

OP-SF NET – Volume 33, Number 2 – March 15, 2026

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 to OPSF Activity Group members and non-members alike through the OP-SF Talk listserv.

If you are interested in subscribing to the Newsletter and/or OP-SF Talk, or if you would like to submit a topic to the Newsletter or a contribution to OP-SF Talk, please send an email to the OP-SF Net Editors.

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Calendar of Events:

March 18–22, 2026

International Number Theory Conference in honor of Krishna Alladi's 70th birthday,
University of Florida, Gainesville, Florida, USA

Opening Conference Lecture: Peter Sarnak, Institute for Advanced Study, Princeton

Erdős Memorial Lecture: Andrew Granville, University of Montréal

Straus Memorial Lecture: Carl Pomerance, Dartmouth College

Ramanujan Colloquium: Maksym Radziwill, Northwestern University

Alladi Ramakirshnan Memorial Lecture: Sergei Suslov, Arizona State University

<https://qseries.org/alladi70/>

April 9–10, 2026

Fourth Meeting Gruppo di Attività [ANA&A – SIMAI](#),
Department of Mathematics “Giuseppe Peano”, University of Turin, Torino, Italy
<https://fourthmeetinganaa.uninettunouniversity.net/index.html>

April 9–10, 2026

Spectral Theory by the Lakes,
Lancaster University, Lancaster, UK,
<https://benjamineichinger.eu/ST2026/>

May 26–29, 2026

International Conference on Mathematics, Numerics and Applications (MNA2026),
Budva, Montenegro,
<https://mat.mas.bg.ac.rs/mna2026>

June 1–5, 2026

Alps Approximation School and Meeting (AASM 2026),
[Villaggio Olimpico Bardonecchia](#), Bardonecchia, Italy
<https://aasm2026.uninettunouniversity.net>

June 8–12, 2026

Quantum Symmetric Pairs, Hecke Algebras, and Representations: Exploring Spherical Functions
(Q-SPHERE 2026),
[Radboud University](#), Nijmegen, The Netherlands
<https://indico.imapp.ru.nl/event/345/>

June 15–19, 2026

Orthogonal Polynomials, Special Functions and their Applications Summer School (OPSF-S11),
[Universidad de Alcalá](#), Alcalá, Spain,
<https://opsfa2026.web.uah.es>

June 22–26, 2026

OPERA 2026 – Orthogonal Polynomials, Exponential Analysis, Rational Approximation,
with Applications,
[University of Stirling](#), Scotland, UK
<https://www.opera2026.uk/>

July 6– 10, 2026

2026 SIAM Annual Meeting (AN26), Cleveland, Ohio, USA,
<https://www.siam.org/conferences-events/siam-conferences/an26/>

July 8–18, 2026

Foundations of Computational Mathematics (FoCM 2026), University of Vienna, Vienna, Austria
<https://focm2026.univie.ac.at/>

Workshop related to SIAG/OPSF:

July 9–11: Special Functions and Orthogonal Polynomials

Organizers: Daan Huybrechs ([KU Leuven](#)), Erik Koelink ([Radboud Universiteit](#))
and Teresa Pérez ([Universidad de Granada](#))

August 17–21, 2026

18th International Symposium on Orthogonal Polynomials, Special Functions and Applications
Muromachi Campus, Doshisha University, Kyoto, Japan
<https://opsfa18.com/>

From: Juan J. Moreno Balcázar (balcazar@ual.es) and Francisco Marcellán (pacomarc@ing.uc3m.es),
Subject: Report: Biennial Meeting of Real Sociedad Matemática Española

Report on Biennial Congress of the Royal Spanish Mathematical Society (RSME)



Figure 1: Group photo for the 2026 Biennial Congress of the Royal Spanish Mathematical Society (RSME). Top Row (left-to-right): Juan F. Mañas–Mañas, Amparo Gil, Ruymán Cruz–Barroso, María J. Cantero–Medina, Óscar Ciaurri, Mario Pérez, Ester Pérez–Sinusía, Judit Mínguez–Ceniceros, Misael Marriaga, Juan Antonio Villegas, Manuel Mañas. Bottom Row (left-to-right): Antonio Durán, Francisco Marcellán, Thomas Chouteau, Cristina Rodríguez–Perales, Alejandro Gil–Asensi, Juan J. Moreno–Balcázar, Juan Carlos García–Ardila, Miguel Piñar, Teresa E. Pérez.

The Biennial Congress of the Royal Spanish Mathematical Society (RSME), held in Alicante from January 19 to 23, 2026, with a special session dedicated to recent advances in orthogonal polynomials, special functions, and approximation theory. The session was organized by Francisco Marcellán (University Carlos III de Madrid) and Juan J. Moreno–Balcázar (University of Almería) and included speakers from several Spanish universities.

The session took place from Monday, January 19 to Tuesday, January 20. On Monday, Teresa E. Pérez (University of Granada) presented her work on Bernstein–type operators on the simplex with negative parameters. Juan Antonio Villegas (University of Granada) discussed zonal function networks from a super–resolution perspective. The talk originally scheduled by Miguel Rojas (Complutense University of Madrid), on perturbations of measures in mixed multiple orthogonality, was delivered by Manuel Mañas. The day concluded with a presentation by María José Cantero (University of Zaragoza) on the relationship between inverse Darboux transformations and Sobolev products via matrix–valued polynomials.

On Tuesday, the morning sessions featured Amparo Gil (University of Cantabria), who addressed numerical algorithms and computational implementations for inversion problems of special functions; Ester Pérez Sinusía (University of Zaragoza), who presented new convergent and uniform developments of the Lerch transcendent function; and Óscar Ciaurri (University of La Rioja), who delivered a lecture on Bessel functions and transplantation and transfer theorems. The afternoon program included talks by Cristina Rodríguez Perales (University of Almería) on difference equations for quasi-orthogonal polynomials, Misael E. Marriaga (Rey Juan Carlos University) on higher-order ladder operators for classical orthogonal polynomials, Juan C. García Ardila (Polytechnic University of Madrid) on generalized Gauss-Rys orthogonal polynomials, Víctor Soto Larrosa (University of Alcalá and European University of Madrid) on semiclassical analysis of symmetric orthogonal polynomials with truncated Freud weights, Judit Mínguez Ceniceros (University of La Rioja) on symmetric Dunkl coherent pairs of second-type positive measures, and Antonio J. Durán (University of Seville), who closed the session with a lecture on the zeros of linear combinations of orthogonal polynomials.

The sessions were attended by 22 people and a stimulated fruitful discussion. A group photo of the participants is included.

Topic #2 ——— OP – SF Net 33.2 ——— March 15, 2026

From: Evelyne Hubert (evelyne.hubert@inria.fr), Radu Ioan Boț (radu.bot@univie.ac.at)
and Elena Celledoni (elena.celledoni@ntnu.no)
Subject: Report: Second Call for Posters – FoCM 2026

Second Call for Posters – [FoCM 2026](#), Vienna, Austria (July 8–18, 2026)

The 11th International Conference on Foundations of Computational Mathematics (FoCM 2026) will take place in Vienna, Austria, from July 8 to July 18, 2026, beginning with an evening reception on July 8. FoCM conferences, held every three years since 1995, are recognized as vibrant and collegial gatherings that bring together several hundred researchers from across the broad spectrum of computational mathematics: <https://focm2026.univie.ac.at>.

The scientific program will feature plenary lectures in the mornings and parallel thematic workshops in the afternoons. Across three periods, the 21 workshops span a wide range of topics, including numerical analysis, optimization, data science and machine learning, computational geometry and topology, algebraic and symbolic computation, stochastic computation, quantum algorithms,.... Poster sessions provide an opportunity for participants to present recent results and ongoing work, especially fostering discussion and interaction across fields.

Submission instructions

Poster contributions should be submitted with a specific FoCM 2026 workshop in mind, as posters will be associated with workshop poster sessions.

The submissions must be made through the FoCM 2026 poster submission portal: [link](#).

Posters submitted before **March 15th 2026** will receive full consideration.

Submissions received after this date will be considered on a space-available basis.

The planned workshops for FoCM 2026 are as follows:

July 9–11:

- Computational Geometry and Topology
- Computational Optimal Transport
- Foundations of Numerical PDEs

- Foundations of Data Science and Machine Learning
- Information-Based Complexity
- Real Number Complexity
- Special Functions and Orthogonal Polynomials

July 13–15:

- Approximation Theory & Computational Harmonic Analysis
- Computational Algebraic Geometry
- Computational Number Theory
- Geometric Integration and Computational Mechanics
- Inverse Problems
- Random Matrices
- Stochastic Computation

July 16–18:

- Continuous Optimization
- Computational Dynamics
- Graph Theory and Combinatorics
- Multiresolution and Adaptivity in Numerical PDEs
- Numerical Linear Algebra
- Quantum Information and Quantum Algorithms
- Symbolic Analysis

FoCM 2026 promises to be an inspiring event highlighting the breadth and depth of computational mathematics, and poster sessions will play an important role in fostering scientific exchange and collaboration.

We look forward to your submissions and to welcoming you in Vienna in July 2026.

Radu Bot, Elena Celledoni, Evelyne Hubert.

Topic #3 ——— OP – SF Net 33.2 ——— March 15, 2026

From: Clemente Cesarano (clemente.cesarano@uninettunouniversity.net)

Subject: Report: Special Functions and PDEs by **Cesarano**

Special functions and PDEs: Algorithms and Software Development,
Rome, 12 – 13 February, 2026

This workshop represents the final moment of the research project Special functions and PDEs: Algorithms and Software Development, funded by the National Group for Scientific Computing (GNCS) of INdAM, whose P.I. was Clemente Cesarano. The project involved the study of some fundamental equations in mathematical physics, which represent a significant field of research in both mathematics and physics.

The approach is based on some specific features that emerge in the study of certain classes of equations, relative to the investigation methodology; in particular, while series solution techniques (Frobenius



Figure 2: From left-to-right: Daniele Funaro (Univ. of Modena and Reggio Emilia, Italy), Pierluigi Maponi (Univ. of Camerino, Italy), Nadaniela Egidi (Univ. of Camerino, Italy), Gabriella Bretti (IAC – CNR, Italy), Elishan Christian BRAUN (IAC –CNR, Italy), Pablo Buitron (Uninettuno University, Italy), Clemente Cesarano (Uninettuno University, Italy), Yilmaz Simsek (Akadeniz University, Turkey), Yilmaz’s wife Saniye Simsek.

method) allow deriving solutions for many ordinary differential equations, but only under certain conditions, on the other hand, there is a need to construct solutions with numerical techniques that allow the development of predictive tools, such as equilibrium codes, that include a broader range of parameters.

The central part of the project and consequently of the workshop concerned relevant results in the field of special functions and in particular for Bessel functions in relation to the Fourier–Bessel series.

Many of the results obtained, both analytically and numerically have led to the definition of new classes of special functions with useful relationships in various fields of mathematics and physics and beyond. Given that for some families of ordinary second-order equations, only one numerically satisfactory solution has been deduced between the two required fundamental solutions, and that the solutions are local (in the sense that they have narrow regions of convergence and fail for large parameters), one of the goals of the project is to expand the coverage region of the solutions and achieve their numerical stability.

From a numerical perspective, we studied the accuracy of the algorithm for the solution functions implemented in Wolfram Mathematica and test the algorithm’s performance for both new parameter combinations and real-world applications. An important aspect studied concerns the problem of connection

formulas for different solutions of the equations under study (such as Heun-type equations) generated at different singular points. The computational efficiency of the algorithm implemented in Mathematica has been examined and compared with that of alternative methods, to allow for the assessment of both the robustness and the overall reliability of the implemented algorithm. In particular, computational techniques based on Radial Basis Functions (RBFs) have been developed and calibrated for the numerical solution of these problems. The proposed models, the numerical discretization used, and the related solution procedures has been studied; the software resulting from the implementation of these techniques has been compared with NDSolve.

Over thirty researchers from various European and non-European countries participated in the workshop. The proceedings of the workshop will be published in the coming months in a special issue of the [SEMA SIMAI](#) Springer series.

Topic #4 ——— OP – SF Net 33.2 ——— March 15, 2026

From: OP–SF Net Editors

Subject: Remembrances of **Theodore (Ted) Seio Chihara** (1929–2026)

Remembrances of Ted Chihara (March 14, 1929 – February 11, 2026)

Below are nine remembrances of Ted Chihara from his family and some of his colleagues:

Laura Chihara; Mourad E. H. Ismail; Dennis Stanton; Paco Marcellán; Lance Littlejohn; Ana Loureiro; Walter Van Assche, Jeff Geronimo, and Christian Berg.

In the next Newsletter we expect to receive a remembrance for Ted Chihara from **Paul Nevai**.

If anyone else would like to contribute a remembrance of Ted, please don't hesitate to submit it for the next Newsletter OP–SF NET 33.3, to be published on May 15, 2026.

* * *

Ted Chihara

Laura Chihara (lchihara@carleton.edu)

Theodore Chihara was born on pi day, 1929, in Seattle WA. His family was uprooted from their home during World War II and they spent several years at the Minidoka Japanese–American Internment camp in Idaho. After the war, he moved to Spokane where he attended Gonzaga High School. He received his BS in Chemistry at Seattle University and left the Pacific Northwest for Indiana to continue his studies at Purdue University. While there, he realized that Mathematics was his true calling, switched fields, and earned his PhD in Mathematics in 1955 under Artur Rosenthal. He returned to Seattle and held positions, including department chair, at Seattle University for many years. He left in 1969 and had visiting positions at the University of Alberta and University of Victoria in Canada, before returning to Indiana to spend the remaining years of his career at Purdue University Northwest (formerly Calumet).

During his retirement, he enjoyed watching classic old movies, babysitting his grandchildren, and playing with his beloved dachshunds, Max I, Maxine, Max II and Max III (are you sensing a pattern here?). He also enjoyed traveling overseas to attend Orthogonal Polynomial conferences where he could spend time with

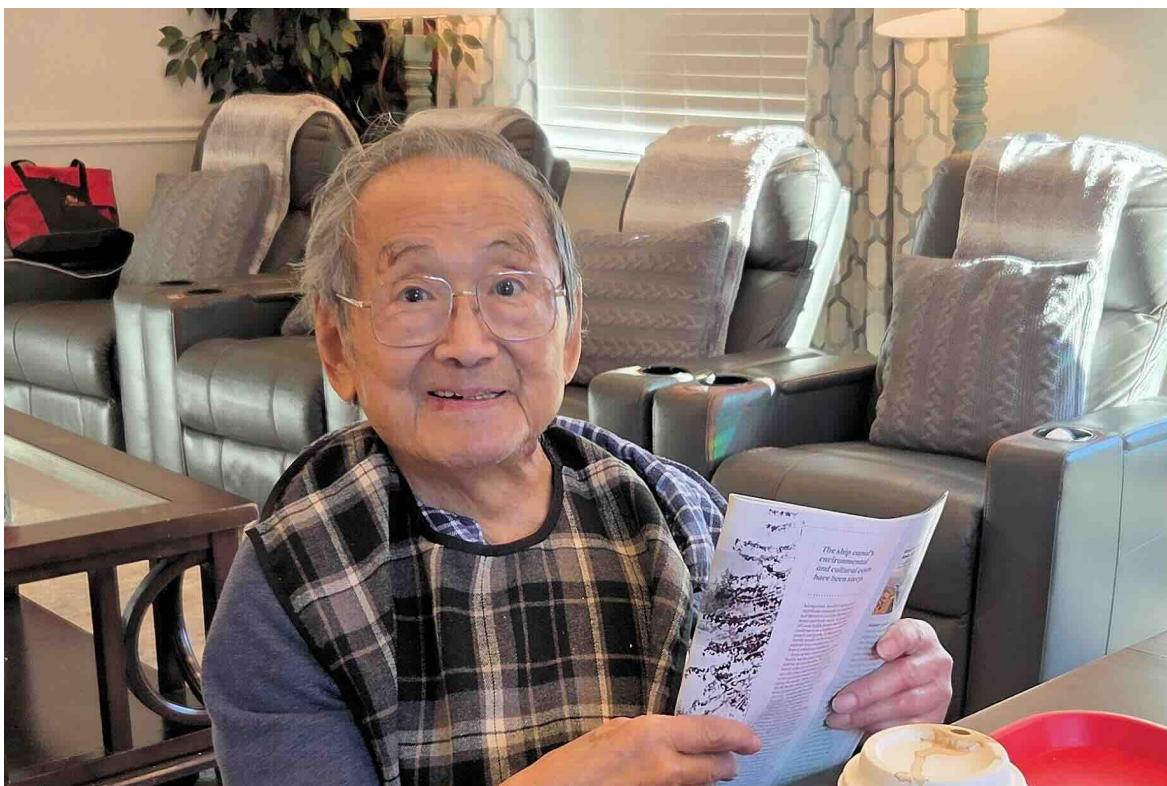


Figure 3: A recent (2026) photo of Ted

old friends and colleagues and meet the next generation of mathematicians. He died at the age of 96 years, one month shy of his 97th birthday.

His wife Amy preceded him in death in 1991. He is survived by 5 children, Laura, Lisa (Dom), Linda, Jerry (Jackie) and Gregg (Jennifer); 5 grandchildren, Stephanie, Seio, Alex, Amy, and Jeremy; and 2 great-grandchildren, Cynthia and Cora; a brother Paul and a sister Catholine.

Laura Chihara
 Professor Emerita of Mathematics and Statistics
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 Northfield, MN 55057

Ted Chihara

Mourad E. H. Ismail (mourad.eh.ismail@gmail.com), Emeritus Professor, Mathematics

I first met Ted when he visited the University of Alberta in the early 1970's. He had an ongoing collaboration with my thesis advisor Waleed Al-Salam. Ted visited U of A at least once a year and spent a year there as a visiting professor. He always gave interesting talks and ran a weekly seminar during his one year visit.

In the early 1970's, Ted was still polishing his book manuscript [1]. He lectured on parts of it and I enjoyed his lectures very much. One thing he emphasized was chain sequences. Recall that a sequence $\{a_n : n > 0\}$ is a chain sequence if there is a parameter sequence $\{g_n : n \geq 0\}$ such that $a_n = g_n(1 - g_{n-1})$ with $0 \leq g_0 < 1$ and $0 < g_n < 1$ for $n > 0$. Also recall that a sequence of monic orthogonal polynomials satisfies a three-term recurrence relation

$$y_{n+1}(x) = (x - b_n)y_n(x) - \lambda_n y_{n-1}(x), \quad n \geq 0, \quad (1)$$

with $\lambda_{n+1} > 0$ and $b_n \in \mathbb{R}$ for $n = 0, 1, \dots$. Chain sequences were introduced by Marion Wetzel in her doctoral dissertation written under the supervision of H. S. Wall [2].

Ted proved that all the zeros of the polynomials generated by (1) are $\geq s$ if and only if $b_n > s$, $n \geq 1$ and $\lambda_n / ((s - b_n)(s - b_{n-1}))$, $n > 0$, is a chain sequence. Ismail and Li used this idea to write explicit bounds for the largest and smallest zeros [3].

Chihara and Al-Salam were interested in characterization theorems. Their best known collaboration is their 1976 paper where they identified what we now call the Al-Salam-Chihara polynomials [4]. They assumed that $\{r_n(x)\}$ and $\{s_n(x)\}$ are orthogonal polynomials and considered the polynomials $\{\phi_n(x, y)\}$ defined by the convolution

$$\phi_n(x, y) = \sum_{k=0}^n r_k(x) s_{n-k}(y).$$

They proved that $\{\phi_n(x, y)\}$ is a sequence of orthogonal polynomials in x for infinitely many values of y if and only if $\{r_n(x)\}$ and $\{s_n(x)\}$ are Sheffer A-type zero and $\phi_n(x, y) = \phi_n(x + y)$, or $\{r_n(x)\}$, $\{s_n(x)\}$ and $\{\phi_n(x, y)\}$ are Al-Salam-Chihara polynomials. Their weight function was first identified in the Askey-Ismail AMS memoir [5] then became part of the Askey scheme as special Askey-Wilson polynomials.

I wrote a joint paper with Ted [6]. He looked at queuing processes where potential potential customers are discouraged by the queue length. The model was a birth and death process with birth rate $c/(n + 1)$ and constant death (service) rate. He had some ideas and we identified the orthogonal polynomials and found their measure of orthogonality.

Ted regularly attended the OPSFA meetings. In fact he was even considering going to Kyoto this summer. It was very fortunate to have met and became friends with Ted. He had a delightful personality and working with him was a pleasure. We all miss you Ted.

- [1] T. S. Chihara, An introduction to orthogonal polynomials. Mathematics and its Applications, Vol. 13. Gordon and Breach Science Publishers, New York-London-Paris, xii+249 pp. ISBN: 0-677-04150-0 (1978)
- [2] M. D. Wetzel, The analytic theory of positive definite J-fractions. Thesis (Ph.D.)-Northwestern University. 64 pp. (1943). ISBN: 978-1339-65937-4
- [3] M. E. H. Ismail and X. Li, Bounds on the extreme zeros of orthogonal polynomials, Proc. Amer. Math. Soc. **115**, 1, 131-140 (1992)
- [4] W. A. Al-Salam and T. S. Chihara, Convolutions of orthonormal polynomials. SIAM J. Math. Anal. **7**, 1, 16-28 (1976)
- [5] R. A. Askey and M. E. H. Ismail, Recurrence relations, continued fractions and orthogonal polynomials, Memoirs Amer. Math. Soc. Number **300** (1984).
- [6] T. S. Chihara and M. E. H. Ismail, Orthogonal polynomials suggested by a queueing model. Adv. in Appl. Math. **3**, 4, 441-462 (1982)

Ted Chihara

Dennis Stanton (stant001@umn.edu)

I first saw Ted Chihara at the infamous April Fools' Day conference in Madison in 1975. Later as a new assistant professor in Minnesota I noticed that there was a graduate student with the same last name, Laura Chihara. But I did not know that she was his daughter until Laura told me. She became my student and wrote a thesis in orthogonal polynomials. Thus I had this extra pleasure of being connected to Ted. I found inspiration in his clearly written book, which I have bought and given to colleagues as an important book to have. I still refer to it frequently. In person Ted was a model colleague, always with kind and helpful ideas.

Dennis Stanton

* * *

A remembrance of Ted Chihara

Paco Marcellán (pacomarc@ing.uc3m.es)

Two weeks ago I received a sad news: Our friend Ted Chihara passed away after a long and intensive trajectory as a mathematician leader on the fields of orthogonal polynomials and related areas.

When I started my PhD courses, the main references on orthogonal polynomials were the monographs by G. Szegő, G. Freud and Y. L. Geronimus. We learned a lot from them in order to increase our knowledge on the topic. But I remember when I discovered the book by Ted, "An introduction to Orthogonal Polynomials," published in 1978 by Gordon and Breach. I checked its contents in the site of such a publisher in Helsinki on the occasion of the International Congress of Mathematicians in August 1978. Its approach was completely different to those mentioned above. In particular, the first four chapters where the orthogonal polynomials were treated from the point of view of the linear functionals, instead of weight functions or positive Borel measures and focusing the attention on the three-term recurrence relations that such orthogonal polynomials satisfy and the conditions on the coefficients in order to have information about the linear functionals and their integral representations. The last two chapters summarize the state of the art concerning specific sets of orthogonal polynomials and they constitute a dictionary for the reader interested not only in their properties but also in the future advances of non standard families, far away of the classical ones. The updated bibliography and the useful notes at the end of the book allows one to complete his approach.

Unfortunately, I was not able to buy the book immediately, but thanks to financial support of my Department of Function Theory at Universidad de Zaragoza, we had access to it some weeks later. From such a moment, we did a deep analysis of the contents of the book which was available not only to people such as me, a young postdoc, but also to other people in my country starting their research activities in orthogonal polynomials. In such a way, our mathematical community built its own identity, thanks among other contributions, to the book by Ted.

Ted attended the most relevant events on orthogonal polynomials. Not only in USA, but also abroad. I will emphasize three to them.

I met him for the first time in Columbus, Ohio, on the occasion of the NATO Advanced Study Institute on Orthogonal Polynomials and Their Applications, May 22–June 3, 1989, organized by Paul Nevai. He delivered a very nice talk about the three-term recurrence relation and spectral properties of orthogonal polynomials. He presented an illustrative survey on these topics. This was the first time I met Ted, and I greatly enjoyed his company and friendly attitude.

In September 1999, the International Symposium on Orthogonal Polynomials, Special Functions and Applications held in Patras, Greece, was dedicated to Ted on the occasion of his 70th birthday. I recommend that you read the contribution: R. Askey, M. E. H. Ismail, W. Van Assche, "Ted Chihara and his work on orthogonal polynomials", in the proceedings of this meeting, published in *Journal of Computational and Applied Mathematics* **133** (2001) 1–11. The three sections, "Who is T. S. Chihara", "Chihara's work in

orthogonal polynomials” and “Ted Chihara, from the eyes of a graduate student,” respectively, constitute a friendly approach to the life and the scientific outputs by Ted. The contribution by Ted, “45 years of orthogonal polynomials: a view from the wings”, on pages 13–21 of the proceedings, was, as he wrote in the abstract, “an informal and rather personal report on what a big player observed happening in this ongoing drama we call orthogonal polynomials.” It provides basic information about the evolution of our area from 1950 to 2000 from his personal perspective. It’s of remarkable value from a historical perspective which must be emphasized.

It was in Granada, Spain, in June 2024, when I met Ted last time. He attended there the 17th edition of the OPSFA meetings and we enjoyed not only the social dinner sharing the same table but also the scientific program and the discussions concerning the new directions on our field.

Ted will remain alive in our hearts and our minds forever!

Remembrance of Ted Chihara

Lance Littlejohn (Lance_Littlejohn@baylor.edu)

I was saddened to learn of Ted Chihara’s recent passing. He was a great friend. We last spoke a few months ago, and we agreed to meet in Kyoto this summer. He very much enjoyed attending OPSFA meetings and seeing old friends and colleagues while meeting younger mathematicians new to the scene. If you met Ted, you knew you were his friend for life.

I have included two pictures I took of Ted for this tribute (Figures 4, 5). Both photos were taken in Greece in 2012. In one of them, you can see Ted running uphill to the Parthenon at the age of 82 (see Figure 4). I am 22 years his junior and I could not keep up with him!

I first met Ted in 1986 at an approximation theory conference in Edmonton. That was also where I first met Erik van Doorn and it didn’t take very long for the three of us to become fast, lifelong friends. Ted’s mark on the subject of orthogonal polynomials is well known. Co-recursive orthogonal polynomials, Al-Salam-Chihara polynomials, the Brenke-Chihara polynomials, and the Chihara-Ismail polynomials are just a few examples of his influence on the subject. For a comprehensive look at Ted’s mathematical career, I recommend the 2001 paper “Ted Chihara and his work on orthogonal polynomials,” by Dick Askey, Mourad Ismail, and Walter van Assche [J. Comput. Appl. Math., **133** (2001), pp. 1–11]. In that same issue, pp. 13–21, Ted wrote an article “45 years of orthogonal polynomials: a view from the wings”. This paper chronicles Ted’s perspective and insights on the subject in each decade from the 1950’s – 1990’s. Both of these papers were written from lectures given by the authors at the Fifth OPSFA meeting held in Patras, Greece in 1999.

Ted’s 1978 book “An Introduction to Orthogonal Polynomials” had a huge influence on many of us, especially me. Indeed, Ted’s algebraic approach to orthogonal polynomials using moment functionals set the stage for a distributional study of moment functionals which led to constructing weight functions for certain classes of orthogonal polynomials, generally named Krall polynomials, satisfying spectral-type differential equations. It was also this distributional approach that K. H. Kwon, S. S. Kim, and S. S. Han successfully used to solve the open Bessel moment problem in 1992. After Ted’s book went out of print, I encouraged him to have it republished by Dover so it is still available, still a gem, almost fifty years later.

While I was Chair of the mathematics department at Baylor, Ted visited us several times. I wanted him to be around and interact with my graduate students. His energy was infectious and it was quite a treat for my students to run some seminars with Ted, soak up his vast knowledge of the subject, and have him offer helpful advice on their own research.



Figure 4: Ted visiting the Parthenon in 2012.

Many of you know that Ted, and his family, were forced into the Minidoka Idaho ‘relocation’ camp along with more than 13,000 Japanese–Americans living in the Pacific Northwest during the Second World War. The Chihara family was forced from their Seattle home in the middle of a night in 1942 and taken to Idaho. In fact, Ted’s father was first imprisoned for more than a year because he was a ‘community leader’ in Seattle before he was sent to Minidoka to join his family. Ted and I had spoken many times about the family’s experiences in Minidoka.

With financial help from Baylor University in 2012, I brought in Ted together with his younger brothers Charles and Paul, to speak to our faculty and students about their memories of living in the Minidoka camp. Remarkably, despite the incredible hardships they faced, the brothers stressed how their experiences in the camp shaped their later lives. And shape it did. Ted obtained his Ph.D. in mathematics in 1955 from Purdue University as a student of Arthur Rosenthal and spent most of his career at Purdue–Calumet. Charles, who passed away in 2020, earned his Ph.D. in philosophy in 1960 from the University of Washington and spent 37 years as a world–renowned mathematical philosopher at UC–Berkeley. Paul, the youngest brother, earned his doctorate in music from Cornell in 1965 and is a multi–award–winning musician on faculty at New York University.

Our community of researchers in orthogonal polynomials, approximation theory, special functions and their applications, have lost one of its early leaders. RIP Ted.



Figure 5: Ted with Maria Cantero at Patras 2012.

Lance L. Littlejohn

A tribute to Ted Chihara

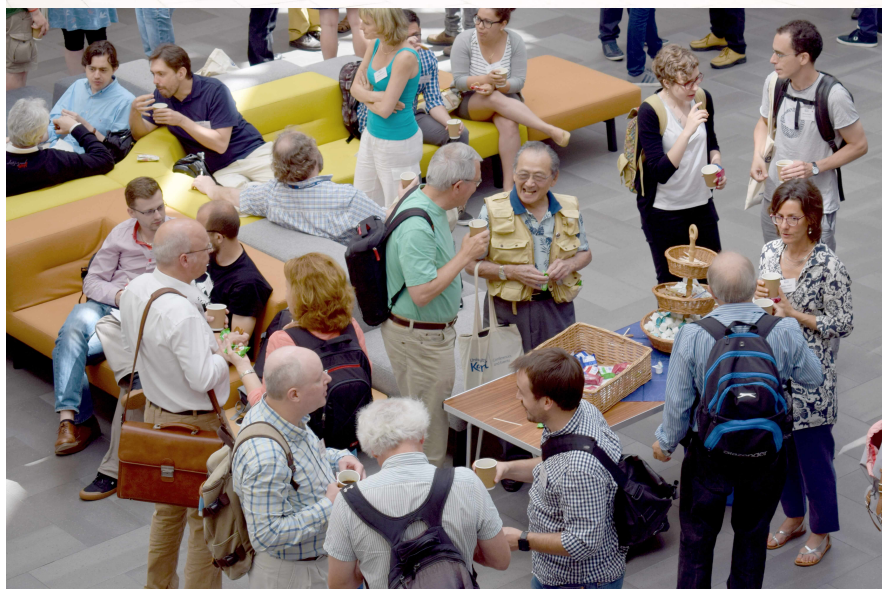
Ana Loureiro (A.Loureiro@kent.ac.uk)

Meeting Sensei Ted Chihara was always a joy. After our gatherings at a number of conferences, he would often share photographs he had taken (and Ted always carried a camera with him!) – gestures that reflected his generosity.

Ted's warm smile, gentle words, and youthful, optimistic energy were truly singular. Those qualities made every conversation with him memorable, and I will always treasure the enthusiasm and encouragement he so readily offered. When Ted visited Kent for the OPSFA meeting, he delivered a lecture to a completely full room. Watching him speak for the first time was deeply impressive.



OPSFA 2015, Kent



Ted leaves us with a fantastic legacy in the field of orthogonal polynomials. His scientific contributions undoubtedly inspire and benefit those who want to learn about orthogonal polynomials and special functions. I feel honoured and fortunate to have met Ted, and I thank him for all the encouragement he offered and allowing me to become a friend.

Thank you Ted for all you gave us!



Photomemorabilia from Copenhagen in 2012,

Marseille in 2009,

Linz in 2019.

Ted Chihara

Walter Van Assche (walter.vanassche@kuleuven.be)

It was very bad news to hear that our beloved colleague Ted Chihara passed away. Ted was one of my earliest mathematics friends and he was very influential through his book *An Introduction to Orthogonal Polynomials* (1978) and his papers, introducing a few families of orthogonal polynomials that now bear his name (Al-Salam-Chihara polynomials, Chihara-Ismail polynomials) and many interesting results and open problems for orthogonal polynomials and their recurrence coefficients. I believe Ted's most important contribution is his clever use of chain sequences in the study of orthogonal polynomials. Chain sequences already appeared in the work of Wall (1948) on continued fractions, but Chihara reintroduced them in his paper *Chain sequences and orthogonal polynomials* [Trans. Amer. Math. Soc. 104 (1962), 1-16] and later in his book (Chapter III, §5). He was able to use chain sequences to obtain new and interesting results for orthogonal polynomials using the three-term recurrence relation.



Figure 6: Ted and Laura Chihara in Columbus, Ohio (1989)

Knowing Ted was really a blessing since he was such a nice person to talk to and he was very much willing to share his knowledge and some open problems with anyone else. I think I first met him at the NATO-ASI meeting in Columbus, Ohio in 1989. His daughter Laura was also at that meeting, see Figure 6.

I met him at many more conferences, especially the OPSFA conferences which are organized every two years and which he was keen to attend, even many years after his retirement. The OPSFA conference in Patras (1999) was in honour of Ted and he was one of the plenary speakers giving some insight of 45 years of orthogonal polynomials from his point of view. The last time I met him was at the OPSFA conference in Granada (2024), see Figure 7 where he was joined by his grandson. After the conference we were on the same plane going to Munich and the last thing he said to me was 'see you at the next OPSFA in 2026'. Unfortunately he will be missed at the next OPSFA but he will definitely be remembered as one of the nicest and original researchers in our field.



Figure 7: Ted Chihara at the banquet in Granada (2024)

Walter Van Assche, KU Leuven

Ted Chihara, a Fond Remembrance

Jeff Geronimo (jeffrey.geronimo@math.gatech.edu)

I was introduced to Ted Chihara by Dick Askey at a conference I was attending in the late 1970's. I was already familiar with his work since he had disproved a conjecture of Ken Case. Case, who was my advisor at the time, had conjectured that if the coefficients in a Jacobi matrix (a_n, b_n) , with a_n positive and b_n real, tend to their asymptotic values at a rate of $O(1/n^2)$ i.e. $a_n - a = O(1/n^2) = b_n - b$ with $a > 0$ and b real and finite, then the spectral measure would have only a finite number of mass points outside of the essential spectrum. This conjecture was based on a loose analogy to the weak Coulomb potential in the Schrödinger equation. In his paper Chihara masterfully used chain sequences to show this conjecture was not true, and he also investigated the end point continuity behavior of the spectral measure. Furthermore, he obtained results that matched those in the Coulomb Schrödinger equation. Later, Case and I, using the techniques in the book of Agranovich and Marchenko showed that if $\sum n(|a_n - a| + |b_n - b|) < \infty$ then there were only a finite number of mass points outside the essential spectrum. Chihara and Nevai became interested in this result and gave two proofs of the result, the first being based on chain sequences. Because of this I remember avidly reading Ted's influential book "An introduction to Orthogonal polynomials". There is much more on Ted's work in the very nice article of Askey, Ismail and Van Assche.

I would run into Ted from time to time at conferences, even when he had retired and he was always very gracious and he had interesting insights. One of these times he was with his daughter, Laura, who is also a mathematician and it was a great delight to learn that they had published a father–daughter paper.

Ted Chihara

Christian Berg (berg@math.ku.dk)

Around 1980 my interest changed from potential theory to orthogonal polynomials and moment problems, especially to the indeterminate case discovered by Stieltjes in his 1894 memoir. Upon the advice of Dick Askey, I wrote to Chihara in September 1983 and asked if he knew any explicit examples of N -extremal solutions to indeterminate moment problems. They are discrete solutions for which the polynomials are dense in the associated L^2 -space, and I searched in vain for examples in the classical monographs by Shohat–Tamarkin and Akhiezer.

Chihara replied to me that he had mentioned an example in his recently published paper, *Indeterminate Symmetric Moment problems*, JMAA **85** (1982), 331–346, the example coming from special parameter values of the Al-Salam and Carlitz polynomials. He added that Askey had raised doubts about the correctness and he warned me, that if I myself would try to verify the details, there were many misprints in the original Al-Salam and Carlitz paper, *Some orthogonal q -polynomials*, Math. Nachr. **30** (1965), 47–61. He also mentioned the corrections to be done and this was later very important for the paper by Valent and myself, *The Nevanlinna parametrization for some indeterminate Stieltjes moment problems associated with birth and death processes*, Methods and Appl. Analysis **1** (1994), 169–209, where we identified the entire Nevanlinna functions for the indeterminate part of that moment problem.

In a follow up letter from December 1983 Ted wrote to me that Askey on the phone had told him that he was now convinced about the correctness. Meanwhile Ted and I had talked about that I should participate in an AMS-meeting in Notre Dame in April 1984. Unfortunately, I was finally unable to participate, so I only met Ted for the first time at the 1989 Columbus meeting, which became my first encounter with the whole OPSFA-group.

During the following years we met at many meetings including two in Copenhagen in 2003 and 2012. The last time was at the Granada meeting in 2024, where he was accompanied by a grandson.

The 5th OPSFA at Patras in 1999 was dedicated to Ted Chihara, and at the proceedings Ted posted a question concerning kernel polynomials and chain sequences, motivated by results in a paper of his from 1962. In a quite technical paper with Jacob Stordal Christiansen, *A question by T.S. Chihara about shell polynomials and indeterminate moment problems*, J. Approx. Theory **163** (2011), 1449–1464, we were able to answer the question.

It has always been a pleasure to study the well written papers of Ted as well as his wonderful book *An Introduction to Orthogonal Polynomials* from 1978. I appreciated very much his studies of the sequence $\xi_j := \lim_{n \rightarrow \infty} x_{n,j}$, $j = 1, 2, \dots$, where $x_{n,1} < x_{n,2} < \dots < x_{n,n}$ are the zeros of the n th orthogonal polynomial. In the indeterminate Stieltjes case the points $(\xi_j)_{j \geq 1}$ were later identified by Henrik L. Pedersen as the support of the Friedrichs solution.

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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 January and February 2026. This list has been separated into two categories.

OP–SF Net Subscriber E–Prints

<http://arxiv.org/abs/2601.00631>

A simple inequality relating the Euler–Riemann zeta function, digamma, and cotangent over the unit interval

Michael Andrew Henry

<http://arxiv.org/abs/2601.02866>

New biorthogonal sequences generated by index integrals of the weight functions

Semyon Yakubovich

<http://arxiv.org/abs/2601.04704>

Automorphic vector–forms using the Cohn–Elkies magic functions

Michael Andrew Henry

<http://arxiv.org/abs/2601.04783>

Szegő Mapping and Hermite–Padé Polynomials for Multiple Orthogonality on the Unit Circle

Rostyslav Kozhan, Marcus Vaknäs

<http://arxiv.org/abs/2601.05068>

Dick and Liz Askey’s visit to U.S.S.R. in 1987, and how the discrete Askey scheme also originated in Russia

Tom H. Koornwinder

<http://arxiv.org/abs/2601.05112>

Schrödinger operators on the half–line with integrable complex potentials

Alexander Pushnitski, František Štampach

<http://arxiv.org/abs/2601.05337>

Remarkable Dates and Place: One Hundred Years Ago

Sergei K. Suslov

<http://arxiv.org/abs/2601.07030>

Special L –values of certain CM weight three Hecke eigenforms

Paresh Arora, Koustav Mondal, Akio Nakagawa, Fang–Ting Tu

<http://arxiv.org/abs/2601.08366>

Symmetric Dyck paths and q –Narayana numbers

Johann Cigler

<http://arxiv.org/abs/2601.10488>

A proof of the soliton resolution conjecture for the Benjamin–Ono equation

Louise Gassot, Patrick Gérard, Peter D. Miller

<http://arxiv.org/abs/2601.12453>

Unbounded banded matrices, shifted positive bidiagonal factorizations, and mixed-type multiple orthogonality

Amílcar Branquinho, Ana Foulquié–Moreno, Manuel Mañas

<http://arxiv.org/abs/2601.12590>

Integrals of products of four modified Bessel functions

Robert E. Gaunt

<http://arxiv.org/abs/2601.13158>

On the characteristic function of the asymmetric Student's t -distribution and an integral involving the sine function

Robert E. Gaunt

<http://arxiv.org/abs/2601.13471>

Directional Ballistic Transport in Quantum Waveguides

Adam Black, David Damanik, Peter Kuchment, Tal Malinovitch, Giorgio Young

<http://arxiv.org/abs/2601.14074>

LU-type factorizations for birth–death processes and their Darboux transformations

José Arcia–Manoleskos, Manuel Domínguez de la Iglesia

<http://arxiv.org/abs/2601.15052>

Bispectral rational functions and Leonard trios

Nicolas Crampé, Wolter Groenevelt, Quentin Labriet, Lucia Morey, Luc Vinet, Carel Wagenaar

<http://arxiv.org/abs/2601.15680>

Arithmetic Properties of Colored Partitions Restricted by Parity of the Parts

M. P. Thejitha, James A. Sellers, S. N. Fathima

<http://arxiv.org/abs/2601.15750>

Rankin–Cohen brackets in Representation Theory

Toshiyuki Kobayashi, Michael Pevzner

<http://arxiv.org/abs/2601.16270>

Generalisation of Bureau–Guillot systems with Painlevé transcendents in the coefficients

Marta Dell'Atti, Galina Filipuk

<http://arxiv.org/abs/2601.17075>

The quaternionic systems of imprimitivity for the reflection groups of rank two

Shayne Waldron

<http://arxiv.org/abs/2601.17337>

Coulomb equilibrium in the external field of an attractive–repellent pair of charges

R. Orive, F. Wielonsky

<http://arxiv.org/abs/2601.17832>

Computing bounded solutions to linear Diophantine equations with the sum of divisors

Max A. Alekseyev

<http://arxiv.org/abs/2601.18039>

Quaternities, correspondences, and tetrahedron equations (Summa tetralogiae)

Gleb Koshevoy, Vadim Schechtman, Alexander Varchenko

<http://arxiv.org/abs/2601.18427>

Biorthogonal ensembles of derivative type
Tom Claeys, Jiyuan Zhang

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A mixed interpolation–regression method for numerical integration on the unit circle using zeros of para-orthogonal polynomials
Ruymán Cruz–Barroso, Lidia Fernández, Francisco Marcellán

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Strengthening the balanced set condition for the distance–regular graph of the bilinear forms
Paul Terwilliger, Jason Williford

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Kathrin Bringmann, Badri Vishal Pandey, Jan–Willem van Ittersum

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Mark Adler, Pierre van Moerbeke

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On Askey’s extension of Clausen’s identity and its polynomial perturbation
Dmitrii Karp, Vinay Shukla

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New polar–finite forms of generalized Euler identities for $A_1^{(1)}$ –string functions and mock theta conjecture–like identities
Stepan Konenkov, Eric T. Mortenson

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Equilibrium measures for higher dimensional rotationally symmetric Riesz gases
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Aikaterini Gkogkou, Guido Mazzuca, Kenneth D. T-R McLaughlin

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Laguerre–Sobolev orthogonal Polynomials and Boundary Value Problems on a semi–infinite domain

Cleonice F. Bracciali, Miguel A. Piñar

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Quadratic irrational analogues of Ramanujan’s series for $1/\pi$

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Discrete equations from Bäcklund transformations of the fifth Painlevé equation

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<http://arxiv.org/abs/2602.01052>

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Eimear Byrne, Giovanni Longobardi, and Rocco Trombetti

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Three vignettes on hypergeometric normal functions

Matt Kerr

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F. Colombo, A. De Martino, S. Pinton

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A new improved explicit estimate for $\zeta(1/2 + it)$

Michael Revers

<http://arxiv.org/abs/2602.06199>

Explicit conditional bounds for $\zeta(s)$ at the edge of the critical strip

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<http://arxiv.org/abs/2602.09426>

q –Rationals, link invariants and webs
Perrine Juteur, Hoel Queffelec

<http://arxiv.org/abs/2602.12166>

Generic twisted Pollicott–Ruelle resonances and zeta function at zero
Tristan Humbert, Zhongkai Tao

<http://arxiv.org/abs/2602.12644>

Line congruences associated to Appell’s hypergeometric functions of rank–4
Matthew Ryan, Michael T. Schultz

<http://arxiv.org/abs/2602.12672>

Combinatorial formulas for symmetric Macdonald polynomials by superizations
Emma Yu Jin, Xiaowei Lin

<http://arxiv.org/abs/2602.13027>

Representation zeta functions of split extensions of $SL_2^m(O)$
J. Moritz Petschick, Margherita Piccolo

<http://arxiv.org/abs/2602.13107>

Intersecting Codes and the Connectivity of q –Matroids
Fabrizio Conca, Benjamin Jany, Alberto Ravagnani

<http://arxiv.org/abs/2602.13338>

Lyapunov–type inequality for fractional BVPs involving two Hadamard fractional derivatives of different orders
Zaid Laadjal

<http://arxiv.org/abs/2602.13495>

A Characterization of the Macdonald Hypergeometric Series ${}_r\Phi_s(x; q, t)$ and ${}_r\Phi_s(x, y; q, t)$ via q -Difference Equations

Hong Chen

<http://arxiv.org/abs/2602.13508>

A remarkable subset of poles of the motivic zeta function

Nero Budur, Eduardo de Lorenzo Poza, Quan Shi, Huaiqing Zuo

<http://arxiv.org/abs/2602.13589>

Painlevé XXXIV asymptotics for the defocusing nonlinear Schrödinger equation with a finite-genus algebro-geometric background

Engui Fan, Gaozhan Li, Yiling Yang, Lun Zhang

<http://arxiv.org/abs/2602.14204>

Geometric realisation of hypergeometric local systems

Asem Abdelraouf, Giulia Gugiatti

<http://arxiv.org/abs/2602.16761>

Algebraic representatives of the ratios $\zeta(2n+1)/\pi^{2n}$ and $\beta(2n)/\pi^{2n-1}$

Luc Ramsès Talla Waffo

<http://arxiv.org/abs/2602.16941>

The GKZ hypergeometric \mathcal{D} -module

Lei Fu

<http://arxiv.org/abs/2602.17179>

Multispecies inhomogeneous t -PushTASEP with general capacity

Arvind Ayyer, Atsuo Kuniba

<http://arxiv.org/abs/2602.17727>

Chebyshev polynomials and a refinement of the local residue/non-residue structure at a prime

Kok Seng Chua

<http://arxiv.org/abs/2602.19195>

Proofs of Lupu's conjectures for multiple zeta values and multiple t -values

Wenzhong Lei, Jinmin Yu, Shaofang Hong

<http://arxiv.org/abs/2602.23209>

Mesoscopic fluctuation theory of particle systems driven by Poisson noise: study of the q -TASEP

Alexandre Krajenbrink, Pierre Le Doussal

Topic #6 ——— OP – SF Net 33.2 ——— March 15, 2026

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 33.3 should be sent by May 1, 2026.

OP-SF NET is the electronic newsletter of the SIAM Activity Group on Special Functions and Orthogonal Polynomials (SIAG/OPSF). We disseminate your contributions on anything of interest to the special

functions and orthogonal polynomials community. This includes announcements of conferences, forthcoming books, new software, electronic archives, research questions, and job openings as well as news about new appointments, promotions, research visitors, awards and prizes. OP-SF Net is transmitted periodically through a post to OP-SF Talk which is currently managed and moderated by Howard Cohl (howard.cohl@nist.gov). Anyone wishing to be included in the mailing list (SIAG/OPSF members and non-members alike) should send an email expressing interest to him. Bonita Saunders also posts the Newsletter through SIAM Engage (SIAG/OPSF) which is received by all SIAG/OPSF members.

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

WWW home page of this Activity Group:

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

Information on joining SIAM and this activity group: service@siam.org

The elected Officers of the Activity Group (2025–2027) are:

Howard Cohl, Chair

Kerstin Jordaan, Program Director

Tom Trogdon, Secretary

The appointed officers are:

Howard Cohl, OP-SF NET co-editor

Sarah Post, OP-SF NET co-editor

Bonita Saunders, Webmaster and SIAM Engage (SIAG/OPSF) moderator

Topic #7 OP – SF Net 33.2 March 15, 2026

From: OP-SF Net Editors

Subject: Thought of the Month by **Terence Tao**

“There’s one secret sauce that makes this all work which is formal verification. This is a special type of computer language which, roughly speaking, can take a mathematical argument and check if it’s correct or not, automatically. The key to this is that it breaks the trust barrier. So previously in mathematics, if you want to collaborate with other people you either have to check every line of what they submitted, or you have to trust what they did. Because of formal verification, we can accept anonymous contributions or untrusted contributions.”

Terence Tao, Mathematics in the Age of AI, AI for Science: Kickoff 2026, The Foundation for Science and AI Research, Institute for Pure and Applied Mathematics at University of California, Los Angeles (UCLA), Los Angeles, California, February 25, 2026.