O P - S F N E T - Volume 21, Number 3 - May 15, 2014

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The Electronic News Net of the SIAM Activity Group on Orthogonal Polynomials and Special Functions http://math.nist.gov/opsf/

> Please send contributions to: poly@siam.org Subscribe by mailing to: poly-request@siam.org or to: listproc@nist.gov

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Calendar of Events:

May 19-23, 2014

Workshop on Random Matrices and Jacobi Operators, Mittag-Leffler Institute, Djursholm, Sweden http://www.mittag-leffler.se/?q=0519

May 26-30, 2014

Constructive Functions 2014. In honor of Ed Saff's 70th birthday. Vanderbilt University, Nashville, Tennessee, USA. http://www.math.vanderbilt.edu/~constructive2014/

May 26-30, 2014

From Macdonald Processes to Hecke Algebras and Quantum Integrable Systems, Institut Henri Poincaré, Paris, France http://math.mit.edu/~icorwin/IHP2014.html

June 17-20, 2014

Fourth Iberoamerican Workshop on Orthogonal Polynomials and Applications (EIBPOA 2014), Bogotá, Colombia www.matematicas.unal.edu.co/newsite/fcweb/index.php?id=179&L=1

June 23-26, 2014

Fifth Jaen Conference on Approximation Theory, Computer Aided Geometric Design, Numerical Methods and Applications, Úbeda, Spain. http://ucua.ujaen.es/ajlopez/jca/dates.php

July 7-11, 2014

SIAM Annual Meeting, Chicago, Illinois, USA http://www.siam.org/meetings/an14/

July 14-18, 2014

XXXth International Colloquium on Group Theoretical Methods in Physics, Ghent, Belgium

http://www.group30.ugent.be/

July 21-25, 2014

VIII Pan American Workshop in Applied and Computational Mathematics/Computational Science and Engineering, Barranquilla, Colombia

http://www.csrc.sdsu.edu/panam2014/index.html

August 13-21, 2014

International Congress of Mathematicians, Seoul, Korea http://www.icm2014.org

August 25-29, 2014

Exact Solvability and Symmetry Avatars, Conference held on the occasion of Luc Vinet's 60th birthday, Centre de Recherches Mathématiques, Montreal Canada

http://www.crm.umontreal.ca/2014/Vinet60/index_e.php

September 7-12, 2014

Exceptional Orthogonal Polynomials and exact solutions in Mathematical Physics, Segovia, Spain 21.2 #2 http://www.icmat.es/congresos/2014/xopconf/

October 18-19, 2014

American Mathematical Society, Eastern Section Meeting, including Special Session on "Special Functions and their Applications" (organized by Mourad Ismail and Nasser Saad), Halifax, Nova Scotia, Canada http://www.ams.org/meetings/sectional/2223_program.html

December 11-20, 2014

Foundations of Computational Mathematics, Montevideo, Uruguay (including workshops on Approximation Theory and on Special Functions and Orthogonal Polynomials)

http://www.fing.edu.uy/~jana/www2/focm_2014.html

June 1-5, 2015

13th International Symposium on Orthogonal Polynomials, Special Functions and Applications (OPSFA13), Gaithersburg, Maryland, USA http://www.siam.org/meetings/opsfa13/

Topic #1 ----- OP-SF NET 21.3 ----- May 15, 2014

From: Walter Van Assche Walter.VanAssche@wis.kuleuven.be

Subject: Message from the Chair

As of May 15, 2014 our activity has 114 members. This is not such an impressive number and it is very low compared to the earlier days of the activity group. (We reached a level of 172 members in the 1990s.) The average number of members over the years is 147. About 42% of the members are from the USA and 33% from Europe; the remaining members are from South and Central America, Asia, Australia/New Zealand, Canada and Africa, Most members are from mathematics departments (73%) but engineering, physics, and computational sciences are also well represented with 8% each. We are the smallest activity group of all, the largest is Computational Science and Engineering with more than 2000 members and our closest neighbor is Geometric Design with about 150 members. What can we do about this low membership? Well, there is a lot of potential growth in the number of student members. There is free membership for graduate students from an academic member of SIAM and at present there are 400 academic members. So please check whether your university or institute is an academic member (http://siam.org/membership/academic/academic_members.php) and if so tell your students to join SIAM for free and to join our activity group (http://www.siam.org/membership/individual/free.php).

Another possibility is to nominate up to two students per year for free membership in SIAM

(http://www.siam.org/membership/nominate.php).

In my previous message (OP-SF NET 21.1), I made a call for volunteers wanting to help out with the newsletter and the website and I raised the idea of starting a blog. I received very little response: in fact only one person mailed me saying that the idea of starting a blog is interesting, and he referred to the n-Category Café (http://golem.ph.utexas.edu/category/). So I repeat my call for volunteers for the newsletter/website/blog.

Topic #2 ----- OP-SF NET 21.3 ----- May 15, 2014

From: Walter Van Assche Walter.VanAssche@wis.kuleuven.be Subject: OPSFA Steering Committee

The OPSFA Steering Committee was founded during the OPSFA-11 meeting in Leganés (Spain) in 2011. Its main task is to coordinate (but not to organize) the

international meetings in the OPSFA community, such as the biennial international symposium on "Orthogonal Polynomials, Special Functions and Applications" and summer schools. The Steering Committee consists of three local organizers of the past five OPSFA meetings and a representative of the SIAM Activity Group on Orthogonal Polynomials and Special Functions (not necessarily the chair). The first committee consisted of Francisco Marcellán (SIAG chair), Christian Berg (OPSFA-7), Walter Van Assche (OPSFA-10) and Guillermo López Lagomasino (OPSFA-11). The Steering Committee members have agreed that from 2014 on the committee will consist of Walter Van Assche (OPSFA-10 and SIAG chair), Guillermo López Lagomasino (OPSFA-11), Mohamed Jalel Atia (OPSFA-12) and Diego Dominici (SIAG program director). Any suggestions for future OPSFA conferences and summer schools should be directed to the Steering Committee who will get in touch will all people involved. http://wis.kuleuven.be/events/OPSFA/Steering

Topic #3 ----- OP-SF NET 21.3 ----- May 15, 2014

From: OP-SF NET Editors

Subject: OPSFA-13 in Gaithersburg, MD

The 13th International Symposium on Orthogonal Polynomials, Special Functions and Applications (OPSFA13) will be held at NIST (National Institute of Standards and Technology), Gaithersburg, MD (near Washington, DC), USA during the period June 1-5, 2015.

The following information is from the web site

http://www.siam.org/meetings/opsfa13/

Conference Co-Chairs:

Daniel W. Lozier, National Institute of Standards and Technology, USA Diego Dominici, State University of New York at New Paltz, USA

Scientific Committee:

Richard A. Askey, University of Wisconsin, USA

Howard S. Cohl, National Institute of Standards and Technology, USA

Kathy Driver, University of Cape Town, South Africa

Tom H. Koornwinder, University of Amsterdam, The Netherlands

Robert S. Maier, University of Arizona, USA

Zeinab Mansour, King Saud University, Saudi Arabia

Andrei Martinez-Finkelshtein, Universidad de Almeria, Almeria, Spain

Willard Miller, University of Minnesota, USA

Victor H. Moll, Tulane University, USA

Adri Olde Daalhuis, The University of Edinburgh, United Kingdom

Audrey Terras, University of California San Diego, USA

Walter Van Assche, Katholieke Universiteit Leuven, Belgium

Luc Vinet, University of Montreal, Canada

Invited Speakers:

Percy Deift, Courant Institute of Mathematical Sciences, New York University, USA

Charles F. Dunkl, University of Virginia, USA

Olga Holtz, Technische Universität Berlin, Germany

Mourad E.H. Ismail, University of Central Florida, USA

Teresa E. Pérez Fernández, Universidad de Granada, Spain

Sarah Post, University of Hawaii at Manoa, USA

Nico Temme, Centrum Wiskunde & Informatica (CWI), The Netherlands

Craig A. Tracy, University of California Davis, USA

Lauren Williams, University of California Berkeley, USA

Wadim Zudilin, The University of Newcastle, Australia

Alexei Zhedanov, Donetsk Institute for Physics and Technology, Ukraine

The call for papers will be posted June 2014.

From: Elena Berdysheva

Subject: Question on spherical Bessel functions

Working on a so-called discrete Turán problem for ℓ -1 radial functions, Professor Berens and I arrived at the following monotonicity property of spherical Bessel functions. For a given $\nu \in \mathbb{N}$, let $\{\lambda_{n;\nu}\}_{n=1}^{\infty}$ be the positive roots of the spherical Bessel function $j_{\nu}(x) = (\pi/(2x))^{1/2}J_{\nu+1/2}(x)$ in increasing order.

Conjecture.

For
$$n = 2, 3, \dots,$$

$$\frac{(-j'_{\nu}(\lambda_{n;\nu}))}{\int_0^{\lambda_{n;\nu}} j_{\nu}(\tau) d\tau} < \frac{(-j'_{\nu}(\lambda_{1;\nu}))}{\int_0^{\lambda_{1;\nu}} j_{\nu}(\tau) d\tau}.$$

Note that the integrals $\int_0^{\lambda_{n;\nu}} j_{\nu}(\tau) d\tau$ are always positive (R. G. Cooke). On the other hand, $j'_{\nu}(\lambda_{n;\nu})$ is negative for odd n and positive for even n. This means that the inequality is trivial for even n, and we only need to prove it for odd n.

We can prove this conjecture for $\nu=0,1,3,$ and 5. Our method is quite straightforward (a Sonine type argument), and it does not seem to be extendable to higher values of ν . We would be thankful for any hints and ideas concerning the conjecture, and we are open for collaboration on this subject. Please contact me at elena.berdysheva@gutech.edu.om .

Topic #5 ----- OP-SF NET 21.3 ----- May 15, 2014

From: OP-SF NET Editors Subject: Preprints in arXiv.org

The following preprints related to the fields of orthogonal polynomials and special functions were posted or cross-listed to one of the subcategories of arXiv.org, mostly during March and April 2014.

http://arxiv.org/abs/1311.0028

Legendre-Gauss-Lobatto grids and associated nested dyadic grids Kolja Brix, Claudio Canuto, Wolfgang Dahmen

http://arxiv.org/abs/1311.0681

Computation of the Marcum Q-function A. Gil, J. Segura, N.M. Temme

http://arxiv.org/abs/1403.0483

A hypergeometric basis for the Alpert multiresolution analysis Jeffrey S. Geronimo, Plamen Iliev

http://arxiv.org/abs/1403.1654

The monodromy representation of Lauricella's hypergeometric function F_C Yoshiaki Goto

http://arxiv.org/abs/1403.1833

Expansions of the solutions to the confluent Heun equation in terms of the Kummer confluent hypergeometric functions T.A. Ishkhanyan, A.M. Ishkhanyan

http://arxiv.org/abs/1403.1884

Confluent hypergeometric expansions of the solutions of the double-confluent Heun equation

T.A. Ishkhanyan, A.M. Ishkhanyan

http://arxiv.org/abs/1403.1982

On multiserver retrial queues: history, Okubo-type hypergeometric systems and matrix continued-fractions F. Avram, D. Matei, Y.Q. Zhao

http://arxiv.org/abs/1403.3607

Certain Transformations for Hypergeometric series in \$p\$-adic setting Rupam Barman, Neelam Saikia

http://arxiv.org/abs/1403.5232

Some supercongruences occurring in truncated hypergeometric series Ling Long, Ravi Ramakrishna

Evaluations of some terminating hypergeometric \${}_2F_1(2)\$ series Y S Kim, A K Rathie, R B Paris

http://arxiv.org/abs/1403.7863

Hypergeometric expansions of the solutions of the general Heun equation governed by two-term recurrence relations for expansion coefficients T.A. Ishkhanyan, T.A. Shahverdyan, A.M. Ishkhanyan

http://arxiv.org/abs/1404.3270

Geometric properties of basic hypergeometric functions Sarita Agrawal, Swadesh Sahoo

http://arxiv.org/abs/1403.1374

Orthogonal polynomials for Minkowski's question mark function Zoé Dresse, Walter Van Assche

http://arxiv.org/abs/1403.2662

Identification of the theory of multidimensional orthogonal polynomials with the theory of symmetric interacting Fock spaces with finite dimensional one particle space

Luigi Accardi, Abdessatar Barhoumi, Ameur Dhahri

http://arxiv.org/abs/1403.3729

On Nikishin systems with discrete components and weak asymptotics of multiple orthogonal polynomials

A. I. Aptekarev, G. López Lagomasino, A. Mártinez-Finkelshtein

http://arxiv.org/abs/1403.5733

Spatiotemporal Orthogonal Polynomial Approximation for Partial Differential Equations

Samir Kumar Bhowmik, Sharanjeet Dhawan

http://arxiv.org/abs/1403.6249

On Sobolev orthogonal polynomials

F. Marcellan, Y. Xu

http://arxiv.org/abs/1403.6456

Orthogonal polynomials for area-type measures and image recovery E. B. Saff, H. Stahl, N. Stylianopoulos, V. Totik

http://arxiv.org/abs/1403.0323

New Recurrence Relationships between Orthogonal Polynomials which Lead to New Lanczos-type Algorithms Muhammad Farooq, Abdellah Salhi

http://arxiv.org/abs/1403.8083

Orthogonal polynomials associated with Coulomb wave functions Frantisek Stampach, Pavel Stovicek

Orthogonal polynomials associated with the deltoid curve Olfa Zribi (IMT)

http://arxiv.org/abs/1404.4730

Triangular random matrices and biorthogonal ensembles Dimitris Cheliotis

http://arxiv.org/abs/1404.5401

Existence and Orthogonality of Generalized Jack Polynomials and Its \$q\$-Deformation Yusuke Ohkubo

http://arxiv.org/abs/1404.1551

On the existence of orthogonal polynomials for oscillatory weights on a bounded interval Hassan Majidian

http://arxiv.org/abs/1404.2012

Toda-Schrödinger correspondence and orthogonal polynomials Satoshi Tsujimoto, Alexei Zhedanov

http://arxiv.org/abs/1403.0053

Bootstrapping and Askey-Wilson polynomials Jang Soo Kim, Dennis Stanton

http://arxiv.org/abs/1403.4962

Beyond Zudilin's Conjectured \$q\$-analog of Schmidt's problem Thotsaporn Aek Thanatipanonda

http://arxiv.org/abs/1404.2541

The Stokes phenomenon for the Ramanujan's \$q\$-difference equation and its higher order extension

Takeshi Morita

http://arxiv.org/abs/1404.7647

The Hahn-Exton \$q\$-Bessel function as the characteristic function of a Jacobi matrix

Frantisek Stampach, Pavel Stovicek

http://arxiv.org/abs/1403.1200

Recent software developments for special functions in the Santander-Amsterdam project
A. Gil, J. Segura, N. M. Temme

http://arxiv.org/abs/1403.7927

Computation of a numerically satisfactory pair of solutions of the differential equation for conical functions of non-negative integer orders T. M. Dunster, A. Gil, J. Segura, N. M. Temme

The asymptotic and numerical inversion of the Marcum \$Q-\$function A. Gil, J. Segura, N. M. Temme

http://arxiv.org/abs/1403.8113

On the complex zeros of Airy and Bessel functions and those of their derivatives A. Gil, J. Segura

http://arxiv.org/abs/1403.0716

Some asymptotic formulae for Bessel process Yuu Hariva

http://arxiv.org/abs/1403.6385

Strong convergence rates and temporal regularity for Cox-Ingersoll-Ross processes and Bessel processes with accessible boundaries Martin Hutzenthaler, Arnulf Jentzen, Marco Noll

http://arxiv.org/abs/1403.6399

Reconstruction of Support of a Measure From Its Moments Ashkan Jasour, Constantino Lagoa

http://arxiv.org/abs/1403.7848

On the analytical formulas for three three-particle integrals with spherical Bessel and Neumann functions Alexei M. Frolov

http://arxiv.org/abs/1404.3383

Vanishing of certain equivariant distributions on p-adic spherical spaces, and non-vanishing of spherical Bessel functions
Avraham Aizenbud, Dmitry Gourevitch, Alexander Kemarsky

http://arxiv.org/abs/1403.0278

Integral representations and complete monotonicity related to the remainder of Burnside's formula for the gamma function Feng Qi

http://arxiv.org/abs/1404.2705

Exactification of Stirling's Approximation for the Logarithm of the Gamma Function
Victor Kowalenko

http://arxiv.org/abs/1403.6513

Asymptotic Bohr Radius for the Polynomials in One Complex Variable Cheng Chu

http://arxiv.org/abs/1403.0189

Difference equations of q-Appell polynomials Nazim I. Mahmudov

Matrix-valued Gegenbauer polynomials Erik Koelink, Ana M. de los Rios, Pablo Roman

http://arxiv.org/abs/1403.3716

Chebyshev polynomials and the Frohman-Gelca formula Hoel Queffelec, Heather M. Russell

http://arxiv.org/abs/1403.4014

Umbral "classical" polynomials

Alexei Zhedanov

http://arxiv.org/abs/1403.6927

On a Theorem by Bojanov and Naidenov applied to families of Gegenbauer-Sobolev polynomials

Vanessa G. Paschoa, Dilcia Pérez, Yamilet Quintana

http://arxiv.org/abs/1403.8080

ew families of q and (q;p)-Hermite polynomials Mahouton Norbert Hounkonnou, Sama Arjika, Won Sang Chung

http://arxiv.org/abs/1404.0217

On the asymptotics of a sequence of lacunary binomial-type polynomials R B Paris

http://arxiv.org/abs/1403.7978

Exponential asymptotics of the Voigt functions R B Paris

http://arxiv.org/abs/1403.7973

An asymptotic expansion for the generalised quadratic Gauss sum revisited R B Paris

http://arxiv.org/abs/1403.7782

Generalization of a quadratic transformation due to Exton Y S Kim, A K Rathie, R B Paris

http://arxiv.org/abs/1403.5632

Asymptotics of the Wright function $\{\}_1\Psi_1(z)\}$ on the Stokes lines Richard B Paris

http://arxiv.org/abs/1404.2293

On the explicit representation of orthonormal Bernstein polynomials Michael A. Bellucci

http://arxiv.org/abs/1404.3110

Recurrences for Eulerian polynomials of type B and type D Matthew Hyatt

Chebyshev Polynomials on a System of Continua

V. V. Andrievskii

http://arxiv.org/abs/1404.7252

Multivariate circular Jacobi polynomials

Genki Shibukawa

http://arxiv.org/abs/1404.7400

The Evaluation of the Sums of More General Series by Bernstein Polynomials Mehmet Acikgoz, Ilknur Koca, Serkan Araci

http://arxiv.org/abs/1404.7491

Multivariate Meixner, Charlier and Krawtchouk polynomials Genki Shibukawa

http://arxiv.org/abs/1403.4558

Zeta functions over zeros of Zeta functions and an exponential-asymptotic view of the Riemann Hypothesis

André Voros

http://arxiv.org/abs/1403.5786

Large proportion of the zeros of the Riemann zeta function on the critical line Sergei Preobrazhenskii, Tatyana Preobrazhenskaya

http://arxiv.org/abs/1403.4484

Asymptotic of the generalized Li's sums which non-negativity is equivalent to the Riemann Hypothesis Sergey K. Sekatskii

http://arxiv.org/abs/1403.7126

On the distribution (mod 1) of the normalized zeros of the Riemann Zeta-function $% \left(1\right) =\left(1\right) +\left(1\right) +\left$

Juan Arias de Reyna

http://arxiv.org/abs/1404.1717

Riemann hypothesis and the arc length of the Riemann \$Z(t)\$-curve Jan Moser

http://arxiv.org/abs/1404.6649

On the large values of the Riemann zeta-function on short segments of the critical line

M.A.Korolev

http://arxiv.org/abs/1404.7276

First applications of generalized Li's criterion to study the Riemann zeta-function zeroes location Sergey Sekatskii

Connection problem for the sine-Gordon/Painlevé III tau function and irregular conformal blocks

A. Its, O. Lisovyy, Yu. Tykhyy

http://arxiv.org/abs/1404.3819

Continuous and discrete Painleve equations arising from the gap probability distribution of the finite \$n\$ Gaussian Unitary Ensembles

Man Cao, Yang Chen, James Griffin

http://arxiv.org/abs/1404.5105

Critical edge behavior in the modified Jacobi ensemble and Painlevé equations Shuai-Xia Xu, Yu-Qiu Zhao

http://arxiv.org/abs/1404.5938

Noncommutative geometry and Painlevé equations Andrei Okounkov, Eric Rains

Topic #6 ----- OP-SF NET 21.3 ----- May 15, 2014

From: OP-SF NET Editors

Subject: 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 115 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/

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 Activity Group sponsors OP-SF NET, an electronic newsletter, and SIAM-OPSF (OP-SF Talk), a listserv, as a free public service; membership in SIAM is not required. OP-SF NET is transmitted periodically through a post to OP-SF Talk. The OP-SF Net Editors are Diego Dominici (dominicd@newpaltz.edu) and Martin Muldoon (muldoon@yorku.ca).

Back issues of OP-SF NET can be obtained at the WWW addresses: https://staff.fnwi.uva.nl/t.h.koornwinder/opsfnet/http://math.nist.gov/~DLozier/OPSFnet/

SIAM-OPSF (OP-SF Talk), which was recently moved to a SIAM server, facilitates communication among members and friends of the Activity Group. To

subscribe or to see a link the archive of all messages, go to http://lists.siam.org/mailman/listinfo/siam-OPSF and follow the instructions under the sub-heading "Subscribing to SIAM-OPSF". To contribute an item to the discussion, send email to siam-opsf@siam.org. The moderators are Bonita Saunders (bonita.saunders@nist.gov) and Diego Dominici (dominicd@newpaltz.edu).

SIAM has several categories of membership, including low-cost categories for students and residents of developing countries. In addition, there is the possibility of reduced rate membership for the members of several societies with which SIAM has a reciprocity agreement; see http://www.siam.org/membership/individual/reciprocal.php

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 email: service@siam.org WWW: http://www.siam.org

http://www.siam.org/membership/outreachmem.htm

Topic #7 ----- OP-SF NET 21.3 ----- May 15, 2014

From: OP-SF NET Editors

Subject: Submitting contributions to OP-SF NET and SIAM-OPSF (OP-SF Talk)

To contribute a news item to OP-SF NET, send email to one of the OP-SF Editors dominicd@newpaltz.edu or muldoon@yorku.ca.

Contributions to OP-SF NET 21.4 should be sent by July 1, 2014.

OP-SF NET is an electronic newsletter of the SIAM Activity Group on Special Functions and Orthogonal Polynomials. We disseminate your contributions on anything of interest to the special functions and orthogonal polynomials community. This includes announcements of conferences, forthcoming books. new software, electronic archives, research questions, and job openings. OP-SF NET is transmitted periodically through a post to SIAM-OPSF (OP-SF Talk).

SIAM-OPSF (OP-SF Talk) is a listsery of the SIAM Activity Group on Special Functions and Orthogonal Polynomials, which facilitates communication among members, and friends of the Activity Group. See the previous Topic. To post an item to the listsery, send email to siam-opsf@siam.org.

WWW home page of this Activity Group:

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

Information on joining SIAM and this activity group: service@siam.org

The elected Officers of the Activity Group (2014-2016) are:

Chair: Walter Van Assche Vice Chair: Jeff Geronimo

Program Director: Diego Dominici

Secretary: Yuan Xu

The appointed officers are:

Diego Dominici, OP-SF NET co-editor and OP-SF Talk moderator

Martin Muldoon, OP-SF NET co-editor

Bonita Saunders, Webmaster and OP-SF Talk moderator