O P-S F N E T - Volume 29, Number 5 - September 15, 2022

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.

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Calendar of Events:

October 22-23 (Saturday-Sunday), 2022
2022 Fall Western Sectional Meeting, American Mathematical Society,
University of Utah, Salt Lake City, UT.
Associate Secretary for the AMS Scientific Program: Michelle A. Manes.

AMS Special Session on Hypergeometric Functions and q-Series,
Organized by Howard Cohl, Robert Maier and Roberto S. Costas-Santos,
http://www.ams.org/meetings/sectional/2295_progfull.html

November 10-11 (Thursday-Friday), 2022
Two days on Orthogonal Polynomials,
Universidad de Granada, Granada, Spain.
https://www.ugr.es/ goya/D2PO2022/

April 1-2 (Saturday-Sunday), 2023
2023 Spring Eastern Virtual Sectional Meeting, American Mathematical Society,
Associate Secretary for the AMS Scientific Program: Steven H. Weintraub, shw2@lehigh.edu.

AMS Special Session on Hypergeometric functions, q-Series and Adjacent Topics,
Organized by Howard Cohl, Robert Maier and Roberto S. Costas-Santos,
http://www.ams.org/meetings/sectional/2305_progfull.html

June 12–21, 2023

Foundations of Computational Mathematics (FoCM 2023), Sorbonne University, Paris, France
https://focm2023.org/

Workshops related to our SIAG:

Session II.5, June 15–17, 2023: **Random Matrices**
Organizers: Ioana Dumitriu, University of Washington, Sheehan Olver, Imperial College

Session III.2, June 19–21,2023: **Approximation Theory**
Organizers: Albert Cohen, Sorbonne Université
Peter Binev, University of South Carolina, Guergana Petrova, Texas A&M University

Session III.7, June 19–21, 2023: **Special Functions and Orthogonal Polynomials**
Organizers: Ana Loureiro, University of Kent,
Paco Marcellán, Universidad Carlos III de Madrid,
Andrei Martínez-Finkelshtein, Baylor University and Universidad de Almería.

Topic #1 ——— OP – SF Net 29.5 ——— September 15, 2022

From: Teresa E. Pérez (tperez@ugr.es)
Subject: Announcement: Two Days on Orthogonal Polynomials in Granada, Spain

The Research Group on Orthogonality and Applications: https://www.ugr.es/∼goya/ is organizing the workshop "D2PO 2022. Two Days on Orthogonal Polynomials" at the University of Granada, Spain, on November 10–11, 2022. The aim of this meeting is to share the latest research trends on orthogonal polynomials and special functions, as well as their connection with areas such as Approximation Theory, Operator Theory, Number Theory, Information Theory, Fourier analysis, Numerical Analysis, and their applications in Mathematical Physics, Optics, Science and Technology. We have planned two days of invited talks as well as a poster section.

All the information can be found at the web page:
https://www.ugr.es/∼goya/D2PO2022/.

Topic #2 ——— OP – SF Net 29.5 ——— September 15, 2022

From: Erik Koelink (e.koelink@math.ru.nl) and Walter Van Assche (walter.vanassche@kuleuven.be)
Subject: Report by **Juarez** and **Wagenaar**: August OPSF Summer school at Radboud University

The last OPSF Summer School before the Covid19 pandemic was in 2018 in Tunisia, and the first post-covid OPSF Summer School was held August 8-12 at Radboud University, Nijmegen, the Netherlands, after being postponed twice because of the pandemic. At the summer school there were five series of lectures on various topics:

- *Numerical analysis and orthogonal polynomials*, Daan Huybrechs (KU Leuven, Belgium)
- *Matrix valued orthogonal polynomials*, Pablo Román (Universidad Nacional de Córdoba, Argentina)
- *Hypergeometric functions of several variables and harmonic analysis*, Margit Rösler (Universität Paderborn, Germany)

- *Orthogonal polynomials and quantum information/computing*, Rafael Nepomechie (University of Miami, USA)
- *Number theory and special functions: modular functions*, Wadim Zudilin (Radboud Universiteit, the Netherlands).

Rafael Nepomechie replaced Luc Vinet at the last moment and did an excellent job, as did the other lecturers. Each of the lecturers gave 5 hours of talks and there was a lively interaction with the participants. Apart from these lectures, there were exercise classes and some lectures by participants. The OPSF Summer School took place during a heatwave in the Netherlands, and was organised as part of the Radboud Summer School programme by Erik Koelink and Walter Van Assche. Due to covid and visa problems the turnout was a bit lower than expected and 30 participants registered for the school. All participants joined in the social programme including drinks and snacks, a dinner downtown, a pub quiz and a BBQ on the Nijmegen "beach" along the river Waal. The busy social programme gave the participants a great way to get to know each other much better, and several new friendships have been formed during the week. It was very unfortunate that Walter Van Assche contracted covid the weekend before the summer school, and had to miss out on the school.

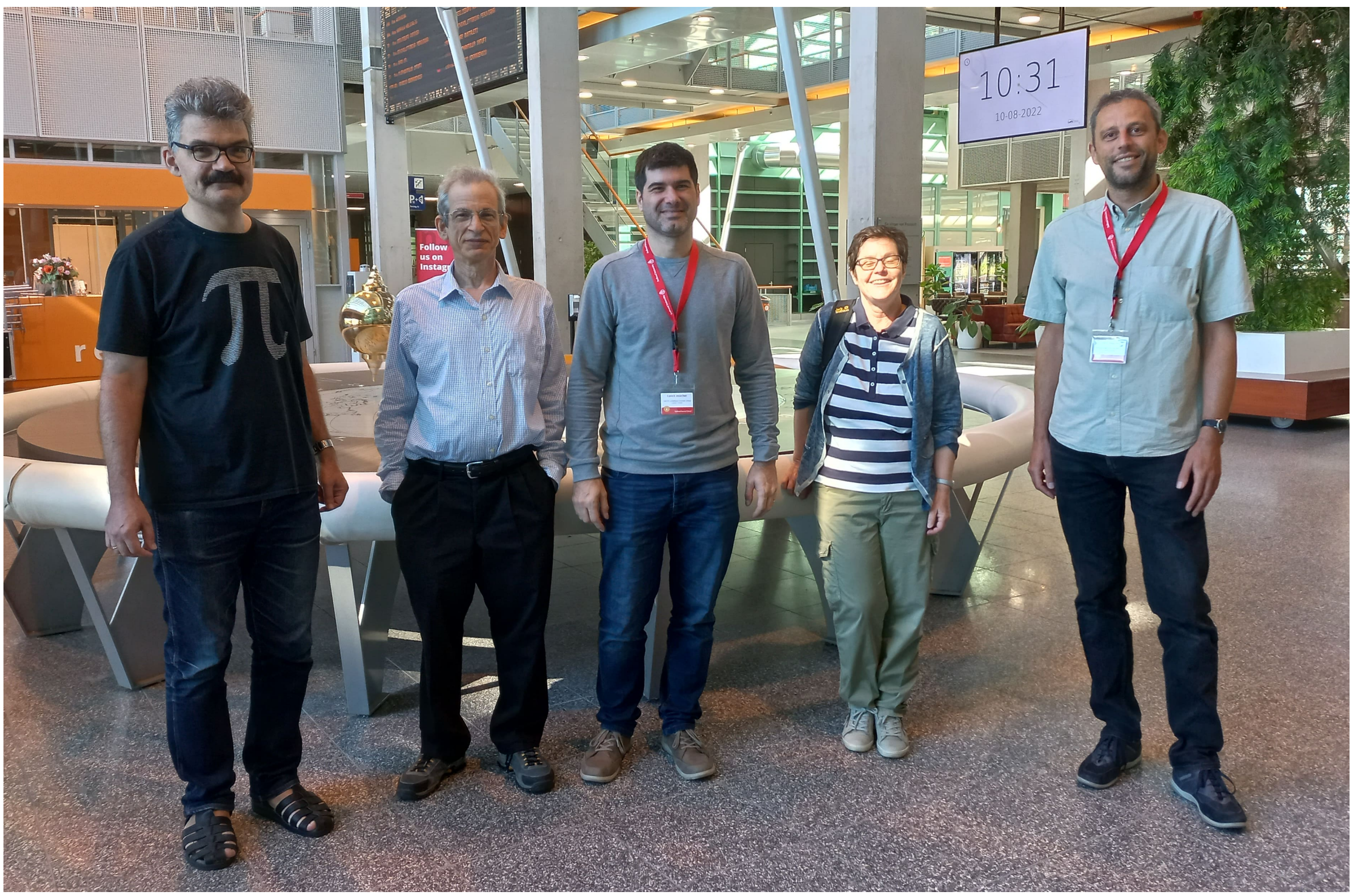

Figure 1: The lecturers from left to right: Wadim Zudilin, Rafael Nepomechie, Pablo Román, Margit Rösler, Daan Huybrechs in front of Foucault's pendulum.

We include two reports by participants. The first is by Claudia Juarez (UNAM, Mexico), who refers in the beginning to the central introduction of all the Radboud Summer Schools.

> The Netherlands is a country, its people are Dutch and they speak Dutch, there is no country called Holland but there are provinces of North and South Holland. The

Netherlands is part of a kingdom with the same name: the Kingdom of the Netherlands contains 3 more countries and it shares a border with the French Republic on the other side of the world on an island called Saint Martin three times... . These are the first things I learned when I arrived at Radboud University and it was the beginning of the most amazing week I spent in Nijmegen during this Summer School. I submitted my application to participate in the OPSF Summer School hoping to expand my knowledge in Orthogonal Polynomials, or just mathematics for those who do not know what I am talking about, but along the way I learned many more things.

During this week I had the opportunity to get in touch with lectures and participate in courses taught by people from different parts of the world. I met many young people who, surprisingly, are also interested in Orthogonal Polynomials. Now I look forward to collaborating one day with all of them with whom during this week we discuss ideas, exchange opinions and in general share a lot of knowledge.

Special thanks to the organizers because with the Social Programme of the Summer School we were able to interact with young people interested in other topics such as environmental sciences, treatment of anxiety and depression, quantum computing, gifted education among others, all of them sharing with great enthusiasm a part of their work. I finished this week very happy to have shared with my colleagues, knowing that there is a lot to learn, with a little broken heart for having to say goodbye to my new friends but very happy to know that outside there are many people who do what they like with great enthusiasm and prepare with impatience to one day do their bit to make this world a better place.

The second is by Carel Wagenaar (TU Delft, the Netherlands).

After being postponed from the original year 2020, the summer school on Orthogonal Polynomials, Special Functions and Applications took place from the 8$^{\text{th}}$ till the 12$^{\text{th}}$ of August 2022. The host this time was the Radboud University: a vivid and spacious campus within walking distance from the center of Nijmegen, one of the oldest cities in the Netherlands. This was the first time I physically met with such a large group of mathematical colleagues. I very much enjoyed the energy and passion that everybody put into speaking about their research and, at least as important, their eagerness and willingness to explain it.

The five topics this year varied a lot and it was very interesting to see a whole kaleidoscope of where orthogonal polynomials and special functions appear. Margit Rösler showed how multivariable hypergeometric functions appear in harmonic analysis. Then Rafael Nepomechie explained the basics of quantum mechanics and then suddenly Krawtchouk polynomials appeared as eigenfunctions of the Hamiltonian of a free Fermion model. The usefulness of orthogonal polynomials was emphasized by Daan Huybrechs, who showed in several examples how orthogonal polynomials are extremely useful in numerical mathematics; in particular that Chebyshev polynomials are an indispensable tool in approximating functions. The beauty of mathematics was then once again emphasized by Wadim Zudilin by an introduction to modular functions. Lastly, Pablo Román gave a crash course in matrix-valued orthogonal polynomials, which are polynomials where the coefficients are matrices instead of scalars. A prototype of something that shows up often in mathematics: a conceptually simple generalization that is an interesting and complex subject on its own.

We hope that future schools can be organised live as well, so that the next generation of young researchers can start building their research network at such an event.

From: Ken Ono (ken.ono691@virginia.edu)
Subject: Mathematical Intelligencer interview by **Ken Ono** with **Maryna Viazovska**

An Interview with Maryna Viazovska[1]

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Reprinted with permission by *The Mathematical Intelligencer*, published by Springer Nature

Figure 2: Maryna Viazovska; photo by Fred Merz

[1]This article is published in *Mathematical Intelligencer*, **44** (4) September, 2022.

On July 5, 2022, Ukrainian number theorist Maryna Viazovska became the second woman in history to be awarded the Fields Medal, one of the highest honors a mathematician can receive. Viazovska, who is based at the Swiss Federal Institute of Technology in Lausanne (EPFL), is most famous for her work on the sphere-packing problem in dimensions 8 and 24. The official citation[2] for her prize reads:

> Maryna Viazovska is awarded the Fields Medal 2022 for the proof that the E_8 lattice provides the densest packing of identical spheres in 8 dimensions, and further contributions to related extremal problems and interpolation problems in Fourier analysis.

Those further contributions include her extraordinary work, with collaborators Henry Cohn, Abhinav Kumar, Stephen D. Miller, and Danylo Radchenko, that solves the sphere-packing problem in 24 dimensions, with the Leech lattice giving the densest packing.

Mathematical Intelligencer correspondent Ken Ono spoke with Viazovska about the award and the historical significance of her achievements.

Ono: You just won one of the four 2022 Fields Medals, only the second woman so honored, for your work on sphere-packings. Can you talk a bit about the history of the sphere-packing problem and the mathematical context from which it evolved?

Viazovska: The sphere-packing problem is a very natural geometric problem that has a long, long history. It is very famous in the three-dimensional case, where it was known as Kepler's conjecture. Let me first explain this problem. It's actually rather simple. We have a huge box and an infinite supply of identical hard balls, and we want to fit as many of them into this box as possible. Now imagine that our box is somehow infinite, so that it covers all space. What is the densest possible configuration of these hard nonintersecting balls?

This problem was famously posed by Johannes Kepler in his essay on the six-angled snowflake. In the seventeenth century, when atomic theory was a very hot topic in science, the question was a very daring idea. These days, we know that this view of condensed matter is rather naive, and so the sphere-packing problem is not enough. There are more complicated optimization problems that come into play involving quantum mechanics that were not considered at the time. As a pure math problem, it has attracted the attention of many mathematicians. It is an example of a very difficult geometric optimization problem.

And it took more than 300 years to solve it. It was finally solved by Thomas Hales at the very end of the twentieth century. His work is also important in the history of mathematics, in that the proof was one of the first accepted computer-assisted proofs of an important theorem. There were many discussions in the community about how to deal with such proofs, and in my opinion, this opened a lot of new directions to the benefit of mathematics.

In my work, I solved the sphere-packing problem in dimension 8, and in dimension 24 with Cohn, Kumar, Miller, and Radchenko [MR3664817].

[2] For the full citation, see the International Mathematical Union website: https://www.mathunion.org/fileadmin/IMU/Prizes/Fields/2022/IMU_Fields22_Viazovska_citation.pdf.

Ono: You discovered “magic functions” whose existence played an instrumental role in the solution to the sphere-packing problem in dimensions 8 and 24. Can you say something about your search for these functions and what allowed you to achieve what others before you had not?

Viazovska: When it comes to geometric optimization problems, we don’t have universal methods that solve them all. We don’t dare to even hope for that. For example, the solution by Hales in three dimensions was a rather direct geometric approach of splitting the sphere-packing problem into many optimization problems obtained by carefully studying three-dimensional geometry. These many problems were then handled with computer assistance.

There is another approach, which we can call a linear programming method. Vaguely, one can say that here, instead of studying the original problem, we investigate a hopefully simpler optimization problem. We usually do this, not in the direct space of point configurations, but in some suitable space of functions, where linearity makes sense. So we speak of convex optimization. This method is actually quite well developed, and it has been applied to many geometric optimization problems. For example, it has been applied to the kissing problem in dimension 8, which was solved in 1979 by two independent teams: Vladimir Levenshtein in Moscow [MR0529659], and the Americans Andrew Odlyzko and Neil Sloane [MR0530296]. The same method was adopted by Henry Cohn and Noam Elkies for the sphere-packing problems in Euclidean space [MR1973059]. Thanks to these mathematicians’ papers, I learned about the sphere-packing problem, and I decided to work on it.

I mostly worked with a later paper by Henry Cohn and Noam Elkies. And yes, this method as they further developed it is very elegant. Instead of looking at the geometric problem itself, the idea is to construct an auxiliary function, one that satisfies certain inequalities. The function itself satisfies those inequalities, and its Fourier transform must also satisfy further inequalities. Whenever we can find such an auxiliary function with the right parameters, we can prove an upper bound on the density of a sphere-packing. Cohn and Elkies applied this method numerically for dimensions from 3 to 36, and they obtained explicit upper bounds. Independently, a similar method was developed by Dmitry Gorbachev. All of this work improved previously known bounds, but in general, it is believed to provide far from optimal solutions, though with two exceptional cases: dimensions 8 and 24. Their numerical bounds in these cases came extremely close to the densities of known configurations, the E_8 lattice for dimension 8 and the Leech lattice in 24 dimensions. The packing densities for these lattices agreed with the numerical bounds to many decimal places!

To prove these cases, the problem then was to find auxiliary functions that matched and hence proved the optimality of these known constructions. If I remember correctly, Stephen Miller named them “magic functions.” He doesn’t exactly remember, but he thinks it was his idea to call them magic because they are very difficult to find. So all of the work was about finding these functions. Once we find them, everything works smoothly and nicely. My contribution to the field was to find explicit constructions for these magic functions. The existence of the functions was strongly supported by the numerical data. I gave an exact formula for this function in dimension 8, and it turned out that in a space of Schwartz functions, it is unique. So there is this unique special object. And you know, whenever we have a unique special object, then for number theorists that rings a bell. We should have a nice and beautiful explicit formula, and here the intuition worked correctly. Indeed, there is a rather simple and nice explicit formula for the magic function, and it comes from modular forms.

Ono: When did you discover your passion for mathematics? Do you think that your gender presented some obstacles to developing that passion?

Viazovska: I liked mathematics even in the first grade, when we had to learn how to read, how to write, and how to count, and for me, I liked counting very much. I liked counting much more than the other two. Of course, I learned later that the ability to read and write is still very important for mathematicians. I think this was my first guess that maybe mathematics was the right field for me.

Did my gender present any obstacles? I was pursuing my passion, and at the time I didn't think so. But now, I know that it did. Now that I know more about the world, I understand that I was actually extremely lucky. I was lucky that my parents did not force me to study things that some people think are more appropriate for a girl. They also did not discourage me from studying mathematics just because it's a male-dominated field. And then I was lucky that they supported my curiosity for science and mathematics.

I was also very lucky with teachers, and I think in general, with people I met in life. Of course, I cannot say that sexism does not exist in the world. I was particularly lucky that I was born where I was, Ukraine, that my parents were my parents, and that I had the right teachers.

Ono: Are there particular mentors who played a central role in your career? If so, can you say a bit about the nature of their influence?

Viazovska: Yes, many people have helped me, starting from my very first teachers. My first teacher, who taught me how to read and write, was a very strict woman. She taught me the notion of work ethic and to try not to avoid hard tasks. She was, I don't know, a kind of "iron lady," but someone who, I think, was still very, very kind, a teacher who cared for her students despite being strict. For example, I remember that in our class she made students who weren't doing well come to school one hour early to practice the subjects they weren't doing well in. And of course, when I was a child, I thought that this was just terrible. Now, though, I understand that she was amazing and that she too had to come in early when she didn't have to, so she could help her students.

After I finished primary school, my first teacher of mathematics—I think she was actually a close friend of my first grade teacher—was like a "super iron lady." So she was just a super, super strict math teacher. When I look back, I think the mathematics we studied was quite basic and maybe not that interesting. I know what you study in the fourth or fifth grade is not that exciting, but I still remember that I liked mathematics a lot. She had this very systematic approach, which I feel is somehow missing in some modern math books for children.

After seven years of general schooling, I was invited to a special school for physics and mathematics. There I met, I think, truly amazing teachers of physics and mathematics, and I think I was kind of lucky to have them. There were two absolutely amazing people who were more than teachers. They thought like scientists, so studying under them was a real adventure. They trained us like a team for all kinds of math and physics Olympiads, with many nonstandard problems. They taught topics that are not part of the usual school curriculum. I took advantage of my specialized school, as did the other students. We were very motivated to study, and this created a special environment. Of course, it was not that easy and was rather competitive. But at the same time, I think it's maybe one of the choices we have in life, and I was lucky to be able to discuss subjects I really cared about with others who also cared.

Igor Schevchuk was my teacher at Kyiv University. He taught me mathematical analysis and was the person who encouraged me to participate in math competitions. He kind of created this world for me. It was a great team experience, because it was cool, although maybe I did not do as well as I would have hoped. I continued in this way in university, and it was a wonderful opportunity to meet a lot of great people. Igor Schevchuk was also the person who, even when I was a college student, encouraged me to think about some research problems. I think, for me at least, that this was extremely productive. I'm not sure that it's something that every college student should do. There are different styles of learning and different styles of maturing as a mathematician, but I think for me it was super productive. Maybe this is because I'm not a very patient person, and sometimes I get bored. Researching mathematics is like breathing fresh air, when you can be creative. Maybe there is no right answer, or at least the answer isn't known to anyone. It is so exciting to be the first person to discover it.

Another person who was very influential in my life was Sergiy Ovsienko. He taught me algebra and so many of the things I know about it. Maybe he is the reason I became a number theorist and not an analyst. I had many, many, many discussions with him, but unfortunately, he passed away several years ago. He was very kind, a great person who took care of his students. He raised a whole generation of algebraists at Kyiv University.

Then, you know too, Ken, as you often come to Bonn, that when people speak of science, they sometimes speak of the "ivory tower." The Max Planck Institute there is certainly an incarnation of such a tower on earth. Max Planck is a secret place hidden in the center of a city and situated over a post office. People should think of it as something like track $9\frac{3}{4}$ in King's Cross in *Harry Potter*, a secret entrance on this platform that only magicians can enter. Instead of magicians, this place is filled with mathematicians. It is a great atmosphere, of course—everyone loves mathematics. In this place, where mathematicians share their treasures, there is a wizard—Don Zagier. He seems to work not 24, maybe not 25, but maybe 26 hours a day. I'm very happy that my magical mathematical adventure led me to my PhD advisor, Don Zagier.

Ono: You were born and raised in Ukraine, but you now work in Switzerland. Can you speak about the history of Ukrainian mathematics, and the impact your Fields Medal will have on your compatriots?

Viazovska: Ukraine is a country with very strong traditions in mathematics. Many mathematicians who made important mathematical contributions have come from Ukraine. In many cases, mathematicians have established careers in other countries after their basic education in Ukraine.

What is happening now in Ukraine is a terrible tragedy, and the world is watching. Of course, the biggest tragedy is the loss of so many human lives. And, maybe it is a bit of a cliché, but it seems true that war takes the best people. This is particularly painful for me as a Ukrainian. We cannot watch this calmly. What is happening in Ukraine, in addition to the huge loss of life, is terrible for humanity and culture. For example, the city of Kharkiv is slowly being erased. At the moment, around ten percent of the buildings in Kharkiv have been destroyed. The situation is not as tragic as in some other cities (Mariupol, Sievierodonetsk, etc.), where more than ninety percent of the buildings are ruined. Unfortunately, rocket strikes and shelling continue every day. And there are, of course, many other cities that are incredibly historically important, including the history of science and mathematics, that are being devastated. Maybe this is the point when I get too emotional. And, yeah, so maybe, we can switch to more optimistic topics.

I hope that my prize makes some Ukrainians feel better. In this difficult time, maybe it is good to receive some good news. My wish now is for Ukraine to somehow protect itself. I want the restoration of peace in our land, and then a proper rebuilding. We will not forget about science, and maybe my prize can be a reminder. I want to be modest here, but maybe my prize can remind people that Ukrainians are really great at doing science. Ukrainians deserve great opportunities in education, so that young people have the possibility to become scientists. The history of Ukraine is one of the most depressing subjects you can learn. This can lead to a kind of despair and disbelief. There have been difficult times before, such as when deindustrialization hit our country, and people who trained for jobs in science and technology essentially had to search for alternative careers. I hope that news of my prize will help Ukrainians endure and then overcome the trauma, and then use it to restore our commitment to science. Unfortunately, none of this is what is on on their minds today. All thoughts are about war and defending our country.

Ono: How do you think your life will change now that you have won the Fields Medal? Presumably, winning the medal has completely changed your life.

Viazovska: Okay, so today, yes, but in the future, I hope not. I hope that maybe in a month I will return to my usual life as a mathematician and mathematics professor. I will like some of the privileges that come with the Fields Medal, but I hope that my life will return to normal and that I will return to teaching and to doing my research.

I will probably have a bit more to do as I expect people will look to me somehow as a leader with important opinions. Historically, some winners completely changed their lives after winning the medal. Some may have completely changed the direction of their research or even quit science and started doing completely different things. I don't have such plans. I'm really quite happy being a mathematician.

Right now, I do have to give many interviews, and I am getting many more invitations to give speeches, including at many events that are not purely scientific. But I would like to remain a scientist. From time to time, I expect that I will have to leave the ivory tower and talk to those who fund mathematical research. It is important to explain what we are doing and why it is important. So probably, I will get to do this on a few occasions now.

Ono: What advice or message can you offer to young students of mathematics?

Viazovska: Of course, to students of mathematics I want to say that it is important to study mathematics. Students should follow the passion they feel in their heart. Students pursuing mathematical research for any other reason might be better off considering alternative careers. Don't just do something because others, like parents, want you to. One should follow the passion in one's heart. This is the most difficult kind of advice that a professor can give.

I do hope that most people who join math departments as students do so because they love mathematics. The life of a mathematician is not always that easy. One should be prepared for different twists and surprises. Of course, I think that mathematics offers simple and pure intellectual joy for those with the passion for the subject in their heart.

At a practical level, I think that mathematics is an extremely useful profession. The job market can be quite tricky, and so I would advise students to be aware of that. Some students will become research mathematicians and professors of mathematics. Others will enter the "real world," getting real jobs. Both are important. I see the value of mathematics becoming more and more recognized, and so I hope that the journey of today's students will be really exciting. To all math students, I do believe that the mathematics they learn now at university will benefit our society. So my advice would be to be a good student and to follow the passion in your heart.

Topic #4 ——— OP - SF Net 29.5 ——— September 15, 2022

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 July and August 2022. This list has been separated into two categories.

OP-SF Net Subscriber E-Prints

http://arxiv.org/abs/2207.00044
A finite analogue of a q-series identity of Bhoria, Eyyunni and Maji and its applications
Atul Dixit, Khushbu Patel

http://arxiv.org/abs/2207.00359
Heat-diffusion semigroup and other translations
Á. P. Horváth

http://arxiv.org/abs/2207.00393
Differential-Difference Properties of Hypergeometric Series
Nicolas Brisebarre, Bruno Salvy

http://arxiv.org/abs/2207.00613
Product of exponentials concentrates around the exponential of the sum
Michael Anshelevich, Austin Pritchett

http://arxiv.org/abs/2207.01031
FPS In Action: An Easy Way To Find Explicit Formulas For Interlaced Hypergeometric Sequences
Bertrand Teguia Tabuguia, Wolfram Koepf

http://arxiv.org/abs/2207.02068
Critical measures on higher genus Riemann surfaces
Marco Bertola, Alan Groot, Arno B. J. Kuijlaars

http://arxiv.org/abs/2207.02591
The mixed mock modularity of certain duals of generalized quantum modular forms of Hikami and Lovejoy
Eric T. Mortenson, Sander Zwegers

http://arxiv.org/abs/2207.02713
Best algebraic bounds for ratios of modified Bessel functions
Javier Segura

http://arxiv.org/abs/2207.05551
On an Umbral point of view to the Gaussian and Gaussian like functions
Giuseppe Dattoli, Emanuele Di Palma, Silvia Licciardi

http://arxiv.org/abs/2207.05967
Generalized Laguerre functions and Whittaker vectors for holomorphic discrete series
Jan Frahm, Gestur Ólafsson, Bent Ørsted

http://arxiv.org/abs/2207.07741
Tridiagonal pairs, alternating elements, and distance-regular graphs
Paul Terwilliger

http://arxiv.org/abs/2207.07747
Distance-regular graphs, the subconstituent algebra, and the Q-polynomial property
Paul Terwilliger

http://arxiv.org/abs/2207.08308
Strong asymptotics of multi-level Hermite-Padé polynomials
L. G. González Ricardo, G. López Lagomasino

http://arxiv.org/abs/2207.08433
On the existence of critical exponents for self-avoiding walks
Anthony J. Guttmann, Iwan Jensen

http://arxiv.org/abs/2207.08524
Computer Algebra and Hypergeometric Structures for Feynman Integrals
Johannes Bluemlein, Marco Saragnese, Carsten Schneider

http://arxiv.org/abs/2207.08709
Summing Sneddon-Bessel series explicitly
Antonio J. Durán, Mario Pérez, Juan L. Varona

http://arxiv.org/abs/2207.09997
Some identities on degenerate r-Stirling numbers via boson operators
Taekyun Kim, Dae San Kim

http://arxiv.org/abs/2207.10224
Triangular Recurrences, Generalized Eulerian Numbers, and Related Number Triangles
Robert S. Maier

http://arxiv.org/abs/2207.11326
On the Almkvist-Meurman theorem for Bernoulli polynomials
Ira M. Gessel

http://arxiv.org/abs/2207.13180
Hermite trace polynomials and chaos decompositions for the Hermitian Brownian motion
Michael Anshelevich, David Buzinski

http://arxiv.org/abs/2207.13563
Dual forms of the orthogonality relations of q-orthogonal polynomials
Xinrong Ma, Jin Wang

http://arxiv.org/abs/2207.14383
Bernstein-Szegő measures in the plane
Jeffrey S. Geronimo, Plamen Iliev

http://arxiv.org/abs/2207.14479
"Diophantine" and Factorisation Properties of Finite Orthogonal Polynomials in the Askey Scheme
Satoru Odake, Ryu Sasaki

http://arxiv.org/abs/2208.01125
Truncated Hermite polynomials
Diego Dominici, Francisco Marcellán

http://arxiv.org/abs/2208.02167
ℓ^1-summability and Fourier series of B-splines with respect to their knots
Martin Buhmann, Janin Jäger, Yuan Xu

http://arxiv.org/abs/2208.02410
Noise Effects on Padé Approximants and Conformal Maps
Ovidiu Costin, Gerald V. Dunne, Max Meynig

http://arxiv.org/abs/2208.03278
Gap probabilities for the Bures-Hall Ensemble and the Cauchy-Laguerre Two-Matrix Model
N. S. Witte, L. Wei

http://arxiv.org/abs/2208.03732
Dimorphic Mersenne numbers and their applications
Taekyun Kim, Dae san Kim

http://arxiv.org/abs/2208.04684
The complex elliptic Ginibre ensemble at weak non-Hermiticity: edge spacing distributions
Thomas Bothner, Alex Little

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Topic #5 ——— OP - SF Net 29.5 ——— September 15, 2022

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 29.6 should be sent by November 1, 2022.

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
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The elected Officers of the Activity Group (2020-2022) are:
  Peter Alan Clarkson, Chair
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  Howard Cohl, OP-SF NET co-editor
  Sarah Post, OP-SF NET co-editor
  Bonita Saunders, Webmaster and SIAM Engage (SIAG/OPSF) moderator

From: OP-SF Net Editors
Subject: Thought of the Month by **Doron Zeilberger**

“Special Functions are functions that occur so often that they deserve a name, but even more important than functions are *people*, and Dick Askey is one of the most special people I have ever met.”

Doron Zeilberger, Dick Askey: A Special (and VERY IMPORTANT!) Guru Indeed: a short tribute to one of my greatest heroes, September 8, 2019 (less than a month before Askey passed away).