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Calendar of Events:

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 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 COVID-19 outbreak.
http://www.mca2021.org/en

January 10–14, 2022—Updated new date due to COVID–19 outbreak.
9th International Conference on Computational Methods and Function Theory (CMFT 2021)
Federico Santa María Technical University, Valparaíso, Chile
http://cmft2021.inf.utfsm.cl/

OPSFA–16
Centre de Recherches Mathématiques, Montreal, Canada

August 2022—Updated new date due to COVID–19 outbreak.
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 COVID–19 outbreak.
Functional Analysis, Approximation Theory and Numerical Analysis (FAATNA)
Matera, Italy
http://web.unibas.it/ faatna20/

Topic #1 ______ OP – SF Net 28.1 ______ January 15, 2021

From: Peter Clarkson (P.A.Clarkson@kent.ac.uk)
Subject: Message from the Chair

Happy New Year! Let’s hope that 2021 is better year than 2020, though the start of 2021 has been much the same as 2020 in many parts of the world.

There was some positive news for our Activity Group in 2020 with the renewal of our SIAM Charter for another two years. SIAM still have concerns about our SIAG, in particular the membership numbers. We have made some suggestions as to how SIAM might help.

It is disappointing that two major events for our Activity Group have been postponed to 2022. The 16th OPSFA International Symposium will now take place in July 2022 in Montreal, Canada and the next OPSFA Summer School will now take place in August 2022 in Nijmegen, The Netherlands.

Whilst there have been no physical conferences and workshops to attend in 2020, the OPSF community has been involved with various virtual events in 2020. The was an invited presentation by Andrei Martínez–Finkelshtein and mini–symposium organised by Andrei and Walter Van Assche at the SIAM Annual Meeting in July. There has been seminar series on “Orthogonal Polynomials, Special Functions, Operator Theory and Applications” (OPSFTA) organised by Ana Loureiro, Thomas Bothner, Adri Olde Daalhuis, Walter Van Assche and Jani Virtanen, which is hosted by the ICMS in Edinburgh, Scotland. From a personal point of view, whilst much of my time in 2020 was taken up with teaching and admin related matters, much additional work due to the pandemic, it has been good to (virtually) attend a number of seminars on a virtual basis.

As reported elsewhere in this newsletter, there was a Special Session on the Legacy of Dick Askey at the JMM 2021 meeting earlier this month organized by George Andrews, Howard Cohl and
Mourad Ismail. I expect most conferences, minisymposia, special sessions and workshops will be virtual for several months to come.

I wish you a safe 2021 and hope to be able to see many or, virtually or physically, during the year.

Peter

Topic #2 ——— OP – SF Net 28.1 ——— January 15, 2021

From: Walter Van Assche (walter.vanassche@kuleuven.be)
Subject: Announcement: Peter Clarkson awarded the Senior Anne Bennett Prize

Peter Clarkson, Chair of the SIAM Activity Group on Orthogonal Polynomials and Special Functions, has been awarded the Senior Anne Bennett Prize in recognition of his tireless work to support gender equality in UK mathematics, and particularly for his leadership in developing good practice among departments of mathematical sciences. This prize is offered by the London Mathematical Society (LMS) every three years.

Clarkson, Professor of Mathematics at the University of Kent, School of Mathematics, Statistics and Actuarial Science, is an eminent mathematician with a long record of service to the profession. Most notable are his considerable efforts in the area of gender equality, in which he has had a tremendous impact as a Head of Department at Kent, as a member of the Athena SWAN advisory group at Equality Challenge Unit (ECU), and as one of the longest-serving and most active members of the LMS Women in Mathematics Committee. From joining the committee in 2007, he was a driving force behind its work, particularly in the establishment of the highly successful Good Practice Scheme (GPS) to support university Mathematics Departments. He was one of the founding members of the GPS Steering Group and chair from 2013–2018. Peter was one of the key GPS players (along with Cathy Hobbs and Gwyneth Stallard) involved in commissioning the first ever national benchmarking survey of good practice in UK mathematics departments.

As a highly regarded Head of Department, Peter provided a bridge between the LMS WIM Committee, ECU and Heads of Department of Mathematical Sciences (HoDoMS). His understanding of the issues and practicalities facing heads of departments was hugely important in shaping the GPS, ensuring that it is relevant and supportive to departments, and enabled him to provide valuable guidance and advice to ECU around the development of the Athena SWAN Charter process.

Peter’s energy and commitment to improving gender diversity in the UK mathematics community has been substantial, inspiring and successful. He has a huge personal commitment and drive to ensure that women are able to flourish in their mathematical careers and has acted as mentor, both formally and informally, for many women at different levels of their careers. He has provided enormous moral and practical support in enabling the chairs of the WIM Committee to fulfill their roles successfully—in a world that is still predominantly male, the active support of a highly regarded male professor is of enormous benefit and importance.

More details about the 2020 LMS Prize Winners can be found at: https://www.lms.ac.uk/news-entry/26062020–1657/lms-prize-winners–2020.

Topic #3 ——— OP – SF Net 28.1 ——— January 15, 2021

From: OP–SF Net Editors
Subject: Announcement: Introduction to $q$–analysis by Warren Johnson
We would like to draw your attention to the following book “An Introduction to \( q \)-analysis,” by Warren P. Johnson: Connecticut College, New London, Connecticut. It is published by the American Mathematical Society, Providence, 2020, xv+519.

Link to AMS: https://bookstore.ams.org/mbk-134.

Description: Starting from simple generalizations of factorials and binomial coefficients, this book gives a friendly and accessible introduction to \( q \)-analysis, a subject consisting primarily of identities between certain kinds of series and products. Many applications of these identities to combinatorics and number theory are developed in detail. There are numerous exercises to help students appreciate the beauty and power of the ideas, and the history of the subject is kept consistently in view.

The book has few prerequisites beyond calculus. It is well suited to a capstone course, or for self–study in combinatorics or classical analysis. Ph.D. students and research mathematicians will also find it useful as a reference.

Readership: Undergraduate students interested in \( q \)-analysis, combinatorics, and number theory.

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Topic #4  OP – SF Net 28.1  January 15, 2021

From: Tom Koornwinder (thkmath@xs4all.nl)
Subject: Obituary for Mogens Flensted–Jensen (1942–2020) by Tom Koornwinder

This was prepared by Tom Koornwinder (with thanks to Henrik Schlichtkrull).

The Danish mathematician Mogens Flensted-Jensen, Professor Emeritus of the University of Copenhagen, passed away in December 2020. See an extensive obituary on https://www.math.ku.dk/english/about/news/obituary-of-professor-mogens-flensted-jensen/.

I got acquainted with Mogens when we both participated as graduate students in a special year on noncommutative harmonic analysis at the Mittag-Leffler Institute in Djursholm, Sweden during the academic year 1970–71. We have kept friendly contacts during the fifty years since then. Precisely in the middle of that half century, in the fall of 1995, we were again together for a longer period at the Mittag-Leffler Institute on the same theme as in 1970 (see the photo).

In 1970–71 Mogens worked on harmonic analysis for Jacobi functions $\phi^{(\alpha,\beta)}_\lambda$. His motivation came from the occurrence of these functions as spherical functions on noncompact Riemannian symmetric spaces of rank one, for instance on the hyperbolic space $SO_0(p,1)/SO(p)$. In joint work [1] we obtained the positive convolution structure for Jacobi function expansions. In the late seventies we had two further joint papers on Jacobi functions.
Mogens also studied the case of parameter values for which the Fourier-Jacobi transform has a Plancherel formula with (finitely many) discrete terms for certain imaginary values of $\lambda$. Such Jacobi functions occur in several group settings. They can be generalized spherical functions with respect to one-dimensional $K$-types, notably for $G = SU(p,1)$, $K = S(U(p) \times U(1))$. They also live as $K$-invariant functions on semisimple symmetric spaces $G/H$ of rank one. For instance, $G = SO_0(p,q)$, $H = SO_0(p, q - 1)$, $K = SO(p) \times SO(q)$. The discrete spectrum for Jacobi functions living there gives rise to subspaces of $L^2(G/H)$ which are invariant and irreducible under $G$ and contain a nonzero $K$-fixed vector ($K$-spherical discrete series for $G/H$).

Also Mogens' most important work dealt with the discrete series on $G/H$, but now of general rank and the discrete series being not necessarily $K$-spherical. His paper [2] in 1980 in Annals of Mathematics gave a simple sufficient condition in terms of $G$ and $H$ for existence of infinitely many discrete series representations on $G/H$. In 1984 Oshima and Matsuki showed the condition also to be necessary. The problem is still open to find all discrete series representations for each $G/H$. Recently Mogens was considering this on some special $G/H$. The $K$-spherical discrete series for general rank is relevant here. This means to find the discrete mass points in
the Plancherel formula for Opdam’s Jacobi functions associated with root systems, which may
occur if there are negative root multiplicities. Right now, but too late for Mogens to watch it,
some progress has been reported on this.

During 1979–2007 Mogens was a professor at the Royal Veterinary and Agricultural University
in Copenhagen. His tasks of teaching and administration there were quite a change from doing
analysis on Lie groups, but he performed them with great enthusiasm and success.

[1] M. Flensted-Jensen and T. Koornwinder, The convolution structure for Jacobi function expan-
sions, Ark. Mat. 11 (1973), 245–262.

Topic #5  OP – SF Net 28.1  January 15, 2021

From: George Andrews (gea1@psu.edu)
Subject: Obituary for Dick Askey (1933–2019) from the LMS Newsletter by George Andrews

The following obituary, Richard Askey (1933–2019), written by George Andrews, appeared in the
51.

⋆ ⋆ ⋆

Richard Allen (Dick) Askey was born on June 4, 1933, in St. Louis, Missouri, to Philip and Bessie
Askey. He received his B.A. from Washington University in 1955, an M.A. from Harvard in 1956
and from there went to Princeton University where he received his Ph.D. in 1961 under the di-
rection of Salomon Bochner. His thesis was titled “Mean Convergence of Orthogonal Series and
Conjugate Series”, foreshadowing extensive and important contributions to the study of orthog-
onal polynomials.

After instructorships at Washington University and the University of Chicago, Dick joined the
faculty of the University of Wisconsin, Madison in 1963 where he remained for 40 years until
retirement in 2003. At Madison, he was named Gábor Szegő Professor of Mathematics in 1986
and in 1995 was awarded a John Bascom Professorship.

His many honors included Fellowships in the American Academy of Arts and Sciences (1993), the
National Academy of Sciences (1999), the Society of Industrial and Applied Mathematics (2009),
and the American Mathematical Society (2012). Also, he was appointed an Honorary Fellow of the
Indian Academy of Sciences and received an honorary doctorate from SASTA University in India
(2012). He was an invited speaker at the ICM in Warszawa (1983).

Dick’s impact and influence in the world of special functions and orthogonal polynomials cannot
be overstated. His early work with George Gasper yielded an inequality that was central to Louis
deBrange’s proof of the Bieberbach conjecture. In the mid-1980’s, building on long-neglected
work of L.J. Rogers, Dick wrote two AMS memoirs, the first with Mourad Ismail and the second
with Jim Wilson. The latter memoir not only introduced the now widely used Askey–Wilson poly-
nomials but also included the famous Askey–scheme which provided a hierarchical classification
of the classical orthogonal polynomials. The influence of L. J. Rogers is also especially evident in
the series of papers, “Sieved Orthogonal Polynomials,” a topic initiated by Askey and extended
by Ismail and others. This latter series pointed to a new connection with number theory which is
in its infancy.
Dick was not just a powerful researcher. He was a charismatic force in the mathematics community generally. Early in his career, he determined that the three-volume work, *Higher Transcendental Functions*, (a.k.a. the Bateman Project) needed to be extensively updated. His vision and persistence inspired many, and it is not unreasonable to suggest that the Digital Library of Mathematical Functions owes much to the influence of Richard Askey.

Dick was also passionate in his efforts to improve mathematics education at all levels. He was extremely skeptical of many fads that promised instant improvement and delivered little.

All of the above points to the importance of Askey’s contributions; however, the charm, the kindness and the mischievous sense of humor are perhaps impossible to convey here. I will close with a short anecdote that at least hints at these latter qualities:

In the early 1990s, Paul Halmos wrote an article for the MAA Focus entitled *The Calculus Turmoil*. I thought it was a wonderful defense of the traditional teaching of calculus and wrote to tell him so. Halmos wrote back an equally warm response. I then called Dick to discuss the article and to tell him of my exchange with Halmos. Dick’s first words were, “I hated that article”. Adrenaline surged in my system. It seemed to me there were only two possible reasons for Dick’s words. Either I had completely misread the article (unlikely), or this was going to be my first real educational clash with Dick. Having seen how effective he was in debate, I was not looking forward to the rest of the conversation. I managed to stammer out: “What makes you say that?” He replied, “I HATED it! I cannot stand to agree with a single word Paul Halmos writes, and I agreed with every word in that article.”

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**Topic #6 ——— OP – SF Net 28.1 ——— January 15, 2021**

From: George Andrews (aea1@psu.edu), Howard Cohl (howard.cohl@nist.gov) and Mourad Ismail (mourad.eh.ismail@gmail.com)

Subject: Report on JMM 2021 Special Session on the Legacy of Dick Askey

A special session on the Legacy of Dick Askey at JMM 2021 was organized by George Andrews, Howard Cohl and Mourad Ismail. The special session was composed of two different sessions. In the first session on Thursday January 7, there were 8 speakers (Diaconis, Koornwinder, Driver, Koelink, Christiansen, Rosengren, Howe and Cuoco) and in the second afternoon session there were 10 speakers (Andrews, Ono, Vinet, Zeilberger, Stanton, Johnson, Post, Berndt, Cooper, Ismail).

The first morning session started with a lecture by Persi Diaconis (joint work with Chenyang Zhong) entitled, *Orthogonal polynomials and the Burnside Process*. Diaconis’ talk began by expressing how important it was to Askey—that theories should be not only elegant and complete, but also useful to scientists working in other fields. Diaconis gave an example of thinking via the Askey scheme which is a natural problem in enumerative combinatorics where Hahn polynomials allow for very sharp answers. Consider the set $\mathcal{X}$ of binary $n$-tuples. The symmetric group $S(n)$ acts on $\mathcal{X}$ by permuting coordinates. The Burnside process, specialized to this setting, allows a choice of a uniformly random orbit. From $x \in \mathcal{X}$, choose a permutation $w$ fixing $x$ (uniformly at random). From $w$ choose a binary $n$-tuple $y$ fixed by $w$. This is one step of a Markov chain, going from $x$ to $y$. This chain has discrete Chebyshev polynomial eigenfunctions and this permits us to prove that the chain ‘gets random’ in a few steps, no matter how large $n$. The Discrete Chebyshev polynomials are a special case ($\alpha = \beta = 1$) of the Hahn polynomials. We managed to deform the chain to give a natural chain with general (symmetric) Hahn eigenfunctions. This deformation gives an abstract generalization for all applications of the Burnside process. The next talk was by Tom Koornwinder entitled, *Charting the Askey and $q$-Askey scheme* which discussed the
preprint by Luis Verde-Star, arXiv:2002.07932, which showed that the $q$–hypergeometric representations of the OPs in the $q$–Askey scheme can be described by $3 + 3 + 5$ parameters under three constraints and four invariances. Koornwinder presented a $q$–Askey scheme where each arrow implies the vanishing of a parameter. Koornwinder also gave the dependence on these parameters of the structure constants in the Zhedanov algebra and gave a $q$–Zhedanov scheme where each arrow implies the vanishing of a structure constant. Then Kathy Driver presented a talk entitled Zeros of Jacobi polynomials. Driver explained that it is known that the zeros of the Jacobi polynomials $P_n^{(\alpha, \beta)}(x)$ and $P_{n-1}^{(\alpha+t, \beta+k)}(x)$ interlace when $\alpha, \beta > -1$, $0 \leq t, k \leq 2$. Driver explained how to prove that partial, but in general not full, interlacing holds between the zeros of $P_n^{(\alpha, \beta)}(x)$ and $P_{n+1}^{(\alpha+t, \beta+1)}(x)$ for $t \in \{0, 1\}$. Then Erik Koelink (joint work with Maarten van Pruijssen and Pablo Román) presented a talk entitled Multivariable matrix valued orthogonal polynomials from representation theory. Koelink explained how by using group representations one can derive multivariable matrix valued orthogonal polynomials for the root system of type $A$. This is done by viewing the corresponding compact group as a symmetric space, and studying matrix spherical functions. Then Jacob Christiansen (joint work with Barry Simon and Maxim Zinchenko) presented a talk entitled Residual polynomials. Christiansen started by explaining how Dick Askey was a great fan of Gabor Szegő as seen by his wonderful, readable notes on Szegő’s papers in Szegő’s complete works, which Dick edited as a clear labor of love. In particular, it is clear that Askey was fond of Szegő asymptotics so he dedicated an extension of such asymptotics for Residual Polynomials to Dick’s memory. Then Hjalmar Rosengren presented a talk entitled On the Kanade–Russell identities. Rosengren explained that the Kanade–Russell identities are a collection of Rogers–Ramanujan–type identities for triple series, which are related to affine Lie algebras and to partition theory. Rosengren discussed how to prove some of these conjectures, using quadratic transformations for Askey–Wilson polynomials. This work resulted in some new summation identities for $\phi_1^2$ functions. Then Roger Howe presented a talk entitled Dick Askey and Mathematics Education. In that talk Howe gave several examples of the many contributions of Richard Askey to the national conversation on how to improve mathematics education in the U.S. One major contribution was the founding and hosting for over 20 years of the discussion group MathEd. However, his activities also included writing reviews, advising projects, and speaking at and organizing conferences. Then Al Cuoco presented a talk entitled Adventures with Dick in Mathematics Education. There, Cuoco discussed Dick’s important help as a critical reviewer for the CME high school mathematics program and Dick’s approach to elementary trigonometry. The talk ended with a video clip from a talk Dick gave in Santiago, Chile in 2010. See also the following link which points to a set of Dick’s lecture notes on trigonometry edited by Al Cuoco and Shaun Cooper.

George Andrews started out the afternoon session by presenting a talk entitled Chebyshev polynomials and Compositions. The object of the presentation was to reveal the relationship of the Chebyshev polynomials to the theory of integer compositions. Numerous classical identities for Chebyshev polynomials were given combinatorial interpretations and proofs. Then Ken Ono presented a talk entitled Variants of Lehmer’s Conjecture on Ramanujan’s tau-function. Ono explained how Dick was a key figure in his career, and how grateful he was for the opportunity to share some of his recent work with friends on Ramanujan’s tau–function. Ono’s lecture was on variations of Lehmer’s Conjecture. He explained how to rigorously determine whether any given non–zero integer alpha appears as a value of Ramanujan’s tau function. The method makes use of the theory of Lucas sequences and modular forms which reduce the problem to a search for special rational points on specific curves of hyperelliptic and Thue type. Among the results, he showed that the odd primes less than 100 are never absolute values of tau–values. The next talk by Luc Vinet was entitled A unified algebraic underpinning for the Hahn polynomials and rational functions. Vinet explained that at present, we have a useful description of the polynomials of the Askey scheme based on the representation theory of algebras said to be of the Askey–Wilson type. Vinet’s presentation explored the possibility of accounting similarly for the bispectral prop–
erties of biorthogonal rational functions. He presented such a picture for functions of the Hahn class based on an algebra called meta-Hahn. The study leads one to believe that there should exist other meta algebras that could offer a unified description of the Askey scheme augmented with associated biorthogonal rational functions. Then Doron Zeilberger presented a talk entitled How Richard Askey Inspired the Happy Marriage of Special Functions and Combinatorics. In that talk Zeilberger explained that While Dick Askey was not a combinatorist himself (he only had one paper, joint with Tom Koornwinder and Mourad Ismail) that may be called combinatorial proper), he inspired lots of seminal combinatorics. He first popularized that first revolution of combinatorial special functions initiated by Joseph Gillis, and through his challenges, inspired the second revolution initiated by Dominique Foata. Zeilberger discussed first revolution, that implied that the EXACT number of ways of deranging a standard deck of cards (ignoring suits) is EXACTLY:

149380444449903354916284290188948031229880469556.

The next talk by Dennis Stanton was entitled Combinatorics of type $R_I$ orthogonal polynomials. In 1995 Ismail and Masson defined a new general family of orthogonal polynomials by perturbing the 3-term recurrence relation. Stanton described the combinatorial theory for these polynomials which corresponds to Viennot’s theory. He included path models for the polynomials as well as moments, continued fractions and Hankel determinants. Examples are given in the Askey scheme, including Askey–Wilson and $q$–Racah polynomials. Then Warren Johnson presented a talk entitled Functional Equations in the Research and Teaching of Dick Askey. Johnson went through several functional equation arguments that Dick gave either in his papers or in his Special Functions class. One argument evaluated the beta function assuming no previous knowledge of the Gamma function, one derives Ramanujan’s $_1\psi_1$ summation formula, and the other worked out a generalization of the Askey–Wilson integral. Johnson also evaluated a determinant that generalizes one of Sylvester that Dick was interested in. Then Sarah Post (joint work with Ian Marquette and Lisa Ritter) presented a talk entitled Exceptional Orthogonal Polynomials and rational solutions of Painlevé Equations. In that talk Post described how rational solutions of Painlevé IV, expressed in terms of Hermite polynomials, can be obtained from considering superintegrable Hamiltonian systems connected with exceptional orthogonal polynomials. She then described how this method can be extended to Jacobi polynomials and their connection to rational solutions of Painlevé VI. Then Bruce Berndt presented a talk entitled Ramanujan’s Beautiful Integrals. In that talk Berndt offered a selection of some of Ramanujan’s most fascinating integrals. Representatives were taken from his published papers, (earlier) notebooks, lost notebook, and questions he posed in the Journal of the Indian Mathematical Society. The lecture concluded with two entries on Gaussian quadrature and orthogonal polynomials from the unorganized pages in Ramanujan’s second notebook that were proved by Richard Askey. Then Shaun Cooper presented a talk entitled Some elliptic integrals in Ramanujan’s lost notebook. He outlined how an integral recorded by Ramanujan can be incorporated into a broad theory that can be used to create series for $1/\pi$. He gave a new integral of a similar type that was not recorded by Ramanujan, and described how it and several other functions studied by Ramanujan, e.g., the Rogers–Ramanujan continued fraction, fit within the theory. Then Mourad Ismail ended the session by presenting a talk entitled Mathematical Reminiscence about Dick Askey. Ismail talked about his association and friendship with Dick Askey and Dick’s influence on his research and his outlook on mathematics. He was Dick’s post doctorate assistant and their collaboration continued for many years. They worked on combinatorial problems involving orthogonal polynomials, moment problems, specific systems of orthogonal polynomials, and positivity.

The special session was recorded and the videos will be available for meeting participants on the Meeting Platform within a couple weeks.
An AMS Special Session on Continued Fractions was held at the Joint Mathematics Meetings on January 8th 2021.

This special session was co-organized by James G. Mc Laughlin, West Chester University, Geremías Polanco Encarnación, Hampshire College, Barry Smith, Lebanon Valley College and Nancy Wyshinski, Trinity College.

This special session is the latest in a series of special sessions on continued fractions, with the first (organized by Jimmy and Nancy) taking place at JMM 2004 in Phoenix. Previous special sessions were held at the:

- 2019 Joint Meetings in Baltimore
- 2017 Joint Meetings in Atlanta
- 2015 Joint Meetings in San Antonio
- 2013 Joint Meetings in San Diego
- 2011 Joint Meetings in New Orleans
- 2009 Joint Meetings in Washington, D.C.
- 2006 Joint Meetings in San Antonio
- 2004 Joint Meetings in Phoenix

This year the special session was held remotely due to the coronavirus (as was the entire JMM), and this was likely the reason that there were fewer presentations than in previous years.

The schedule of talks was as follows:

- 8:00 – 8:45 AM Subgroups of $SL_2(Z)$ characterized by certain continued fraction representations. Johann Thiel, Sandie Han, Ariane Masuda and Satyanand Singh, New York City College of Technology – CUNY.
- 9:00 – 9:20 AM On Hurwitz stability of Composite Polynomials. Saroj Aryal and Sarita Nemani, Georgian Court University.
- 1:00 – 1:45 PM Approximation on Affine Subspaces: A Khintchine Type result. Daniel Alvey, Wesleyan University.

The topic of the first talk, by Johann Thiel, may be described as follows. For positive integers $u$ and $v$, let

$$L_u = \begin{bmatrix} 1 & 0 \\ u & 1 \end{bmatrix} \text{ and } R_v = \begin{bmatrix} 1 & v \\ 0 & 1 \end{bmatrix}.$$ 

Let $S_{u,v}$ be the monoid generated by $L_u$ and $R_v$, and $G_{u,v}$ be the group generated by $L_u$ and $R_v$.

In the talk the author describes an expansion of a characterization of matrices $M = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$.
in $S_{k,k}$ and $G_{k,k}$ when $k \geq 2$ given by Esbelin and Gutan to $S_{u,v}$ when $u, v \geq 2$ and $G_{u,v}$ when $u, v \geq 3$.

He gives a simple algorithmic way of determining if $M$ is in $G_{u,v}$ using a recursive function and the short continued fraction representation of $b/d$.

In the second talk, by Saroj Aryal, a conjecture on the robustness of stable transfer polynomials has been settled. In this talk, the author formulates a characterization of stable transfer polynomials, which are used to identify a class of polynomials satisfying the conjecture. Further results are derived as variations of the conjecture.

In the third talk, by Moshe Cohen, is random knots obtained from finite continued fractions in +1 and -1. A knot is a circle embedded in 3-space. A 2-bridge knot can be described by a finite sequence of nonzero integers counting crossings in alternating twist regions; such a knot is also called a rational knot. A Chebyshev knot diagram has in its finite continued fraction only +1 and -1, giving way to fewer knot diagrams for the same knot. Schubert translated results on continued fractions into results on 2-bridge knots, and Koseleff and Pecker, in formalizing Chebyshev knots, built on these results for continued fractions in +1 and -1. Together with Sunder Ram Krishnan and then Chaim Even-Zohar, the speaker developed this into a model for random knots. In this talk the speaker presents extensions of this work, including new work with the second author, an undergraduate student.

The topic of the fourth talk, by Daniel Alvey, is motivated by a conjecture of Mahler, which led to a rich tradition of investigating the Diophantine properties of subspaces of Euclidean space. Mahler’s original conjecture was concerned with the extremality of a specific manifold. Another such property is that of Khintchine type, or whether the zero–one law of Khintchine’s Theorem is inherited by the measure on a subspace. The author presented a Khintchine type for divergence result for affine subspaces which satisfy a certain multiplicative Diophantine condition.

The special session was recorded and the videos will be available for meeting participants on the Meeting Platform within a couple weeks.

Topic #8      OP – SF Net 28.1      January 15, 2021

From: Erik Koelink (e.koelink@math.ru.nl)
Subject: Postponement: OPSF-S9 Summer School, Radboud University, Nijmegen

Due to the current developments in the COVID crisis, we have decided to reschedule the OPSF-S9 Summer School at the Radboud University, Nijmegen, the Netherlands (originally planned for August 2020, and initially postponed to August 2021) to August 2022. Precise dates will follow later.

Please see the Calendar of Events for a complete list of postponements and updates.

Topic #9      OP – SF Net 28.1      January 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 November and December
2020. This list has been separated into two categories.

**OP–SF Net Subscriber E–Prints**

Computing Equilibrium Measures with Power Law Kernels
Timon S. Gutleb, José A. Carrillo, Sheehan Olver

On difference equations of Kravchuk–Sobolev type polynomials of higher order
Roberto S. Costas–Santos, Anier Soria–Lorente

Strichartz Estimates with Broken Symmetries
Felipe Gonçalves, Don Zagier

A compact presentation for the alternating central extension of the positive part of $U_q(\hat{\mathfrak{sl}_2})$
Paul Terwilliger

On positivity of orthogonal series and its applications in probability
Paweł J. Szabłowski

An application of the Goulden–Jackson cluster theorem
Ira M. Gessel

On the Logarithmic Energy of Points on $S^2$
Stefan Steinerberger

Asymptotics of some generalised sine–integrals
R. B. Paris

Reflectionless canonical systems, I. Arov gauge and right limits
Roman Bessonov, Milivoje Lukić, Peter Yuditskii

Reflectionless canonical systems, II. Almost periodicity and character–automorphic Fourier transforms
Roman Bessonov, Milivoje Lukić, Peter Yuditskii

On the domain of convergence of spherical harmonic expansions
O. Costin, R. D. Costin, C. Ogle, M. Bevis

A note on generalized $q$–difference equations for general Al–Salam–Carlitz polynomials
Jian Cao, Binbin Xu, Sama Arjika
Nonsymmetric Macdonald Superpolynomials
Charles F. Dunkl

A 2-component Camassa–Holm equation, Euler–Bernoulli Beam Problem and Non–Commutative Continued Fractions
Richard Beals, Jacek Szmigielski

Two Quick Proofs of a Catalan Lemma Needed by Lisa Sauermann and Yuval Wigderson
Shalosh B. Ekhad, Doron Zeilberger

Relations between moments for the Jacobi and Cauchy random matrix ensembles
Peter J. Forrester, Anas A. Rahman

Note on the Equilibrium Measures of Julia sets of Exceptional Jacobi Polynomials
Á. P. Horváth

Discrete index transformations with Bessel and Lommel functions
Semyon Yakubovich

A variational characterisation of projective spherical designs over the quaternions
Shayne Waldron

A note on degenerate derangement polynomials and numbers
Taekyun Kim, Dae san Kim, Hyunseok Lee, Lee-Chae Jang

Representation of hypergeometric products of higher nesting depths in difference rings
Evans Doe Ocansey, Carsten Schneider

Fractional partitions and conjectures of Chern–Fu–Tang and Heim–Neuhauser
Kathrin Bringmann, Ben Kane, Larry Rolen, Zack Tripp

Weighted uniform convergence of entire Grünwald operators on the real line
Friedrich Littmann, Mark Spanier

Orthogonality of the Dickson polynomials of the \((k + 1)\)–th kind
Diego Dominici

Orthogonal polynomials on planar cubic curves
Marco Fasondini, Sheehan Olver, Yuan Xu
A combinatorial bijection on di-sk trees
Shishuo Fu, Zhicong Lin, Yaling Wang

The monogenic Hua–Radon transform and its inverse
Denis Constales, Hendrik De Bie, Teppo Mertens, Frank Sommen

Heun operator of Lie type and the modified algebraic Bethe ansatz
Pierre–Antoine Bernard, Nicolas Crampe, Dounia Shaaban Kabakibo, Luc Vinet

Global and local scaling limits for the $\beta = 2$ Stieltjes–Wigert random matrix ensemble
Peter J. Forrester

(\(q\)-)Supercongruences hit again
Wadim Zudilin

Cylindric partitions and some new $A_2$ Rogers–Ramanujan identities
Sylvie Corteel, Jehanne Dousse, Ali K. Uncu

Absorbing–reflecting factorizations for birth–death chains on the integers and their Darboux transformations
Manuel D. de la Iglesia, Claudia Juarez

Quadrant Walks Starting Outside the Quadrant
Manfred Buchacher, Manuel Kauers, Amelie Trotignon

Construction of a generalization of the Leibnitz numbers and their properties
Yilmaz Simsek

Asymptotic behavior and zeros of the Bernoulli polynomials of the second kind
František Štampach

Approximation and localized polynomial frame on cones and hyperboloids
Yuan Xu

The $\mathbb{F}_q$–Selberg Integral
Richard Rimanyi, Alexander Varchenko

On the Density arising from the Domain of Attraction between Sum and Supremum: the $\alpha$–Sun operator
N. S. Witte, P. E. Greenwood
The generating function of Kreweras walks with interacting boundaries is not algebraic
Alin Bostan, Manuel Kauers, Thibaut Verron

The $\mathbb{F}_p$-Selberg integral of type $A_n$
Richard Rimanyi, Alexander Varchenko

On some Féjer-type trigonometric sums
R. B. Paris

Kronecker theta function and a decomposition theorem for theta functions I
Zhi-Guo Liu

Multivariate Difference Gončarov Polynomials
Ayomikun Adeniran, Lauren Snider, Catherine Yan

Moments of $q$–Jacobi Polynomials and $q$–Zeta Values
Frédéric Chapoton, Christian Krattenthaler, Jiang Zeng

Spectral Theory of Exceptional Hermite Polynomials
David Gomez-Ullate, Yves Grandati, Robert Milson

A vertex model for LLT polynomials
Sylvie Corteel, Andrew Gitlin, David Keating, Jeremy Meza

Persistent Laplacians: properties, algorithms and implications
Facundo Mémoli, Zhengchao Wan, Yusu Wang

Bounded Dyck paths, bounded alternating sequences, orthogonal polynomials, and reciprocity
Johann Cigler, Christian Krattenthaler

Guessing about Guessing: Practical Strategies for Card Guessing with Feedback
Persi Diaconis, Ron Graham, Sam Spiro

Indeterminate moment problem associated with continuous dual $q$–Hahn polynomials
Kerstin Jordaan, Maurice Kenfack Nangho

Finding Structure in Sequences of Real Numbers via Graph Theory: a Problem List
Dana G. Korssjoen, Biyao Li, Stefan Steinerberger, Raghavendra Tripathi, Ruimin Zhang
A note on truncated degenerate Bell polynomials
Taekyun Kim, Dae san Kim

http://arxiv.org/abs/2012.05040
Filter integrals for orthogonal polynomials
Tewodros Amdeberhan, Adriana Duncan, Victor H. Moll, Vaishavi Sharma

A heuristic guide to evaluating triple-sums
Eric T. Mortenson

Construction of eigenfunctions for the elliptic Ruijsenaars difference operators
Edwin Langmann, Masatoshi Noumi, Junichi Shiraishi

Representations of degenerate poly–Bernoulli polynomials
Taekyun Kim, Dae San Kim, Jongkyum Kwon, Hyunseok Lee

http://arxiv.org/abs/2012.06676
A new approach to the Dyson rank conjectures
Frank Garvan

Application of the Efros theorem to the function represented by the inverse Laplace transform of
$s^{-\mu} \exp(-s^\nu)$
Alexander Apelblat, Francesco Mainardi

A Differential Analogue of Favard’s Theorem
Arieh Iserles, Marcus Webb

http://arxiv.org/abs/2012.07493
$J$–matrix method of scattering for inverse–square singular potential with supercritical coupling
I. Theory
Abdulaziz D. Alhaidari, Hocine Bahlouli, Carlos P. Aparicio, Saeed M. Al–Marzoug

http://arxiv.org/abs/2012.07549
$q$–Fractional Askey–Wilson Integrals and Related Semigroups of Operators
Mourad E. H. Ismail, Ruiming Zhang, Keru Zhou

Bispectral Jacobi type polynomials
Antonio J. Durán, Manuel D. de la Iglesia

Neural Collapse with Cross–Entropy Loss
Jianfeng Lu, Stefan Steinerberger

Joint moments of a characteristic polynomial and its derivative for the circular $\beta$–ensemble
Peter J. Forrester
Geometric Brownian motion with affine drift and its time-integral
Runhuan Feng, Pingping Jiang, Hans Volkmer

A new asymptotic representation and inversion method for the Student’s $t$ distribution
Amparo Gil, Javier Segura, Nico M. Temme

Rational hypergeometric identities
Gor A. Sarkissian, Vyacheslav P. Spiridonov

The Sigma Form for the Second Painlevé Hierarchy
Irina Bobrova, Marta Mazzocco

Sparse spectral methods for partial differential equations on spherical caps
Ben Snowball, Sheehan Olver

Momentum approach to the $1/r^2$ potential as a toy model of the Wilsonian renormalization
Jan Dereziński, Oskar Grocholski

Cyclic Pólya Ensembles on the Unitary Matrices and their Spectral Statistics
Mario Kieburg, Shi-Hao Li, Jiyuan Zhang, Peter J. Forrester

Sharp Estimates of Radial Dunkl and Heat Kernels in the Complex Case $A_n$
P. Graczyk, P. Sawyer

A generalized modified Bessel function and explicit transformations of certain Lambert series
Atul Dixit, Aashita Kesarwani, Rahul Kumar

Hahn polynomials for hypergeometric distribution
Plamen Iliev, Yuan Xu

Stahl–Totik Regularity for Dirac Operators
Benjamin Eichinger, Ethan Gwaltney, Milivoje Lukić

Spectral density functions of bivariable stable polynomials
Jeffrey S. Geronimo, Hugo J. Woerdeman, Chung Y. Wong

Generalised Airy Polynomials
Peter A. Clarkson, Kerstin Jordaan
Asymptotics and statistics on Fishburn Matrices: dimension distribution and a conjecture of Stoimenow
Hsien–Kuei Hwang, Emma Yu Jin, Michael J. Schlosser

An extension of a supercongruence of Long and Ramakrishna
Victor J. W. Guo, Ji–Cai Liu, Michael J. Schlosser

Relations for a class of terminating \(_4F_3(4)\) hypergeometric series
Ilia D. Mishev

Hahn polynomials and the Burnside process
Persi Diaconis, Chenyang Zhong

Multiple orthogonal polynomials with respect to Gauss' hypergeometric function
Helder Lima, Ana Loureiro

An asymptotic expansion for the expected number of real zeros of Kac–Geronimus polynomials
Hanan Aljubran, Maxim L. Yattselev

Elliptic solutions of dynamical Lucas sequences
Michael J. Schlosser, Meesue Yoo

Other Relevant OP–SF E–Prints

Analytic continuation of multiple polylogarithms in positive characteristic
Hidekazu Furusho

Some extended hypergeometric matrix functions and their fractional calculus
Ashish Verma, Ravi Dwivedi, Vivek Sahai

Resurgence Analysis of Meromorphic Transforms
Jørgen Ellegaard Andersen

CDF of non–central \(\chi^2\) distribution revisited. Incomplete hypergeometric type functions approach
Dragana Jankov Maširević, Tibor K. Pogány

Close–to–Convexity properties of Clausen’s Hypergeometric Function \(_3F_2(a, b, c; d, e; z)\)
K. Chandrasekran, D. J. Prabhakaran
Equiconvergence for perturbed Jacobi polynomial expansions
K. Jotsaroop, Giacomo Gigante

On the algebraic dependence of holonomic functions
Julien Roques, Michael F. Singer

Determinant formulas for the five-vertex model
Ivan N. Burenev, Andrei G. Pronko

Exponential of tridiagonal Toeplitz matrices: applications and generalization
Mehdi Tatari, Majed Hamadi

A Gelfand–Tsetlin type base for the algebra $\mathfrak{sp}_4$ and hypergeometric functions
Dmitry Artamonov

Weighted Sums of Euler Sums and Other Variants of Multiple Zeta Values
Sasha Berger, Aarav Chandra, Jasper Jain, Daniel Xu, Ce Xu, J. Zhao

Lauricella hypergeometric series $F_n^A$ over finite fields
Arjun Singh Chetry, Gautam Kalita

Proof of a supercongruence conjecture of (F.3) of Swisher using the WZ-method
Arijit Jana, Gautam Kalita

A positivity conjecture related to the Riemann zeta function
Hugues Bellemare, Yves Langlois, Thomas Ransford

New identities with Stirling, hyperharmonic, and derangement numbers, Bernoulli and Euler polynomials, powers, and factorials
Khristo N. Boyadzhiev

Elliptic umbilic representations connected with the caustic
E. G. Abramochkin, E. V. Razueva

Closed-form Tight Bounds and Approximations for the Median of a Gamma Distribution
Richard F. Lyon

Jacobi Ensemble, Hurwitz Numbers and Wilson Polynomials
Massimo Gisonni, Tamara Grava, Giulio Ruzza
Generating functions for sums of polynomial multiple zeta values
Minoru Hirose, Hideki Murahara, Shingo Saito

Degenerate Riemann–Hilbert–Birkhoff problems, semisimplicity, and convergence of WDVV–potentials
Giordano Cotti

On random convex chains, orthogonal polynomials, PF sequences and probabilistic limit theorems
Anna Gusakova, Christoph Thäle

Some properties of Wigner $3j$ coefficients: non–trivial zeros and connections to hypergeometric functions
Jean–Christophe Pain

Exponential–Weierstrass type, exponential–Jacobi type and solitary type solutions to some con–formable fractional equations
Sirendaoreji

Stationary probabilities of the multispecies TAZRP and modified Macdonald polynomials: I
Arvind Ayyer, Olya Mandelshtam, James B. Martin

Multiple Fourier series and lattice point problems
Shigehiko Kuratsubo, Eiichi Nakai

Unique positive solutions to $q$–discrete equations associated with orthogonal polynomials
Tomas Lasic Latimer

Fonctions spéciales et polynômes orthogonaux: cours et exercices corrigés
Benaoumeur Bakhti

Gaps in the spectrum of two–dimensional square packing of stiff disks
L. D’Elia, S. A. Nazarov

A correlation function for the classical orthogonal polynomials
Enno Diekema

Mock Eisenstein Series
Ranveer Kumar Singh
On families of constrictions in model of overdamped Josephson junction and Painlevé 3 equation
Yulia Bibilo, Alexey Glutsyuk

The family of confluent Virasoro fusion kernels and a non–polynomial $q$–Askey scheme
Jonatan Lenells, Julien Roussillon

Muttalib–Borodin plane partitions and the hard edge of random matrix ensembles
Dan Betea, Alessandra Occelli

Solutions of Heun’s general equation and elliptic Darboux equation
Bartolomeu D. B. Figueiredo

A Note on harmonic maps
G. Polychrou

A New Product Formula Involving Bessel Functions
Mohamed Amine Boubatra, Selma Negzaoui, Mohamed Sifi

Laplace Green’s Functions for Infinite Ground Planes with Local Roughness
Nail Gumerov, Ramani Duraiswami

Functional equations for Selberg zeta functions with Tate motives
Shin–ya Koyama, Nobushige Kurokawa

On values of the higher derivatives of the Barnes zeta function at non–positive integers
Shinpei Sakane, Miho Aoki

Pfaffian control of some polynomials involving the $j$–function and Weierstrass elliptic functions
John Armitage

Decorated Dyck paths, polyominoes, and the Delta conjecture
Michele D’Adderio, Alessandro Iraci, Anna Vanden Wyngaerd

Generalized Catalan numbers
Keke Zhang

Fourier expansion of derivatives of the Riemann zeta function
Lahoucine Elaissaoui
Higher moments of distribution of zeta zeros
Farzad Aryan

Existence and orbital stability of standing waves to a nonlinear Schrödinger equation with inverse square potential on the half–line
Elek Csobo

Local monodromy formula of Hadamard products
Ricardo Pérez–Marco

Introducción al Cálculo Fraccional
A. Torres–Hernandez, F. Brambila–Paz

Another look at Zagier’s formula for multiple zeta values involving Hoffman elements
Cezar Lupu

Completion of local zeta functions associated with a certain class of homogeneous cones
Hideto Nakashima

The shifted harmonic oscillator and the hypoelliptic Laplacian on the circle
Boris Mityagin, Petr Siegl, Joe Viola

Notes on the historical bibliography of the gamma function
Ricardo Pérez–Marco

Schottky uniformization and Bloch–Wigner dilogarithm on higher genus curves
Ilyas Bayramov

Riemannian Gaussian distributions, random matrix ensembles and diffusion kernels
Leonardo Santilli, Miguel Tierz

A Primer on Zeta Functions and Decomposition Spaces
Andrew Kobin

Calculating the Mandel parameter for an oscillator–like system generated by generalized Cheby–shev polynomials
V. V. Borzov, E. V. Damaskinsky
A note on the Grover walk and the generalized Ihara zeta function of the one-dimensional integer lattice
Takashi Komatsu, Norio Konno, Iwao Sato

A generalized regularization theorem and Kawashima’s relation for multiple zeta values
Masanobu Kaneko, Ce Xu, Shuji Yamamoto

Universal relations in asymptotic formulas for orthogonal polynomials
D. R. Yafaev

On local zeta–integrals for $GSp(4)$ and $GSp(4) \times GL(2)$
David Loeffler

Connectors of the Ohno relation for parametrized multiple zeta series
Hideki Murahara, Tomokazu Onozuka

Zagier’s weight $3/2$ mock modular form
Ajit Bhand, Ranveer Kumar Singh

Multiplier Theorem for Fourier Series in continuous–discrete Sobolev orthogonal polynomials
B. P. Osilenker

Fourier Analysis and the closed form for the Zeta Function at even positive integers
Jibran Iqbal Shah

Log–trigonometric integrals and elliptic functions
Martin Nicholson

A combinatorial formula for the nabla operator
Erik Carlsson, Anton Mellit

On the behavior of multiple zeta–functions with identical arguments on the real line I
Kohji Matsumoto, Ilija Tanackov

On the behavior of multiple zeta–functions with identical arguments on the real line
Kohji Matsumoto, Toshiki Matsusaka, Ilija Tanackov

Zeta functions over finite fields– An exposition of Dwork’s methods
Martin Ortiz Ramirez
Finite–Part Integration in the Presence of Competing Singularities: Transformation Equations for the hypergeometric functions arising from Finite–Part Integration
Lloyd Villanueva, Eric A. Galapon

A new generalization of the Genocchi numbers and its consequence on the Bernoulli polynomials
Bakir Farhi

Explicit Relations between Multiple Zeta Values and Related Variants
Ce Xu

Perturbative and Geometric Analysis of the Quartic Kontsevich Model
Johannes Branahl, Alexander Hock, Raimar Wulkenhaar

A focus on the Riemann’s Hypothesis
Jean Max Coranson Beaudu

Integral formula for the Bessel function of the first kind
Enrico De Micheli

Modules of Zeta Integrals for GL(1)
Gal Dor

An Inequality for Coefficients of the Real–rooted Polynomials
J. J. F. Guo

On an approximation of a J–Bessel integral and its applications (with an appendix by J.S. Friedman*)
George Anton, Jesen A. Malathu, Shelby Stinson

Derangements and the $p$–adic incomplete gamma function
Andrew O'Desky, David Harry Richman

Supercongruences for central trinomial coefficients
Hao Pan, Zhi–Wei Sun

Spectral analysis of some random matrices based schemes for stable and robust nonparametric and functional regression estimators
Asma Ben Saber, Abderrazek Karoui
http://arxiv.org/abs/2012.05469
Properties of Clifford Legendre Polynomials
Hamed Baghal Ghaaffari, Jeffrey A. Hogan, Joseph D. Lakey

http://arxiv.org/abs/2012.05639
On matrix Painlevé II equations
V. E. Adler, V. V. Sokolov

New identities for Theta operators
Michele D'Adderio, Marino Romero

Analytical recurrence formulas for non-trivial zeros of the Riemann zeta function
Artur Kawalec

http://arxiv.org/abs/2012.07026
Motivic zeta function of the Hilbert schemes of points on a surface
Luigi Pagano

Supercongruences of multiple harmonic $q$-sums and generalized finite/symmetric multiple zeta values
Yoshihiro Takeyama, Koji Tasaka

Families of inverse functions: coefficient bodies and the Fekete–Szegő problem
Mark Elin, Fiana Jacobzon

Elliptic asymptotic representation of the fifth Painlevé transcendent
Shun Shimomura

An asymptotic structure of the bifurcation boundary of the perturbed Painlevé–2 equation
O. M. Kiselev

Distribution of Beurling primes and zeroes of the Beurling zeta function I. Distribution of the zeroes of the zeta function of Beurling
Szilárd Gy. Révész

Zero–free strips for the Riemann zeta–function derived from the Prime Number Theorem
Douglas Azevedo

http://arxiv.org/abs/2012.09506
Special zeta Mahler functions
Berend Ringeling

Functional equations of polygonal type for multiple polylogarithms in weights 5, 6 and 7
Steven Charlton, Herbert Gangl, Danylo Radchenko
Around spin Hurwitz numbers
A. D. Mironov, A. Yu Morozov, S. M. Natanzon, A. Yu Orlov

Gaussian Multiplicative Chaos for Gaussian Orthogonal and Symplectic Ensembles
Pax Kivimae

A non–hypergeometric $E$–function
Javier Fresán, Peter Jossen

Zeros of hypergeometric functions in the $p$–adic setting
Neelam Saikia

A smooth summation of Ramanujan expansions
Giovanni Coppola

A variant of van Hoeij’s algorithm to compute hypergeometric term solutions of holonomic recurrence equations
Bertrand Teguia Tabuguia

Betti structures of hypergeometric equations
Davide Barco, Marco Hien, Andreas Hohl, Christian Sevenheck

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Topic #10  OP – SF Net 28.1  January 15, 2021

From: OP–SF Net Editors
Subject: Submitting contributions to OP–SF NET and SIAM-OPSF (OP–SF Talk)

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From: OP–SF Net Editors
Subject: Thought of the Month by George Pólya

“The elegance of a mathematical theorem is directly proportional to the number of independent ideas one can see in the theorem and inversely proportional to the efforts it takes to see them.”