O P–S F N E T – Volume 25, Number 1 – January 15, 2018

The Electronic News Net of the
SIAM Activity Group on Orthogonal Polynomials and Special Functions

http://math.nist.gov/opsf

OP–SF Net is distributed through OP–SF Talk.
Subscribe to OP–SF Talk at http://lists.siam.org/mailman/listinfo/siam–OPSF.
Please send contributions to the OP–SF Net editors.

Editors:
Howard S. Cohl   howard.cohl@nist.gov
Sarah Post   spost@hawaii.edu

Topics:

1. Eric Rains and Luc Vinet appointed as AMS Fellows
2. Kannan Soundararajan and Peter Sarnak appointed as AMS Fellows
3. Report on: II Orthonet School in Madrid, Spain, by Bonneux
4. Report on: ACTA 2017 in Belgrade, Serbia, by Van Assche
5. Monograph: "Orthogonal Polynomials and Painlevé Equations," by Van Assche
6. Conference Announcement: SIDE 13 in Fukuoka, Japan
7. Preprints in arXiv.org
8. Submitting contributions to OP–SF NET and SIAM–OPSF (OP–SF Talk)

Calendar of Events:

January 29–February 2, 2018
   Winter School: "Partition Functions and Automorphic Forms"
   Bogoliubov Laboratory of Theoretical Physics, JINR, Dubna, Russia
   http://indico.jinr.ru/event/diastp/Winter2018

September 2–15, 2018
   Complex Differential and Difference Equations
   Banach Center, Będlewo, Poland
   https://www.impan.pl/en/activities/banach–center/conferences/18–cdde

November 11–17, 2018
   Symmetries and Integrability of Difference Equations (SIDE13:2018)
   Fukuoka, Japan
   http://side–conferences.net

June 25–29, 2018
   Orthogonal Polynomials and Special Functions Summer School (OPSF–S8)
   Higher School of Sciences and Technology, Sousse University, Sousse, Tunisia
   http://www.essths.rnu.tn/OPSF–S8/acceuil.html

October 26–29, 2018

The Mediterranean International Conference of Pure and Applied Mathematics and Related Areas, Dedicated to Professor Gradimir V. Milovanovic on the occasion of his 70th Anniversary, Antalya, Turkey
http://micopam2018.akdeniz.edu.tr/information

Summer, 2019

International Symposium on Orthogonal Polynomials, Special Functions & Applications (OPSFA-15)
RISC, Johannes Kepler University, Linz, Austria

Topic #1 ——— OP – SF Net 25.1 ——— January 15, 2018

From: Tom Koornwinder (T.H.Koornwinder@uva.nl)
Subject: Eric Rains and Luc Vinet appointed as AMS Fellows

Eric M. Rains (California Institute of Technology) has become a Fellow of the AMS, in the 2018 Class, "For contributions to quantum information theory and coding theory, the theory of random matrices, the study of special functions, non-commutative geometry and number theory."

Luc Vinet (Université de Montréal) has become a Fellow of the AMS, in the 2018 Class, "For contributions to mathematical physics and special functions, and for service to the mathematical community." Vinet was a plenary speaker at OPSFA-12 (Sousse, Tunisia, 2013).

See http://www.ams.org/profession/ams-fellows/new-fellows.

Topic #2 ——— OP – SF Net 25.1 ——— January 15, 2018

From: OP-SF Net Editors
Subject: Kannan Soundararajan and Peter Sarnak appointed as AMS Fellows

Kannan Soundararajan (Stanford University) has become a Fellow of the AMS, in the 2018 Class, "For contributions to analytic number theory."

Peter Sarnak (Princeton University and The Institute for Advanced Study) has become a Fellow of the AMS, in the 2018 Class, "For contributions to number theory and analysis."

See http://www.ams.org/profession/ams-fellows/new-fellows.

Topic #3 ——— OP – SF Net 25.1 ——— January 15, 2018

From: Niels Bonneux (niels.bonneux@kuleuven.be)
Subject: Report on: II Orthonet School in Madrid, Spain, by Bonneux

The Instituto de Ciencias Matemáticas and the Orthonet network organized the II Orthonet school as part of the thematic program *Orthogonal polynomials and special functions in approximation theory and mathematical physics*. The school took place at ICMAT (Madrid,

Spain) at the end of October and can still be classified as a summer school, since it was above 25℃ [77 ℉] during the entire week. I attended all four advanced courses in orthogonal polynomials and approximation theory. For completeness, the I Orthonet school took place in Sevilla, Spain, in November 2016.

On Sunday, I went to Madrid, together with the rest of the Belgian delegation, to begin the summer school. While travelling to the residence which was located near the campus, we spotted a lot of Spanish flags which stressed the Catalan crisis. The research center, where no student classes are organized, is located a bit outside the city center, and is therefore very quiet on a Sunday evening.

Figure 1: Group picture.

The school started on Monday and the organizers David Gómez-Ullate and Antonio Durán introduced the speakers. Arieh Iserles (DAMTP, Cambridge University) gave the first lecture about quadrature. Next, Robert Milson (Dalhousie University), who had travelled quite a bit, introduced exceptional orthogonal polynomials. In this research domain, the classical Hermite, Laguerre and Jacobi operator are extended to exceptional operators. These two lectures were followed by the typical Spanish siesta. In the afternoon, Walter Van Assche (KU Leuven) taught his first lecture about random matrices and Riemann–Hilbert problems. These last two topics were my main reason for joining this summer school.

On the second day, the same courses continued and went further into their theory. Arieh Iserles discussed recent work on quadrature of highly oscillatory functions and therefore tackled some very technical results. Robert Milson started to classify exceptional orthogonal polynomials as he (and collaborators) proved recently that exceptional polynomials only pop up when you start from a classical operator and apply a finite number of Darboux transformations on it. After the long break, Walter Van Assche treated the Riemann–Hilbert problem for orthogonal polynomials. In conclusion: all talks on the second day dealt with orthogonal polynomials and thus reflected the theme of this summer school very well. In the evening, we played some pool at the residence and enjoyed the sunny evening.

On Wednesday, Iserles went further into technical details. Although, his enthusiasm triggered us to keep paying attention during the full ninety minute lecture. Next, Milson, who was now fully recovered from his jetlag, explained how operators with rational coefficients still can have an infinite number of eigenpolynomials. At the end of the day, Walter talked during his lecture about how he had a cold despite the beautiful weather. "Is that a drop of water on my nose? No, it's not! You get it? Snot." This was one of the many jokes that he told during his lectures. This helped me to pay attention, even though it was already a long day containing a lot of new and interesting material.

On Thursday, a new speaker arrived at the summer school, Luis Velázquez (Universidad de Zaragoza). He talked about the connection of orthogonal polynomials in random walks and quantum walks. After the lectures, David Gómez-Ullate invited us to visit the city center. We went by train and metro (ruled by different entities). We discovered a couple of famous places in Madrid. "For more touristic details, just visit Wikipedia," as David said. We went to a couple of bars, and the last bar was owned by a friend of David's. It was there that we learned that the organizer of this school was a famous rugby player (a long

time ago). We ate some tapas (typically Spanish), and we arrived back at the residence close to midnight! On Friday morning, me, the other members of the Belgian delegation, and just a few others, attended the last lecture of Iserles. Since there was such a small audience, one can conclude that the trip to the city center was a success. After the morning lecture, Velázquez gave two more lectures about random and quantum walks. His slides were very colorful and funny. For example, all main characters of the Simpsons were present in his slides. If you don't believe me, you can check the slides on all topics here: https://www.icmat.es/RT/optrim/school/lectures.php.

Figure 2: From left to right: W. Van Assche, M. Stevens, N. Bonneux and M. Leurs.

On Friday evening, Walter remembered that he had brought Belgian chocolates for David. Nevertheless, we already said goodbye to him and therefore we got to eat this delightful treat ourselves [Note from editor: isn't that convenient?]. To end this week, we (the Belgian delegation) played the card game 'Oh hell' with Robert Milson and a few other participants. Of course, we added some special Belgian rules to optimize the fun.

One small peculiarity to end this report with: Dinner in Madrid is served around 20:30. This is a Spanish habit which is quite strange for us Belgians. We usually eat somewhere between 18:00 and 19:00. After a week, we finally got used to this and realized that it was time to return home. So, on Saturday, we flew back to Belgium, just as Carles Puigdemont [the Catalan nationalist politician] did a few days later!

The II Orthonet School in Madrid, Spain, was a very useful school which offered advanced lectures involving orthogonal polynomials. My attendance here will definitely improve my upcoming research in exceptional orthogonal polynomials. I hope to visit Madrid again during my PhD. More information on this extremely well-organized, useful, and fun school can be found at: https://www.icmat.es/RT/optrim/school.

Topic #4 ——— OP – SF Net 25.1 ——— January 15, 2018

From: Walter Van Assche (walter.vanassche@kuleuven.be)
Subject: Report on: ACTA 2017 in Belgrade, Serbia, by Van Assche

An international conference *Approximation and Computation – Theory and Applications (ACTA 2017)* was held in Belgrade, Serbia from November 30 to December 2, 2017. This conference was dedicated to Walter Gautschi on the occasion of his 90th birthday. Walter Gautschi and his wife Erika were both present and he actively participated in the conference. Walter Gautschi is very well known in our community of Orthogonal Polynomials and Special Functions and is one of the leading scientists in the field of numerical analysis and approximation. He was professor at Purdue University since 1963 (now emeritus).

The first day was held at the Serbian Academy of Sciences and Arts in a historic building with a very nice lecture room. After the official opening, Gradimir Milovanović gave an overview of Walter Gautschi's work and described him as a *master in approximation*

and computation. Walter Gautschi then gave some reflections on his career and called it *progress by accident.* Miodrag Spalević went on to describe *Walter Gautschi's relation with the Serbian school of numerical integration.* The remainder of the day was filled with plenary talks by five international speakers. I gave a talk on *Multiple Hermite polynomials and simultaneous quadrature* because I knew that Walter Gautschi has a keen interest in numerical quadrature and some people from the Serbian school of numerical integration have recently done some work on the computation of nodes and weights for simultaneous quadrature. In the afternoon Martin Gander (University of Geneva) talked about *Five decades of time parallel time integration: best current methods for parabolic and hyperbolic problems,* related to Gautschi's earlier work on numerical methods for differential equations. Next, Paco Marcellán (Universidad Carlos III de Madrid) talked about *Orthogonal polynomials, Geronimus transformations and quadrature rules.* Sotirios Notaris (National and Kapodistrian University of Athens) talked on *Gauss-Kronrod quadrature: Recent advances and open questions.* Soririos Notaris is a former PhD student of Gautschi with a PhD at Purdue University in 1988. The last speaker of the day was Lothar Reichel (Kent State University, Ohio) with a talk on *Generalized anti-Gauss-type quadrature rules.* I was quite happy to see he was also using simultaneous quadrature but for discrete weights.

The next two days of the conference were held at the Faculty of Mechanical Engineering of the University of Belgrade. There were talks by participants from 12 countries and many talks by young researchers from Serbia. Giuseppe Mastroianni and his (female) colleagues from the University of Basilicata in Italy (Donatella Occorsio, Incoronata Notarangelo, Maria Carmela De Bonis, and Concetta Laurita), talked about polynomial approximation and applications in integration rules for hypersingular integrals, Nyström's method for Fredholm integral equations other integro–differential equations. Walter Gautschi himself gave a talk on *Binet-type polynomials and their zeros* where he recalled Markov's theorem about the monotic behavior of zeros of orthogonal polynomials, which he applied to orthogonal polynomials with a special weight function. Ramon Orive (Universidad de La Laguna, Tenerife) talked about minimax approximation, Yilmaz Simsek (Akdeniz University, Turkey) manipulated several generating functions for special polynomials, and various people explained their work on finite–difference schemes for various differential equations. Since some of the talks were in parallel sessions, I was unable to attend all the talks and had to make a selection, where I usually decided to follow the talks that had titles that sounded familiar or at least not frightening. This unfortunately made me miss a talk by Katica Stevanović Hedrih about *Approximations in vibro-impact dynamics of rolling bodies in successive central collisions on a curvilinear trace,* which I later was told was quite interesting and entertaining.

On Saturday we also had the opportunity to visit the Nikola Tesla museum. This is highly recommended to anyone visiting Belgrade. It started with a short movie explaining Tesla's life and achievements, and then there were some exciting experiments with all sorts of electric generators, lightnings, remotely controlled boats, and lamps. The museum has a number of original items of Nikola Tesla, like books, letters, clothes, etc.

The organizers did a very good job running this conference and the level of speakers and the high quality results surely made this a useful conference and I am pretty sure that Walter Gautschi was very pleased with this scientific token of appreciation of his work and career.

Trivia:

- Walter Gautschi was born on December 11, 1927 in Basel, Switzerland.

- Walter had a twin brother Werner, who passed away on October 3, 1959 in Basel.

- Selected works of Walter (and Werner) Gautschi are published by Birkhäuser in their Contemporary Mathematicians series (http://www.springer.com/gp/book/9781461470335). The three volumes are edited by Claude Brezinski and Ahmed Sameh and contain a selection of papers with commentaries by 12 scientists.

- According to MathSciNet, Walter Gautschi has 198 publications (as of December 6, 2017), and this doesn't include his latest paper *Polynomials orthogonal with respect to cardinal B-spline weight functions* in Numerical Algortihms, Volume 76, Issue 4, pp. 1099–1107 (December 2017).

- Walter Gautschi has written 3 books:

  1. Numerical Analysis: An Introduction, Birkhäuser, Boston, 1997 (2nd edition 2012).
  2. Orthogonal Polynomials: Computation and Approximation, Numerical Mathematics and Scientific Computation, Oxford University Press, 2004.
  3. Orthogonal Polynomials in MATLAB: Exercises and Solutions, SIAM, Philadelphia, 2016.

  One more book will appear soon (by SIAM as an e-book only) about his software repository for orthogonal polynomials.

- Walter Gautschi was involved in two chapters for the Handbook of Mathematical Functions (edited by M. Abramowitz and I. A. Stegun): the chapter *Exponential integral and related function* (which he wrote with William F. Cahill) and the chapter *Error function and Fresnel integrals* (which he wrote alone).

- Walter was also involved in Louis de Branges' proof of the Bieberbach conjecture. He verified (numerically) some essential inequalities and called Richard Askey to find out whether these inequalities were known. Within one day Askey confirmed that the inequalities were true and they were proved in his paper with George Gasper.

Topic #5 ⸺ OP – SF Net 25.1 ⸺ January 15, 2018

From: OP–SF Net Editors
Subject: Monograph: "Orthogonal Polynomials and Painlevé Equations," by Van Assche

Title: Orthogonal Polynomials and Painlevé Equations
Author: Walter Van Assche
Series: Australian Mathematical Society Lecture Series, volume 27
Publisher: Cambridge University Press

There are a number of intriguing connections between Painlevé Equations and orthogonal polynomials, and this book is one of the first to provide an introduction to these. Researchers in integrable systems and non-linear equations will find the many explicit examples where Painlevé equations appear in mathematical analysis very useful. Those interested in the asymptotic behavior of orthogonal polynomials will also find the description of Painlevé transcendents and their use for local analysis near certain critical points helpful to their work. Rational solutions and special function solutions of Painlevé equations are worked out in detail, with a survey of recent results and an outline of their

Australian Mathematical Society Lecture Series 27

Orthogonal Polynomials and Painlevé Equations

Walter Van Assche

close relationship with orthogonal polynomials. Exercises throughout the book help the reader to get to grips with the material. The author is a leading authority on orthogonal polynomials, giving this work a unique perspective on Painlevé equations.

Table of contents:

1. Introduction
2. Freud weights and discrete Painlevé I
3. Discrete Painlevé II
4. Ladder operators
5. Other semi-classical orthogonal polynomials
6. Special solutions of Painlevé equations
7. Asymptotic behavior of orthogonal polynomials near critical points
   Appendix. Solutions to exercises
   References
   Index

For members of the SIAM activity group there is a 20% discount. Visit this link and enter the code VANASSCHE2017 at the checkout.

This offer expires on October 31, 2018.

Topic #6 ———— OP – SF Net 25.1 ———— January 15, 2018

From: Kenji Kajiwara (kaji@imi.kyushu–u.ac.jp)
Subject: Conference Announcement: SIDE 13 in Fukuoka, Japan

Venue: JR Hakata City Conference Rooms, Fukuoka, Japan
Dates: Sunday November 11 (arrival day) to Saturday November 17 (departure day), 2018

SIDE 13 is the 13th in a series of biennial conferences devoted to Symmetries and Integrability of Difference Equations, and in particular to: ordinary and partial difference equations, analytic difference equations, orthogonal polynomials and special functions, symmetries and reductions, discrete differential geometry, integrable discrete systems on graphs, integrable dynamical mappings, (discrete) Painlevé equations, integrability criteria, Yang-Baxter type equations, cluster algebras, difference Galois theory, quantum mappings, quantum field theory on space-time lattices, representation theory, combinatorics, numerical models of differential equations, discrete stochastic models and other related topics.

The first SIDE conference took place in Estérel, Quebec, Canada, May 22-29, 1994. The event was so successful that it gave rise to the series of conferences since held in the United Kingdom, Italy, Japan, France, Finland, Germany, Australia, Bulgaria, China, India and Canada.

SIDE 13 will take place at JR Hakata City Conference Rooms, in Fukuoka, Japan, from November 11, 2018 (arrival day) to November 17, 2018 (departure day). JR Hakata City is located within JR Hakata Station in Fukuoka, and is just five minutes travel from Fukuoka Airport by subway. Fukuoka is one of the oldest historic cities in Japan and famous for its excellent local food. Transportation to and from other major cities in Japan is frequent and reasonably fast: there are more than 60 flights per day from Tokyo (1:30), and more than 70 JR Shinkansen trains per day from Osaka (typically 2:30).

It is expected that the number of participants to the meeting will exceed the number of available slots for talks and posters. The scientific committee will therefore have to make a selection of proposed presentations. Applicants will be informed of the decision of the scientific committee by August 10, 2018.

In general, all talks will be allotted 30 minutes (including discussions). A poster session will be organized and each presenter will have a short two minute oral presentation to advertise the poster. Poster Awards will be organized for students and early career researchers. There will be no parallel sessions. Instead of publishing proceedings we plan to arrange a book of abstracts (1 page each in A4 size).

Important Dates:

- Registration and submission opens: May 13 2018
- Financial support application deadline: June 15, 2018
- Notification of the result of each application: August 10, 2018
- Notification of financial support: July 15, 2018
- Submission deadline for titles and abstracts: July 31, 2018
- Notification of the result of each application: August 10, 2018
- Early bird registration deadline: September 15, 2018
- Final deadline, September 30, 2018

Registration Fee and Related Costs:

- Registration fee:
  - 30,000 JPY (on or before September 15, 2018)
  - 35,000 JPY (after September 15, 2018)
- Conference dinner: 8,000 JPY
- Excursion: 2,000 JPY

Accompanying persons will not be required to pay the registration fee. However, if they choose to attend, the conference dinner and excursion will be charged as above.

Financial Support:

Limited financial support, mainly for early career researchers and students giving presentations, will be available. The deadline of application will be June 15 and the result will be notified July 15. Early Career Researchers: Researchers within five years after obtaining their PhD degrees, counted from May 1, 2018. Other information such as detailed submission guidelines will be given in later announcements.

For further information, please see our website:
http://side13conference.net

JR Hakata City Conference Rooms:
http://www.jrhakatacity.com.e.bv.hp.transer.com/communicationspace/meetingroom
https://www.jrhakatacity.com/translation (Chinese and Korean versions)

For information on the SIDE series see:
http://side-conferences.net

Topic #7 ——— OP – SF Net 25.1 ——— January 15, 2018

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 November and December 2017. This list has been separated into two categories.

OP-SF Net Subscriber E-Prints

http://arxiv.org/abs/1711.00332
Totally bipartite tridiagonal pairs
Kazumasa Nomura, Paul Terwilliger

http://arxiv.org/abs/1711.00456
Series for $1/\pi$ of signature 20
Tim Huber, Dan Schultz, Dongxi Ye

http://arxiv.org/abs/1711.00459
Level 17 Ramanujan-Sato series
Tim Huber, Dan Schultz, Dongxi Ye

http://arxiv.org/abs/1711.01429
The dynamics of conservative peakons in the NLS hierarchy
Stephen C. Anco, Xiangke Chang, Jacek Szmigielski

http://arxiv.org/abs/1711.01590
Asymptotics of Polynomials Orthogonal with respect to a Logarithmic Weight
T. Oliver Conway, Percy Deift

http://arxiv.org/abs/1711.01933
Index transforms with Weber type kernels
Semyon Yakubovich

http://arxiv.org/abs/1711.02362
Laguerre polynomials and transitional asymptotics of the modified Korteweg-de Vries
equation for step-like initial data
Marco Bertola, Alexander Minakov

http://arxiv.org/abs/1711.03006
The asymptotics of the generalised Bessel function
R B Paris

http://arxiv.org/abs/1711.03340
Some remarks on Rogers-Szegő polynomials and Losanitsch's triangle
Johann Cigler

http://arxiv.org/abs/1711.03349
A Characterization of Askey-Wilson polynomials
Maurice Kenfack Nangho, Kerstin Jordaan

http://arxiv.org/abs/1711.03360
The Kontsevich-Penner matrix integral, isomonodromic tau functions and open intersec-
tion numbers
Marco Bertola, Giulio Ruzza

http://arxiv.org/abs/1711.04383
Critical edge behavior in the perturbed Laguerre ensemble and the Painlevé V transcen-
dent
Min Chen, Yang Chen, Engui Fan

http://arxiv.org/abs/1711.04756
Best polynomial approximation on the triangle
Han Feng, Christian Krattenthaler, Yuan Xu

http://arxiv.org/abs/1711.05671
A spectral Szegő theorem on the real line
R. V. Bessonov, S. A. Denisov

http://arxiv.org/abs/1711.07780
A (p,ν)-extension of the Appell function $F_1(\cdot)$ and its properties
S. A. Dar, R. B. Paris

http://arxiv.org/abs/1711.07809
A (p, ν)-extension of Srivastava's triple hypergeometric function and its properties
S. A. Dar, R. B. Paris

http://arxiv.org/abs/1711.07852
Zeros of real random polynomials spanned by OPUC
Maxim L. Yattselev, Aaron Yeager

http://arxiv.org/abs/1711.07862
Algebraic Heun operator and band-time limiting
F. Alberto Grünbaum, Luc Vinet, Alexei Zhedanov

http://arxiv.org/abs/1711.09372
Single-use MIMO system, Painlevé transcendents and double scaling
Hongmei Chen, Min Chen, Gordon Blower, Yang Chen

http://arxiv.org/abs/1711.09495
Analytic and Numerical Analysis of Singular Cauchy integrals with exponential-type weights
S. B. Damelin, K. Diethelm, H. S. Jung

http://arxiv.org/abs/1711.10480
The asymptotics of a generalised Struve function
R. B. Paris

http://arxiv.org/abs/1711.11178
Zeros of random orthogonal polynomials with complex Gaussian coefficients
Aaron Yeager

http://arxiv.org/abs/1712.00447
Newton-Okounkov bodies, cluster duality, and mirror symmetry for Grassmannians
Konstanze Rietsch, Lauren Williams

http://arxiv.org/abs/1712.00928
Effective computation of traces, determinants, and ζ-functions for Sturm-Liouville operators
Fritz Gesztesy, Klaus Kirsten

http://arxiv.org/abs/1712.01324
On (p, q)-Appell Polynomials
P. Njionou Sadjang

http://arxiv.org/abs/1712.01681
Asymptotics to all orders of the Hurwitz zeta function
Arran Fernandez, Athanassios S. Fokas

http://arxiv.org/abs/1712.03482
Asymptotics of Chebyshev Polynomials, III. Sets Saturating Szegő, Schiefermayr, and Totik-Widom Bounds
Jacob S. Christiansen, Barry Simon, Maxim Zinchenko

http://arxiv.org/abs/1712.04250
On three dimensional multivariate version of q-Normal distribution and probabilistic interpretations of Askey-Wilson, Al-Salam-Chihara and q-ultraspherical polynomials
Paweł J. Szabłowski

http://arxiv.org/abs/1712.05636
The two periodic Aztec diamond and matrix valued orthogonal polynomials
Maurice Duits, Arno B. J. Kuijlaars

http://arxiv.org/abs/1712.06382
Partial-skew-orthogonal polynomials and related integrable lattices with Pfaffian tau-functions
Xiang-Ke Chang, Yi He, Xing-Biao Hu, Shi-Hao Li

http://arxiv.org/abs/1712.06422
Symmetry algebra for the generic superintegrable system on the sphere
Plamen Iliev

http://arxiv.org/abs/1712.06474
H_q-semiclassical orthogonal polynomials via polynomial mappings
K. Castillo, M. N. De Jesus, F. Marcellán, J. Petronilho

http://arxiv.org/abs/1712.07018
4d $\mathcal{N} = 1$ quiver gauge theories and the A_n Bailey lemma
Frederic Brünner, Vyacheslav P. Spiridonov

http://arxiv.org/abs/1712.07179
A note on Linnik's Theorem on quadratic non-residues
Paul Balister, Béla Bollobás, Jonathan D. Lee, Robert Morris, Oliver Riordan

http://arxiv.org/abs/1712.08306
Degasperis-Procesi peakons and finite Toda lattice of CKP type: isospectral deformations of tau-functions related to Cauchy kernel
Xiang-Ke Chang, Xing-Biao Hu, Shi-Hao Li

http://arxiv.org/abs/1712.08371
The expansion of the confluent hypergeometric function on the positive real axis
R. B. Paris

http://arxiv.org/abs/1712.08432
Boundaries of sine kernel universality for Gaussian perturbations of Hermitian matrices
Tom Claeys, Thorsten Neuschel, Martin Venker

http://arxiv.org/abs/1712.08435
Zeros of combinations of the Riemann Ξ-function and the confluent hypergeometric function on bounded vertical shifts
Atul Dixit, Rahul Kumar, Bibekananda Maji, Alexandru Zaharescu

http://arxiv.org/abs/1712.09033
The Chazy XII Equation and Schwarz Triangle Functions
Oksana Bihun, Sarbarish Chakravarty

http://arxiv.org/abs/1712.09200
Quantum Walks on Graphs of the Ordered 2-Hamming Scheme and Spin Networks
Hiroshi Miki, Satoshi Tsujimoto, Luc Vinet

http://arxiv.org/abs/1712.10072
On the Intriguing Problem of Counting $(n+1, n+2)$-Core Partitions into Odd Parts
Anthony Zaleski, Doron Zeilberger

http://arxiv.org/abs/1712.10330
A note on the equivalence of fractional relaxation equations to differential equations with varying coefficients
Francesco Mainardi

Other Relevant OP-SF E-Prints

http://arxiv.org/abs/1711.00223
Life-Span of Semilinear Wave Equations with Scale-invariant Damping: Critical Strauss Exponent Case
Ziheng Tu, Jiayun Lin

http://arxiv.org/abs/1711.00353
Semigroup's series for negative degrees of the gaps values in numerical semigroups generated by two integers and identities for the Hurwitz zeta functions
Leonid G. Fel, Takao Komatsu

http://arxiv.org/abs/1711.00434
Quantum algebra from generalized q-Hermite polynomials
Kamel Mezlini, Najib Ouled Azaiez

http://arxiv.org/abs/1711.00908
Feynman-Kac formula for the stochastic Bessel operator
Patrick Waters

http://arxiv.org/abs/1711.00925
The scaling properties and the multiple derivative of Legendre polynomials
Guillaume Marc Laurent, Geoffrey Robert Harrison

http://arxiv.org/abs/1711.01113
New gravitational solutions via a Riemann-Hilbert approach
G. L. Cardoso, J. C. Serra

http://arxiv.org/abs/1711.01356
Dunkl Operators for Arbitrary Finite Groups
Micho Durdevich, Stephen Bruce Sontz

http://arxiv.org/abs/1711.01516
The equidistribution of Fourier coefficients of half integral weight modular forms on the plane
Mezroui Soufiane

http://arxiv.org/abs/1711.01536
On Powers of the Catalan Number Sequence
Gwo Dong Lin

http://arxiv.org/abs/1711.01664
Hypergeometric function and modular curvature
Yang Liu

http://arxiv.org/abs/1711.01827
Identity involving symmetric sums of regularized multiple zeta-star values
Tomoya Machide

http://arxiv.org/abs/1711.01873
Product matrix processes for coupled multi-matrix models and their hard edge scaling limits
Gernot Akemann, Eugene Strahov

http://arxiv.org/abs/1711.02063
Cluster integrable systems, q-Painlevé equations and their quantization
M. Bershtein, P. Gavrylenko, A. Marshakov

http://arxiv.org/abs/1711.02603
Explicit expressions for a certain class of Appell polynomials. A probabilistic approach
José A. Adell, Alberto Lekuona

http://arxiv.org/abs/1711.03501
On distribution formulas for complex and ℓ-adic polylogarithms
Hiroaki Nakamura, Zdzislaw Wojtkowiak

http://arxiv.org/abs/1711.03529
The Ghirlanda-Guerra identities for a randomized Riemann zeta function
Frédéric Ouimet

http://arxiv.org/abs/1711.04257
On multivariable averages of divisor functions
László Tóth, Wenguang Zhai

http://arxiv.org/abs/1711.04746
Checkerboard style Schur multiple zeta values and odd single zeta values
Henrik Bachmann, Yoshinori Yamasaki

http://arxiv.org/abs/1711.04747
An insertion algorithm over staircase tableaux compatible with the ASEP's matrix ansatz
Patxi Laborde-Zubieta

http://arxiv.org/abs/1711.05029
Analytic scattering theory for Jacobi operators and Bernstein-Szegő asymptotics of orthogonal polynomials
D. R. Yafaev

http://arxiv.org/abs/1711.05842
Evaluation of Certain Hypergeometric Functions over Finite Fields
Fang-Ting Tu, Yifan Yang

http://arxiv.org/abs/1711.05985
A kind of orthogonal polynomials and related identities II
Zhi-Hong Sun

http://arxiv.org/abs/1711.06561
Meixner-Pollaczek Quantum System
Tunde Joseph Taiwo

http://arxiv.org/abs/1711.06579
Rogue periodic waves of the focusing NLS equation
Jinbing Chen, Dmitry E. Pelinovsky

http://arxiv.org/abs/1711.06811
Exact solution of the wave equation of a scalar particle in the zero mass limit of Kerr and
Kerr-(anti-)de-Sitter space-times
T. Birkandan, M. Hortaçsu

http://arxiv.org/abs/1711.06849
Closed form expressions for derivatives of Bessel functions with respect to the order
J. L. González-Santander

http://arxiv.org/abs/1711.06902
Shift-invariant Spaces with Countably Many Mutually Orthogonal Generators on the Heisen-
berg group
R. Radha, Saswata Adhikari

http://arxiv.org/abs/1711.07100
Probabilistic and Combinatorial Interpretations for Bernoulli and Euler Polynomials
Lin Jiu, Diane Yahui Shi

http://arxiv.org/abs/1711.07122
Wave functions in abelian Chern-Simons theory on the torus as modular forms of weight
two
Yasuhiro Abe

http://arxiv.org/abs/1711.07126
Exact results for a fractional derivative of elementary functions
Gavriil Shchedrin, Nathanael C. Smith, Anastasia Gladkina, Lincoln D. Carr

http://arxiv.org/abs/1711.08049
Exceptional Bannai-Ito polynomials
Yu Luo, Satoshi Tsujimoto

http://arxiv.org/abs/1711.08368
New Integral representations for the Fox-Wright functions and its applications
Khaled Mehrez

http://arxiv.org/abs/1711.08432
Fluctuation exponents for stationary exactly solvable lattice polymer models via a Mellin
transform framework
Hans Chaumont, Christian Noack

http://arxiv.org/abs/1711.08610
Some identities involving the Cesàro average of Goldbach numbers
Marco Cantarini

http://arxiv.org/abs/1711.08794
A simple expression for the four-point scalar function from Gaussian integrals and Fourier transform
Kamel Benhaddou

http://arxiv.org/abs/1711.08854
F-isocrystal and syntomic regulators via hypergeometric functions
Masanori Asakura, Kazuaki Miyatani

http://arxiv.org/abs/1711.08928
The a-values of the Riemann zeta function near the critical line
Junsoo Ha, Yoonbok Lee

http://arxiv.org/abs/1711.09302
Evaluations of Series of Hyperbolic Functions
Nikolaos D. Bagis

http://arxiv.org/abs/1711.09769
A Pedagogical Intrinsic Approach to Relative Entropies as Potential Functions of Quantum Metrics: the $q-z$ Family
Florio M. Ciaglia, Fabio Di Cosmo, Marco Laudato, Giuseppe Marmo, Fabio M. Mele, Franco Ventriglia, Patrizia Vitale

http://arxiv.org/abs/1711.10519
Vector-valued Hirzebruch-Zagier series and class number sums
Brandon Williams

http://arxiv.org/abs/1711.10638
Asymptotic Expansions of Fundamental Solutions in Parabolic Homogenization
Jun Geng, Zhongwei Shen

http://arxiv.org/abs/1712.00611
Factorization Theorems for Generalized Lambert Series and Applications
Mircea Merca, Maxie D. Schmidt

http://arxiv.org/abs/1712.01155
Matrix methods for Padé approximation: numerical calculation of poles, zeros and residues
Luca Perotti, Michal Wojtylak

http://arxiv.org/abs/1712.01344
On a new (p,q)-Mathieu type power series and its applications
Khaled Mehrez, Zivorad Tomovski

http://arxiv.org/abs/1712.01601
Rooted tree maps and the derivation relation for multiple zeta values
Henrik Bachmann, Tatsushi Tanaka

http://arxiv.org/abs/1712.01687
Certain Geometric Properties of Some Bessel Functions
Rabha M. El-Ashwah, Alaa H. El-Qadeem

http://arxiv.org/abs/1712.01689
Some Characterizations on the Normalized Lommel, Struve and Bessel Functions of the First Kind
Rabha M. El-Ashwah, Alaa H. El-Qadeem

http://arxiv.org/abs/1712.01979
Legendre Polynomials Roots and the F-Pure Threshold of bivariate Forms
Gilad Pagi

http://arxiv.org/abs/1712.02160
Green's function for second order elliptic equations in non-divergence form
Sukjung Hwang, Seick Kim

http://arxiv.org/abs/1712.02255
A new proof for the exact values of $\zeta(2k)$ for $k \in \mathbb{N}$
Marius Costandin

http://arxiv.org/abs/1712.03155
Orthogonal Polynomials in Mathematical Physics
Chuan-Tsung Chan, A. Mironov, A. Morozov, A. Sleptsov

http://arxiv.org/abs/1712.03313
On addition theorems related to elliptic integrals
Malkhaz Bakuradze, Vladimir Vershinin

http://arxiv.org/abs/1712.03571
Polynomial birth-death processes and the second conjecture of Valent
Ivan Bochkov

http://arxiv.org/abs/1712.03576
On differential operators for bivariate Chebyshev polynomials
E. V. Damaskinsky, M. A Sokolov

http://arxiv.org/abs/1712.03647
Generalized hypergeometric series for Racah matrices in rectangular representations
A. Morozov

http://arxiv.org/abs/1712.04152
Determinant expressions of constraint polynomials and the spectrum of the asymmetric quantum Rabi model
Kazufumi Kimoto, Cid Reyes-Bustos, Masato Wakayama

http://arxiv.org/abs/1712.04387
On a generalization of the Bessel function Neumann expansion
Antti Koskela, Elias Jarlebring

http://arxiv.org/abs/1712.05169
On zeros of the bilateral Hurwitz and periodic zeta functions
Takashi Nakamura

http://arxiv.org/abs/1712.05503
On averages of sums over regular integers modulo n
Waseem Alass

http://arxiv.org/abs/1712.05705
New properties of Special Functions and applications
Vagner Jikia, Ilia Lomidze

http://arxiv.org/abs/1712.06082
The fundamental Laplacian eigenvalue of the regular polygon with Dirichlet boundary conditions
Robert Stephen Jones

http://arxiv.org/abs/1712.06133
Critical graph of a polynomial quadratic differential related to a Schrödinger equation with quartic potential
Mondher Chouikhi, Faouzi Thabet

http://arxiv.org/abs/1712.06506
A new fractional derivative of variable order with non-singular kernel and fractional differential equations
J. Vanterler da C. Sousa, E. Capelas de Oliveira

http://arxiv.org/abs/1712.07055
Zero distribution for Angelesco Hermite-Padé polynomials
Evguenii A. Rakhmanov

http://arxiv.org/abs/1712.07208
Several explicit formulae of sums and hyper-sums of powers of integers
Fouad Bounebirat, Diffalah Laissaoui, Mourad Rahmani

http://arxiv.org/abs/1712.07341
Infinitesimal Chow Dilogarithm
Sinan Unver

http://arxiv.org/abs/1712.07503
Filtering the Tau method with Frobenius-Padé Approximants
João Carrilho de Matos, José M. A. Matos, Maria João Rodrigues

http://arxiv.org/abs/1712.07579
Derivatives of Horn-type hypergeometric functions with respect to their parameters
V. Bytev, B. Kniehl, S. Moch

http://arxiv.org/abs/1712.07581
Riemann-Theta Boltzmann Machine
Daniel Krefl, Stefano Carrazza, Babak Haghighat, Jens Kahlen

http://arxiv.org/abs/1712.07582
Solving differential and integral equations with Tau method
João Carrilho de Matos, José M. A. Matos, Maria João Rodrigues

http://arxiv.org/abs/1712.07766
Interlacing Families III: Sharper Restricted Invertibility Estimates
Adam W. Marcus, Daniel A. Spielman, Nikhil Srivastava

http://arxiv.org/abs/1712.07903
Introduction to Random Matrices - Theory and Practice
Giacomo Livan, Marcel Novaes, Pierpaolo Vivo

http://arxiv.org/abs/1712.08039
Two asymptotic expansions for gamma function developed by Windschitl's formula
Zhen-Hang Yang, Jing-Feng Tian

http://arxiv.org/abs/1712.08051
An accurate approximation formula for gamma function
Zhen-Hang Yang, Jing-Feng Tian

http://arxiv.org/abs/1712.08174
Poincaré and Eisenstein series for Jacobi forms of lattice index
Andreea Mocanu

http://arxiv.org/abs/1712.08247
Pricing double barrier options on homogeneous diffusions: a Neumann series of Bessel functions representation
Igor V. Kravchenko, Vladislav V. Kravchenko, Sergii M. Torba, José Carlos Dias

http://arxiv.org/abs/1712.08434
The Fourier transform of the non-trivial zeros of the zeta function
Levente Csoka

http://arxiv.org/abs/1712.08492
Quantitative Boltzmann Gibbs principles via orthogonal polynomial duality
Mario Ayala, Gioia Carinci, Frank Redig

http://arxiv.org/abs/1712.08541
Special functions, transcendentals and their numerics
Jakob Ablinger, Johannes Blumlein, Mark Round, Carsten Schneider

http://arxiv.org/abs/1712.08546
Tau functions as Widom constants
M. Cafasso, P. Gavrylenko, O. Lisovyy

http://arxiv.org/abs/1712.08614
Combinatorial structure of colored HOMFLY-PT polynomials for torus knots
Petr Dunin-Barkowski, Aleksandr Popolitov, Sergey Shadrin, Alexey Sleptsov

http://arxiv.org/abs/1712.09231
Graphic Enumerations and Discrete Painlevé Equations via Random Matrix Models
Chuan-Tsung Chan, Hsiao-Fan Liu

http://arxiv.org/abs/1712.09516
Expansions of multiple Stratonovich stochastic integrals, based on generalized multiple Fourier series
Dmitriy F. Kuznetsov

http://arxiv.org/abs/1712.09564
On q-deformations of Heun equation
Kouichi Takemura

http://arxiv.org/abs/1712.09746
Expansion of Multiple Ito Stochastic Integrals of Arbitrary Multiplicity, Based on Generalized Multiple Fourier Series, Converging in the Mean
Dmitriy F. Kuznetsov

http://arxiv.org/abs/1712.09933
The hyperbolic asymptotics of elliptic hypergeometric integrals arising in supersymmetric gauge theory
Arash Arabi Ardehali

http://arxiv.org/abs/1712.09976
p-adic multiple zeta values at roots of unity and p-adic pro-unipotent harmonic actions; IV : around p-adic continuity and interpolation in $\mathbb{Z}_p^{\text{depth}}$; IV-1 : p-adic multiple zeta values at roots of unity extended to sequences of integers of any sign
David Jarossay

http://arxiv.org/abs/1712.10323
New generalizations of Zeta-Function and Tricomi function
N. Virchenko, A. Ponomarenko

http://arxiv.org/abs/1712.10332
Integrals containing the logarithm of the Airy Function $Ai'(x)$
Bernard J. Laurenzi

Topic #8 ——— OP – SF Net 25.1 ——— January 15, 2018

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 e-mail to one of the OP-SF Editors howard.cohl@nist.gov, or spost@hawaii.edu.
Contributions to OP-SF NET 25.2 should be sent by March 1, 2018.

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 as well as news about new appointments, promotions, research visitors, awards and prizes. 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 e-mail 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 (2017–2019) are:
    Walter Van Assche, Chair
    Andrei Martínez-Finkelshtein, Vice Chair
    Sarah Post, Program Director
    Yuan Xu, Secretary

The appointed officers are:
    Howard Cohl, OP-SF NET co-editor
    Sarah Post, OP-SF NET co-editor
    Diego Dominici, OP-SF Talk moderator
    Bonita Saunders, Webmaster and OP-SF Talk moderator

Thought of the month

"The problem of distinguishing prime numbers from composites, and of resolving composite numbers into their prime factors, is one of the most important and useful in all of arithmetic...The dignity of science seems to demand that every aid to the solution of such an elegant and celebrated problem be zealously cultivated."

Carl Friedrich Gauss, Disquisitiones Arithmeticæ, Article 329 (1801).