

An International Conference on Mathematical Research and Education - in memory of Dr. Demissu Gemedu, ICMRE 2009

Department of Mathematics, Faculty of Science, AAU

Organizing Committee

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International

1. Dr. Shiferaw Berhanu, Temple University, U.S.A.
2. Dr. Ahmed Mohammed, Ball State University, U.S.A.
3. Dr. Rikard Bogvad, Stockholm University, Sweden

1 Introduction and main objectives

The planned international conference will bring together mathematicians from Ethiopia, Kenya, Tanzania, Uganda, Europe and the U.S. and it will also be attended by a large group of graduate students currently enrolled in the Masters Program in the Mathematics Department of the Addis Ababa University. It will take place over a four day period, July 3 to July 6, 2009, with each day consisting of morning and afternoon sessions. In the morning, several mathematicians will give talks on their current research. These talks are designed to indicate to students and young mathematicians possible areas in which they can pursue their doctoral studies under the supervision of the speakers. The researchers who will give the talks have expressed their willingness to mentor graduate students in Ethiopia.

The afternoon sessions will serve as a forum for discussing the ways that the mathematicians residing in Europe and the U.S. can help the Department in Addis Ababa in training graduate students. In the U.S. alone, there are many Ethiopian mathematicians with Ph.D.'s who hold academic employment in various institutions. An electronic forum has already been set up where over twenty five mathematicians from Ethiopia, Europe, and the U.S. are exchanging views so as to identify the main issues the conference can address.

2 Tribute to Demissu Gemedu

This International Conference was initiated by The Department of Mathematics of Addis Ababa University, by Former students of Dr. Demissu Gemedu who reside in the U.S., Europe and Ethiopia, and by the Mathematical Association of Ethiopia whose founders were Dr. Demissu and his colleagues. Dr. Demissu Gemedu was a great scholar and a great citizen of Ethiopia. He dedicated his life to the growth of mathematical education and

research in Ethiopia. He made lasting contributions to Ethiopian Education in general, and to the Addis Ababa University, in particular. Therefore, the planned "International Conference on Mathematical Research and Education" will recognize Dr. Demissu Gemedas life-long service and contributions.

2.1 Capacity Building

Currently Ethiopia is pursuing policies aimed at expanding graduate programs in the natural sciences and engineering where mathematics plays a vital role. Such a conference is indispensable if we are to realize these goals set by the nation. This international conference will present a rare opportunity to explore the various ways in which the participants can make contributions on a sustained basis to promote mathematical teaching and research in Ethiopia.

Expertise of speakers

1. Dr. Shiferaw Berhanu is a professor of mathematics at Temple University in Philadelphia, U.S.A. His primary area of interest is the theory of over determined systems of first order partial differential equations. He has researched on the properties of solutions of complex vector fields and has published about 35 papers. Recently he has been working on applications of CR manifolds to first order, fully nonlinear partial differential equations. Berhanu, Cordaro and Hounie have written a book entitled *An introduction to involutive structures* which has recently been published by Cambridge University Press.
2. Dr. Rikard Bogvad is an associate professor of mathematics at Stockholm University in Sweden. His research interests are centered around algebraic applications of differential operators to algebraic geometry and, both in positive characteristics and over the complex numbers. Recently he has been working on asymptotic analysis of zeroes of analytic functions (a set of points is a very simple variety) through formal analysis of differential equations and difference equations.
3. Dr. Abdulkadir Hassen is a professor of mathematics at Rowan University, Glassboro, NJ, U.S.A. His primary research interest is analytic number theory. Recently he has been engaged in a generalization of the Riemann Zeta function via integral representation. He is also active in

advising undergraduate research in mathematics. Some of his undergraduate students are engaged in translating Euler's work in Number Theory from Latin. He is also interested in the use of technology in the teaching and learning of mathematics and has coauthored a Mathematics manual for use in calculus courses. This manual is published by the W.H. Freeman Publishing Co.

4. Dr. Ahmed Mohammed is an associate professor of Mathematical Sciences at Ball State University, USA. His area of interest is in Partial differential Equations and the main focus of his recent research has been the study of qualitative properties of solutions to elliptic nonlinear partial differential equations. He is the author or co-author of about twenty three papers in referred journals related to both linear and nonlinear equations.
5. Dr. Giovanni Porru is a professor of mathematics at Cagliari University in Italy. His area of interest is in partial differential equations with a focus on maximum principles, boundary blow-up problems, and optimization of functionals involving rearrangements. He has published about 55 papers.
6. Dr. Akalu Tefera is an associate professor of mathematics at Grand Valley State University in Grand Rapids, USA. His research interest is in algorithmic theorem proving and combinatorics. He has published several papers in the area of enumerative combinatorics. He has also written several computer algebra packages that have useful applications in mathematics. One notable example is the Maple program MultInt, which is the first general implementation of the continuous version of the (multi) Wilf-Zeilberger method for symbolic evaluation of multiple integrals with application to the computer generated proof of integral identities of hyper-exponential type. Currently he is working on finding computer generated proofs for recently conjectured identities.
7. Jan-Erik Bjork is a professor at Stockholm University, Sweden.
His PhD studies took place at Stanford and Cambridge Universities, UK and received his PhD in 1968 at Stockholm University, Sweden. In 1974 he was appointed as a professor at Stockholm University.
Bjork has published two books: *Rings of Differential Operators in 1979* and *Algebra:D-Modules in 1989*.

8. V.I. Burenkov is a professor of mathematics at Cardiff University, UK. In recognition of his significant contribution to mathematical research and education, he was made an Honorary Professor at two universities: the Russian-Armenian State University, Yerevan, Armenia and Eurasian National University, Astana, Kazakhstan.

He received his PhD in 1967 and DSc (Doctor of Sciences) in 1982 in Moscow. Since 1984 he has been a professor at the Department of Differential Equations and Functional Analysis of the People's Friendship University (Moscow). Since 1996 he has been serving as a professor Chair in Mathematics at the School of Mathematics of Cardiff University. He has published more than 100 papers and several books, given over 150 invited lectures in more than 20 countries. He was the guest of honor at the Congress of African Mathematicians held in Nairobi in 1990. He has supervised the Ph.D. dissertations of 15 students.

Currently, Prof. Burenkov is the Head of the INTAS project "**Function spaces and applications to partial differential equations**" involving 11 research groups from 11 countries. He is also serving as the vice president of the "**International Society for Analysis, its Applications and Computation (ISAAC)**".

The areas of his research interest are: pure mathematics (real and functional analysis, partial differential equations, integral equations, ill-posed problems) and applied mathematics (mathematical modeling in radiolocation, geophysics, acoustics, pattern recognition, and quantum mechanics).

Place and Time

The workshop will take place in the Addis Ababa University, Ethiopia, July 3–6, 2009.

Daily schedule

Each day will begin with a morning session consisting of three fifty minute lectures. This will be followed by an afternoon session that will focus on how to engage mathematicians, particularly those of Ethiopian descent, in mentoring graduate students in Ethiopia.

Invitees from Europe and the U.S. and titles of talks

1. V.I. Burenkov, Cardiff University, UK: Title of talk
- **Spectral Stability of Elliptic Differential Operators**
2. Tilahun Abebaw, Stockholm University, Sweden: Title of talk
- **D-modules on hyperplane configurations**
3. Shiferaw Berhanu, Temple University, U.S.A: Title of talk I - **On analyticity of solutions of systems of first order partial differential equations, part I;**

Talk II: **On analyticity of solutions of systems of first order partial differential equations, part II.**

4. Rikard Bogvad, Stockholm University, Sweden: Title of talk I -
Potential theory: an introduction;

Talk II - **How the number of ways a product can be bracketed with parentheses influences the location of the zeroes of certain algebraic functions depending on a parameter**

5. Abdulkadir Hassen, Rowan University, U.S.A.: Title of talk - **A generalization of the Riemann zeta function via integral representation**
6. Ahmed Mohammed, Ball State University, U.S.A.: Title of talk I -
Ground state solutions to elliptic semi-linear equations - Background and some results from the literature.

Talk II - **Recent results on Ground State Solutions to mixed type elliptic semi-linear equations.**

7. Rolf Kallstram, University of Gavle, Sweden: Title of talk - **Rational points on curves**
8. Marco Gaviano, Cagliari University, Italy: Title of talk - **An optimal method for global optimization**

9. Giovanni Porru, Cagliari University, Italy: Title of talk - **Optimization problems in a class of rearrangements**
10. Akalu Tefera, Grand Valley State University, U.S.A.: Title of talk - **Computerized Proofs Techniques**
11. Yohannes Tadesse, Stockholm University, Sweden: Title of talk I-**Demissu Gameda's dissertation on the multiplicative structure of resolutions of monomial ideals**
Title of talk II - **Multiplier ideals of monomial ideals.**
12. Jan-Erik Bjork, Stockholm University, Sweden: Title of talk - **D-modules**
13. Achenef Tesfahun, Norwegian University of Science and Technology, Norway: Title of talk -**Global Well-posedness of the 1D Dirac-Klein-Gordon system in Sobolev spaces of negative index.**
14. Minassie Ephrem: Title of talk -**On K - theory of graph C^* -algebras**

Invitees from various regions in Ethiopia and titles of talk

1. Ermias Dagne, Addis Ababa University, Ethiopia: Title of talk - **Demissu's pivotal role in the Development of Amharic Scientific Terms**
2. Abebe Getahun, Addis Ababa University, Ethiopia: Title of talk - **Dr.Demissu's contribution on the development of *Shirka Woreda***
3. Berhanu Guta, Addis Ababa University, Ethiopia: Title of talk -**TBA**
4. Semu Mitiku, Addis Ababa University, Ethiopia: Title of talk - **Multi-level programming**
5. Taddese Abdi, Addis Ababa University, Ethiopia: Title of talk -**TBA**

6. Tefera Worku, Addis Ababa University, Ethiopia: Title of talk -**How big the dimension of homogeneous polynomials of degree m in n variables is.**
7. Tsegaye Gedif, Addis Ababa University, Ethiopia: Title of talk -**Analysis of two-operator Boundary-Domain Integral Equations**
8. Berhanu Bekele, Addis Ababa University, Ethiopia: Title of talk -**Linear time-varying systems**
9. Abraham Nigussie, Addis Ababa University, Ethiopia: Title of talk -**Iterated norms in Nikolskii-Besov type spaces with generalized smoothness**
10. Habtu Zegeye, Bahirdar University, Ethiopia: Title of talk -**Approximate fixed point sequences and convergence theorem for Lipschitz pseudocontractive maps”**

Themes of the Conference

- Pure Mathematics
- Applied Mathematics
- Mathematics Education
- Mathematical Modeling and Related Topics

Send your Abstracts to

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