

OP-SF NET – Volume 27, Number 6 – November 15, 2020

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

<http://math.nist.gov/opsf>

OP-SF Net is distributed through [OP-SF Talk](#).

Subscribe to OP-SF Talk at <http://lists.siam.org/mailman/listinfo/siam-OPSF>.

Please send contributions to the OP-SF Net editors.

Editors:

Howard S. Cohl

howard.cohl@nist.gov

Sarah Post

spost@hawaii.edu

Topics:

1. Announcement: OPSFA-16 date changed to **2022**, dedicated to **Richard Askey**
2. Announcement: London Mathematical Society Lecture Note Series: OPSF-S6 2016
3. Announcement: **Askey-Bateman** Project Vol. 1. Univariate Orthogonal Polynomials
4. Announcement: **Askey-Bateman** Project Vol. 2. Multivariable Special Functions
5. Announcement: JMM 2021 AMS Special Session on The Legacy of **Dick Askey**
6. Essay by **Tom Koornwinder**: **Hendrik Lorentz** and **Harry Bateman**
7. Preprints in arXiv.org
8. Submitting contributions to OP-SF NET and SIAM-OPSF (OP-SF Talk)
9. Thoughts of the Month by **Bertrand Russell**

Calendar of Events:

January 6–9, 2021

2021 Joint Mathematics Meetings, American Mathematical Society,
Happening Virtually in 2021. *Join your colleagues online for the latest in mathematics.*

AMS Special Session on The Legacy of Dick Askey,

Organized by Howard Cohl, Mourad Ismail and George Andrews,

https://jointmathematicsmeetings.org/meetings/national/jmm2021/2247_program_ss39.html

AMS Special Session on Continued Fractions,

Organized by James McLaughlin, Geremías Polanco Encarnación, Barry Smith, Nancy J. Wyshinski,

https://jointmathematicsmeetings.org/meetings/national/jmm2021/2247_program_ss62.html

June 7–11, 2021

33rd International Colloquium on Group Theoretical Methods in Physics (Group33)

Cotonou, Benin

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

June 20–26, 2021

8th 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

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

July 6–9, 2021

Functional Analysis, Approximation Theory and Numerical Analysis (FAATNA)

Matera, Italy

<http://web.unibas.it/faatna20/>

July 12–16, 2021

9th International Conference on Computational Methods and Function Theory (CMFT 2021)

Federico Santa María Technical University, Valparaíso, Chile

<http://cmft2021.inf.utfsm.cl/>

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

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

August 9–13, 2021

OPSFA Summer School 2021

Radboud University, Nijmegen, The Netherlands

<https://www.ru.nl/radboudsummerschool/courses/2021/opsfa-summer-school/>

July 11–15, 2022—tentative new dates due to COVID-19 outbreak.

OPSFA-16

Centre de Recherches Mathématiques, Montreal, Canada

Topic #1 ——— OP – SF Net 27.6 ——— November 15, 2020

From: Luc Vinet (vinet@CRM.UMontreal.CA)

Subject: Announcement: OPSFA-16 date changed to **2022**, dedicated to **Richard Askey**

The 16th International Symposium on Orthogonal Polynomials, Special Functions and Applications (OPSFA-16) will take place at the [Centre de Recherches Mathématiques](#) (CRM) in Montreal in **2022** (instead of 2021 as initially planned). The tentative dates are **July 11–15, 2022**.

The call for Mini Symposia proposals will be made in January 2021.

This conference will be dedicated to the memory of **Richard Askey**.

The Organizing Committee consists of:

- Hendrik De Bie (Ghent University)
- Jan Felipe van Diejen (University of Talca)
- Erik Koelink (Radboud University)
- Mourad H. E. Ismail (University of Central Florida)
- Ana Loureiro (University of Kent)
- Francesco Marcellán (University Carlos III de Madrid)
- Sarah Post (University of Hawaii)
- Margit Rösler (University of Paderborn)
- Luc Vinet (Chair) (CRM, University of Montréal)

From: Howard S.Cohl (howard.cohl@nist.gov)

and Mourad E. H. Ismail (mourad.eh.ismail@gmail.com)

Subject: Announcement: London Mathematical Society Lecture Note Series: OPSF–S6 2016

We would like to draw your attention to the following set of Lecture Notes published by Cambridge University Press: London Mathematical Society Lecture Note Series, **464**.

Lectures on Orthogonal Polynomials and Special Functions,
OPSF6 Sixth Summer School, Norbert Wiener Center, University of Maryland,
College Park, Maryland, July 11–15, 2016.

Edited by **Howard S. Cohl**, National Institute of Standards and Technology, USA,
and **Mourad E. H. Ismail**, University of Central Florida, Orlando, Florida, USA.

Publisher: Cambridge University Press

Online publication date: October 2020

publication year: 2020

Online ISBN: 9781108908993

DOI: <https://doi.org/10.1017/9781108908993>

Link to CUP: [LMS Lecture Note Series 464](#).

Description: Written by experts in their respective fields, this collection of pedagogic surveys provides detailed insight and background into five separate areas at the forefront of modern research in orthogonal polynomials and special functions at a level suited to graduate students. A broad range of topics are introduced including exceptional orthogonal polynomials, q -series, applications of spectral theory to special functions, elliptic hypergeometric functions, and combinatorics of orthogonal polynomials. Exercises, examples and some open problems are provided. The volume is derived from lectures presented at the OPSF–S6 Summer School in 2016 at the University of Maryland, and has been carefully edited to provide a coherent and consistent entry point for graduate students and newcomers.

Five lectures:

1. **Antonio Durán** (70 pages):
Exceptional Orthogonal Polynomials via Krall Discrete Polynomials;
2. **Mourad E. H. Ismail** (53 pages):
a Brief Review of q -Series;
3. **Erik Koelink** (76 pages):
Applications of Spectral Theory to Special Functions;
4. **Hjalmar Rosengren** (65 pages):
Elliptic hypergeometric functions; and
5. **Jiang Zeng** (52 pages):
Combinatorics of Orthogonal Polynomials and their Moments

Table of Contents:

Contributors page	x
Preface	xi
1. Exceptional Orthogonal Polynomials via Krall Discrete Polynomials	1
Antonio J. Durán	
1.1 The classical and classical discrete families	4
1.1.1 Weights on the real line	4
1.1.2 The three-term recurrence relation	5
1.1.3 Some examples of orthogonal polynomials	6
1.1.4 Second-order differential operator	10
1.1.5 Characterization theorem	12
1.1.6 The classical families and the basic quantum models	13
1.1.7 The classical discrete families	15
1.2 Expanding the Askey tableau	18
1.2.1 The Askey tableau	18
1.2.2 Krall and exceptional polynomials	21
1.2.3 Krall polynomials	23
1.2.4 Darboux transforms	25
1.3 \mathcal{D} -operators	30
1.3.1 \mathcal{D} -operators	30
1.3.2 \mathcal{D} -operators on the stage	32
1.3.3 \mathcal{D} -operators of type 2	37
1.4 Constructing Krall polynomials by using \mathcal{D} -operators	38
1.4.1 Back to the orthogonality	39
1.4.2 Krall-Laguerre polynomials	40
1.4.3 Krall discrete polynomials	42
1.5 Exceptional discrete polynomials	48
1.5.1 Comparing the Krall continuous and discrete cases	48
1.5.2 First expansion of the Askey tableau	50
1.5.3 Exceptional polynomials	53
1.5.4 Constructing exceptional discrete polynomials by using duality	56
1.6 Exceptional polynomials	60
1.6.1 Exceptional Charlier polynomials: admissibility	60
1.6.2 Exceptional Hermite polynomials by passing to the limit	62
1.6.3 Exceptional Meixner and Laguerre polynomials	64
1.6.4 Second expansion of the Askey tableau	68
1.6.5 Appendix: invariance and symmetries	68
References	70
2. A Brief Review of q -Series	76
Mourad E.H. Ismail	
2.1 Introduction	76
2.2 Notation and q -operators	77
2.3 q -Taylor series	81
2.4 Summation theorems	85
2.5 Transformations	90
2.6 q -Hermite polynomials	94
2.7 The Askey-Wilson polynomials	101
2.8 Ladder operators and Rodrigues formulas	106
2.9 Identities and summation theorems	113
2.10 Expansions	115
2.11 Askey-Wilson expansions	119

2.12 A q -exponential function	125
References	128
3. Applications of Spectral Theory to Special Functions	131
Erik Koelink	
3.1 Introduction	133
3.2 Three-term recurrences in $\ell^2(\mathbb{Z})$	139
3.2.1 Exercises	147
3.3 Three-term recurrence relations and orthogonal polynomials	149
3.3.1 Orthogonal polynomials	149
3.3.2 Jacobi operators	152
3.3.3 Moment problems	154
3.3.4 Exercises	154
3.4 Matrix-valued orthogonal polynomials	155
3.4.1 Matrix-valued measures and related polynomials	156
3.4.2 The corresponding Jacobi operator	163
3.4.3 The resolvent operator	167
3.4.4 The spectral measure	171
3.4.5 Exercises	173
3.5 More on matrix weights, matrix-valued orthogonal polynomials and Jacobi operators	174
3.5.1 Matrix weights	174
3.5.2 Matrix-valued orthogonal polynomials	176
3.5.3 Link to case of $\ell^2(\mathbb{Z})$	178
3.5.4 Reducibility	179
3.5.5 Exercises	180
3.6 The J -matrix method	180
3.6.1 Schrödinger equation with Morse potential	182
3.6.2 A tridiagonal differential operator	186
3.6.3 J -matrix method with matrix-valued orthogonal polynomials	190
3.6.4 Exercises	198
3.7 Appendix: The spectral theorem	199
3.7.1 Hilbert spaces and operators	199
3.7.2 Hilbert C^* -modules	201
3.7.3 Unbounded operators	202
3.7.4 The spectral theorem for bounded selfadjoint operators	202
3.7.5 Unbounded self-adjoint operators	204
3.7.6 The spectral theorem for unbounded selfadjoint operators	205
3.8 Hints and answers for selected exercises	206
References	206
4. Elliptic Hypergeometric Functions	213
Hjalmar Rosengren	
4.1 Elliptic functions	216
4.1.1 Definitions	216
4.1.2 Theta functions	217
4.1.3 Factorization of elliptic functions	220
4.1.4 The three-term identity	222
4.1.5 Even elliptic functions	223
4.1.6 Interpolation and partial fractions	226
4.1.7 Modularity and elliptic curves	229
4.1.8 Comparison with classical notation	233
4.2 Elliptic hypergeometric functions	236

4.2.1 Three levels of hypergeometry	236
4.2.2 Elliptic hypergeometric sums	237
4.2.3 The Frenkel–Turaev sum	240
4.2.4 Well–poised and very well–poised sums	243
4.2.5 The sum ${}_{12}V_{11}$	245
4.2.6 Biorthogonal rational functions	249
4.2.7 A quadratic summation	250
4.2.8 An elliptic Minton summation	254
4.2.9 The elliptic gamma function	255
4.2.10 Elliptic hypergeometric integrals	257
4.2.11 Spiridonov’s elliptic beta integral	259
4.3 Solvable lattice models	263
4.3.1 Solid–on–solid models	263
4.3.2 The Yang–Baxter equation	265
4.3.3 The R –operator	267
4.3.4 The elliptic SOS model	268
4.3.5 Fusion and elliptic hypergeometry	270
References	277
5. Combinatorics of Orthogonal Polynomials and their Moments	280
Jiang Zeng	
5.1 Introduction	280
5.2 General and combinatorial theories of formal OPS	283
5.2.1 Formal theory of orthogonal polynomials	283
5.2.2 The Flajolet–Viennot combinatorial approach	291
5.3 Combinatorics of generating functions	294
5.3.1 Exponential formula and Foata’s approach	294
5.3.2 Models of orthogonal Sheffer polynomials	297
5.3.3 MacMahon’s Master Theorem and a Mehlertype formula	299
5.4 Moments of orthogonal Sheffer polynomials	304
5.4.1 Combinatorics of the moments	304
5.4.2 Linearization coefficients of Sheffer polynomials	309
5.5 Combinatorics of some q –polynomials	315
5.5.1 Al–Salam–Chihara polynomials	315
5.5.2 Moments of continuous q –Hermite, q –Charlier and q –Laguerre polynomials	316
5.5.3 Linearization coefficients of continuous q –Hermite, q –Charlier and q –Laguerre polynomials	319
5.5.4 A curious q –analogue of Hermite polynomials	324
5.5.5 Combinatorics of continued fractions and γ –positivity	328
5.6 Some open problems	330
References	331

From: Tom H. Koornwinder (thkmath@xs4all.nl)

Subject: Announcement: **Askey–Bateman** Project Vol. 1. Univariate Orthogonal Polynomials

We would like to draw your attention to the publication of the first volume of Encyclopedia of Special Functions, The **Askey–Bateman** Project.

Volume 1. Univariate Orthogonal Polynomials.

Edited by **Mourad E. H. Ismail**, University of Central Florida, Orlando, Florida, USA, assisted by **Walter Van Assche**, Katholieke Universiteit, Leuven, Belgium.

Publisher: Cambridge University Press

Publication date: September 2020

ISBN: 9780521197427

Link to CUP: [The Askey–Bateman Project. Volume 1. Univariate Orthogonal Polynomials.](#)

Description: This is the first of three volumes that form the Encyclopedia of Special Functions, an extensive update of the Bateman Manuscript Project. Volume 1 contains most of the material on orthogonal polynomials, from the classical orthogonal polynomials of Hermite, Laguerre and Jacobi to the Askey–Wilson polynomials, which are the most general basic hypergeometric orthogonal polynomials. Separate chapters cover orthogonal polynomials on the unit circle, zeros of orthogonal polynomials and matrix orthogonal polynomials, with detailed results about matrix-valued Jacobi polynomials. A chapter on moment problems provides many examples of indeterminate moment problems. A thorough bibliography rounds off what will be an essential reference.

Table of Contents:

List of contributors	ix
Preface	xi
1. Preliminaries Mourad E. H. Ismail	1
2. General Orthogonal Polynomials Mourad E. H. Ismail	16
3. Jacobi and Related Polynomials Mourad E. H. Ismail	51
4. Recursively Defined Polynomials Mourad E. H. Ismail	100
5. Wilson and Related Polynomials Mourad E. H. Ismail	119
6. Discrete Orthogonal Polynomials Mourad E. H. Ismail	129
7. Some q -Orthogonal Polynomials Mourad E. H. Ismail	157
8. The Askey–Wilson Family of Polynomials Mourad E. H. Ismail	178
9. Orthogonal Polynomials on the Unit Circle L. Golinskii	199
10. Zeros of Orthogonal Polynomials A. Laforgia & M. Muldoon	242
11. The Moment Problem C. Berg & J. S. Christiansen	269

12. Matrix-Valued Orthogonal Polynomials and Differential Equations A. Durán & F. A. Grünbaum	307
13. Some Families of Matrix-Valued Jacobi Orthogonal Polynomials F. A. Grünbaum, I. Pacharoni & J. A. Tirao	334
Index	385

Topic #4 ——— OP – SF Net 27.6 ——— November 15, 2020

From: Tom H. Koornwinder (thkmath@xs4all.nl)

Subject: Announcement: **Askey-Bateman** Project Vol. 2. Multivariable Special Functions

We would like to draw your attention to the publication of the first volume of
Encyclopedia of Special Functions, The **Askey-Bateman** Project.

Volume 2. Volume 2. Multivariable Special Functions.

Edited by **Tom H. Koornwinder**, Universiteit van Amsterdam, The Netherlands,
and **Jasper V. Stokman**, Universiteit van Amsterdam, The Netherlands.

Publisher: Cambridge University Press

Publication date: October 2020

publication year: 2020

ISBN: 9781107003736

Link to CUP: [The Askey-Bateman Project. Volume 2. Multivariable Special Functions.](#)

Description: This is the second of three volumes that form the Encyclopedia of Special Functions, an extensive update of the Bateman Manuscript Project. Volume 2 covers multivariable special functions. When the Bateman project appeared, study of these was in an early stage, but revolutionary developments began to be made in the 1980s and have continued ever since. World-renowned experts survey these over the course of 12 chapters, each containing an extensive bibliography. The reader encounters different perspectives on a wide range of topics, from Dunkl theory, to Macdonald theory, to the various deep generalizations of classical hypergeometric functions to the several variables case, including the elliptic level. Particular attention is paid to the close relation of the subject with Lie theory, geometry, mathematical physics and combinatorics.

Table of Contents:

List of Contributors	ix
Preface	xi
1. General Overview of Multivariable Special Functions T. H. Koornwinder and J. V. Stokman	1
2. Orthogonal Polynomials of Several Variables Yuan Xu	19
3. Appell and Lauricella Hypergeometric Functions K. Matsumoto	79
4. A -Hypergeometric Functions N. Takayama	101
5. Hypergeometric and Basic Hypergeometric Series and Integrals Associated with Root Systems M. J. Schlosser	122
6. Elliptic Hypergeometric Functions Associated with Root Systems H. Rosengren and S. O. Warnaar	159

7. Dunkl Operators and Related Special Functions C. F. Dunkl	187
8. Jacobi Polynomials and Hypergeometric Functions Associated with Root Systems G. J. Heckman and E. M. Opdam	217
9. Macdonald–Koornwinder Polynomials J. V. Stokman	258
10. Combinatorial Aspects of Macdonald and Related Polynomials J. Haglund	314
11. Knizhnik–Zamolodchikov–Type Equations, Selberg Integrals & Related Special Functions V. Tarasov and A. Varchenko	368
12. q -Coefficients and Higher J. Van der Jeugt	402
Index	420

Topic #5 ——— OP – SF Net 27.6 ——— November 15, 2020

From: OP–SF Net Editors

Subject: Announcement: JMM 2021 AMS Special Session on The Legacy of **Dick Askey**

We would like to invite you to attend the virtual [JMM 2021
AMS Special Session on The Legacy of Dick Askey](#).

Organizers: Howard S. Cohl, Mourad E.H. Ismail and George E. Andrews

All times below are **U.S. Mountain Standard Time** (the time zone of Denver, Colorado)

Thursday January 7, 2021, 8:00 a.m.–11:50 a.m.

AMS Special Session on The Legacy of Dick Askey, I

- 8:00 a.m. **Persi Diaconis***, Chenyang Zhong
Orthogonal Polynomials and the Burnside Process.
- 8:30 a.m. **Tom H. Koornwinder***
Charting the Askey and q -Askey schemes.
- 9:00 a.m. **Kathy A. Driver***
Zeros of Jacobi polynomials.
- 9:30 a.m. **Erik Koelink***, Maarten van Puijssen, Pablo Román
Multivariable matrix valued orthogonal polynomials from representation theory.
- 10:00 a.m. **Jacob Stordal Christiansen***, Barry Simon, Maxim Zinchenko
Residual Polynomials.
- 10:30 a.m. **Hjalmar Rosengren***
On the Kanade–Russell identities.
- 11:00 a.m. **Roger Howe***
Dick Askey and Mathematics Education.
- 11:30 a.m. **Al Cuoco***
Adventures with Dick in Mathematics Education.

Friday January 8, 2021, 1:00 p.m.–5:50 p.m.

AMS Special Session on The Legacy of Dick Askey, II

- 1:00 p.m. **George E. Andrews***
Chebyshev polynomials and Compositions.
- 1:30 p.m. Jennifer Balakrishnan, William Craig, **Ken Ono***, Wei–Lun Tsai
Variants of Lehmer’s Conjecture on Ramanujan’s tau–function.
- 2:00 p.m. **Luc Vinet***, Alexei Zhedanov
A unified algebraic underpinning for the Hahn polynomials and rational functions.

2:30 p.m. **Doron Zeilberger***

How Richard Askey Inspired the Happy Marriage of Special Functions and Combinatorics.

3:00 p.m. **Dennis Stanton***

Combinatorics of type R_I orthogonal polynomials.

3:30 p.m. **Warren P. Johnson***

Functional Equations in the Research and Teaching of Dick Askey.

4:00 p.m. **Sarah Post***, Ian Marquette, Lisa Ritter

Exceptional Orthogonal Polynomials and rational solutions of Painlevé Equations.

4:30 p.m. **Bruce C. Berndt***

Ramanujan's Beautiful Integrals.

5:00 p.m. **Shaun Cooper***

Some elliptic integrals in Ramanujan's lost notebook.

5:30 p.m. **Mourad E. H. Ismail***

Mathematical Reminisce about Dick Askey.

Topic #6 ——— OP – SF Net 27.6 ——— November 15, 2020

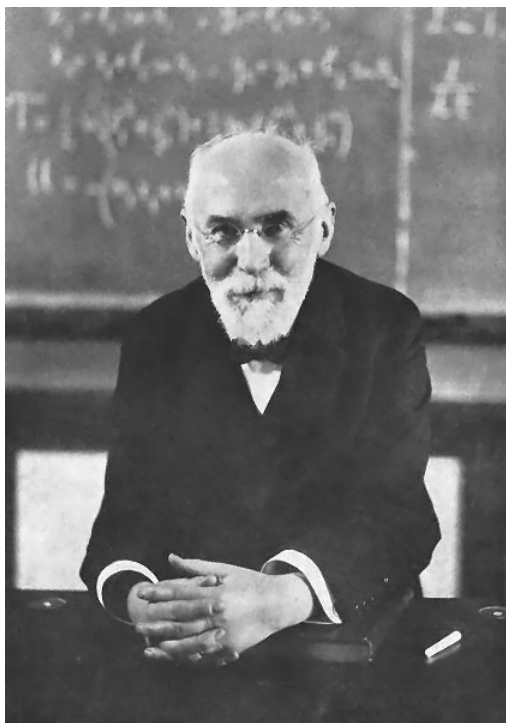
From: Tom Koornwinder (thkmath@xs4all.nl)

Subject: Essay by Tom Koornwinder: Hendrik Lorentz and Harry Bateman

Lorentz and Bateman

by Tom Koornwinder

There are two ways by which the Dutch physicist Hendrik Antoon Lorentz (1853–1928) and the American, originally English, mathematician Harry Bateman (1882–1946) are scientifically related. Do you know which ones?



Hendrik Lorentz (1853–1928)



Harry Bateman (1882–1946)

1. Lorentz and Bateman both figure on a group photo (see [link](#) and below) taken at Caltech, Pasadena in 1922 (see [1] for a photo of less quality, but with Bateman closer to Lorentz.). Lorentz is central in the row of those sitting on chairs and Bateman is fourth to the right from him. The group consists of the people attending Lorentz' lecture course there. Bateman, who was a faculty



member at Caltech, was charged with taking notes and sending a draft to Lorentz so that it could be published as a book. Already in May 1922 Bateman had done his job. Lorentz was very slow in making corrections and writing additions. He was burdened by administrative duties. The book was finally published in 1927: Problems of Modern Physics, a course of lectures delivered in the California Institute of Technology [2], see a review in [3]. If we remember Bateman mainly as the grandfather of handbooks on special functions, we may be surprised that he was assigned to prepare this book for Lorentz. But according to Erdélyi's obituary [4] of Bateman, he had earlier done work on Maxwell equations which contained ideas of general relativity theory, independently of Einstein. So he may have been the best suitable person for taking notes.

2. After the flood of 1916, a law was passed in the Netherlands that a closure dam of the Zuiderzee (see old situation at [5] and new situation at [6]) should be built. In 1918, a committee of specialists was installed for preparing a final technical proposal for the construction of the dam. Lorentz became chairman. This turned out to be a major job since new theory had to be developed on how the tides would behave after the dam was built and how the dam should be in order to stand storm floods. Lorentz was the only person in this committee of hydraulic engineers who was able to develop such a theory. Even for him, the man who had completely understood Einstein's general relativity theory in a few months after its publication in 1915, it was a tour de force. It took until 1926 before the committee published its report. At a certain stage Bessel functions entered in Lorentz' research for this project. The hydraulic engineers were not familiar at all with these functions. Of course, Bateman knew these functions very well, but

probably he did not know that one of the reasons that he had to wait so long for the final version of the Caltech lecture notes, was that Lorentz was busy with Bessel functions. See the final report [7] (in Dutch); Bessel functions are introduced on p.232.

I found these facts from a recent biography of Lorentz (in Dutch). See a short description in English on [8].

References

- [1] <https://www.aip.org/history-programs/niels-bohr-library/photos/caltech-e7>
- [2] Problems of Modern Physics: a Course of Lectures Delivered in the California Institute of Technology Hendrik Antoon Lorentz; Harry Bateman; California Institute of Technology, Dover, New York (N.Y.) 1967.
- [3] https://projecteuclid.org/download/pdf_1/euclid.bams/1183492751
- [4] <https://www.jstor.org/stable/769103>
- [5] <http://www.ijsselmeervissen.nl/portals/32/Geschiedenis%20Zuiderzee/oude-zuiderzee.jpg>
- [6] <https://www.teylersmuseum.nl/nl/bezoek-het-museum/teylers-verhalen/knikwinklerprins.jpg>
- [7] <https://repository.tudelft.nl/islandora/object/uuid:f5a4fe20-b26a-4875-9f96-6be04ba16c59/datastream/OBJ1/download>
- [8] <https://www.universiteitleiden.nl/en/news/2019/10/lorentz-celebrated-physicist-born-mediator>

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 September and October 2020. This list has been separated into two categories.

OP–SF Net Subscriber E-Prints

<http://arxiv.org/abs/1301.3556> [major update in September 2020]
Multi-integral representations for associated Legendre and Ferrers functions
Howard S. Cohl, Roberto S. Costas-Santos

<http://arxiv.org/abs/2009.00230>
Generalized Bessel functions of dihedral-type: expression as a series of confluent Horn functions and Laplace-type integral representation
Luc Deleaval, Nizar Demni

<http://arxiv.org/abs/2009.00446>
A Series Representation for Riemann's Zeta Function and some Interesting Identities that Follow
Michael Milgram

<http://arxiv.org/abs/2009.01962>
Uniformization and Constructive Analytic Continuation of Taylor Series
Ovidiu Costin, Gerald V. Dunne

<http://arxiv.org/abs/2009.02087>
Dunkl intertwining operator for symmetric groups
Hendrik De Bie, Pan Lian

<http://arxiv.org/abs/2009.02360>
Self-similar potentials in quantum mechanics and coherent states
V. P. Spiridonov

<http://arxiv.org/abs/2009.02871>
Resolving singularities and monodromy reduction of Fuchsian connections
Yik-Man Chiang, Avery Ching, Chiu-Yin Tsang

<http://arxiv.org/abs/2009.04269>
Refined Wilf-equivalences by Comtet statistics
Shishuo Fu, Zhicong Lin, Yaling Wang

<http://arxiv.org/abs/2009.04666>
Sharp error bounds for turning point expansions
T. M. Dunster, A. Gil, J. Segura

<http://arxiv.org/abs/2009.04910>
The elliptic function dn_2 of Shen
P.L. Robinson

<http://arxiv.org/abs/2009.05767>

Comments on the paper “Universal bounds and monotonicity properties of ratios of Hermite and Parabolic Cylinder functions”

Javier Segura

<http://arxiv.org/abs/2009.05905>

A unified algebraic underpinning for the Hahn polynomials and rational functions

Luc Vinet, Alexei Zhedanov

<http://arxiv.org/abs/2009.06186>

Definition and properties of logopoles of all degrees and orders

Matt Majic, Eric C. Le Ru

<http://arxiv.org/abs/2009.06195>

Perfect state transfer in two dimensions and the bivariate dual–Hahn polynomials

Hiroshi Miki, Satoshi Tsujimoto, Luc Vinet

<http://arxiv.org/abs/2009.07051>

On discrete coherent pairs of measures

R. Álvarez–Nodarse, K. Castillo, D. Mbouna, J. Petronilho

<http://arxiv.org/abs/2009.07069>

Hypergeometric identities in elliptic signature six

P.L. Robinson

<http://arxiv.org/abs/2009.07318>

Gauss hypergeometric representations of the Ferrers function of the second kind

Howard S. Cohl, Justin Park, Hans Volkmer

<http://arxiv.org/abs/2009.07607>

Stokes phenomenon arising in the confluence of the Gauss hypergeometric equation

Calum Horrobin, Marta Mazzocco

<http://arxiv.org/abs/2009.07781>

Airy process with wanderers, KPZ fluctuations, and a deformation of the Tracy–Widom GOE distribution

Karl Liechty, Gia Bao Nguyen, Daniel Remenik

<http://arxiv.org/abs/2009.08803>

Differentiation of the Wright functions with respect to parameters and other results

Alexander Apelblat, Francesco Mainardi

<http://arxiv.org/abs/2009.09432>

Convergence Rates of Exceptional Zeros of Exceptional Orthogonal Polynomials

Brian Simanek

<http://arxiv.org/abs/2009.09437>

Twisted traces and positive forms on quantized Kleinian singularities of type A

Pavel Etingof, Daniil Klyuev, Eric Rains, Douglas Stryker

<http://arxiv.org/abs/2009.09711>

Positivity of Turán determinants for orthogonal polynomials II

Ryszard Szwarc

<http://arxiv.org/abs/2009.10196>

Zeros of Jacobi and ultraspherical polynomials

J. Arvesú, K. Driver, L. Littlejohn

<http://arxiv.org/abs/2009.10206>

Interlacing of zeros of Laguerre polynomials of equal and consecutive degree

J. Arvesú, K. Driver, L. Littlejohn

<http://arxiv.org/abs/2009.10439>

Asymptotics of 3–stack–sortable permutations

Colin Defant, Andrew Elvey Price, Anthony J Guttmann

<http://arxiv.org/abs/2009.10873>

Dyson’s Crank and the Mex of Integer Partitions

Brian Hopkins, James A. Sellers, Dennis Stanton

<http://arxiv.org/abs/2009.11668>

Rational solutions of Painlevé systems

David Gomez–Ullate, Yves Grandati, Robert Milson

<http://arxiv.org/abs/2009.12238>

Discrete index Whittaker transforms

Semyon Yakubovich

<http://arxiv.org/abs/2009.12641>

A q –analog of the binomial distribution

Andrew V. Sills

<http://arxiv.org/abs/2009.13168>

Transformations of the hypergeometric ${}_4F_3$ with one unit shift: a group theoretic study

Dmitrii Karp, Elena Prilepkina

<http://arxiv.org/abs/2009.14475>

Orthogonal polynomials of type R_I

Jang Soo Kim, Dennis Stanton

<http://arxiv.org/abs/2009.14609>

Magnetic (quasi–)modular forms

Vicențiu Pașol, Wadim Zudilin

<http://arxiv.org/abs/2009.14694>

A new identity for the sum of products of generalized basic hypergeometric functions

S.I. Kalmykov, D. Karp, A. Kuznetsov

<http://arxiv.org/abs/2010.00076>

Complete classification of rational solutions of A_{2n} –Painlevé systems

David Gómez–Ullate, Yves Grandati, Robert Milson

<http://arxiv.org/abs/2010.01435>

Proof of a bi–symmetric septuple equidistribution on ascent sequences

Emma Yu Jin, Michael J. Schlosser

<http://arxiv.org/abs/2010.01763>

Multivariate Lagrange interpolation and polynomials of one quaternionic variable
Shayne Waldron

<http://arxiv.org/abs/2010.03381>

Finite-dimensional representations of the symmetry algebra of the dihedral Dunkl-Dirac operator
Hendrik De Bie, Alexis Langlois-Rémillard, Roy Oste, Joris Van der Jeugt

<http://arxiv.org/abs/2010.04477>

Exact solution of the position-dependent effective mass and angular frequency Schrödinger equation: harmonic oscillator model with quantized confinement parameter
E.I. Jafarov, S.M. Nagiyev, R. Oste, J. Van der Jeugt

<http://arxiv.org/abs/2010.05011>

Proofs for certain conjectures of Gosper on q -trigonometric identities
Bing He

<http://arxiv.org/abs/2010.05018>

Inequalities for Taylor series involving the divisor function
Horst Alzer, Man Kam Kwong

<http://arxiv.org/abs/2010.05428>

Uniform asymptotic expansions for solutions of the parabolic cylinder and Weber equations
T. M. Dunster

<http://arxiv.org/abs/2010.15906>

Expanding the quasisymmetric Macdonald polynomials in the fundamental basis
Sylvie Corteel, Olya Mandelshtam, Austin Roberts

<http://arxiv.org/abs/2010.06486>

Orthogonal functions related to Lax pairs in Lie algebras
Wolter Groenevelt, Erik Koelink

<http://arxiv.org/abs/2010.06733>

On $\beta = 6$ Tracy-Widom distribution and the second Calogero-Painlevé system
Alexander Its, Andrei Prokhorov

<http://arxiv.org/abs/2010.07723>

Airy kernel determinant solutions to the KdV equation and integro-differential Painlevé equations
Mattia Cafasso, Tom Claeys, Giulio Ruzza

<http://arxiv.org/abs/2010.09502>

Discrete index transformations with squares of Bessel functions
Semyon Yakubovich

<http://arxiv.org/abs/2010.09612>

Correlation Functions for a Chain of Short Range Oscillators
Guido Mazzuca, Tamara Grava, Thomas Kriecherbauer, Ken D. T.-R. McLaughlin

<http://arxiv.org/abs/2010.10321>

An explicit example of polynomials orthogonal on the unit circle with a dense point spectrum generated by a geometric distribution

Alexei Zhedanov

<http://arxiv.org/abs/2010.10611>

Higher Order Coercive Inequalities

Yifu Wang, Boguslaw Zegarliniski

<http://arxiv.org/abs/2010.10690>

A note on an asymptotic formula for integrals of products of Jacobi polynomials

Maxim Derevyagin, Nicholas Juricic

<http://arxiv.org/abs/2010.11118>

Uniform (very) sharp bounds for ratios of Parabolic Cylinder functions

Javier Segura

<http://arxiv.org/abs/2010.11275>

Determinant of \mathbb{F}_p -hypergeometric solutions under ample reduction

Alexander Varchenko

<http://arxiv.org/abs/2010.11937>

Asymptotic properties of short-range interaction functionals

Douglas Hardin, Edward B. Saff, Oleksandr Vlasjuk

<http://arxiv.org/abs/2010.12410>

Almost all entries in the character table of the symmetric group are multiples of any given prime

Sarah Peluse, Kannan Soundararajan

<http://arxiv.org/abs/2010.13069>

Proofs of two conjectures on the real zeros of the cylinder and Airy functions

Gergő Nemes

<http://arxiv.org/abs/2010.13526>

q -Analogues of some supercongruences related to Euler numbers

Victor J. W. Guo

<http://arxiv.org/abs/2010.14315>

A proof of the mod 4 unimodal sequence conjectures and related mock theta functions

Rong Chen, Frank Garvan

<http://arxiv.org/abs/2010.14696>

Representations of degenerate Hermite polynomials

Taekyun Kim, Dae San Kim, Lee-Chae Jang, Hyunseok Lee, Hanyoung Kim

<http://arxiv.org/abs/2010.15080>

Bernoulli-Fibonacci Polynomials

Oktay K. Pashaev, Merve Ozvatan

<http://arxiv.org/abs/2010.15107>

Partition-theoretic formulas for arithmetic densities, II

Ken Ono, Robert Schneider, Ian Wagner

<http://arxiv.org/abs/2010.15118>

A Note on Generalized q -Difference Equations and Their Applications Involving q -Hypergeometric Functions

Hari Mohan Srivastava, Jian Cao, Sama Arjika

<http://arxiv.org/abs/2010.15276>

Ladder operators and hidden algebras for shape invariant nonseparable and nondiagonalizable models with quadratic complex interaction. II. Three-dimensional model

Ian Marquette, Christiane Quesne

<http://arxiv.org/abs/2010.15424>

On a result of Koecher concerning Markov–Apéry type formulas for the Riemann zeta function

Karl Dilcher, Christophe Vignat

<http://arxiv.org/abs/2010.15608>

When are the roots of a polynomial real and distinct? A graphical view

David W. Farmer

Other Relevant OP–SF E–Prints

<http://arxiv.org/abs/2009.00671>

Realization by a differential operator of the annihilation operator for generalized Chebyshev oscillator

V.V. Borzov, E.V. Damaskinsky

<http://arxiv.org/abs/2009.00769>

An Explicit Upper Bound for $|\zeta(1 + it)|$

Dhir Patel

<http://arxiv.org/abs/2009.00840>

The geometry of generalized Lamé equation, III: One-to-one of the Riemann–Hilbert correspondence

Zhijie Chen, Ting–Jung Kuo, Chang–Shou Lin

<http://arxiv.org/abs/2009.01418>

Limit theorems and soft edge of freezing random matrix models via dual orthogonal polynomials

Sergio Andraus, Kilian Hermann, Michael Voit

<http://arxiv.org/abs/2009.01428>

Selberg’s zeta function for the modular group in the critical strip

Yasufumi Hashimoto

<http://arxiv.org/abs/2009.01793>

Optimal approximants and orthogonal polynomials in several variables II: families of polynomials in the unit ball

Meredith Sargent, Alan A. Sola

<http://arxiv.org/abs/2009.02323>

Uniform pointwise estimates for ultraspherical polynomials

Valentina Casarino, Paolo Ciatti, Alessio Martini

<http://arxiv.org/abs/2009.02640>

The recurrence formulas for primes and non-trivial zeros of the Riemann zeta function
Artur Kawalec

<http://arxiv.org/abs/2009.02804>

Convolution operators via orthogonal polynomials
Maksim Kukushkin

<http://arxiv.org/abs/2009.02916>

Weighted spectral cluster bounds and a sharp multiplier theorem for ultraspherical Grushin operators
Valentina Casarino, Paolo Ciatti, Alessio Martini

<http://arxiv.org/abs/2009.03277>

Are the Stieltjes constants irrational? Some computer experiments
Krzysztof D. Maslanka, Marek Wolf

<http://arxiv.org/abs/2009.03405>

Relative Nash-type and L^2 -Sobolev inequalities for Dunkl operators and applications
S. Mustapha, M. Sifi

<http://arxiv.org/abs/2009.03479>

Higher Order Apostol-Type Poly-Genocchi Polynomials with Parameters a, b and c
Cristina B. Corcino, Roberto B. Corcino

<http://arxiv.org/abs/2009.03481>

Some Formulae of Genocchi Polynomials of Higher Order
Cristina B. Corcino, Roberto B. Corcino, Joy Ann A. Canete

<http://arxiv.org/abs/2009.03526>

q RS t : A probabilistic Robinson-Schensted correspondence for Macdonald polynomials
Florian Aigner, Gabriel Frieden

<http://arxiv.org/abs/2009.03931>

Families of eulerian functions involved in regularization of divergent polyzetas
V.C. Bui, V. Hoang Ngoc Minh, Q.H. Ngo

<http://arxiv.org/abs/2009.04099>

Extreme values for iterated integrals of the logarithm of the Riemann zeta-function
Shōta Inoue

<http://arxiv.org/abs/2009.04112>

Truncated t -adic symmetric multiple zeta values and double shuffle relations
Masataka Ono, Shin-ichiro Seki, Shuji Yamamoto

<http://arxiv.org/abs/2009.04670>

The many faces of the stochastic zeta function
Benedek Valkó, Bálint Virág

<http://arxiv.org/abs/2009.04752>

Moments of Generalized Cauchy Random Matrices and continuous-Hahn Polynomials
Theodoros Assiotis, Benjamin Bedert, Mustafa Alper Gunes, Arun Soor

<http://arxiv.org/abs/2009.04760>

On a distinguished family of random variables and Painlevé equations
Theodoros Assiotis, Benjamin Bedert, Mustafa Alper Gunes, Arun Soor

<http://arxiv.org/abs/2009.04955>

Polar harmonic Maaß forms and holomorphic projection
Joshua Males, Andreas Mono, Larry Rolen

<http://arxiv.org/abs/2009.05003>

Strong approximation of Gaussian β -ensemble characteristic polynomials: the edge regime and the stochastic Airy function
Gaultier Lambert, Elliot Paquette

<http://arxiv.org/abs/2009.05125>

A local Theory of Domains and its (Noncommutative) Symbolic Counterpart
V.C. Bui, G.H.E. Duchamp, V. Hoang Ngoc Minh, Q.H. Ngo, K. Penson

<http://arxiv.org/abs/2009.05251>

A harmonic sum over nontrivial zeros of the Riemann zeta-function
Richard P. Brent, David J. Platt, Timothy S. Trudgian

<http://arxiv.org/abs/2009.05364>

Asymptotic evaluation of a lattice sum associated with the Laplacian matrix
Arzu Boysal, Fatih Ecevit, Cem Yalçın Yıldırım

<http://arxiv.org/abs/2009.05692>

Balancing Polynomials in the Chebyshev Norm
Victor Reis

<http://arxiv.org/abs/2009.05878>

Several new product identities in relation to two-variable Rogers-Ramanujan type sums and mock theta functions
Alexandru Pascadi

<http://arxiv.org/abs/2009.06012>

Seesaw Identities and Theta Contractions with Generalized Theta Functions, and Restrictions of Theta Lifts
Shaul Zemel

<http://arxiv.org/abs/2009.06250>

Algebraic independence of certain infinite products involving the Fibonacci numbers
Daniel Duverney, Yohei Tachiya

<http://arxiv.org/abs/2009.06452>

A family of Exponential Integrals suggested by Stellar Dynamics
Luca Ciotti

<http://arxiv.org/abs/2009.06583>

Rational values of powers of trigonometric functions
Genki Shibukawa

<http://arxiv.org/abs/2009.06597>

On a nonlinear relation for computing the overpartition function
Mircea Merca

<http://arxiv.org/abs/2009.06718>

Discriminants of cubic curves and determinantal representations
Manh Hung Tran

<http://arxiv.org/abs/2009.06743>

An introduction to the Bernoulli function
Peter H. N. Luschny

<http://arxiv.org/abs/2009.06839>

Airy Point Process via Supersymmetric Lifts
Andrew Ahn

<http://arxiv.org/abs/2009.07134>

Generalized hypergeometric expansion related to the Hurwitz zeta function
Alexander Adam

<http://arxiv.org/abs/2009.07159>

Bergman–Szegő kernel asymptotics in weakly pseudoconvex finite type cases
Chin–Yu Hsiao, Nikhil Savale

<http://arxiv.org/abs/2009.07194>

Theta functions, fourth moments of eigenforms, and the sup–norm problem I
Ilya Khayutin, Raphael S. Steiner

<http://arxiv.org/abs/2009.07319>

Asymptotics of Fundamental Solution of Cauchy Problem for Parabolic Equation with Small Parameter and Degeneration
Mark Rakhel

<http://arxiv.org/abs/2009.08143>

Yang–Baxter R -operators for osp superalgebras
A.P. Isaev, D. Karakhanyan, R. Kirschner

<http://arxiv.org/abs/2009.08184>

A pair correlation problem, and counting lattice points with the zeta function
Christoph Aistleitner, Daniel El–Baz, Marc Munsch

<http://arxiv.org/abs/2009.08419>

Moments and hybrid subconvexity for symmetric–square L -functions
Rizwanur Khan, Matthew P. Young

<http://arxiv.org/abs/2009.08558>

The Ruelle zeta function at zero for nearly hyperbolic 3–manifolds
Mihajlo Cekić, Semyon Dyatlov, Benjamin Küster, Gabriel P. Paternain

<http://arxiv.org/abs/2009.09409>

Lucas–Euler relations using balancing and Lucas–balancing polynomials
Robert Frontczak, Taras Goy

<http://arxiv.org/abs/2009.09613>

Schatten class Bergman-type and Szegő-type operators on bounded symmetric domains
Lijia Ding

<http://arxiv.org/abs/2009.09885>

Multiple zeta values and iterated Eisenstein integrals
Alex Saad

<http://arxiv.org/abs/2009.09921>

Coherent States of Systems with Pure Continuous Energy Spectra
Zouhair Mouayn, Hashim A. Yamani

<http://arxiv.org/abs/2009.10213>

Fibonacci polynomials
A. Garsia, G. Ganzberger

<http://arxiv.org/abs/2009.10503>

Orthogonal Die Random Measures, Primes, and Applications
Caleb Deen Bastian, Grzegorz A Rempala

<http://arxiv.org/abs/2009.11269>

New mixed recurrence relations of two-variable orthogonal polynomials via differential operators
Mosaed M. Makky, Mohammad Shadab

<http://arxiv.org/abs/2009.11703>

Relating certain weighted Fibonacci series to Bernoulli polynomials via the polylogarithm function
Kunle Adegoke

<http://arxiv.org/abs/2009.11704>

Dirichlet type extensions of Euler sums
Weiping Wang, Ce Xu

<http://arxiv.org/abs/2009.11886>

X-Ray of Zhang's eta function
Jeffrey Stopple

<http://arxiv.org/abs/2009.12127>

The birth of the strong components
Élie de Panafieu, Sergey Dovgal, Dimbinaina Ralaivaosaona, Vonjy Rasendrasahina, Stephan Wagner

<http://arxiv.org/abs/2009.12242>

Further study on the conformable fractional Gauss hypergeometric function
Mahmoud Abul-Ez, Mohra Zayed, Ali Youssef

<http://arxiv.org/abs/2009.12513>

Spectral invariants of convex billiard maps: a viewpoint of Mather's beta function
Jianlu Zhang

<http://arxiv.org/abs/2009.12594>

Real zeros of the Barnes double zeta function
Kazuma Sakurai

<http://arxiv.org/abs/2009.12851>

Time dependent rationally extended Pöschl–Teller potential and some of its properties
D. Nath, P. Roy

<http://arxiv.org/abs/2009.12996>

A remark on renormalization group theoretical perturbation in a class of ordinary differential equations
Atsuo Kuniba

<http://arxiv.org/abs/2009.13098>

Matrix orthogonality in the plane versus scalar orthogonality in a Riemann surface
Christophe Charlier

<http://arxiv.org/abs/2009.13728>

Mapping properties of the zero–balanced hypergeometric functions
Li–Mei Wang

<http://arxiv.org/abs/2009.13791>

Accurate estimation of sums over zeros of the Riemann zeta–function
Richard P. Brent, David J. Platt, Timothy S. Trudgian

<http://arxiv.org/abs/2009.13892>

Method of fundamental solutions for Neumann problems of the modified Helmholtz equation in disk domains
Shin–Ichiro Ei, Hiroyuki Ochiai, Yoshitaro Tanaka

<http://arxiv.org/abs/2009.13904>

An exceptional symmetry algebra for the 3D Dirac–Dunkl operator
Alexis Langlois–Rémillard, Roy Oste

<http://arxiv.org/abs/2009.13928>

Limit theorems for Bessel and Dunkl processes of large dimensions and free convolutions
Michael Voit, Jeannette H.C. Woerner

<http://arxiv.org/abs/2009.13963>

A Littlewood–Richardson rule for Koornwinder polynomials
Kohei Yamaguchi

<http://arxiv.org/abs/2009.14121>

Convergence of Ramanujan expansions, I
Giovanni Coppola, Luca Ghidelli

<http://arxiv.org/abs/2009.14198>

Orbifold partition function, pentagon identity and star–triangle relation
Deniz N. Bozkurt, Ilmar Gahramanov, Mustafa Mullahasanoglu

<http://arxiv.org/abs/2009.14742>

A generalization of Krull–Webster’s theory to higher order convex functions: multiple Γ –type functions
Jean–Luc Marichal, Naïm Zénaïdi

<http://arxiv.org/abs/2010.00107>

Sobolev Orthogonal Polynomials on the Sierpinski Gasket

Qingxuan Jiang, Tian Lan, Kasso Okoudjou, Robert Strichartz, Shashank Sule, Sreeram Venkat, Xiaoduo Wang

<http://arxiv.org/abs/2010.00125>

Novel Results of Two Generalized Classes of Fibonacci and Lucas Polynomials and Their Uses in the Reduction of Some Radicals

W.M. Abd-Elhameed, N.A. Zeyada, A.N. Philippou

<http://arxiv.org/abs/2010.00690>

The Fundamental Solution for the Heat Equation on the half-line with Drift and Dirichlet Boundary Condition

Tertuliano Franco, Patrícia Gonçalves, Nicolas Perkowski, Marielle Simon

<http://arxiv.org/abs/2010.00707>

Periods of Hodge cycles and special values of the hypergeometric function

Jorge Duque Franco

<http://arxiv.org/abs/2010.01563>

symODE2: Symbolic analysis of second-order ordinary differential equations with polynomial coefficients

Tolga Birkandan

<http://arxiv.org/abs/2010.02143>

Jet schemes, Quantum dilogarithm and Feigin-Stoyanovsky's principal subspaces

Hao Li, Antun Milas

<http://arxiv.org/abs/2010.02268>

Zeta functions of Lie \mathbb{F}_p -algebras and finite p -groups

Seungjai Lee

<http://arxiv.org/abs/2010.02344>

Tight bounds on the mutual coherence of sensing matrices for Wigner D-functions on regular grids

Arya Bangun, Arash Behboodi, Rudolf Mathar

<http://arxiv.org/abs/2010.02677>

Chebyshev polynomials and higher order Lucas Lehmer algorithm

Kok Seng Chua

<http://arxiv.org/abs/2010.02689>

On the Exact Distributions of the Maximum of the Asymmetric Telegraph Process

Fabrizio Cinque, Enzo Orsingher

<http://arxiv.org/abs/2010.02707>

Fractional truncated Laplacians: representation formula, fundamental solutions and applications

Isabeau Birindelli, Giulio Galise, Erwin Topp

<http://arxiv.org/abs/2010.02719>

Self-Bäcklund curves in centroaffine geometry and Lamé's equation

Misha Bialy, Gil Bor, Serge Tabachnikov

<http://arxiv.org/abs/2010.02833>

Application of Bernoulli Polynomials for Solving Variable-Order Fractional Optimal Control-Affine Problems

Somayeh Nemati, Delfim F. M. Torres

<http://arxiv.org/abs/2010.03521>

A few properties of the ratio of Davenport-Heilbronn Functions

Tao Liu, Juhao Wu

<http://arxiv.org/abs/2010.03727>

Distribution evaluation of hypergeometric series

Ming Hao Zhao

<http://arxiv.org/abs/2010.03919>

Elementary Integral Series for Heun Functions. With an Application to Black-Hole Perturbation Theory

P.-L. Giscard, A. Tamar

<http://arxiv.org/abs/2010.04241>

Raising type twisted Pieri formulas for Jack polynomials and their applications to interpolation Jack polynomials

Genki Shibukawa

<http://arxiv.org/abs/2010.05175>

On the deformation of linear Hamiltonian systems

Harald Schmid

<http://arxiv.org/abs/2010.05192>

A kernel-independent sum-of-Gaussians method by de la Vallée-Poussin sums

Jiuyang Liang, Zixuan Gao, Zhenli Xu

<http://arxiv.org/abs/2010.05208>

Entropy monotonicity and superstable cycles for the quadratic family revisited

José M. Amigó, Angel Giménez

<http://arxiv.org/abs/2010.05217>

On a class of canonical systems corresponding to matrix string equations: general-type and explicit fundamental solutions and Weyl-Titchmarsh theory

Alexander Sakhnovich

<http://arxiv.org/abs/2010.05231>

Horizontal and Vertical Log-Concavity

Bernhard Heim, Markus Neuhauser

<http://arxiv.org/abs/2010.05335>

All Complex Zeroes of the Riemann Zeta Function Are on the Critical Line: Two Proofs of the Riemann Hypothesis

Roberto Violi

<http://arxiv.org/abs/2010.05505>

Duality of one-variable multiple polylogarithms and their q -analogues

Shuji Yamamoto

<http://arxiv.org/abs/2010.05559>

Weights, Kovalevskaya exponents and the Painlevé property
Hayato Chiba

<http://arxiv.org/abs/2010.05596>

Topological recursion and uncoupled BPS structures I: BPS spectrum and free energies
Kohei Iwaki, Omar Kidwai

<http://arxiv.org/abs/2010.05955>

Fractal zeta functions of orbits of parabolic diffeomorphisms
Pavao Mardešić, Goran Radunović, Maja Resman

<http://arxiv.org/abs/2010.06228>

A Chebyshev–Tau spectral method for normal modes of underwater sound propagation with a layered marine environment
Houwang Tu, Yongxian Wang, Qiang Lan, Wei Liu, Wenbin Xiao, Shuqing Ma

<http://arxiv.org/abs/2010.06297>

Arithmetic properties of Fourier coefficients of meromorphic modular forms
Steffen Löbrich, Markus Schwagenscheidt

<http://arxiv.org/abs/2010.06894>

Continuous window functions for NFFT
Daniel Potts, Manfred Tasche

<http://arxiv.org/abs/2010.07000>

Analytical parameter estimation of the SIR epidemic model. Applications to the COVID–19 pandemic
Dimitar Prodanov

<http://arxiv.org/abs/2010.07112>

A Series Representation of $\zeta(m)$ Involving Root of Unity
Xiaowei Wang

<http://arxiv.org/abs/2010.07685>

Integrable Billiards on Pseudo–Euclidean Hyperboloids and Extremal Polynomials
Vladimir Dragovic, Sean Gasiorek, Milena Radnovic

<http://arxiv.org/abs/2010.07890>

Formulas for coefficients of polynomials assigned to arithmetic functions
Bernhard Heim, Markus Neuhauser

<http://arxiv.org/abs/2010.08011>

Autocorrelation functions for quantum particles in supersymmetric Pöschl–Teller Potentials
Francesco Cellarosi

<http://arxiv.org/abs/2010.08077>

Characteristic determinant and Manakov triple for the double elliptic integrable system
A. Grekov, A. Zotov

<http://arxiv.org/abs/2010.08156>

An Involution on Semistandard Skyline Fillings
Neil J.Y. Fan, Peter L. Guo, Nicolas Y. Liu

<http://arxiv.org/abs/2010.08332>

Joint value–distribution of shifts of the Riemann zeta–function
Łukasz Pańkowski

<http://arxiv.org/abs/2010.08552>

Yangian Bootstrap for Massive Feynman Integrals
Florian Loebbert, Julian Miczajka, Dennis Müller, Hagen Münkler

<http://arxiv.org/abs/2010.08736>

A proof of Ibukiyama’s Shimura type conjecture on Siegel modular forms of half–integral weight and of degree 2
Hiroshi Ishimoto

<http://arxiv.org/abs/2010.09021>

Painlevé type reductions for the non–Abelian Volterra lattices
V. E. Adler

<http://arxiv.org/abs/2010.09053>

On regularization of the Heun functions
Oleg V. Motygin

<http://arxiv.org/abs/2010.09167>

Linear Forms in Polylogarithms
Sinnou David, Noriko Hirata–Kohno, Makoto Kawashima

<http://arxiv.org/abs/2010.09449>

Non–Gaussian integrals and general hypergeometric functions
Alexander Roi Stoyanovsky

<http://arxiv.org/abs/2010.09699>

Hecke–Rogers double–sums and false theta functions
Eric T. Mortenson

<http://arxiv.org/abs/2010.09702>

Appell and Sheffer sequences: on their characterizations through functionals and examples
Sergio A. Carrillo, Miguel Hurtado

<http://arxiv.org/abs/2010.09860>

The Polylogarithm Function in Julia
Matthew Roughan

<http://arxiv.org/abs/2010.09862>

Higher Derivatives of the Tangent and Inverse Tangent Functions and Chebyshev Polynomials
M.J. Kronenburg

<http://arxiv.org/abs/2010.10160>

An exact solution to asymptotic Bethe equation
Yuan Miao

<http://arxiv.org/abs/2010.10290>

Where did the examples of Abel’s continuity theorem go?
Sergio A. Carrillo

<http://arxiv.org/abs/2010.10358>

Non-real zeros of polynomials in a polynomial sequence satisfying a three-term recurrence relation

Innocent Ndikubwayo

<http://arxiv.org/abs/2010.10376>

On derivatives, Riesz transforms and Sobolev spaces for Fourier-Bessel expansions

Bartosz Langowski, Adam Nowak

<http://arxiv.org/abs/2010.10490>

The number of zeros of linear combinations of L -functions near the critical line

Youness Lamzouri, Yoonbok Lee

<http://arxiv.org/abs/2010.10576>

A Sharp Isoperimetric Inequality for the Second Eigenvalue of the Robin Plate

L. Mercredi Chasman, Jeffrey J. Langford

<http://arxiv.org/abs/2010.10675>

Some explicit and unconditional results on gaps between zeroes of the Riemann zeta-function

A. Simonič, T. Trudgian, C. L. Turnage-Butterbaugh

<http://arxiv.org/abs/2010.10689>

On Ramanujan Sums of a Real Variable and a New Ramanujan Expansion for the Divisor Function

Matthew S. Fox, Chaitanya Karamchedu

<http://arxiv.org/abs/2010.11216>

Null Kähler geometry and isomonodromic deformations

Maciej Dunajski

<http://arxiv.org/abs/2010.11235>

Trans-Series Asymptotics of Solutions to the Degenerate Painlevé III Equation: A Case Study

A. Vartanian

<http://arxiv.org/abs/2010.11360>

Normal zeta functions of small \mathfrak{S}_2 -groups and their behaviour on residue classes

Seungjai Lee

<http://arxiv.org/abs/2010.13079>

Dwork hypersurfaces of degree six and Greene's hypergeometric function

Satoshi Kumabe

<http://arxiv.org/abs/2010.13258>

Gaussian Asymptotics of Jack Measures on Partitions from Weighted Enumeration of Ribbon Paths

Alexander Moll

<http://arxiv.org/abs/2010.13307>

On explicit estimates for $S(t)$, $S_1(t)$, and $\zeta(\frac{1}{2} + it)$ under the Riemann hypothesis

Aleksander Simonič

<http://arxiv.org/abs/2010.13335>

Convergence Acceleration via Chebyshev Step: Plausible Interpretation of Deep-Unfolded Gradient Descent

Satoshi Takabe, Tadashi Wadayama

<http://arxiv.org/abs/2010.13638>

Proof of some supercongruences concerning truncated hypergeometric series

Chen Wang, Dian-Wang Hu

<http://arxiv.org/abs/2010.14468>

The p -Airy distribution

Sergio Caracciolo, Vittorio Erba, Andrea Sportiello

<http://arxiv.org/abs/2010.15275>

A direct method for solving inverse Sturm-Liouville problems

Vladislav V. Kravchenko, Sergii M. Torba

<http://arxiv.org/abs/2010.15473>

Combinatorics of multiseccant Fay identities

V.E. Vekslerchik

<http://arxiv.org/abs/2010.15529>

Discrete and continuous Muttalib-Borodin processes I: the hard edge

Dan Betea, Alessandra Occelli

<http://arxiv.org/abs/2010.16093>

Bailey-type factorizations for Horn functions

Carlo Verschoor

<http://arxiv.org/abs/2010.16371>

A Kronecker limit formula for indefinite zeta functions

Gene S. Kopp

<http://arxiv.org/abs/2010.16406>

(p, q) -complex Itô-Hermite polynomials

Abdelhadi Benahmadi, Allal Ghanmi

Topic #8 ——— OP – SF Net 27.6 ——— November 15, 2020

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 28.1 should be sent by January 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.

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 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

Topic #9 ——— OP – SF Net 27.6 ——— November 15, 2020

From: OP-SF Net Editors

Subject: Thoughts of the Month by **Bertrand Russell**

“It seems to me now that mathematics is capable of an artistic excellence as great as that of any music, perhaps greater ... because it gives in absolute perfection that combination, characteristic of great art, of godlike freedom, with the sense of inevitable destiny; because, in fact, it constructs an ideal world where everything is perfect and yet true.”

Bertrand Russell (1872–1970), In Letter to Gilbert Murray, April 3, 1902.

“One of the painful things about our time is that those who feel certainty are stupid, and those with any imagination and understanding are filled with doubt and indecision.”

Bertrand Russell, In *New Hopes for a Changing World*, Simon and Schuster, New York, pp. 4–5 (1951).