

## OP - SF NET - Volume 14, Number 3 - May 15, 2007

Editors:

Diego Dominici

[dominid@newpaltz.edu](mailto:dominid@newpaltz.edu)

Martin Muldoon

[muldoon@yorku.ca](mailto:muldoon@yorku.ca)

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

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Today's Topics:

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2. Conference in Honor of Prof. J. S. Dehesa
3. Luigi Gatteschi 1923-2007
4. New edition of Gradshteyn and Ryzhik
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8. Submitting contributions to OP-SF NET

Calendar of Events:

2007

May 18-20: International Conference on Special Functions & their Applications  
(7th Annual Conference of SSFA, India) St. Thomas College, Arunapuram P.O., Pala,  
Kottayam, Pin 686574, Kerala, India  
<http://www.ssfa.gq.nu/conf.htm>

June 10-12: Leonhard Euler Festival, Saint-Petersburg, Russia  
<http://www.pdmi.ras.ru/EIMI/2007/Euler300/>

June 24-30: Seventh International Conference: Symmetry in Nonlinear  
Mathematical Physics, Kyiv (Kiev), Ukraine 13.6 #3  
<http://www.imath.kiev.ua/~appmath/conf.html>

June 24-July 1: 45th International Symposium on Functional Equations, Bielsko-Biala, Poland  
[http://www.ams.org/mathcal/info/2007\\_jun24-jul1\\_bielsko-biala.html](http://www.ams.org/mathcal/info/2007_jun24-jul1_bielsko-biala.html)

July 2-6: The 9th Conference on Orthogonal Polynomials, Special  
Functions and Applications, Marseille, France 13.6 #1, 14.2 #1  
[http://www.cirm.univ-mrs.fr/liste\\_rencontre/Rencontres2007/Valent07/Valent07.html](http://www.cirm.univ-mrs.fr/liste_rencontre/Rencontres2007/Valent07/Valent07.html)

July 2-4: 2007 International Conference of Applied and Engineering Mathematics, London, U.K  
<http://www.iaeng.org/WCE2007/ICAEM2007.html>

July 2-6: 19th International Conference on Formal Power Series and Algebraic Combinatorics  
Nankai University, Tianjin, China  
<http://www.fpsac.cn/>

July 9-13: International Conference on Scientific Computation and  
Differential Equations, Saint-Malo, France  
<http://scicade07.irisa.fr/>

July 9-13: Conference on Applied Mathematics and Scientific Computing, Brijuni Island, Croatia  
<http://applmath.math.hr/>

July 16-20: ICIAM 2007 - 6th International Congress on Industrial and Applied Mathematics,  
including Minisymposium on Web Math, Zurich, Switzerland  
<http://www.iciam07.ch> 13.4 #2 13.6 #4

July 23-27: Twelfth International Conference on Difference Equations and Applications (ICDEA07)  
The Technical University of Lisbon, Portugal  
<http://www.math.ist.utl.pt/icdea2007/>

September 2-8: 28th Conference on Quantum Probability and Related Topics, Guanajuato, Mexico.  
See <http://www.cimat.mx/Eventos/28quantum/> 14.2 #4

September 9-14: Applications of Macdonald Polynomials, Banff International Research Station,  
Banff, Alberta, Canada 13.5 #1  
[www.pims.math.ca/birs/birspages.php?task=displayevent&event\\_id=07w5048](http://www.pims.math.ca/birs/birspages.php?task=displayevent&event_id=07w5048)

September 16-20: International Conference of Numerical Analysis and Applied Mathematics 2007  
(ICNAAM 2007) Corfu, Greece  
<http://www.icnaam.org/>

September 17-19: Interdisciplinary conference "SPECIAL FUNCTIONS, INFORMATION THEORY AND  
MATHEMATICAL PHYSICS", in honor of Jesús S. Dehesa's 60th birthday, Granada, Spain 14.2 #3  
<http://www.ugr.es/~jsd60th>

December 12-15: Joint Meeting of the American Mathematical Society and the New Zealand  
Mathematical Society including Special Session on Special Functions and Orthogonal Polynomials 14.2 #5  
<http://www.mcs.vuw.ac.nz/%7Emathmeet/amsnzms2007/index.shtml>

2008

January 6-9: Joint Mathematics Meetings including the AMS-SIAM Special Session on  
Asymptotic Methods in Analysis with Applications, San Diego, California  
[http://www.ams.org/amsmtg/2109\\_program\\_ss18.html#title](http://www.ams.org/amsmtg/2109_program_ss18.html#title)

January 14 - July 4: Program: Combinatorics and Statistical Mechanics  
Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom  
<http://www.newton.cam.ac.uk/programmes/CSM/>

May 15-17: Twelfth International Conference Devoted to the Memory of Academician Mykhailo Kravchuk (Krawtchouk) (1892-1942), Kyiv, Ukraine  
Information: Ukraine, 03056, Kyiv-56, Peremohy Ave. 37, National Technical University of Ukraine (KPI), Phys.-Math. Departments, Corpus 7, Room 437, M. Kravchuk Conference, N. Virchenko; tel. (380) 44 454-97-40; e-mail: [kravchukconf.@yandex.ru](mailto:kravchukconf.@yandex.ru).

**Topic #1                    OP-SF NET 14.3                    May 15, 2007**

From: Peter Clarkson [P.A.Clarkson@kent.ac.uk](mailto:P.A.Clarkson@kent.ac.uk)  
Subject: Message from the Chair

Welcome to the latest issue of the OPSF newsletter.

Our activity group is scheduled to hold elections for officers this year and a nominating committee is being set up. There are four elected officers (Chair, Vice-Chair, Secretary and Program Director). SIAM likes to have contested elections so please consider putting yourself forward as an officer for our SIAG. Don't hesitate to contact any of the current officers for more information.

I have been having a dialogue with Tim Kelly (SIAM's Vice President for Publications) concerning accessibility of SIAM journals for members of our SIAG as I had heard comments from members of OPSF about this matter. The most "natural" SIAM journal for members of OPSF to publish in seems to be the SIAM Journal of Mathematical Analysis (SIMA). Tim has contacted Bob Pego, the Editor in Chief of SIMA, says who says that SIMA is now insisting more than it did 10-15 years ago on a tangible connection to applications, and that papers in orthogonal polynomials and special functions which such a connection would certainly be welcome in SIMA. I would be grateful for comments and your experience of publishing in SIAM journals to be sent to me so that I can pass them onto Tim.

For your information, Jim Crowley (SIAM Executive Director) and Tim are worried about a larger question, which is how the smaller communities within SIAM fit into the journals, and our SIAG is such community. SIAM has a journals committee, chaired by Margaret Wright, and Tim will be asking them to look into this later in the year. Tim will also bring this up at the board/council meetings in July.

There will be a meeting of members of the activity group during the 9<sup>th</sup> OPSFA Conference [http://www.cirm.univ-mrs.fr/liste\\_rencontre/Rencontres2007/Valent07/Valent07.html](http://www.cirm.univ-mrs.fr/liste_rencontre/Rencontres2007/Valent07/Valent07.html) in Marseilles, July 2-6, 2007. The time and place will be decided during the meeting.

**Topic #2                    OP-SF NET 14.3                    May 15, 2007**

From: OP-SF NET Editors  
Subject: Conference in Honor of Prof. J. S. Dehesa

As announced in OP-SF NET 14.2, Topic #3, an interdisciplinary conference "SPECIAL FUNCTIONS, INFORMATION THEORY AND MATHEMATICAL PHYSICS", in honor of Jesús S. Dehesa's 60th birthday. will take place in Granada (Spain), on

September 17-19, 2007.

The Second Announcement of the Conference has now appeared. It includes much information on the Conference including the following list of main speakers:

**Alexander I. Aptekarev**, Keldysh Institute of Applied Mathematics, Moscow University, Russia.  
"Asymptotic theory of the orthogonal polynomials entropy".

**John Avery**, Department of Chemistry, University of Copenhagen, Denmark.  
"Harmonic polynomials, hyperspherical harmonics, and atomic spectra."

**Manuel García Velarde**, Instituto pluridisciplinar, Universidad Complutense, Madrid, Spain. "Waiting for mathematical rigor: Matching, patching, and other tinkering ways of handling with physical insight some multiscales nonlinear problems."

**Lance Littlejohn**, Department of Mathematics, Baylor University, USA.  
"Left-definite spectral theory and orthogonal polynomials".

**Francisco Marcellán**, Universidad Carlos III, Madrid, Spain.  
"JSD: A shared life with Orthogonal Polynomials from 1975 to 2007"

**Edward B. Saff**, Vanderbilt University, USA.  
"Bergman orthogonal polynomials on archipelagos"

**Kalidas D. Sen**, School of Chemistry, University of Hyderabad, Hyderabad, India. "Characteristic features of net information entropy of standard model potentials under spherically confined soft and hard boundary walls."

**Constantino Tsallis**, Centro de Pesquisas Fisicas, Brazil.  
"On the extensivity of the nonadditive entropy and the q-generalization of the central limit theorem"

**Walter Van Assche**, Katholieke Universiteit Leuven, Belgium.  
"On the scientific work of Jesus S. Dehesa".

For further information, see the conference web site:  
<http://www.ugr.es/~jsd60th>

**Topic #3** ----- **OP-SF NET 14.3** ----- **May 15, 2007**

From: Andrea Laforgia [laforgia@mat.uniroma3.it](mailto:laforgia@mat.uniroma3.it)  
Subject: Luigi Gatteschi 1923-2007

Luigi Gatteschi died in Torino on April 11, 2007, when his physical conditions quickly worsened after routine surgery.

Gatteschi was born in Pelago, a Tuscan village close to Florence on July 15, 1923. After high school classical studies, he graduated from the University of Florence in Mathematics in 1945. He started his academic and research career in Florence, where he developed his interest in the study of

special functions. In 1951 he spent six months at Stanford University under a Fulbright Scholarship. There he met key scientists in the field of special functions and experts in asymptotic methods for their analysis.

He relocated with his family to the University of Bari in 1952, where (the first in Italy) he achieved the "Libera Docenza" in Numerical and Graphical Analysis in 1955.

In 1956 he was called by Francesco Giacomo Tricomi to become his assistant at the University of Torino. Under the influence of his mentor he acquired the awareness of the constructive and algorithmic role of Mathematics that was to lead him to his way of practicing a rigorous although applicable mathematics. He taught at the University of Torino until his retirement in 1998.

During his academic tenure in Turin he played many local, national and international roles, including: Director of the Computing Center of the Mathematics Department, Member of the Board of the Italian National Research Center, member of the Accademia delle Scienze di Torino and, when retired, "Professor Emeritus".

Luigi was the author or co-author of almost 100 papers, including some articles with almost 15 coauthors in collaboration with his students and colleagues. Most of these papers are in the areas of Special functions (asymptotics and inequalities for the zeros of Bessel functions and classical orthogonal polynomials) and quadrature formulas.

In the last two decades of his life, serious illness did not prevent Luigi from continuing to teach and participate actively in the international communities. He traveled to international congresses and study tours until 2004, when he was unable to sustain long-distance travel. He maintained his mind engaged in research until the very last moments of his life, as a reviewer and referee for international reviews and collaborating with his former colleagues on developing papers. He leaves his wife Marcella and three sons, daughters-in-law and granddaughters. He will be remembered as a good man and a great scientist that traveled the world to get to know people who shared his passion for mathematics.

For me he was a Master who introduced me to the study of special functions.

Andrea Laforgia

**Topic #4** ----- **OP-SF NET 14.3** ----- **May 15, 2007**

From: Tom Koornwinder [thk@science.uva.nl](mailto:thk@science.uva.nl)  
Subject: New edition of Gradshteyn and Ryzhik

The seventh edition of Gradshteyn and Ryzhik, Table of Integrals, Series, and Products came out in February 2007; see <http://books.elsevier.com/us/apmath/us/subindex.asp?maintarget=&isbn=9780123736376>

A homepage for this book is maintained at <http://www.mathtable.com/gr/>  
It has also a list of errata for the sixth edition.  
Please send any new errata to Daniel Zwillinger, [zwilling@az-tec.com](mailto:zwilling@az-tec.com).

Victor Moll of Tulane University has started the ambitious process of verifying the integrals in GR. Many proofs are at <http://www.math.tulane.edu/~vhm/Table.html> Please visit this link, and contact him ([vhm@math.tulane.edu](mailto:vhm@math.tulane.edu)), if you have proofs of G&R integrals.

**Topic #5**                      **OP-SF NET 14.3**                      **May 15, 2007**

From: OP-SF NET Editors  
Subject: New book on Discrete Orthogonal Polynomials

The following information is from  
<http://press.princeton.edu/titles/8450.html>

J. Baik, T. Kriecherbauer, K. T.-R. McLaughlin & P. D. Miller  
Discrete Orthogonal Polynomials: Asymptotics and Applications  
Princeton University Press, 2007, 184 pp.  
Paper, \$39.50, ISBN13: 978-0-691-12734-7  
Cloth, \$79.50, ISBN13: 978-0-691-12733-0

This book describes the theory and applications of discrete orthogonal polynomials--polynomials that are orthogonal on a finite set. Unlike other books, Discrete Orthogonal Polynomials addresses completely general weight functions and presents a new methodology for handling the discrete weights case.

J. Baik, T. Kriecherbauer, K. T.-R. McLaughlin & P. D. Miller focus on asymptotic aspects of general, nonclassical discrete orthogonal polynomials and set out applications of current interest. Topics covered include the probability theory of discrete orthogonal polynomial ensembles and the continuum limit of the Toda lattice. The primary concern throughout is the asymptotic behavior of discrete orthogonal polynomials for general, nonclassical measures, in the joint limit where the degree increases as some fraction of the total number of points of collocation. The book formulates the orthogonality conditions defining these polynomials as a kind of Riemann-Hilbert problem and then generalizes the steepest descent method for such a problem to carry out the necessary asymptotic analysis.

J. Baik is Associate Professor of Mathematics at the University of Michigan. T. Kriecherbauer is Professor of Mathematics at Ruhr-Universität Bochum in Bochum, Germany. K. T.-R. McLaughlin is Professor of Mathematics at the University of Arizona. P. D. Miller is Associate Professor of Mathematics at the University of Michigan.

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**Topic #6** ----- **OP-SF NET 14.3** ----- **May 15, 2007**

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 during March and April 2007.

<http://arxiv.org/abs/0704.3650>

Title: Bernstein-Szego Polynomials Associated with Root Systems  
Authors: [J.F. van Diejen](#), [A.C. de la Maza](#), [S. Ryom-Hansen](#)  
Comments: LaTeX, 12 pages  
Subjects: Combinatorics (math.CO)  
MSC classes: 05E05, 05E35

<http://arxiv.org/abs/0704.3177>

Title: Computing modular polynomials in quasi-linear time  
Author: [Andreas Engle](#) (INRIA Futurs)  
Subjects: Number Theory (math.NT); Computational Complexity (cs.CC)

<http://aps.arxiv.org/abs/0704.3232>

Title: Characterization of polynomials  
Author: [V.E.S. Szabo](#)  
Comments: 5 pages  
Subjects: Analysis of PDEs (math.AP); Functional Analysis (math.FA)  
MSC classes: 35D99 (Primary) 46F05 (Secondary)

<http://arxiv.org/abs/0704.3903>

Title: An abundance of invariant polynomials satisfying the Riemann hypothesis  
Author: [Koji Chinen](#)  
Comments: 19 pages  
Subjects: Number Theory (math.NT)  
MSC classes: 11T71; 94B05; 30C15

<http://arxiv.org/abs/0704.0065>

Title: Littlewood-Richardson polynomials  
Author: [A. I. Molev](#)  
Comments: 21 pages, minor changes  
Subjects: Algebraic Geometry (math.AG); Combinatorics (math.CO)

<http://arxiv.org/abs/0704.0685>

Title: A generalization of Chebyshev polynomials and non rooted posets

Author: [Masaya Tomie](#)

Comments: 11 pages

Subjects: Combinatorics (math.CO)

MSC classes: 06A07

<http://arxiv.org/abs/0704.2617>

Title: Regions without complex zeros for chromatic polynomials on graphs with bounded degree

Authors: [Roberto Fernandez](#), [Aldo Procacci](#)

Comments: 14 pages, to appear in Combinatorics, Probability and Computing

Subjects: Mathematical Physics (math-ph); Combinatorics (math.CO)

MSC classes: 82B20; 05C15

<http://arxiv.org/abs/0704.3067>

Title: Kazhdan--Lusztig polynomials for maximally-clustered hexagon-avoiding permutations

Author: [Brant C. Jones](#)

Comments: 18 pages

Subjects: Combinatorics (math.CO); Representation Theory (math.RT)

MSC classes: 20C08

<http://arxiv.org/abs/0704.3363>

Title: Topology and Factorization of Polynomials

Author: [Hani Shaker](#)

Comments: 8 pages

Subjects: Algebraic Geometry (math.AG); Algebraic Topology (math.AT)

MSC classes: 12D05 (Primary) 14F40,14J70(Secondary)

<http://arxiv.org/abs/0704.3196>

Title: Distributed Gaussian polynomials as  $q$ -oscillator eigenfunctions

Author: [Hasan Karabulut](#)

Subjects: Mathematical Physics (math-ph)

Journal reference: Journal of Mathematical Physics 47, 013508 (2006)

<http://arxiv.org/abs/0704.3123>

Title: On factorization of  $q$ -difference equation for continuous  $q$ -ultraspherical polynomials

Authors: [I. Area](#), [M.K. Atakishiyeva](#), [J. Rodal](#)

Subjects: Classical Analysis and ODEs (math.CA); Mathematical Physics (math-ph)

MSC classes: 33D45, 39A13

<http://arxiv.org/abs/0704.3576v1>

Title: A class of generalized complex Hermite polynomials

Author: [Allal Ghanmi](#)

Comments: 16 pages, Submitted

Subjects: Classical Analysis and ODEs (math.CA); Mathematical Physics (math-ph); Spectral Theory (math.SP)

MSC classes: 35C45

<http://arxiv.org/abs/0704.1431>

Title: Generalized characteristic polynomials of graph bundles

Authors: [Dongseok Kim](#), [Hye Kyung Kim](#), [Jaeun Lee](#)

Subjects: Combinatorics (math.CO)

MSC classes: 05C50, 05C25, 15A15, 15A18

<http://arxiv.org/abs/0704.1690>

Title: Two Results on Homogeneous Hessian Nilpotent Polynomials

Authors: [Arno van den Essen](#), [Wenhua Zhao](#)

Comments: Latex, 7 pages

Subjects: Algebraic Geometry (math.AG); Complex Variables (math.CV)

MSC classes: 14R15, 31B05

<http://arxiv.org/abs/math/0703672>

Title: Piecewise polynomials, Minkowski weights, and localization on toric varieties

Authors: [Eric Katz](#), [Sam Payne](#)

Comments: 17 pages

Subjects: Algebraic Geometry (math.AG); Combinatorics (math.CO)

MSC classes: 14M25; 14C17, 52B20

<http://arxiv.org/abs/math.CA/0703350>

Title: Schur type inequalities for complex polynomials with no zeros in the unit disk

Author: [Szilárd Gy. Révész](#)

Subjects: Classical Analysis and ODEs (math.CA)

MSC classes: Primary 41A17. Secondary 30E10, 41A44

<http://arxiv.org/abs/math.NT/0703440>

Title: Joint moments of derivatives of characteristic polynomials or of the Riemann zeta function

Author: [Paul-Olivier Dehaye](#)

Comments: 31 pages, 1 figure, 6 tables. Additional data available attached to the Latex source of this arXiv submission or on the author's website

Subjects: Number Theory (math.NT); Mathematical Physics (math-ph)

MSC classes: 11M26; 60B15, 15A52, 33C80, 05E10

<http://arxiv.org/abs/0704.1691>

Title: A Vanishing Conjecture on Differential Operators with Constant Coefficients

Author: [Wenhua Zhao](#)

Comments: Latex, 32 pages

Subjects: Complex Variables (math.CV); Algebraic Geometry (math.AG)

MSC classes: 14R15, 33C45, 32W99

<http://arxiv.org/abs/math.CA/0703387v1>

Title: Inequalities for Multivariate Polynomials

Author: [Szilárd Gy. Révész](#)

Subjects: Classical Analysis and ODEs (math.CA)

MSC classes: Primary: 41A17. Secondary: 41A63, 41A44, 46B20, 46B99, 46G25, 26D05, 26D10, 32U15, 47H60

Journal reference: Annals of the Marie Curie Fellowships, 4 (2006), (electronic),

<http://www.mariecurie.org/annals/>.

<http://arxiv.org/abs/math-ph/0703012>

Title: An Explicit Formula for Symmetric Polynomials Related to the Eigenfunctions of Calogero-Sutherland Models

Author: [Martin Hallnäs](#)

Comments: This is a contribution to the Proc. of workshop on Geometric Aspects of Integrable Systems (July 17-19, 2006; Coimbra, Portugal), published in SIGMA (Symmetry, Integrability and Geometry: Methods and Applications) at

<http://www.emis.de/journals/SIGMA/>

Subjects: Mathematical Physics (math-ph); Classical Analysis and ODEs (math.CA); Exactly Solvable and Integrable Systems (nlin.SI)

Journal reference: SIGMA 3 (2007), 037, 17 pages

<http://arxiv.org/abs/math/0703722>

Title: Using hyperelliptic curves to find positive polynomials that are not sum of three squares in  $\mathbb{R}(x, y)$

Author: [Valéry Mahé](#)

Comments: 61 pages

Subjects: Number Theory (math.NT); Algebraic Geometry (math.AG)

MSC classes: 14H40; 14G05; 14H05; 14P99; 14Q05

<http://arxiv.org/abs/math-ph/0703043>

Title: Random matrices, non-backtracking walks, and orthogonal polynomials

Author: [Sasha Sodin](#)

Comments: minor changes

Subjects: Mathematical Physics (math-ph); Spectral Theory (math.SP)

<http://arxiv.org/abs/math.CA/0703386>

Title: Some polynomial inequalities on real normed spaces

Author: [Szilard Gy. Revesz](#)

Subjects: Classical Analysis and ODEs (math.CA)

MSC classes: Primary: 41A17. Secondary: 41A63, 41A44, 46B20, 46B99, 46G25, 26D05, 26D10, 32U15, 47H60

Journal reference: Publicaciones del Dpto. de Analisis del Matematico, Seccion 1 N<sup>o</sup>. 63 (2004), 111-135

<http://arxiv.org/abs/math.CA/0703452v1>

Title: Uniform Convergence Behavior of the Bernoulli Polynomials

Author: [John Mangual](#)

Comments: 8pages, 3 figures. To be submitted

Subjects: Classical Analysis and ODEs (math.CA)

<http://arxiv.org/abs/math-ph/0703026>

Title: Polynomial Expansions for Solutions of Higher-Order q-Bessel Heat Equation

Authors: M.S.Ben Hammouda, [Akram Nemri](#)

Subjects: Mathematical Physics (math-ph)

MSC classes: 33C10, 33D60, 26D15, 33D05, 33D15, 33D90

<http://arxiv.org/abs/math/0703242>

Title: First and second kind paraorthogonal polynomials and their zeros

Author: [Manwah Lilian Wong](#)

Comments: To appear in the Journal of Approximation Theory

Subjects: Classical Analysis and ODEs (math.CA)

<http://arxiv.org/abs/math/0703487>

Title: A positivity conjecture for Jack polynomials

Author: [Michel Lassalle](#) (CNRS, Marne la Vallee, France)

Comments: 24 pages, LaTeX

Subjects: Combinatorics (math.CO)

<http://arxiv.org/abs/math/0703546>

Title: Quantum Hilbert matrices and orthogonal polynomials

Authors: [Jorgen Ellegaard Andersen](#) (University of Aarhus), [Christian Berg](#) (University of Copenhagen)

Comments: 10 pages

Subjects: Classical Analysis and ODEs (math.CA)

MSC classes: 33D45;11B39

<http://arxiv.org/abs/math/0703476>

Title: A note on the q-Genocchi numbers and polynomials

Author: [Taekyun Kim](#)

Comments: 8 pages

Subjects: Number Theory (math.NT)

MSC classes: 11S80;11B68

<http://aps.arxiv.org/abs/math.PR/0703375>

Title: Random walks and orthogonal polynomials: some challenges

Author: [F. Alberto Grunbaum](#)

Subjects: Probability (math.PR); Spectral Theory (math.SP)

<http://arxiv.org/abs/math/0703588>

Title: Equivalent norms for polynomials on the sphere

Authors: [Jordi Marzo](#), [Joaquim Ortega-Cerdà](#)

Comments: 14 pages, 1 figure

Subjects: Classical Analysis and ODEs (math.CA)

MSC classes: 33C55 ; 26D05

<http://arxiv.org/abs/math/0703180>

Title: On value sets of polynomials over a field

Author: [Zhi-Wei Sun](#)

Comments: 10 pages. Final version, to appear in Finite Fields Appl

Subjects: Number Theory (math.NT); Combinatorics (math.CO)

MSC classes: 11T06; 05A05; 11B75; 11P99; 12E10

<http://arxiv.org/abs/math/0703284>

Title: On Primes Represented by Quadratic Polynomials

Authors: [Stephan Baier](#), [Liangyi Zhao](#)

Comments: six(6) pages

Subjects: Number Theory (math.NT)

MSC classes: 11L07, 11L20, 11L40, 11N13, 11N32, 11N37

<http://arxiv.org/abs/0704.2733>

Title: The order of the decay of the hole probability for Gaussian random  
SU(m+1) polynomials

Author: [Scott Zrebiec](#)

Comments: This paper generalizes one which was previously posted by the author

Subjects: Complex Variables (math.CV); Probability (math.PR)

MSC classes: 30B20; 30C15; 60G60; 82B10

<http://arxiv.org/abs/0704.3542>

Title: Polynomial solutions of qKZ equation and ground state of XXZ spin chain  
at  $\Delta = -1/2$

Authors: [A. V. Razumov](#), [Yu. G. Stroganov](#), [P. Zinn-Justin](#)

Subjects: Mathematical Physics (math-ph); Combinatorics (math.CO); Exactly Solvable  
and Integrable Systems (nlin.SI)

<http://arxiv.org/abs/0704.3099>

Title: Elliptic hypergeometric functions

Author: [V.P. Spiridonov](#)

Comments: 20 pages, a complement to the book by G.E. Andrews, R. Askey,  
and R. Roy, Special Functions, Encycl. of Math. Appl. 71, Cambridge Univ. Press,  
1999, written for its Russian edition

Subjects: Classical Analysis and ODEs (math.CA)

MSC classes: 33E20

Report number: RIMS-1589

<http://arxiv.org/abs/math-ph/0703010>

Title: Bessel functions of integer order in terms of hyperbolic functions

Authors: [V. Bârsan](#), [S. Cojocaru](#)

Comments: 5 pages

Subjects: Mathematical Physics (math-ph)

MSC classes: 33C10

<http://arxiv.org/abs/0704.1844>

Title: A New Algebraic Structure of Finite Quantum Systems and the Modified  
Bessel Functions

Author: [Kazuyuki Fujii](#) (Yokohama City University)

Comments: Latex ; 14 pages ; no figure

Subjects: Quantum Physics (quant-ph); Mathematical Physics (math-ph)

<http://arxiv.org/abs/0704.1881>

Title: Statistical Properties of Many Particle Eigenfunctions

Comments: 13 pages, 4 figures

Subjects: Quantum Physics (quant-ph)

<http://arxiv.org/abs/math/0703520>

Title: Limit theorems for radial random walks on  $pxq$ -matrices as  $p$  tends to infinity

Authors: [Margit Rösler](#), [Michael Voit](#)

Comments: 24 pages

Subjects: Classical Analysis and ODEs (math.CA); Probability (math.PR)

MSC classes: 43A85; 33C67; 60F; 43A62; 60B12

<http://arxiv.org/abs/0704.0539>

Title: Integral representations for convolutions of non-central multivariate gamma distributions

Author: [Thomas Royen](#)

Comments: 12 pages

Subjects: Statistics (math.ST)

MSC classes: 62H10; 62E15

<http://arxiv.org/abs/math/0703030>

Title: Scaled Asymptotics For Some  $q$ -Series

Author: [Ruiming Zhang](#)

Comments: 18pages

Subjects: Classical Analysis and ODEs (math.CA); Complex Variables (math.CV)

MSC classes: 30E15;33D45

<http://arxiv.org/abs/0704.0354>

Title: General asymptotic solutions of the Einstein equations and phase transitions in quantum gravity

Author: [D. Podolsky](#)

Comments: 8 pages; reference added, acknowledgement added

Subjects: High Energy Physics - Theory (hep-th); General Relativity and Quantum Cosmology (gr-qc)

Report number: HIP-2007-17/TH

<http://arxiv.org/abs/0704.1208>

Title: Asymptotic profiles of solutions to convection-diffusion equations

Authors: [Said Benachour](#) (IECN), [Grzegorz Karch](#), [Philippe Laurençot](#) (MIP)

Subjects: Analysis of PDEs (math.AP)

MSC classes: 35K15; 35B40

Journal reference: Comptes rendus de l'acad\ 'emie des sciences, Math\ 'ematiques 338 (07/01/2004) 369-374

<http://arxiv.org/abs/math.CA/0703023v1>

Title: Asymptotic solutions of forced nonlinear second order differential equations and their extensions

Authors: [Angelo B. Mingarelli](#), [Kishin Sadarangani](#)

Subjects: Classical Analysis and ODEs (math.CA); Functional Analysis (math.FA)

MSC classes: 39A11, 34E10, 34A30, 34C10

<http://arxiv.org/abs/0704.0679>

Title: Finite branch solutions to Painleve VI around a fixed singular point

Author: [Katsunori Iwasaki](#)

Comments: 45 pages, 22 figures, 5 tables

Subjects: Algebraic Geometry (math.AG); Classical Analysis and ODEs (math.CA)

MSC classes: 34M55; 37F10

<http://arxiv.org/abs/0704.2574>

Title: Higher order Painleve system of type  $D^{(1)}_{2n+2}$  arising from integrable hierarchy

Authors: [Kenta Fuji](#), [Takao Suzuki](#)

Comments: 20 pages

Subjects: Mathematical Physics (math-ph); Representation Theory (math.RT)

MSC classes: 34M55; 17B80; 37K10

<http://arxiv.org/abs/0704.1972>

Title: Critical edge behavior in unitary random matrix ensembles and the thirty fourth Painleve transcendent

Authors: [A.R. Its](#), [A.B.J. Kuijlaars](#), [J. Ostensson](#)

Comments: 51 pages, 6 figures

Subjects: Classical Analysis and ODEs (math.CA); Mathematical Physics (math-ph)

MSC classes: 15A52; 33E17; 34M55

<http://arxiv.org/abs/0704.0378>

Title: An equilibrium problem for the limiting eigenvalue distribution of banded Toeplitz matrices

Authors: [Maurice Duits](#), [Arno B.J. Kuijlaars](#)

Comments: 28 pages; 7 figures

Subjects: Complex Variables (math.CV); Classical Analysis and ODEs (math.CA)

MSC classes: 15A18; 30E20; 31A99; 47B06

<http://arxiv.org/abs/math/0703256>

Title: Finite-gap potential, Heun's differential equation and WKB analysis

Author: [Kouichi Takemura](#)

Comments: 12 pages, An extended version of talk given at "Algebraic Analysis and the Exact WKB Analysis for Systems of Differential Equations", RIMS, Kyoto, December 2006

Subjects: Classical Analysis and ODEs (math.CA); Mathematical Physics (math-ph); Exactly Solvable and Integrable Systems (nlin.SI)

MSC classes: 34M35,33E10,34E20

<http://arxiv.org/abs/math/0703057>

Title: Towards Finite-Gap Integration of the Inozemtsev Model

Author: [Kouichi Takemura](#)

Comments: This is a contribution to the Vadim Kuznetsov Memorial Issue on Integrable Systems and Related Topics, published in SIGMA (Symmetry, Integrability and Geometry: Methods and Applications) at <http://www.emis.de/journals/SIGMA/>

Subjects: Classical Analysis and ODEs (math.CA); Mathematical Physics (math-ph); Exactly Solvable and Integrable Systems (nlin.SI)

Journal reference: SIGMA 3 (2007), 038, 17 pages

<http://arxiv.org/abs/0704.3456>

Title: Spectral methods for orthogonal rational functions

Author: [Luis Velazquez](#)

Comments: 62 pages

Subjects: Classical Analysis and ODEs (math.CA)

MSC classes: 42C05; 47B36

<http://arxiv.org/abs/0704.2438>

Title: New  ${}_5F_4$  hypergeometric transformations, three-variable Mahler measures, and formulas for  $1/\pi$

Author: [Mathew D. Rogers](#)

Comments: 14 Pages

Subjects: Number Theory (math.NT)

MSC classes: 33C20; 33C05; 11F66

<http://arxiv.org/abs/math/0703084>

Title: Inequalities and monotonicity of ratios for generalized hypergeometric function

Authors: [D. Karp](#), [S.M. Sitnik](#)

Comments: 14 pages, submitted to J. of Approximation Theory

Subjects: Classical Analysis and ODEs (math.CA)

MSC classes: 33C20

<http://arxiv.org/abs/math.CA/0703082>

Title: Numerical Evaluation of Generalized Hypergeometric Functions for Degenerated Values of Parameters

Author: [Yasushi Tamura](#)

Comments: 11 pages, 3 figures

Subjects: Classical Analysis and ODEs (math.CA)

<http://arxiv.org/abs/0704.3448v1>

Title: Finite Euler products and the Riemann Hypothesis

Author: [S. M. Gonek](#)

Comments: 4 figures

Subjects: Number Theory (math.NT); Complex Variables (math.CV)

MSC classes: 11M26

<http://arxiv.org/abs/math.CA/0703448v1>

Title: A matrix generalization of Euler identity  $e^{ix} = \cos x + i \sin x$

Author: [Gianluca Argentini](#)

Comments: 5 pages, research work done at R&D Dept. of Company Institution

Subjects: Classical Analysis and ODEs (math.CA); Mathematical Physics (math-ph);

General Mathematics (math.GM); Fluid Dynamics (physics.flu-dyn);

Quantum Physics (quant-ph)

MSC classes: 15A24; 15A90

<http://arxiv.org/abs/math.NT/0703508>

Title: Generalized Euler constants

Authors: [Harold G. Diamond](#), [Kevin Ford](#)

Comments: 17 pages

Subjects: Number Theory (math.NT)

MSC classes: 11N25; 11N35

<http://arxiv.org/abs/math.CA/0703641v1>

Title: Resurgence of the Euler-Maclaurin summation formula

Authors: [Ovidiu Costin](#), [Stavros Garoufalidis](#)

Comments: AMS-LaTeX, 15 pages with 2 figures

Subjects: Classical Analysis and ODEs (math.CA); Combinatorics (math.CO)

<http://arxiv.org/abs/0704.2842>

Title: Quadrature formulas for the Laplace and Mellin transforms

Authors: [Rafael G. Campos](#), [Francisco Mejia](#)

Comments: 10 pages, 5 figures

Subjects: Numerical Analysis (math.NA)

MSC classes: 44A10, 65D32, 33C45

<http://arxiv.org/abs/math/0703037>

Title: Local well-posedness for the modified KdV equation in almost critical  $H^r_s$ -spaces

Authors: [Axel Gruenrock](#), [Luis Vega](#)

Comments: 12 pages

Subjects: Analysis of PDEs (math.AP)

MSC classes: 35Q53

<http://arxiv.org/abs/0704.0329>

Title: Solutions of fractional reaction-diffusion equations in terms of the H-function

Authors: [H.J. Haubold](#), [A.M. Mathai](#), [R.K. Saxena](#)

Comments: 9 pages, LaTeX

Subjects: Probability (math.PR); Classical Analysis and ODEs (math.CA); Statistics (math.ST)

<http://arxiv.org/abs/math-ph/0703046>

Title: Distributed Order Calculus and Equations of Ultraslow Diffusion

Author: [Anatoly N. Kochubei](#)

Comments: 39 pages

Subjects: Mathematical Physics (math-ph); Analysis of PDEs (math.AP)

MSC classes: 26A33, 35K99, 82C31

<http://arxiv.org/abs/0704.1764>

Title: Another Riemann-Farey Computation

Author: [Scott B. Guthery](#)

Comments: 6 pages, 3 figures

Subjects: General Mathematics (math.GM)

MSC classes: 11M26

<http://arxiv.org/abs/math/0703367v2>

Title: The Riemann Hypothesis

Author: [Tribikram Pati](#)

Comments: Typos corrected, abstract revised. Comments welcome

Subjects: Number Theory (math.NT); Complex Variables (math.CV)

**Topic #7** ----- **OP-SF NET 14.3** ----- **May 15, 2007**

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 140 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](mailto:bonita.saunders@nist.gov)).

The Activity Group sponsors 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 Editors are Diego Dominici ([dominid@newpaltz.edu](mailto:dominid@newpaltz.edu)) and Martin Muldoon ([muldoon@yorku.ca](mailto:muldoon@yorku.ca)).

To receive the OP-SF NET, send your name and email address to [poly-request@siam.org](mailto:poly-request@siam.org).

Back issues can be obtained at the WWW addresses:

<http://staff.science.uva.nl/~thk/opsfnet>

<http://www.math.ohio-state.edu/JAT/DATA/OPSFNET/opsfnet.html>

<http://cio.nist.gov/esd/emaildir/lists/opsfnet/maillist.html>

For several years the Activity Group sponsored a printed Newsletter, most recently edited by Rafael Yanez. Back issues are accessible at:

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

Given the widespread availability of email and the Internet, the need for the printed Newsletter has decreased. Discussions are underway concerning whether an annual printed Newsletter or Annual Report should be instituted.

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

email: [service@siam.org](mailto:service@siam.org)

WWW : <http://www.siam.org>

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

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

subscribe opsftalk Your Name

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>

**Topic #8**      -----      **OP-SF NET 14.3**      -----      **May 15, 2007**

From: OP-SF NET Editors  
Subject: Submitting contributions to OP-SF NET

To contribute a news item to OP-SF NET, send email to poly@siam.org with a copy to one of the OP-SF Editors [dominicd@newpaltz.edu](mailto:dominicd@newpaltz.edu) or [muldoon@yorku.ca](mailto:muldoon@yorku.ca).

Contributions to OP-SF NET 14.4 should be sent by July 1, 2007.

OP-SF NET is a forum 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, job openings.

Send submissions to: [poly@siam.org](mailto:poly@siam.org)  
Subscribe by mailing to: [poly-request@siam.org](mailto:poly-request@siam.org)  
or to: [listproc@nist.gov](mailto:listproc@nist.gov)

Back issues can be obtained at the WWW addresses:  
<http://staff.science.uva.nl/~thk/opsfnet>  
<http://www.math.ohio-state.edu/JAT/DATA/OPSFNET/opsfnet.html>  
<http://math.nist.gov/opsfnet/archive>

WWW home page of this Activity Group:  
<http://math.nist.gov/opsf/>

Information on joining SIAM  
and this activity group: [service@siam.org](mailto:service@siam.org)

The elected Officers of the Activity Group (2005-2007) are:

Peter A. Clarkson, Chair  
Daniel W. Lozier, Vice Chair  
Javier Segura, Secretary  
Peter A. McCoy, Program Director

The appointed officers are:

Diego Dominici, OP-SF NET co-editor  
Martin Muldoon, OP-SF NET co-editor  
Bonita Saunders, Webmaster