late Professors Dr. M.Raziuddin Siddiqui was the President of the Pakistan Academy of Sciences and Professor Dr.Q.K.Ghori, former Director, Mathematical Institute, Islamabad University, was the second mathematician who was a Fellow of the Pakistan Academy of Sciences. It was due to their personal efforts that Pakistan became member of the IMU in sixties.

Pakistan Mathematical Society had also submitted application for Pakistan's membership of the IMU but the application by the PAS was accepted mainly due to the personal interest and commitment of Professor Dr. Atta-ur-Rahaman, President, Pakistan Academy of Sciences, to pay the annual subscription for the membership through PAS.

The International Commission on Mathematical Instruction (ICMI)

The International Commission on Mathematical Instruction (ICMI) was founded at the fourth ICM Meeting held in Rome in 1908. It was initiated to support a then widespread interest among mathematicians in school education. The Rome Congress adopted a resolution, submitted on the initiative of the American mathematician, teacher-educator, and historian of mathematics David Eugene Smith (1860–1944), creating an international commission with the initial mandate of making 'a comparative study on the methods and plans of teaching mathematics at secondary schools'. The birth of the ICMI was not modest. The great German mathematician Felix Klein (1849–1925), for whom mathematics education was a deep and career-long interest, became its founding president, while the first secretary-general was Henri Fehr (1870–1954) from Switzerland, one of the co-founders of L'EM.

A small but significant place for mathematics education was reserved at the ICM's, in a section initially called 'Teaching and History of Mathematics'. It was in this section at the 1900 ICM in Paris that David Hilbert gave the talk 'Mathematical problems' that shaped much of twentieth-century mathematics. As the history of mathematics later acquired a section of its own, the name changed to 'Teaching and Popularization of Mathematics' and most recently to 'Mathematics Education and Popularization of Mathematics', reflects the broader nature of the field.

Over time, as the mission of general education expanded (more advanced knowledge, for more people), the needs and complexity of mathematics education grew as well, leading to the development in due course of corresponding communities of both practicing professionals and scholars. The small venue afforded by the one section of the ICM's became inadequate for the communication of problems and ideas in this expanded domain. This led ICMI president Hans Freudenthal to organize the first International Congress on Mathematical Education (ICME) in Lyon in 1969. These ICME's have since

evolved into quadrennial congresses in years divisible by four, the next one to be ICME-10 in Copenhagen, 4th to 11th July 2004, where some 3,500 participants, including a significant number of mathematicians attended. From Pakistan, the Pakistan Mathematical Society was invited to attend the congress.

Structurally, the ICMI now exists as a member of the IMU family. After interruptions of activity around the two world wars, the ICMI was reconstituted in 1952, at a time when the international mathematical community was being reorganized, as an official commission of the International Mathematical Union. This still defines the formal position of the ICMI today. Thus, the Terms of Reference of the ICMI are established by the General Assembly of the IMU, which is also responsible for the election of the Executive Committee, the administrative leadership of the ICMI. Furthermore, the vast majority of the funding of the ICMI comes from the IMU. As is the case for the IMU, members of the ICMI are not individuals, but countries—namely, those countries which are members of the IMU and other countries specifically co-opted to the commission. There are currently eighty-one members of the ICMI, sixty-five of which are also members of the IMU. Each member of the ICMI appoints a representative and may create a sub commission for the ICMI.

The ICMI's objective today could be globally described as offering researchers, practitioners, curriculum designers, decision makers, and others interested in mathematical education a forum for promoting reflection, collaboration, exchange and dissemination of ideas, and information on all aspects of the theory and practice of contemporary mathematical education, as seen from an international perspective. ICMI has program series of ICMI Studies, a most successful set of activities launched in the mid-1980s.

ICMI has currently collaborated with UNESCO on an international exhibition on the theme 'Why Mathematics?' aimed particularly at young people, their parents, and their teachers. This exhibition was launched at the 4th European Congress of Mathematics in Stockholm in June 2004.

Initiated in the 1990s a 'Solidarity Program in Mathematics Education' based on a twofold approach. The central to this program of international assistance was the establishment of a fund to provide financial support for the approved projects. The Solidarity Fund is based on voluntary donations from individuals and organizations and is kept separate from the ICMI's general funds.

The first component of this program is the ICMI Solidarity Fund, established by the ICMI in 1992 at the suggestion of its president, Miguel de Guzmán. The overall objective of the Solidarity Fund is to increase, in a variety of ways, the commitment and involvement of mathematics educators around the world in order to help the progress of mathematics education in those parts of the world where there is a need for it that justifies international assistance and where the economic and socio-political contexts do not permit adequate and autonomous development. This initiative thus aims to foster solidarity in mathematics education between well-defined quarters in developed and less-

developed countries. Particular emphasis is placed on projects that enable the activation of a self-sustainable infrastructure within mathematics education in the region, country, or province at issue.

The second component of the ICMI Solidarity Program aims at having a balanced representation from all over the world among the presenters and the general participants in activities such as the ICMI Studies or the ICME's. In support of this goal, the ICMI has implemented, starting with ICME-8 in 1996, a general policy of forming for each ICME an ICME Solidarity Fund established by setting aside 10 percent of the registration fees in order to provide grants to congress delegates from no affluent countries. At each of the recent ICME's, some 100 to 150 participants from economically challenged regions of the world have thus been given financial support to facilitate their presence at the congress. In the same spirit, efforts are made by the organizers of each ICMI Study to find financial resources so as to facilitate the participation in the Study Conference of a substantial delegation from no affluent countries.

Pakistan has joined International Commission on Mathematics Instruction. It was due to the personal efforts of Professor Dr Qaiser Mushtaq that the Pakistan Mathematical Society (PMS) has won affiliation with the ICMI. PMS was invited to participate in ICME-10 at Copenhagen Denmark but Pakistani delegation could not attend due to scarcity of time for visa formalities.

Center for Advanced Studies in Mathematics LUMS

A Center for Advanced Studies in Mathematics (CASM) is being established in Lahore University of Management Sciences starting from 1st July 2004. The center is aimed to provide a best resource center, an excellent learning place for mathematics, increase interaction with industry and trade, promote interaction of mathematicians with computer and social scientists. The Centre will be housed in the Department of Mathematics at Lahore University of Management Sciences (LUMS) and will have close collaboration with all other departments of LUMS. The center will be headed by a Scientific Director to be appointed by the Vice Chancellor.

The establishment of Center is yet another effort to promote and develop research in different areas of mathematics at LUMS in particular and in Pakistan in general. We hope that this center achieves its aims and objectives and become a national resource for promotion of quality research in mathematics.

CASM to host Summer Workshop in Mathematics

To promote the applications of mathematics CASM has been making concerted efforts to highlight some of the following salient features in the workshop being convened at LUMS, Lahore, on 16th to 20th August 2004.

- Exposure to modern research trends in different areas of Mathematics.
- Training to use On-line libraries, Internet and other Literature Sources.

- Introduction to Research Methodologies and Fun of writing Mathematics.

Registered Ph.D. students of any university/institute or who has recently completed Ph.D. can attend the workshop. Those who are interested in attending the workshop should send their curriculum vitae along with recommendation letters from their supervisors to the Scientific Director, Centre for Advanced Studies in Mathematics, LUMS, 54792-Lahore (e-mail:kashifi@lums.edu.pk) preferably by 6th August 2004. Registration is free and participation is only by invitation. The Center will arrange shared accommodation for the participants from outside Lahore.

Pak Mathematician's Contribution to Semigroup Theory

Three generations of Pakistani mathematicians have played a major role in the evolution of the theory of semigroups at the international level.

This was stated by Professor Dr.S.M. Yusuf, former Dean and department Chairman, Quaid-i-Azam University, at a national seminar on the evolution of semigroup theory in Pakistan organized by the Pakistan Mathematical Society on 18th June 2004.

The term semigroup first appeared in French mathematical literature in 1904, said Professor Yusuf, who was the first to introduce the algebraic theory of semigroups and its generalizations in Pakistan. The very first paper on semigroups was published in America in 1905, and the theory really began in 1928.

Professor Yusuf, who modernized mathematics in Pakistan and was awarded Tamgh-i-Imtiaz, has just celebrated his fiftieth year in the teaching Professor. He said that local mathematicians and researchers have helped to develop the different branches of Semigroup Theory, contributing enormously to global research in this field.

Professor Yusuf was educated at Cambridge University (UK) and Tennessee University (US) and is the author of several standard textbooks on mathematics at F.Sc. and B.Sc. level.

He cited the example of his former M.Phil. student, Professor Dr.Qaiser Mushtaq, current Chairman of the Mathematics Department of QAU, who developed a related theory, viz., Left Almost Semigroup Theory.

The latter's M.Phil. and Ph.D. students, notably Professor Dr.Sarwar Kamran and Dr. Qamar Iqbal, in turn have been contributing to further research in this field.

Their research papers are a landmark in the development of Left Almost Semigroup Theory and their research has had a great influence in the recent development of the theory, said Professor Yusuf. Their work, he continued, are being cited internationally in

research papers and books written by mathematicians who are considered authorities on the subject.

The applications of these theories are important in several branches of mathematics. They also have significant applications in the theory of formal languages, automata theory, and also in the solving of practical problems, for example in improving the efficiency of railway systems.

Semigroup theory is the only branch of mathematics that has such a tremendous contribution by three generations of local mathematicians, said Professor Yusuf.

The seminar, the third such seminar organized by the Pakistan Mathematical Society, was attended by scholars and students from various tertiary institutions.

Mathematics and Social Values

No discipline, other than philosophy, has contributed as much to our civilization in finding ways out of predicaments and in predicting future crises. This was stated by Professor Dr. Qaiser Mushtaq, President of the Pakistan Mathematical Society, while speaking on "Mathematics and Social Values" at PMS' 4th National Seminar on mathematics held on 24th June 2004.

Philosophy is a hypothetical interpretation of the unknown or of the inexactly known, said Professor Mushtaq, who is also chairman of the Mathematics Department, Quaid-i-Azam University.

Philosophy includes five fields of study and discourse: logic, esthetics, ethics, politics, and metaphysics. Two of the most important are logic and ethics. Logic, explained Professor Mushtaq, is the study of the ideal method in thought and research and includes observation, hypothesis and experiment, analysis and synthesis. Logic is the essence of mathematics.

Ethics on the other hand is the study of ideal conduct, the knowledge of good and bad, and the knowledge of the wisdom of life. An action is good not because it has good results, or because it is wise, but because it is done in obedience to an inner sense of duty.

While logic is an analysis of the concepts used in reasoning, the task of ethics is to unify character and conduct.

The way we think is to a large extent dependent on the way our economic, political, and social life is ordered, said Professor Mushtaq. The values we practice are not the values we profess, and the difference between the two is wide indeed. Selfishness exists because it pays, he said. Unselfishness, on the other hand, is most unrewarding. That is why we put ourselves before society whenever circumstances permit.

The values, which we practice, are not really moral values for they relate solely to the satisfaction of ends, which are directly opposed to the social good, said Professor Mushtaq.

The value of leaving off till tomorrow if possible is most dangerous in the education sector, said Professor Mushtaq. There is no short cut to learning and there should be none. It is therefore important that one works continually with resolution towards learning. Unfortunately, many short cuts exist and they are generally accepted as something normal. A mathematically trained mind, which should know the difference between 'cause and effect', should not be practicing it in fact.

The value that the end of social intercourse is to acquire useful contacts, is being widely followed in our educational institutions, opined Professor Mushtaq. It is generating 'powerful mafias' and 'immense academic injustice'.

To put justification of our academic failures on others has become a value. This is responsible for deteriorating academic standards because then we do not feel that our failures are due to our own shortcomings and they need to be overcome. Because this is largely the case, we come to be, in the process, largely uncritical both of what we say and what we do, and we often cannot distinguish between rationalizing correct reasoning.

A mathematically trained mind can recognize patterns, exactnesses, rationalities, irrationalities, causes and effects, realities and imaginaries, proportionalities, symmetries and changes. Mathematics germinates in minds, objectivity and analyticity. A person, who is well versed in mathematics, can easily differentiate between 'mind' and 'matter', that is, emotions and reasons. If one has these abilities, the corrupt social values would not have been in practice.

The result of practicing this value is not only deterioration in our academic culture, but an increasing inability to tackle the problems Pakistan is faced with, Professor Mushtaq concluded.

The seminar, the fourth such seminar organized by the Pakistan Mathematical Society, was chaired by eminent Professor Dr B.A.Saleemi and attended by scholars and students from various tertiary institutions in the twin cities.

List of Mathematics Journals at G-C.University, Lahore

The following list of mathematics journals subscribed by the library of the Government College University Lahore (GCUL) through the courtesy of a former faculty member of GCUL, Mr. Mohammad Shamir, now Associate Professor at Government Post Graduate College, Asghar Mall Rawalpindi.

1. Journal of Natural Sciences & Mathematics
2. Rodovi Mathematicki, Bosnia
3. Aannales Universitis Scientiarum

4. Studia Scientiarum Mathematicarum Hungarica
5. Glasgow Mathematical Journal
6. Publications De L'Institut Mathematique
7. Bulletin of the Iranian Mathematical Society
8. The Journal of the Indian Academy of Mathematics
9. Research Bulletin of the Punjab University
10. Memoirs of the Faculty of Science
11. Hiroshima Mathematical Journal
12. Journal of the Mathematical Society of Japan
13. Tokyo Journal of Mathematics
14. Publication of the Research Institute for Mathematical Sciences
15. Kobe Journal of Mathematics
16. Osaka Journal of Mathematics
17. Journal of Mathematics of Kyoto University
18. Bulletin of Fukuoka University of Education
19. Nagoya Mathematical Journal
20. New Zealand Journal of Mathematics
21. Mathematical Chronicle
22. The Nepali Mathematical Science Report
23. Hamdard Islamicus
24. The Punjab University Journal of Mathematics
25. Studii si Cercetari Stiintifice
26. Commentatiines Mathematicae
27. Istanbul University Fen Fakultesi Matematik Dergisi
28. Bulletin of the London Mathematical Society
29. The Quarterly Journal of Mathematics
30. Notices of the American Mathematical Society
31. Michigan Mathematical Journal
32. Pacific Journal of Mathematics
33. The Rocky Mountain Journal of Mathematics
34. Indiana University Mathematics Journal
35. Bulletin of American Mathematical Society
36. Annals of Mathematics
37. Glasnik Mathematicki

5th International Pure Mathematics Conference 2004
on
Algebra, Analysis, Geometry, and Mechanics
20 - 22 August 2004
Best Western Hotel, Islamabad, Pakistan

Research is a global activity. Most of our researchers do not get sufficient opportunities on regular basis whereby they can interact with researchers from mathematically developed countries. Thus they work virtually in isolation. By and large their research, therefore, remains out of stream. Realizing these needs, the Pakistan Mathematical Society has committed itself to organize international conferences regularly every year. It has thus organized 1st, 2nd, 3rd and 4th Pure Mathematics Conferences in 2000, 2001, 2002 and 2003. The 5th International Pure Mathematics Conference is a sequel to these conferences. It serves also the purpose of introducing Pakistani culture and society to the foreign delegates for improving better relationship between Pakistani mathematicians and their counterparts in other countries.

Special Advisor to the Prime Minister of Pakistan, Dr Ishfaq Ahmad *S.I., N.I., H.I*, has very kindly consented to be the Chief Guest at the Inaugural Session on 20th August 2004.

Invited Speakers

Professor B.K. Dass (India)
Professor W.A. Dudek (Poland)
Professor M. Hasanov (Turkey)
Professor P.K.Jain (India)
Professor S. T.Rizvi (USA)
Professor K.P. Shum (HK)
Professor S.N. Sidki (Brazil)
Professor N. Stevanovic (Serbia and Montenegro)
Professor P.V.Protic (Serbia and Montenegro)
Professor G. Wenbin (China)

The 5th International Pure Mathematics Conference 2004 will be held in Islamabad from 20th to 22n August 2004. Accommodation and local hospitality will be provided to the participants.

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Registration is open and is available in both paper based and on line formats. For on line registration and details, please visit the conference website at the:

URL: http://www.pmc.org.pk
E-mail: info@pmc.org.pk