O P-S F N E T – Volume 30, Number 4 – July 15, 2023

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Topics:

1. Report by **Van Assche**: AAA2023, **Gradimir Milovanović** 75th in Vrnjačka Banja, Serbia
2. Report by: **Van der Jeugt**: Algebraic structures and SF, **Luc Vinet** 70th in Ghent, Belgium
3. Report by: **Kuijlaars**: OP & Applications, dedicated to **Walter Van Assche** in Leuven, Belgium
4. Report by: **Organizers**: ILAS2023: Minisymposium on OP & Matrix Analysis in Madrid, Spain
5. Report by: **Martínez-Finkelshtein**: FoCM 2023 conference & OPSF Workshop in Paris, France
6. Report by: **Dumitriu**: FoCM 2023 conference, Workshop on Random Matrices in Paris, France
7. Preprints in arXiv.org
8. Submitting contributions to OP-SF NET and SIAM-OPSF (OP-SF Talk)
9. Thought of the Month by **Tom H. Koornwinder**

Calendar of Events:

August 14-18, 2023
   International Conference on Spectral Theory and Approximation (ICSTA)
   Lund University, Lund, Sweden.
   https://icsta.se/
   *Registration is now open (deadline June 14)
   *Funding is available for Ph.D. students/postdocs

December 14-15, 2023
   4th Workshop "Two Days of Orthogonal Polynomials "
   University of Almería, Almería, Spain
    Dedicated to Guillermo López Lagomasino for his 75th anniversary and to
    Andrei Martínez Finkelshtein for his 60th anniversary.
   https://w3.ual.es/GruposInv/Tapo/D2PO-2023/comollegar.html

January 3–6, 2024

2024 Joint Mathematics Meetings, American Mathematical Society,
Moscone Center, San Francisco, California, USA
https://www.jointmathematicsmeetings.org/meetings/national/jmm2024/2300_program.html

AWM–AMS Noether Lecture: Anne Schilling: The Ubiquity of Crystal Bases

AMS Special Session on Numerical Analysis, Spectral Graph Theory, Orthogonal Polynomials,
and Quantum Algorithms,
Organized by Anastasiia Minenkova, Gamal Mograby, and Anastasiia Minenkova (SS 92A)

AMS Special Session on Partition Theory and q–Series,
Organized by William Jonathan Keith, Brandt Kronholm, and Dennis Eichhorn (SS 30A)

June 24–28, 2024

17th International Symposium on Orthogonal Polynomials, Special Functions and Applications
(OPSFA–17),
Universidad de Granada, Granada, Spain.
https://opsfa17.com/

Topic #1 —— OP – SF Net 30.4 —— July 15, 2023

From: Walter Van Assche (walter.vanassche@kuleuven.be)
Subject: Report by **Van Assche**: AAA2023, **Gradimir Milovanović** 75th in Vrnjačka Banja, Serbia

Report on *International Mathematical Conference on Analysis, Approximation and Applications* (AAA2023)
by Walter Van Assche

In order to celebrate the 75th birthday of Professor Gradimir Milovanović, an international conference was held in Vrnjačka Banja, a popular spa in Serbia, some 200 km south of Belgrade, from July 21 to July 24, 2023. There were four plenary talks by Alexander Aptekarev, Vilmos Totik, Paco Marcellán and Walter Van Assche on topics close to the research interests of Milovanović, i.e., L^p–bounds for orthogonal polynomials, polynomial inequalities, orthogonal polynomials and quadrature formulas, and multiple orthogonal polynomials. On the first day, Miodrag Spalević and Marija Stanić gave an overview of the life and scientific career of Gradimir Milovanović, who was a professor at the University of Niš from 1986 to 2008, where he was Rector from 2004 until 2006, and from 2008 to 2011, he was Dean of the Faculty of Computer Sciences at Megatrend University. At present he is a Research Professor at the Mathematical Institute of the Serbian Academy of Sciences and Arts (SANU) and he is a full member of the Serbian Academy since 2012.

There was also a talk by Walter Gautschi, a special guest and longtime collaborator of Milovanović, who proved that at the age of 95 one can still do interesting and relevant mathematical research by presenting his work on Gauss quadrature for Ramanujan's integral

$$\int_0^1 \frac{\Gamma(a,t)}{\Gamma(a)}\,\mathrm{d}a,$$

which involves the gamma function and the incomplete gamma function. The contributed talks were in three parallel sessions. All the talks took place in a local Gymnasium (high school) at Vrnjačka Banja.

Figure 1: Group photo with Gradimir Milovanović on the first row, third from the right, next to Walter Gautschi and Marija Stanić.

Topic #2 ——— OP – SF Net 30.4 ——— July 15, 2023

From: Joris Van der Jeugt (Joris.VanderJeugt@ugent.be)
Subject: Report by: **Van der Jeugt**: Algebraic structures and SF, **Luc Vinet** 70th in Ghent, Belgium

Report on the Workshop "Algebraic structures and special functions in theoretical physics", Ghent, Belgium, 26–30 June 2023.

This workshop was organized to celebrate the achievements of Professor Luc Vinet (Montreal) on the occasion of his 70th birthday. The aim of this workshop, where participation was by invitation only, was to bring together researchers and scientists who have collaborated with Luc or whose work is close to that of Luc. The organizers (Hendrik De Bie and Joris Van der Jeugt from Ghent University, and Nicolas Crampé from University of Tours) had a limited budget available, so it was not possible to invite all scientists of the huge network of Luc. So they had to make a choice, based on availability and on personal contacts. Senior scientists as well as young postdocs from Luc were present.

Luc Vinet is a leading figure in the field of mathematical physics. He is known for his expertise in: algebraic structures, special functions and orthogonal polynomials, theory of quantized fields, quantum information, quantum mechanics, symmetry and conservation laws, integrable systems and random processes. All of these areas were covered during the workshop. Quite a lot of presentations were on
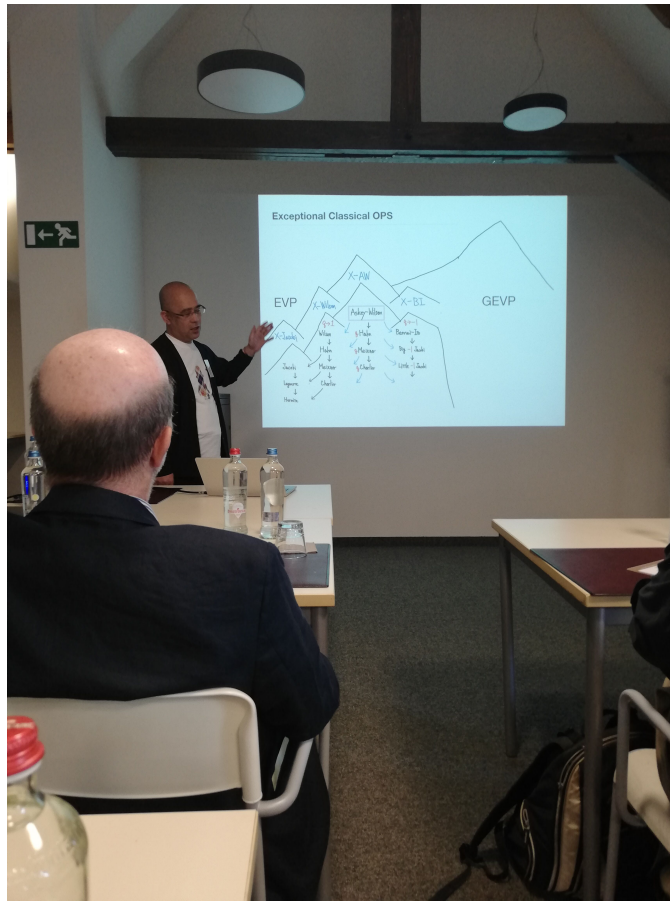
Figure 2: Satoshi Tsujimoto explains his extension of the Askey mountains. Photo provided by Hendrik De Bie.

topics of relevance for this SIAM Activity Group. To name a few: Luc Lapointe talked about m-symmetric Macdonald polynomials; Luc Frappat about multivariate orthogonal polynomials in a icosidodecahedron scheme, derived from the rank two Racah algebra; Plamen Iliev about the Gaudin model for the multinomial distribution; Tom Koornwinder about symmetric and nonsymmetric Askey-Wilson functions and symmetries of the Askey-Wilson DAHA; Eric Koelink about convolution identities; Julien Gaboriaud about tridiagonal pairs of particular shape, the $sl(2)$ algebra and underlying orthogonal polynomials; Walter Van Assche about multiple orthogonal polynomials; Loïc Poulain d'Andecy about Racah polynomials and Rankin-Cohen brackets; Satoshi Tsujimoto about exceptional biorthogonal rational functions.

Yvan Saint-Aubin presented, apart from a scientific talk, also a special presentation on the Life(s) of Luc, and the different highlights as a scientist, as an organizer, as a director and manager, as a leader, promoter and supervisor who always brings out the best in his students and postdocs.

All participants stayed in the same hotel Monasterium Poortackere, in the historic center of Ghent, where the workshop itself took place in a conference room. There were long breaks, so participants had time to exchange ideas and to get inspiration for future work. The participants and Luc enjoyed the charming place, the beautiful surroundings, and the relaxed atmosphere of the workshop.

Figure 3: Yvan Saint-Aubin presenting the life(s) of Luc. Photo provided by Hendrik De Bie.

Figure 4: Conference dinner 'honorary' table: Back row: Hendrik De Bie – Luc Vinet – Letitia (wife of Luc) – Nicolas Crampé. Front row: Hendrik's wife Annelies – Joris's wife Vera – Joris Van der Jeugt – Jean-Sébastien Caux. Photo provided by Hendrik De Bie.

From: Arno Kuijlaars (arno.kuijlaars@kuleuven.be)
Subject: Report by: **Kuijlaars**: OP & Applications, dedicated to **Walter Van Assche** in Leuven, Belgium

Report on: *Orthogonal Polynomials and Applications*, June 8–10, 2023, in Leuven, Belgium, a conference dedicated to **Walter Van Assche**.

Walter Van Assche is a leading figure in the field of orthogonal polynomials, special functions and their applications. He made fundamental contributions to orthogonal and multiple orthogonal polynomials, their algebraic and analytic properties as well as to their asymptotic analysis.

Figure 5: The grave of Stieltjes in Toulouse (taken in March 1995) together with Jacob Korevaar (who turned 100 this year) and Marcel de Bruin.

With the conference in Leuven, we celebrated the achievements of Walter Van Assche on the occasion of his 65th birthday. In the Belgian situation, reaching the age of 65 inevitably means that Walter will be emeritus professor, starting October 1st, 2023. However, he promised to remain active in research.

The conference was attended by around 50 participants, many old friends and colleagues of Walter, but also younger researchers. The program consisted of 9 invited talks and 17 shorter contributions. The talks gave a good overview of current developments in orthogonal polynomials and special functions.

Interesting contributions from Ph.D. students and postdocs showed that the field continues to attract new young people. The talks were met with lively discussions.

Alexander Aptekarev, Galina Filipuk, and Paul Nevai, who were not able to join the meeting in person, gave their online greetings to Walter. They joined the other participants in showing pictures of Walter at various events, and sharing their reminiscences about more than 40 successful years of work in orthogonal polynomials and special functions.

Figure 6: Two giants in OPSFA: Askey and Olver, taken in Washington DC in April 2011.

At the end of the conference, also Walter contributed by showing his own set of pictures. This included many of the friends and colleagues that were present at this memorable event.

Topic #4 ——— OP – SF Net 30.4 ——— July 15, 2023

From: Paco Marcellán (pacomarc@ing.uc3m.es), Amilcar Branquinho (ajplb@mat.uc.pt),
  Ana Foulquié (foulquie@ua.pt), Manuel Mañas (mmanasba@ucm.es)
Subject: Report by: **Organizers**: ILAS2023: Minisymposium on OP & Matrix Analysis in Madrid, Spain

The contributed Minisymposium on Orthogonal Polynomials, Matrix Analysis and Applications at the 25th Conference of the International Linear Algebra Society (ILAS2023), which took place in Madrid, Spain, on June 14–16, 2023, was dedicated to discussing recent trends in the field of orthogonal polynomials, matrix analysis, and their applications in various areas. The event was held in the historical

buildings of the Polytechnic School for Forestry, Forest Engineering, and Natural Environment, Universidad Politécnica de Madrid, creating a friendly atmosphere. Over the course of three days, we had 13 talks, each lasting half an hour, with an average audience size of 30 people per talk.

During the first session on Wednesday morning, Jean Bernard Lasserre (Université de Toulouse, France) presented a talk on the applications of the Christoffel function in real algebraic geometry, the equilibrium measure of compact sets, polynomial Pell's equation, and duality in polynomial optimization. Teresa E. Pérez (Universidad de Granada, Spain) introduced a time-dependent parameter and explained how to solve a Lax-type pair system for the coefficients of the three-term relations. She also deduced several characterizations relating the Lax-type pair, the shape of the weight, Stieltjes function, moments, a differential equation for the weight, and bidimensional Toda-type systems. Maxim Derevyagin (University of Connecticut, USA) reviewed the basics of discrete Darboux transformations for orthogonal polynomials, demonstrating how these transformations lead to various types of orthogonalities such as Sobolev and exceptional, and how they generate rational orthogonal functions. Francisco Marcellán (Universidad Carlos III de Madrid, Spain) discussed Darboux transformations for CMV matrices and the presence of spurious solutions, illustrating that these spurious solutions are associated with certain Sobolev inner products.

The Thursday morning session featured talks on bivariate orthogonality, exceptional orthogonality, and Sobolev orthogonal polynomials, delivered by Jeffrey S. Geronimo (Georgia Institute of Technology, USA), Mirta M. Castro Smirnova (Universidad de Sevilla, Spain), and Niel van Buggenhout (Univerzita Karlova, Czech Republic), respectively. Jeff presented a class of Bernstein-Szegő measures on $\mathbb{R}^2$, extending the one-dimensional class of Bernstein-Szegő measures, and discussed their spectral properties as well as conditions involving finitely many moments that completely characterize this class. Mirta discussed examples of exceptional orthogonal polynomials in connection with the problem of time and band-limiting. Niel introduced the projection of a certain Jordan matrix onto the Krylov subspace to obtain a Hessenberg matrix containing the recurrence coefficients for polynomials orthogonal with respect to a Sobolev inner product. He proposed two new algebraic methods for the numerical generation of Sobolev orthogonal polynomials and compared them to existing methods.

In the afternoon, Ana Foulquié Moreno (Universidade de Aveiro, Portugal) and Vladimir Lysov (Keldysh Institute of Applied Mathematics, Russia) presented talks on recursion matrices and multiple orthogonal polynomials. Raquel Gonzalo (Universidad Politécnica de Madrid, Spain) focused her presentation on Sobolev orthogonality. Ana showed how the spectral and factorization properties of oscillatory matrices lead to a spectral Favard theorem for bounded banded matrices that admit a positive bidiagonal factorization, in terms of sequences of mixed multiple orthogonal polynomials with respect to a set of positive Lebesgue-Stieltjes measures. She also proved a mixed multiple Gauss quadrature and determined the corresponding degrees of precision. Vladimir considered tridiagonal Jacobi matrices (or discrete Schrödinger operators) on graphs, implementing such operators on homogeneous trees using Hermite-Padé interpolation problems for perfect systems. He posed an interpolation problem for Nikishin systems, a subclass of perfect systems, in which the solutions satisfy nearest-neighbor recurrent relations while the coefficients and the Jacobi matrix remain bounded. Finally, Raquel discussed the problem of locating the zeros of Sobolev polynomials associated with compactly supported measures in the complex plane, applying a matrix analysis approach through the associated moment matrix.

The final session, held on Friday morning, included three talks on matrix analysis in moment problems and orthogonal polynomial theory, presented by Alberto Lastra (Universidad de Alcalá, Spain), Luis Verde-Star (Universidad Autónoma Metropolitana, Mexico), and Carmen Escribano (Universidad Politécnica de Madrid, Spain). Alberto considered kernel functions for generalized summability to find the general solution to a linear system of moment differential equations $\partial_m y = Ay$ for a given complex matrix A. He illustrated this method with different sequences m, describing the asymptotic growth of the solutions at infinity in terms of the associated moment sequence from various perspectives. Luis showed that the three-term recurrence relation satisfied by a sequence of orthogonal polynomials can be expressed as the matrix equation $LC = CX$, where L is the infinite tridiagonal Jacobi matrix with

recurrence coefficients, C is a given matrix, and X is the right shift matrix representing the operator of multiplication by x. This matrix equation was used to obtain simple algebraic formulas for the linearization coefficients. Finally, Carmen discussed Sobolev orthogonal polynomials using matrix analysis via the associated moment matrix. She focused on the behavior of eigenvalues of Hermitian positive definite matrices associated with inner Sobolev products with respect to a set of measures, in relation to the problem of locating zeros of Sobolev orthogonal polynomials. She provided results in this context.

Organizers: **Amilcar Branquinho**, **Ana Foulquié**, **Manuel Mañas** and **Francisco Marcellán**

Topic #5 ——— OP – SF Net 30.4 ——— July 15, 2023

From: Andrei Martínez–Finkelshtein (andrei@ual.es)
Subject: Report by: **Martínez–Finkelshtein**: FoCM 2023 conference & OPSF Workshop in Paris, France

Report on Workshop on Special Functions and Orthogonal Polynomials, Session III.7 of FoCM 2023, June 19–21, 2023, Paris, France, by Andrei Martínez–Finkelshtein.

Figure 7: Some participants of the FoCM 2023 workshop "Special Functions and Orthogonal Polynomials". Photo taken by Andrei Martínez–Finkelshtein.

The 2023 Foundations of Computational Mathematics (FoCM 2023) conference that took place in Paris in June was the ninth conference of the FoCM society, following the meeting that gave birth to the idea of FoCM in Park City (1995) and eight very successful meetings in Rio de Janeiro (1997), Oxford (1999), Minneapolis (2002), Santander (2005), Hong Kong (2008), Budapest (2011), Montevideo (2014) and Barcelona (2017). The conference in Vancouver planned for 2020 was canceled due to the Covid–19 pandemic. These conferences typically attract hundreds of participants from all branches of mathematics, and this one was no exception.

As usual, the conference was organized in three periods, with plenary talks in the mornings and workshops (including poster sessions) in the afternoons running in parallel. Among other highlights, Walter Van Assche gave a plenary talk about multiple orthogonal polynomials, and the 2023 Vasil A. Popov prize winner was announced (Matthew Colbrook, from the University of Cambridge).

The third period (June 19–21) had the workshop "Special Functions and Orthogonal Polynomials," organized by Ana Loureiro, Paco Marcellán, and Andrei Martínez–Finkelshtein. There were 18 talks, among them three semi–plenary (Peter Clarkson, Rob Milson, and Dan Huybrechs), and 10 poster contributors. All sessions took place at the Sorbonne University International Conference Center in central Paris.

Topic #6 ———— OP – SF Net 30.4 ———— July 15, 2023

From: Ioana Dumitriu (idumitriu@ucsd.edu)
Subject: Report by: **Dumitriu**: FoCM 2023 conference, Workshop on Random Matrices in Paris, France

Report on Workshop on Random Matrices, Session II.5 of FoCM 2023, June 15–17, 2023, Paris, France, by Ioana Dumitriu.

This workshop was part of the Foundations of Computational Mathematics 2023 conference, which took place during June 12–21 in Paris, at the Sorbonne University; our workshop took place during the second period (June 15–17). By design, FoCM conferences consist of plenary talks in the mornings and workshops in the afternoon. Over the course of the three afternoons of the workshop, we listened to 14 talks by a variety of researchers; the workshop also contributed three poster submissions to the conference poster session for Period II.

The aim of the workshop was twofold: one, to highlight new developments in random matrix theory and two, to showcase new and interesting uses of random matrix theory in other fields, from randomized numerical linear algebra to statistical physics, quantum computation, combinatorics, and data science. We had two semi–plenary talks, by Gunnar Martinsson (UT Austin) on June 16, and by Roman Vershynin (UC Irvine) on June 17. Gunnar's talk was a survey of techniques for producing low–rank approximations for matrices, including state–of–the–art algorithms; Roman presented a (new) weak Szemeredi regularity lemma using Groethendieck's identity; both of these talks fit under the second objective of our workshop (applications).

The workshop included presentation on theoretical random matrix theory results, with talks on June 15 by Ke Wang (HKUST) on random perturbations of low–rank matrices and by Alan Edelman (MIT) on the conditional determinantal point processes (DPP) approach to random matrix distributions. On June 16, we were treated to an unscheduled talk by March Boedihardjo (Michigan State University) on the spectral radii of symmetric inhomogeneous random matrices and a presentation by Arno Kuijlaars (Katholieke Universiteit Leuven) on Ginibre ensembles with point insertions; the day was closed by Ioana Dumitriu (UC San Diego) with a talk on the extreme singular values of sparse, rectangular, inhomogeneous matrices.

In addition to the plenary talks, the applications part of the workshop consisted of talks on June 15 by Jorge Garza–Vargas (Caltech) on spectral stability under random perturbations, by Tom Trogdon on the predictability and universality in numerical computation, and by Joel Tropp (Caltech) on using random sparse Hamiltonians to prove quantum advantage. On June 16, Liza Rebrova (Princeton) presented a randomized Kaczmarz method for corrupted linear systems, and Folkmar Bornemann (TU Munich) showcased a method to compute asymptotic expansions relating to the longest increasing subsequences in random permutations. On June 17, Pierre Youssef (NYU Abu Dhabi) presented a surprising method to improve the constant connected to the relaxation time of a Markov chain, and Sheehan Olver (Imperial College) discussed numerical methods for computing equilibrium measures from random matrix theory

as well as extensions to other types of particle interactions.

The poster submissions by Henri Goulart (Toulouse INP / IRIT), Jaehee Kim (Duksung University) and Ryan Schneider (UC San Diego) covered applications to random tensors, brain temporal networks, respectively, randomized computation of generalized eigenvalues. The posters were on display for the duration of the period (June 15–17).

The workshop was well-attended, with audiences reaching into the sixties during the semi-plenary talks, and there was a very good amount of interaction between participants during coffee breaks and also after hours.

Topic #7 ——— OP – SF Net 30.4 ——— July 15, 2023

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 May and June 2023. This list has been separated into two categories.

OP-SF Net Subscriber E-Prints

http://arxiv.org/abs/2305.00791
Wave functions for quantum integrable particle systems via partial confluences of multivariate hypergeometric functions
Jan Felipe van Diejen, Erdal Emsiz

http://arxiv.org/abs/2305.00505
Fixed-time safe tracking control of uncertain high-order nonlinear pure-feedback systems via unified transformation functions
Chaoqun Guo, Jiangping Hu, Jiasheng Hao, Sergej Celikovsky, Xiaoming Hu

http://arxiv.org/abs/2305.00778
Symmetry groups, fundamental solutions and conservation laws for conformable time fractional partial differential system with variable coefficients
Xiaoyu Cheng, Lizhen Wang

http://arxiv.org/abs/2305.01282
Cubature rules from Hall-Littlewood polynomials
Jan Felipe van Diejen, Erdal Emsiz

http://arxiv.org/abs/2305.01289
Cubature rules for unitary Jacobi ensembles
Jan Felipe van Diejen, Erdal Emsiz

http://arxiv.org/abs/2305.01532
Maximal polarization for periodic configurations on the real line
Markus Faulhuber, Stefan Steinerberger

http://arxiv.org/abs/2305.01774
Domino tilings of generalized Aztec triangles
Sylvie Corteel, Frederick Huang, Christian Krattenthaler

http://arxiv.org/abs/2305.02194
Generalized hypergeometric coherent states for special functions: mathematical and physical properties
Isiaka Aremua, Messan Médard Akouetegan, Komi Sodoga, Mahouton Norbert Hounkonnou, Yaogan Mensah

http://arxiv.org/abs/2305.02928
Asymptotics of parity biases for partitions into distinct parts via Nahm sums
Kathrin Bringmann, Siu Hang Man, Larry Rolen, Matthias Storzer

http://arxiv.org/abs/2305.02989
Strong q–analogues for values of the Dirichlet beta function
Ankush Goswami, Timothy Huber

http://arxiv.org/abs/2305.03157
Good Will Hunting's Problem: Counting Homeomorphically Irreducible Trees
Ira M. Gessel

http://arxiv.org/abs/2305.03600
Exact formulas for the fourth and fifth cumulant of the Rosenblatt distribution
Enno Diekema

http://arxiv.org/abs/2305.03651
$(\mathfrak{S}_p \times \mathfrak{S}_q)$–Invariant Graphical Parking Functions
Lauren Snider, Catherine Yan

http://arxiv.org/abs/2305.04302
Generalized degenerate stirling numbers arising from degenerate boson normal ordering
Taekyun Kim, Dae San Kim, Hye Kyung Kim

http://arxiv.org/abs/2305.05476
Rational extensions of the Dunkl oscillator in the plane and exceptional orthogonal polynomials
C. Quesne

http://arxiv.org/abs/2305.05995
A sufficient condition for (α, β) Somos 4 Hankel determinants
Ying Wang, Zihao Zhang

http://arxiv.org/abs/2305.06031
A facial order for torsion classes
Eric J. Hanson

http://arxiv.org/abs/2305.06717
On a generalization of Jacobi's elegantissima
Luc Haine

http://arxiv.org/abs/2305.08472
Splitting Appell functions in terms of single quotients of theta functions
Eric T. Mortenson, Dilshod Urazov

http://arxiv.org/abs/2305.09029
Log-concavity and log-convexity of series containing multiple Pochhammer symbols
Dmitrii Karp, Yi Zhang

http://arxiv.org/abs/2305.09030
Using Symbolic Computation to Explore Generalized Dyck Paths and Their Areas
AJ Bu, Doron Zeilberger

http://arxiv.org/abs/2305.11065
Uniform approximation of common Gaussian process kernels using equispaced Fourier grids
Alex Barnett, Philip Greengard, Manas Rachh

http://arxiv.org/abs/2305.11076
Blendstrings: an environment for computing with smooth functions
Robert M. Corless

http://arxiv.org/abs/2305.13038
Generalized L-functions related to the Riemann zeta function
Kathrin Bringmann, Ben Kane, Srimathi Varadharajan

http://arxiv.org/abs/2305.13255
The Geometric Approach to the Classification of Signals via a Maximal Set of Signals
Leon A. Luxemburg, Steven B. Damelin

http://arxiv.org/abs/2305.14253
A heuristic for discrete mean values of the derivative of the Riemann zeta function
Christopher Hughes, Greg Martin, Andrew Pearce-Crump

http://arxiv.org/abs/2305.16933
Representing Piecewise Linear Functions by Functions with Small Arity
Christoph Koutschan, Bernhard Moser, Anton Ponomarchuk, Josef Schicho

http://arxiv.org/abs/2305.17278
One-Parameter Meromorphic Solution of the Degenerate Third Painlevé Equation with Formal Monodromy Parameter $a = \pm i/2$ Vanishing at the Origin
A. V. Kitaev, A. Vartanian

http://arxiv.org/abs/2305.17585
Curious multisection identities by index factorization
C. Vignat, M. Milgram

http://arxiv.org/abs/2305.19025
Prediction theory in Hilbert Spaces: Operator-valued Szego Theory
Badr Missaoui, Nicholas H. Bingham

http://arxiv.org/abs/2305.19128
Uniform relations between the Gauss-Legendre nodes and weights
Óscar López Pouso, Javier Segura

http://arxiv.org/abs/2305.19608
An inverse spectral problem for non-self-adjoint Jacobi matrices
Alexander Pushnitski, František Štampach

http://arxiv.org/abs/2305.19954
Matrix Orthogonal Polynomials: A Riemann-Hilbert approach
Amílcar Branquinho, Ana Foulquié-Moreno, Assil Fradi, Manuel Mañas

http://arxiv.org/abs/2306.01882
A bivariate Q-polynomial structure for the non-binary Johnson scheme
Nicolas Crampé, Luc Vinet, Meri Zaimi, Xiaohong Zhang

http://arxiv.org/abs/2306.02442
Elliptic A_n Selberg integrals
Seamus P. Albion, Eric M. Rains, S. Ole Warnaar

http://arxiv.org/abs/2306.02714
Superspace realizations of the Bannai-Ito algebra
N. Crampe, H. De Bie, P. Iliev, L. Vinet

http://arxiv.org/abs/2306.03035
Double summation addition theorems for Jacobi functions of the first and second kind
Howard S. Cohl, Roberto S. Costas-Santos, Loyal Durand, Camilo Montoya, Gestur Ólafsson

http://arxiv.org/abs/2306.03223
Matrix exceptional Laguerre polynomials
Erik Koelink, Lucía Morey, Pablo Román

http://arxiv.org/abs/2306.04638
Sun's series via cyclotomic multiple zeta values
Yajun Zhou

http://arxiv.org/abs/2306.04921
A hyperelliptic saga on a generating function of the squares of Legendre polynomials
Mark van Hoeij, Duco van Straten, Wadim Zudilin

http://arxiv.org/abs/2306.05158
Mutually inverse series relating Ferrers and associated Legendre functions and generating functions pertaining to them
P. Malits

http://arxiv.org/abs/2306.06681
New asymptotic representations of the noncentral t-distribution
Amparo Gil, Javier Segura, Nico M Temme

http://arxiv.org/abs/2306.07733
Shifted Hankel determinants of Catalan numbers and related results II: Backward shifts
Johann Cigler

http://arxiv.org/abs/2306.08172
Sharp Hardy's Inequalities in Hilbert Spaces
Dimitar K. Dimitrov, Ivan Gadjev, Mourad E. H. Ismail

http://arxiv.org/abs/2306.10523
On Periodic Points in Covering Systems
Yihan Wang

http://arxiv.org/abs/2306.10655
An Infinite Product of the Incomplete Beta Function-type Hypergeometric Function and its Probabilistic Origins
N. S. Witte

http://arxiv.org/abs/2306.10991
Modular relations involving generalized digamma functions
Atul Dixit, Sumukha Sathyanarayana, N. Guru Sharan

http://arxiv.org/abs/2306.11500
A remark on continued fractions for permutations and D-permutations with a weight -1 per cycle
Bishal Deb, Alan D. Sokal

http://arxiv.org/abs/2306.11929
Experimenting with Discrete Dynamical Systems
George Spahn, Doron Zeilberger

http://arxiv.org/abs/2306.12539
On the Hill discriminant of Lamé's differential equation
Hans Volkmer

http://arxiv.org/abs/2306.12682
Counting occurrences of patterns in permutations
Andrew R. Conway, Anthony J. Guttmann

http://arxiv.org/abs/2306.15785
Two-sided permutation statistics via symmetric functions
Ira M. Gessel, Yan Zhuang

http://arxiv.org/abs/2306.15847
Asymptotics and total integrals of the P_I^2 tritronquée solution and its Hamiltonian
Dan Dai, Wen-Gao Long

http://arxiv.org/abs/2306.16411
Expansions and characterizations of sieved random walk polynomials
Stefan Kahler

http://arxiv.org/abs/2306.17085
Rogers-Ramanujan type identities involving double, triple and quadruple sums
Zhi Li, Liuquan Wang

Other Relevant OP-SF E-Prints

http://arxiv.org/abs/2305.00198
Infinitesimal generators for a family of polynomial processes – an algebraic approach
Jacek Wesołowski, Agnieszka Zięba

http://arxiv.org/abs/2305.00202
The resolvent kernel on the discrete circle and twisted cosecant sums
Jay Jorgenson, Anders Karlsson, Lejla Smajlović

http://arxiv.org/abs/2305.00364
φ-(k,n)-absorbing and φ-(k,n)-absorbing primary hyperideals in a krasner (m,n)-hyperring
Mahdi Anbarloei

http://arxiv.org/abs/2305.00498
Some series involving harmonic numbers
Xiaoxia Wang, Haihong He

http://arxiv.org/abs/2305.00563
Dickman multiple polylogarithms and the Lindemann–Furry letters
David Broadhurst, Stephan Ohlmeyer

http://arxiv.org/abs/2305.00626
On two–term hypergeometric recursions with free lower parameters
John M. Campbell, Paul Levrie

http://arxiv.org/abs/2305.00701
First integrals of nonlinear differential equations from nonlocal constants
Mattia Scomparin

http://arxiv.org/abs/2305.00789
A construction of the polylogarithm motive
Clément Dupont, Javier Fresán

http://arxiv.org/abs/2305.00846
On ordered beta distribution and the generalized incomplete beta function
Mayad Al–Saidi, Alexey Kuznetsov, Mikhail Nediak

http://arxiv.org/abs/2305.01262
New developments toward the Gonek Conjecture on the Hurwitz zeta–function
Masahiro Mine

http://arxiv.org/abs/2305.01369
The spectrum of the Poincaré operator in an ellipsoid
Yves Colin de Verdière, Jérémie Vidal

http://arxiv.org/abs/2305.01460
p–adic generalizations of hyper–elliptic functions
Yaacov Kopeliovich

http://arxiv.org/abs/2305.01829
The merging operation and $(d-i)$–simplicial i–simple d–polytopes
Isabella Novik, Hailun Zheng

http://arxiv.org/abs/2305.01950
The Chow–Kontsevich dilogarithm
Sinan Ünver

http://arxiv.org/abs/2305.02754
A lower bound for the beta function
Tiehong Zhao, Miaokun Wang

http://arxiv.org/abs/2305.03367
Orthogonal Intertwiners for Infinite Particle Systems In The Continuum
Stefan Wagner

http://arxiv.org/abs/2305.03370
More properties of (β, γ)–Chebyshev functions and points
Stefano De Marchi, Giacomo Elefante, Francesco Marchetti, Jean–Zacharie Mariethoz

http://arxiv.org/abs/2305.03951
The Riemann Hypothesis for period polynomials of cusp forms
William Craig, Wissam Raji

http://arxiv.org/abs/2305.03978
40 Bilinear Relations of q–Painlevé VI from $N = 4$ Super Chern–Simons Theory
Sanefumi Moriyama, Tomoki Nosaka

http://arxiv.org/abs/2305.03986
First Derivative of Automorphic Function of Triangle Groups
Md. Shafiul Alam

http://arxiv.org/abs/2305.04071
The reflection coefficient of a fractional reflector
Laurent Demanet, Olivier Lafitte

http://arxiv.org/abs/2305.04131
Asymptotics of Generalized Bessel Functions and Weight Multiplicities via Large Deviations of Radial Dunkl Processes
Jiaoyang Huang, Colin McSwiggen

http://arxiv.org/abs/2305.04240
Painlevé/CFT correspondence on a torus
Harini Desiraju

http://arxiv.org/abs/2305.04251
Mellin definition of the fractional Laplacian
Gianni Pagnini, Claudio Runfola

http://arxiv.org/abs/2305.04404
On a class of elliptic orthogonal polynomials and their integrability
Harini Desiraju, Tomas Lasic Latimer, Pieter Roffelsen

http://arxiv.org/abs/2305.04472
KP hierarchy, affine Yangian and $W_{1+\infty}$ algebra
Na Wang

http://arxiv.org/abs/2305.04488
Zak transform associated with the Weyl transform and the system of twisted translates on $\mathbb{R}^{2n}$
Radha Ramakrishnan, Rabeetha Velsamy

http://arxiv.org/abs/2305.04633
Fractal derivatives, fractional derivatives and q–deformed calculus
Airton Deppman, Eugenio Megias, Roman Pasechnik

http://arxiv.org/abs/2305.04781
An extension of Schur's irreducibility result
Ankita Jindal, Sudesh Kaur Khanduja

http://arxiv.org/abs/2305.04786
On the period of Pell-Narayana sequence in some groups
Bahar Kuloğlu, Engin Özkan, Marin Marin

http://arxiv.org/abs/2305.04903
Newton-Okounkov bodies and minimal models for cluster varieties
Lara Bossinger, Man-Wai Cheung, Timothy Magee, Alfredo Nájera Chávez

http://arxiv.org/abs/2305.04906
Quantum Lefschetz theorem revisited
Jun Wang

http://arxiv.org/abs/2305.04999
Enhanced computation of the proximity operator for perspective functions
Luis M. Briceño-Arias, Cristóbal Vivar-Vargas

http://arxiv.org/abs/2305.06069
The Wigner-Vlasov formalism for time-dependent quantum oscillator
E.E. Perepelkin, B.I. Sadovnikov, N.G. Inozemtseva, A.A. Korepanova

http://arxiv.org/abs/2305.06107
On real zeros of the Hurwitz zeta function
Karin Ikeda

http://arxiv.org/abs/2305.06197
Parametric Dynamic Mode Decomposition for nonlinear parametric dynamical systems
Shuwen Sun, Lihong Feng, Hoon Seng Chan, Tamara Miličić, Tanja Vidaković-Koch, Peter Benner

http://arxiv.org/abs/2305.06623
Hankel determinants and Jacobi continued fractions for q-Euler numbers
Shane Chern, Lin Jiu

http://arxiv.org/abs/2305.06761
Isoperiodic foliation of the stratum $\mathcal{H}(1, 1, -2)$
Gianluca Faraco, Guillaume Tahar, Yongquan Zhang

http://arxiv.org/abs/2305.06766
On the Convergence of Random Fourier-Jacobi Series in $\mathrm{L}^{\mathrm{p}}(d\mu_{\zeta, \eta})$ Space
Partiswari Maharana Sabita Sahoo

http://arxiv.org/abs/2305.06998
The Fueter-Sce mapping and the Clifford-Appell polynomials
Antonino De Martino, Kamal Diki, Ali Guzmán Adán

http://arxiv.org/abs/2305.07412
An asymptotic expansion for a Lambert series associated to Siegel cusp forms
Babita, Abhash Kumar Jha, Abhishek Juyal, Bibekananda Maji

http://arxiv.org/abs/2305.07860
Szegő–type theorems on compact Abelian groups and spectral approximations for multiplicative Toeplitz matrices
Kunyu Guo, Dilong Li, Qi Zhou

http://arxiv.org/abs/2305.07869
Some new curious congruences involving multiple harmonic sums
Rong Ma, Ni Li

http://arxiv.org/abs/2305.07966
Positive formula for Jack polynomials, Jack characters and proof of Lassalle's conjecture
Houcine Ben Dali, Maciej Dołęga

http://arxiv.org/abs/2305.08074
Orthogonal polynomial approximation and Extended Dynamic Mode Decomposition in chaos
Caroline L. Wormell

http://arxiv.org/abs/2305.08101
The generalized Zwegers' μ–function and transformation formulas for the bilateral basic hypergeometric series
Genki Shibukawa, Satoshi Tsuchimi

http://arxiv.org/abs/2305.08364
Emergence of the Gambier equation in cosmology
D. Batic, P. Guha, A. Ghose Choudhury

http://arxiv.org/abs/2305.08554
Universality in Binary Black Hole Dynamics: An Integrability Conjecture
José Luis Jaramillo, Badri Krishnan, Carlos F. Sopuerta

http://arxiv.org/abs/2305.08581
Multivariate Kawtchouk polynomials as Birth and Death polynomials
Ryu Sasaki

http://arxiv.org/abs/2305.08618
A note on Appell's functions related to the denominators of affine Lie superalgebras $\widehat{sl}(2|1)$ and $\widehat{osp}(3|2)$
Minoru Wakimoto

http://arxiv.org/abs/2305.08751
Deviation of the rank and crank modulo 11
Nikolay Borozenets

http://arxiv.org/abs/2305.08862
Transition Probabilities and Almost Periodic Functions
S. O. Juriaans, P. C. Queiroz

http://arxiv.org/abs/2305.08976
Eigenvalues of truncated unitary matrices: disk counting statistics
Yacin Ameur, Christophe Charlier, Philippe Moreillon

http://arxiv.org/abs/2305.09170
Multivariate Hahn polynomials, a Birth and Death approach
Ryu Sasaki

http://arxiv.org/abs/2305.09217
Wall–crossing formula for framed quiver moduli
Ryo Ohkawa

http://arxiv.org/abs/2305.09227
On n^{th} order Euler polynomials of degree n that are Eisenstein
Michael Filaseta, Thomas Luckner

http://arxiv.org/abs/2305.09340
Bézout identities and control of the heat equation
François Ollivier

http://arxiv.org/abs/2305.09670
On the zeros of Riemann's Xi Function
Akhila Raman

http://arxiv.org/abs/2305.10858
H^p theory of separately (α, β)–harmonic functions in the unit polydisc
Jelena Gajic, Milos Arsenovic, Miodrag Mateljevic

http://arxiv.org/abs/2305.11492
Results on the Non–Vanishing of Derivatives of L-Functions of Vector–Valued Modular Forms
Subong Lim, Wissam Raji

http://arxiv.org/abs/2305.11836
Fundamental solutions and critical Lane-Emden exponents for nonlinear integral operators in cones
Gabrielle Nornberg, Disson dos Prazeres, Alexander Quaas

http://arxiv.org/abs/2305.12007
Ramanujan sums and rectangular power sums
John Shareshian, Sheila Sundaram

http://arxiv.org/abs/2305.12051
Regulator of the Hesse cubic curves and hypergeometric functions
Yusuke Nemoto

http://arxiv.org/abs/2305.12210
The dual reciprocity boundary elements method for one–dimensional nonlinear parabolic partial differential equations
Peyman Alipour

http://arxiv.org/abs/2305.12241
Analytic continuation of better–behaved GKZ systems and Fourier–Mukai transforms
Zengrui Han

http://arxiv.org/abs/2305.12754
q–difference equation satisfied by the universal mock theta functions
Satoshi Tsuchimi

http://arxiv.org/abs/2305.13007
On the number of roots of Sturm–Liouville random sums
Federico Dalmao, José R. León

http://arxiv.org/abs/2305.13039
On the Study of the Klein-Gordon Equation in the Dunkl Setting
Mohamed Gaidi, Mounir Bedhiafi

http://arxiv.org/abs/2305.14015
The Fan-Taussky-Todd inequalities and the Lumer-Phillips theorem
Benedict Bauer, Stefan Gerhold

http://arxiv.org/abs/2305.14367
A series of Ramanujan, two-term dilogarithm identities and some Lucas series
Kunle Adegoke, Robert Frontczak

http://arxiv.org/abs/2305.14393
Finite Sums and Products involving Special Functions
Robert Reynolds

http://arxiv.org/abs/2305.14664
Two Matrix Model, the Riemann Hypothesis and Master Matrix Obstruction
Michael McGuigan

http://arxiv.org/abs/2305.14988
Some Identities of Ramanujan's q-Continued Fractions of Order Fourteen and Twenty-Eight, and Vanishing Coefficients
Shraddha Rajkhowa, Nipen Saikia

http://arxiv.org/abs/2305.15514
Rotational cmc surfaces in terms of Jacobi elliptic functions
Denis Polly

http://arxiv.org/abs/2305.15806
Expansion of generalized Stieltjes constants in terms of derivatives of Hurwitz zeta-functions
M. Prévost

http://arxiv.org/abs/2305.15882
A filtered Chebyshev spectral method for conservation laws on network
Sabrina Francesca Pellegrino

http://arxiv.org/abs/2305.15970
Boundedness of zeros of Sobolev orthogonal polynomials via generalized eigenvalues
C. Escribano, R. Gonzalo

http://arxiv.org/abs/2305.16184
Analytic continuation of ℓ-generalized Fibonacci zeta function
Dilip Kumar Sahoo, Nabin Kumar Meher

http://arxiv.org/abs/2305.16218
Non-vanishing of multiple zeta values for higher genus curves over finite fields
Daichi Matsuzuki

http://arxiv.org/abs/2305.16537
Functional equations and gamma factors of local zeta functions for the metaplectic cover of SL_2
Kazuki Oshita, Masao Tsuzuki

Oscillating asymptotics for a Nahm-type sum and conjectures of Andrews
Amanda Folsom, Joshua Males, Larry Rolen, Matthias Storzer

ASEP proofs of some partition identities and the blocking stationary behaviour of second class particles
Daniel Adams, Márton Balázs, Jessica Jay

Determination of the symmetry group for some QRT roots
Giorgio Gubbiotti, Yang Shi

An Analysis of the Johnson-Lindenstrauss Lemma with the Bivariate Gamma Distribution
Jason Bernstein, Alec M. Dunton, Benjamin W. Priest

Direct Integral Pseudospectral and Integral Spectral Methods for Solving a Class of Infinite Horizon Optimal Output Feedback Control Problems Using Rational and Exponential Gegenbauer Polynomials
Kareem T. Elgindy, Hareth M. Refat

Tilted biorthogonal ensembles, Grothendieck random partitions, and determinantal tests
Svetlana Gavrilova, Leonid Petrov

On q-Painlevé VI and the geometry of Segre surfaces
Pieter Roffelsen

Matrix-valued θ-deformed bi-orthogonal polynomials, Non-commutative Toda theory and Bäcklund transformation
Claire Gilson, Shi-Hao Li, Ying Shi

On MaxCut and the Lovász theta function
Igor Balla, Oliver Janzer, Benny Sudakov

Sharp Gaussian decay for the one-dimensional harmonic oscillator
Danylo Radchenko, João P. G. Ramos

Determination of normalized extremal quasimodular forms of depth 1 with integral Fourier coefficients
Tomoaki Nakaya

Universality theorems of the Selberg zeta functions for arithmetic groups
Yasufumi Hashimoto

http://arxiv.org/abs/2305.18833
Gaussian Unitary Ensembles with Fisher–Hartwig Singularities and Generalized Painlevé IV Equation
Xinyu Mu, Shulin Lyu

http://arxiv.org/abs/2305.19368
Hypergeometric Sheaves and General Linear Groups
Lee Tae Young

http://arxiv.org/abs/2305.19616
Rodrigues formula and linear independence for values of hypergeometric functions with parameters vary
Makoto Kawashima

http://arxiv.org/abs/2305.19680
Spectral theory of Jacobi operators with increasing coefficients. The critical case
D. R. Yafaev

http://arxiv.org/abs/2305.19852
Generalised unitary group integrals of Ingham–Siegel and Fisher–Hartwig type
Gernot Akemann, Noah Aygün, Tim R. Würfel

http://arxiv.org/abs/2305.19975
The Pieri formulas and the Littlewood–Richardson rule for Schur multiple zeta functions
Shutaro Nakaoka

http://arxiv.org/abs/2306.00161
On the equidistribution properties of patterns in prime numbers Jumping Champions, metaanalysis of properties as Low–Discrepancy Sequences, and some conjectures based on Ramanujan's master theorem and the zeros of Riemann's zeta function
Arturo Ortiz–Tapia

http://arxiv.org/abs/2306.00215
An Elliptic Generalization of A_1 Spherical DAHA at $K = 2$
S. Arthamonov, Sh. Shakirov

http://arxiv.org/abs/2306.00460
Spirals of Riemann's Zeta–Function – Curvature, Denseness, and Universality –
Athanasios Sourmelidis, Jörn Steuding

http://arxiv.org/abs/2306.01331
Quantum dilogarithms over local fields and invariants of 3-manifolds
Stavros Garoufalidis, Rinat Kashaev

http://arxiv.org/abs/2306.01767
On Schur's irreducibility results and generalised φ–Hermite polynomials
Anuj Jakhar

http://arxiv.org/abs/2306.02241
Visible Point Partition Identities for Polylogarithms, and Parametric Euler Sums
Geoffrey B. Campbell

http://arxiv.org/abs/2306.02554
The Voronoi Summation Formula for GL_n via the Godement–Jacquet Zeta Integrals
Dihua Jiang, Zhaolin Li

http://arxiv.org/abs/2306.02635
Supercongruences arising from a $_7F_6$ hypergeometric transformation formula
Chen Wang

http://arxiv.org/abs/2306.02641
On some conjectural series containing binomial coefficients and harmonic numbers
Chuanan Wei

http://arxiv.org/abs/2306.04659
Monotonicity rules for the ratio of two function series and two integral transforms
Zhong-Xuan Mao, Jing-Feng Tian

http://arxiv.org/abs/2306.04799
An unconditional Montgomery Theorem for Pair Correlation of Zeros of the Riemann Zeta Function
Siegfred Alan C. Baluyot, Daniel Alan Goldston, Ade Irma Suriajaya, Caroline L. Turnage-Butterbaugh

http://arxiv.org/abs/2306.04807
On a smoothed average of the number of Goldbach representations
Daniel A. Goldston, Ade Irma Suriajaya

http://arxiv.org/abs/2306.05371
New results on the associated Meixner, Charlier, Laguerre, and Krawtchouk polynomials
Khalid Ahbli

http://arxiv.org/abs/2306.06214
The Bicomplex-Real Calculus and Applications to Bicomplex Hermite-Itô Polynomials
Daniel Alpay, Kamal Diki, Mihaela Vajiac

http://arxiv.org/abs/2306.06444
On the D_ω-classical orthogonal polynomials
Khalfa Douak

http://arxiv.org/abs/2306.06623
Commutative families in W_∞, integrable many-body systems and hypergeometric τ-functions
A. Mironov, V. Mishnyakov, A. Morozov, A. Popolitov

http://arxiv.org/abs/2306.06890
On the irreducibility of extended Laguerre Polynomials
Anuj Jakhar, Srinivas Kotyada, Arunabha Mukhopadhyay

http://arxiv.org/abs/2306.07062
Non-integrability of a four-dimensional Painlevé system of type $D_5^{(1)}$
Tsvetana Stoyanova

http://arxiv.org/abs/2306.07063
Rational Hermite-Padé Approximants vs Padé Approximants. I. Numerical Results
Nikolay R. Ikonomov, Leonid A. Knizhnerman, Sergey P. Suetin

http://arxiv.org/abs/2306.07073
Painlevé type asymptotics of defocusing mKdV equation with a nonzero background
Zhaoyu Wang, Taiyang Xu, Engui Fan

http://arxiv.org/abs/2306.07431
Deformed (s,t)-Binomial Formula applied to the (s,t)-analogues of Elementary functions, Gamma Function and Binomial Series
Ronald Orozco López

http://arxiv.org/abs/2306.07648
Jacob's ladders, almost linear increments of the Hardy–Littlewood integral (1918) and their relations to the Selberg's formula (1946) and the Fermat-Wiles theorem
Jan Moser

http://arxiv.org/abs/2306.07777
Simultaneous extreme values of zeta and L-functions
Winston Heap, Junxian Li

http://arxiv.org/abs/2306.08022
On an Alternating Double Sum of a Triple Product of Aerated Binomial Coefficients
Richard J. Mathar

http://arxiv.org/abs/2306.08389
On Derkachov-Manashov R-matrices for the principal series of unitary representations
Yury A. Neretin

http://arxiv.org/abs/2306.08411
The MacWilliams Identity for the Hermitian Rank Metric
Izzy Friedlander

http://arxiv.org/abs/2306.08493
A Note on Twisted Moments of Dirichlet L-functions
J. C. Andrade, J. MacMillan

http://arxiv.org/abs/2306.08831
Integrality of the higher Rademacher symbols
Cormac O'Sullivan

http://arxiv.org/abs/2306.09102
The Average Number of Goldbach Representations and Zero-Free Regions of the Riemann Zeta-Function
Keith Billington, Maddie Cheng, Jordan Schettler, Ade Irma Suriajaya

http://arxiv.org/abs/2306.10393
Many p-adic odd zeta values are irrational
Li Lai, Johannes Sprang

http://arxiv.org/abs/2306.10446
Hurwitz spaces, Nichols algebras, and Igusa zeta functions
Kevin Chang

http://arxiv.org/abs/2306.10653
Weierstrass elliptic functions for the pendulum
Oliver Knill

http://arxiv.org/abs/2306.10680
Explicit bounds for the Riemann zeta function and a new zero-free region
Chiara Bellotti

http://arxiv.org/abs/2306.11381
Computation of the Wright function from its integral representation
Dimiter Prodanov

http://arxiv.org/abs/2306.11718
`MultiHypExp`: A Mathematica Package For Expanding Multivariate Hypergeometric Functions In Terms Of Multiple Polylogarithms
Souvik Bera

http://arxiv.org/abs/2306.11875
Quartic Gauss sums over primes and metaplectic theta functions
Chantal David, Alexander Dunn, Alia Hamieh, Hua Lin

http://arxiv.org/abs/2306.12263
Local Statistics in Normal Matrix Models with Merging Singularity
Torben Krüger, Seung-Yeop Lee, Meng Yang

http://arxiv.org/abs/2306.12265
Spectral quantization of discrete random walks on half-line, and orthogonal polynomials on the unit circle
Adam Doliwa, Artur Siemaszko

http://arxiv.org/abs/2306.12399
Character analogues of Cohen type identities and related Voronoi summation formulas
Debika Banerjee, Khyati Khurana

http://arxiv.org/abs/2306.12877
Trigonometric analogue of the identities associated with twisted sums of divisor functions
Debika Banerjee, Khyati Khurana

http://arxiv.org/abs/2306.13289
Explicit bounds for the Riemann zeta-function on the 1-line
Ghaith A. Hiary, Nicol Leong, Andrew Yang

http://arxiv.org/abs/2306.13309
Partitions with parts separated by parity: conjugation, congruences and the mock theta functions
Shishuo Fu, Dazhao Tang

http://arxiv.org/abs/2306.13619
Sampling in the shift-invariant space generated by the bivariate Gaussian function
José Luis Romero, Alexander Ulanovskii, Ilya Zlotnikov

http://arxiv.org/abs/2306.13635
Factoring determinants and applications to number theory
Estelle Basor, Brian Conrey

http://arxiv.org/abs/2306.14107
A Riemann-Hilbert approach to skew-orthogonal polynomials of symplectic type
Alex Little

http://arxiv.org/abs/2306.14166
Random normal matrices: eigenvalue correlations near a hard wall
Yacin Ameur, Christophe Charlier, Joakim Cronvall

http://arxiv.org/abs/2306.14371
Shuffle formula in science fiction for Macdonald polynomials
Donghyun Kim, Seung Jin Lee, Jaeseong Oh

http://arxiv.org/abs/2306.14625
On the relation between quantum walks and absolute zeta functions
Norio Konno

http://arxiv.org/abs/2306.14656
Discrete Bessel functions and discrete wave equation
Amar Bašić, Lejla Smajlović, Zenan Šabanac

http://arxiv.org/abs/2306.14835
Asymptotics of the deformed higher order Airy-kernel determinants and applications
Jun Xia, Yi-Fan Hao, Shuai-Xia Xu, Lun Zhang, Yu-Qiu Zhao

http://arxiv.org/abs/2306.15936
Finite field analogues of integral representations of Appell-Lauricella functions using confluent hyper-geometric functions
Akio Nakagawa

http://arxiv.org/abs/2306.15972
On q-Gevrey asymptotics for logarithmic type solutions in singularly perturbed q-difference-differential equations
Alberto Lastra, Stéphane Malek

http://arxiv.org/abs/2306.16679
A short note on strong convergence of q-Gaussians
Akihiro Miyagawa

http://arxiv.org/abs/2306.16720
Asymptotic analysis of the characteristic polynomial for the Elliptic Ginibre Ensemble
Quentin François, David García-Zelada

http://arxiv.org/abs/2306.17677
Dunkl symplectic algebra in generalized Calogero models
Tigran Hakobyan

Topic #8 ———— OP – SF Net 30.4 ———— July 15, 2023

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 30.5 should be sent by September 1, 2023.

OP-SF NET is the electronic newsletter of the SIAM Activity Group on Special Functions and Orthogo-nal Polynomials (SIAG/OPSF). 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 OP–SF Talk which is currently managed and moderated by Howard Cohl (howard.cohl@nist.gov). Anyone wishing to be included in the mailing list (SIAG/OPSF members and non-members alike) should send an email expressing interest to him. Bonita Saunders also posts the Newsletter through SIAM Engage (SIAG/OPSF) which is received by all SIAG/OPSF members.

OP–SF Talk is a listserv associated with SIAG/OPSF which facilitates communication among members, non-members and friends of the Activity Group. To post an item to the listserv,
send e-mail to howard.cohl@nist.gov.

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 (2020–2022*) are:
    Peter Alan Clarkson, Chair
    Luc Vinet, Vice Chair
    Andrei Martínez–Finkelshtein, Program Director
    Teresa E. Pérez, Secretary and SIAM Engage (SIAG/OPSF) moderator

The appointed officers are:
    Howard Cohl, OP–SF NET co-editor
    Sarah Post, OP–SF NET co-editor
    Bonita Saunders, Webmaster and SIAM Engage (SIAG/OPSF) moderator

*As of the date of the publication of OP–SF NET 30.4, the SIAG/OPSF elections have not occurred.

Topic #9 ——— OP – SF Net 30.4 ——— July 15, 2023

From: OP–SF Net Editors
Subject: Thought of the Month by **Tom H. Koornwinder**

"The addition formula for ultraspherical (or Gegenbauer) polynomials is usually ascribed to Gegenbauer in (1874)[1]. However, it is already stated and proved by Allé in 1865[2]. The subsequent proofs by Gegenbauer in 1874 and 1893[3], and by Heine [10, p. 455] in (1878)[4] do not mention Allé's result."

Tom H. Koornwinder, *Dual Addition Formulas Associated with Dual Product Formulas*, Chapter 19, pp. 373–392, Frontiers in Orthogonal Polynomials and q–Series, Ed. M. Zuhair Nashed & Xin Li, Contemporary Mathematics and Its Applications, Vol. 1, 2018, arXiv:1607.06053v5.

Comment by **Claude Brezinski** and **Michela Redivo–Zaglia** on July 4, 2023: I found that Gegenbauer polynomials were also given by **Robert Most**, Ueber die Differentialgleichungen der Kugelfunctionen, J. Reine Angew. Math., 70 (1869) 163–168.

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[2] M. Allé. Über die Eigenschaften derjenigen Gattung von Functionen, welche in der Entwicklung von $(1 - 2qx + q^2)^{-\frac{m}{2}}$ nach aufsteigenden Potenzen von q auftreten, und über die Entwicklung des Ausdruckes $\{1 - 2q[\cos\theta\cos\theta' + \sin\theta\sin\theta'\cos(\psi-\psi')]+q^2\}^{-\frac{m}{2}}$. Sitzungsberichte der mathematisch–naturwissenschaftlichen Classe der kaiserlichen Akademie der Wissenschaften Wien, 51:429–458, 1865.

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