

# OP-SF NET – Volume 28, Number 3 – May 15, 2021

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](mailto:howard.cohl@nist.gov)

Sarah Post

[spost@hawaii.edu](mailto:spost@hawaii.edu)

Topics:

1. Announcement: Nominations for **George Pólya** Prize in Mathematics
2. Announcement: Request for **Askey** PDF's
3. Special Issue on: Orthogonal Polynomials, Special Functions and Applications
4. Preprints in arXiv.org
5. Submitting contributions to OP-SF NET and SIAM-OPSF (OP-SF Talk)
6. Thought of the Month by **Lucy Joan Slater**

## Calendar of Events:

### June 7–11, 2021

33<sup>rd</sup> International Colloquium on Group Theoretical Methods in Physics (Group33)

Cotonou, Benin

<http://www.cipma.net/group33-cotonou-benin>

### June 20–26, 2021

8<sup>th</sup> European Congress of Mathematics (8ECM)

Mini-symposium on Orthogonal Polynomials and Special Functions

Organized by Paco Marcellán, Juan J. Moreno-Balcázar and Galina Filipuk,

Portorož, Slovenia—**Now virtual due to coronavirus pandemic.**

<https://www.8ecm.si/minisymposia>

### July 19–24, 2021

Mathematical Congress of the Americas (MCA 2021)

Special Session on *Special Functions and Orthogonal Polynomials*

Organized by Diego Dominici, Luis E. Garza, Jan Felipe van Diejen

Buenos Aires, Argentina—**Now virtual due to coronavirus pandemic.**

<http://www.mca2021.org/en>

**January 10–14, 2022—Updated new date due to coronavirus pandemic.**

9<sup>th</sup> International Conference on Computational Methods and Function Theory (CMFT 2021)  
Federico Santa María Technical University, Valparaíso, Chile  
<http://cmft2021.inf.utfsm.cl/>

**August 2022—Updated new date due to coronavirus pandemic.**

OPSFA Summer School 2021  
Radboud University, Nijmegen, The Netherlands  
<https://www.ru.nl/radboudsummerschool/courses/2021/opsfa-summer-school/>

**Summer 2022—Tentative new date due to coronavirus pandemic.**

Functional Analysis, Approximation Theory and Numerical Analysis (FAATNA)  
Matera, Italy  
<http://web.unibas.it/faatna20/>

**Summer, 2022—Tentative new dates due to coronavirus pandemic.**

OPSFA-16  
Centre de Recherches Mathématiques, Montreal, Canada

Topic #1 ——— OP – SF Net 28.3 ——— May 15, 2021

From: Walter Van Assche ([walter.vanassche@kuleuven.be](mailto:walter.vanassche@kuleuven.be))

Subject: Announcement: Nominations for **George Pólya** Prize in Mathematics

The George Pólya Prize in Mathematics is awarded every four years for a significant contribution, as evidenced by a refereed publication, in an area of mathematics of interest to George Pólya not covered by the George Pólya Prize in Applied Combinatorics or the George Pólya Prize for Mathematical Exposition. Such areas may include approximation theory, complex analysis, number theory, orthogonal polynomials, probability theory, and mathematical discovery and learning. The prize is broadly intended to recognize specific recent work. The deadline for submission of nominations (that must include "two or three letters of support from experts") is October 15, 2021. More information and submission of nominations can be found at <https://www.siam.org/prizes-recognition/major-prizes-lectures/detail/george-polya-prize-for-mathematics>

Topic #2 ——— OP – SF Net 28.3 ——— May 15, 2021

From: Howard Cohl ([howard.cohl@nist.gov](mailto:howard.cohl@nist.gov))

Subject: Announcement: Request for **Askey** PDF's

If you have a PDF or image of a paper, correspondence or note by by Dick Askey, I would request that you contact me and send me those documents. In collaboration with the expert in-house staff bibliographer at [Celebratio Mathematica](#), they are assembling a full bibliography of Dick's works in connection with the Liber Amicorum for Dick Askey. These PDFs/images will be invaluable for our search and publication. If you perhaps have some especially rare or hard to find copy of one of Dick's papers, we would gratefully appreciate that.

Topic #3 ——— OP – SF Net 28.3 ——— May 15, 2021

From: Gradimir V. Milovanovic ([gvm@mi.sanu.ac.rs](mailto:gvm@mi.sanu.ac.rs))

Subject: Special Issue on: Orthogonal Polynomials, Special Functions and Applications

The journal [Axioms](#) will publish a special issue entitled:  
*Orthogonal Polynomials, Special Functions and Applications*.

The guest editor for this special issue is [Gradimir V. Milovanović](#).

This Special Issue of Axioms is devoted to various aspects of the theory of orthogonality in real or complex spaces with respect to the standard inner product (classical and strongly nonclassical cases) and moment functionals, including one-dimensional and multidimensional cases. Contributions considering the development and application of special functions, as well as problems in which special functions play a significant role, are welcome. Particularly interesting are theories and applications in which both orthogonality and special functions are represented. Consideration of problems in which special functions play a significant role, as well as applications of orthogonal polynomials in approximation theory in the broadest sense, including quadrature formulas and integral equations, will be particularly appreciated. Furthermore, applications and algorithms for solving open problems in mathematics, physics, and technical sciences are of interest.

Scope: Orthogonal polynomials on the real line; Orthogonal polynomials on the unit circle; Matrix orthogonal polynomials; Multiple orthogonal polynomials; Multivariate orthogonal polynomials; Sobolev orthogonal polynomials; Integrable systems; Random matrices; Quadrature and cubature formulas; Rational approximation; Approximation with splines; Wavelets.

The special issue title is:

*Orthogonal Polynomials, Special Functions and Applications*.

The deadline for manuscript submissions is: 1 December 2021.

The webpage for the special issue is can be found here: [link](#).

To submit a manuscript to this special issue, go to this [link](#).

Topic #4 ——— OP – SF Net 28.3 ——— May 15, 2021

From: OP–SF Net Editors

Subject: Preprints in arXiv.org

The following preprints related to the fields of orthogonal polynomials and special functions were posted or cross-listed to one of the subcategories of arXiv.org during March and April 2021. This list has been separated into two categories.

### OP–SF Net Subscriber E–Prints

<http://arxiv.org/abs/2103.00337>

Extreme Superposition: High–Order Fundamental Rogue Waves in the Far–Field Regime  
Deniz Bilman, Peter D. Miller

<http://arxiv.org/abs/2103.01652>

Pascal triangle, Hoggatt matrices, and analogous constructions  
Johann Cigler

<http://arxiv.org/abs/2103.01725>

Notes on solutions of KZ equations modulo  $p^s$  and  $p$ -adic limit  $s \rightarrow \infty$   
Alexander Varchenko

<http://arxiv.org/abs/2103.02094>

Spatial asymptotics of Green’s function and applications

Sergey A. Denisov

<http://arxiv.org/abs/2103.02291>

The asymptotic expansion of a function due to L.L. Karasheva  
R. B. Paris

<http://arxiv.org/abs/2103.02321>

Associated orthogonal polynomials of the first kind and Darboux transformations  
Juan C. García-Ardila, Francisco Marcellán, Paul H. Villamil-Hernández

<http://arxiv.org/abs/2103.03028>

The alternating central extension of the  $q$ -Onsager algebra  
Paul Terwilliger

<http://arxiv.org/abs/2103.03349>

Bound states of a quartic and sextic inverse-powerlaw potential for all angular momenta  
A. D. Alhaidari, I. A. Assi, A. Mebirouk

<http://arxiv.org/abs/2103.03601>

The Strong Asymptotic Analysis of the first kind Orthogonal Trigonometric Polynomial  
Huili Han, Hua Liu, Yufeng Wang

<http://arxiv.org/abs/2103.03969>

A determinant identity for moments of orthogonal polynomials that implies Uvarov's formula for the orthogonal polynomials of rationally related densities  
C. Krattenthaler

<http://arxiv.org/abs/2103.04151>

On the  $r$ -Derangements of type B  
István Mezo, Victor H. Moll, José L. Ramírez, Diego Villamizar

<http://arxiv.org/abs/2103.04229>

Painlevé IV,  $\sigma$ -Form and the Deformed Hermite Unitary Ensembles  
Mengkun Zhu, Dan Wang, Yang Chen

<http://arxiv.org/abs/2103.04231>

Quantum interpolating ensemble: Average entropies and orthogonal polynomials  
Lu Wei, Nicholas Witte

<http://arxiv.org/abs/2103.04284>

On the asymptotic of Wright functions of the second kind  
Richard Paris, Armando Consiglio, Francesco Mainardi

<http://arxiv.org/abs/2103.04427>

Laguerre expansions on conic domains  
Yuan Xu

<http://arxiv.org/abs/2103.05696>

Chebyshev Polynomials and Inequalities for Kleinian Groups  
Hala Alaqaq, Jianhua Gong, Gaven Martin

<http://arxiv.org/abs/2103.05742>

Remarks on Askey-Wilson polynomials and Meixner polynomials of the second kind

K. Castillo, D. Mbouna, J. Petronilho

<http://arxiv.org/abs/2103.07816>

Painlevé V for a Jacobi unitary ensemble with random singularities  
Mengkun Zhu, Chuanzhong Li, Yang Chen

<http://arxiv.org/abs/2103.07872>

$\pi$ -Formulae from Dual Series of the Dougall Theorem  
Wenchang Chu

<http://arxiv.org/abs/2103.08370>

Compactness criteria via Laguerre and Hankel transformations  
Á. P. Horváth

<http://arxiv.org/abs/2103.09631>

The rational Sklyanin algebra and the Wilson and para-Racah polynomials  
Geoffroy Bergeron, Julien Gaboriaud, Luc Vinet, Alexei Zhedanov

<http://arxiv.org/abs/2103.09653>

Representations of integers as sums of four polygonal numbers and partial theta functions  
Kathrin Bringmann, Min-Joo Jang, Ben Kane

<http://arxiv.org/abs/2103.09681>

Quantization of Calogero-Painlevé system and Multi-particle quantum Painlevé equations II-VI  
Fatane Mobasheramini, Marco Bertola

<http://arxiv.org/abs/2103.09748>

On the Whitney extension problem for near isometries and beyond  
Steven B. Damelin

<http://arxiv.org/abs/2103.11229>

The compact presentation for the alternating central extension of the  $q$ -Onsager algebra  
Paul Terwilliger

<http://arxiv.org/abs/2103.12852>

A Bijective Proof of Richard Stanley's Observation that the sum of the cubes of the  $n$ -th row of Stern's Diatomic array equals 3 times 7 to the power  $n-1$   
Shalosh B. Ekhad, Doron Zeilberger

<http://arxiv.org/abs/2103.12855>

Automated Generation of Generating Functions Related to Generalized Stern's Diatomic Arrays in the footsteps of Richard Stanley  
Shalosh B. Ekhad, Doron Zeilberger

<http://arxiv.org/abs/2103.13092>

Equidistributions around special kinds of descents and excedances  
Bin Han, Jianxi Mao, Jiang Zeng

<http://arxiv.org/abs/2103.13312>

Ratios of the Gauss hypergeometric functions with parameters shifted by integers: part I  
Alexander Dyachenko, Dmitrii Karp

<http://arxiv.org/abs/2103.13715>

Multiple Orthogonal Polynomials and Random Walks

Amílcar Branquinho, Ana Foulquié–Moreno, Manuel Mañas, Carlos Álvarez–Fernández, Juan E. Fernández–Díaz

<http://arxiv.org/abs/2103.13936>

Fock Spaces with Nearest Neighbor Coupling

Michael Anshelevich, Jacob Mashburn

<http://arxiv.org/abs/2103.14002>

Ramanujan’s Beautiful Integrals

Bruce C. Berndt, Atul Dixit

<http://arxiv.org/abs/2103.14296>

Inverse scattering transforms for the sixth–order nonlinear Schrödinger equation with zero/nonzero boundary conditions: Bound–state soliton and rogue wave

Weiqi Peng, Yong Chen

<http://arxiv.org/abs/2103.15176>

Bounded cutoff window for the non–backtracking random walk on Ramanujan Graphs

Evita Nestoridi, Peter Sarnak

<http://arxiv.org/abs/2103.16666>

Bounds for an integral involving the modified Lommel function of the first kind

Robert E. Gaunt

<http://arxiv.org/abs/2104.00710>

Evaluation of Nonsymmetric Macdonald Superpolynomials at Special Points

Charles F. Dunkl

<http://arxiv.org/abs/2104.00957>

A note on some infinite sums of Hurwitz zeta functions

R. B. Paris

<http://arxiv.org/abs/2104.01187>

Bispectral dual Hahn polynomials with an arbitrary number of continuous parameters

Antonio J. Durán

<http://arxiv.org/abs/2104.01349>

New examples of Krall–Meixner and Krall–Hahn polynomials, with applications to the construction of exceptional Meixner and Laguerre polynomials

Antonio J. Durán

<http://arxiv.org/abs/2104.01354>

Exceptional Hahn and Jacobi polynomials with an arbitrary number of continuous parameters

Antonio J. Durán

<http://arxiv.org/abs/2104.01415>

Inhomogeneous spin  $q$ –Whittaker polynomials

Alexei Borodin, Sergei Korotkikh

<http://arxiv.org/abs/2104.01430>

A note on  $\mathfrak{su}(2)$  models and the biorthogonality of generating functions of Krawtchouk polynomials

Luc Vinet, Alexei Zhedanov

<http://arxiv.org/abs/2104.01599>

Triplicate Dual Series of Dougall–Dixon Theorem  
Xiaojing Chen, Wenchang Chu

<http://arxiv.org/abs/2104.01665>

Extremal Graphs for a Spectral Inequality on Edge–Disjoint Spanning Trees  
Sebastian M. Cioabă, Anthony Ostuni, Davin Park, Sriya Potluri, Tanay Wakhare, Wiseley Wong

<http://arxiv.org/abs/2104.01700>

Uniform asymptotic expansions for Lommel, Anger–Weber and Struve functions  
T. M. Dunster

<http://arxiv.org/abs/2104.01731>

Some Deep and Original Questions about the "critical exponents" of Generalized Ballot Sequences  
Shalosh B. Ekhad, Doron Zeilberger

<http://arxiv.org/abs/2104.02348>

Bernstein– and Markov–type inequalities  
Sergei Kalmykov, Béla Nagy, Vilmos Totik

<http://arxiv.org/abs/2104.03563>

Uniform asymptotics for the discrete Laguerre polynomials  
Dan Dai, Luming Yao

<http://arxiv.org/abs/2104.03733>

Riesz energy problems with external fields and related theory  
Peter Dragnev, Ramon Orive, Edward B. Saff, Franck Wielonsky

<http://arxiv.org/abs/2104.04890>

Sufficiency for Nephroid Starlikeness using Hypergeometric Functions  
A. Swaminathan, Lateef Ahmad Wani

<http://arxiv.org/abs/2104.06363>

Two–parameter Identities for Divisor Sums in Algebraic Number Fields  
Bruce C. Berndt, Martino Fassina, Sun Kim, Alexandru Zaharescu

<http://arxiv.org/abs/2104.06568>

A Summation of Series Involving Bessel Functions and Order Derivatives of Bessel Functions  
Yilin Chen

<http://arxiv.org/abs/2104.07942>

Differential, Difference and Asymptotic Relations for Pollaczek–Jacobi Type Orthogonal Polynomials and Their Hankel Determinants  
Chao Min, Yang Chen

<http://arxiv.org/abs/2104.08254>

The  $m = 2$  amplituhedron and the hypersimplex: signs, clusters, triangulations, Eulerian numbers  
Matteo Parisi, Melissa Sherman–Bennett, Lauren Williams

<http://arxiv.org/abs/2104.08516>

Multiple Laguerre polynomials: Combinatorial model and Stieltjes moment representation  
Alan D. Sokal

<http://arxiv.org/abs/2104.08596>

The Bateman Functions Revisited After 90 Years – A Survey of Old and New Results  
Alexander Apelblat, Armando Consiglio, Francesco Mainardi

<http://arxiv.org/abs/2104.08740>

On the  $\Phi$ -Stability and Related Conjectures  
Lei Yu

<http://arxiv.org/abs/2104.08855>

Sums of products of Bessel functions and order derivatives of Bessel functions  
Yilin Chen

<http://arxiv.org/abs/2104.11198>

A Graph Decomposition motivated by the Geometry of Randomized Rounding  
Stefan Steinerberger

<http://arxiv.org/abs/2104.12241>

On the Efficient Evaluation of the Azimuthal Fourier Components of the Green's Function for Helmholtz's Equation in Cylindrical Coordinates  
James Garritano, Yuval Kluger, Vladimir Rokhlin, Kirill Serkh

<http://arxiv.org/abs/2104.12912>

Uniform asymptotic expansions for the Whittaker functions  $M_{\kappa,\mu}(z)$  and  $W_{\kappa,\mu}(z)$  with  $\mu$  large  
T. M. Dunster

<http://arxiv.org/abs/2104.13549>

Convergence of two-point Padé approximants to piecewise holomorphic functions  
M.L. Yattselev

<http://arxiv.org/abs/2104.13784>

Stokes manifolds and cluster algebras  
Marco Bertola, Sofia Tarricone

<http://arxiv.org/abs/2104.13960>

Orthogonal polynomials and the deformed Jordan plane  
André Beaudoin, Geoffroy Bergeron, Antoine Brillant, Julien Gaboriaud, Luc Vinet, Alexei Zhedanov

<http://arxiv.org/abs/2104.14705>

A universal identity for theta functions of degree eight and applications  
Zhi-Guo Liu

<http://arxiv.org/abs/2104.14822>

Matrix-valued orthogonal polynomials related to hexagon tilings  
Alan Groot, Arno B.J. Kuijlaars

## Other Relevant OP-SF E-Prints

<http://arxiv.org/abs/2103.00214>

Elliptic solutions to Toda lattice hierarchy and elliptic Ruijsenaars-Schneider model  
V. Prokofev, A. Zabrodin



<http://arxiv.org/abs/2103.00549>

Operational Calculus for the general fractional derivatives with the Sonine kernels  
Yuri Luchko

<http://arxiv.org/abs/2103.00691>

Stability and conservation properties of Hermite-based approximations of the Vlasov–Poisson system  
Daniele Funaro, Gianmarco Manzini

<http://arxiv.org/abs/2103.00904>

At least two of  $\zeta(5), \zeta(7), \dots, \zeta(35)$  are irrational  
Li Lai, Li Zhou

<http://arxiv.org/abs/2103.01215>

Poncelet polygons and monotonicity of rotation numbers: iso-periodic confocal pencils of conics, hidden traps, and marvels  
Vladimir Dragović, Milena Radnović

<http://arxiv.org/abs/2103.01264>

On combinatorial properties and the zero distribution of certain Sheffer sequences  
Gi-Sang Cheon, Tamás Forgács, Hana Kim, Khang Tran

<http://arxiv.org/abs/2103.01377>

Explicit Relations of Some Variants of Convolved Multiple Zeta Values  
Ce Xu, Jianqiang Zhao

<http://arxiv.org/abs/2103.01393>

Exact meromorphic solutions of Schwarzian differential equations  
Liangwen Liao, Chengfa Wu

<http://arxiv.org/abs/2103.01404>

A packaged whispering gallery resonator device based on an optical nanoantenna coupler  
Angzhen Li, Ke Tian, Jibo Yu, Rashmi A. Minz, Jonathan M. Ward, Samir Mondal, Pengfei Wang, Síle Nic Chormaic

<http://arxiv.org/abs/2103.01405>

Fundamental solutions for the Dirac equation in curved spacetime and generalized Euler–Poisson–Darboux equation  
Karen Yagdjian, Anahit Galstian

<http://arxiv.org/abs/2103.01564>

The natural extension of the Gauss map and Hermite best approximations  
Nicolas Chevallier

<http://arxiv.org/abs/2103.01612>

Numerical solutions of electromagnetic wave model of fractional derivative using class of finite difference scheme  
Vijay Kumar Patel, Dharendra Bahuguna

<http://arxiv.org/abs/2103.01646>

Yang–Baxter deformations of WZW model on the Heisenberg Lie group  
Ali Eghbali, Tayebe Parvizi, Adel Rezaei–Aghdam

<http://arxiv.org/abs/2103.01732>

Asymptotic estimation for eigenvalues in the exponential potential and for zeros of  $K_{i\nu}(z)$  with respect to order

Yuri Krynytskyi, Andrij Rovenchak

<http://arxiv.org/abs/2103.02053>

A note on the generalized-hypergeometric solutions of general and single-confluent Heun equations

D. Yu. Melikdzhanian, A. M. Ishkhanyan

<http://arxiv.org/abs/2103.02223>

A Solution to the Riemann Hypothesis

Jeet Kumar Gaur

<http://arxiv.org/abs/2103.02353>

Extension of Laguerre polynomials with negative arguments

T. N. Shorey, Sneha Bala Sinha

<http://arxiv.org/abs/2103.02423>

RBF approximation of three dimensional PDEs using Tensor Krylov subspace methods

M. El Guide, K. Jbilou, A. Ratnani

<http://arxiv.org/abs/2103.02450>

Multi-cell NOMA: Coherent Reconfigurable Intelligent Surfaces Model With Stochastic Geometry

Chao Zhang, Wenqiang Yi, Yuanwei Liu, Qiang Wang

<http://arxiv.org/abs/2103.02545>

Non-intersecting Brownian bridges in the flat-to-flat geometry

Jacek Grela, Satya N. Majumdar, Gregory Schehr

<http://arxiv.org/abs/2103.02697>

New Coalescences for the Painlevé Equations

V. C. C. Alves

<http://arxiv.org/abs/2103.02951>

A parametric congruence arising from Orr's identity

Chen Wang, Zhi-Wei Sun

<http://arxiv.org/abs/2103.02994>

A sharp centro-affine isospectral inequality of Szegő-Weinberger type and the  $L^p$ -Minkowski problem

Emanuel Milman

<http://arxiv.org/abs/2103.03110>

Definite integrals involving combinations of powers and logarithmic functions of complicated arguments expressed in terms of the Hurwitz zeta function

Robert Reynolds, Allan Stauffer

<http://arxiv.org/abs/2103.03165>

Abelian differentials with prescribed singularities

Quentin Gendron, Guillaume Tahar

<http://arxiv.org/abs/2103.03470>

A note on  $\mathcal{F}_n$ -multiple zeta values

Masataka Ono, Kosuke Sakurada, Shin-ichiro Seki

<http://arxiv.org/abs/2103.03640>

Flag Hilbert–Poincaré series of hyperplane arrangements and their Igusa zeta functions  
Joshua Maglione, Christopher Voll

<http://arxiv.org/abs/2103.03673>

An unfitted radial basis function generated finite difference method applied to thoracic diaphragm simulations  
Igor Tominec, Pierre–Frederic Villard, Elisabeth Larsson, Victor Bayona, Nicola Cacciani

<http://arxiv.org/abs/2103.03751>

Analytic Combinatorics of Composition schemes and phase transitions with mixed Poisson distributions  
Cyril Banderier, Markus Kuba, Michael Wallner

<http://arxiv.org/abs/2103.03792>

Ginzburg algebras and the Hitchin connection for parabolic  $G$ -bundles  
Indranil Biswas, Swarnava Mukhopadhyay, Richard Wentworth

<http://arxiv.org/abs/2103.03929>

On Properties of the Dirichlet Green’s function for linear diffusions on a half line  
Joseph G. Conlon, Michael Dabkowski

<http://arxiv.org/abs/2103.04071>

Estimates for Green’s functions of elliptic equations in non-divergence form with continuous coefficients  
Seick Kim, Sungjin Lee

<http://arxiv.org/abs/2103.04072>

On a Conjecture Concerning the Approximates of Complete Elliptic Integral of the First Kind by Inverse Hyperbolic Tangent  
Song–Liang Qiu, Qi Bao, Xiao–Yan Ma, Hong–Biao Jiang

<http://arxiv.org/abs/2103.04078>

A quantum wavelet uncertainty principle  
Sabrine Arfaoui, Maryam G Alshehri, Anouar Ben Mabrouk

<http://arxiv.org/abs/2103.04424>

Multilevel approximation of Gaussian random fields: Covariance compression, estimation and spatial prediction  
Helmut Harbrecht, Lukas Herrmann, Kristin Kirchner, Christoph Schwab

<http://arxiv.org/abs/2103.04461>

Exact solutions of the Schrödinger Equation with Dunkl Derivative for the Free–Particle Spherical Waves, the Pseudo–Harmonic Oscillator and the Mie–type Potential  
R. D. Mota, D. Ojeda–Guillén

<http://arxiv.org/abs/2103.04561>

Decompositions of index one Jacobi forms into  $N = 4$  characters and formulas for mock modular forms  
Matthew Krauel, Geoffrey Mason, Michael Tuite, Gaywalee Yamskulna

<http://arxiv.org/abs/2103.04788>

Generation of orthogonal rational functions by procedures for structured matrices  
Niel Van Buggenhout, Marc Van Barel, Raf Vandebril

<http://arxiv.org/abs/2103.04817>

Maxima of a Random Model of the Riemann Zeta Function over Intervals of Varying Length  
Louis–Pierre Arguin, Guillaume Dubach, Lisa Hartung

<http://arxiv.org/abs/2103.05287>

Inverse problem for determining the order of fractional derivative in mixed–type equations  
R. R. Ashurov, R. T. Zunnunov

<http://arxiv.org/abs/2103.05341>

Saturating Receiver and Receptor Competition in Synaptic DMC: Deterministic and Statistical Signal Models

Sebastian Lotter, Maximilian Schäfer, Johannes Zeitler, Robert Schober

<http://arxiv.org/abs/2103.05492>

Multivariable connected sums and multiple polylogarithms  
Hanamichi Kawamura, Takumi Maesaka, Shin–ichiro Seki

<http://arxiv.org/abs/2103.05574>

On testing mean proportionality of multivariate normal variables  
Etaash Katiyar, Qingyuan Zhao

<http://arxiv.org/abs/2103.05613>

Nonminimal solutions to the Ginzburg–Landau equations  
Ákos Nagy, Gonçalo Oliveira

<http://arxiv.org/abs/2103.05919>

Estimates for the entropy numbers of the Nikol’skii–Besov classes of periodic functions of many variables in the space of quasi–continuous functions

A. S. Romanyuk, S. Ya. Yanchenko

<http://arxiv.org/abs/2103.05935>

Expansion in Cayley graphs, Cayley sum graphs and their twists  
Arindam Biswas, Jyoti Prakash Saha

<http://arxiv.org/abs/2103.05986>

Explicit Interval Estimates for Prime Numbers  
Michaela Cully–Hugill, Ethan S. Lee

<http://arxiv.org/abs/2103.06069>

The fundamental solutions of the curve shortening problem via the Schwarz function  
Robb McDonald

<http://arxiv.org/abs/2103.06163>

On Certain Probabilistic Properties of Polynomials over the Ring of  $p$ –adic Integers  
Antonio Lei, Antoine Poulin

<http://arxiv.org/abs/2103.06237>

Bounding the log–derivative of the zeta–function  
Andrés Chirre, Felipe Gonçalves

<http://arxiv.org/abs/2103.06321>

Okamoto Transformations relating Equivariant Instanton Bundles via Painlevé VI  
Jan Segert

<http://arxiv.org/abs/2103.06934>

Singularity analysis and analytic solutions for the Benney–Gjevik equations  
Andronikos Paliathanasis, Genly Leon, P. G. L. Leach

<http://arxiv.org/abs/2103.07071>

Representation of measures of noncompactness and its applications related to an initial–value problem in Banach spaces  
Xiaoling Chen, Lixin Cheng

<http://arxiv.org/abs/2103.07082>

Constructing Squeezed States of Light with Associated Hermite Polynomials  
Kevin Zelaya, Véronique Hussin, Oscar Rosas–Ortiz

<http://arxiv.org/abs/2103.07265>

Pendants to the Euler Beta function  
Martin Himmel

<http://arxiv.org/abs/2103.07357>

Elliptic solutions to matrix KP hierarchy and spin generalization of elliptic Calogero–Moser model  
V. Prokofev, A. Zabrodin

<http://arxiv.org/abs/2103.07400>

Super–Macdonald polynomials: Orthogonality and Hilbert space interpretation  
Farrokh Atai, Martin Hallnäs, Edwin Langmann

<http://arxiv.org/abs/2103.07628>

A  $C^1$ –conforming Petrov–Galerkin method for convection–diffusion equations and superconvergence analysis over rectangular meshes  
Waixiang Cao, Lueling Jia, Zhimin Zhang

<http://arxiv.org/abs/2103.07743>

Exact Reconstruction of Extended Exponential Sums using Rational Approximation of their Fourier Coefficients  
Nadiia Dereviako, Gerlind Plonka

<http://arxiv.org/abs/2103.07896>

Euler’s Reflection Formula, Infinite Product Formulas, and the Correspondence Principle of Quantum Mechanics  
Tamar Friedmann, Quincy Webb

<http://arxiv.org/abs/2103.08002>

Variance of the number of zeros of dependent Gaussian trigonometric polynomials  
Louis Gass

<http://arxiv.org/abs/2103.08015>

Chebyshev–Fibonacci polynomial relations using generating functions  
Robert Frontczak, Taras Goy

<http://arxiv.org/abs/2103.08303>

Weighted  $L^2$ -Norms of Gegenbauer polynomials  
Johann S. Brauchart, Peter J. Grabner

<http://arxiv.org/abs/2103.08367>

Closed-form expressions, generating function and Mehler-Heine type formula for the associated Meixner polynomials and some applications  
Khalid Ahbli

<http://arxiv.org/abs/2103.08484>

A Chebyshev multidomain adaptive mesh method for Reaction-Diffusion equations  
Jae-Hun Jung, Daniel Olmos-Liceaga

<http://arxiv.org/abs/2103.08666>

Spline quadrature and semi-classical orthogonal Jacobi polynomials  
Helmut Ruhland

<http://arxiv.org/abs/2103.08728>

Husmi Q-functions attached to hyperbolic Landau levels  
Z. Mouayn, H. Chhaiba, H. Kassogue, P. K. Kikodio

<http://arxiv.org/abs/2103.08810>

$H(\text{curl}^2)$ -conforming quadrilateral spectral element method for quad-curl problems  
Lixiu Wang, Weikun Shan, Huiyuan Li, Zhimin Zhang

<http://arxiv.org/abs/2103.08848>

An asymptotic preserving scheme for Lévy-Fokker-Planck equation with fractional diffusion limit  
Wuzhe Xu, Li Wang

<http://arxiv.org/abs/2103.08858>

A Whipple  ${}_7F_6$  formula revisited  
Wen-Ching Winnie Li, Ling Long, Fang-Ting Tu

<http://arxiv.org/abs/2103.08899>

Relaxation models for scalar traffic networks and zero relaxation limit  
Raul Borsche, Axel Klar

<http://arxiv.org/abs/2103.08989>

A boundary-value problem for a mixed type equation involving hyper-Bessel fractional differential operator and Hilfer's double order fractional derivative  
E. Karimov, M. Ruzhansky, B. Toshtemirov

<http://arxiv.org/abs/2103.09280>

Value-Gradient based Formulation of Optimal Control Problem and Machine Learning Algorithm  
Alain Bensoussan, Jiayue Han, Sheung Chi Phillip Yam, Xiang Zhou

<http://arxiv.org/abs/2103.09418>

On some results of Agelas concerning the GRH and of Vassilev-Missana concerning the prime zeta function  
Richard P. Brent

<http://arxiv.org/abs/2103.09654>

Ramanujan in Computing Technology  
V. N. Krishnachandran

<http://arxiv.org/abs/2103.09799>

Fibonacci–Zeta infinite series associated with the polygamma functions  
Kunle Adegoke, Sourangshu Ghosh

<http://arxiv.org/abs/2103.09847>

Infinite–Horizon Offline Reinforcement Learning with Linear Function Approximation: Curse of Dimensionality and Algorithm  
Lin Chen, Bruno Scherrer, Peter L. Bartlett

<http://arxiv.org/abs/2103.09871>

Integral formulas for Painlevé–2 transcendent  
O. M. Kiselev

<http://arxiv.org/abs/2103.09909>

Stochastic Processes and Statistical Mechanics  
Themis Matsoukas

<http://arxiv.org/abs/2103.09980>

Limit theorems for moment processes of beta Dyson’s Brownian motions and beta Laguerre processes  
Fumihiko Nakano, Hoang Dung Trinh, Khanh Duy Trinh

<http://arxiv.org/abs/2103.10009>

Categorification of DAHA and Macdonald polynomials  
Syu Kato, Anton Khoroshkin, Ievgen Makedonskyi

<http://arxiv.org/abs/2103.10099>

Integrable extensions of classical elliptic integrable systems  
M. Olshanetsky

<http://arxiv.org/abs/2103.10132>

An efficient algorithm to compute the exponential of skew–Hermitian matrices for the time integration of the Schrödinger equation  
Philipp Bader, Sergio Blanes, Fernando Casas, Muaz Seydaoğlu

<http://arxiv.org/abs/2103.10138>

Hyperbolic quadrature method of moments for the one–dimensional kinetic equation  
Rodney Fox, Frédérique Laurent

<http://arxiv.org/abs/2103.10160>

Some characterizations of multiple selfdecomposability with extensions and an application to the Gamma function  
Wissem Jedidi, Zbigniew J. Jurek, Jumanah Al Romian

<http://arxiv.org/abs/2103.10228>

Colored HOMFLY–PT for hybrid weaving knot  $\widehat{W}_3(m, n)$   
Vivek Kumar Singh, Rama Mishra, P. Ramadevi

<http://arxiv.org/abs/2103.10327>

A vector Riemann–Hilbert approach to the Muttalib–Borodin ensembles  
Dong Wang, Lun Zhang

<http://arxiv.org/abs/2103.10343>

Spectral Monic Chebyshev Approximation for Higher Order Differential Equations  
M. Abdelhakem, Aya Ahmed, M. El-kady

<http://arxiv.org/abs/2103.10347>

Shifted Monic Ultraspherical Approximation for solving some of Fractional Orders Differential Equations

M. Abdelhakem, Doha M.R., A. F. Saadallah, M. El-Kady

<http://arxiv.org/abs/2103.10770>

Shaken Dynamics on the 3-D Cubic Lattice

Benedetto Scoppola, Alessio Troiani, Matteo Veglianti

<http://arxiv.org/abs/2103.10777>

Pedagogical Justifications That Zero Factorial Equals One

Munir Mahmood, Lori L. Murray, Ricardas Zitikis, Ibtihal Mahmood

<http://arxiv.org/abs/2103.10800>

Towards quantized complex numbers:  $q$ -deformed Gaussian integers and the Picard group  
Valentin Ovsienko

<http://arxiv.org/abs/2103.11034>

Exact Solutions and Critical Behaviour for a Linear Growth-Diffusion Equation on a Time-Dependent Domain

Jane Allwright

<http://arxiv.org/abs/2103.11260>

New Invariants of Poncelet-Jacobi Bicentric Polygons

Pedro Roitman, Ronaldo Garcia, Dan Reznik

<http://arxiv.org/abs/2103.11308>

Nonlinear RF Fingerprints Authentication for OFDM Wireless Devices based on Demodulated Symbols  
Yan Yan, Hong-lin Yuan, Zhi-hua Bao, Guo-an Zhang

<http://arxiv.org/abs/2103.11498>

Spinodal-assisted nucleation in the two-dimensional  $q$ -state Potts model with short-to-long range interactions

Giuseppe Gagliardi, Francesco Macheda

<http://arxiv.org/abs/2103.11839>

Explicit evaluation of some integrals involving polylogarithm functions

Rusen Li

<http://arxiv.org/abs/2103.11841>

Asymptotic Coefficients and Errors for Chebyshev Polynomial Approximations with Weak Endpoint Singularities: Effects of Different Bases

Xiaolong Zhang, John P. Boyd

<http://arxiv.org/abs/2103.11899>

On 1D,  $N = 4$  Supersymmetric SYK-Type Models (I)

S. James Gates, Jr., Yangrui Hu, S.-N. Hazel Mak

<http://arxiv.org/abs/2103.11905>

The Generalized Fourier Transform: A Unified Framework for the Fourier, Laplace, Mellin and  $\mathcal{Z}$  Trans-



forms

Pushendra Singh, Anubha Gupta, Shiv Dutt Joshi

<http://arxiv.org/abs/2103.11923>

Asymptotic solution to convolution integral equations on large and small intervals  
Dmitry Ponomarev

<http://arxiv.org/abs/2103.12114>

Skew-orthogonal polynomials in the complex plane and their Bergman-like kernels  
Gernot Akemann, Markus Ebke, Iván Parra

<http://arxiv.org/abs/2103.12143>

A local-to-global weak (1,1) type argument and applications to Fourier integral operators  
Duván Cardona, Michael Ruzhansky

<http://arxiv.org/abs/2103.12175>

Average Rate Analysis of RIS-aided Short Packet Communication in URLLC Systems  
Ramin Hashemi, Samad Ali, Nurul Huda Mahmood, Matti Latva-aho

<http://arxiv.org/abs/2103.12590>

Integrals of polylogarithms and infinite series involving generalized harmonic numbers  
Rusen Li

<http://arxiv.org/abs/2103.12971>

Grover/Zeta correspondence based on the Konno-Sato theorem  
Takashi Komatsu, Norio Konno, Iwao Sato

<http://arxiv.org/abs/2103.13118>

Alternating variants of multiple poly-Bernoulli numbers and finite multiple zeta values in characteristic 0 and  $p$   
Daichi Matsuzuki

<http://arxiv.org/abs/2103.13378>

Rough pseudodifferential operators on Hardy spaces for Fourier integral operators II  
Jan Rozendaal

<http://arxiv.org/abs/2103.13466>

Asymptotic Freeness of Layerwise Jacobians Caused by Invariance of Multilayer Perceptron: The Haar Orthogonal Case  
Benoit Collins, Tomohiro Hayase

<http://arxiv.org/abs/2103.13508>

Translated Logarithmic Lambert Function and its Applications to Three-Parameter Entropy  
Cristina B. Corcino, Roberto B. Corcino

<http://arxiv.org/abs/2103.13542>

Moments of the Hurwitz zeta Function on the Critical Line  
Anurag Sahay

<http://arxiv.org/abs/2103.13935>

Near-optimal approximation methods for elliptic PDEs with lognormal coefficients  
Albert Cohen, Giovanni Migliorati

<http://arxiv.org/abs/2103.13995>

On sign changes of primitive Fourier coefficients of Siegel cusp forms  
Karam Deo Shankhadhar, Prashant Tiwari

<http://arxiv.org/abs/2103.14318>

Schur  $Q$ -Polynomials and Kontsevich–Witten Tau Function  
Xiaobo Liu, Chenglang Yang

<http://arxiv.org/abs/2103.14615>

Convergence of the self-dual  $U(1)$ -Yang–Mills–Higgs energies to the  $(n - 2)$ -area functional  
Davide Parise, Alessandro Pigati, Daniel Stern

<http://arxiv.org/abs/2103.14851>

Ohno-type relation for interpolated multiple zeta values  
Minoru Hirose, Hideki Murahara, Masataka Ono

<http://arxiv.org/abs/2103.14966>

Analogue of the Tricomi problem for the mixed-type equation with fractional derivative. Inverse problems  
R. R. Ashurov, R.T. Zunnunov

<http://arxiv.org/abs/2103.15000>

General fractional integrals and derivatives of arbitrary order  
Yuri Luchko

<http://arxiv.org/abs/2103.15527>

On the geometry of operator mixing in massless QCD-like theories  
Marco Bochicchio

<http://arxiv.org/abs/2103.15528>

On asymptotic expansions for the derivatives of the alternating Hurwitz zeta functions  
Su Hu, Min-Soo Kim

<http://arxiv.org/abs/2103.15713>

Fourier coefficients of automorphic  $L$ -functions over primes in ray classes  
Amir Akbary, Peng-Jie Wong

<http://arxiv.org/abs/2103.15926>

Interpolation by decomposable univariate polynomials  
Joachim von zur Gathen, Guillermo Matera

<http://arxiv.org/abs/2103.16124>

Generalized hypergeometric Bernoulli numbers  
Kalyan Chakraborty, Takao Komatsu

<http://arxiv.org/abs/2103.16873>

Rapidly convergent series representations of symmetric Tornheim double zeta functions  
Takashi Nakamura

<http://arxiv.org/abs/2103.16904>

The extended coset leader weight enumerator of a twisted cubic code  
Aart Blokhuis, Ruud Pellikaan, Tamás Szőnyi

<http://arxiv.org/abs/2103.17039>

Weighted Prime Powers Truncation of the Asymptotic Expansion for the Logarithmic Integral: Properties and Applications

Shaun R. Deaton

<http://arxiv.org/abs/2103.17092>

Inversion of  $\alpha$ -sine and  $\alpha$ -cosine transforms on  $\mathbb{R}$

Ly Viet Hoang, Evgeny Spodarev

<http://arxiv.org/abs/2103.17117>

Generalized Brézin–Gross–Witten tau–function as a hypergeometric solution of the BKP hierarchy

Alexander Alexandrov

<http://arxiv.org/abs/2103.17134>

First Eigenvalue of the Laplacian of a Geodesic Ball and Area–Based Symmetrization of its Metric Tensor

Vicent Gimeno, Erik Sarrion–Pedralva

<http://arxiv.org/abs/2104.00043>

The Snyder–de Sitter Scalar  $\varphi_{\star}^4$  Quantum Field Theory in  $D=2$

S. A. Franchino–Viñas, S. Mignemi

<http://arxiv.org/abs/2104.00153>

Relationship between renormalized values of shuffle type and of harmonic type of multiple zeta functions

Nao Komiyama

<http://arxiv.org/abs/2104.00215>

Ihara zeta function and twisted Alexander invariants

Zipei Zhuang

<http://arxiv.org/abs/2104.00401>

Fourier coefficients of Siegel cusp forms of degree 2 in the Atkin–Lehner type newspace

Pramath Anamby

<http://arxiv.org/abs/2104.00505>

Simplified SFT moduli spaces for Legendrian links

Russell Avdek

<http://arxiv.org/abs/2104.00524>

Themes of parity in the valuation for integer numbers of the zeta function and of five related functions

David Pouvreau

<http://arxiv.org/abs/2104.00610>

Boundary controllability for a coupled system of degenerate/singular parabolic equations

Brahim Allal, Abdelkarim Hajjaj, Jawad Salhi, Amine Sbai

<http://arxiv.org/abs/2104.00661>

Upper–tail large deviation principle for the ASEP

Sayan Das, Weitao Zhu

<http://arxiv.org/abs/2104.00697>

The Gamma Function via Interpolation  
Matthew F. Causley

<http://arxiv.org/abs/2104.00966>

Riemann–Hilbert problem for the nonlinear Schrödinger equation with multiple high–order poles under nonzero boundary conditions

Jin–Jie Yang, Shou–Fu Tian, Zhi–Qiang Li

<http://arxiv.org/abs/2104.01357>

Q–Polynomial expansion for Brezin–Gross–Witten tau–function

Xiaobo Liu, Chenglang Yang

<http://arxiv.org/abs/2104.01412>

A lattice approach to the Beta distribution induced by stochastic dominance: Theory and applications

Yann Braouezec, John Cagnol

<http://arxiv.org/abs/2104.01500>

On Fundamental Solutions of Higher–Order Space–Fractional Dirac equations

Nelson Faustino

<http://arxiv.org/abs/2104.01801>

Szegő kernel equivariant asymptotics under Hamiltonian Lie group actions

Roberto Paoletti

<http://arxiv.org/abs/2104.01880>

Monotonicity properties related to the ratio of two gamma functions

Nian Hong Zhou, Da–Wei Niu

<http://arxiv.org/abs/2104.01912>

Multi–RIS–aided Wireless Systems: Statistical Characterization and Performance Analysis

Tri Nhu Do, Georges Kaddoum, Thanh Luan Nguyen, Daniel Benevides da Costa, Zygmunt J. Haas

<http://arxiv.org/abs/2104.01957>

The null set of a polytope, and the Pompeiu property for polytopes

Fabício Caluza Machado, Sinai Robins

<http://arxiv.org/abs/2104.02181>

A decision–making machine learning approach in Hermite spectral approximations of partial differential equations

Lorella Fatone, Daniele Funaro, Gianmarco Manzini

<http://arxiv.org/abs/2104.02259>

A Caputo fractional derivative–based algorithm for optimization

Yeonjong Shin, Jérôme Darbon, George Em Karniadakis

<http://arxiv.org/abs/2104.02351>

Sharp Uncertainty Principle inequality for solenoidal fields

Naoki Hamamoto

<http://arxiv.org/abs/2104.02448>

Combinatorics of a disordered two–species ASEP on a torus

Arvind Ayyer, Philippe Nadeau

<http://arxiv.org/abs/2104.02692>

Exact Limit Theorems for Restricted Integer Partitions  
Asaf Cohen Antonir, Asaf Shapira

<http://arxiv.org/abs/2104.02711>

A Bombieri–Vinogradov theorem for higher rank groups  
Yujiao Jiang, Guangshi Lü, Jesse Thorner, Zihao Wang

<http://arxiv.org/abs/2104.02942>

Comparing formulas for type  $GL_n$  Macdonald polynomials  
Weiyang Guo, Arun Ram

<http://arxiv.org/abs/2104.03072>

Two classes of explicitly solvable sextic equations  
Francesco Calogero, Farrin Payandeh

<http://arxiv.org/abs/2104.03456>

Characteristic polynomials of random banded Hessenberg matrices and Hermite–Padé approximation  
Abey López–García, Vasiliy A. Prokhorov

<http://arxiv.org/abs/2104.03461>

Linear and Sublinear Time Spectral Density Estimation  
Vladimir Braverman, Aditya Krishnan, Christopher Musco

<http://arxiv.org/abs/2104.03745>

Classical Hamiltonian Systems with Balanced loss and gain  
Pijush K. Ghosh

<http://arxiv.org/abs/2104.03873>

Numerical methods and hypoexponential approximations for gamma distributed delay differential equations  
Tyler Cassidy, Peter Gillich, Antony R. Humphries, Christiaan H. van Dorp

<http://arxiv.org/abs/2104.04009>

Around  $L^1$  (un)boundedness of Bergman and Szegő projections  
Gian Maria Dall’Ara

<http://arxiv.org/abs/2104.04344>

Clean single-valued polylogarithms  
Steven Charlton, Claude Duhr, Herbert Gangl

<http://arxiv.org/abs/2104.04578>

Comparing formulas for type  $GL_n$  Macdonald polynomials: Supplement  
Weiyang Guo, Arun Ram

<http://arxiv.org/abs/2104.05042>

Archimedean zeta integrals for  $GL(3) \times GL(2)$   
Miki Hirano, Taku Ishii, Tadashi Miyazaki

<http://arxiv.org/abs/2104.05051>

On  $q$ -Horn hypergeometric functions  $H_6$  and  $H_7$   
Ayman Shehata

<http://arxiv.org/abs/2104.05092>

Remark on the Chain rule of fractional derivative in the Sobolev framework  
Kazumasa Fujiwara

<http://arxiv.org/abs/2104.05157>

Beyond the Weyl barrier for  $GL(2)$  exponential sums  
Roman Holowinsky, Ritabrata Munshi, Zhi Qi

<http://arxiv.org/abs/2104.05381>

Asymptotic of densities of exponential functionals of subordinator  
Martin Minchev, Mladen Savov

<http://arxiv.org/abs/2104.05389>

Exact results for the six-vertex model with domain wall boundary conditions and a partially reflecting end  
Linnea Hietala

<http://arxiv.org/abs/2104.05510>

Duality of exponential families: the real case, from large deviations to dilogarithm  
G rard Letac

<http://arxiv.org/abs/2104.05587>

Generalized translation operator and the Heat equation for the canonical Fourier Bessel transform  
Sami Ghazouani, Jihed Sahbani

<http://arxiv.org/abs/2104.05625>

Defining relations of quantum symmetric pair coideal subalgebras  
Stefan Kolb, Milen Yakimov

<http://arxiv.org/abs/2104.05870>

Numerical viscosity solutions to Hamilton–Jacobi equations via a Carleman estimate and the convex-ification method  
Michael Klibanov, Loc H. Nguyen, Hung V. Tran

<http://arxiv.org/abs/2104.06116>

Numerical Solution and Bifurcation Analysis of Nonlinear Partial Differential Equations with Extreme Learning Machines  
Gianluca Fabiani, Francesco Calabr , Lucia Russo, Constantinos Siettos

<http://arxiv.org/abs/2104.06291>

Optimal design for kernel interpolation: applications to uncertainty quantification  
Akil Narayan, Liang Yan, Tao Zhou

<http://arxiv.org/abs/2104.06471>

Simplified forms of the transition probabilities of the two-species ASEP with some initial orders of particles  
Eunghyun Lee, Temirlan Raimbekov

<http://arxiv.org/abs/2104.06693>

The momentum distribution of two bosons in one dimension with infinite contact repulsion in harmonic trap gets analytical  
K. Bencheikh, L. M. Nieto, L. U. Ancarani

<http://arxiv.org/abs/2104.06941>

Riemann–Hilbert correspondence for Alexander complexes  
Lei Wu

<http://arxiv.org/abs/2104.07025>

Some  $q$ -supercongruences modulo the fifth and sixth powers of a cyclotomic polynomial  
Chuanan Wei

<http://arxiv.org/abs/2104.07119>

Multidimensional scaling and visualization of patterns in distribution of nontrivial zeros of the zeta–function  
José Tenreiro Machado, Yuri Luchko

<http://arxiv.org/abs/2104.07317>

Polynomial methods in statistical inference: theory and practice  
Yihong Wu, Pengkun Yang

<http://arxiv.org/abs/2104.07690>

Revisiting dynamics of interacting quintessence  
Patrocinio Pérez, Ulises Nucamendi, Roberto De Arcia

<http://arxiv.org/abs/2104.07816>

Local Zeta Functions From Calabi–Yau Differential Equations  
Philip Candelas, Xenia de la Ossa, Duco van Straten

<http://arxiv.org/abs/2104.08069>

A Bivariate Beta Distribution with Arbitrary Beta Marginals and its Generalization to a Correlated Dirichlet Distribution  
Susanne Trick, Frank Jäkel, Constantin A. Rothkopf

<http://arxiv.org/abs/2104.08260>

Coupling of complex function theory and finite element method for crack propagation through energetic formulation: conformal mapping approach and reduction to a Riemann–Hilbert problem  
Dmitrii Legatiuk, Daniel Weisz–Patrault

<http://arxiv.org/abs/2104.08327>

Polynomial Hermite–Padé  $m$ -system for meromorphic functions on a compact Riemann surface  
Aleksandr Komlov

<http://arxiv.org/abs/2104.08407>

On Lommel Matrix Polynomials  
Ayman Shehata

<http://arxiv.org/abs/2104.08598>

Interpolation polynomials, bar monomials, and their positivity  
Yusra Naqvi, Siddhartha Sahi, Emily Sergel

<http://arxiv.org/abs/2104.08833>

Degenerate Fubini–type polynomials associated with degenerate Apostol–Bernoulli and Apostol–Euler polynomials of order  $\alpha$   
Muhammet Cihat Dağlı

<http://arxiv.org/abs/2104.09030>

Shintani–Barnes cocycles and values of the zeta functions of algebraic number fields  
Hohto Bekki

<http://arxiv.org/abs/2104.09129>

Analysis of Bell based Euler polynomials and thier application  
Nabiullah Khan, Saddam Husain

<http://arxiv.org/abs/2104.09140>

Some new formulas for the Horn’s hypergeometric functions  
Ayman Shehata, Shimaa I. Moustafa

<http://arxiv.org/abs/2104.09143>

On certain new formulas for the Horn’s hypergeometric functions  $\mathcal{G}_1$ ,  $\mathcal{G}_2$  and  $\mathcal{G}_3$   
Ayman Shehata, Shimaa I. Moustafa

<http://arxiv.org/abs/2104.09256>

Dynamics of groups of birational automorphisms of cubic surfaces and Fatou/Julia decomposition for Painlevé 6  
Julio Rebelo, Roland Roeder

<http://arxiv.org/abs/2104.09470>

Geodesic bi–angles and Fourier coefficients of restrictions of eigenfunctions  
Emmett Wyman, Yakun Xi, Steve Zelditch

<http://arxiv.org/abs/2104.09695>

The weak (1,1) type of Fourier integral operators with complex phases  
Duván Cardona, Michael Ruzhansky

<http://arxiv.org/abs/2104.09729>

Alexander modules, Mellin transformation and variations of mixed Hodge structures  
Eva Elduque, Moisés Herradón Cueto, Laurențiu Maxim, Botong Wang

<http://arxiv.org/abs/2104.09997>

Meshfree Approximation for Stochastic Optimal Control Problems  
Hui Sun, Feng Bao

<http://arxiv.org/abs/2104.10028>

Asymptotic Expansion of Laplace–Fourier–Type Integrals  
Sara Konrad, Matthias Bartelmann

<http://arxiv.org/abs/2104.10055>

Divisors of Fourier coefficients of two newforms  
Arvind Kumar, Moni Kumari

<http://arxiv.org/abs/2104.10169>

An Exact Integral–to–Sum Relation for Products of Bessel Functions  
Oliver H. E. Philcox, Zachary Slepian

<http://arxiv.org/abs/2104.10243>

Zeros of higher derivatives of Riemann zeta function  
Mithun Kumar Das, Sudhir Pujahari

<http://arxiv.org/abs/2104.10287>



Walk/Zeta correspondence  
Takashi Komatsu, Norio Konno, Iwao Sato

<http://arxiv.org/abs/2104.10539>

A symmetry on weakly increasing trees and multiset Schett polynomials  
Zhicong Lin, Jun Ma

<http://arxiv.org/abs/2104.10548>

A note on some information-theoretic divergences between Zeta distributions  
Frank Nielsen

<http://arxiv.org/abs/2104.10589>

Reductions of nonlocal nonlinear Schrödinger equations to Painlevé type functions  
Jonathon Liu

<http://arxiv.org/abs/2104.10929>

Spin-torque induced wall motion in perpendicularly magnetized discs: ballistic versus oscillatory behavior  
Paul Bouquin, Joo-Von Kim, Olivier Bultynck, Siddharth Rao, Sebastien Couet, Gouri Sankar Kar, Thibaut Devolder

<http://arxiv.org/abs/2104.11054>

TeraMIMO: A Channel Simulator for Wideband Ultra-Massive MIMO Terahertz Communications  
Simon Tarboush, Hadi Sardeddeen, Hui Chen, Mohamed Habib Loukil, Hakim Jemaa, Mohamed Slim Alouini, Tareq Y. Al-Naffouri

<http://arxiv.org/abs/2104.11196>

Entropy function and orthogonal polynomials  
R. V. Bessonov

<http://arxiv.org/abs/2104.11433>

Discrete Painlevé transcendent solutions to the multiplicative type discrete KdV equations  
Nobutaka Nakazono

<http://arxiv.org/abs/2104.11527>

Eigenvalue contour lines of Kac-Murdock-Szegő matrices with a complex parameter  
George Fikioris, Christos Papapanos

<http://arxiv.org/abs/2104.11630>

Sharp double inequality for complete elliptic integral of the first kind  
Qi Bao

<http://arxiv.org/abs/2104.11632>

Encrypted Distributed Lasso for Sparse Data Predictive Control  
Andreea B. Alexandru, Anastasios Tsiamis, George J. Pappas

<http://arxiv.org/abs/2104.11672>

Uniformly accurate low regularity integrators for the Klein-Gordon equation from the classical to non-relativistic limit regime  
María Cabrera Calvo, Katharina Schratz

<http://arxiv.org/abs/2104.12007>

Solutions of algebraic linear ordinary differential equations

Camilo Sanabria Malagón

<http://arxiv.org/abs/2104.12216>

Integrals of products of incomplete beta functions with an application to string enumeration  
Stephen B. Connor, Christopher J. Fewster

<http://arxiv.org/abs/2104.12412>

On the elegance of Ramanujan's series for  $\pi$   
Chieh-Lei Wong

<http://arxiv.org/abs/2104.12504>

Integration in Finite Terms: Dilogarithmic Integrals  
Yashpreet Kaur, Varadharaj R. Srinivasan

<http://arxiv.org/abs/2104.12552>

Generalized heterogeneous hypergeometric functions and the distribution of the largest eigenvalue of an elliptical Wishart matrix  
Aya Shinozaki, Koki Shimizu, Hiroki Hashiguchi

<http://arxiv.org/abs/2104.12584>

Localization formulas of cohomology intersection numbers  
Saiei-Jaeyeong Matsubara-Heo

<http://arxiv.org/abs/2104.12635>

Asymmetry of tensor product of asymmetric and invariant vectors arising from Schur-Weyl duality based on hypergeometric orthogonal polynomial  
Masahito Hayashi, Akihito Hora, Shintarou Yanagida

<http://arxiv.org/abs/2104.12765>

Stability of a Szegő-type asymptotics  
Peter Müller, Ruth Schulte

<http://arxiv.org/abs/2104.12906>

The curve shrinking flow, compactness and its relation to scale manifolds  
Oliver Neumeister

<http://arxiv.org/abs/2104.12976>

Green's functions and the Cauchy problem of the Burgers hierarchy and forced Burgers equation  
Mathew Zuparic, Keeley Hoek

<http://arxiv.org/abs/2104.12978>

Anti-Ramsey number of edge-disjoint rainbow spanning trees in all graphs  
Linyuan Lu, Andrew Meier, Zhiyu Wang

<http://arxiv.org/abs/2104.12988>

Topological properties on isochronous centers of polynomial Hamiltonian differential systems  
Guangfeng Dong

<http://arxiv.org/abs/2104.13223>

A Novel Proof of Ramanujan's Formula for  $\zeta(2m+1)$   
Sarth Chavan

<http://arxiv.org/abs/2104.13466>

Simulation of non-linear structural elastodynamic and impact problems using minimum energy and simultaneous diagonalization high-order bases

A. P. C. Dias, J. L. Suzuki, G. L. Valente, M. L. Bittencourt

<http://arxiv.org/abs/2104.13558>

Subconvexity of Shintani's zeta functions

Robert Hough, Eun Hye Lee

<http://arxiv.org/abs/2104.13609>

Self-adjoint Jacobi operators in the limit circle case

D. R. Yafaev

<http://arxiv.org/abs/2104.13751>

Voros coefficients at the origin and at the infinity of the generalized hypergeometric differential equations with a large parameter

Takashi Aoki, Shofu Uchida

<http://arxiv.org/abs/2104.13758>

A Non-Nested Multilevel Method for Meshless Solution of the Poisson Equation in Heat Transfer and Fluid Flow

Anand Radhakrishnan, Michael Xu, Shantanu Shahane, Surya Pratap Vanka

<http://arxiv.org/abs/2104.13846>

$q$ RSt: A probabilistic Robinson-Schensted correspondence for Macdonald polynomials (extended abstract)

Florian Aigner, Gabriel Frieden

<http://arxiv.org/abs/2104.13864>

From the Riemann surface of TASEP to ASEP

Sylvain Prohac

<http://arxiv.org/abs/2104.13980>

Renormalization Group in Six-derivative Quantum Gravity

Leslaw Rachwal, Leonardo Modesto, Aleksandr Pinzul, Ilya L. Shapiro

<http://arxiv.org/abs/2104.14038>

Riemann-Hilbert problem on an elliptic surface and a uniformly stressed inclusion embedded into a half-plane subjected to antiplane strain

Y. A. Antipov

<http://arxiv.org/abs/2104.14092>

On transformation formulas of  $p$ -adic hypergeometric functions  $\mathcal{F}_{a,\dots,a}^{(\sigma)}(t)$  and  $\widehat{\mathcal{F}}_{a,\dots,a}^{(\sigma)}(t)$

Wang Chung-Hsuan

<http://arxiv.org/abs/2104.14253>

On the Atkinson formula for the  $\zeta$  function

Daniele Dona, Sebastian Zuniga Alterman

<http://arxiv.org/abs/2104.14413>

The Chern class for  $K_3$  and the cyclic quantum dilogarithm

Kevin Hutchinson

<http://arxiv.org/abs/2104.14507>

On periodic approximate solutions of dynamical systems with a quadratic right-hand side  
Mikhail Malykh, Leonid Sevastianov

<http://arxiv.org/abs/2104.14652>

Fast Multiscale Diffusion on Graphs

Sibylle Marcotte, Amélie Barbe, Rémi Gribonval, Titouan Vayer, Marc Sebban, Pierre Borgnat, Paulo Gonçalves

<http://arxiv.org/abs/2104.14794>

On a unified double zeta function of Mordell–Tornheim type

Shin-ya Kadota, Takuya Okamoto, Masataka Ono, Koji Tasaka

<http://arxiv.org/abs/2104.14974>

Variation operators for semigroups associated with Fourier–Bessel expansions

Jorge J. Betancor, Alejandro J. Castro, Marta De León–Contreras

Topic #5 ——— OP – SF Net 28.3 ——— May 15, 2021

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](mailto:howard.cohl@nist.gov), or [spost@hawaii.edu](mailto:spost@hawaii.edu).

Contributions to OP–SF NET 28.4 should be sent by July 1, 2021.

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](mailto: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](mailto: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 OP–SF Talk moderator

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

From: OP–SF Net Editors

Subject: Thought of the Month by **Lucy Joan Slater**

“In his work *Arithmetica Infinitorum* (1655), the Oxford professor John Wallis (1616–1703) first used the term ‘hypergeometric’ (from the Greek  $\acute{\upsilon}\pi\epsilon\rho$ , above or beyond) to denote any series which was beyond the ordinary geometric series

$$1 + x + x^2 + x^3 + \dots$$

In particular, he studies the series

$$1 + a + a(a + 1) + a(a + 1)(a + 2) + \dots$$

”

**Lucy Joan Slater** (1922–2008), quoted in *Generalized Hypergeometric Functions*, by L. J. Slater, Cambridge University Press, Cambridge, UK, 1966.