O P - S F N E T - Volume 18, Number 5 – September 15, 2011

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Calendar of Events:

September 11-17, 2011
   Fourteenth International Conference on Functional Equations and Inequalities
   (14th ICFEI), Będlewo, Poland
   http://mat.ap.krakow.pl/icfei/14ICFEI/index.php

September 19 - 25, 2011
   9th International Conference of Numerical Analysis and Applied Mathematics
   (ICNAAM), Hilkidiki, Greece
   http://www.icnaam.org/

October 3-7, 2011
   GranMa 2011 (Grandes Matrices Aleatoires) Institut Henri Poincaré, Paris
   http://www.lpthe.jussieu.fr/~pzinn/granma2011/?section=announce

October 20-23, 2011

International Conference "Transform Methods & Special Functions'2011" , Sofia, Bulgaria   18.4 #1

http://www.math.bas.bg/~tmsf/2011/

December 4-6, 2011

National Conference on Ramanujan's Work in the Field of Hypergeometric Series and its Applications, Jaunpur, India

http://www.ams.org/meetings/calendar/2011_dec4-6_jaunpur.html

December 12-16, 2011

ICREA Conference on Approximation Theory and Fourier Analysis, Barcelona, Spain

http://www.crm.cat/icreaapproximation/

February 20-24, 2012

Conference on Superintegrability, Exact Solvability, and Special Functions, Centro Internacional de Ciencias A.C., Cuernavaca, Mexico, 20-24 February 2012.

http://www.cicc.unam.mx/activities/2012/superinte.html

May 17-19, 2012

International Conference on Applied Mathematics and Approximation Theory – AMAT 2012, Ankara, Turkey (Celebrating the 60th birthday of Professor George A. Anastassiou)

http://amat2012.etu.edu.tr/

May 29 – June 1, 2012

Hypergeometric series and their generalizations in algebra, geometry, number theory and physics, Paris, France.

http://www.liafa.jussieu.fr/~lovejoy/hypergeometric.html

June 11 -15, 2012

International Symposium on Orthogonal Polynomials and Special Functions — a Complex Analytic Perspective, Copenhagen, Denmark   18.4 #2

http://www.matdat.life.ku.dk/~henrikp/osca2012/

June 25-29, 2012

AIM Workshop: Hypergeometric Motives, International Centre for Theoretical Physics, Trieste, Italy

http://aimath.org/ARCC/workshops/hypermotives.html

July 9-13, 2012

SIAM Annual Meeting, Minneapolis, Minnesota, USA

http://www.siam.org/meetings/an12/

Topic #1   -----------   OP-SF NET 18.5 ----------   September 15, 2011

From: Tom Koornwinder T.H.Koornwinder@uva.nl
Subject: Report on OPSFA 11

The 11th International Symposium on Orthogonal Polynomials, Special Functions and Applications took place during the period 29 August – 2 September 2011, in Leganés, in the southern part of the Madrid metropolitan area. Leganés houses the compact campus of the Escuela Politécnica Superior, part of Universidad Carlos III de Madrid, a relatively young university founded in 1989. The main building of this campus is the Edificio Sabatini dating from 1783. This very characteristic gigantic square building with small peaked turrets at the four corners and with a large square courtyard had a military function until late in the 20th century, when it was renovated to be used by the university. It houses, among others, the mathematics department, in particular the Applied Mathematical Analysis Group. Prominent members of this group are the conference chair Guillermo López Lagomasino and Francisco (Paco) Marcellán Español to whom the conference was dedicated on the occasion of his 60th birthday. Some neighbouring modern buildings on the campus impress by their architecture. The conference took place in one of these buildings,

Edificio Padre Soler. The Aula de Grados in this building provided a convenient room for the plenary lectures, while facilities for coffee, lunch and opening reception were located in the same building. Many of the participants stayed in the Tryp Leganés Hotel, a five-minute walk from the conference site. A closing cocktail party was held in this hotel.

The number of participants was unusually high for OPSFA meetings. The conference book lists 214 names. The actual number will certainly have been higher. Undoubtedly, this was also caused by the spotlight on Paco Marcellán and by the very large number of Spanish mathematicians working in the field of OPSF (to which Paco has greatly contributed, as was frequently emphasized during the conference). The number of contributed lectures was correspondingly high. To accommodate these, the organizers scheduled four parallel sessions each day and a poster session every morning during coffee break.

The first morning of the conference had two lectures about Paco Marcellán: on his life by Manuel Alfaro and on his mathematical work by Walter Van Assche. Both presentations included many pictures, which one can find in the photo album at

http://matematicas.uc3m.es/index.php/selected-works-of-paco

There one can also download the digital version of the selected works of Paco, a book that was presented in hardcopy to Paco by Renato Alvarez during the conference banquet. From the lectures I learnt many new things about Paco, for instance his old work about orthogonal polynomials on lemniscates and Cassini ovals, and his rugby playing during his student years in Zaragoza.

After the coffee break there was another celebration: Tom Claeys was awarded the first Gábor Szegö Prize. After the laudatio by SIAG OPSF chair Paco Marcellán and a very clear short lecture by Arno Kuijlaars (Tom's former thesis adviser) on the work of Tom Claeys. Tom himself gave a marvellous lecture on "Phase transitions in the asymptotics for Toeplitz determinants". See Topic #2 for more information.

Below is a list of the other plenary lectures, ordered roughly from OP's on the real line via OP's on the circle and more general OP's to topics more remote from OP's. There was only one plenary lecture (by Iliev) about multivariable polynomials and none on OP's associated with root systems or on matrix-valued polynomials. Many lectures touched on approximation theory, potential theory and complex analysis, but there was little on combinatorics. Saff's lecture impressed by its richness of applications. The lecture by Andrei Martinez was interrupted several times by applause for the special effects (using Apple's Keynote).

· Roderick Wong, *Asymptotics of Discrete Orthogonal Polynomials*
· Plamen Iliev, *Bispectral commuting partial difference operators for multivariate hypergeometric polynomials*
· Barry Simon, *Cantor polynomials and their brothers*
· Maria José Cantero, *Spectral transformations of hermitian linear functionals*
· Alberto Grünbaum, *Quantum walks and CMV matrices*

· Vilmos Totik, *Fast decreasing polynomials and Christoffel functions*
· Andrei Martinez Finkelshtein, *Heine, Hilbert, Padé, Riemann, and Stieltjes:*
   a Nuttall's work 25 years later
· Doron Lubinsky, *Universality limits and reproducing kernel spaces*
· Evguenii Rakhmanov, *Critical measures, S-curves and G-functions*
· Ed Saff, *Discretizing compact manifolds with minimum energy*
· Ulises Fidalgo Prieto, *A version of the fundamental theorem of algebra for Markov functions and a generalization of Markov's theorem*
* Peter Yuditskii, *On special conformal mappings in approximation theory*

There was also a lot of interesting stuff in the contributed lectures and posters. There was a reasonable thematic unity per contributed session, which made switching between lectures (a five minutes walk between the two most widely separated rooms) less urgent. Still, these were long afternoons of 3 1/2 hours without a break (a plenary lecture followed by five contributed lectures).

The Wednesday afternoon excursion was to the very historic city of Segovia, where OPSFA 2 was held 25 years ago. I attended that meeting, but my memory of the city had faded somewhat. Thus I very much enjoyed the guided walking tour. From Segovia the bus delivered us to nearby Torrecaballeros, where we had a delicious meal in a large pleasant dining room in El Rancho de la Aldegüela. In the after-dinner speeches more honour was given to Paco. In addition, Walter Van Assche, on behalf of a special selection committee, announced that Tunisia had been chosen to host OPSFA 12 in 2013.

A meeting of the SIAG OPSF was held at lunchtime on Thursday. Although everybody, including nonmembers, was welcome, most preferred to go directly to lunch. This was a pity, for the Activity Group faces big challenges for which the support and advice of many in the field would have been helpful.

A better format was chosen for the Open Problems session on Friday. Packed lunches could be taken to the meeting room, leading to a good attendance.

The slides of the invited lectures and the group photo will be made available soon at the conference site:
http://matematicas.uc3m.es/index.php/11thopsfa

Guillermo López and his team deserve our thanks for the great job they did in organizing this conference.

Topic #2   -----------   OP-SF NET 18.5 ----------   September 15, 2011

From: Walter Van Assche   Walter.VanAssche@wis.kuleuven.be
Subject: New Gábor Szegő Prize awarded to Tom Claeys

In 2010 the SIAM Activity Group on *Orthogonal Polynomials and Special Functions* (OPSF) established the *Gábor Szegő Prize*, which will be awarded biennially for outstanding research contributions in the area of orthogonal polynomials and special functions.

This prize is intended for an early career researcher who has at most 10 years (full time equivalent) of involvement in mathematics since his/her Ph.D. at the award date, allowing for breaks in continuity, or who, in the opinion of the prize committee, is at an equivalent career stage.

The award consists of a plaque and a certificate containing the citation. As part of the award, the recipient will be invited to give a plenary lecture at the biennial International Symposium on Orthogonal Polynomials, Special Functions, and Applications (OPSFA).

Gábor Szegő (1895-1985) is well known to members of the OPSF Activity Group for his many contributions to analysis and probably mostly because of his book

Orthogonal Polynomials, which appeared in the American Mathematical Society Colloquium Publications as Volume 23 in 1939. He is also known for the wonderful books *Aufgaben und Lehrsätze aus der Analysis*, I, II (Problems and Theorems in Analysis I, II) which he wrote with George Pólya. One of his most important results is the asymptotic behavior of the determinants of Toeplitz matrices, in particular the strong Szegő limit theorem which turned out to be very relevant for the two dimensional Ising model. The picture shows a bust of G. Szegő in his birthplace, Kunhegyes, Hungary.

The first recipient of the OPSF Gábor Szegő prize is **Tom Claeys**. He received the 2011 Gábor Szegő Prize `*for his important contributions in the theory of Painlevé functions, throwing new light on the correspondence between two different Painlevé hierarchies, and giving significant applications to random matrix theory*'.   The Painlevé functions are considered by many leading experts to be "the special functions of the 21st century".   Claey's work is always motivated by applications from random matrix theory, integrable systems, or Toeplitz determinants. His nomination was based on two important papers:

- T. Claeys, M. Vanlessen, *The existence of a real pole-free solution of the fourth order analogue of the Painlevé I equation*, Nonlinearity **20** (2007), 1163-1184 (with two more papers by Claeys et al. in *Comm. Math. Phys.* building on this paper);
- T. Claeys, A.R. Its, I. Krasovsky, *Higher order analogues of the Tracy-Widom distribution and the Painlevé II hierarchy*, Comm. Pure Appl. Math. **63** (2010), 362-412.

On the basis of the evaluation of the originality, independence and importance of his work, the committee (F. Marcellán, T. H. Koornwinder, R. Askey, K. Driver and R. Wong) nominated Tom Claeys as the first worthy recipient of the Gábor Szegő Prize prize for 2011. This proposal was approved by Nick Higham, Vice-President at Large of SIAM on April 6, 2011. The prize was awarded at OPSFA 2011 (August 29 -- September 2, 2011) at Universidad Carlos III de Madrid in Leganés, Spain. After a brief ceremony with the announcement of the prize (by F. Marcellán, Chair of the SIAM Activity Group on OPSF) and an introduction by Arno Kuijlaars, Tom Claeys gave a plenary lecture on *Phase transitions in the asymptotics for Toeplitz determinants*.

Tom Claeys did his doctoral work at Katholieke Universiteit Leuven in Belgium under the supervision of Arno Kuijlaars and defended his Ph.D. thesis *Universality in critical random matrix ensembles and pole-free solutions of Painlevé equations* on December 11, 2006. In 2007-2008 he was a visiting researcher at Brunel

University (West London, U.K.), in 2008-2009 he was a postdoctoral researcher at K.U.Leuven, in 2009-2010 he was Maître de Conférences at Université de Lille 1 in France and since 2010 he is a Chargé de Cours at Université Catholique de Louvain (Louvain-la-Neuve, Belgium). So far he has published 13 papers in excellent journals, such as *Annals of Mathematics, Communications on Pure and Applied Mathematics*, and *SIAM Journal on Mathematical Analysis.*

The picture shows Tom Claeys receiving the Szegő prize from Paco Marcellán.

Topic #3   -----------   OP-SF NET 18.5 ---------- September 15, 2011

From: Diego Dominici   dominicd@newpaltz.edu
Subject: OPSF "track" at SIAM Annual meeting 2013

The 2013 SIAM Annual Meeting will be held on July 8-12, 2013 in San Diego, California. One of the charges to each SIAG is to organize a track at an Annual Meeting at least every five years. Our SIAG on Orthogonal Polynomials and Special Functions will work with the AN13 co-chairs, Hinke Osinga and Bruce Hendrickson, to develop a track for the Meeting.

A track consists of at least one invited topical speaker, four to six minisymposia, and contributed sessions spread out over two days. Diego Dominici will be our SIAG representative, serve on the AN13 Organizing Committee and work with the Committee to invite a Topical Speaker.

Please send proposals for minisymposia to Diego Dominici, dominicd@newpaltz.edu, by the end of November. Unfortunately, SIAM will not provided complimentary registration and will not cover expenses for minisymposia speakers or organizers.

Topic #4   -----------   OP-SF NET 18.5 ---------- September 15, 2011

From: Lance Littlejohn   Lance_Littlejohn@baylor.edu
Subject: William Norrie Everitt, 1924-2011

Professor William Norrie Everitt, FRSE, who died on July 17, 2011, aged 87, will be remembered as a leading British mathematical analyst who contributed extensively to the areas of ordinary and partial differential equations, linear operators, inequalities, special functions, orthogonal polynomials, and computational spectral theory.

Norrie was born on June 10, 1924 in Birmingham, the son of Charles Ernest and Elizabeth Cloudsley Everitt. He received his early school education at Kings Norton Grammar School in Birmingham. In 1944, he graduated with first class honours in

electrical engineering from the University of Birmingham. From 1942-1947, Norrie served in the UK armed forces. He suffered a fractured spine while aboard *HMS Promise* during a violent storm in the North Sea in January 1947 and spent nearly a year recuperating in hospital; after being told at the age of 23 that he might never walk again, he climbed the Matterhorn at the age of 25. Upon his military discharge, Norrie resumed his university studies in 1949, this time at Oxford (Balliol College), and in mathematics. In 1952, he received his B. A. in Mathematics (First Class Honours) and, then in 1955, his D.Phil. under the supervision of Professor E. C. Titchmarsh.

MathSciNet currently lists more than 200 research papers and books by Norrie and numerous co-authors; the number will undoubtedly increase in the next few years. In addition to four monographs with Larry Markus on the connections between boundary value problems and symplectic algebra, Norrie is well known for editing the English translation of *Linear Differential Operators* by M. A. Naimark, a book that has had a profound influence on western mathematical analysis for more than forty years.

Norrie was an eminent authority on the spectral theory of differential operators and various ancillary areas. It is not possible to describe adequately his mathematical work in this note, so we only give a glimpse of his contributions and, with apologies, name only a few of his many co-authors. He generalized the Hardy, Littlewood, Polya inequality to yield the HELP inequality (E for Everitt), which is intimately connected with spectral theory, and, together with Malcolm Brown , Desmond Evans and others, contributed to the general theory of inequalities. With Anton Zettl and Paul Bailey, Norrie helped set up the SLEIGN2 program which resulted in a computer code to calculate the eigenvalues of Sturm-Liouville problems.

Norrie began his professional mathematical career as a lecturer, then senior lecturer, in the Department of Mathematics at the Royal Military College of Science in Shrivenham , where he taught during the years 1954-1963. From 1963-1982, he was the Baxter Professor of Mathematics in the Department of Mathematical Sciences at the University of Dundee, serving as Head of the Department during 1963-1967 and 1977-1980. It was during the Dundee years that he demonstrated his leadership and organizational skills in initiating and running the well known Dundee Conferences on Differential Equations. These meetings attracted mathematicians from all corners of the world every two years from 1970 until 1982. In 1982, Norrie returned to Birmingham, his birthplace, to the Mason Chair and to be Head of the Department of Mathematics in the University of Birmingham. He remained Head until his official retirement from the University in 1989, and then stayed on in the department as an active and productive honorary Senior Research Fellow until September 2009.

Norrie supervised 13 Ph.D. students during his career. He excelled in this supervisory and mentoring role throughout his distinguished career, and many mathematicians throughout the world have benefited greatly from his mathematical knowledge and his sincere willingness to discuss and share ideas. He will be particularly remembered for his kindness and the help and guidance he readily gave to young mathematicians. He made several trips to countries behind the Iron

Curtain during the Cold War, a valuable contribution to the effort being made to ensure that the flow of mathematical ideas continued between the East and the West.

Norrie held many visiting academic positions throughout his career, particularly in the USA. He also received many honours and awards: he especially cherished the Mathematical Medal which he received from the Union of Czechoslovak Mathematicians and Physicists in 1990. He was elected a Fellow of the Institute of Mathematics and Its Applications (1964), the Royal Society of Edinburgh (1966), the Royal Society of Sciences in Sweden (1973), the Academy of Sciences, Letters and Arts, Palermo, Italy (1978), and the Serbian Academy of Sciences and Arts, Yugoslavia (2003). Norrie was President of the Edinburgh Mathematical Society in 1970-1971 and served as Vice President of the Royal Society of Edinburgh from 1970-1973. He had many editorial roles during his career, including that of Executive Editor of the Proceedings of the Royal Society of Edinburgh (1972-1982). He was a member of the UK Science Research Council from 1967-1975 and the British National Committee for Mathematics from 1972-1977. He was part of the UK delegation to the International Mathematical Union in 1978 when the International Congress of Mathematicians met in Helsinki.

On July 25 1953, Norrie married his Scottish sweetheart, Katharine Elizabeth Gibson (affectionately known to all as Kit), who survives him. Also surviving are their two sons, Dr. Charles Kingston Everitt (known also as Father Gabriel, OSB) and Timothy Fraser Everitt, as well as granddaughters, Sophie and Lucy, the children of Timothy and Andrea Everitt.

Lastly, we make some personal observations on Norrie. He was an expert and keen student of Italian opera, British history, literature, poetry, trees, classic films, railroad history, and the American West. He could instantly recall quotations from Shakespeare, Wilde, Churchill and others. Finally, any sketch of Norrie's life and career would be incomplete without mention of his teaching and blackboard management skills. Whatever the size of the blackboard, Norrie would begin writing his carefully prepared lectures in the upper left-hand corner and end his talk, on time, with his customary period (.) in the lower right-hand corner. Later in his career, as the technology for presentations evolved, Norrie adapted and skillfully delivered Beamer-type presentations.

With the passing of William Norrie Everitt, Mathematics has lost one of its consummate servants and admirers. Moreover, Norrie was a dear friend who will be greatly missed by all who knew him.

Written by Desmond Evans (Cardiff University), Tomas Johansson (University of Birmingham, UK), and Lance Littlejohn (Baylor University, USA). A full obituary of Norrie Everitt is expected to appear in a forthcoming issue of the Bulletin of the London Mathematical Society.

Topic #5   -----------   OP-SF NET 18.5 ---------- September 15, 2011

From: OP-SF NET Editors
Subject: NIST Handbook and DLMF in AMS Notices

The August 2011 issue (vol 58, no 7) of Notices of The American Mathematical Society has a cover story and article "A Special Functions Handbook for the Digital Age" by Ronald Boisvert, Charles W. Clark, Daniel Lozier, and Frank Olver at pages 905-911. The article describes the differences between the new book and the 1964 NBS Handbook, gives some details about the content of the new book, describes the web version and the general question of "Math on the Web".

This issue of Notices of the AMS may be viewed at
http://www.ams.org/notices/201107/

In addition to the article, one may (top of page) view the cover and "About the Cover".

The September 2011 issue (vol 58, no 8) of the Notices has a lengthy review of the Handbook and the DLMF by Richard Beals at pages 1115-1118.

This issue of Notices of the AMS may be viewed at
http://www.ams.org/notices/201108/

Topic #6   -----------   OP-SF NET 18.5 ---------- September 15, 2011

From: Martin Muldoon   muldoon@yorku.ca
Subject: "Special Functions" by Beals and Wong

Richard Beals and Roderick Wong, **Special functions – a graduate text**. Cambridge Studies in Advanced Mathematics, 126. Cambridge University Press, 2010. x+456 pp. ISBN: 978-0-521-19797-7

Richard Beals writes at his web site: "Through various research projects I was drawn, reluctantly, into a passing acquaintance with special functions (the ones that you don't learn about in calculus but that have names nonetheless). Some random events led to co-authoring a book on the subject, with Roderick Wong …, who is an actual expert in the subject…."

From the cover: "The subject of special functions is often presented as a collection of disparate results, which are rarely organised in a coherent way. This book answers the need for a different approach to the subject. The authors' main goals are to emphasise general unifying principles coherently and to provide clear motivation, efficient proofs, and original references for all of the principal results. The book covers standard material, but also much more, including chapters on discrete orthogonal polynomials and elliptic functions. The authors show how a very large part of the subject traces back to two equations - the hypergeometric equation and the confluent hypergeometric equation - and describe the

various ways in which these equations are canonical and special. Providing ready access to theory and formulas, this book serves as an ideal graduate-level textbook as well as a convenient reference."

The emphasis on unifying principles may remind us of classic titles that base the study of special functions on Lie theory or group representations. But the unifying principles here are ones that can be grasped easily by a student or newcomer to the field. This emphasis informs the whole book, affecting the order of presentation, the exercises, the choice of what to omit, and so on. Perhaps the main unifying principle is the emphasis on characterizations and the natural reasons to single out, say, the gamma function, the hypergeometric and confluent hypergeometric equations and the classical orthogonal polynomials, even of they did not arise, say, in applying separation of variables to some partial differential equations arising in applications. This has the result that the special functions do seem "special" (in the sense of "striking" rather than just "particular"). It seems as if Beals' reluctance to get acquainted with special functions was what encouraged the authors to take this approach. If so, we can be grateful for the "random events" that made this collaboration possible.

In Chapter 1 (Orientation), the authors consider power series solutions of a differential equation $p(x) u'' + q(x) u' + r(x) u = 0$ with analytic coefficients and show that the coefficients of a power series solution *can be obtained from a recursion* (2-term recurrence) only if the equation is the confluent hypergeometric equation, the hypergeometric equation or another one can be transformed to the confluent hypergeometric one in a simple way. The power series method leads to the use of the shifted factorial, one motivation for the gamma function. The series for the confluent hypergeometric function $M(a,c;x)$ leads to an integral representation that motivates the beta function. This leads to three questions: (1) Why is it that so many of the named special functions are solutions of the confluent hypergeometric and hypergeometric equations? (2) What does one want to know about these functions? and (3) Is this list of functions or related functions exhaustive, in any sense?

The prerequisites for reading the book are relatively modest. The approach is very reader-friendly; the authors anticipate the reader's question including ones he/she may not think to ask or be "afraid to ask". For example: Why talk about 3 or 4 special function solutions of a second order ODE when two are sufficient to span the set of all solutions?

Each Chapter concludes with "Remarks" on history and references to further information. There is a bibliography of 322 items, with a preference for the classics. Thus, for second order ODEs, reference is made to the books by Forsythe, Ince and Coddington/Levinson, dating respectively from 1885, 1926 and 1955. But since, in each case, the bibliography refers only to a recent printing, one might be led to believe that Ince dates from 1956, and Forsythe from 1996! Similarly the unwary reader might mistakenly date Watson's *Bessel Functions* (essentially unchanged since 1922) from 1995 and Whittaker and Watson's *Modern Analysis* (4th ed., 1927) from 1969.

Naturally, in a book of this size, many topics have to be omitted. There is very little

information on *q*-analogues of special functions, for example. Nevertheless, the Remarks in Chapters 4,5 and 8 give guidance and references to readers interested in this direction.

There are hundred of exercises; many simply fill gaps in the text while others introduce new material.

The chapter summaries are a unique feature of the book. Generally they repeat the Chapter material in summary form, emphasizing the important topics. Since they add substantially to the book's length, one may question whether they constitute a wise use of space. Probably they are intended for those using the book for self-study and are in keeping with its reader-friendly nature.

Contents
  1. Introduction
  2. Gamma, beta, zeta
  3. Second–order differential equations
  4. Orthogonal polynomials
  5. Discrete orthogonal polynomials
  6. Confluent hypergeometric functions
  7. Cylinder functions
  8. Hypergeometric functions
  9. Spherical functions
10. Asymptotics
11. Elliptic functions
Appendix A. Complex analysis
Appendix B. Fourier analysis

Topic #7   -----------   OP-SF NET 18.5 ---------- September 15, 2011

From: OP-SF NET Editors
Subject: Selected Works of George E. Andrews

The following is from the World Scientific web site
http://www.worldscibooks.com/mathematics/p762.html

Selected Works of George E. Andrews   (With Commentary)
by George E Andrews (Pennsylvania State University, USA) & edited by Andrew V Sills (Georgia Southern University, USA)

George E Andrews is the Evan Pugh Professor of Mathematics at Pennsylvania State University. He is also President of the American Mathematical Society (AMS) for the period of 2009–2011. He is a world pioneer in partitions and q-series and his contributions include more than 250 scientific papers and several books on number theory and the theory of partitions. In 1976 he discovered Ramanujan's Lost Notebook, a finding which changed the shape of modern q-series research.

Besides giving readers access to George Andrews' most important papers, this volume also provides his background commentary and comprehensive assessment of years of research and findings within the field of integer partitions.

Contents:
- The Geometry of Numbers
- *q*-Series
- Partition Identities
- Plane Partitions
- Combinatorics, Fibonacci Numbers, and Computers
- Number Theory
- Surveys
- Education, History, etc

Readership: Graduate students and researchers in number theory, combinatorics and special functions.
1100pp (approx.); Pub. date: Scheduled Winter 2011
ISBN: 978-1-84816-666-0 1-84816-666-4   US$298 / £185

Topic #8   -----------   OP-SF NET 18.5 ---------- September 15, 2011

From: OP-SF NET Editors
Subject: Development of Elliptic Functions according to Ramanujan

The following is from the World Scientific web site
http://www.worldscibooks.com/mathematics/8252.html

  Monographs in Number Theory - Vol. 6

Development of Elliptic Functions according to Ramanujan
by K Venkatachaliengar (deceased), edited and revised by Shaun Cooper (Massey University, New Zealand)

This unique book provides an innovative and efficient approach to elliptic functions, based on the ideas of the great Indian mathematician Srinivasa Ramanujan. The original 1988 monograph of K Venkatachaliengar has been completely revised. Many details, omitted from the original version, have been included, and the book has been made comprehensive by notes at the end of each chapter.
The book is for graduate students and researchers in Number Theory and Classical Analysis, as well for scholars and aficionados of Ramanujan's work. It can be read by anyone with some undergraduate knowledge of real and complex analysis.

Contents:
- Generalized Ramanujan Identity
- Weierstrass Elliptic Function
- Ramanujan's Differential Equations, Ramanujan's 1-Psi-1 Summation Formula
- Jacobi Triple Product Identity
- Jordan–Kronecker Function

- Fundamental Multiplicative Identity
- Hypergeometric Functions
- Halphen's Differential Equations
- Sums of Two and Four Squares
- Ramanujan's Theories of Elliptic Functions to Alternative Bases
- Jacobian Elliptic Functions
- Modular Equations
- Addition Theorem for Elliptic Integrals
- Quintuple Product Identity

Readership: Graduate students and researchers in Number Theory and Classical Analysis, as well as scholars and aficionados of Ramanujan's work.

184pp (approx.) Pub. date: Oct 2011

ISBN: 978-981-4366-45-8   981-4366-45-5   US$64 / £42

Topic #9   -----------   OP-SF NET 18.5 ---------- September 15, 2011

From: OP-SF NET Editors
Subject: Applications of Unitary Symmetry and Combinatorics

The following is from the World Scientific web site
http://www.worldscibooks.com/mathematics/8161.html

Applications of Unitary Symmetry and Combinatorics
by James D Louck (Los Alamos National Laboratory Fellow, Santa Fe, New Mexico, USA)

This monograph is a synthesis of the theory of the pairwise coupling of the angular momenta of arbitrarily many independent systems to the total angular momentum in which the universal role of doubly stochastic matrices and their quantum-mechanical probabilistic interpretation is a major theme. A uniform viewpoint is presented based on the structure of binary trees. This includes a systematic method for the evaluation of all $3n–j$ coefficients and their relationship to cubic graphs. A number of topical subjects that emerge naturally are also developed, such as the algebra of permutation matrices, the properties of magic squares and an associated generalized Regge form, the Zeilberger counting formula for alternating sign matrices, and the Heisenberg ring problem, viewed as a composite system in which the total angular momentum is conserved.

The readership is intended to be advanced graduate students and researchers interested in learning about the relationship between unitary symmetry and combinatorics and challenging unsolved problems. The many examples serve partially as exercises, but this monograph is not a textbook. It is hoped that the topics presented promote further and more rigorous developments that lead to a deeper understanding of the angular momentum properties of complex systems viewed as composite wholes.

Contents:
- Composite Quantum Systems
- Algebra of Permutation Matrices
- Coordinates of A in Basis $\mathbb{P}_{\Sigma_{n(e,p)}}$
- Further Applications of Permutation Matrices
- Doubly Stochastic Matrices in Angular Momentum Theory
- Magic Squares
- Alternating Sign Matrices
- The Heisenberg Magnetic Ring

Readership: Graduate students and researchers in physics and mathematics who wish to learn about the relationships between symmetry and combinatorics.

The Table of Contents, Preface and Prelude and
Chapter 1: (Composite Quantum Systems) can be downloaded from the web site:
http://www.worldscibooks.com/mathematics/8161.html

Topic #10   -----------   OP-SF NET 18.5 ---------- September 15, 2011

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 July and August 2011.

http://arxiv.org/abs/1107.4875
Proof of the BMV Conjecture
Herbert R Stahl

http://arxiv.org/abs/1108.4363
Weighted Extremal Domains and Best Rational Approximation
Laurent Baratchart, Herbert Stahl, Maxim Yattselev

http://arxiv.org/abs/1107.0773
Some results on zeros distributions and uniqueness of derivatives of difference polynomials
Kai Liu, Xin-Ling Liu, Ting-Bin Cao

http://arxiv.org/abs/1107.2236
Asymptotic zero distribution of a class of hypergeometric polynomials
K. A. Driver, S. J. Johnston

http://arxiv.org/abs/1107.2423
On the orthogonality of q-classical polynomials of the Hahn class
R. Alvarez-Nodarse, R. Sevinik-Adiguzel, H. Taseli

http://arxiv.org/abs/1107.2425
On the orthogonality of q-classical polynomials of the Hahn class II
R. Alvarez-Nodarse, R. Sevinik-Adiguzel, H. Taseli

http://arxiv.org/abs/1107.2427
Standard q-Racah-Krall polynomials
R. Alvarez-Nodarse, R. Sevinik-Adiguzel

http://arxiv.org/abs/1107.2680
Some integrals and series involving the Gegenbauer polynomials and the Legendre
functions on the cut (-1,1)
Radosław Szmytkowski

http://arxiv.org/abs/1107.4024
The algebra of factorial polynomials
D. Babusci, G. Dattoli, M. Carpanese

http://arxiv.org/abs/1107.5090
Exact polynomial solutions of second order differential equations and their
applications
Yao-Zhong Zhang

http://arxiv.org/abs/1107.5950
A Unified Generating Function of the q-Genocchi Polynomials with their
Interpolation Functions
Serkan Araci, Mehmet AÇIkgÖz, Hassan Jolany, And Jong Jin Seo

http://arxiv.org/abs/1108.0132
Dual -1 Hahn polynomials: "classical" polynomials beyond the Leonard duality
Satoshi Tsujimoto, Luc Vinet, Alexei Zhedanov

http://arxiv.org/abs/1108.0914
A characterization of ultraspherical polynomials
Michael Anshelevich

http://arxiv.org/abs/1108.1546
On divisibility of sums of Apery polynomials
Hao Pan

http://arxiv.org/abs/1108.1615
Multivariate Bernoulli and Euler polynomials via Lévy processes
E. Di Nardo, I. Oliva

http://arxiv.org/abs/1108.3531
Jordan algebras and orthogonal polynomials
Satoshi Tsujimoto, Luc Vinet, Alexei Zhedanov

http://arxiv.org/abs/1108.3535
CMV matrices and little and big -1 Jacobi polynomials
Maxim Derevyagin, Luc Vinet, Alexei Zhedanov

http://arxiv.org/abs/1108.3917
Interlacing properties of zeros of multiple orthogonal polynomials
Maciej Haneczok, Walter Van Assche

http://arxiv.org/abs/1108.3918
Asymptotics for the ratio and the zeros of multiple Charlier polynomials
François Ndayiragije, Walter Van Assche

http://arxiv.org/abs/1108.4391
Formulae for the number of partitions of n into at most m parts (using the quasi-polynomial ansatz)
Andrew V. Sills, Doron Zeilberger

http://arxiv.org/abs/1107.2015
A method for determining the mod-2^k behaviour of recursive sequences, with applications to subgroup counting
Manuel Kauers (RISC, Johannes Kepler Universität Linz), Christian Krattenthaler (Universität Wien), Thomas W. Müller (Queen Mary)
Comments: AmS-LaTeX; 66 pages

http://arxiv.org/abs/1108.5155
Zeros and ratio asymptotics for matrix orthogonal polynomials
Steven Delvaux, Holger Dette

http://arxiv.org/abs/1108.6130
On the zeros of orthogonal polynomials on the unit circle
María Pilar Alfaro, Manuel Bello-Hernández, Jesús María Montaner

http://arxiv.org/abs/1108.0321
Asymptotics of orthogonal polynomials with complex varying quartic weight: global structure, critical point behaviour and the first Painleve' equation
Marco Bertola, Alexander Tovbis

http://arxiv.org/abs/1107.5161
Anti de Sitter quantum field theory and a new class of hypergeometric identities
Jacques Bros, Henri Epstein, Michel Gaudin, Ugo Moschella, Vincent Pasquier

http://arxiv.org/abs/1108.6019
Finding new relationships between hypergeometric functions by evaluating Feynman integrals
Bernd A. Kniehl, Oleg V. Tarasov

http://arxiv.org/abs/1108.2583
Methods for Summing General Kapteyn Series
R. C. Tautz, I. Lerche, D. Dominici

http://arxiv.org/abs/1107.2007
Some asymptotics for the Bessel functions with an explicit error term
Ilia Krasikov

http://arxiv.org/abs/1108.0238
Riesz Potentials, Bessel Potentials and Fractional Derivatives on Besov-Lipschtz
spaces for the Gaussian Measure
A. Eduardo Gatto, Ebner Pineda, Wilfredo Urbina

http://arxiv.org/abs/1107.3479
Recursion Relations and Functional Equations for the Riemann Zeta Function
Henrik Stenlund

http://arxiv.org/abs/1107.5134
Some bounds and limits in the theory of Riemann's zeta function
J. Arias de Reyna (University of Seville), J. van de Lune (formerly at CWI)

http://arxiv.org/abs/1108.1893
Congruences arising from Apéry-type series for zeta values
Khodabakhsh Hessami Pilehrood, Tatiana Hessami Pilehrood

http://arxiv.org/abs/1107.5898
On the Properties of Special Functions on the linear-type lattices
R.Alvarez-Nodarse, J.L. Cardoso

http://arxiv.org/abs/1107.3544
The universal Askey-Wilson algebra and the equitable presentation of
$U_q(\mathfrak{sl}_2)$
Paul Terwilliger

http://arxiv.org/abs/1108.2484
Bipartite Q-polynomial distance-regular graphs and uniform posets
Stefko Miklavic, Paul Terwilliger

Topic #11   -----------   OP-SF NET 18.5 ---------- September 15, 2011

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 130
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:
http://staff.science.uva.nl/~thk/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 see the archive of all messages, go to http://lists.siam.org/mailman/listinfo/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 #12   -----------   OP-SF NET 18.5 ---------- September 15, 2011

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 18.6 should be sent by November 1, 2011.

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 listserv 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 listserv, 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 (2011-2013) are:
Chair: Francisco Marcellán
Vice Chair: Jeff Geronimo
Program Director: Diego Dominici
Secretary: Peter Clarkson

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