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The members' magazine of the Institute of Mathematical Statistics

IMS Bulletin

August 2023

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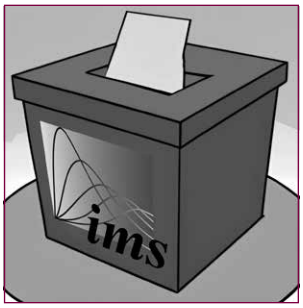
IMS Elections 2023



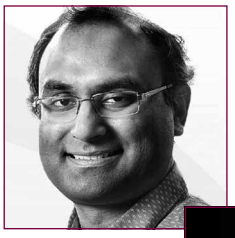
The 2023 election results are in! We are pleased to announce that the incoming IMS President-elect is Tony Cai. The new Executive Committee, for August 2023 to August 2024, will be comprised of: Michael Kosorok (President); Peter Bühlmann (Past President); Tony Cai (President-Elect); Annie Qu (Program Secretary); Jiashun Jin (Treasurer); and Peter Hoff (Executive Secretary). Leaving the Executive this year are former President Krzysztof (Chris) Burdzy and Executive Secretary for 2018–2023 Edsel Peña.

Those elected to the IMS Council are the following members: Sourav Chatterjee, Gábor Lugosi, Caroline Uhler, Huixia Judy Wang, and Linda Zhao. They will join Council members Aurore Delaigle, Davar Khoshnevisan, Samuel Kou, Dylan Small, and Daniela Witten (who have two more years to serve), and Siva Athreya, Rina Foygel Barber, Judith Rousseau, Ryan Tibshirani, and Harrison Zhou (who will serve one more year). Rotating off the Council in August after their three-year terms are Richard A. Davis, Radu Craiu, Martin Wainwright, and Fang Yao. (Tony Cai will move from Council to Executive Committee.)

New IMS President-elect Tony Cai

All those elected this year will formally take up their new roles at the annual IMS business meeting, which will take place at the Joint Statistical Meetings in Toronto, in the Tuesday lunchtime slot.

Many thanks to all those who have served the Institute, those who are about to, those who stood for election, and every member who voted this year!



New IMS Council members (left–right): Sourav Chatterjee, Gábor Lugosi, Caroline Uhler, Huixia Judy Wang, and Linda Zhao.

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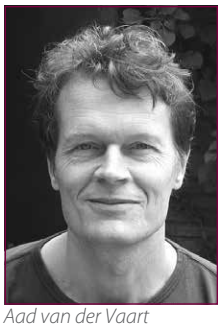
Contact information

IMS Members' News

Aad van der Vaart elected a member of the Academy of Europe


Aad van der Vaart

IMS Fellow Aad van der Vaart has been elected a member of the Academia Europaea (Academy of Europe). Aad van der Vaart is a professor in the Delft Institute of Applied Mathematics (DIAM) at TU Delft in The Netherlands; he previously held positions at Leiden University; the University of California, Berkeley; Vrije Universiteit Amsterdam; Université Paris XI; Mathematical Sciences Research Institute, Berkeley; and Texas A& M University. Among his honours and awards, Aad van der Vaart is a Knight of the Order of the Lion of the Netherlands; a Fellow of IMS and ISBA; and an elected member of the ISI, the International Mathematical Union Circle, and the Royal Netherlands Academy of Sciences; he was awarded the 2020 DeGroot Prize (for his book, *Fundamentals of Nonparametric Bayesian Inference*), the 2015 Spinoza prize, the 2000 van Dantzig prize of the Netherlands Statistical Society (which is awarded every five years), and Leiden University's 1988 C.J. Kok prize. His research interests include nonparametric Bayesian statistics, causal inference, high-dimensional statistics, statistical genetics, semiparametric theory, Le Cam theory, mathematical finance, inverse problems, genomics, time series, and empirical processes.

Academia Europaea, established in 1988, is the pan-European Academy of Sciences, Humanities and Letters. See https://www.ae-info.org/ae/Member/van_der_Vaart_Aad.

Peter Hall Prize awarded to Aaditya Ramdas


Aaditya Ramdas

Aaditya Ramdas of Carnegie Mellon University has received the 2023 Peter Gavin Hall IMS Early Career Prize. Dr. Ramdas receives the award "for significant contributions in the areas of reproducibility in science and technology; active, sequential decision-making; and assumption-light uncertainty quantification." As an Assistant Professor in the Departments of Statistics and Data Science and Machine Learning, Dr. Ramdas' research spans algorithms, theory, and applications of statistical inference and machine learning. His work delves into fundamental questions in statistics, data science, machine learning, and artificial intelligence, when applied towards solving basic problems in science and technology.

The Peter Gavin Hall IMS Early Career Prize recognizes one researcher annually who is within the first eight years of completing their doctoral degree. Dr. Ramdas' outstanding achievements recognize his potential to shape the future of statistics. His dedication and expertise have positioned him as an emerging leader in the field, and his innovative contributions continue to push the boundaries of statistical research.

Inchi Hu invites you to First Georges Reception at JSM

The First Georges' Reception by George Mason University (GMU), George Washington University (GWU), and Georgetown University (GU) at the JSM will be on Tuesday, August 8, 2023, from 6–8pm, at the Intercontinental Toronto Centre, Ballroom A. IMS member Inchi Hu says, "Alumni, friends, and members are welcome."

Caucus for Women in Statistics

Jessica Kohlschmidt is the Executive Director of the Caucus for Women in Statistics. She writes with an update on recent and forthcoming CWS activities:

The Caucus for Women in Statistics and Data Science, CWS (https://cwstat.org/) is pleased to share the following information.

We have selected our third annual recipient for the CWS Societal Impact Award: Dr. Saleha Naghmi Habibullah, who is Professor of Statistics at Kinnaird College For Women in Pakistan. This award was established to recognize the impact that statisticians make to society at large. The award will be given annually to a statistician who has actively worked to advance social justice, or diversity, equity and inclusion through their research, teaching or service. Congratulations Dr. Saleha Habibullah! The deadline for this award is February of each year. Please consider nominating one of your outstanding colleagues for this award. See https://cwstat.org/societal-impact-award/

CWS also has several travel awards. We are currently accepting applications (until August 31, 2023) for the Prof. Suddhendu Biswas Student Travel Award, a student travel award for an individual in a developing country to attend an international conference in India. We would like to announce the winners of our JSM travel award: Dr. Sayantee Jana won the 2023 CWS Do-Bui Travel Award, Taylor Krajewski won the 2023 CWS Lee Travel Award, and Ann Marie Weideman won the 2023 CWS Travel Award. The JSM Travel Award deadline is in May of each year and we welcome applications.

JSM is quickly approaching and there will be CWS-sponsored events: see https://cwstat.org/joint-statistical-meetings-jsm-2023/. We will be hosting a pre-JSM "Know Before You Go" webinar on July 26 by our 2023 CWS President-Elect Cynthia Bland, RTI International. We will have a recording available after the webinar (https://cwstat.org/cws-webinar-jsml-know-before-you-go-7-26-at-4-pm-et/). We will host our Governing Council at JSM on August 6th at 9 am. Our annual CWS Reception and Business Meeting will be on August 8th from 6–8 pm in the Metro Toronto Convention Centre, room CC-701A. Please join us if you are able: Drs. Ji-Hyun Lee and Sayantee Jana will be our featured speakers.

CWS is hosting the second annual International Day for Women in Statistics and Data Science. This event will take place on October 10th from midnight to midnight UTC time; it is entirely virtual and registration is free. Check out https://www.idwsds.org/ for more information and to register.

Florence Nightingale Day is starting its sixth year. To honor Nightingale's legacy, the Florence Nightingale Day was launched in 2018 by 2018 CWS President, Dr. Shili Lin, to engage students, promote future career opportunities in statistics and data science, and celebrate the contributions of women to these fields. Our vision is to inspire a diverse group of young people to become future leaders in data-related disciplines. Pre-college students (ages 13 and above) from around the world are encouraged to attend this one-day event offered at various time and places throughout the academic year, 2023-2024. Components of the day include trivia games, panels of professional and student speakers, hands-on activities, and networking. See https://fndaystats.org/ for updates.

Sound the Gong: Why ChatGPT is like Botox

Ruobin Gong writes:

ChatGPT is a chatbot that derives its power from large language models trained on massive amounts of data. For the most part, it appears to be incredibly smart and knowledgeable. Botox, or botulinum toxin A, is a neurotoxic protein that can relax facial muscles. It is a favorite cosmetic procedure among those who wish to look younger. I argue that these two objects share striking similarities.

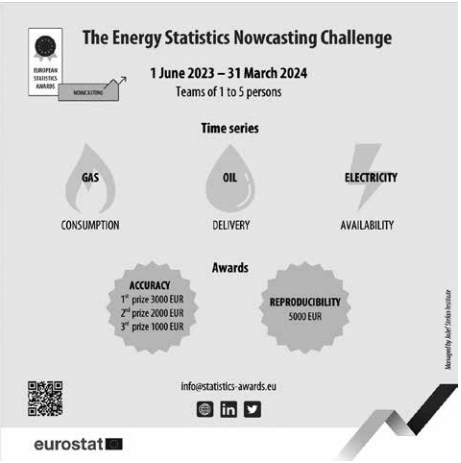
Consider the following facts.

1. Both are the crown jewel of a multi-billion-dollar company.*
2. Both can smooth wrinkles.
3. When used correctly, they take time off their subjects.
4. There is only one correct way to use them. It must be such that an uninformed inspection cannot tell whether they were used or not. Judicious and artful administration is key. Excessive application (especially in the wrong places) creates a robotic, emotionless appearance that can be more jarring than enjoyable to look at.
5. Despite a devoted following growing in size, whether either of them can create "true beauty" remains very much questionable. Perhaps this debate will never cease to be contentious, because as we all agree, the only universally agreed upon elements to true beauty are water, exercise, and sleep. (Reading is optional, but it helps.)
6. Both create trust issues.
7. For the above reason, most people who use them prefer to keep it to themselves. Some might divulge to a trusted circle of friends, who might then go on to try it out. Only the trailblazer (or showoff) announces their private decision, even praises the good effects publicly. (Surprisingly, such fearless candor is usually quite well received.)
8. Both are a high-tech invention of the modern times. People who wield them well are generally happy that they exist. Even so, they cannot help every so often longing for the old days when everything and everyone was *au naturel.*

* Allergan, the owner of the trade name Botox® which makes up around half of its aesthetic business [https://news.abbvie.com/news/press-releases/abbvie-reports-full-year-and-fourth-quarter-2022-financial-results.htm], was purchased for $63B USD by AbbVie in 2019 [https://www.crunchbase.com/organization/allergan]. As of April 2023, OpenAI is valued at between $27B and $29B USD [https://www.reuters.com/markets/deals/openai-closes-10-bln-funding-round-27-bln-29-bln-valuation-tech-crunch-2023-04-28/]. (All sources retrieved on June 14, 2023).

Energy Statistics Nowcasting Challenge

The second round of the European Statistics Awards for Nowcasting is on now, with registrations open until 28 September 2023



Eurostat has announced the second round of European Statistics Awards for Nowcasting, which started in June 2023. The competition aims to stimulate innovation in the area of Nowcasting for European statistics.

In the Energy Statistics Nowcasting Challenge, teams will focus on using advanced modelling techniques and (nearly) real-time auxiliary data, to come up with nowcasts for key energy time series way ahead of the official figures. The nowcasts that are closest to the official European statistics will be rewarded for accuracy, and the team that best documents their nowcasting models will win the Reproducibility Award.

You can register your team (between one and five people) for the Energy Statistics Nowcasting Challenge at https://statistics-awards.eu/accounts/signup/

The competition began on 1 June 2023, and will run for ten months until 31 March 2024. Register by 28 September 2023 and try your chances on your own or with a team of peers. **You can win up to €8000 per nowcasted time series**. If your team secures the top spot for all three time series, you could earn up to €24000 in this round.

For more information on the European Statistical Awards Programme, please refer to the European Statistics Awards website https://statistics-awards.eu/ or email to learn about any further details at info@statistics-awards.eu.

Radu's Rides: The Stand-up Statistician

Radu Craiu is being serious about the lessons to be learned from comedy:

I had a dream in which Poisson's cousin claimed that the 21st century will be either humorous or poisonous. While I still look for a relevant reference, I confess that *my* 21st century is a lot more tolerable because of stand-up comedy and, of course, statistics. The two are not as unrelated as they seem, and I argue that the idea of getting some inspiration from comedians stands up to scrutiny. I hope you don't think that I am going to write an IMS column suggesting that a statistician's work is a joke—in fact, I argue, quite the contrary: humor is a funny business that can seriously inspire.

Comedic success is built on years of working small rooms, sometimes with only a few onlookers. Even after doing the work, results can be a mixed bag. Some days one goes away with the image of three puzzled audience members; other days one watches as the room slowly empties, dreams of success going up in smoke before punchlines have a chance to land. If this sounds unlike anything you have experienced, remember your early contributing talks at a large conference, say JSM? Or, more recently, that online talk where the only feedback was the echo of your voice asking over and over whether there were questions or suggestions?

Failure for a comedian is unambiguous—heckling and critical reviews are as "in your face" as it gets—but it can also be illuminating. A devoted disciple of the craft will gracefully take the punches and use the time-honored alchemy of combining transpiration and inspiration to turn them into successful punchlines. Honing a joke or a story takes many iterations, just like our papers require multiple rewrites and iterations before publication. Self-citing often brings to mind Amy Poehler's dictum: "I am big enough to admit I am often inspired by myself."

There is a delicate balance that is kept in comedy circles between cumulated prestige and current output. It is often said that the great stand-up comedians continue to be judged by the quality of their latest show, which is perhaps more aspirational than realistic. The prior probability that the same is true for statisticians or not is almost surely influenced by the size of your professional clique.

A research presentation is story-telling constrained—by time, logic and ability to interest. It is a monumental optimization task and sometimes I wish we could find and study another group where their members spend time alone on stage speaking about their obsessions… The gigantic challenge of giving the conference's post-dinner talk while keeping people in their chairs is on par with late-night live comedy where the audience needs to be lured into paying attention *and* buying drinks. The successful cocktail of a strong stand-up act goes beyond a good joke, just like a successful talk often relies on more than a good idea. Timing and an absence of inapposite details, powdered with subtle humor, can raise the levels of entrancement.

Comedy that tackles daily events feels perhaps more relevant to the contemporary zeitgeist but tends to have a short shelf-life. In opposition to that, the comedy gold inspired by some of the more perennial issues that plague us has a way to avoid oxidation, as recently pointed out by a recent *New York Times* article ("What's the deal with adulthood? 25 years later 'Seinfeld' feels revelatory") featuring one of the best comedy shows. The comedic trade-offs implied when choosing between ephemeral and perpetual topics are not unlike the ones we face in the midst of this data science revolution/involution.

Perhaps more fundamental inspiration comes from the comedians' reputation of calling it how it is. In coffee-fueled interviews, Seinfeld & Co. talk endlessly about the constant pursuit of truth, and the incessant exposure of frauds and hypocrites. In the past, I called statisticians the "science ninjas" and the "universal scientists" because the scientific method has placed our discipline squarely at the center of innovation. We are the ones who are supposed to be "keeping it real" by not fawning over fashionable theories and convenient intellectual shortcuts. Whether we are doing it or not depends on our proclivities, but the tools and the mission have been clearly described to all of us.

Differences remain, thank goodness. If statisticians raise the pulse of people witnessing their acts, I cannot tell for sure, but I am fairly certain that, so far, no one has slapped someone else over a misplaced lemma. Unlike the mathematical lore that postulates greatness (only) for the young, the world of comedians seldom sees success early on, perhaps because one cannot scrutinize, much less make fun of things one doesn't properly understand. As Robin Williams put it, "What's right is what's left after you do everything wrong."

On the face of it, both professions benefit from variation, and both have developed methods to tame it. One could think of a joke as a (very) low-dimensional representation of reality (this is an existence result, and a general constructive proof is not available) where the less canonical the projecting space is, the funnier the joke. In fact, it can be argued that a comedian's job is to *mix* signal and noise, while we try hard to do the opposite.

Those who dream of being in the club of funny statisticians will do well to remember Groucho Marx: "I refuse to join any club that would have me as a member."

IMS Lecture Preview

Aurore Delaigle: Medallion Lecture

Aurore Delaigle is a Professor and ARC Future Fellow at The University of Melbourne. Before moving to Melbourne in 2007, she held positions at the University of California at Davis and at San Diego, and at the University of Bristol.

Aurore's main research interests include nonparametric estimation, measurement errors, deconvolution problems and functional data analysis. She is particularly interested in developing new methods for indirectly and imperfectly observed data, especially if they have some seemingly unappealing form (e.g. incomplete, irregular, nonstationary, too big to handle with usual methods).

In 2013, Aurore was elected a Fellow of the IMS and was awarded the Moran Medal from the Australian Academy of Science. She is an associate editor for some of the most prestigious international statistics journals. She was the Executive Secretary of the IMS from 2011–17, and was the Associate Program Chair of the 2017 Joint Statistical Meetings.

This Medallion Lecture will be given at the **Joint Statistical Meetings in Toronto**, August 5–10, 2023.

Estimation of the density of a long-term trend from repeated semi-continuous data, with applications to episodically consumed food

In this talk we consider semiparametric and nonparametric estimation of the density of the long-term trend of a semi-continuous variable observed repeatedly over time. Variables of this type arise when measuring the intensity of an intermittent phenomenon, such as the intake of an episodically consumed nutrient measured through repeated 24 hour recalls or the concentration of an intermittent toxic substance: on a day where the phenomenon is absent, the measurement is equal to zero; otherwise, it takes a positive value. Unlike daily consumed nutrients which are typically represented by a classical measurement error model, data with clumping at zero are usually represented by a two-part model describing the zeros and the non-zeros separately, and connected through latent variables. Several variants of the model and methods have been proposed under parametric assumptions. We study more flexible non and semiparametric approaches to this problem, which can be viewed as one with a combination of measurement errors and excess zeros.

JSM, the Joint Statistical Meetings, this year will be in Toronto, August 5–10. Check out the program at https://ww2.amstat.org/meetings/jsm/2023/. IMS highlights include two Wald lectures by Bin Yu; the Blackwell lecture (Ya'acov Ritov); the Wahba lecture (Wing-Hung Wong); four Medallion lectures, from Ingrid Van Keilegom, Runze Li, Yingying Fan, and Aurore Delaigle; and the IMS Presidential Address and Awards session on the Monday evening. This is alongside a packed program of talks, posters, roundtables, professional development courses and workshops, award ceremonies, and countless other meetings and activities. JSM will be held at the Metro Toronto Convention Centre (255 Front Street West, Toronto), with additional meetings and events at the Delta and InterContinental hotels. See you there!

Lines from Layla: Shark! Shark!

Layla Parast has learned a hard lesson:

Summer is my favorite time of year. To me, summer means watermelon, pools, and the smell of sunscreen and mosquito repellent. My favorite, well-known example explaining how correlation is not causation involves summer: the numbers show that ice cream sales and shark attacks are correlated, so do more ice cream sales increase shark attacks? Should we cease selling ice cream? Of course not. Summer is the answer. In the summer, it's hot, more people buy ice cream, and more people go to the beach and go in the water.

I am very fearful of a shark attack. I used to do triathlons, but then in graduate school in Boston, I got hit by a car while riding my bike, and fractured my back. I moved on to races that were swim–run only, leaving out the bike portion. However, over time, I became too scared of the swim portion because in Southern California, they tended to be in the ocean. Often, when I mentioned that I am scared of a shark attack, people would laugh and say the phrase that gets me every time: *"Don't you know you're more likely to be struck by lightning than be attacked by a shark?"*[1] Especially as a statistician, they would say, how can you be afraid of a shark attack?

We don't have an accurate estimate of the probability of being attacked by a shark. The best resource I have found is the International Shark Attack Files created by the Florida Museum of Natural History at the University of Florida.[2] They categorize shark attacks into unprovoked vs. provoked attacked, and tabulate attacks by country. The US leads the world in the number of unprovoked shark attacks, which is perhaps unsurprising given that it is the third largest country by population[3] — but it is *ninth* in terms of miles of coastline.[4]

The difficulty with estimating the *probability* of shark attack is the denominator. We don't have the right denominator. Some sources provide a probability estimate that simply takes the number of shark attacks as the numerator with the country's population in the denominator. Clearly, that is not what we want. The best estimate I have found has the number of beach users in the denominator.[5] But still, this is not what we want. The denominator needs to be the number of hours at risk of a shark attack. We want a rate that tells us the probability of a shark attack per hour of exposure, not just the relative risk. Laying out at the beach is not exposure. Playing volleyball on the beach is not exposure. Going in the water, even waist-deep, *is* exposure. Swimming, surfing, snorkeling are all exposures. And that denominator seems nearly impossible to get. We don't have the estimate that we want.

To be sure, more people are struck by lightning than attacked by sharks. One is more likely to die in a car accident than be attacked by a shark. Many other things I do in life carry higher risk. But my probability of being attacked by a shark if I don't swim in the ocean is essentially zero. I worked on this fear for a while with my CrossFit mental training coach (yes, I have one). I signed up for a triathlon in Hermosa Beach CA, my first in 10 years and each week I would practice going in the ocean and swimming a little bit further out each time, sometimes even doing an open-water swim. And I absolutely hated it. Leading up to the race, I had nightmares, I couldn't sleep. My heart-rate would skyrocket just driving to the beach and my smart watch would ask what workout I was in the middle of. A friend bought me an ankle device that emits something to keep sharks away, but I was scared to use it, afraid that it would somehow actually attract sharks to me.

I told my coach, this isn't working, I don't know what to do, how do I conquer this fear? And finally, she told me: *don't*. Don't do the race. Stop doing your ocean swims. Your body is telling you that it just can't handle this right now. Your plate is full, so stop. Quit. Somehow quitting something, and telling people I was quitting, seemed scarier than getting in the ocean. I did quit and I do feel like I failed. But maybe that was the lesson for me. Sometimes quitting is the tougher thing to do.

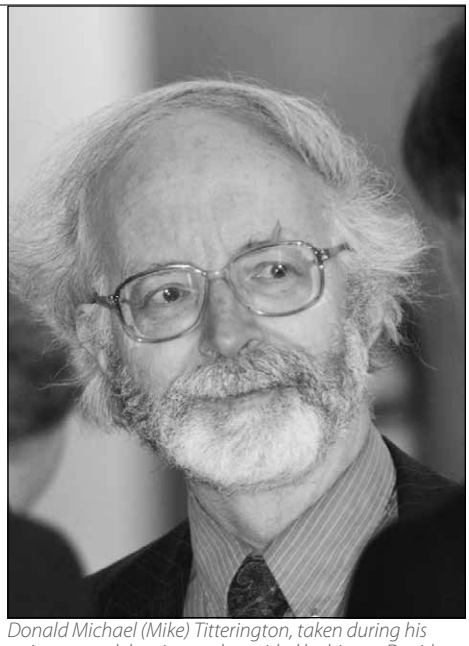
Happily, now in Texas, most of the triathlons here are in non-ocean bodies of water. But I am still waiting for that accurate estimate of shark attack risk.

Muhammet Gedik / Pixabay

1 https://www.floridamuseum.ufl.edu/shark-attacks/odds/compare-risk/lightning-strikes/
2 https://www.floridamuseum.ufl.edu/shark-attacks/
3 https://www.census.gov/popclock/world
4 https://www.cia.gov/the-world-factbook/field/coastline/
5 https://www.floridamuseum.ufl.edu/shark-attacks/odds/more-people/

Obituary: D.M. Titterington

1945–2023



Donald Michael (Mike) Titterington, taken during his retirement celebration and provided by his son David

Donald M. (Mike) Titterington sadly passed away last April after suffering for many years from Parkinson's disease; he had spent his entire academic career at the University of Glasgow until his retirement in 2011. Mike was born in Marple, England, but moved at an early age to Stirling, Scotland and graduated in 1967 from the University of Edinburgh, before heading south of the Border to start a PhD advised by Peter Whittle. He was a genuine Scotsman, if not in the SNP sense, and he would spend summer breaks with his family looking after Robert Burns' house in Dumfries and sailing around the coast of Scotland.

Mike was a hugely significant figure in the fields of statistics, classification, and machine learning, and a ground-breaker in many ways, innovating in an incredible range of topics, from mixtures and hidden Markov models, to data generative processes, variational Bayes, image analysis, mean-field approximations, and belief propagation. Among his books, *Statistical Analysis of Finite Mixture Distributions*, written jointly with Adrian Smith and Udi Makov in the early 80s, was to become a standard reference for decades (and was CPR's first exposure to mixtures a few years later). He also edited *Statistics and Neural Networks: Advances at the Interface* with Jim Kay in 2000, which provided strong insights on the incoming neural network modelling revolution, and the beautiful *Biometrika: One Hundred Years*, which brought together landmark papers published in that journal since its creation by Francis Galton, Karl Pearson, and Raphael Weldon in 1901.

Mike indeed made many outstanding research contributions over the years, calling on both his deep scholarship and on a keen eye for new opportunities. Sequential design, mixture analysis, image and signal analysis, missing data, neural networks and high-dimensional data were among the key cross-cutting topics in which his work was highly regarded and impactful, all areas with both mathematical depth and broad scientific and societal impact. Among the PhD students he advised let us mention Adrian Bowman (Glasgow), Ernest Fokoue (Rochester Institute of Technology), Nial Friel (UCD), Clare McGrory (QUT), and Jing-Hao Xue (UCL).

However, we also want Mike's unique personality to be remembered here: he was one of the kindest people in the discipline, tolerant to a fault and generous with his time and advice; CPR and many others, notably Peter Hall, greatly enjoyed their repeated visits to Glasgow to work with him (sometimes escaping to the hills).

An example of this dedication to the community was the time and effort he invested as the (sole) editor of *Biometrika* for 11 years. To this day we remain amazed at the workload he mastered, remembering his arrival at his office on Byres Road with printouts of accepted papers covered in red with suggestions for style and contents, taking advantage of his bus commute from and to his (country) home to act as a managing editor as well. In these days when statistics journals had not yet adopted web interfaces, he would write (in his rather terrible handwriting) to every author, rather than delegating to managing editors. The *Biometrika* style guide (a substantial eight-page document) sets out his vision of what a *Biometrika* paper should look like. Before the Biometrika era, he was editor of *JRSS Series B* (1986–89) and AE for many top journals. He also was the co-chair of the AISTATS 2010 conference, which is a hugely demanding if short-term responsibility, as the time constraints for handling numerous contributions are extreme. Positions like these, and others such as his service in the governance of the Royal Statistical Society, and in chairing UK Research Council panels, are a testament to the trust and respect that he enjoyed in the research community.

Mike spent several long-term visits in India (ISI, Kolkata), Australia (Melbourne), and France (Grenoble). The trips to Australia were associated with his long friendship with Peter Hall (1951–2016), for whom he wrote a strong and touching obituary in 2016 for *Significance*. His conclusion that Peter Hall "was held in deep affection and admiration by the many friends, colleagues and passing acquaintances (...) Many have expressed gratitude for assistance provided freely in collaborations. He was kind, generous and humble, and is already sorely missed" applies equally well to himself.

Written by Peter J. Green (Bristol) and Christian P. Robert (Paris)

Obituary: Tze Leung Lai

1945–2023


Tze Leung Lai

Tze Leung Lai, the Ray Lyman Wilbur Professor of Statistics at Stanford University, passed away on May 21, 2023, at the age of 77. He made far-reaching contributions to sequential statistical analysis and a wide range of applications in the biomedical sciences, engineering and finance. Tze received many honors for his research, including being the first Chinese recipient of the COPSS Award and an elected member of Academia Sinica. Tze also had a positive influence on many students, colleagues and friends through his infectious love of research, institution building and kindness.

Tze was born on June 28, 1945, in Hong Kong, where he grew up and attended The University of Hong Kong, receiving his B.A. degree (First Class Honors) in Mathematics in 1967. He went to Columbia University in 1968 for graduate study in statistics and received his PhD in 1971 with David Siegmund advising his dissertation. He stayed on the faculty at Columbia and was appointed Higgins Professor of Mathematical Statistics in 1986. A year later he moved to Stanford where he remained for the rest of his career. He was the chair of the Stanford Statistics department from 2001–04.

Tze made many fundamental contributions to sequential statistical analysis such as the development of a comprehensive theory of sequential tests of composite hypotheses that unified previous approaches and far-reaching extensions of sequential statistical methods to cope with practical complexities that arise in changepoint detection in engineering and group sequential clinical trials in medicine. He also did groundbreaking work in areas such as (i) the multi-armed bandit problem; (ii) stochastic approximation and recursive estimation; (iii) adaptive control of linear stochastic systems and Markov decision processes; (iv) saddlepoint approximations and boundary-crossing probabilities in Markov random walks and random fields; (v) survival analysis; (vi) inference for hidden Markov models; and (vii) fundamental contributions to probability theory such as establishing the law of the iterated logarithm for Gaussian processes, characterizing the limit set to be the unit ball of the corresponding reproducing kernel Hilbert space.

In his early years on the faculty at Columbia, Tze focused entirely on methodology and theory, but when teaching a new course on time series, he was asked to be a statistical consultant for a medical project involving time series about sudden infant death syndrome. This marked the beginning of an enduring interest in multidisciplinary research and prolific contributions in a wide range of areas including medicine, engineering and finance. This was reflected in the many roles he was playing in multidisciplinary institutions at the time of his passing, including founder and leadership roles: founder and director of Financial and Risk Modelling Institute; co-founder and co-director of the Center for Innovative Study Design; co-director of the Biostatistics Core of the Stanford Cancer Institute; core member of the Center for Innovation in Global Health, Center for Precision Mental Health and Wellness, and Center for Population Health Sciences in the School of Medicine; and faculty affiliate of the Doerr School of Sustainability & Climate Change.

In addition to the institution building Tze did at Stanford, he did much institution building in China. He was the C.V. Starr Visiting Professor at Hong Kong University (HKU) from 2003–08 where he developed programs in mathematical statistics and mathematical finance (Tze donated all his earnings from the visiting professorship to HKU's Department of Mathematics); the honorary dean of the Center for Financial Technology & Risk Analytics at Fudan University; a visiting chair professor of Southwestern University of Finance and Economics; and an advisory committee member of the Yau Center for Mathematical Sciences at Tsinghua University, the Center for Statistical Science at Peking University, the Department of Statistics and Actuarial Science at the University of Hong Kong and the Institute of Statistical Science, Academia Sinica.

Tze launched the careers of a tremendous number of students, advising 79 PhD dissertations. Tze was beloved by his students for his care and devotion to us. He could be frustrating to work with, though. This combination is captured in his relating of his experience with his student Milan Shen in her, Ka Wai Tsang and Samuel Po-Shing Wang's "Conversations with Tze Leung Lai" (*ICSA Bulletin*, January 2016). Tze had suggested to Milan an ambitious dissertation topic which it appeared would take two more years to complete, but when Milan received a job offer from Airbnb that would require her to start in eight months and she was worried that she would not be able to complete her dissertation in time, Tze told her to go ahead and accept the offer as he knew it was a good opportunity for her. Tze recalled to Milan

Tze Leung Lai, 1945–2023

Continued from previous page

what happened thereafter, "[When under stress, it is important] to have a firm grasp of one's constraints and to optimize subject to the constraints. Of course the constraints are often time-varying, and that is why you found me repeatedly ignoring the date (the end of August) you had to show up at Airbnb until late July when I began to take it seriously. In other words, I do not want to restrict creativity by these constraints until they become real. This is also consistent with my philosophy of adaptation in study design, statistical analysis and dynamic optimization." When one of us (Dylan) was just midway through working on his dissertation, Tze emailed from a trip to Hong Kong to tell me to please finish up my dissertation work in the next three weeks before he returned as he wanted us to focus on some new directions he had developed during his trip. After a frantic three weeks in which I of course didn't come close to finishing my dissertation, Tze returned and I worriedly showed him what I had done. He had forgotten about telling me to finish up my dissertation and what the new direction he was thinking we would pursue, but laughed and said that if he hadn't told me that, I wouldn't have gotten so far while he was gone. However frustrating his changes in direction could sometimes be, it was hard to stay mad at him as he could laugh at himself and it was always clear he had our interests at heart. Even after we graduated, Tze could always be counted on for help if we needed it and continued caring for our postdoctoral career development. One of us (Zhiliang) recalled his memorable experiences of visiting Tze in the summer after his PhD: "He invited me to visit Stanford for a month to finish a few papers, suggesting that I stay in his house. It was such a generous offer, and a wonderful experience for me. I still think it's the most productive month I have ever had although I felt a little guilty as I literally took over the living room for the entire month. His family, especially his mother, were so kind and treated me so well."

Beyond his students, Tze provided guidance and support to many others. He was full of smiles and encouraging stories, and helped junior researchers to make collaborative connections. Since his passing, comments have poured in remembering Tze's positive impact. Some examples are "It is hard to think of what my early years as a scholar would have been without his support and encouragement," and, "I am extremely saddened by the news. Professor Lai was instrumental and supportive in my entire career." Tze had a big heart when he thought someone needed help. When one of us (Dylan) described to Tze how a former student of my own was having a problem that his strong work was not being appreciated by his department chair for political reasons, Tze dropped everything to talk to my former student and came up with a bewildering range of practical (as well as impractical) suggestions to help.

Tze was legendary for his hard work and work habits. After often spending the day in back-to-back meetings when he wasn't teaching, he would have a light dinner and then go the Stanford math library (if you couldn't find Tze, you knew to look for him in the math library and he would always make time for you). After the library closed at 9pm, it was back to his office to work. When one of us (Dylan) was a graduate student, I noticed one summer that Tze seemed to be staying in the department even later than usual, until around 1 or 2am. I met him walking out of Sequoia Hall late one night and mentioned that he seemed to be working unusually hard lately and maybe he should try to take it a little easy. He responded happily that usually his wife Letitia would pick him up because their son was using their other car and she did not want to pick him up past 10pm so she could sleep, but with his son away that summer, he could drive himself and stay as late as he wanted.

Tze is survived by his wife of 48 years Letitia, his two sons David and Peter, his two daughters-in-law Crystal and Iris, his two grandchildren Valerie and Kit and his sister Anna. Tze told one of us (Dylan) that his proudest achievement was raising his two sons David and Peter. David said, "My dad wasn't the type to coach our Little League teams due to his busy academic schedule but he was very dedicated to us in his own way." When they were in elementary school, Tze would take David and Peter after dinner to Stanford's Green Library where he would do his work and make sure they did their homework, bribing them by taking them to the store to get candy bars they couldn't have at home. David remarked that at the time he thought it was normal for eight-year-olds to go to Green Library, but now as a historian who works a lot at Green Library, he realizes there aren't any other eight year olds there.

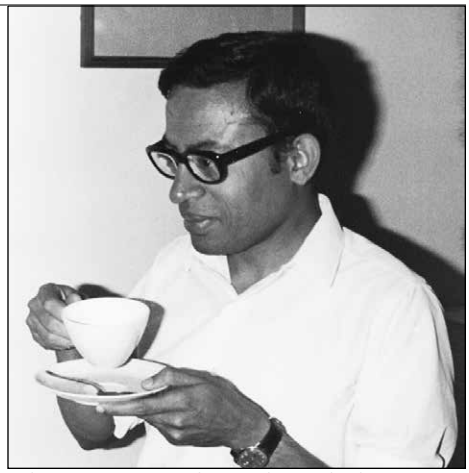
When Tze passed away unexpectedly, the heartbreaking news quickly spread around the world. Tze's energy, brilliance and kindness will be sorely missed, but will live on through the many in the statistical community on whom he had a positive influence, and the institutions he has built.

Written by Ying Lu, Stanford University; Dylan Small, University of Pennsylvania; and Zhiliang Ying, Columbia University.

For another online obituary, see https://hkumath.hku.hk/web/memory/memory_tllai_main.php

Obituary: K.R. Parthasarathy

1936–2023



Kalyanapuram Rangachari Parthasarathy (known as "KRP") at Oberwolfach

Kalyanapuram Rangachari Parthasarathy, known to generations of mathematicians and probabilists simply as KRP, passed away on June 14 in New Delhi; he was 86. Professor Parthasarathy made numerous extremely deep contributions over a stunningly wide spectrum of mathematics: probability, quantum probability, graph theory, linear algebra, statistics and other mathematical domains. With his passing, India has lost an icon of 20th century mathematics.

Professor Parthasarathy was born in Madras, now Chennai, in 1936. After his BA (Honours) degree in Mathematics from Vivekananda College, he moved to the ISI (Indian Statistical Institute) in Calcutta in 1956, where he had C.R. Rao, D. Basu, Raghu Raj Bahadur and Radha Govind Laha, among others, as his teachers, and Ranga Rao, V.S. Varadarajan and Raghu Varadhan as his compatriots. Mostly by their personal interactions and incredible enterprise, the so-called "famous four " learned a tremendous amount on ergodic theory, limit theorems on general (infinite-dimensional) Hilbert spaces and topological groups by using non-Fourier methods, Lie algebras, and information theory framed in the language of quantum mechanics. These were all extremely difficult topics, especially at that time, to master on one's own. This deep and broad education during his ISI years was a catalyst for his ultimate profound and scholarly career in mathematics and quantum probability.

C.R. Rao and Mahalanobis persuaded Kolmogorov to give the convocation speech at the ISI while KRP was a student there. Kolmogorov agreed, but he refused to fly. Amazingly, it was possible to work out a trip from Moscow to Calcutta, and back, by boats and trains. Having met Kolmogorov at the ISI, Parthasarathy went to the Steklov Institute, where he attended seminar series by Kolmogorov, Dynkin, Gelfand and others. These had a huge influence on KRP's subsequent work. Parthasarathy got his PhD from ISI Calcutta in 1962, supervised by C.R. Rao.

While at the ISI, he married his wife Shyama. The famous botanist T.A. Davis was working with J.B.S. Haldane, who was faculty at the ISI then, and very graciously, Davis found a modest campus accommodation for Professor Parthasarathy and his wife. Soon though, they left for Sheffield at Dr. Varadarajan's suggestion. It was here that Eugene Lukacs happened to see KRP's handwritten notes on probability measures and weak convergence in (mostly, separable) metric spaces; Academic Press published Parthasarathy's classic *Probability Measures on Metric Spaces* in 1967. Nearly sixty years after its publication, it is still regarded as one of the main foundations for construction of the elegant one-dimensional empirical process theory, which has become a grand unifier of almost all of asymptotic theory. It has received 4,400 citations so far. Parthasarathy authored many other books and monographs on quantum probability and SDEs on abstract spaces, and these too are regarded as first-rate contributions. Special mentions may be made of the 1984 paper with Robin Hudson on quantum Itô formulas, which has received 1,600 citations; the 1963 article with Ranga Rao and Raghu Varadhan on probabilities on locally compact Abelian groups; the 1967 article with Ranga Rao and Varadarajan on representations of Lie groups; the 2000 paper with Rajendra Bhatia on positive definite functions; and the 1992 book on quantum stochastic calculus, which has received 1,700 citations. On the derivation of the Lévy–Khintchine formula for the characteristic function of an infinitely divisible distribution on the real line, Parthasarathy said that he read a comment made by Joe Doob that the proof rests entirely on positive definite functions, and there is no probability there. Parthasarathy said that this gave him the idea of considering positive definite kernels and that is how the monograph with K. Schmidt started. There are also numerous papers with Kalyan Sinha on operator theory and quantum diffusions, martingales and Markov processes; and many charming special papers, on graph theory, infinite divisibility, extreme points of convex sets, tomography, transmission rate of information, C^* algebras, and several other interesting topics.

Following his years at Sheffield, he moved to Manchester and served as faculty of statistics for several years there. Parthasarathy and his family returned to India at the initiative of S.S. Shrikhande around 1967. He joined the CASM at Bombay (now Mumbai). C.R. Rao had already moved to Delhi from Calcutta (Kolkata), and some time around 1973, C.R. Rao suggested to Parthasarathy that he move to Delhi, as Rao very much wished that Parthasarathy join the Delhi center of the ISI, which was due to be opened soon.

K.R. Parthasarathy (KRP), 1936–2023

Continued from previous page

Parthasarathy accepted C.R. Rao's suggestion and joined the IIT Delhi. One year later, in 1974, Indira Gandhi inaugurated the Delhi center of the ISI, where Parthasarathy was Distinguished Professor until his retirement in 1996. Among his many distinguished students are K. Balasubramanian, B.V.R. Bhat, Rajendra Bhatia and Inder Rana. He was Distinguished Professor Emeritus at ISI Delhi at the time of his passing.

For his contributions to the advancement of mathematical sciences, Professor Parthasarathy was given the Shanti Swarup Bhatnagar Prize in 1977.

Parthasarathy suggested that fresh PhDs should all start a seminar series, even if it is for just two or three people. They should talk to each other, generate ideas and spread these ideas by always writing notes on the seminar topics. That was his model for spreading world-class mathematics in India on a large scale. Parthasarathy had very original ideas about the role of mathematics in life. He said that sciences such as physics, chemistry and biology deal with external reality, like three dimensions. But there is also an internal reality, which is what mathematics treats, like n dimensions. And this internal reality then feeds into the external reality.

Parthasarathy was dedicated to the passionate pursuit of mathematics and probability all his life; he did not have other ambitions. But he did have other interests. He loved classic English literature and Indian classical music. He had a great sense of humor. He was a true and unfeigned academician, an esteemed representative of the best and golden days of the ISI, the days that still live in India's romantic nostalgia.

He is survived by his wife Shyama and their two sons.

Written by Anirban DasGupta, Purdue University

Sources: Wikipedia, Conversation with B.V.R. Bhat, YouTube, Google Scholar, LinkedIn, Veethi.com

Recent papers: two IMS-supported journals

Bayesian Analysis

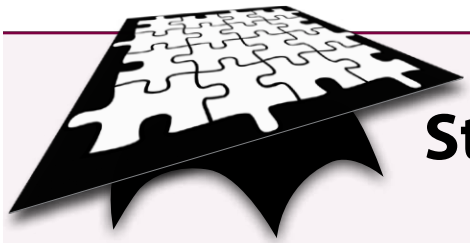
Bayesian Analysis is an electronic journal of the International Society for Bayesian Analysis. It seeks to publish a wide range of articles that demonstrate or discuss Bayesian methods in some theoretical or applied context. The journal welcomes submissions involving presentation of new computational and statistical methods; critical reviews and discussions of existing approaches; historical perspectives; description of important scientific or policy application areas; case studies; and methods for experimental design, data collection, data sharing, or data mining. The Editor-in-Chief is Mark Steel (University of Warwick, UK).
Access papers at **https://projecteuclid.org/journals/bayesian-analysis**

Volume 18, No 2, June 2023

Brazilian Journal of Probability and Statistics

The *Brazilian Journal of Probability and Statistics* is an official publication of the Brazilian Statistical Association and is supported by the IMS. The Journal publishes papers in applied probability, applied statistics, computational statistics, mathematical statistics, probability theory and stochastic processes. The Editor is Francisco José A. Cysneiros. Access papers at **https://projecteuclid.org/journals/brazilian-journal-of-probability-and-statistics**

Volume 37, No 1, March 2023



Student Puzzle Corner 46

Student Puzzle Editor Anirban DasGupta poses another two problems, and says, "Our statistics problem this time is on universally consistent estimation of the regression coefficients for not necessarily Gaussian errors, and the probability problem is on probabilistic graph theory. The statistics problem is a practically important problem that will make you think, and the probability problem is a fun, unusual problem, but a simple one." Send us your solution, to either or both.

Deadline: September 15, 2023

Puzzle 46.1. Consider the usual linear model $Y_i = \beta_0 + \beta_1 x_{i,1} + \ldots + \beta_p x_{i,p} + \epsilon_i$, $i = 1, 2, \ldots, n$, $1 \le p < \infty$. We assume that $\epsilon_i \overset{\text{iid}}{\sim} f(z)$, where $f(z) = c(\alpha)\, e^{-|z|^\alpha}$, $-\infty < z < \infty$, $0 < \alpha < \infty$, and $c(\alpha)$ is the normalizing constant. Provide infinitely many explicit consistent estimators of the vector of regression coefficients, estimators that are consistent under all error densities f stated above.

Puzzle 46.2. Suppose X, Y, Z are i.i.d. Poisson with mean $\lambda > 0$. Let $f(\lambda) = P_\lambda(X, Y, Z$ are the degrees of a nonempty graph on 3 vertices). Find $\sup_{\lambda>0} f(\lambda)$.

Student members of IMS are invited to submit solutions to bulletin@imstat.org (with subject "Student Puzzle Corner"). The names of student members who submit correct solutions to either or both of these puzzles, and the answer, will be published in the issue following the deadline.

The Puzzle Editor is Anirban DasGupta. His decision is final.

Solution to Puzzle 45

Thanks to Bilol Banerjee (ISI Kolkata) and Soham Bonnerjee (University of Chicago), who sent in answers, and a special well done to Bishakh Bhattacharya (ISI Kolkata) whose solution to 45.1 was "admirably detailed." Anirban DasGupta explains:

Puzzle 45.1 (see right) The key is to show separately that (almost surely) $\max\{X_1^2, X_2^2, \ldots, X_n^2\} \sim 2 \log n$ and $\sum_{i=1}^n X_i^2 \sim n$, where we say that for two positive sequences a_n, b_n, $a_n \sim b_n$ if $\frac{a_n}{b_n} \to 1$. That $\sum_{i=1}^n X_i^2 \sim n$ is just the strong law. To show that $\max\{X_1^2, X_2^2, \ldots, X_n^2\} \sim 2 \log n$, let $F(x) = 2\Phi(x) - 1$ denote the CDF of $|X_1|$ and $q_n = F(1 - \frac{1}{n}) = \Phi^{-1}(1 - \frac{1}{2n}) \sim \sqrt{2 \log n}$. By using the formula for $F(x)$, we show easily that for each $c > 1$, $\sum_{n=1}^\infty \left[1 - F(c\, q_n)\right] < \infty$.
This suffices to show that $\max\{|X_1|, |X_2|, \ldots, |X_n|\} \sim F^{-1}(1 - \frac{1}{n}) \sim \sqrt{2 \log n}$, and hence, $\max\{X_1^2, X_2^2, \ldots, X_n^2\} \sim 2 \log n$. Therefore, $\max\{X_1^2, X_2^2, \ldots, X_n^2\} / \sum_{i=1}^n X_i^2 \sim \frac{2 \log n}{n}$. On the other hand, by the prime number theorem, $\pi(n) \sim \frac{n}{\log n}$. This finishes the proof of Problem 45.1.

Puzzle 45.2 Denoting the t-percentile $t_{\alpha/2, n-1}$ by c, the t-confidence interval at level $1-\alpha$ is $C_n = \bar{X} \pm c \frac{s}{\sqrt{n}}$. Hence, $\mu \notin C_n \Leftrightarrow \mu > \bar{X} + c \frac{s}{\sqrt{n}} \cup \mu < \bar{X} - c \frac{s}{\sqrt{n}}$. Therefore, by symmetry considerations,

$$E\left[\text{dist}(\mu, C_n) \mid \mu \notin C_n\right] = 2 \times E\left[\mu - (\bar{X} + c \tfrac{s}{\sqrt{n}}) \mid \mu > \bar{X} + c \tfrac{s}{\sqrt{n}}\right] = 2 \times \frac{2}{\alpha} \int \frac{s}{\sqrt{n}} (t - c)\, I_{t>c} f_n(s, t)\, ds dt,$$

where t denotes the t-statistic $\frac{\sqrt{n}(\bar{X}-\mu)}{s}$, and $f_n(s, t)$ denotes the joint density of (s, t), and this can be calculated by the usual Jacobian method, starting with the joint density of $(\bar{X}, s)$. A (long) calculation then shows that

$$\int \frac{s}{\sqrt{n}} (t - c)\, I_{t>c} f_n(s, t)\, ds dt = \frac{\sigma}{\sqrt{n}} \left[\phi(z_{\alpha/2}) - \frac{\alpha}{2} z_{\alpha/2}\right] + O(n^{-3/2}).$$

In order to get this above expression in terms of $z_{\alpha/2}$, one will need to use the fact that for any given α, $c = z_{\alpha/2} + O(\frac{1}{n})$.

Puzzle 45.1: Suppose $X_1, X_2, \ldots$ is a sequence of i.i.d. standard normal variables. For any given $n \ge 1$, define $R_n = \frac{\max\{X_1^2, \ldots, X_n^2\}}{X_1^2 + \ldots + X_n^2}$. Let also $\pi(n)$ denote the usual *prime counting function*, i.e., $\pi(n)$ denotes the number of prime numbers $\le n$. Prove that $\frac{R_n}{2/\pi(n)} \overset{\text{a.s.}}{\to} 1$.

Puzzle 45.2: Assume that we have i.i.d. normal variables with mean μ and variance σ^2, and let for given $n \ge 2$, C_n denote the usual $100(1-\alpha)\%$ t-confidence interval for μ. Derive an asymptotic approximation for $E(\text{dist}(\mu, C_n) \mid \mu \notin C_n)$, where $\text{dist}(\mu, C_n)$ stands for the (Euclidean) distance between μ and the interval C_n.

Clara-fications

Columnist **Clara Grazian** introduces our new advice column for early-career researchers:

Question 1: ***I am interested in pursuing an internship in a company, but my advisor thinks that this will slow down my dissertation progress. How should I proceed?***

Clara responds: Ha, this is a great question! I believe there are advantages to experiencing the world outside academia: you get to see the opportunities available beyond it.

However, there is a disadvantage to pursuing this during your PhD, as it may slow down the development of your dissertation, which your supervisor is concerned about. You need to consider not only the time you may not be able to work or on your thesis during the internship but also the potential weakening of your focus on the thesis. There are economies of scale in consistently working on a project.

One possibility is to incorporate the internship into your thesis. Can you use something you develop during the internship for your research? This kind of collaboration between the university and industry can be a significant strength. It may even develop a collaboration between the department and the company.

If this isn't feasible, but you still wish to pursue the internship, it's important to have a well-organized conversation with your supervisor. For instance, can the internship be scheduled during a less active period at the university (maybe summer)? What is your timeframe before and after the internship? What tasks do you plan to complete before starting the internship and what are your plans immediately after its conclusion? Additionally, what skills do you anticipate acquiring during the internship that can be applied to your thesis? Supervisors are usually more supportive when they see that the student's focus remains on their thesis. It would also be helpful to clearly explain to your supervisor why you want to pursue this internship, particularly in terms of its potential impact on your future career.

Lastly, I'd like to mention that there are plenty of opportunities out there. If this specific opportunity doesn't work out, there will be others in the near future. Therefore, it's important not to view it as a once-in-a-lifetime opportunity. (Though this might not apply to your situation, it's something I've observed in the past!)

Question 2: ***In general, I am not fully committed to a life in academia because there are many opportunities to work in industry where I would be well rewarded and have interesting problems to think about. What are the pros and cons of academic life? I should add that my research interests are in computational finance.***

Clara responds: Finance is one of those fields where salaries outside academia are definitely much higher than those within academia, so money is not really on the side of the pros!

From my perspective, there are two main advantages in academia: flexibility and freedom.

Flexibility doesn't only refer to leaving at 3 pm in the afternoon; in fact, I often work more hours than many of my friends in industry! It means that you can usually slow down during specific periods or days if needed, and there is typically support available for extended leaves. The academic career can be stressful or not—it often depends on the researcher—and it doesn't have to be stressful all the time. Many industry jobs, especially well-paid ones, don't offer the same level of flexibility.

The other advantage is that you have the freedom to pursue your interests. There is no one dictating what research you should focus on, allowing you to follow your curiosity. Granted, this freedom isn't absolute: to be competitive in grants, it's often necessary to demonstrate external interest in your research field, and publishing on popular topics may be easier. However, it's not essential, and you can still pursue your own interests even if you are the only one in the world. This aspect can be seen as both an advantage and a disadvantage: on one hand, you have the independence to make your own decisions; on the other hand, in some cases, you may lack guidance, as there isn't someone telling you what to do; also, as it happens to me and many researchers I know, it sometimes mean that you don't understand why you are doing something. But it is true that in academia, you can have long-term plans and define your own path towards your goals. In industry, you typically follow your company's objectives, which may or may not align with your own.

Young researchers are welcome to send their **questions about the life of a researcher or ask for career advice**, and Clara will try to find an answer… We'll publish these [*anonymized to avoid awkwardness!*] in the next available issue. Send your questions to **bulletin@imstat.org**.

YoungStatS: Random Matrix Theory

Andrej Srakar, University of Ljubljana, is the coordinator and Co-Editor of the YoungStatS project. He writes about random matrices in probability and mathematical physics:

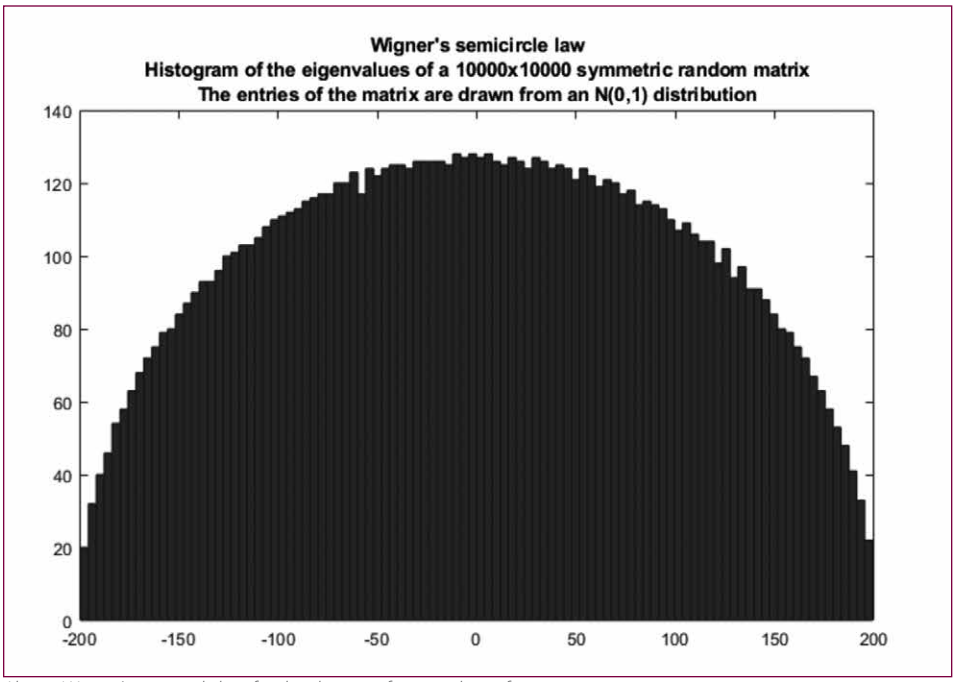
We start our YoungStatS short contributions for the *IMS Bulletin* with a topic from probability theory, namely **random matrix theory** (**RMT**). In today's mathematics, probability has become a foremost area regarding research possibilities. Randomness and stochastic elements can enrich any mathematical theory: algebra, number theory, topology or partial differential equations. Probability theory bridges several areas subject to intense research, such as random geometry deriving from Oded Schramm's solution of stochastic Loewner's equation (2000), showing that its solution is a limit of many, if not most, stochastic processes on a plane.

While random matrix theory could be traced back to works by Wishart and James, its real start is usually attributed to influential papers by Eugene Wigner in the 1950s. Wigner suggested that fluctuations in positions of compound nuclei resonances can be described in terms of statistical properties of eigenvalues of very large real symmetric matrices with independent and identically distributed entries. Wigner's ideas were further substantiated by Freeman J. Dyson who gave important symmetry classification of Hamiltonians, implying the existence of three major symmetry classes of random matrices: orthogonal, unitary and symplectic. He also introduced the circular versions of random matrix ensembles, developed a detailed theory of their spectra, and suggested a model of Brownian motion in random matrices ensembles.

In two important contributions, Percy Deift listed key open problems in random matrix theory, namely the solution of Korteweg–de Vries equation with almost periodic initial data, universality for random matrices, interacting particle systems in light of the Kardar–Parisi–Zhang universality class, numeric computations with random data, initial boundary value problems for integrable systems and numerical solutions of integrable systems. Important novel probability theory strands such as free probability and traffic probability have emerged, with the first deriving from works of Romanian mathematician Dan-Virgil Voiculescu, being intrinsically connected to many problems in random matrix theory. It introduces a novel concept of independence for random objects, applicable to noncommutative products of random matrices. In recent works, Camille Male introduced an operadic generalization of free probability based on graph operations and motivated by the study of permutation invariant random matrices, and labeled it traffic probability. Independent permutation invariant random matrices provide a canonical model of traffic independence in the large-N limit.

Recent works in random matrix theory address spectra of random graphs, random matrices and related combinatorial problems. There has been great progress in the study of matrices which arise naturally in random graphs, like the adjacency matrix, the Laplacian matrix, or the transition matrix of the random walk on the graph. This relates to the understanding of information contained in eigenvalues and eigenvectors of high-dimensional random matrices. Important are applications of tools stemming from random graphs theory that can be used to study the spectrum of random matrices. Antti Knowles studies eigenvalue problems for Erdős–Rényi and sparse Erdős–Rényi graphs. French mathematician Alice Guionnet studies the theory of large deviations for the spectrum of large random matrices. Also, Gérard Ben Arous studies phase transitions, universality and the spectrum of heavy-tailed random matrices.

Continues on **page 17**



Above: Wigner's semicircle law for distribution of eigenvalues of a symmetric matrix. Source: Marco Taboga, https://www.statlect.com/glossary/random-matrix

Random Matrix Theory continued

In an important 2003 article, Romanian American mathematicians Dumitru and Edelman presented a list of open problems for the study of beta ensembles, key objects in random matrix theory. To date, many have remained unaddressed and unresolved.

Study of random matrices features important applications in statistics, data science and econometrics. Frequently, spiked covariance matrices in statistics and econometrics are studied using tools from RMT which forms also the basis of principal component and factor analysis approaches. Development of several machine learning and data science approaches, algorithms and applications is based on random matrix theory. Random matrices can be generalized to random tensors and studied accordingly.

Probability theory is an extremely vibrant and lively field of mathematics. During pandemic time it was the One World Probability seminar, started by Leif Döring and Andreas Kyprianou, which paved the way to a movement of One World online seminars—with 26 such seminars in mathematics to date (including One World YoungStatS). Sometimes, disagreements between probability scholars and statisticians are noted (as noted in Bernard Silverman's contribution in the August 2022 *IMS Bulletin* [from his after-dinner speech at last year's IMS meeting in London]). In the arising artificial intelligence era, which should make the role of mathematics even more pronounced than at present, probability theory is likely to play a highly important, if not a leading role, in developments awaited. At the YoungStatS project we feature two editorial board members active in probability (Lucio Galeati and Andrej Srakar).

We have already published contributions by Balázs Ráth, Jan Swart, Sam Punshon-Smith and Jacopo Borga, among others, and organized several webinars in probability theory. We aim to reflect and steer developments in probability theory, and in random matrices, in the future.

YoungStatS

Access the YoungStatS website at https://youngstats.github.io/

Recent posts have been on graphical models (*Illustration of Graphical Gaussian Process models to analyze highly multivariate spatial data*, by Debangan Dey, Abhirup Datta, Sudipto Banerjee); random geometry / probability theory / combinatorics (*The scaling limit of Baxter permutations*, by Jacopo Borga); Bayesian nonparametrics / Bayesian statistics / copula models (*Bayesian nonparametric modeling of conditional multidimensional dependence structures*, by Rosario Barone and Luciana Dalla Valle); and stochastic differential equations / stochastic processes / fluid-dynamics (*Chaotic mixing and the statistical properties of scalar turbulence*, by Sam Punshon-Smith).

Send us your Invitation to Research

In the September 2022 issue, we introduced an "Invitation to Research" section, kicked off by **Alexander Y. Mitrophanov**, Senior Statistician at the Frederick National Laboratory for Cancer Research, National Institutes of Health, USA. Alex invited members to collaborate on Quantitative Perturbation Theory for Stochastic Processes at https://imstat.org/2022/08/31/an-invitation-to-research/.

Alex says he's had some "very meaningful" follow-up, which has triggered some further interactions.

We are now inviting *your* invitation! IMS members are encouraged to write in to propose new research ideas or directions. These do not need to be formally/provably absolutely new; it's an opportunity to emphasize the benefit of an idea for the research community. The purpose is twofold: to **gauge the research community's interest** before investing more time and effort into these ideas; and to **find collaborators** to tackle these new ideas, if other people become interested and come up with related ideas.

We encourage interested readers to respond to these ideas with critical comments and/or suggestions, and to write in and share your own ideas: bulletin@imstat.org.

IMS meetings around the world

Joint Statistical Meetings

2023 Joint Statistical Meetings
August 5–10, 2023 in Toronto
w https://ww2.amstat.org/meetings/jsm/2023/
The IMS Program Chair is Huixia Judy Wang, George Washington University.

JSM, the Joint Statistical Meetings, this year will be in Toronto, August 5–10, 2023. Check out the program online at the JSM website, https://ww2.amstat.org/meetings/jsm/2023/. IMS program highlights include two Wald lectures by Bin Yu; the Blackwell lecture from Ya'acov Ritov; the Wahba lecture by Wing-Hung Wong; four Medallion lectures, from Ingrid Van Keilegom, Runze Li, Yingying Fan, and Aurore Delaigle; and the IMS Presidential Address and Awards session on the Monday evening.

This is alongside a packed program of talks, posters, roundtables, professional development courses and workshops, award ceremonies, and countless other meetings and activities.

JSM will be held at the Metro Toronto Convention Centre (255 Front Street West, Toronto), with additional meetings and events at the Delta and InterContinental hotels.

The IMS will as usual have a booth in the Expo Hall. See you there!

IMS New Researchers Conference
(23rd Meeting of New Researchers in Statistics and Probability)
August 2–5, 2023. University of Toronto
w https://sites.google.com/site/linbowangpku/nrc-2023
Promoting interaction and networking among new researchers in statistics and probability, the meeting will take place immediately before JSM Toronto. The application deadline has passed.

JSM dates for 2024–2029 (no info yet for 2027)

JSM 2024	IMS Annual Meeting @ JSM 2025	JSM 2026	JSM 2028	JSM 2029
August 3–8, 2024	August 2–7, 2025	August 1–6, 2026	August 5–10, 2028	August 4–9, 2029
Portland, Oregon, USA	Nashville, TN, USA	Boston, MA, USA	Philadelphia, PA, USA	Seattle, WA, USA

At a glance:

forthcoming IMS Annual Meeting and JSM dates

2024

IMS Annual Meeting/ 11th World Congress: Bochum, Germany, **August 12–16, 2024**

JSM: Portland, OR, **August 3–8, 2024**

2025

IMS Annual Meeting @ JSM: Nashville, TN, USA, **August 2–7, 2025**

2026

IMS Annual Meeting: TBD

JSM: Boston, MA, **August 1–6, 2026**

2027

IMS Annual Meeting @ JSM: Location TBA, **August [dates TBA], 2027**

More IMS meetings

2024 Joint Statistical Meetings
August 3–8, 2024
Portland, Oregon, USA
w https://ww2.amstat.org/meetings/jsm/2024/

Your proposal for an invited session at next year's JSM is invited. The deadline for submissions is September 7. Other key dates are:

Short Course Proposal Submission: July 13 – September 30, 2023

Computer Technology Workshop Proposal Submission: July 13, 2023 – January 15, 2024

Topic-Contributed Session Proposal Submission: November 15 – December 7, 2023

Contributed Abstract Submission: December 1, 2023 – February 1, 2024

Registration & Housing reservations open May 1, 2024.

2023 IMS International Conference on Statistics and Data Science 2023 (ICSDS)
December 18–21, 2023
Lisbon, Portugal
w https://sites.google.com/view/icsds2023/

We are delighted to report that the IMS 2023 ICSDS (International Conference on Statistics and Data Science), December 18–21, 2023 in Lisbon, Portugal, has received a tremendous response, including many outstanding invited speakers from different countries and continents, covering a wide range of subjects in statistics and data science, in theory, methodology and applications. In particular, we are pleased to announce the **four confirmed plenary speakers**: David Donoho, Michael Jordan, Gábor Lugosi and Caroline Uhler. For more details, see https://sites.google.com/view/icsds2023/plenary-speakers

Registration and abstract submission (for all invited and contributed talks and posters) will open on May 25. Please register soon to take advantage of early registration discount rates.

Finally, the ICSDS will provide **10 Student Travel Awards, $800 USD each, to PhD students who participate in the invited or contributed program**. Applicants for the awards must be members of IMS, and joining at the time of application is allowed. Note that IMS membership is FREE for all students. The submission site for applications for travel awards will be open from July 1 to September 15, 2023.

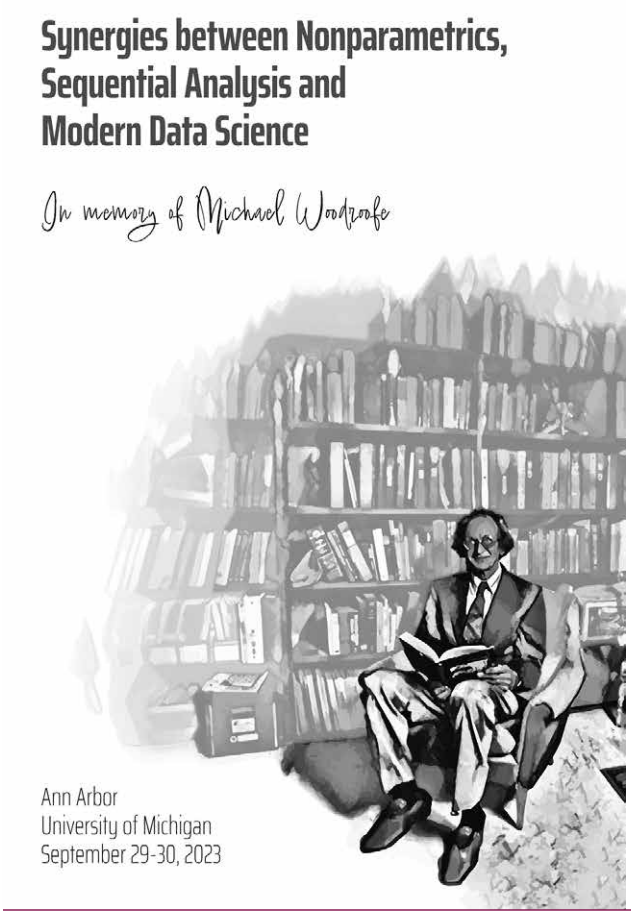
We look forward to seeing you at the ICSDS in Lisbon in December.

Regina Liu and Annie Qu, Program Co-chairs, 2023 IMS ICSDS

International Symposium on Nonparametric Statistics (ISNPS 2024) NEW
June 25–29, 2024
Braga, Portugal
w https://w3.math.uminho.pt/ISNPS2024/

We are pleased to announce that the next International Symposium on Nonparametric Statistics will be held in Braga, Portugal, from June 25–29, 2024. The venue is Altice Forum Braga, a conference site which is situated 15 minutes walk from the city center of Braga.

Inspired by the success of the previous Nonparametric conferences in Chalkidiki (Greece, 2012), Cadiz (Spain, 2014), Avignon (France, 2016), Salerno (Italy, 2018) and Paphos (Cyprus, 2022), the conference will bring forth recent advances and trends in several areas of nonparametric statistics, in order to facilitate the exchange of research ideas, promote collaboration among researchers from all over the world, and contribute to the further development of the field. The program will include plenary talks, special invited talks, invited talks, contributed talks and a poster session on all areas of nonparametric statistics.

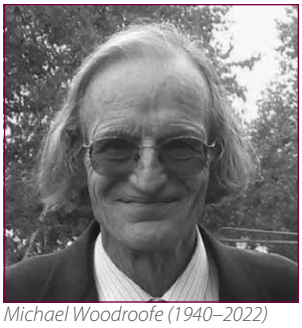


NEW

Synergies between Nonparametrics, Sequential Analysis, and Modern Data Science
September 29–30, 2023. University of Michigan, Ann Arbor, USA.
w https://sites.lsa.umich.edu/woodroofememorial/

The Department of Statistics at the University of Michigan (UM) will host a conference titled Synergies between Nonparametrics, Sequential Analysis, and Modern Data Science on the UM campus from September 29 to 30, 2023. The conference will feature distinguished speakers in non-parallel sessions, covering a range of topics including:

- Sequential Analysis in Clinical Trials
- Shape Constraints and Applications
- Limit Theorems for Dependent Data
- Modern Data Science and Reinforcement Learning
- Semi-, Nonparametrics and Selection Biases
- Astrostatistics in the 21st Century


Michael Woodroofe (1940–2022)

It aims to celebrate the remarkable contributions of Michael Woodroofe to Statistics and Probability and provide a platform for exchanging ideas. Registration for the conference is now open. Junior researchers and graduate students who present posters may receive priority in securing financial support from the anticipated NSF funding for this event. To register and see the most up-to-date information, please visit https://sites.lsa.umich.edu/woodroofememorial/

2024 Seminar on Stochastic Processes NEW
March 13, 2024
Houston TX, USA
w https://depts.washington.edu/ssproc/

Seminar on Stochastic Processes is a series of annual conferences devoted to stochastic analysis, Markov processes and other topics in probability theory of current interest. Every conference features five invited speakers and provides opportunity for short informal presentations of recent results and open problems.

IMS representative on Program Committee: Frederi Viens.

More details to follow. Please mark your calendars!

Fifth International Workshop on the Statistical Analyses of Multi-Outcome Data NEW
July 9–10, 2024
Salzburg, Austria
w https://sam-workshop.github.io/SAM_2024/

The fifth international workshop on Statistical Analyses of Multi-Outcome Data, also known as SAM 2024, will take place in Salzburg, Austria, on July 9–10, 2024. Salzburg, renowned as Mozart's birthplace and the picturesque setting for the film *The Sound of Music*, is a spectacularly scenic city and an ideal destination for a summer visit. We hope you will be able to join us!

Our workshop covers a broad range of topics, such as complex longitudinal and survival data analysis, high-dimensional data analysis, precision medicine, and artificial intelligence/machine learning methods, among others. The workshop will have two plenary sessions (speakers TBA), 24 invited sessions, and a poster session. A banquet will be held on the evening of July 9.


Scenic Salzburg hosts SAM 2024

More IMS meetings

Southeastern Probability Conference (the second one in 2023)
August 14–15, 2023
University of Virginia, Charlottesville
w https://sites.google.com/view/sepc2023ii/
The Southeastern Probability Conference is co-sponsored by the Institute for Mathematical Statistics and supported by NSF grant DMS 2011385.
The speakers at the University of Virginia meeting in August are

Partha Dey, University of Illinois, Urbana-Champaign
Promit Ghosal, Massachusetts Institute of Technology
Arjun Krishnan, University of Rochester
Jessica Lin, McGill University
Jonathan Mattingly, Duke University
Oanh Nguyen, Brown University
Jonathon Peterson, Purdue University
Igor Pritsker, Oklahoma State University
Firas Rassoul-Agha, University of Utah

Graduate students and early career faculty may apply for support. There will be 10–12 awards of up to $500 for expenses of attending the conference. For more details, please visit the website.

Asia-Pacific Seminar in Probability and Statistics
Ongoing and online
w https://sites.google.com/view/apsps/home
The Asia-Pacific Seminar in Probability and Statistics (APSPS) is a monthly online seminar, broadcast on a mid-month Wednesday via Zoom. The seminar series was created as a permanent forum for good research in the field. Topics include: probabilistic models for natural phenomena, stochastic processes and statistical inference, statistical problems in high-dimensional spaces, asymptotic methods, statistical theory of diversity. The organizers—Sanjay Chaudhuri, Mark Holmes, Estate Khmaladze (chair), Krishanu Maulik, Spiro Penev, Masanobu Taniguchi, Lijiang Yang, and Nakahiro Yoshida—seek an emphasis on novelty, beauty, and clarity. Presentations are intended to be accessible to good postgraduate students in probability and mathematical statistics.

If you are interested in receiving email announcements about the next speakers, send an email to any of the Board members listed above.

2024 ENAR/IMS Spring Meeting
March 10–13, 2024
Baltimore, MD, USA
w https://enar.org/meetings/future.cfm

IMS–APRM in Melbourne, Australia
NEW DATES: January 4–7, 2024 UPDATED
w https://ims-aprm2024.com/
IMS-APRM will provide an excellent forum for scientific communications and collaborations for researchers in Asia and the Pacific Rim, and promote communications and collaborations between the researchers in this area and those from other parts of the world. The program covers a wide range of topics in statistics and probability, presenting recent developments and the state of the art in a variety of modern research topics and in applications. The conference organizers are now accepting session proposals (deadline for submission is April 16, 2023).

WNAR2024
held in conjunction with the 2024 Graybill Conference
June 9–12, 2024
Fort Collins, Colorado, USA
w https://wnar.org/Meetings
The 2024 meeting of the Western North American Region of The International Biometric Society will be held joint with the 2024 Graybill Conference.

IMS annual meeting
Bernoulli–IMS 11th World Congress in Probability and Statistics
August 12–16, 2024
Ruhr-University Bochum, Germany
w https://www.bernoulli-ims-worldcongress2024.org/ UPDATED
The Institute of Mathematical Statistics Annual Meeting will be held at the 11th World Congress.

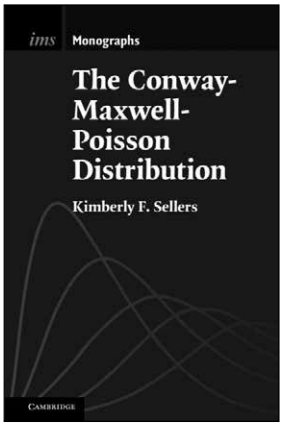
One World ABC Seminar: Ongoing and online
w https://warwick.ac.uk/fac/sci/statistics/news/upcoming-seminars/abcworldseminar
The One World Approximate Bayesian Computation (ABC) Seminars are **monthly** seminars that take place via Zoom on Thursdays, typically 9.30am or 1.30pm [UK time]. Register to receive the webinar link via email. The organizers welcome proposals for future talks. This webinar is part of the larger One World seminar initiative [*see below*].

One World Probability Seminar (OWPS): Ongoing and online
w https://www.owprobability.org/one-world-probability-seminar/
Thursdays, 14:00 UTC/GMT [resuming in September]. Please subscribe to the mailing list for updates about the upcoming seminars and other events: https://www.owprobability.org/mailing-list

NEW BOOK

The Institute of Mathematical Statistics presents

IMS MONOGRAPHS


ims Monographs
The Conway-Maxwell-Poisson Distribution
Kimberly F. Sellers
CAMBRIDGE

The Conway–Maxwell–Poisson Distribution

Kimberly F. Sellers, Georgetown University, Washington DC

While the Poisson distribution is a classical statistical model for count data, the distributional model hinges on the constraining property that its mean equal its variance. This text instead introduces the Conway-Maxwell-Poisson distribution and motivates its use in developing flexible statistical methods based on its distributional form.

This two-parameter model not only contains the Poisson distribution as a special case but, in its ability to account for data over- or under-dispersion, encompasses both the geometric and Bernoulli distributions. The resulting statistical methods serve in a multitude of ways, from an exploratory data analysis tool, to a flexible modeling impetus for varied statistical methods involving count data.

The first comprehensive reference on the subject, this text contains numerous illustrative examples demonstrating R code and output. It is essential reading for academics in statistics and data science, as well as quantitative researchers and data analysts in economics, biostatistics and other applied disciplines.

Kimberly F. Sellers is Professor in the Department of Mathematics and Statistics at Georgetown University, and Principal Researcher with the Center for Statistical Research and Methodology at the US Census Bureau.

Hardback $135.00 available in March

IMS members receive a 40% discount: email ims@imstat.org to request your code

www.imstat.org/cup

Cambridge University Press, with the Institute of Mathematical Statistics, established the *IMS Monographs* and *IMS Textbooks* series of high-quality books. The series editors are Nancy Reid (Coordinating Editor), Ramon van Handel (Probability), Arnaud Doucet (Algorithms) and John Aston (Statistics).

Other meetings and events around the world

Workshop on Stochastic Analysis, Random Fields, and Applications
August 14–16, 2023. East Lansing, MI, USA
https://stt.natsci.msu.edu/events/sarf2023/
This workshop will be held in honor of the late Professor Atma Mandrekar, who was a professor in the Department of Statistics and Probability at Michigan State University from 1968 to 2021. The main purpose of this workshop is to bring together leading experts in stochastic analysis, stochastic partial differential equations, random fields, and their applications in mathematical finance, statistics, and machine learning to share their cutting-edge research with graduate students and early-career researchers and to promote further research in these areas. Registration is open.

SIAM Conference on Uncertainty Quantification
February 27–March 1, 2024. Trieste, Italy
https://www.siam.org/conferences/cm/conference/uq24
Uncertainty quantification (UQ) is essential for establishing the reliability of predictions made by computational models. Such models are often deterministic, and the UQ discipline has traditionally focused on how to quantify uncertainty in that case. Statistical methods play a major role in that effort, and represent an alternative modeling strategy when less is known about the system of interest. The two approaches are naturally synergistic, and with the emergence of machine learning as a practical tool, it is becoming more important than ever to view the whole UQ ecosystem through a unifying lens. UQ is application-driven and inherently interdisciplinary, relying on a broad range of mathematical and statistical foundations, domain knowledge, and algorithmic and computational tools. UQ24 will bring together mathematicians, statisticians, scientists, engineers, and others interested in the theory, development, and application of UQ methods. Major conference themes will include mathematical and statistical foundations, data-driven approaches and computational advances, applications of UQ in biology, medicine, environmental and climate sciences, decision making for societal benefit, and all areas of physical science and engineering. The goal of the conference is to provide a forum for exchanging ideas between diverse groups from academia, industry, and government laboratories, thereby enhancing communication and contributing to future advances in the field.

Eighth International Workshop in Sequential Methodologies
May 21–24, 2024
Utah Valley University, Orem, UT, USA
https://www.uvu.edu/math/events/iwsm2024/index.html
The Department of Mathematics at Utah Valley University (UVU) is pleased to organize the 8th International Workshop in Sequential Methodologies (IWSM2024) during May 21–24, 2024. The Department of Mathematics at UVU is located on the main campus in the city of Orem in the state of Utah, USA. The International Workshop in Sequential Methodologies (IWSM) is a biennial conference that covers all aspects of sequential methodologies in statistics, applied mathematics, information theory, change point detection, and virtually any applications in mathematical finance, quality control, clinical trials, signal and image processing, etc.

Applied Statistics 2023
September 24–26, 2023
Koper / Capodistria, Slovenia
https://as.mf.uni-lj.si/
The AS conference brings together researchers and practitioners from around the world working on various aspects of data analysis, data science, and statistics to present their latest research and learn from each other. The scientific program at AS 2023 includes invited talks as well as oral and poster presentations of accepted abstracts. The two-day main conference will be preceded by a workshop day.

The invited speakers are Dankmar Böhning, University of Southampton; Richard De Veaux, Williams College; and Cécile Proust-Lima, University of Bordeaux.

Koper/Capodistria is the fifth largest city in Slovenia. Located in the Istrian region in the southwestern part of the country, approximately five kilometres south of the border with Italy and 20 kilometres from Trieste.

Registration is open, with an early bird deadline of July 31.

21st Winter School on Mathematical Finance
January 22–24, 2024
Soesterberg, The Netherlands
https://staff.fnwi.uva.nl/a.khedher/winterschool/winterschool.html
Minicourses by Christa Cuchiero (University of Vienna) on Signatures in Finance and by Carole Bernard (Grenoble Ecole de Management and Vrije Universiteit Brussel) on Robust Risk Management. Special invited lectures by Claudio Fontana (University of Padova), Griselda Deelstra (Université libre de Bruxelles) and Antonis Papapantoleon (Delft University of Technology).

Employment Opportunities

Belgium: Leuven

University of Leuven (KU Leuven)
Professor in Financial Mathematics or Mathematical Statistics
https://jobs.imstat.org/job//69765885

Singapore

Nanyang Technological University
Assistant Professor/Associate Professor in Mathematics (Mathematics and Mathematics Education Academic Group)
https://jobs.imstat.org/job//69753800

Taiwan: Taipei

National Taiwan University
Faculty Positions
https://jobs.imstat.org/job//64514112

USA: Chicago, IL

University of Chicago
Clinical Professor Open Rank MS in Applied Data Science
https://jobs.imstat.org/job//69594206

USA: Chicago, IL

University of Chicago
Part Time Lecturer MS in Applied Data Science
https://jobs.imstat.org/job//69594213

USA: Cambridge, MA

Harvard University, Department of Statistics
Tenure-Track Faculty in Statistics
https://jobs.imstat.org/job//69851579

International Calendar of Statistical Events

IMS meetings are highlighted in maroon with the ims logo, and new or updated entries have the NEW or UPDATED symbol. Please submit your meeting details and any corrections to Elyse Gustafson: ims@imstat.org

Online and Ongoing

ONLINE ims **Asia-Pacific Seminar in Probability and Statistics** **w** https://sites.google.com/view/apsps/home

ONLINE ims **COPSS–NISS COVID-19 Data Science Webinar series** **w** https://www.niss.org/copss-niss-covid-19-data-science-webinar-series

ONLINE ims **One World ABC Seminar** **w** https://warwick.ac.uk/fac/sci/statistics/news/upcoming-seminars/abcworldseminar

ONLINE ims **One World Probability Seminar** **w** https://www.owprobability.org/one-world-probability-seminar

ONLINE ims **One World YoungStatS Webinar series** **w** https://youngstats.github.io/categories/webinars/

ONLINE **Video series:** *The Philosophy of Data Science* **w** https://www.podofasclepius.com/philosophy-of-data-science

August 2023

ims August 2–5: Toronto, Canada. **IMS New Researchers Conference** **w** sites.google.com/site/linbowangpku/nrc-2023

ims August 5–10: Toronto, Canada. **IMS Annual Meeting at JSM 2023** **w** https://ww2.amstat.org/meetings/jsm/2023/

ims August 14–15: University of Virginia, USA. **Southeastern Probability Conference II** **w** https://services.math.duke.edu/~rtd

NEW August 14–16: East Lansing, MI, USA. **Workshop on Stochastic Analysis, Random Fields, and Applications** **w** https://stt.natsci.msu.edu/events/sarf2023/

August 20–25: Tokyo, Japan. **ICIAM2023: 10th International Congress on Industrial and Applied Mathematics** **w** https://iciam2023.org/

September 2023

September 7: London, UK. **7th IMA Conference on Mathematics in Defence and Security** w https://ima.org.uk/20850/7th-ima-defence/

UPDATED ONLINE September 11–15: Now online (previously advertised in Ljubljana, Slovenia). **23rd European Young Statisticians Meeting (EYSM) 2023** w https://sites.google.com/view/eysm2023

NEW September 24–26: Koper / Capodistria, Slovenia. **Applied Statistics 2023** w https://as.mf.uni-lj.si/

NEW September 29–30: Ann Arbor, MI, USA. **Synergies between Nonparametrics, Sequential Analysis, and Modern Data Science** w https://sites.lsa.umich.edu/woodroofememorial/

October 2023

HYBRID October 3: London, UK, and online. **RSS Discussion Meeting: 'Parameterizing and Simulating from Causal Models' by Robin Evans and Vanessa Didelez** w https://rss.org.uk/training-events/events/key-events/discussion-papers/

October 13–14: Washington DC, USA. **New Frontiers in Reliability and Risk Analysis: A Tribute to Nozer D. Singpurwalla** w https://statistics.columbian.gwu.edu/nds2023

November 2023

November 9–10: Northfield, MN, USA. **NISS Ingram Olkin Forum (IOF) workshop: Statistical Challenges in the Analysis of Police Use of Force** w https://www.niss.org/events/iof-workshop-statistical-challenges-analysis-police-use-force

December 2023

ims December 18–21: Lisbon, Portugal. **2023 IMS International Conference on Statistics and Data Science (ICSDS)** w https://sites.google.com/view/icsds2023

Meeting organizers: to get a FREE LISTING in this calendar, please submit the details (as early as possible) at https://www.imstat.org/ims-meeting-form/ Or you can email details to Elyse Gustafson at ims@imstat.org We'll list them in the Bulletin, and on the IMS website too, at imstat.org/meetings-calendar/

January 2024

ims January 4–7 (postponed from January 2021): Melbourne, Australia. **IMS Asia Pacific Rim Meeting (IMS-APRM2024)** w http://ims-aprm2024.com/

NEW January 22–24: Soesterberg, The Netherlands. **21st Winter School on Mathematical Finance** w https://staff.fnwi.uva.nl/a.khedher/winterschool/winterschool.html

February 2024

NEW February 27–March 1: Trieste, Italy. **SIAM Conference on Uncertainty Quantification** w https://www.siam.org/conferences/cm/conference/uq24

March 2024

ims March 10–13: Baltimore, USA. **2024 ENAR/IMS Spring Meeting** w http://www.enar.org/meetings/future.cfm

NEW March 13–16: Houston TX, USA. **2024 Seminar on Stochastic Processes** w https://depts.washington.edu/ssproc/

May 2024

NEW May 21–24: Utah Valley University, Orem, UT, USA. **Eighth**

Continues on **page 26**

International Calendar *continued*

May 2024 continued

International Workshop in Sequential Methodologies w https://www.uvu.edu/math/events/iwsm2024/index.html

June 2024

June 9–12: Fort Collins, Colorado, USA. **WNAR2024, joint with Graybill Conference** w https://wnar.org/meetings

NEW June 25–29: Braga, Portugal. **International Symposium on Nonparametric Statistics (ISNPS 2024)** w https://w3.math.uminho.pt/ISNPS2024/

July 2024

Dates TBC: Venice, Italy. **ISBA World Meeting 2024** w https://bayesian.org/2024-world-meeting/

July 7–14: Sydney, Australia. **15th International Congress on Mathematics Education** w https://icme15.com/home

NEW July 9–10: Salzburg, Austria. **Fifth International Workshop on the Statistical Analyses of Multi-Outcome Data** w https://sam-workshop.github.io/SAM_2024/

August 2024

UPDATED August 3–8: Portland, OR, USA. **JSM 2024** w https://ww2.amstat.org/meetings/jsm/2024/

August 12–16: Bochum, Germany. **Bernoulli/IMS World Congress in Probability and Statistics** w https://www.bernoulli-ims-worldcongress2024.org/

August 2025

August 2–7: Nashville, TN, USA. **IMS Annual Meeting at JSM 2025** w https://www.amstat.org/meetings/joint-statistical-meetings

August 2026

August 1–6: Boston, MA, USA. **JSM 2026** w https://www.amstat.org/meetings/joint-statistical-meetings

August 2027

NEW Dates TBA: Location TBA. **IMS Annual Meeting at JSM 2027** w https://www.amstat.org/meetings/joint-statistical-meetings

August 2028

NEW August 5–10: Philadelphia, PA, USA. **JSM 2028** w https://www.amstat.org/meetings/joint-statistical-meetings

August 2029

NEW August 4–9: Seattle, WA, USA. **IMS Annual Meeting at JSM 2029** w https://www.amstat.org/meetings/joint-statistical-meetings

Are we missing something? If you know of any statistics or probability meetings which aren't listed here, please let us know.
You can email the details to Elyse Gustafson at ims@imstat.org, or you can submit the details yourself at https://www.imstat.org/ims-meeting-form/
We'll list them here in the Bulletin, and on the IMS website too, at imstat.org/meetings-calendar/

Membership and Subscription Information: 2023

Journals

The scientific journals of the Institute of Mathematical Statistics are *The Annals of Statistics*, *The Annals of Probability*, *The Annals of Applied Statistics*, *The Annals of Applied Probability*, and *Statistical Science*. The *IMS Bulletin* is the news organ of the Institute.

Individual Memberships

Each individual member receives the *IMS Bulletin* (print and/or electronic) and may elect to receive one or more of the five scientific journals. Members pay annual dues of $105. An additional $130 is added to the dues of members for each scientific journal selected ($87 for *Stat Sci*). **Reduced membership dues** are available to full-time students, new graduates, permanent residents of countries designated by the IMS Council, and retired members.

Individual and General Subscriptions

Subscriptions are available on a calendar-year basis. **Individual subscriptions** are for the personal use of the subscriber and must be in the name of, paid directly by, and mailed to an individual. Individual subscriptions for 2023 are available to *The Annals of Applied Probability* ($245), *The Annals of Applied Statistics* ($245), *The Annals of Probability* ($245), *The Annals of Statistics* ($245), *Statistical Science* ($202), and *IMS Bulletin* ($115). **General subscriptions** are for libraries, institutions, and any multiple-readership use. Institutional subscriptions for 2023 are available to *The Annals of Applied Probability*, *The Annals of Applied Statistics*, *The Annals of Probability*, and *The Annals of Statistics* (each title $563 online only / $707 print+online), *Statistical Science* ($324/$403), and *IMS Bulletin* ($167 print). Airmail delivery is no longer offered.

IMS Bulletin

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