Orthogonal Polynomials and Special Functions

SIAM Activity Group on Orthogonal Polynomials and Special Functions

★ ★ ★ ★   Newsletter   ★ ★ ★ ★

Contents

From the Editor

This is the first issue of the newsletter done without the collaboration of Renato Alvarez-Nodarse. He left his duty as co-editor of the newsletter when he got new obligations in the Spanish Mathematical Society. Good luck, Renato. So, please, excuse any mistake that you could find in this issue. Thank you for your comprehension.

The chairperson of our activity group, Dan Lozier, asked me to direct your attention to the upcoming SIAM Annual Meeting, to be held in Montreal, June 16 - 20, 2003. Our Program Committee is planning for a major address and several minisymposia at this meeting. See the Forthcoming Meetings and Conferences section of this Newsletter for further information.

October 15, 2002

Rafael J. Yáñez
(ryanez@ugr.es)

Message from the Chair

In this message I will report on two recent developments that should be of interest to all members of our activity group.

Possible Establishment of Szego Prize

In a previous message from the chair, I mentioned the idea of establishing a SIAM OPSF Prize. This idea was discussed last year at the activity group membership meeting during the OPSFA conference in Rome, and the name Szego Prize was suggested. The discussion centered around the idea of a cash prize to be awarded to a young researcher every third year. The feeling I got at the time was that the members in attendance were enthusiastically in favor of trying to establish such a prize and to name it for Gabor

Szego.

I brought the subject up with Jim Crowley, Executive Director of SIAM, at the SIAM Annual Meeting. I had discussed it with him previously but this was a more in-depth consideration of how it could be established. It turns out that SIAM's support for prizes is generous. But the activity group membership also has a financial role to play, if we want to have a cash award. Specifically, it is our responsibility to raise a sufficient amount of money, call it an endowment, such that the earnings from the endowment would cover any cash award for the prize recipient. The administration of the endowment would be done at SIAM, which relieves us of any necessity to handle money. As for earnings, SIAM imputes an investment return from its own investment program that is added into the endowment. In addition, SIAM will cover the full cost of travel, lodging, registration and incidental expenses for the recipient to attend the SIAM Annual Meeting and receive the award.

Prizes, some with and some without cash awards, are presented by several other SIAM activity groups. The criteria for these prizes can be seen at http://www.siam.org/prizes/. Our next step, if the membership wishes to proceed, will be to develop similar criteria for consideration by the appropriate SIAM governing bodies.

I am assuming the activity group membership wishes its leadership to go ahead with this plan. If there are dissenting opinions, please let me know by October 1.

Finally, I expect to form a committee to develop a proposal and fund-raising strategy. The activity group officers will take the lead in this work. Voluteers to assist the committee will be very welcome. If you are interested, please contact me.

Possible SIAM OPSFA Meeting in Washington in 2004

Personally, I would very much like to have a SIAM-sponsored international conference on OP and SF during my remaining time as Chair of the activity group. This has never been done in our activity group, and in fact ours is the only activity group in SIAM that has never had its own conference. Here again there are real advantages to working with SIAM. The conference staff at SIAM will handle almost all necessities such as negotiating with a hotel, advertising and mailing, and collecting and expending money. Our responsibility is limited, chiefly, to putting together the scientific program.

Rather than compete with the already existing and very successful OPSFA series, I would offer to hold a SIAM-sponsored OPSFA conference in 2004 (I am unaware if another institution has already offer to sponsor OPSFA in 2004). This would be in Washington, DC, in June 2004.

There is another interesting opportunity with regard to the proposed conference. A colleague of mine at NIST, Ron Boisvert, is chair of a mathematical software working group (WG2.5) that is part of IFIP (International Federation of Information Processing Societies). His group holds an annual business meeting which is usually accompanied by an informal open workshop with 35-50 attendees. WG2.5 has expressed interest in holding its meeting in Washington in conjunction with the OPSFA conference, with the theme for its technical program centered on software for special functions and applications. The mutual interaction might well be beneficial to both groups.

Ron and I discussed these possible plans with Jim Crowley at the SIAM meeting. Jim was very supportive. He encouraged us to go ahead and take the issue to our respective memberships. I hope you will send me your thoughts, whether for or against or somewhere in between.

Daniel Lozier
(dlozier@nist.gov)

Forthcoming Meetings and Conferences

1. Special session on "Special Functions and q-Series". Baltimore, January 15-18, 2003

Meeting and book dedicated to Mizan Rahman.

The American Mathematical Society has approved a special session on "Special Functions and q-Series" for the Annual Meeting of the Society to be held in Baltimore during January 15-18, 2003. This special session is organised by Mourad E. H. Ismail, University of South Florida. See http://www.ams.org/amsmtgs/2074_intro.html for more information.

We take the opportunity of having such a session to honour Mizan Rahman and dedicate the talks to him in recognition of his many contributions to the subject. The list of confirmed speakers includes, amongst others: Richard Askey, George Andrews, Bruce Berndt, George Gasper, Mourad Ismail, Erik Koelink, Steve Milne, Michael Schlosser, Dennis Stanton, Sergei Suslov, and of course, Mizan Rahman.

The book "*Theory and Applications of Special Functions. A volume dedicated to Mizan Rahman*" will appear in the series *Developments in Mathematics*, edited by Krishnaswami Alladi and a companion series to the *Ramanujan Journal*. Mourad E.H. Ismail and Erik Koelink will act as editors for this book dedicated to Mizan Rahman. Research papers will be refereed with high standards comparable to those of the Ramanujan Journal, Constructive Approximation or Journal of Approximation Theory. We invite contributions to the volume and those interested please submit the paper no later than 2/2/2003, and send it to:

> Denise Marks, Department of Mathematics,
> University of South Florida,
> 4202 E. Fowler Ave., PHY 114
> Tampa, FL 33620-5700, USA

If you prefer a particular one of the editors to handle your paper, please indicate your preference at the time of submission.

We hope that both the meeting and the book will reflect Mizan Rahman's contributions to and influence on mathematics and mathematicians.

Mourad Ismail and Erik Koelink

> Erik Koelink
> (h.t.koelink@its.tudelft.nl)

2. International Conference on Advances In Constructive Approximation, Vanderbilt University, Nashville, Tennessee, May 14-17, 2003

This conference will mark the official opening of the Special Year in Approximation Theory (May 2003 - May 2004) at Vanderbilt University, organized by the newly founded Center for Constructive Approximation. Our aim is to bring together researchers from diverse areas of approximation theory, to stimulate international collaboration, and to promote interaction and the exchange of ideas. We welcome the participation of pure and applied mathematicians working in approximation theory from around the world. We especially encourage young mathematicians and graduate students to attend. We are currently applying for funding to be able to partially support the expenses of graduate students and other mathematicians without support. We expect that the conference will be funded by the NSF and by the Department of Mathematics of Vanderbilt University.

We invite you to contribute a talk or a poster in any area of approximation theory and its applications. The duration of contributed talks will depend on the number of participants and will be announced at a later date. The deadline to submit an abstract is April 23, 2003. We expect to publish a proceedings containing survey papers by the invited speakers and refereed contributed papers. To learn more about the conference, please click here. If you would like to attend the conference, please register. If you register before April 30, 2003, you will be paying a discounted registration fee.

Organizing Committee:

- Akram Aldroubi
- Doug Hardin
- Mike Neamtu
- Edward Saff

Plenary Speakers:

- John J. Benedetto (Univ. of Maryland, USA)
- Len Bos (Univ. of Calgary, Canada)
- Kirill Kopotun (Univ. of Manitoba, Canada)
- Kenneth McLaughlin (Univ. N. Carolina, Chapel Hill, USA)
- Gerlind Plonka (Gerhart-Mercator Univ., Germany)
- Mihai Putinar (Univ. of California, Santa Barbara, USA)

- Vilmos Totik (Univ. South Florida, USA, and Univ. of Szeged, Hungary)

- Joseph D. Ward (Texas A & M Univ., College Station, USA)

Scope of the symposium: Our aim is to bring together researchers from diverse areas of approximation theory, to stimulate international collaboration, and to promote interaction and the exchange of ideas. We welcome the participation of both pure and applied mathematicians working in approximation theory from all around the world. We especially encourage young mathematicians and graduate students to attend.

Contributed Talks: We invite you to contribute a talk or a poster in any area of approximation theory and its applications. The duration of contributed talks will depend on the number of participants and will be announced later. The deadline for submitting an abstract is April 23, 2003.

Conference Topics: The topics of interest include, but are not limited to:

- Abstract approximation

- Approximation with constraints

- Classical approximation

- Complex approximation

- Extremal problems

- Interpolation and smoothing

- Curves and surfaces

- Multiresolution analysis

- Nonlinear approximationO

- Orthogonal polynomials

- Radial basis functions

- Shift-invariant spaces

- Splines

- Subdivision and refinable functions

- Image and signal processing

- Wavelets

Registration: If you are interested in attending this meeting, please register at your earliest convenience. If you register online by April 30, 2003, you will save money by paying less in registration fee. If you are not ready to register at this time, please email us if you want to receive announcements about this conference and you have not received any previous such announcements.

Proceedings: We expect to publish a proceedings containing survey papers by the invited speakers and refereed contributed papers. The proceedings is included in the registration and every participant will receive a copy.

Financial Support: We applied for funding to be able to partially support the expenses of graduate students and other mathematicians without support.

Contact Information:

E-mail: advances@math.vanderbilt.edu (all e-mail concerning the conference should be sent here)

Phone: (615) 343-4107

Fax: (615) 343-0215

http://www.math.vanderbilt.edu/~advances

Conference Address:

Advances in Constructive Approximation 2003
Center for Constructive Approximation
Department of Mathematics
Vanderbilt University
1326 Stevenson Center
Nashville, TN 37240, USA

Rafael J. Yáñez
(ryanez@ugr.es)

3. 2003 SIAM Annual Meeting, Montreal, Quebec, Canada, June 16-20, 2003

SIAM and the 2003 Organizing Committee invite you to attend our annual meeting in Montreal, Quebec, Canada, June 16-20, 2003, at the Fairmont, Queen Elizabeth Hotel. Hotel information can be found:

Fairmont, The Queen Elizabeth
900 Rene Levesque Blvd. W.
Montreal, Quebec
Canada
H3B 4A5
Telephone: (514) 861-3511
Fax: (514) 954-2256
Email: queenelizabethhotel@fairmont.com

Organizing Committee:

- Canadian Chair: Jacques Bélair, Université de Montréal

- U.S. Chair: Ilse Ipsen, North Carolina State University

- Anne Bourlioux, Université de Montréal

- Russel Caflisch, University of California, Los Angeles

- Carlos Castillo-Chavez, Cornell University

- Carolyn Cho, Physiome Sciences

- Claudé Crepeau, McGill University

- Martin Golubitsky, University of Houston

- Norden E. Huang, NASA Goddard Space Flight Center

- William Newman, University of California, Los Angeles

- George Papanicolaou, Stanford University

- Robert Russell, Simon Fraser University

- Sam Shen, University of Alberta

Conference themes:

- Fluid Dynamics

- Environment

- Mathematical Biology

- Nanosciences

- Quantum Computing

- Numerical Methods

Deadline dates:

- Minisymposium proposals: January 3, 2003

- Minisymposium abstracts and contributed abstracts: January 23, 2003

- Contributed papers in lecture or poster format: January 23, 2003

- Audio-Visual Requirements:April 21, 2003

How to participate:

You are invited to contribute a presentation for this conference in one of the following formats.

Minisymposia:

A minisymposium consists of four 25-minute presentations, with an additional five minutes for discussion after each presentation. Prospective minisymposium organizers are asked to submit a proposal consisting of a title, a description (not to exceed 100 words), and a list of speakers and titles of their presentations using the Conference Management System available at: http://www.siam.org/meetings/an03/part.htm

It is recommended that the minisymposium organizer make the first presentation. Each minisymposium speaker should submit a 75-word abstract. The Organizing Committee will referee contributed minisymposia. The number of minisymposia may be limited to retain an acceptable level of parallelism in the conference sessions.

For further minisymposium organizer and participant information, please visit: http://www.siam.org/meetings/resources/
       miniguid.htm

Deadline for submission of minisymposium proposals is January 3, 2003.

Contributed presentations in lecture or poster format:

Contributed presentations in lecture or poster format are invited in all areas consistent with the conference themes. A lecture format involves a 15-minute oral presentation with an additional 5 minutes for discussion. A poster format involves the use of visual aids such as 8-1/2" x 11" sheets for mounting on a 4' x 6' poster board. A poster session is two hours long. Each contributor, either for a lecture or a poster, must submit a title and a brief abstract not to exceed 75 words.

Please submit contributed presentations in lecture or poster format using the Conference Management System available at: http://www.siam.org/meetings/an03/part.htm

Deadline for submission of contributed abstracts is January 23, 2003.

Electronic submission:

Please use SIAM's Conference Management System to submit minisymposium proposals, minisymposium abstracts and contributed abstracts in lecture or poster format.

Registration:

Registration information will be posted in the web page of the conference as information becomes available.

General information:

General information will be posted in the web page of the conference as information becomes available.

Program:

The program schedule and updates will be posted in the web page of the conference as information becomes available.

For further information see:
http://www.siam.org/meetings/an03/index.htm

Note from the editor: At the invitation of SIAM, our activity group will have a major presence at this meet-

ing. This will consist of a semi-plenary address and up to four minisymposia. The semi-plenary speaker will be Nico Temme. His address will be in parallel with just one other presentation. Plans for the minisymposia are currently under development in our program committee, headed by Paco Marcellan. Watch for details in future releases of OPSF-Net and the next issue of this Newsletter.

<div align="right">Rafael J. Yáñez
(ryanez@ugr.es)</div>

4. Special Session on Constructive Approximation Theory. Seville (Spain), June 18-21, 2003

The American Mathematical Society has approved a special session on "Constructive Approximation Theory" for the First Joint International Meeting between the American Mathematical Society (AMS) and the Real Sociedad Matemática Española (RSME).

This session is organized by Antonio Duran, University of Sevilla (duran@us.es) and Edward B. Saff, Vanderbilt University (esaff@math.vanderbilt.edu).

The topics to be considered are Aproximation Theory, Orthogonal Polynomials and related topics.

Further information will appear in the WWW

http://www.us.es/rsme-ams/

and also in the AMS WWW page

http://www.ams.org/amsmtgs/2083_program.html

<div align="right">Renato Álvarez-Nodarse
(ran@us.es)</div>

5. Fourth ISAAC Congress 2003. York University, Toronto (Canada), August 11-16, 2003

The ISAAC (International Society for Analysis, its Applications and Computation) board, the local organizing committee and the Department of Mathematics and Statistics at York University, are pleased to announce that the fourth ISAAC Congress will be held at York University in Toronto, Canada, from August 11, 2003 to August 16, 2003.

Plenary Speakers:

- Richard A. Askey (University of Wisconsin-Madison) (Special Functions and Orthogonal Polynomials)

- Vladimir Georgiev (University of Pisa, Italy) (Hyperbolic PDE)

- Peter C. Greiner (University of Toronto) (PDE, Geometric Analysis)

- Peter D. Lax (Courant Institute of Mathematical Sciences) (Functional Analysis, PDE, Computing)

- M. Zuhair Nashed (University of Delaware) (Wavelets, Inverse Problems, Numerical Functional Analysis)

- Louis Nirenberg (Courant Institute of Mathematical Sciences) (PDE, Differential Geometry, Complex Analysis)

- Luigi Rodino (University of Torino, Italy) (PDE, Microlocal Analysis)

- Elias M. Stein (Princeton University) (Harmonic Analysis, PDE)

- Gilbert Strang (MIT) (Wavelets, Applied Mathematics, Numerical Analysis)

- James S. Walker (University of Wisconsin-Eau Claire) (Time-Frequency Analysis, Wavelets, Fourier Analysis)

Special Sessions and organizers:

- Reproducing Kernels and Related Topics. D. Alpay (Ben-Gurion University, Israel), J. A. Ball (Virginia Polytechnic Institute and State University, U.S.A.), T. Ohsawa (Nagoya University, Japan), S. Saitoh (Gunma University, Japan).

- Pseudo-Differential Operators. Ryuichi Ashino (Osaka Kyoiku University, Japan), Paolo Boggiatto (University of Torino, Italy), M. W. Wong (York University, Canada).

- Banach Spaces of Analytic Functions. Rauno Aulaskari (University of Joensuu, Finland), Jari Taskinen (University of Joensuu, Finland).

- Value Distributions of Complex Functions, Generalizations and Related Topics. Greigor Barsegian (Armenian Academy of Sciences, Armenia), Alain Escassut (Université Blaise Pascal, Clermont-Ferrand, France).

- Complex and Functional Analytic Methods in Partial Differential Equations. Heinrich Begehr (Freie Universität Berlin, Germany), Alberto Cialdea (Università della Basilicata, Italy).

- Homogenization. Alain Bourgeat (Centre National de la Recherche Scientifique, France), Robert P. Gilbert (University of Delaware, U.S.A.), Alex Panchenko (Pennsylvania State University, U.S.A.).

- Function Spaces and Applications. Victor Burenkov (Cardiff University, U.K.).

- Harmonic Analysis and Its Applications to Partial Differential Equations. Galia Dafni (Concordia University, Canada), Andrea Fraser (Dalhousie University, Canada).

- Applied Complex Analysis. Dao-Qing Dai (Zhongshan University, P. R. China), Wei Lin (Zhongshan University, P. R. China).

- Inverse Problems. Robert P. Gilbert (University of Delaware, U.S.A.), Armand Wirgin (LMA/CNRS, Marseille, France), Yongzhi Xu (University of Tennessee-Chattanooga, U.S.A.).

- Numerical Partial Differential Equations. Steve Hou (Iowa State University, U.S.A.).

- Applied/Computational Analysis. Huaxiong Huang (York University, Canada).

- Stochastic Analysis and Applications. Nils Jacob (University of Wales at Swansea, U.K.).

- Fractional Calculus and Applications. Anatoly Kilbas (Belarusian State University, Belarus), Stefan Samko (Universidade do Algarve, Portugal).

- Boundary Value Problems and Integral Equations. P. A. Krutitskii (Moscow State University, Russia).

- Control Theory of Partial Differential Equations. Irena Lasiecka (University of Virginia, U.S.A.), Walter Littman (University of Minnesota, U.S.A.), Roberto Triggiani (University of Virginia, U.S.A.).

- Orthogonal Polynomials and Special Functions. Martin Muldoon (York University, Canada).

- Interaction of Inverse Problems and Image Analysis. M. Zuhair Nashed (University of Delaware, U.S.A.).

- Sampling Theory in Signal Processing. M. Zuhair Nashed (University of Delaware, U.S.A.).

- Hyperbolic Problems: Degeneracies, Nonlinearities and Global Existence. Michael Reissig (Technische Universität Bergakademie Freiberg, Germany), D. Del Santo (Università di Trieste, Italy).

- Clifford Analysis, Applications and Related Topics. John Ryan (University of Arkansas, U.S.A.), Wolfgang Sprössig (Freiberg University for Mining and Technology, Germany).

- Toeplitz-Like Structures in Analysis and Applied Sciences. Bernd Silbermann (Technical University of Chemnitz-Zwickau, Germany), Nikolai Vasilevski (Cinvestav del I.P.N., Mexico).

- Nonlinear Analysis and Applications. S. P. Singh (Memorial University of Newfoundland, Canada).

- Complex Analysis and Potential Theory. Promarz M. Tamrazoo (Academy of Sciences, Ukraine).

- Operator Algebras. Keith Taylor (University of Saskatchewan, Canada).

- Analysis on the Heisenberg Group. Jingzhi Tie (University of Georgia, U.S.A.), M. W. Wong (York University, Canada).

- Time-Frequency Analysis, Wavelets and Applications. James S. Walker (University of Wisconsin-Eau Claire, U.S.A.).

Local Information: York University is located in the Northwest part of the city of Toronto, about a 20-minute drive from Pearson International Airport. It is about 1.5 km S of highway 407/ETR ("Express Toll Route") and about one hour from downtown Toronto by public transportation.

Program: Registration will take place from 3:30 p.m. to 6:30 p.m. on Sunday, August 10, 2003 and will continue throughout the congress. The program will begin early morning on Monday, August 11, 2003 and end sometime in the afternoon on Saturday, August 16, 2003. An excursion to Niagara Falls is scheduled for Wednesday, August 13, 2003. There will be a banquet from 7:00 p.m. to 10:00 p.m. on Thursday, August 14, 2003. The ISAAC board will meet from 7:00 p.m. to 9:00 p.m. on Tuesday, August 12, 2003.

Registration Fee:

- CDN$350.00 (7% GST included) before March 31, 2003

- CDN$400.00 (7% GST included) before May 31, 2003

- CDN$450.00 (7% GST included) after May 31, 2003

(On October 8, 2002, US$1=CDN$1.59580 and 1 Euro=CDN$1.56903.)

Registration fees are mandatory for all participants unless waived by the local organizing committee in writing. To confirm pre-registration, cheques or money orders for the registration fee (in Canadian $ only) and payable to York University should be sent to Professor M. W. Wong, Department of Mathematics and Statistics, York University, 4700 Keele Street, Toronto, Ontario M3J 1P3, Canada as soon as possible in order to assist in the planning of the congress.

Congress Proceedings: The proceedings of the congress will be published by Kluwer Academic publishers provided that a bulk purchase is guaranteed. If you intend to purchase a copy, it is helpful if you can inform the local organizing committee well in advance. The price can then be negotiated with the publisher accordingly.

Financial Support: The funds for the congress are extremely limited. While it is expected that some financial support may be available for some participants, you are urged to seek funds from your home institutions and/or government grants in support of the participation in the congress. Applications for financial support should be addressed to Professor M. W. Wong.

Local Organizing Committee:

- Q. Cheng

- H. Huang

- M. E. Muldoon

- S. Scull

- M. Walker

- M. W. Wong

Correspondence on the scientific program should be directed to Man Wah Wong: `mwwong@mathstat.yorku.ca`

The 3rd ISAAC Congress was held in Berlin in 2001.

This series should not be confused with the meetings sponsored by ISSAC (International Symposium on Symbolic and Algebraic Computation). Nor should we confuse this ISAAC with another one: International Society for Augmentative and Alternative Communication.

For further information see:
`http://www.math.yorku.ca/isaac03/`

Martin Muldoon
(`muldoon@yorku.ca`)

6. Seventh International Symposium on Orthogonal Polynomials, Special Functions and Applications Copenhagen (Denmark), August 18-22, 2003

At the Sixth International Symposium on Orthogonal Polynomials, Special Functions and Applications (The 6th OPSFA) in Rome, June 18-22, 2001, it was discussed when and where the next meeting should take place. Teams from Holland and Denmark were both willing to host a meeting in 2003 (see the item below). It was left to those teams to find an agreement.

Such an agreement has now been reached to the effect that the Copenhagen team promises to arrange the *Seventh International Symposium on Orthogonal Polynomials, Special Functions and Applications (The 7th OPSFA)* in Copenhagen, August 18-22, 2003.

The plan is that the meeting will take place at the Department of Mathematics of the University of Copenhagen.

The conference will be a continuation of the series of International Conferences with the meetings of Sevilla (1997), Patras (1999) and Rome/Ostia (2001) as the immediate predecessors.

The invited speakers are:

- Professor Richard Askey, University of Wisconsin, Madison, USA

- Professor Percy Deift, New York University, USA

- Professor Antonio J. Duran, University of Sevilla, Spain

- Professor Uffe Haagerup, University of Southern Denmark, Denmark

- Professor Mourad Ismail, University of South Florida, USA

- Professor Erik Koelink, Technical University Delft, the Netherlands

- Professor Masatoshi Noumi, Kobe University, Japan

- Professor Franz Peherstorfer, University of Linz, Austria

- Professor Simon Ruijsenaars, Center for Mathematics and Computer Science, the Netherlands

- Professor Jan Felipe van Diejen, University of Talca, Chile

- Professor Yuan Xu, University of Oregon, USA

The international scientific committee is

- Antonio J. Duran, University of Sevilla, Spain

- Mourad E. H. Ismail, University of South Florida, USA

- Erik Koelink, Technical University Delft, the Netherlands

- Paolo Emilio Ricci, University of Rome "La Sapienza", Italy

- Vilmos Totik, Bolyai Institute, Hungary and University of South Florida, USA

- Christian Berg, University of Copenhagen

- Henrik L. Pedersen, University of Copenhagen

The local organizing committee will be Christian Berg (berg@math.ku.dk), Jacob Stordal Christiansen (stordal@math.ku.dk) and Henrik L. Pedersen (henrikp@math.ku.dk)

You are welcome to spread the information about the conference to potentially interested colleagues. (Those who have participated in the meetings in Rome and/or Patras should be on our email list.)

There will be opportunities to present shorter talks in parallel sessions.

We are also pleased to inform you about a special grant from the Danish Ministry of Science, Technology and Development with the purpose of supporting the participation of young scientists. We shall soon announce this possibility on the conference home page, with precise conditions for application. Deadline for application: February 1st 2003.

Information about registration, accommodation and abstracts of submitted talks will be given in a second circular in the beginning of 2003.

You may contact us via email: opsfa@math.ku.dk

Information about the meeting will be made available at the homepage

http://www.math.ku.dk/conf/opsfa2003/

Christian Berg
(berg@math.ku.dk)

Future Planning

There are plans to organize a summer school on Orthogonal Polynomials and Special Functions in Portugal in July 2003 (July). (Contact person: Amilcar Branquinho). This is in the series Inzell, 2001 (OP-SF NET 8.3, Topic #3), and Leuven, 2002 (OP-SF NET 8.4, Topic #4). The coordinator of the three summer schools is Erik Koelink (koelink@dutiaw4.twi.tudelft.nl). These summer schools are part of our Activity Group's scientific program. The scientific committee consists of Erik Koelink, Rupert Lasser, Amilcar Branquinho, Paco Marcellan and Walter Van Assche.

Dan Lozier (see Message from the Chair) suggests a SIAM-sponsored meeting in Orthogonal Polynomials and Special Functions to be held in Washington, DC in June 2004.

Books and Journals

Book Announcements

1. **Generalized Associated Legendre Functions and Their Applications.** By N. Virchenko and I. Fedotova. World Scientific, River Edge, NJ, 2000. $48.00. xx+195 pp., hardcover. ISBN 981-02-4357-7.

A review by Mourad Ismail appears in SIAM Review, Vol 44, no 2, June 2002, pp 288-291; see http://epubs.siam.org/sam-bin/dbq/article/97090

Ismail gives a succinct introduction to the functions of the title as essentially special Jacobi functions and goes on to give a mainly positive review of the book.

Extract from information from the publisher: http://www.wspc.com/books/mathematics/4463.html

"The various types of special functions have become essential tools for scientists and engineers. One of the important classes of special functions is of the hypergeometric type. It includes all classical hypergeometric functions such as the well-known Gaussian hypergeometric functions, the Bessel, Macdonald, Legendre, Whittaker, Kummer, Tricomi and Wright functions, the generalized hypergeometric functions rFq, Meijer's G-function, Fox's H-function, etc."

"Application of the new special functions allows one to increase considerably the number of problems whose solutions are found in a closed form, to examine these solutions, and to investigate the relationships between different classes of the special functions."

"This book deals with the theory and applications of generalized associated Legendre functions of the first and the second kind, $P_k^{m,n}(z)$ and $Q_k^{m,n}(z)$, which are important representatives of the hypergeometric functions. They occur as generalizations of classical Legendre functions of the first and the second kind respectively. The authors use various methods of contour integration to obtain important properties of the generalized associated Legendre functions as their series representations, asymptotic formulas in a neighborhood of singular points, zero properties, connection with Jacobi functions, Bessel functions, elliptic integrals and incomplete beta functions."

"The book also presents the theory of factorization and composition structure of integral operators associated with the generalized associated Legendre function, the fractional integro-differential properties of the functions $P_k^{m,n}(z)$ and $Q_k^{m,n}(z)$, the classes of dual and triple integral equations associated with the function $P_{-1/2+it}^{m,n}(\cosh \alpha)$ etc.

Contents:

- A General Information on Legendre Functions

- The Generalized Associated Legendre Functions

- The Series Representations of the Generalized Associated Legendre FunctionsR

- Relations Between Different Solutions of the Generalized Legendre Equation.

- Wronskians of Linearly Independent Solutions

- Relations Between Contiguous Generalized Associated Legendre Functions

- Differential Operators Generated by the Generalized Associated Legendre Equation

- Asymptotic Formulas for the Generalized Associated Legendre Functions in a Neighborhood of Singular Points

- Asymptotic Representations of the Generalized Associated Legendre Functions as the Functions of Parameters

- Integral Representations of the Generalized Associated Legendre Functions of the First Kind

- Integral Representations of the Generalized Associated Legendre Functions of the Second Kind

- Zeros of the Generalized Associated Legendre Functions

- Connection of the Generalized Associated Legendre Functions with the Jacobi Functions and other topics

<div align="right">

Martin Muldoon
(muldoon@yorku.ca)

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2. Series Associated with the Zeta and Related Functions. By H. M. Srivastava and Junesang Choi. Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001. $127.00. ix+388 pp., hardcover. ISBN 0-7923-7054-6.

A review by Jet Wimp appears in SIAM Review, Vol 44, no 2, June 2002, pp 305=308; see http://epubs.siam.org/sam-bin/dbq/article/97090

Wimp begins: "The title of this book doesn't describe its contents. It is really a meditation on the gamma function and some related functions. Readers may have the feeling of being transported back in time to find themselves negotiating a minor but scenic tributary of 19th century mathematics. This is fine with me. ..." He gives a favourable account of the first two Chapters but has misgivings about the long third one "Series Involving Zeta Functions". But the review has to be read completely to be savoured.

The following extracts are form the publishers wed site: http://www.wkap.nl/prod/b/0-7923-7054-6

"Designed as a reference work and also as a graduate-level textbook, this volume presents an up-to-date and comprehensive account of the theories and applications of the various methods and techniques used in dealing with problems involving closed-form evaluations of (and representations of the Riemann Zeta function at positive integer arguments as) numerous families of series associated with the Riemann Zeta function, the Hurwitz Zeta function, and their extensions and generalizations such as Lerch's transcendent (or the Hurwitz-Lerch Zeta function)."

"Audience: This book is intended for professional mathematicians and graduate students in mathematical sciences (both pure and applied)."

Contents

- Preface.

- Acknowledgements.

1. Introduction and Preliminaries.

2. The Zeta and Related Functions.

3. Series Involving Zeta Functions.

4. Evaluations and Series Representations.

5. Determinants of the Laplacians.

6. Miscellaneous Results.

- Bibliography.

- Author Index.

- Subject Index.

<div align="right">

Martin Muldoon
(muldoon@yorku.ca)

</div>

3. A.M. Krall, Hilbert space, boundary value problems and orthogonal Polynomials, Birkhauser, 2002. 368 pages, Hardcover, Euro 128.-, Swiss Francs 192.-; ISBN 3-7643-6701-6

From: http://www.birkhauser.ch/books/math/6701.htm

This monograph consists of three parts: the abstract theory of Hilbert spaces, leading up to the spectral theory of unbounded self-adjoined operators; the application to linear Hamiltonian systems, giving the details of the spectral resolution; and further applications such as to orthogonal polynomials and Sobolev differential operators.

Written in textbook style this up-to-date volume is geared towards graduate and postgraduate students and researchers interested in boundary value problems of linear differential equations or in orthogonal polynomials.

<div align="right">

Tom H. Koornwinder
(thk@science.uva.nl)

</div>

OP-SF preprints

In this section we will include information on some recent preprints related to Orthogonal Polynomials and Special Functions that were recently posted or cross-listed to one of the subcategories of the xxx archives. See:

- http://front.math.ucdavis.edu/math.CA
- http://front.math.ucdavis.edu/math.CO
- http://front.math.ucdavis.edu/math.QA
- http://xxx.lanl.gov/archive/solv-int

——————— · · · ———————

1. math.CA/0205045

    Title: Parabolic Cylinder Functions: Examples of Error Bounds For Asymptotic Expansions

    Authors: Raimundas Vidunas (1 and 2), Nico M. Temme (2) ((1) CWI, Amsterdam, (2) Korteweg-de Vries Instituut voor Wiskunde, Amsterdam)

    Comments: 22 pages, 4 figures

    Subj-class: Classical Analysis

    MSC-class: 41A60 (Primary) 33C15, 33C10, 30E15, 33F05, 65D20 (Secondary)

2. math.CA/0205064 Title: Two-point Taylor Expansions of Analytic Functions

    Authors: Jose L. Lopez (1), Nico M. Temme (2) ((1) Universidad Publica de Navarra, Pamplona, (2) CWI, Amsterdam)

    Comments: 14 pages, 10 figures

    Subj-class: Classical Analysis

    MSC-class: 30B10 (Primary) 30E20, 40A30 (Secondary)

3. math.CA/0205065

    Title: Large Parameter Cases of the Gauss Hypergeometric Function

    Authors: Nico M. Temme (CWI, Amsterdam)

    Comments: 21 pages, 4 figures

    Subj-class: Classical Analysis

    MSC-class: 33C05 (Primary) 33C45, 41A60, 30C15, 41A10 (Secondary)

4. math.CA/0205094

    Title: Differential properties of matrix orthogonal polynomials

    Authors: M. J. Cantero, L. Moral, L. Velazquez

    Comments: 23 pages

    Subj-class: Classical Analysis

    MSC-class: 42C05

5. math.CA/0205108

    Title: Karlsson-Minton type hypergeometric functions on the root system C_n

    Authors: Hjalmar Rosengren

    Comments: 13 pages

    Subj-class: Classical Analysis

    MSC-class: 33D67

6. math.CA/0205175

    Title: Asymptotic zero behavior of Laguerre polynomials with negative parameter

    Authors: A.B.J. Kuijlaars, K.T-R McLaughlin

    Comments: 28 pages, 10 figures

    Subj-class: Classical Analysis; Complex Variables

    MSC-class: 30E15; 33C45

7. math.CA/0206089

    Title: Heat kernel expansions on the integers

    Authors: F. Alberto Grunbaum, Plamen Iliev

    Comments: 18 pages

    Subj-class: Classical Analysis

8. math.CA/0206177

    Title: Multiple-integral representations of very-well-poised hypergeometric series

    Authors: Wadim Zudilin (Moscow)

    Comments: 8 pages, AmSTeX; a 2-page summary to appear in Uspekhi Mat. Nauk [Russian Math. Surveys] 57:4 (2002)

    Subj-class: Classical Analysis; Number Theory

    MSC-class: Primary 33C20, 33C60; Secondary 11J82

9. math.CA/0206199

    Title: Beta-integrals and finite orthogonal systems of Wilson polynomials

    Authors: Neretin Yurii (Moscow)

    Comments: 18 pages

    Subj-class: Classical Analysis

    MSC-class: 33C05. 33C20, 33C45, 44A15

10. math.CA/0206200

    Title: Asymptotic expansions for ratios of products of gamma functions

    Authors: Wolfgang Bühring

    Comments: 6 pages

    Subj-class: Classical Analysis

    MSC-class: 33B15; 33C20

11. math.CA/0206032

Title: Inversion of bilateral basic hypergeometric series

Authors: Michael Schlosser

Comments: AMS-LaTeX, 23 pages

Subj-class: Classical Analysis; Combinatorics

MSC-class: 33D15; 15A09

12. math.CA/0206285

Title: Algebraic Solutions of the Lamé Equation, Revisited

Authors: Robert S. Maier (University of Arizona)

Comments: 20 pages, elsart document class, no figures

Subj-class: Classical Analysis; Mathematical Physics

MSC-class: 34A20 (Primary) 33E10,14H05 (Secondary)

13. math.CA/0207046

Title: Elliptic hypergeometric series on root systems

Authors: Hjalmar Rosengren

Comments: 27 pages

Subj-class: Classical Analysis; Quantum Algebra

MSC-class: 33D67; 11F50

14. math.CA/0207122

Title: Symmetric Functions and B_N-invariant Spherical Harmonics

Authors: Charles F. Dunkl

Comments: 22 pages

Subj-class: Classical Analysis; Combinatorics

MSC-class: 33C55, 05E05, 81Q05, 82D25

15. math.CA/0208244

Title: Polynomial Solutions to Difference Equations Connected to Painleve' II-VI

Authors: Gert Almkvist

Comments: AMS-LaTeX, 9 pages, no figures

Subj-class: Classical Analysis

MSC-class: 39A10

16. math.CA/0209329

Title: Zeros of orthogonal polynomials on the real line

Authors: Sergey A. Denisov, Barry Simon

Comments: (preliminary version)

Categories: CA Classical Analysis (MP Mathematical Physics)

MSC-Class: 42C05, 47B36

17. math.CA/0209272

Title: Proof of a summation formula for an $\bar{A}_n$ basic hypergeometric series conjectured by Warnaar

Author: Christian Krattenthaler (Universität Wien)

Comments: 9 pages, AmS-LaTeX

Categories: CA Classical Analysis

MSC-Class: 33D67 (Primary) 05A19 05A30 (Secondary)

18. math.CA/0210137

Title: A positive radial product formula for the Dunkl kernel

Author: Margit Rösler

Categories: CA Classical Analysis (RT Representation Theory)

Math Subject Class: 33C52 (Primary); 44A35, 35L15 (Secondary)

Comments: 25 pages

19. math.CO/0205031

Title: A limiting form of the q-Dixon$_4\phi_3$ summation and related partition identities

Authors: Krishnaswami Alladi, Alexander Berkovich

Comments: 12 pages

Subj-class: Combinatorics; Number Theory; Quantum Algebra

MSC-class: 05A17, 05A19, 11P83, 11P81, 33D15, 33D20

20. math.CO/0205055

Title: A new four parameter q-series identity and its partition implications

Authors: Krishnaswami Alladi, George E. Andrews, Alexander Berkovich

Comments: 24 pages, reference added, minor stylistic changes, typos eliminated

Subj-class: Combinatorics; Number Theory; Quantum Algebra

MSC-class: 05A15, 05A17, 05A19, 11B65, 33D15

21. math.CO/0207030

Title: The Bailey lemma and Kostka polynomials

Authors: S. Ole Warnaar

Comments: 39 pages, AMS-LaTeX

Subj-class: Combinatorics; Quantum Algebra

MSC-class: Primary 05A19, 05E05, 11B65; Secondary 17B65, 33D15

22. math.CO/0207175

Title: My Favorite Integer Sequences

Authors: N.J.A. Sloane

Comments: 27 pages, 13 figures

Subj-class: Combinatorics; Number Theory

MSC-class: 05-01, 11-01, 40-01

Journal-ref: Sequences and their Applications (Proceedings of SETA '98), C. Ding, T. Helleseth and H. Niederreiter (editors), Springer-Verlag, London, 1999, pp. 103-130

23. math.CO/0207192

Title: 321-polygon-avoiding permutations and Chebyshev polynomials

Authors: T. Mansour, Z. Stankova

Comments: 11 pages, 1 figure

Subj-class: Combinatorics

24. math.CO/0208046

Title: Permutations Which Avoid 1243 and 2143, Continued Fractions, and Chebyshev Polynomials

Authors: Eric S. Egge, Toufik Mansour

Comments: 32 pages, 4 figures

Subj-class: Combinatorics

MSC-class: 05A05; 05A15

25. math.QA/0205051

Title: Set-theoretical solutions to the Yang-Baxter Relation from factorization of matrix polynomials and θ-functions

Authors: Alexander Odesskii

Comments: 9 pages, to appear in Moscow Math Journal

Subj-class: Quantum Algebra

26. math.QA/0205116

Title: Even powers of divisors and elliptic zeta values

Authors: Giovanni Felder (MSRI and ETH Zurich), Alexander Varchenko (UNC Chapel Hill)

Comments: 5 pages

Subj-class: Quantum Algebra; Number Theory

MSC-class: 33E30;11F11

27. math.QA/0205178

Title: On coefficients of Yablonskii-Vorob'ev polynomial

Authors: Masanobu Kaneko, Hiroyuki Ochiai

Comments: 11 pages, no figures

Subj-class: Quantum Algebra; Combinatorics

MSC-class: 34M55 (Primary) 33E17 (Secondary)

28. math.QA/0205313

Title: Special functions, KZ type equations and Representation theory

Authors: Alexander Varchenko

Comments: Notes of a course given at MIT during the spring of 2002. Notes taken by: J. Scott: Lectures 1-3, M. Grana: Lectures 4-6, I. Mencattini: Lectures 7-12. 99 pages

Subj-class: Quantum Algebra; Mathematical Physics

29. math.QA/0206029

Title: Analysis of Zeta Functions, Multiple Zeta Values, and Related Integrals

Authors: David H. Wohl

Comments: 9 pages

Subj-class: Quantum Algebra; Number Theory

MSC-class: 11M38;14H70;32G34;11G55

30. math.QA/0206030

Title: Selberg Integrals, Multiple Zeta Values and Feynman Diagrams

Authors: David H. Wohl

Comments: 10 pages

Subj-class: Quantum Algebra; Number Theory

MSC-class: 11M38;14H70;32G34;11G55

31. math.QA/0206171

Title: A variation of Euler's approach to values of the Riemann zeta function

Authors: Masanobu Kaneko, Nobushige Kurokawa, Masato Wakayama

Comments: 13 pages

Subj-class: Quantum Algebra; Number Theory

MSC-class: 11M06 (primary), 11B65 (secondary)

32. math.QA/0206029

Title: Analysis of Zeta Functions, Multiple Zeta Values, and Related Integrals

Authors: David H. Wohl

Comments: 9 pages

Subj-class: Quantum Algebra; Number Theory

MSC-class: 11M38;14H70;32G34;11G55

33. math.QA/0206030

Title: Selberg Integrals, Multiple Zeta Values and Feynman Diagrams

Authors: David H. Wohl

Comments: 10 pages

Subj-class: Quantum Algebra; Number Theory

MSC-class: 11M38;14H70;32G34;11G55

34. math.QA/0207159

Title: Fusion and exchange matrices for quantized sl(2) and associated q-special functions

Authors: T.H. Koornwinder, N. Touhami

Comments: 39 pages

Subj-class: Quantum Algebra; Classical Analysis

MSC-class: 17B37, 33D80

35. math.QA/0209181

Title: Generalized Coherent States for Classical Orthogonal Polynomials

Authors: V. V. Borzov, E. V. Damaskinsky

Comments: LaTeX2e, 8 pages, no figures, submitted to Proc. of conference "Day of Difraction 2002" Sankt-Petersburg, Russia, 2002

Categories: QA Quantum Algebra (CA Classical Analysis)

36. math.NT/0205003

Title: A strengthening of the Nyman-Beurling criterion for the Riemann hypothesis, 2

Authors: Luis Baez-Duarte

Comments: 9 pages

Subj-class: Number Theory

37. math.NT/0206176

Title: Arithmetic of linear forms involving odd zeta values

Authors: Wadim Zudilin (Moscow)

Comments: 42 pages, LaTeX; slight modification of the absract

Subj-class: Number Theory; Classical Analysis

MSC-class: Primary 11J72, 11J82; Secondary 33C60

38. math.NT/0206178

Title: A third-order Apery-like recursion for $\zeta(5)$

Authors: Wadim Zudilin (Moscow)

Comments: 5 pages, AmSTeX; to appear in Mat. Zametki [Math. Notes] 72 (2002)

Subj-class: Number Theory; Classical Analysis

MSC-class: Primary 11Y60; Secondary 11J20, 33C20

39. math.NT/0206179

Title: Diophantine problems for q-zeta values

Authors: Wadim Zudilin (Moscow)

Comments: 6 pages, AmSTeX; to appear in Mat. Zametki [Math. Notes] 72 (2002)

Subj-class: Number Theory; Classical Analysis

MSC-class: Primary 11J72, 11J82; Secondary 33D15

40. math.NT/0206018

Title: Integral moments of L-functions

Authors: J. B. Conrey, D. W. Farmer, J. P. Keating, M. O. Rubinstein, N. C. Snaith

Comments: 58 pages, AMSTeX

Subj-class: Number Theory; Mathematical Physics

MSC-class: 11M26; 15A52

41. math.NT/0206022

Title: On modular forms arising from a differential equation of hypergeometric type

Authors: Masanobu Kaneko, Masao Koike

Comments: 19 pages, no figures

Subj-class: Number Theory

MSC-class: 11F11 (Primary) 33C05, 33C45 (Secondary)

42. math.NT/0206024

Title: Quasimodular solutions of a differential equation of hypergeometric type

Authors: Masanobu Kaneko, Masao Koike

Comments: 6 pages, no figures

Subj-class: Number Theory

MSC-class: 11F11 (Primary) 33C05, 33C45 (Secondary)

43. math.NT/0207236

Title: Random matrix theory and discrete moments of the Riemann zeta function

Authors: C.P. Hughes

Subj-class: Number Theory

44. math.NT/0207237

Title: A general statement of the functional equation for the Riemann zeta-function

Authors: Luis Baez-Duarte

Comments: 3 pages

Subj-class: Number Theory; Complex Variables

45. math.NT/0208220

Title: Linear statistics for zeros of Riemann's zeta function

Authors: C.P. Hughes, Z. Rudnick

Subj-class: Number Theory

46. nlin.SI/0205010

Title: Painlevé expressions for LOE, LSE and interpolating ensembles

Authors: Jinho Baik

Comments: LaTex, 41 pages, 2 Figures

Subj-class: Exactly Solvable and Integrable Systems; Probability Theory

47. nlin.SI/0205019

Title: On a q-Difference Painlevé III Equation: I. Derivations, Symmetry and Riccati Type Solutions

Authors: Kenji Kajiwara (1), Kinji Kimura (2) ((1) Graduate School of Mathematics, Kyushu University, (2) Department of Mathematics, Kobe University)

Subj-class: Exactly Solvable and Integrable Systems

48. nlin.SI/0205063

Title: On a q-Difference Painlevé III Equation: II. Rational Solutions

Authors: Kenji Kajiwara

Comments: 18 pages

Subj-class: Exactly Solvable and Integrable Systems

49. nlin.SI/0206009

Title: Computing Riemann Theta Functions

Authors: Bernard Deconinck, Matthias Heil, Alexander Bobenko, Mark van Hoeij, Markus Schmies

Comments: 28 pages, 22 figures. Version with high resolution figures available. Some typos corrected in web addresses

Subj-class: Exactly Solvable and Integrable Systems; Classical Analysis

50. nlin.SI/0208002

Title: Differential systems for biorthogonal polynomials appearing in 2-matrix models and the associated Riemann-Hilbert problem

Authors: M. Bertola, B. Eynard, J. Harnad

Comments: v1:41 pages, 5 figures, 1 table. v2: Typos and other errors corrected. v3: Some conceptual changes, added appendix and two figures v4: Minor typographical changes, improved figures. v5: updated version (submitted) 49 pages, 7 figures, 1 table

Subj-class: Exactly Solvable and Integrable Systems; Classical Analysis; Mathematical Physics

51. nlin.SI/0207036

Title: The Riemann-Hilbert Problem for the Bi-Orthogonal Polynomials

Authors: Andrei A. Kapaev (PDMI, St Petersburg)

Comments: LaTeX, 15 pages. In compare to the original version, the derivation of the matrix wave function is simplified; some comments and references are added

Subj-class: Exactly Solvable and Integrable Systems

52. math-ph/0205013

Title: Hyperspherical Functions and Linear Representations of the Lorentz Group

Author: V.V. Varlamov

Comments: 20 pages, LaTeX2e

Subj-class: Mathematical Physics

MSC-class: 15A66, 22E70, 33C70

53. math-ph/0206023

Title: Sum Rules and the Szego Condition for Orthogonal Polynomials on the Real Line

Authors: Barry Simon, Andrej Zlatos

Subj-class: Mathematical Physics

MSC-class: 47B36; 42C05

54. math-ph/0206044

Title: 6j-symbols for symmetric representations of SO(n) as the double series

Authors: S. Alisauskas

Comments: 21 page

Subj-class: Mathematical Physics; Representation Theory

MSC-class: 33C45; 81R05

55. math-ph/0207005

Title: Painlevé transcendent evaluations of finite system density matrices for 1d impenetrable Bosons

Authors: P.J. Forrester, N.E. Frankel, T.M. Garoni, N.S. Witte

Comments: AMSLatex, requires Commun. Math. Phys. style macros

Subj-class: Mathematical Physics

MSC-class: 81Hxx;15A52;33E17

56. math-ph/0207019

Title: Cyclic identities involving Jacobi elliptic functions - II

Authors: Avinash Khare, Arul Lakshminarayan, Uday Sukhatme

Comments: 34 pages, no figures

Subj-class: Mathematical Physics; Exactly Solvable and Integrable Systems

57. math-ph/0207022

Title: Exactly solvable periodic Darboux q-chains

Authors: Ivan A. Dynnikov, Sergey V. Smirnov

Comments: 3 pages, LaTeX, to appear in Russian Math. Surveys

Subj-class: Mathematical Physics

MSC-class: 39A12 (Primary) 39A70 (Secondary)

58. math-ph/0207028

Title: Associated Lame and various other new classes of elliptic potentials from sl(2,R) and related orthogonal polynomials

Authors: Asish Ganguly

Comments: 34 pages, 4 tables, 1 figure, PDF file

Subj-class: Mathematical Physics

Journal-ref: Published in J. Math. Phys. 43,1980(2002)

59. math-ph/0207044

Title: Random matrix theory and the zeros of zeta'(s)

Authors: Francesco Mezzadri

Comments: 17 pages, 4 figures

Subj-class: Mathematical Physics; Number Theory

MSC-class: 15A52; 11M99

60. math-ph/0208006

Title: Factorization method for functional equations of second order

Authors: Anatol Odzijewicz, Tomasz Golinski

Comments: 19 pages

Subj-class: Mathematical Physics

61. math-ph/0210018

Title: Integrable Dynamics of Charges Related to Bilinear Hypergeometric Equation

Author: Igor Loutsenko

Comments: 20 pages, Latex

Categories: MP Mathematical Physics (DS Dynamical Systems)

MSC-Class: 33C,33E,35Q35,35Q40,35Q51,35Q53,37J

62. math.CV/0205134

Title: On the polynomial moment problem

Authors: F. Pakovich

Comments: 8 pages, 2 figure

Subj-class: Complex Variables; Dynamical Systems

MSC-class: 30E99; 34C99

63. math.CV/0206162

Title: Equilibrium distribution of zeros of random polynomials

Authors: Bernard Shiffman, Steve Zelditch

Comments: 19 pages, 3 figures

Subj-class: Complex Variables; Probability Theory

64. math.CV/0206172

Title: Study of a functional equation associated to the Kummer's equation of the trilogarithm. Applications

Authors: Pirio luc (Universite Paris VI)

Subj-class: Complex Variables; Differential Geometry

MSC-class: 39B(primary), 53A60 (secondary)

65. math.GM/0205183

Title: On the real zeroes of the Hurwitz zeta-function and Bernoulli polynomials

Authors: A.P. Veselov, J.P. Ward

Comments: 9 pages, 2 figures

Subj-class: General Mathematics; Classical Analysis

MSC-class: 33E20, 12D10

66. math.SP/0205319

Title: Spectral estimates for periodic Jacobi matrices

Authors: E.Korotyaev, I.V.Krasovsky

Comments: 18 pages, 5 figures

Subj-class: Spectral Theory; Mathematical Physics

67. math.SP/0209064

Title: On Bochner-Krall orthogonal polynomial systems

Authors: T. Bergkvist, H. Rullgard, B. Shapiro (Stockholm)

Comments: AMSTEX, 5 pages, no pictures

Categories: SP Spectral Theory (CA Classical Analysis)

68. math.FA/0205332

Title: Asymptotic behavior of polynomials orthonormal on a homogeneous set

Authors: Franz Peherstorfer, Peter Yuditskii

Subj-class: Functional Analysis; Numerical Analysis

69. math.FA/0205333

Title: Orthogonal polynomials in several variables. I

Authors: T. Constantinescu

Comments: 17 pages

Subj-class: Functional Analysis

70. math.DG/0206021

Title: Hyperbolic constant mean curvature one surfaces: Spinor representation and trinoids in hypergeometric functions

Authors: Alexander I. Bobenko, Tatyana V. Pavlyukevich, Boris A. Springborn

Comments: 29 pages, 9 figures. v2: figures of cmc1-surfaces corrected

Subj-class: Differential Geometry

MSC-class: 53A10; 53C42

71. math.RT/0206275

Title: Segal-Bargmann transform on Hermitian symmetric spaces and Orthogonal Polynomials

Authors: Mark Davidson, Gestur Olafsson, Genkai Zhang

Subj-class: Representation Theory; Functional Analysis

72. hep-th/0206172

Title: Polynomials Associated with Equilibrium Positions in Calogero-Moser Systems

Authors: S. Odake, R. Sasaki

Comments: 41 pages. A Mathematica file "poly.m" is attached

Subj-class: High Energy Physics - Theory; Mathematical Physics

73. math.KT/0207222

Title: Functional equations of higher logarithms

Authors: Herbert Gangl

Comments: 14 pages, final version, to appear in Selecta Mathematica

Subj-class: K-Theory and Homology

MSC-class: 11G55, 33E20, 39B32

74. cond-mat/0207745

Title: Replica field theories, Painleve transcendents and exact correlation functions

Authors: Eugene Kanzieper

Comments: 4 pages, revtex 4

Subj-class: Disordered Systems and Neural Networks; Mesoscopic Systems and Quantum Hall Effect; Exactly Solvable and Integrable Systems; Mathematical Physics

75. math.AG/0208097

Title: Intersection numbers of twisted cycles and the correlation functions of the conformal field theory II

Authors: Katsuhisa Mimachi (Tokyo Inst Tech), Masaaki Yoshida (Kyushu Univ)

Subj-class: Algebraic Geometry

MSC-class: 33C70;81T40

76. nlin.CD/0208024

Title: Hierarchy of one and many-parameter families of elliptic chaotic maps of cn and sn types

Authors: M.A. Jafarizadeh, S. Behnia

Comments: 14 pages, Latex

Subj-class: Chaotic Dynamics

77. math-ph/0207038

Title: The discretised harmonic oscillator: Mathieu functions and a new class of generalised Hermite polynomials

Authors: M. Aunola

Comments: 16 pages, ReVTeX, complete explanation of the obtained results and some proofs too

Subj-class: Mathematical Physics

Problems and Solutions

Thus far 22 problems have been submitted, seven of which have been solved in previous issues. Still unsolved are Problems #**3, 5, 8, 9, 11, 12, 13, 15, 17, 18, 19, 20, 21** and **22**. This time no new problems have been submitted.

19. Uniform Bounds for Shifted Jacobi Multiplier Sequences. For Fourier series the following is immediate: Suppose the real or complex sequence $\{m_k\}$ generates a bounded operator on $L^p(\mathbf{T})$, $1 \le p \le \infty$, i.e., for polynomial f

$$\left\| \sum m_k \hat{f}_k e^{ik\varphi} \right\|_{L^p(\mathbf{T})} \le \|m\|_{M^p(\mathbf{T})} \left\| \sum \hat{f}_k e^{ik\varphi} \right\|_{L^p(\mathbf{T})},$$

then one has for the shifted sequence $\{m_{k+j}\}_{k \in \mathbf{Z}}$ that

$$\sup_{j \in \mathbf{N}_0} \|\{m_{k+j}\}\|_{M^p(\mathbf{T})} \le C \|m\|_{M^p(\mathbf{T})}, \quad 1 \le p \le \infty. \quad (1)$$

Looking at cosine expansions on $L^p(0, \pi)$ one easily derives the analog of (1) via the addition formula

$$\cos(k \pm j)\theta = \cos k\theta \cos j\theta \mp \sin k\theta \sin j\theta$$

provided the periodic Hilbert transform is bounded, i.e., for $1 < p < \infty$. More generally, by Muckenhoupt's transplantation theorem [2, Theorem 1.6],

$$\left(\int_0^\pi \left| \sum m_{k+j} a_k P_k^{(\alpha,\beta)}(\cos\theta) \right|^p \sin^{2\alpha+1} \frac{\theta}{2} \cos^{2\beta+1} \frac{\theta}{2} \, d\theta \right)^{1/p}$$

$$\equiv \left(\int_0^\pi \left| \sum m_{k+j} b_k \, \phi_k^{(\alpha,\beta)}(\cos\theta) \right|^p w_{\alpha,\beta,p}(\theta) \, d\theta \right)^{1/p}$$

$$\approx \left(\int_0^\pi \left| \sum m_{k+j} b_k \cos k\theta \right|^p w_{\alpha,\beta,p}(\theta) \, d\theta \right)^{1/p},$$

where $P_k^{(\alpha,\beta)}$ are the Jacobi polynomials, $\phi_k^{(\alpha,\beta)}(\cos\theta)$ are the orthonormalized Jacobi functions with respect to $d\theta$, and

$$w_{\alpha,\beta,p}(\theta) = \sin^{(2-p)(\alpha+1/2)} \frac{\theta}{2} \cos^{(2-p)(\beta+1/2)} \frac{\theta}{2}.$$

Therefore, the above argument for cosine expansions also applies to Jacobi expansions provided the periodic Hilbert transform is bounded with respect to the weight function $w_{\alpha,\beta,p}$; hence, the analog of (1) holds for Jacobi expansions when

$$\frac{2\alpha+2}{\alpha+3/2} < p < \frac{2\alpha+2}{\alpha+1/2}, \qquad \alpha \geq \beta \geq -\frac{1}{2}.$$

(i) Can the above p-range be extended? By Muckenhoupt [2, (1.3)], a fixed shift is bounded for all p, $1 < p < \infty$.

(ii) Consider the corresponding problem for Laguerre expansions (for the appropriate setting see [1]); a fixed shift is easily seen to be bounded for all $p \geq 1$.

Both questions are of course trivial for $p = 2$ since $\ell^\infty = M^2$ by Parseval's formula.

References

[1] Gasper, G. and W. Trebels: On necessary multiplier conditions for Laguerre expansions, Canad. J. Math. 43 (1991), 1228 – 1242.

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(Submitted on May 19, 1998)

George Gasper
(george@math.nwu.edu)
Walter Trebels
(trebels@mathematik.tu-darmstadt.de)

20. Question about Elliot's formula Generalization of Legendre's identity for complete elliptic integrals

Let E, K be the complete elliptic integrals. Then

$$K'E + KE' - KK' = \pi/2 \qquad (*)$$

This is the special case $p = r = -a + 1/2$, $q = c + a - 3/2$ in Elliott's identity (see Erdelyi e.a., Higher Transcendental Functions, Vol. 1, p. 85):

$$F(p+\tfrac{1}{2}, -r-\tfrac{1}{2}, 1+p+q; z)F(-p+\tfrac{1}{2}, r+\tfrac{1}{2}; 1+q+r; 1-z)$$
$$+F(p+\tfrac{1}{2}, -r+\tfrac{1}{2}, 1+p+q; z)F(-p-\tfrac{1}{2}, r+\tfrac{1}{2}; 1+q+r; 1-z)$$
$$-F(p+\tfrac{1}{2}, -r+\tfrac{1}{2}, 1+p+q; z)F(-p+\tfrac{1}{2}, r+\tfrac{1}{2}; 1+q+r; 1-z)$$
$$= \frac{\Gamma(p+q+1)\Gamma(q+r+1)}{\Gamma(p+q+r+\tfrac{3}{2})\Gamma(q+\tfrac{1}{2})} \qquad (**)$$

Question 1. Is there a counterpart of Legendre's identity (*) for incomplete elliptic integrals?

Question 2. The Elliott identity (**) provides a generalization of the identity (*) to hypergeometric functions. The only handbook where I have seen this identity is Bateman vol. I. Has Elliott's identity been used or mentioned elsewhere in papers/books?

Question 3. Are there generalizations of the Elliott identity (**) to the $_pF_q$ case or to other generalizations of hypergeometric functions?

Matti Vuorinen
(vuorinen@csc.fi)

21. Question on an exact solvable Schrödinger equation

What are all the Schrödinger equations that have exact solutions expressible in terms of the Kampé de Fériet function?

(Submitted on June 3, 1999)

Ernst Davidovich Krupnikov
(ernst@neic.nsk.su)

22. Question about Kampé de Fériet series

How to prove the following reduction identities for the Kampé de Fériet series:

$$F_{1:0;2}^{1:1;3}\left(\begin{array}{c} 2 \\ 5/2 \end{array} \middle| \begin{array}{c} 1 \\ - \end{array} \middle| \begin{array}{c} 1,1,1 \\ 2,2 \end{array} \middle| x,x \right) =$$
$$_2F_1\left(\begin{array}{c} 1,1 \\ 3/2 \end{array} \middle| x \right) {}_3F_2\left(\begin{array}{c} 1,1,1 \\ 3/2,2 \end{array} \middle| x \right), \qquad (2)$$

$$F_{2:0;2}^{2:1;3}\left(\begin{array}{c} 2,2 \\ 5/2,3 \end{array} \middle| \begin{array}{c} 1 \\ - \end{array} \middle| \begin{array}{c} 1,1,1 \\ 2,2 \end{array} \middle| x,x \right) = \left[{}_3F_2\left(\begin{array}{c} 1,1,1 \\ 3/2,2 \end{array} \middle| x \right) \right]^2, \quad (3)$$

$$F_{2:0;1}^{2:1;2}\left(\begin{array}{c} 2,2 \\ 3,3 \end{array} \middle| \begin{array}{c} 1 \\ - \end{array} \middle| \begin{array}{c} 1,1 \\ 2 \end{array} \middle| 1,1 \right) = 4\, {}_4F_3\left(\begin{array}{c} 1,1,1,1 \\ 2,2,2 \end{array} \middle| 1 \right), \quad (4)$$

$$F_{3:0;1}^{3:1;2}\left(\begin{array}{c} 2,2,2 \\ 3,3,3 \end{array} \middle| \begin{array}{c} 1 \\ - \end{array} \middle| \begin{array}{c} 1,1 \\ 2 \end{array} \middle| 1,1 \right) = 2\, {}_5F_4\left(\begin{array}{c} 1,1,1,1,1 \\ 2,2,2,2 \end{array} \middle| 1 \right)? \quad (5)$$

Is it possible to generalize them?

Ernst Davidovich Krupnikov
(ernst@neic.nsk.su)

Miscellaneous

1. 2003 SIAM Student Paper Prizes

The 2003 SIAM Student Paper Prizes will be presented at the First Joint Meeting of CAIMS and SIAM, June 16-20, at the Queen Elizabeth Hotel in Montreal, Canada. This meeting also will serve as SIAM's 2003 Annual Meeting.

Up to three papers will be selected for the prizes.

The SIAM Student Paper Prizes are awarded every year to the student author(s) of the most outstanding paper(s) submitted to the SIAM Student Paper Competition. This award is based solely on the merit and content of the student's contribution to submitted paper.

The purpose of the Student Paper Prizes is to recognize outstanding scholarship by students in applied mathematics or computing.

Eligibility is restricted to students in good standing who have not received their Ph.D. at the time of submitting their entry or who have completed their degree within one year of submission of their entry.

Submissions may be based on co-authored papers, provided that the student's advisor will attest that the student's work played a pivotal role in the results. A letter from the student's advisor or department chair must accompany each entry to verify these conditions.

To enter the competition, a student must submit: (1) an extended abstract in English of a paper, and (2) a short biography. The total length of the submitted abstract (including bibliography) may not exceed five pages. The student also must submit the complete paper, which will be used for clarification of any questions the selection committee may have on the extended abstract. In addition, the student's advisor or an interested faculty member must submit a letter describing and evaluating the paper's contribution to the literature, and the student's role in the scholarship.

For the 2003 award, all papers and accompanying documentation must be received at the SIAM office by February 15, 2003.

The SIAM president will notify the recipient(s) at least six weeks before the award date.

Each recipient is required to present his or her paper at the meeting where the prizes are awarded; if attending the meeting poses a serious hardship, an exception may be granted by the SIAM president.

Each recipient of the SIAM Student Paper Prize shall receive a framed certificate and a cash award of $1,000, plus $500 toward travel expenses.

Please direct your submission and any questions you may have to A. Bogardo at SIAM, 3600 University City Science Center, Philadelphia, PA 19104-2688; telephone (215) 382-9800; e-mail to bogardo@siam.org

Allison Bogardo
(bogardo@siam.org)

About the Activity Group

The SIAM Activity Group on Orthogonal Polynomials and Special Functions consists of a broad set of mathematicians, both pure and applied. The Group also includes engineers and scientists, students as well as experts. We have around 150 members scattered about in more than 20 countries. Whatever your specialty might be, we welcome your participation in this classical, and yet modern, topic. Our WWW home page is:

http://math.nist.gov/opsf/

which currently covers the topics: Conference Calendar; Books, Conference Proceedings, etc.; Compendia, tools, etc.; Compiled booklist on OP-SF; Meeting Reports; Projects; Problems; Personal, Obituaries, etc.; History; Positions available; Miscellaneous; Memberlist; Preprint Servers and Links to WWW pages of interest to members. This is a convenient point of entry to all the services provided by the Group. Our Webmaster is Bonita Saunders (bonita.saunders@nist.gov).

The *Newsletter* is a publication of the Activity Group. It appears three times a year and is mailed by SIAM. Back issues are accessible at:

http://www.mathematik.uni-kassel.de/~koepf/siam.html

and

ftp://euler.us.es/pub/newsletter

To receive the *Newsletter*, you must be a member of SIAM and of the Activity Group. SIAM has several categories of membership, including low-cost categories for students and residents of developing countries. For current information on SIAM and Activity Group membership, contact:

Society for Industrial and Applied Mathematics
3600 University City Science Center
Philadelphia, PA 19104-2688 USA
phone: +1-215-382-9800
e-mail: service@siam.org
WWW : http://www.siam.org
http://www.siam.org/membership/outreachmem.htm

The Activity Group also sponsors an electronic news net, called the OP-SF Net, which is transmitted periodically by SIAM. It is provided as a free public service; membership in SIAM is not required. The OP-SF Net Editor is Martin Muldoon (muldoon@yorku.ca). The Net provides fast turnaround compared to the *Newsletter*. To receive the Net, send your name and email address to poly-request@siam.org. To contribute a news item to the Net, send email to poly@siam.org with a copy

to the OP-SF Net Editor. Please note that submissions to the Net are automatically considered for the *Newsletter*, and vice versa, unless the contributor requests otherwise. Back issues can be obtained at the WWW addresses:

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Finally, the Activity Group operates an email discussion group, called OP-SF Talk. To subscribe, send the email message

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to `listproc@nist.gov` . To contribute an item to the discussion, send email to `opsftalk@nist.gov` . The archive of all messages is accessible at:

`http://math.nist.gov/opsftalk/archive`

How to Contribute to the Newsletter

Send your Newsletter contributions directly to the Editor:

Rafael J. Yáñez
Departamento de Matematica Aplicada
Universidad de Granada
E-18071 Granada, Spain
phone: +34-958-243359
fax: +34-958-242862
e-mail: ryanez@ugr.es

preferably by e-mail, and in LATEX format. Other formats are also acceptable and can be submitted by e-mail, regular mail or fax.

Deadline for submissions to be included in the February issue 2003 is January 15, 2003.

Activity Group: Addresses

Address corrections: Current Group members should send their address corrections to Arlette Liberatore (liberatore@siam.org). Please feel free to contact any of the Activity Group Officers. Their addresses are:

Daniel W. Lozier ___ *Chair of the Activity Group*
National Institute of Standards and Technology

100 Bureau Drive
Gaithersburg, MD 20899-8910 USA
phone: +1-301-9752706   fax: +1-301-9904127
e-mail: dlozier@nist.gov
WWW: http://math.nist.gov/~DLozier

Walter Van Assche _____ *Vice Chair*
Department of Mathematics
Katholieke Universiteit Leuven
Celestijnenlaan 200B
B-3001 Leuven
Belgium
phone: +32-16-327051   fax: +32-16-327998
e-mail: walter@wis.kuleuven.ac.be
WWW: http://www.wis.kuleuven.ac.be/analyse/
        walter.html

Francisco Marcellán _____ *Program Director*
Departamento de Matematicas
Escuela Politécnica Superior
Universidad Carlos III, Ave. de la Universidad
Edificio Sabatini, E-28911
Leganés, Madrid, Spain
phone: +34-91-6249442   fax: +34-91-6249151
e-mail: pacomarc@ing.uc3m.es

Peter Clarkson _____ *Secretary*
Institute of Mathematics & Statistics
University of Kent
Canterbury, CT2 7NF,
United Kingdom
phone: +44-1227-827781   fax: +44-1227-827932 e-mail: P.A.Clarkson@ukc.ac.uk
WWW: http://www.ukc.ac.uk/IMS/maths/people/
        P.A.Clarkson.html

Rafael J. Yáñez _____ *Editor of the Newsletter*
Departamento de Matemática Aplicada
Universidad de Granada
E-18071 Granada, Spain
phone: +34-958-243359   fax: +34-958-242862
e-mail: ryanez@ugr.es
WWW: http://gandalf.ugr.es/~ryanez

Martin E. Muldoon ____ *Editor of the OP-SF Net*
Department of Mathematics & Statistics
York University
Toronto, Ontario M3J 1P3,   Canada
phone: +1-416-736-5250   fax: +1-416-736-5757
e-mail: muldoon@yorku.ca
WWW: http://www.math.yorku.ca/~muldoon/

Bonita Saunders _____ *Webmaster*
National Institute of Standards and Technology
100 Bureau Drive
Gaithersburg, MD 20899-8910 USA
phone: (301) 975-3836   fax: (301) 990-4127
e-mail: bonita.saunders@nist.gov
WWW: http://math.nist.gov/~BSaunders