

# IMS Bulletin

#### March 2024

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Read it online: imstat.org/news

## **ICSDS Lisbon: another success**

#### ICSDS 2023 took place in Lisbon, Portugal, in December 2023.

Organizers Regina Liu and Annie Qu received very positive feedback, and branded it "another huge success!"

ICSDS 2024 will be in Nice, France, in December 2024. Join us!

Regina Liu and Annie Qu write: We are delighted to report that the 2024 ICSDS (International Conference on Statistics and Data Science), held December 18–21, 2023, in Lisbon, Portugal, has more than duplicated the success of the 2022 ICSDS in Florence!

**Scientific Program**: There were more than 550 participants from 40 countries, ranging from students, junior, mid-career to senior researchers and practitioners, affiliated with industry, government, and academia, and covering broad areas of statistics and data science. The scientific program had four plenary sessions, 57 invited sessions, seven contributed sessions, a student travel award session, a poster session with 57 contributed posters, and a session on "Industry Friends of IMS" initiated by the IMS to promote collaborations between academia and Industry.

Despite the alluring tourist attractions in Lisbon and the unexpected stretch of sunny weather, the conference had strong attendance, even up to the last day. This, in addition to numerous positive comments conveyed to us, clearly attested to the quality of the conference program. The session topics were diverse across a broad spectrum, including deep learning, artificial intelligence, new machine learning methods and computing tools, personalized medicine and genetics, big data visualization and graphics, network data, image and text data, electronic health records data, health policies and environmental statistics, among others.



Belém Tower at sunset. Photo: Annie Qu

The plenary sessions (https://sites. google.com/view/icsds2023/plenaryspeakers) featured the following outstanding speakers:

**David Donoho** (Stanford University) on *Data Science at the Singularity;* 

Michael I. Jordan (UC Berkeley) on Statistical Inference, Asymmetry of Information and Statistical Contract Theory;

Gábor Lugosi (Pompeu Fabra University, Spain) on *Network Archaeology: Models and Some Recent Results;* and

**Caroline Uhler** (MIT) on *Causality Meets Representation Learning.* 

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## **IMS Members' News**

#### Sylvia Serfaty to receive Mirzakhani Prize

The United States National Academy of Sciences (NAS) is honoring 20 individuals in 2024 with awards recognizing their extraordinary scientific achievements in a wide range of fields spanning the physical, biological, social, and medical sciences.

Among the 2024 NAS award winners is **Sylvia Serfaty**, Courant Institute of Mathematical Sciences, New York University, who will receive the 2024 Maryam **Mirzakhani Prize in Mathematics**. Serfaty has made impactful contributions to the study of nonlinear partial differential equations, variational problems, and statistical physics problems. More precisely, Serfaty has studied problems from condensed matter physics, in particular superconductivity and micromagnetics, Coulomb systems, and vortex dynamics. She has developed fundamentally new techniques for analyzing the dynamics of interacting particles or defects and the spatial patterns they form. Her creative approach and capacity to work on a diverse but coherent family of problems shed new light on the Ginzburg–Landau model of superconductivity and the statistical mechanics of Coulombtype systems.

Sylvia Serfaty will be honored in a ceremony during the National Academy of Sciences 161st annual meeting, on April 28.

The Mirzakhani Prize (formerly the National Academy of Sciences Award in Mathematics) was established in 1988 by the American Mathematical Society in honor of its centennial. The prize was renamed to honor the late Maryam Mirzakhani (1977–2017), a highly accomplished and talented mathematician, professor at Stanford University, and member of the US National Academy of Sciences. Mirzakhani was the first woman to win

the Fields Medal.

Made possible through generous gifts from the Simons Foundation and other benefactors, this \$20,000 prize is awarded biennially for exceptional contributions to the mathematical



sciences by a mid-career mathematician.



**Incoming Editors for** *Annals of Statistics* 

IMS Council has approved the appointment of **Hans-Georg Müller** [*pictured left*] and **Harrison Zhou** [*right*] as Editors of *Annals of Statistics* for the term January 1, 2025–December 31, 2027. They will be taking over from co-editors Enno Mammen and Lan Wang.



Harrison Zhou

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#### **Qiyang Han receives David Kendall Award**

The Bernoulli Society and Royal Statistical Society select a young researcher in alternate years to receive the **David G. Kendall Award**. The 2023 recipient is **Qiyang Han**, Assistant \_\_\_\_\_\_ Professor at Rutgers University.



Qiyang Han

Qiyang Han was recognized for his outstanding contributions to, among other things, empirical process theory, nonparametric inference under shape constraints and asymptotics for multivariate models. Qiyang receives a prize of 2,000 Euros. Since this award is being given for contributions to mathematical statistics, he is also invited to give the Kendall Lecture at the 2024 RSS International Conference (which takes place September 2–5, 2024, in Brighton, UK: https://rss.org.uk/conference2024).

The David G. Kendall Award for Young Researchers is presented biannually to a young researcher who has made a significant contribution to the alternating fields of mathematical statistics or probability theory. David G. Kendall (1918–2007) was the first president of the Bernoulli Society and recipient of the RSS Guy Medal in Silver (1955) and in Gold (1981); he was elected an IMS Fellow in 1952.

#### American Society for Quality's Shewhart Medal for Peihua Qiu

IMS Fellow **Peihua Qiu** has been named the recipient of the 2024 ASQ Shewhart Medal. The citation reads: "For seminal research in developing new quality control methodologies; for exploring new applications of process control charts; for leadership in promoting quality and statistics in healthcare and biomedical studies; and for outstanding editorial service to ASQ-sponsored journals."

Peihua Qiu is Dean's Professor and Founding Chair of the Department of Biostatistics at the University of Florida, Gainesville, USA. He is an elected Fellow of the American Statistical

Association, the American Society for Quality, and the IMS, as well as an elected member of the International Statistical Institute. He has served as associate editor for a number of top statistical journals, including the *Journal of the American Statistical Association* and *Biometrics*, and as the editor of *Technometrics*.

#### Don't keep your news to yourself!

If you've won an award, received recognition, or earned an accolade, share it with your community. Email bulletin@imstat.org



access published papers online

#### IMS Journals and Publications

Annals of Statistics: Enno Mammen, Lan Wang https://imstat.org/aos @https://projecteuclid.org/aos

Annals of Applied Statistics: Ji Zhu https://imstat.org/aoas @https://projecteuclid.org/aoas

Annals of Probability: Christophe Garban, Alice Guionnet https://imstat.org/aop @https://projecteuclid.org/aop

Annals of Applied Probability: Kavita Ramanan, Qiman Shao: https://imstat.org/aap © https://projecteuclid.org/aoap

Statistical Science: Moulinath Bannerjee https://imstat.org/sts @https://projecteuclid.org/ss

IMS Collections Mhttps://projecteuclid.org/imsc

IMS Monographs and IMS Textbooks: Mark Handcock https://www.imstat.org/journals-andpublications/ims-monographs/

#### IMS Co-sponsored Journals and Publications

*Electronic Journal of Statistics:* Grace Yi & Gang Li https://imstat.org/ejs @https://projecteuclid.org/ejs

*Electronic Journal of Probability:* Cristina Toninelli © https://projecteuclid.org/euclid.ejp

*Electronic Communications in Probability:* Patrícia Gonçalves

Mhttps://projecteuclid.org/euclid.ecp

Journal of Computational and Graphical Statistics: Galin Jones, Faming Liang https://www.amstat.org/ ASA/Publications/Journals.aspx Dilog into members' area at imstat.org

Probability Surveys: Adam Jakubowski https://imstat.org/ps @https://projecteuclid.org/ps

Statistics Surveys: Yingying Fan https://imstat.org/ss @https://projecteuclid.org/euclid.ssu

#### IMS-Supported Journals

ALEA: Latin American Journal of Probability and Statistics: Daniel Remenik © http://alea.impa.br/english

Annales de l'Institut Henri Poincaré (B): Giambattista Giacomin, Yueyun Hu https://imstat.org/aihp © https://projecteuclid.org/aihp

Bayesian Analysis: Mark Steel © https://projecteuclid.org/euclid.ba

Bernoulli: Davy Paindaveine https://www.bernoullisociety.org/ @https://projecteuclid.org/bj

Brazilian Journal of Probability and Statistics: Francisco José A. Cysneiros https://imstat.org/bjps Dhttps://projecteuclid.org/bjps

#### IMS-Affiliated Journal

Observational Studies: Nandita Mitra Mhttps://obs.pennpress.org/

- Probability and Mathematical Statistics: Krzysztof Bogdan, Krzysztof Dębicki © http://www.math.uni.wroc.pl/~pms/
- Stochastic Systems: Devavrat Shah UPDAT © https://pubsonline.informs.org/journal/stsy



Peihua Qiu

## ICSDS 2023: continued from cover

of Carlston Gray & Annie Q

All of the plenary sessions were extremely well attended, leaving the huge auditorium with standing room only! In addition to presenting numerous important advances in statistics and data science, those talks also covered wide-ranging challenges and opportunities for statistics and data science. The talks were inspiring and thought-provoking, evidenced by the long list of questions and discussions, both during and outside the sessions.

The abstracts of the plenary sessions can be found at https://www.icsds2023.com/plenary-speakers.

Student Travel Awards: The ICSDS presented 12 student travel awards of USD800 each. The awardees selected are diverse in their paper topics, genders, and countries of studies. We extend congratulations to: Alexis Boulin (Laboratoire Jean Alexandre Dieudonné, France); Matthieu Bulté (University of Copenhagen, Denmark); Onrina Chandra (Rutgers University, USA); Michel Groppe (University of Göttingen, Germany); Yu Gui (University of Chicago, USA); Chiara Gaia Magnani (University of Milan-Bicocca, Italy); Manuel Mueller (University of Cambridge, UK); Arpan Singh (IIT Hyderabad, India); Paul Rognon Vael (Universitat Pompeu Fabra, Spain); Lasse Vuursteen (TU Delft; The Netherlands); Xin Xiong (Harvard T.H. Chan School of Public Health, USA); Yuming Zhang, University of Geneva, Switzerland). The award winners are pictured on page below right, along with other photos by Carlston Gray. We gratefully acknowledge the generous support from the funds of Industry Friends of IMS (IFoIMS: https://imstat.org/industry-friends-of-imsifoims/) for the ICSDS Student Travel Awards and Junior Researcher Travel Support.

**Social Program**: More than 300 participants attended the conference banquet, held at the stunningly beautiful Casa do Alentejo, where participants got to enjoy a traditional Portuguese meal as well as a soulful Fado performance. The conference reception was held, concurrent with the poster session, on the beautiful terrace of the conference venue, with several famous historical landmarks in sight. In addition to viewing the posters, networking with fellow participants, and tasting the Portuguese hors d'œuvres (*entradas*), many participants also enjoyed the outdoor setting under the unusually sunny and warm weather conditions, not to mention the stunning views.

Acknowledgments: We are gratified to have received enthusiastic feedback from many participants, several even



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told us that this is the best conference ever for them. We thank all the participants for their participation and contributions to this conference.

Needless to say, an international conference of this scale, with its wide coverage of subjects and size of broad participants from various disciplines across the world, would not have been possible without the collective efforts of many.

We would like to thank the program committee for helping establish the rich program, the Local Organizing Committee: Eunice Carrasquinha (Co-chair, CEAUL-FCUL), Ivette Gomes (Co-chair, CEAUL-FCUL), Tiago Marques (University of St Andrews, UK), Teresa A. Oliveira (Co-chair, CEAUL and Universidade Aberta), Soraia Pereira (CEAUL, Universidade de Lisboa), Giovani Silva (IST, CEAUL, Universidade de Lisboa), and Lisete Sousa (Universidade de Lisboa), for their tremendous efforts for this event. In particular, Ivette and Teresa, together with Min Xu (Rutgers), worked tirelessly to turn the messy and long conference program into a perfectly organized program book of 2023 ICSDS (see https://imstat.org/wp-content/ uploads/2022/12/ICSDS2023-program-book.pdf).

We also thank Elyse Gustafson (IMS Executive Director) for her help with the financial issues and related formalities on behalf of the IMS, and to Arlene Gray (Administrator, ICSDS) for her patience and dedication to the non-stop inquiries and requests from the participants and the conference organizing team. Finally, we would like to acknowledge the invaluable contributions behind the scenes from Min Xu, from managing the conference website and negotiating IT support with the conference venue, to setting up the program and readying all slides. He efficiently met unexpected challenges—technical as well as personal—head-on. It suffices to say that Min did all the heavy lifting to help make the conference program a reality for us all to enjoy.

We hope to continue the success of the first two ICSDS, and to uphold the high standard and broad coverage of the program. We have again set up a strong and diverse program committee for the next ICSDS. *Regina Liu and Annie Qu Co-organizers for ICSDS 2023* 

The 2024 ICSDS will be in Nice, France, from December 16–19, 2024. Details to follow at https://sites.google.com/view/ims-icsds2024/ Hope to see you there!

## **IMS Special Lecture Previews**

## Sébastien Roch: Medallion Lecture

Sébastien Roch is a Professor of Mathematics at the University of Wisconsin–Madison, where he is also affiliated with the Department of Statistics and the Theory of Computing Group. He earned his PhD in Statistics from the University of California, Berkeley. He is the recipient of an NSF CAREER Award, an Alfred P. Sloan Fellowship and a Simons Fellowship. He also received the Best Paper Award at RECOMB 2018. In 2022, he was named Fellow of the IMS. His graduate textbook, *Modern Discrete Probability: An Essential Toolkit*, was recently published. This IMS Medallion Lecture will be given at the Seminar on Stochastic Processes (SSP) 2024 meeting (March 13–16, 2024, at Rice University in Houston, USA: see https://ssp2024.rice.edu/home).



#### **Complex Probabilistic Models in Evolutionary Biology: Challenges and Opportunities**

The reconstruction of species phylogenies from genomic data is a key step in modern evolutionary studies. This task is complicated by the fact that genes evolve under biological phenomena that produce discordant histories. These include horizontal gene transfer, gene duplication and loss, and incomplete lineage sorting, all of which can be modeled using random gene tree distributions building on well-studied stochastic processes (branching processes, the coalescent, etc.). Gene trees are in turn estimated from molecular sequences using Markov models on trees. The rigorous analysis of the resulting complex models can help guide the design of new reconstruction methods with statistical and computational guarantees. I will illustrate the challenges and opportunities in this area via a few recent results. No biology background will be assumed.

## Patrícia Gonçalves: Schramm Lecture



Patrícia Gonçalves received her PhD in 2007 from IMPA, Brazil. She is currently a full Professor at Instituto Superior Técnico, University of Lisbon. She works in the field of interacting particle systems and her work has particularly focused on their scaling limits, namely on hydrodynamic limits, fluctuations and large deviations. Patrícia is the editor-in-chief of the *Electronic Journal of Probability* and associate editor of *Annals of Probability*. She has also been on the editorial board of the *Annals of Applied Probability* and *Electronic Journal of Probability*. In 2016, she was the recipient of an ERC Starting Grant in Mathematics and in 2022 was an invited speaker at the sectional session in Probability at the International Congress of Mathematicians. This Schramm lecture will be delivered at the 11th World Congress in Probability and

Statistics in Bochum, Germany, August 12–16, 2024: https://www.bernoulli-ims-worldcongress2024.org

#### Scaling limits of general exclusion processes

The rigorous mathematical derivation of the macroscopic evolution equations of classical fluid mechanics from the large-scale description of the conserved quantities in Newtonian particle systems is a long-standing problem in mathematical physics. Instead, if the deterministic dynamics are replaced by stochastic dynamics, then the mathematical techniques that have been developed in the last decades can be efficient. Over the last 30 years, there has been remarkable progress in deriving the well-known hydrodynamic limit, from stochastic interacting particle systems, as well as, characterizing the fluctuations of locally conserved quantities around that limit.

The goal of my talk is to review old and recent results about these scaling limits with a special focus on exclusion processes. In this process, each site can be occupied at most by one particle and after an exponential clock of rate 1, it jumps to another position of a lattice according to a certain transition probability. Depending on the transition probability different limit behaviours can be obtained and the system can cross different universality classes. These crossovers will be explained both at the level of hydrodynamic limits as well as fluctuations.

## **Jing Lei: Medallion Lecture**

Jing Lei obtained his PhD in Statistics from UC Berkeley in 2010 and joined Carnegie Mellon University in 2011. He is currently a professor of Statistics & Data Science at CMU. His research areas include nonparametric and predictive inference such as conformal prediction and cross-validation, high-dimensional inference, network data analysis, data privacy, and applications in single-cell genomics. Jing received the ASA Gottfried E. Noether Early Career Award in 2016, was elected an IMS Fellow in 2021, and was one of the two recipients of the ASA Leo Breiman Junior Award in 2023. He currently serves as an associate editor for *Annals of Statistics, Journal of the American Statistical Association*, and *Journal of the Royal Statistical Society, Series B*. This Medallion lecture will be delivered at JSM in Portland, USA, August 3–8, 2024: https://ww2.amstat.org/meetings/jsm/2024/index.cfm



#### Uncertainty Quantification with Nonparametric and Black-Box Models

The fast-increasing complexity and dimensionality in modern data analyses pose new challenges for nonparametric inference. Meanwhile, the emergence of powerful neural networks provides an unprecedented level of success in prediction. The intricate nature and diverse form of neural networks make them quintessential examples of "black-box models," prompting new theoretical and methodological questions: How do we understand the uncertainty in these models? How can we reliably use them in statistical inferences?

In this lecture I will showcase two such inference problems, both stemming from conformal prediction. The first part focuses on understanding the uncertainty in the empirical performance of nonparametric and black-box models. We consider the problem of comparing many competing models using cross-validation, where the main challenge is the possibility of multiple good models and the uncertainty in the cross-validated risks. I will present some recent results on constructing model confidence sets using cross-validation under stability conditions. In the second part, we study the problem of testing two-sample conditional distributions, where black-box predictors are often used to estimate various nuisance parameters. Following an approach inspired from conformal prediction, I will demonstrate that conformal prediction effectively separates the nuisance parameters into two parts: a part that needs to be estimated accurately to ensure validity of inference, and another part whose accuracy will only affect the efficiency.

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## **Chanwoo Lee: IMS Lawrence Brown PhD Student Award winner**

Chanwoo Lee received his PhD at University of Wisconsin–Madison in 2023, advised by Dr. Miaoyan Wang. Before joining UW–Madison, he received a BS in Mathematical Science and Statistics in 2018 from Seoul National University, Korea. He is broadly interested in statistics, machine learning, and optimization. He has worked on developing statistical tools for analyzing matrix or tensor-valued data.

This will be one of three Lawrence D. Brown PhD Student Award winners' talks in a special session at the 11th World Congress in Probability and Statistics in Bochum, Germany, August 12–16, 2024.



#### Statistical and computational rates in high rank tensor estimation

The analysis of higher-order tensors has recently drawn much attention in statistics, machine learning, and data science. Higherorder tensor datasets are collected in applications including recommendation systems, social networks, neuroimaging, genomics, and longitudinal data analysis. One example is a multi-tissue expression data. This dataset collects genome-wide expression profiles from different tissues in a number of individuals, which results in three-way tensor of gene by individual by tissue. Another example is hypergraph networks, in which edges are allowed to connect more than two vertices. Considering multi-way interactions based on hypergraphs helps to understand complex networks in molecule system and computer vision. Tensors are naturally used to represent such hypergraph structures. Along with many important applications, tensor methods have provided effectiveness in data analysis that classical vector- or matrix-based methods fail to offer.

One of popular structures imposed on the tensor of interest is the low-rankness. Common low rank models include CP low rank models, Tucker low rank models, and block models. Despite the popularity of the low rank assumption, it is rather restricted to assume that the rank of the tensor remains fixed while the tensor dimension increases to infinity. In particular, low rank assumption is sensitive to entrywise transformation and inadequate for representing special structures of tensors. In addition, low rank tensors are nowhere dense, and random matrices/tensors are almost surely of full rank. This motivates us to develop a more flexible model that can handle possibly high rank tensors.

In this talk, we develop a latent variable tensor model that addresses both low and high rank tensors. Our model includes, but is not limited to, most existing tensor models such as CP models, Tucker models, generalized linear models, single index models, and simple hypergraphon models. Comprehensive results are developed on both the statistical and computational limits for the signal tensor estimation under the latent variable tensor model.

First, we find that high-dimensional latent variable tensors are of log-rank, which provides a rigorous justification for the empirical success of low-rank methods despite the prevalence of high rank tensors in real data applications.

Second, we discover the gap between statistical and computational optimality in the higher order tensor estimation. We prove the statistically minimax optimal rate of the problem. We find that this rate, however, is non-achievable by any polynomial-time algorithms under hypergraphic planted clique (HPC) conjecture. We then show that a slower computationally optimal rate is achievable by polynomial-time algorithms.

Third, we propose two estimation methods with accuracy guarantees: the least-square estimation (LSE) and double-projection spectral estimation (DSE). The LSE achieves the information-theoretical lower bound demonstrating its statistical optimality. The computation of LSE, however, requires possibly non-polynomial complexity. We then propose the DSE using the idea of double- projection spectral method and the log-rank property of latent variable tensors. We show that the DSE achieves the computational optimal bound within the subclass of polynomial-time estimators.

Numerical experiments and real data applications will be presented to demonstrate the practical merits of our methods. This talk is based on joint work with Miaoyan Wang.

## Apply for next year's PhD Student Award

The **IMS Lawrence D. Brown PhD Student Award** is open for applications. The deadline is May 1, 2024. Eligible applicants compete to be one of three speakers at an invited session as part of the IMS Annual Meeting (the 2025 Joint Statistical Meetings, in Nashville, USA, August 2–7, 2025). The award includes reimbursement for travel and meeting registration fee (up to \$2,000 for each recipient).

The award was created in memory of Lawrence D. Brown (1940–2018), professor of statistics at The Wharton School, University of Pennsylvania, who was an enthusiastic and dedicated mentor to many graduate students. For application details: https://imstat.org/ims-awards/imslawrence-d-brown-ph-d-student-award/

## Nominations invited for 2025 International Prize in Statistics



The International Prize in Statistics—one of the highest honors in statistics—is awarded every two years to an individual or team for major achievements using statistics to advance science, technology, and human welfare.

Nominations are now being accepted for the 2025

International Prize in Statistics. When choosing a nominee for the prize, consider the following points:

- The prize is awarded for a major achievement developed through a single contribution or multiple contributions over time.
- The prize is meant to recognize powerful ideas that have led to breakthroughs in statistics and data science and demonstrated impact on applications, methodology, theory, or practice.
- The prize can be awarded to individuals, teams, or organizations. Generally, the prize is awarded to
  individuals, but groups of individuals working on similar ideas—or even teams of individuals or organizations—can be recognized.
- The recipient(s) must be living at the time of selection for the award.
- Information about the award will be communicated to the public in a way that will enhance public understanding of the depth and scope of statistical science and its impact on modern life. Part of this information is captured through the nomination process.

#### How to nominate

A nomination packet consists of the following:

- Contact information for the person(s) being nominated and the person making the nomination
- The nomination form and all the information requested in it, which includes the following:
- CV(s) of the nominee(s)
- Four letters of reference that focus primarily on the contribution, its importance, and impact
- Information such as descriptions of the nominee's contributions to other areas, their professional leadership, mentoring, etc. (This should be brief.)
- Description of the relationship between the nominator and nominee(s)
- Title and brief description of the nomination (major contribution/achievement)
- Description of importance and impact of the contribution (maximum 1,200 words, explaining the contributions of the nominee(s) in terms understandable to a nonspecialist)
- Draft citation of the contribution (maximum 150 words)

The committee reserves the right to contact the nominator and writers of the support letters to seek additional information and insight.

Unsuccessful nominations are carried over for one selection cycle (two years). Nominators are responsible for updating their nominations if they so desire. The deadline for updating is the same as the deadline for nominations.

#### **More information**

Learn more and download the nomination form from the International Prize in Statistics website, https://www.statprize.org.

Email the form and related materials to nominations@statprize.org by October 1, 2024.



C.R. Rao, 2023 winner



Nan Laird, 2021 winner



Bradley Efron, 2018 winner



David Cox, 2016 winner

## Sound the Gong: Dial Rho for Regulation (and B for Bitcoin)



## Our contributing columnist Ruobin Gong, writes:

"Correlation is not causation" is among the most widely recited tenets of statistical literacy. It is somewhat odd for a concept to be better known for what it is *not* than for what it is. For correlation, the statistician is quick to warn of its

danger because we are too aware of its irresistible allure. The human mind looks at correlation and sees a sketch of the concomitant movements of the universe, a symphony of time and space, and a testimony to the marvels of natural law. We swear to not put our trust into correlation, yet we lean on it for directions, hints, and advice, so much so that our slanted posture sometimes betrays the oath to do otherwise.

Recently, correlation assumed a new role as a financial regulatory device. (The story takes a little bit of time to unpack, so please bear with me.) On January 10, 2024, the US Securities and Exchange Commission (SEC) approved a number of spot Bitcoin exchange-traded products (ETPs), making them available for trading on national security exchanges in the US.<sup>1</sup> (The word "spot" means that these ETPs are backed by actual Bitcoin holdings rather than, say, Bitcoin futures.) The approval is kind of a big deal, because it means that people may soon be able to make Bitcoinbacked investments using their retirement accounts-the 401(k)s and the 403(b)s (hello, my fellow public school employees)without having to wade through the near-mythical obscurity surrounding the trading of Bitcoin or Bitcoin itself.<sup>2</sup> Interestingly, the peace of mind that is now on offer to the public to dabble in the cryptocurrency is the result of a long legal battle, the better part of which the SEC spent on resisting the very idea of granting such an approval.

The SEC had its rightful concerns. It was worried that the exchanges who offer these spot Bitcoin ETPs would not be able

- 1 Gensler, G. (Jan 10, 2024), Statement on the Approval of Spot Bitcoin Exchange-Traded Products, https://www.sec.gov/news/statement/ gensler-statement-spot-bitcoin-011023
- 2 *An obligatory disclaimer:* I trust that you know better than to take financial advice from what I'm saying.

to prevent fraud or market manipulation of the Bitcoin prices, nor be able to shield the investors from these risks. Previously, in order for the SEC to approve any ETP for trading on an exchange, the exchange must demonstrate that it has a "comprehensive surveillance agreement" with a "regulated market of significant size" related to the ETP's underlying asset, so that fraud or manipulation of that underlying asset can be detected and deterred through this market.<sup>3</sup> This rule works for ETPs backed by most assets, such as gold and soybeans, and it even works for ETPs backed by Bitcoin futures, which have been trading in significant quantities at the Chicago Mercantile Exchange (CME) since 2017.<sup>4</sup>

But spot Bitcoin is a different animal. Bitcoin prides itself as a digital-native, blockchain-enabled, non-sovereign currency, whose whole point of existence is that it need not be traded on any regulated market. In the eyes of the SEC, that's why Bitcoin is fundamentally distinct from gold, soybeans, even Bitcoin futures because, simply put, there is no way for Bitcoin to be directly surveilled by an exchange. As such, the SEC could not approve an ETP backed by it.

If the above made sense to you... well, it shouldn't. The SEC's logic leads to the bizarre outcome that an ETP backed by Bitcoin futures can receive approval, but an ETP backed by Bitcoin cannot, despite the fact that Bitcoin futures track—you guessed it— Bitcoin. Last August, a federal court told the SEC that it had failed to adequately explain its reasoning and that it'd better go back and think over the whole thing again.<sup>5</sup>

The moment has finally arrived that our heroine, Correlation, enters the scene. Having mulled over the matter, the SEC revised its decision by endorsing a ground-breaking argument. It examined the price returns data at different temporal resolutions over the course of more than two years (March 2021 to October 2023) and concluded that the prices of Bitcoin and the prices of Bitcoin futures are "consistently correlated." In the approval order, the SEC cited analyses that showed Pearson correlation calculated over the price returns time series of Bitcoin and Bitcoin futures yields more

- 3 Securities and Exchange Commission, Release No. 34-99306 ("approval order").
- 4 CME Group, Bitcoin Futures Liquidity Report, https://www. cmegroup.com/education/bitcoin/futures-liquidity-report.html
- 5 Grayscale Investments, LLC v. SEC, 82 F.4th 1239 (D.C. Cir. 2023).

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than 92% for hourly data and more than 78% for minute-by-minute data. It went further, to conduct an in-house robustness analysis using rolling three-month segments within the same time period, arriving at estimated correlation coefficients that were consistently between 90% to 99.2% for hourly data, and between 67.9% and 83.2% for minute-by-minute data.

Whether these correlations look high enough to you, they certainly bolstered the SEC's newfound confidence in their regulatory significance. The SEC declared that a strong and persistent correlation between Bitcoin and Bitcoin futures prices would mean that any fraud or manipulation that could impact the price of Bitcoin "would likely impact" the price of Bitcoin futures, the latter of which having demonstrated a trading record on the well-regulated CME. Furthermore, since the CME and the exchanges share comprehensive surveillance agreements, the setup is as good as any other when it comes to facilitating the detection and deterrence of fraud and manipulation in the actual Bitcoin market, and therefore serving the purpose of risk regulation for the ETPs it backs.

So, there you have it. Our old friend gets a new job as a watcher of Bitcoin mischief, and with that anointment another chapter of an inspirational biography gets written. Even with a long and stellar career behind her, Correlation never ceases to reinvent herself and keeps contributing to the frontiers of scientific and economic progress as new opportunities arrive at her doorstep.

It is one matter to speculate whether correlation will reliably flag illicit Bitcoin market activities in the years to come. It is a different one to ask whether the logic at play here is a sound one. I, for one, am decidedly undecided. To regulate is to influence, an



affirmative act that both requires and imparts causation. My hopelessly unimaginative mind could only construe a one-way street in which the price of Bitcoin drives the price of Bitcoin futures, with regulatory control travelling sensibly in the same direction. Then again, the Invisible Hand may well be more than a descriptive metaphor, being actually one of the natural laws reified by the market's constant pursuit of rationality. If that is the case, who is to say that a bond between two financial objects is anything less sacred than gravity?

Interestingly, a small footnote in the SEC's approval order reads: "Correlation should not be interpreted as an indicator of a causal relationship or whether one variable leads or lags the other," though it does not say how it should be interpreted. We land again in the twilight zone between "what is" and "what is not," another reminder of just how vast a gulf it can be.

## Any Questions? Call for Clara-fication

Do you need some friendly advice? Are you unsure how to go about something? Does everyone around you look like they know exactly what they're doing? (*They really don't!*). We're inviting early-career researchers to send their **questions about the life of a researcher or ask for career advice**, and *Clara-fications* columnist Clara Grazian will try to find an answer. We'll publish the question and answer in the next available issue. **Don't worry, we won't publish your name.** Your question might even be what someone else has been secretly wondering... Send your questions for Clara to **bulletin@imstat.org**.



## Challenging the Misuse of Statistics in the question of the origin of COVID-19

Dietrich Stoyan and Sung Nok Chiu write: The question of the origin of COVID-19 is of great importance to humankind, as it seeks to understand how this pandemic emerged and how to prevent future pandemics caused by similar viruses. Currently, there are two competing theories, the natural origin (zoonosis) and the lab-leak theory. It was in July 2022 a sensation when a paper was published in Science, saying that the zoonosis hypothesis is true and pinpointing the Huanan Seafood Wholesale Market in Wuhan as the origin. This paper, Worobey et al. (2022)—henceforth referred to as W after its first author-garnered hundreds of thousands of downloads and received global media coverage.

We became aware of their work, in a preprint form, back in March 2022. After identifying its weakness, we prepared a paper to criticize it in August 2022, shortly after its publication in Science. We attempted in vain to engage in discussion with the authors of **W**. We then learned that numerous serious researchers shared doubts about the paper from scientists' perspectives. However, most of the criticism focused on the poor quality of the data used, which were the residential addresses of the early December cases. In contrast, our concerns primarily revolved around their flawed statistical methods. Subsequently we submitted our critique to *JRSS A* in September 2022. Following an extensive review process, our paper, Stoyan and Chiu (2024), was published in January 2024.

To find the main flaw of W, turn to page 2 of W, where you would find: "We also investigated whether the December COVID-19 cases were closer to the market than expected based on an empirical null distribution of Wuhan's population density", followed by some very small *p*-values. Unfortunately, there is no precise wording about the null hypothesis and the test procedure. Interested readers would need to dig deeper by looking into the Supplementary Materials, where it says that "null distributions were generated from the population density data [...]. For each point in each pseudoreplicate the distance to Huanan was calculated, and the median [...] distance to Huanan was calculated for each pseudoreplicate. The median [...] distance between all the early December cases (N = 155) [...] [was] compared to these null distributions." We interpret these sentences as follows. A point pattern of 155 independent points was simulated according to Wuhan's population density. The median of the distances from these 155 points to the Seafood Market (and not to the center of the new sample) was calculated. This procedure was done 1000 times, and the empirical distribution of these medians would be W's null distribution, from which the *p*-value of their test could be determined.

The null distribution employed by **W** is weird. Each simulated pattern of 155 independent points has its points scattered across the entire area of Wuhan city, which is larger than New York City in both size and population. In contrast, the point pattern of the early cases forms a close cluster. Without any computer work it is clear that only in extremely rare cases the distance-median of a simulated sample is smaller than that of the original points.

W also considered the "center-point" of the point cloud of the early cases. Our investigations reveal that, based on their distance-based arguments, it is nearly impossible to exclusively identify only the Seafood Market as the geometrical center, while excluding other places in its proximity, such as the Hankou Railway Station, the Wuhan CDC, and the Wanda Plaza, since the coordinates of the 155 points were imprecise to some extent.

We are pleased to have published our critique. However, we are astonished that no other colleagues have reported similar findings. This situation raises doubts about the current state of the system of modern science and the general understanding of basic principles of statistics in modern society, not to speak about the reviewing process of *Science*.

Upon receiving media inquiries from outlets such as *Newsweek* and *Frankfurter Allgemeine Sonntagszeitung*, the corresponding author of **W**, without providing any scientific arguments, described our paper as having "tunnel vision" and being "*schockierend fehlerhaft*" (shockingly flawed), further commenting that we, the authors, "miss the big scientific picture". However, it is crucial to emphasize that scientifically, neither our statistical analysis nor that of **W** could reject or support either the natural origin or lab-leak theory.

#### **References:**

- Dietrich Stoyan, Sung Nok Chiu, "Statistics did not prove that the Huanan Seafood Wholesale Market was the early epicentre of the COVID-19 pandemic", *Journal of the Royal Statistical Society Series A: Statistics in Society*, 2024, qnad139, DOI: 10.1093/ jrsssa/qnad139
- Michael Worobey et al., "The Huanan Seafood Wholesale Market in Wuhan was the early epicenter of the COVID-19 pandemic", *Science*, 377,951-959, 2022, DOI: 10.1126/science.abp8715



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## Bernoulli–IMS World Congress Pre-Meeting for Young Researchers 2024

We are happy to announce the upcoming Bernoulli–IMS World Congress will feature a Pre-Meeting for Young Researchers. This will take place over the weekend immediately before the World Congress, August 10–11, 2024, at the University of Duisburg–Essen, in Bochum's neighbouring city of Essen, Germany.

The details of the meeting will be announced later, but the organizers are excited to announce the following lectures:

Emmanuel Candès (Stanford University) on conformal inference

Susan Murphy (Harvard University) on reinforcement learning

Remco van der Hofstad (TU Eindhoven) on networks

There will also be sessions with career advice for young researchers. Scholarships for participants from low/middle income countries are available. See https://www.bernoulliims-worldcongress2024.org/young-researchers-pre-meeting for more information.



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## **Celebrating Brilliance: Black Heroes of Statistical Research**

#### Queensley C. Chukwudum (University of Uyo, Nigeria) and Saralees Nadarajah (University of Manchester, UK) report on a recent workshop:

In the realm of academia, there exists an unwavering beacon of brilliance that often goes unnoticed by the broader world. It's the steadfast dedication and groundbreaking work of African-based researchers in statistics and applied mathematics. Despite numerous challenges, these scholars continue to push the boundaries of knowledge and innovation, shaping the future of their fields and contributing to global scientific discourse.

Enter the Black Heroes of Statistical Research virtual workshop, the first of its kind, which was held in November 1-3, 2023 (https://blackheroesstatistics.wordpress.com). It is an initiative that stands as a testament to the extraordinary talent thriving on the African continent. This free platform, born out of a collective vision to celebrate and amplify the voices of African statisticians and mathematicians, serves as a stage where their achievements are not just acknowledged but celebrated.

At the heart of this initiative lies a simple goal: to draw together the top African-based researchers, providing them with a global platform to showcase their research works and achievements, and providing them with international linkages. The workshop is not just about highlighting individual successes but also about fostering collaboration and knowledge exchange within the African statistical community.

One of the most remarkable aspects of this workshop is its focus on leveraging the expertise of these scholars to secure funding for further research endeavors. By consolidating their knowledge and skills, the workshop empowers African researchers to write grants and raise funds, ensuring that they have the resources necessary to continue their groundbreaking work. This approach not only supports the researchers themselves but also paves the way for sustained growth and development within the African scientific community.

The significance of initiatives like the Black Heroes of Statistical Research workshop cannot be overstated. In a world where the contributions of African scholars are often overlooked or undervalued, this workshop serves as a beacon of hope and inspiration. It sends a powerful message that brilliance knows no boundaries and that talent flourishes in every corner of the globe.

Moreover, by amplifying the voices of African researchers, the workshop contributes to a more inclusive and diverse scientific landscape. It challenges the prevailing narratives that center on a few privileged regions and highlights the wealth of knowledge and innovation present in Africa.

But perhaps the most profound impact of this initiative lies in the inspiration it provides to future generations of African scientists. By showcasing the achievements of their peers, the workshop instills a sense of pride and possibility, encouraging young minds to pursue careers in statistics and mathematics and to dream without limits.

The organizers plan to make this an annual workshop. If you missed it, you can watch the videos at https://www.youtube.com/@BlackHeroesStatistics/videos

## YoungStatS: Transport Noise in Fluid Dynamics



**Darryl D. Holm** is a Professor of Applied Mathematics at Imperial

College London. He writes this YoungStatS contribution, giving an overview of how transport noise is used in modeling fluid dynamics:

In this contribution, I will give an overview of some old and new approaches related to the use of transport noise in the stochastic modelling of fluid dynamics. Recent advances on this topic were presented by four young scholars at the One World YoungStatS webinar, supported by FENStatS, the Bernoulli Society and the Institute of Mathematical Statistics, in November 2023 (see https://youngstats. github.io/post/2023/10/14/stochastic-fluid-dynamics/).

Transport noise in fluid dynamics has several forebears in turbulence theory, as in the early 1990s, Kraichnan and Pope sought to explain the anomalous spectral scaling in turbulent flows by computationally simulating stochastic transport of passive scalars and stochastic Lagrangian particle paths. At about the same time, Brzeźniak, Capiński and Flandoli introduced stochasticity into active transport of vorticity in the two-dimensional (2D) Navier–Stokes equation. Cipriano and Cruzeiro established a stochastic variational principle for the 2D Navier–Stokes equation and Constantin and Iyer derived a probabilistic representation of the deterministic three-dimensional (3D) Navier– Stokes equations based on stochastic Lagrangian paths. Stochasticity eventually found its way into both the motion and transport equations for 3D fluid dynamics via Hamilton's variational principle in Holm (2015). The author named his variational stochastic model for fluid transport as Stochastic Advection by Lie Transport (SALT).

In the works of several authors, stochasticity of finite dimensional system of differential equations was soon made Hamiltonian and stochastic Hamiltonian dynamical systems were reformulated in the Lie–Poisson framework. It was natural to expect that stochastic Hamiltonian dynamical systems should also emerge from a phase-space version of Hamilton's principle. A variant of such a theorem was proved in Lázaro-Camí and Ortega, and another one for Lagrangian systems by Bou-Rabee and Owhadi. These discoveries quickly led Cruzeiro, Holm and Ratiu to derive the entire spectrum of finite-dimensional geometric mechanics, from reduction by symmetry of the Lagrangian to derive a stochastic version of the Euler–Poincaré variational principle.

Following the recognition of Lie-group reduction of Hamilton principles for deriving finite-dimensional stochastic Euler–Poincaré (EP) variational principles, it was natural to attempt the same for the Eulerian representation of fluid dynamics, which was soon performed separately by Holm, and Chen, Cruzeiro and Ratiu. As it turned out, in 2D, these variational approaches recovered the planar stochastic Euler vorticity equations with transport noise studied earlier.

When all is said and done in following the EP approach, the stochasticity appears only in the transport velocity of the material loop in Kelvin's theorem for the conservation of circulation around material loops in 3D Euler fluid dynamics. Thus, the EP variational approach is a natural one for deriving stochastic fluid dynamics equations with transport noise.

The next natural step was for Crisan, Flandoli and Holm to examine the analytical properties of the newly derived EP Euler fluid equations with transport noise in three dimensions. Remarkably, because the noise

> involved Lie derivatives, the analytical properties of the stochastic 3D Euler equations with SALT turned out to be essentially the same as for the deterministic case. This agreement in analytic regularity was not entirely a surprise, though, as the SALT model for the Euler equations had been earlier derived by applying the mathematical method of homogenisation.

> The recent work of Crisan, Holm, Leahy and Nilsen (2022a) aims to transfer the fundamental properties of deterministic fluid dynamics derived by Hamilton's principle into a formulation on geometric rough paths. Another work by the same authors

Trajectories from the National Oceanic and Atmospheric Administration Global Drifter Program are shown, in which each shade corresponds to a different drifter. Image courtesy of NOAA's Global Drifter Program.



(2022b) analyses the solution properties of Euler fluid dynamics on rough paths and demonstrates the efficacy of this approach by producing previously unavailable results.

Recent work on stochastic Geophysical Fluid Dynamics has led to collaboration to investigate Stochastic Dynamical Data Assimilation, for quantifying and reducing uncertainty in numerical simulations of weather, climate and ocean circulation. Remarkably, this has also been found to work well for quantifying and reducing uncertainty in applications of stochastic shape analysis for image registration. In particular, foundational development of the new science of Stochastic Geometric Mechanics for spatial smooth invertible maps with stochastic time dependence has produced fruitful applications to uncertainty quantification and reduction of uncertainty via data assimilation in fluid dynamics.

A promising goal in the future is to apply stochastic geometric mechanics for the derivation, analysis, numerical simulation and assimilation of computational data, such as satellite observations of various types of transport like heat, mass, colour, texture, and other observable order parameters in upper ocean dynamics. Reaching this goal will require a variety of developments in modelling and data assimilation, related to transport noise in fluid dynamics.

Transport noise has now found important applications in oceanography under the auspices of the European Research Council Synergy Grant, entitled "Stochastic Transport in Upper Ocean Dynamics" (STUOD), see, e.g., https://www.imperial.ac.uk/ocean-dynamics-synergy/

#### Main references:

- Crisan, D., Holm, D.D., Leahy, J.M. and Nilssen, T., 2022. Variational principles for fluid dynamics on rough paths. *Advances in Mathematics*, 404, p.108409. https://doi.org/10.1016/j. aim.2022.108409.
- Crisan, D., Holm, D.D., Leahy, J.M. and Nilssen, T., 2022. Solution properties of the incompressible Euler system with rough path advection. *Journal of Functional Analysis*, 283(9), p.109632. https://doi.org/10.1016/j.jfa.2022.109632.
- Holm, D.D., 2015. Variational principles for stochastic fluid dynamics. Proc. Roy. Soc. London A, 471(2176). http://doi.org/10.1098/rspa.2014.0963.

## **Parzen Prize accepts Nominations**

The Department of Statistics at Texas A&M University invites nominations for the **Emanuel and Carol Parzen Prize for Statistical Innovation**. To promote the dissemination of statistical innovation, the Emanuel and Carol Parzen Prize for Statistical Innovation is awarded in even-numbered years to a North American statistician whose outstanding research contributions include innovations that have had impact on practice and whose PhD degree is at least 25 years old.

The Parzen Prize is awarded by the Department of Statistics at Texas A&M University and is selected by the members of the Parzen Prize Committee (consisting of

three internal faculty members and two external members). The prize consists of an honorarium of \$1000 and travel to College Station, TX, to present a lecture at the Prize Ceremony.

Nominations for the 2024 Parzen Prize should include a letter describing the nominee's outstanding contributions to high impact innovative research in statistics, a current curriculum vita, and two supporting letters. Nominations should be submitted by **March 29**, **2024**, to Samiran Sinha, the Chair of the 2024 Parzen Prize Committee, via e-mail to sinha@stat.tamu.edu or to:

Professor Samiran Sinha,

Department of Statistics, Texas A&M University, TAMU 3143, College Station, Texas 77843-3143.

For more information on the Parzen Prize, please visit http://www.stat.tamu.edu/about/awards-and-prizes/parzenprize/.



#### The previous Parzen Prize winners are:

2022	Herman Chernoff
	and Peter
	McCullagh
2018	Bin Yu
2016	William Cleveland
2014	Trevor Hastie
2012	Adrian Raftery
2010	Roger Koenker
2008	Nancy Reid and
	Marvin Zelen
2006	Alan Gelfand
2004	Jerome H.
	Friedman
2002	David R. Brillinger
2000	C.R. Rao
1998	Bradley Efron
1996	Donald B. Rubin
1994	Grace Wahba

## Anirban's Angle: Remembering Shanti Gupta

**Anirban DasGupta** shares his memories of Shanti Gupta, a "quiet scholar, architect, and shepherd":



Shanti Gupta devoted 40 years of his life to the foundation and nurturing of the statistics department at Purdue University,

USA. He was a selfless soldier of the profession, an effective and yet gentle fighter. He had the nose of a hound, the energy of an athlete, and a dogged resilience in building a department in the US Midwest that earned the respect of the world. An architect and visionary, uncompromising on quality of work, a soft-spoken leader with incredible people skills: that is the Shanti Gupta I knew for 20 years.

He was born in a remote, small village in the Indian state of Uttar Pradesh in 1925. From modest beginnings, he did his formal education at Delhi University and the University of North Carolina at Chapel Hill, where he was an early and distinguished PhD student of Raj Chandra Bose. In time, he was the President of the IMS, Editor-in-Chief of the JSPI, an advisory member of the National Research Council, a special chaired professor at the Academia Sinica, an Erskine Fellow, and faculty member at Stanford, Berkeley, and the Courant Institute in New York. He was elected a Fellow of the IMS, the AAAS, and the ASA. At the time of his passing in 2002, he had 29 PhD students, including several who are now leaders of the profession.

In 1968 he founded the Purdue University Department of Statistics, and served as department head until 1995. I could write a whole article just about the world-class people he recruited, using his hound-like senses. He never missed a colloquium talk, and could judge within the first

15 or 20 minutes, who had "substance." Here is a very short list of people he hired in his department: Joop Kemperman, Herman Rubin, Sree Pillai, Prem Puri, Jim Berger, Bill Studden, Jayanta Ghosh, Andrew Rukhin, David Moore, Leon Gleser, Burgess Davis, Steve Lalley, Tom Sellke, Glen Baxter, Mary Ellen Bock, Virge Anderson, George McCabe, Wei-Liem Loh, Tony Cai, Dimitris Politis, Rebecca Doerge, Ker-Chau Li. During his 28-year tenure as Head of the Purdue statistics department, the best shining stars of the profession visited regularly: D. Basu, Susie Bayarri, Peter Bickel, Larry Brown, George Casella, Y. S. Chow, Morris DeGroot, Holger Dette, Persi Diaconis, Malay Ghosh, Len Haff, Iain Johnstone, Jack Kiefer, T.L. Lai, Lucien Le Cam, Carl Morris, Tony O'Hagan, Ingram Olkin, C.R. Rao, Christian Robert, Jerry Sacks, Pranab Sen, Bill Strawderman, Bob Wijsman, Michael Woodroofe, Grace Yang, and numerous others. During this period, the department became (and remained, until the end of his tenure in 1995) ranked seventh nationally; statistics faculty were made Sloane Fellows, Guggenheim scholars, IMS Presidents, COPSS award winners, IMS special invited and Medallion lecturers, ASA Presidents, editors of several of the Annals... Purdue University Honorary DSc degrees were given to some prominent leaders of the profession. Shanti had his focus on one dot on the wall: become and remain a top-10 department in the USA. The Purdue statistics department was his family, and he was about the best "father" possible. Selfless, responsible, societally ambitious, encouraging of the "cream," not afraid to trim. He maintained wide international networks to know quickly who to recruit.

He launched the Purdue International Symposia, co-chairing it from 1976 to 1997, and it became the most prominent international conference in statistics and probability after the Berkeley symposia folded.

His publications were many, including several well-known books; he was a household name in selecting and estimating largest means, or a group of largest means. These have potential for concrete use in the high dimensional variable selection problems of today. His beginnings were certainly classical, but in the mid-eighties, he ventured into Bayesian and full decision theoretic solutions of some of his problems. Sometimes he did empirical Bayes. He would always do a theoretical study of the operating characteristics of his methodologies. He would sometimes work out convergence rates of probabilities of correct selections, sometimes convergence rates of Bayes risks or regrets, conservative minimax such as  $\Gamma$ -minimax. It is astonishing that 63 years ago, with hardly any computing power available, he doggedly produced tables of the joint CDF of multivariate normal and multivariate t-distributions. He also did a lot of work that was original and practically useful on reliability and statistical quality control. Many people are surprised that Shanti Gupta wrote a number of articles on Mahatma Gandhi's ideas on labor-capital relations and economic philosophy, whether Gandhi was an economic egalitarian.

Shanti Gupta was a gracious person, with a gentleman's manners. Hosting faculty or members of external review boards at his home, he would serve the best wine in the world. He enjoyed north Indian food immensely, and his wife Marianne learned to make a good chicken curry from him.

Shanti Gupta was one of those vanishingly rare types: a man of quiet scholarliness, an enthusiast, a self-minimizer, and the epitome of integrity. In short, a rare, delicate, elegant, and in some ways a peerless statistical academic. I miss him. He should be missed, a whole lot.

## **Student Puzzle Corner 49**

Anirban DasGupta says, "We have a fun component in our problems this time. The probability problem is an interesting theoretical calculation. The statistics problem is a contest: the top three winners will get our usual recognition, of name, affiliation and (if there's room) photo. Of course, we will also recognize those who send correct answers to the probability problem alone and do not attempt the contest problem." Here are the two components of this month's problem:

**Puzzle 49.1** Suppose we have *n* i.i.d. standard normal observations, and *n* i.i.d. standard Cauchy observations, and assume furthermore that all 2n observations are mutually independent.

(a) Derive an expression for  $\mu(n)$ , the expected number of Cauchy observations that fall within the convex hull of the normal observations.

(b) Compute this expected value when n = 7, 25, 50.

(c) Can you say something concrete about the asymptotic order of  $\mu(n)$ ? Can you justify this, even if it is heuristic?

Puzzle 49.2 And now our contest problem. The following dataset of 14 observations consists of seven standard normal and seven standard Cauchy observations. They were not made up. There are seven simulated standard normal and seven simulated standard Cauchy observations in the dataset. The 14 observations are reported Deadline: March 15, 2024 in ascending order. You are not told which are the Cauchy observations. Identify the seven Cauchy (and by default, the seven normal) observations. You do not have to give a reason, but a reasoned answer would be more satisfactory. For each observation whose distribution you identify correctly, you will get +1 point, and for each misidentified observation, you will get -1 point. You cannot leave any of the 14 observations unidentified. Your score is the total of your 14 points. The top three answers are those with the top three scores. In the case of ties, we will treat the tied answers equally.

Student members of IMS are invited to submit solutions to bulletin@ imstat.org (subject "Student Puzzle Corner"). If correct, we'll publish your name (and photo, if there's space), and the answer. in the next issue. The Puzzle

Editor is Anirban DasGupta. His decision is final.

Here is the dataset: {-50.64, -6.41, -1.39, -0.72, -0.70, -0.16, -0.11, 0.24, 0.92, 1.01, 1.17, 1.75, 6.65, 12.42}

#### A Reminder of Puzzle 48

**Puzzle 48.1a** Show that  $P(G(3, p) \text{ is connected}) = 3p^2 - 2p^3$ .

48.1b We call a vertex isolated if its degree is zero. Find a formula for the mean and the variance of the number of isolated vertices in G(n, p).

**48.1c** Give an elementary proof that the number of isolated vertices in G(n, n) $p_n$ ) converges in probability to zero if  $p_n = c \frac{\log n}{n}$  with c > 1. Can you make a conjecture about the limiting behavior of the number of isolated vertices in G(n, n) $p_n$ ) if  $p_n = c \frac{\log n}{n}$  with c = 1?

**48.1d** Suppose  $p = p_n = c \frac{\log n}{n}$  where 0 < c < 1. What can we conclude about  $\lim_{n\to\infty} P(G(n, p_n) \text{ is connected})?$ 

**Puzzle 48.2a** Suppose you have obtained *N*=100 independent realizations of a G(n, p), where you know n, but you are not willing to assume a known value for p. Suggest a reasonable method to estimate p based on your 100 realizations of G(n, n)*p*). You can suggest more than one method.

**48.2b** Suggest a formulation for the following question: Find a best fitting G(n, p)to a realized graph  $G_0$  on *n* vertices.

#### Solution to Puzzle 48

Congratulations to Deborshi Das [pictured right] from Indian Statistical Institute, Delhi, for a sterling example of precision, lucidity and completeness. Anirban DasGupta explains:



Puzzle 48.1 (see left) If we denote the three verti-

ces as *A*, *B*, *C*, then the prototypes of connected graphs are  $A \sim B \sim C \not\sim A$ , and  $A \sim B \sim C \sim A$ . So, the probability that G(3, p) is connected is  $\binom{3}{2}p^2(1-p) + p^3 = 3p^2 - 2p^3$ . For the next part, write the total number of isolated vertices as the sum of the indicators of vertex *i* being isolated. The expectation of each of these indicators is obviously  $(1 - p)^{n-1}$  and so the expected number is  $n (1 - p)^{n-1}$ . These indicators are not independent. But their covariances can be easily calculated. Then a little bit of algebra gives that the variance of the number of isolated vertices is

 $n(1-p)^{n-1}+2\binom{n}{2}(1-p)^{2n-3}-n^2(1-p)^{2n-2}$ Moving on to the next part, by elementary calculus,  $n(1 - \frac{c \log n}{r})^{n-1} \sim n^{1-c}$ in the usual sense of this notation. It follows that if 0 < c < 1, then the

## **OBITUARY: R.V. Ramamoorthi** 1950–2023

R.V. Ramamoorthi passed away on November 22, 2023, at the relatively young age of 73. Known as RVR to many, he was on the faculty at Michigan State University for 37 years. He retired voluntarily in 2019 and moved with his wife Deepa (whom he married in 1985) to Bengaluru, India for personal reasons. He was receiving treatment at a local hospital in Bengaluru for respiratory problems and died from complications.

RVR was born in Palakkad, which is now in the state of Kerala in South India, but he was Tamil speaking. His father, R.A. Vaideeswaran, was an administrative officer with US AID, and his mother, Mangalambal, was a housewife. After finishing his Masters at Utkal University in Bhubaneswar, he joined the Indian Statistical Institute (ISI) in Kolkata for his PhD. He completed his dissertation under the supervision of Professor Jayanta Ghosh and graduated in 1981. He spent a year as a Visiting Assistant Professor at Florida State before moving to Michigan State in East Lansing in 1982. He was on the faculty in the Department of Statistics and Probability from 1982–2019, first as a visitor, then joining the tenure-track faculty in 1984, and rising up through the ranks to Full Professor.

Over the course of his career, RVR held visiting appointments at several institutions, including the universities of Pavia, Rome, and Bocconi in Italy, ISI (Kolkata, Delhi, Bengaluru), Indian Institute of Science, and Chennai Mathematical Institute. He served on several editorial boards; most notably, he provided extensive service to *Sankhyā* in several capacities.

RVR's research interests were theoretical. He was an ardent Bayesian and was interested in the Foundations of Statistics throughout his career. His PhD dissertation was on Pairwise Sufficiency and Bayes Sufficiency in Undominated Experiments. He continued to study concepts of sufficiency, ancillarity, and Bayesian inference. He was active until the end, and he completed his last paper dealing with "Doob's theorem on posterior consistency" just a few weeks before he was hospitalized. He was preparing to teach a course next semester on Graphical Models at the Chennai Math Institute.

RVR's most well-known research contribution is his book *Bayesian Nonparametrics*, co-authored with J.K. Ghosh, and it is widely considered to be a *tour de force*. The book's reviewers noted that it presented a "comprehensive treatment" of the area with "theoretical underpinnings of nonparametric priors in a rigorous yet extremely lucid style ... It is indispensable to any serious Bayesian. It is bound to become a classic in Bayesian nonparametrics."

Despite his theoretical research, RVR had broad interests and was well informed about emerging directions in the field. He fully recognized the importance of applications and appreciated the need to recruit colleagues with diverse interests. RVR was an unusual academic in these days of "publish or perish" philosophy and emphasis on research funding. He marched to the beat of his own drum, worked only on problems that interested him, and was selective in publishing. But he was a deep thinker, and his contributions were always significant and insightful.

On a personal level, RVR led a simple life and was very non-materialistic. In keeping with his disdain for ceremonies and rituals, he had asked that his body and organs be donated for scientific research. He



R.V. Ramamoorthi

was a voracious reader with diverse interests, and he could carry a conversation on pretty much any topic. He also had a great sense of humor. One of us [VN] will always remember the joke he heard from RVR: "The most interesting stories must be complex. They should have a real part and an imaginary part." It was a lot of fun to spend an evening with him, a glass of whiskey in hand, sharing stories and talking about people and the profession. He was especially fond of his time as a graduate student and the opportunities he had to get to know ISI's distinguished faculty at the time as well as many legendary visitors. He was also a great mentor to students, having served as Graduate Director, and he supported the careers of many junior faculty members.

RVR leaves behind his wife Deepa, and siblings, nieces, and nephews, both in India and the US. He will be dearly missed by all of them, as well as by his many friends.

> Written by Vijay Nair, University of Michigan, Ann Arbor, USA; and B.V. Rao and Rajeeva Karandikar, Chennai Mathematical Institute, India

## **OBITUARY: Kasala Subramanyam**

1946-2023

Dr. Kasala Subramanyam passed at the residence of his daughter, Mohana, in Odessa, Texas on December 1, 2023. He was 77 years old. His children lost a devoted and caring father. His wife lost a lifetime partner. His friends in his profession lost an immeasurable companion.

Dr. Subramanyam was born in 1946, in Munagamakula Kothuru, Andhra Pradesh, India. Following traditional schooling, he earned a Bachelor's and Master's degree in Statistics from Sri Venkateswara University,



Kasala Subramanyam

securing top ranking in the final exams. After negotiating a national competitive entrance exam successfully, he was one of two students who were admitted into the Research Course in 1967 as a prelude to the PhD program at the Indian Statistical Institute (ISI).

It was at the ISI that I met Kasala; I was one year senior to him. He endeared everyone at the Institute by his disarming smile and witticisms. There were many adages concocted by Kasala on the spot relevant to the prevailing environment. His sayings reminded me of *The Good Soldier Švejk*, Jaroslav Hašek's creation. His company was lively and there was never a dull moment. The Institute provided intellectual nourishment for us all. Kasala injected camaraderie into everything we research scholars at the Institute did, besides providing intellectual stimulation.

He started working in some aspects of Statistical Inference under the guidance of Professor Jayanta Kumar Ghosh, Indian Statistical Institute and Purdue University. He made notable contributions in Multivariate Calibration with a 1994 paper published in the *Annals of Statistics*, among others.

Early on, he took up a position at the University of Dar Es Salaam, Tanzania. He visited the University of Sheffield at my behest to complete research into his PhD degree. After a stint in Tanzania, he took up a faculty position at the University of Pittsburgh, followed by a move to the University of North Carolina, Wilmington, where he remained until retirement. I continued to visit him in the summers on research work. We attended JSM and some IMS meetings for many years together. At the University of North Carolina, he is remembered for his active role in teaching, consulting, and the program in Statistics.

> Written by Marepalli Bhaskara Rao, University of Cincinnati

## **Student Puzzle Corner solution:** continued from page 17

probability that the number of isolated vertices is 0 converges to 0, and so the connectedness probability must also converge to 0.

If *c* is exactly equal to one, the expected value as well as the variance of the number of isolated vertices converges to 1. One would feel tempted to conjecture that the number of isolated vertices has a limiting Poisson distribution with mean 1, without requiring any further centering or norming. This is actually true, but requires quite a bit of calculation. The most direct proof is to use the *factorial moment method* for proving weak convergence to Poissonity. (A reference is Galambos and Simonelli (1996), p.137.) Finally, the last part follows simply from the fact that if the expectation of a sequence of non-negative random variables converges to 0, then the sequence converges to 0 in probability.

**Puzzle 48.2** We have various ways to choose a likelihood function to address this problem. A full likelihood would count all the edges

that formed. This is a binomial, but identifying all the edges may be difficult for large n. One can also sacrifice exactness for simplicity of computation. For example, observe which of the realizations are connected. The connectedness probability can actually be written. Then you get another likelihood function. There are other possibilities too, evidently. Whichever likelihood function one uses, p can be estimated by maximum likelihood, for instance.

For the second part, basically, one would like to use a graph *metric* and minimize the metric distance between G(n,p) and  $G_0$ . There are very interesting ways to attack this problem. For example, one can look at the adjacency matrices of G(n,p) and  $G_0$  and compute a distance between them by using a suitable matrix norm. This will involve serious computation. One may use other graph distances to lessen the computation. You can get some ideas of what distances you can use in Wolfram Language Documentation.

## ACM/IMS **Journal of Data Science**



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JDS follows a timetable with three fixed submission deadlines. Visit the JDS website for details.

# Next deadline May 15

JDS is a new journal established to bridge research communities, jointly published by the Association of Computing Machinery (ACM) and the Institute of Mathematical Statistics (IMS). The journal publishes high-impact research from all areas of data science, across foundations, applications and systems. By combining elements of journal and conference publishing, JDS aims to serve the needs of a rapidly evolving research landscape.



## Recent papers: two co-sponsored journals

## Electronic Journal of Statistics

The *Electronic Journal of Statistics (EJS)* publishes research articles and short notes on theoretical, computational and applied statistics. The journal is open access. Articles are refereed and are held to the same standard as articles in other IMS journals. Articles become publicly available shortly after they are accepted. This journal is a free access official journal of the IMS and the Bernoulli Society. The Co-Editors are Grace Y. Yi and Gang Li. Read more at https://imstat.org/journals-and-publications/electronic-journal-of-statistics/

Author or publication fees are not required. Voluntary fees or donations to the Open Access Fund are accepted (see https://www. imstat.org/shop/donation/). Expenses not covered by voluntary payments are paid for by the co-sponsoring societies as a service to the community.

Access papers at https://projecteuclid.org/journals/electronic-journal-of-statistics

### **Statistics Surveys**

*Statistics Surveys* publishes survey articles in theoretical, computational, and applied statistics. The style of articles may range from reviews of recent research to graduate textbook exposition. Articles may be broad or narrow in scope. The essential requirements are a well specified topic and target audience, together with clear exposition. This journal is a free access official journal, sponsored by the American Statistical Association, the Bernoulli Society, the IMS, and the Statistical Society of Canada. The Coordinating Editor is Wendy L. Martinez, and the Editor for IMS is Yingying Fan. The other editors are Ranjan Maitra (ASA), Bodhisattva Sen (Bernoulli), and Richard A. Lockhart (SSC). Read more at https://imstat.org/journals-and-publications/statistics-surveys/

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Access papers at https://projecteuclid.org/journals/statistics-surveys

## **Thirty Years of Women in Probability**

Rick Durrett writes: Thirty years ago, in Ithaca, NY, there was a meeting called Workshop for Women in Probability (WWP). [You can see the photo of attendees below; a larger version, with names, is at https://sites. math.duke.edu/~rtd/wwp/photo94.html.]

To mark the 30th anniversary of this meeting, there will be a similar one, held **August 5–6**, 2024 at the University of North Carolina in Chapel Hill, hosted by the probability group in the department of Statistics and Operations Research. Speakers include Jasmine Foo (Minnesota), Tai Melcher (U. of Virginia), Tamara Broderick (MIT), Ivana Bozic



(Washington), Dana Randall (Georgia Tech), Samantha Petti (Tufts), and Lea Popovic (Concordia). See https:// services.math.duke.edu/~rtd/

After the initial 1994 meeting, the second WWP meeting was held at Cornell, October 5–7, 2008: https:// services.math.duke.edu/~rtd/SEPC2021/wwp2008.pdf. A third was held October 14–16, 2012: https://sites.math. duke.edu/~rtd/wwp12/WWP2012.html.

Tai Melcher then took over organizing these activities. The retitled **Conference on New Developments in Probability** (CNDP) had male and female speakers. The inaugural CNDP, held May 6–8, 2016, was jointly hosted with Northwestern University, in coordination with their Emphasis Year in Probability: https://sites.math. northwestern.edu/~auffing/wipconference.html. A virtual meeting was held during the pandemic.

The next CNDP meeting will be held in Montreal (Centre de Recherches Mathématiques), September 26–28, 2024: http://womeninprobability.org/CNDP.html.

## IMS meetings around the world

## Joint Statistical Meetings

2024 Joint Statistical Meetings August 3-8, 2024 Portland, Oregon, USA

w https://ww2.amstat.org/meetings/jsm/2024/

Your Late-Breaking Session proposal is invited: A late-breaking session covers one or more technical, scientific, or policy-related topics that has arisen in the one-year period before the JSM in which the session is proposed to appear. Proposals are accepted by Debashis Ghosh, JSM 2024 program chair, via the online system (https://ww3.aievolution.com/JSMAnnual2024) until April 15, 2024, and should include the following:



- Session title
- Session description, including a summary of its statistical and scientific content, an explanation of its timeliness, and comments about the specific audiences for which it will be of principal interest
- Format of the session (paper or panel)
- Names of the session organizer; chair; and all speakers, panelists, and/or discussants (prospective session participants should agree to participate in the session before the session proposal is submitted)
- Complete affiliation and contact information (mailing address, phone, email) for organizer, chair, and all participants
- Title for each presentation (if paper session)
- Web links to relevant technical reports, if applicable

Registration & housing reservations open May 1, 2024.

#### JSM dates for 2025-2029 (no information yet for JSM2027)

IMS Annual Meeting	JSM 2026	IMS Annual Meeting
@ JSM 2025	August 1–6, 2026	@ JSM 2027
August 2–7, 2025	Boston, MA, USA	<b>Dates and location</b>
Nashville, TN, USA		to be confirmed

#### **Stochastic Networks** July 1-5, 2024 KTH, Stockholm, Sweden

#### w https://www.kth.se/sn2024

Over the last three decades, this conference has become the most prestigious venue for mathematicians and applied researchers who share an interest in stochastic network models. It began with the workshop organized by Peter Glynn and Tom Kurtz in Madison Wisconsin in 1987 and is now a biannual conference. The conference typically gathers 200 invited participants and consists of 21 invited talks (each one hour long, including questions) and poster sessions.

Poster submission deadline: April 15, 2024. Please use the form on the website.

Philadelphia, PA, August 4-9, 2029 USA Seattle, WA, USA 2024 IMS China Meeting

**JSM 2028** 

NEW

August 5-10, 2028

July 6-8, 2024 Yinchuan City, Ningxia, China w TBD

Please make a note of the date and location of the next IMS China meeting, which will be held in Yinchuan City, in Ningxia, China, from July 6–8, 2024.

**IMS Annual Meeting** 

NEW

@ JSM 2029

We'll update the announcement with more information when we have it ...

## 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: Salzburg, Austria, July 6–9

JSM: Boston, MA, August 1-6, 2026



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

## **More IMS meetings**



2024 ENAR/IMS Spring Meeting March 10–13, 2024 Baltimore, MD, USA

w https://www.enar.org/meetings/spring2024/

The 2024 ENAR/IMS Spring meeting has the theme *ENAR – A Home for Every Biostatistician.* Reneé H. Moore, ENAR 2024 President, says, "No matter whether you are a first-time attendee, a first-time attendee since the pandemic, or too-many- times-to-count attendee, our goal is that you find something exciting and relevant in the scientific and educational programs."

The Presidential Invited Address speakers are **Susan S**. **Ellenberg** (Perelman School of Medicine at the University of Pennsylvania), on "Statisticians and the COVID-19 Pandemic and **Adrian Coles** (Bristol Myers Squibb), on "We Are All in the People Business: A Marine's Reflection on Leadership."

The meeting takes place at the Baltimore Marriott Waterfront which is now accepting room reservations. See https://www.enar.org/meetings/spring2024/hotel.cfm



Baltimore's inner harbor at night

#### IMS annual meeting 2024:

Bernoulli–IMS 11th World Congress in Probability & Statistics August 12–16, 2024, at Ruhr-University Bochum, Germany

w https://www.bernoulli-ims-worldcongress2024.org/ The Institute of Mathematical Statistics Annual Meeting will be held at the 11th World Congress. The plenary speakers have been announced: see https://www.bernoulliims-worldcongress2024.org/plenary-lectures. With 51 invited paper sessions, 55 contributed sessions, and poster sessions, there's something for everyone.

Submissions and registration are now open. Registration of speakers/presenters of contributed talks/

## Theory and Foundations of Statistics in the Era of Big Data April 19–21, 2024

#### Florida State University in Tallahassee, FL, USA

w https://sites.google.com/view/theory-and-foundations-of-stat/ Theory and Foundations of Statistics in the Era of Big Data is a conference hosted by the Department of Statistics, Florida State University, in coordination with the International Indian Statistical Association (IISA), to celebrate the birth centenary of Debabrata Basu and Raghu Raj Bahadur and to honor their fundamental contributions to statistics.

Plenary speakers are **Tony Cai**, Wharton School of the University of Pennsylvania; **Merlise A. Clyde**, Duke University; and **Xiao-Li Meng**, Harvard University.

There will be a Student Paper Competition. Students who are enrolled in an MS/PhD (or equivalent) program in Statistics, Data Sciences, or related fields by the deadline (to be announced) are eligible. Women and under-presented minorities are strongly encouraged to apply.

Registration will open soon.

## IMS–CANSSI joint event: Navigating different stages of a successful career in academia, industry, and beyond

#### August 2024 (exact date TBD), at JSM Portland, USA The Institute of Mathematical Statistics and the Canadian Statistical Sciences Institute are pleased to announce their first joint event, "Navigating different stages of a successful career in goademia, inductry

"Navigating different stages of a successful career in academia, industry, and beyond," at JSM 2024 in Portland, Oregon. A panel of statisticians from different areas and stages, ranging from junior to senior, will discuss their career path, offer advice, and answer Q&A. This mentoring/networking event is suitable for statisticians and data scientists in all sectors and at all stages of their careers. This will be a lunch-time event (with specific date TBD), and free boxed lunch will be provided to the first 75 registered participants. Registration will begin on May 1, 2024 — detailed information will be provided closer to the registration start date.

UPDATED

posters by April 30, 2024. Early registration deadline is May 31, 2024. Note that the registration fee includes a local public transportation pass (the *VRR Preisstufe D*, valid from August 11–17), and which includes trains from Düsseldorf airport. A list of hotels is now available on the congress website, including several that are close to Bochum central station (*Bochum Hbf*).



## **More IMS meetings**

International Symposium on Nonparametric Statistics (ISNPS 2024) 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, 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.

**Submissions and registration are now open.** The deadline for submission of keynotes, invited talks, contributed talks and contributed posters is April 4, 2024. The early registration deadline is April 29, 2024.

#### 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.

#### WNAR / IMS / Graybill 2024 June 9–12, 2024 Fort Collins, Colorado, USA

w https://wnar.org/wnar2024

The 2024 meeting of the Western North American Region of the IBS will be held jointly with the 2024 Graybill Conference. There will be five short courses on June 9, a plenary lecture, Graybill keynote speech and keynote panels from international regulators, invited and contributed sessions, young investigator events, and a Student Paper Award with oral sessions. The theme of the Graybill Conference (https://statistics.colostate.edu/ graybill-conference-2024/) is "Rare Disease Drug Development."

#### Stochastic Processes and their Applications 2025 July 14–18, 2025 Wrocław, Poland

w https://spa.pwr.edu.pl/

The 44th Conference on Stochastic Processes and their Applications (SPA 2025) will be held in Wrocław, Poland, from 14 to 18 July, 2025.

SPA Conferences, organised by the Bernoulli Society and co-sponsored by IMS, are the most important series of international meetings on the

theory and applications of stochastic processes.

Organizing committee members are Krzysztof Bogdan (Wrocław University of Science and Technology) and Krzysztof Dębicki (University of Wrocław).



Convention Bureau, Wrocła

You can pre-register at https://spa.pwr.edu.pl/preregistration.

#### 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

#### 2024 Seminar on Stochastic Processes (SSP) March 13–16, 2024 Houston, TX, USA

#### w https://ssp2024.rice.edu/

The 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.

Apart from informal presentations by conference participants, there will be plenary talks by **Tom Hutchcroft**, **Etienne Pardoux**, **Sébastien Roch [IMS Medallion Lecture]**, **Ludovic Tangpi**, and **Yilin Wang**. The main conference will be held on March 14–16, 2024, on the campus of Rice University in Houston, TX, USA. On March 13, there will be a special set of tutorial lectures and discussions targeted at early-career researchers; the tutorial lecturer is **Perla Sousi** (University of Cambridge).

**Registration has now closed.** SSP 2024 will be held in person, though remote participation may be made available for mobility accommodation.

#### Ninth Workshop on Biostatistics and Bioinformatics May 3–5, 2024

#### Atlanta, GA

w https://math.gsu.edu/yichuan/2024Workshop/

Biostatistics and Bioinformatics have been playing very important roles in scientific research fields in recent years. The goal of the ninth workshop is to stimulate research and to foster the interaction of researchers in the research areas. The workshop will provide the opportunity for faculty and graduate students to meet the top researchers, identify important directions for future research, facilitate research collaborations.

The keynote speaker is **Michael Kosorok**, University of North Carolina at Chapel Hill.

#### Statistics in the Age of Al May 9–11, 2024 Washington DC, USA

w https://statistics.columbian.gwu.edu/statistics-age-ai

The conference "Statistics in the Age of AI" aims to unite established academics, young researchers, and industry professionals in the field of Statistics to explore the impact of the new AI, especially Large Language Models, on both research and education in Statistics, and how Statistics can contribute to the new AI development. Some topics of the conference include efficient handling of data, uncertainty quantification, and responsible decision-making. The conference offers multiple oral sessions, a poster session, a panel discussion, and two short courses on causal inference and conformal inference respectively.

#### IMS International Conference on Statistics and Data Science (ICSDS) December 16–21, 2024 Nice, France

w https://sites.google.com/view/icsds2024

The third IMS International Conference on Statistics and Data Science will take place in beautiful Nice, on the south coast of France, December 16–21, 2024.

The objective of ICSDS is to bring together researchers in statistics and data science from academia, industry, and government in a stimulating setting to exchange ideas on the developments of modern statistics, machine learning, and broadly defined theory, methods, and applications in data science. There will be a student paper award competition, in addition to plenary sessions, and invited, contributed and poster sessions. Young researchers are particularly encouraged to participate, as a portion of the invited sessions will be designated for young researchers.

#### Writing Workshop for Junior Researchers 2024 July 19 & July 26 *online* & August 4, 2024 *in-person* at JSM in Portland, OR

w https://www.niss.org/events/writing-workshop-juniorresearchers-2024

This popular short course is hosted by NISS. This year it will be hybrid with virtual lectures and meetings with your mentor prior to JSM on Fridays 7/19 and 7/26, and an in-person session at JSM to be held on Sunday, August 4, 2024. For recent doctoral graduates who want to improve communication skills. Pre-registration deadline: June 30.

#### Fifth International Workshop on the Statistical Analyses of Multi-Outcome Data

#### 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 (SAM 2024), will take place in Salzburg, Austria, on July 9–10, 2024. Salzburg, Mozart's birthplace and the picturesque setting for *The Sound of Music*, is a spectacularly scenic city and an ideal destination for a summer visit. 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 keynotes (Ian McKeague and Markus Pauly), 24 invited sessions, and a poster session. A banquet will be held on July 9.



## Other meetings and events around the world

#### LinStat 2024 September 2–6, 2024 Poprad, Slovakia

#### https://linstat2024.science.upjs.sk/

The International Conference on Trends and Perspectives in Linear Statistical Inference, LinStat 2024, will bring together researchers sharing an interest in a variety of aspects of statistics and its applications as well as matrix analysis and its applications to statistics, and offer them a possibility to discuss current developments in these subjects. The conference will mainly focus on a number of topics. The topics that have been selected so far include estimation, prediction and testing in linear models, robustness of relevant statistical methods, estimation of variance components appearing in linear models, generalizations to nonlinear models, design and analysis of experiments, including optimality and comparison of linear experiments, and applications of matrix methods in statistics.

The work of young scientists is highly appreciated. The list of Invited Speakers is opened by the winners of the Young Scientists Awards of Linstat 2022. The Scientific Committee will award the best presentation and best poster. The awarded will be Invited Speakers at the next edition of LinStat.

Registration is open; with early bird deadline April 30, 2024.

#### 2024 CRM–PIMS Summer School in Probability July 1–26, 2024 Montreal, Canada

https://secure.math.ubc.ca/Links/ssprob24/ The 2024 CRM–PIMS summer school will feature two long courses, given by Elliot Paquette and Perla Sousi. There will also be three mini-courses, given by Emma Bailey, Jacopo Borga (week 3), and Igor Kortchemski (week 4).

The organizers, Louigi Addario-Berry, Omer Angel, Mathav Murugan, and Gordon Slade, are also planning to run a summer school in 2025 in Vancouver, with courses by Tom Hutchcroft and Mathav Murugan and mini-courses by Nathanael Berestycki, Nina Holden, and Tianyi Zheng. 2024 Conference on Modern Topics in Stochastic Analysis and Applications (in honour of Terry Lyons' 70th birthday) April 22–26, 2024 London, UK

https://www.imperial.ac.uk/events/168741/conference-on-modern-topicsin-stochastic-analysis-and-applications-in-honour-of-terry-lyons-70thbirthday/

Stochastic Analysis deals with the analysis of dynamical systems evolving under the influence of randomness. In the last 30 years, it developed into one of the most active areas of mathematics worldwide. UK-based mathematicians have pioneered its recent developments. Perhaps the most influential contribution in this area has been Terry Lyons' theory of rough paths, a mathematical language to describe the effects a stream can generate when interacting with non-linear dynamical systems. It has had a fundamental impact on extending Itô's theory of SDEs beyond semimartingales, and on the development of Hairer's work on regularity structures, which provides a robust solution theory for many singular stochastic PDEs arising from physics. In recent years, rough path theory has started to play a key role in the design of state-of-the-art machine learning algorithms for processing noisy and high-dimensional data streams in a wide range of contexts.

This conference will gather experts from different areas of theoretical and applied stochastic analysis to investigate and discuss current and future directions of this field, with special emphasis on the interplay between theory and applications. A special session is planned with presentations from industrial and academic practitioners. This conference will mark the 70th birthday of Prof. Terry Lyons.

#### MCQMC 2024

#### August 18–23, 2024. Waterloo, ON, Canada

https://uwaterloo.ca/monte-carlo-methods-scientific-computingconference/

The 16th International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing (MCQMC) will take place at the University of Waterloo, Canada. The biennial MCQMC conference series attracts 150–200 participants. Recent conferences have attracted researchers in Markov-chain Monte Carlo (MCMC).

In a nutshell, Monte Carlo (MC) methods study complex systems by simulations fed by computer-generated pseudo-random numbers. QMC methods replace these random numbers by more evenly distributed (carefully selected) numbers to improve their effectiveness. A large variety of special techniques are developed and used to make these methods more effective in terms of speed and accuracy. The conference focuses primarily on the mathematical study of these techniques, their implementation and adaptation for concrete applications, and their empirical assessment.

## Long Programs at iMSI

#### Uncertainty Quantification and AI for Complex Systems March 3—May 23, 2025 iMSI, Chicago, USA

https://www.imsi.institute/activities/uncertainty-quantification-and-ai-forcomplex-systems/

The field of Uncertainty Quantification (UQ) has broad applications in science and engineering and provides a computational framework for quantifying input and response uncertainties, making model-based predictions and their inferences. As science and technology advance, UQ problems become more complex and diverse, requiring many concepts and tools from mathematics, statistics, machine learning, optimization, and advanced computing techniques. The fast development of Artificial Intelligence (AI) has benefited many fields, including UQ. Specifically, new AI and machine learning algorithms are applied to solve larger-scale and more complicated UQ problems. UQ, together with the advancements in AI and machine learning, has the potential to drive new scientific discoveries and enable engineers to design more robust and reliable systems.

This long program will focus on the newest development of UQ methodologies and how they can improve AI systems and provide solutions to modeling complex systems. It will also give an outlook on future UQ directions and challenges. Through all the activities proposed, the program will bring together interested parties, researchers, practitioners, and students, from different areas of UQ, promote communication, and further break down the barriers between disciplines. The program also has a significant mentoring component, which connects researchers and students at different career stages.

Program workshops (for links see the website above):

UQ and Trustworthy AI Algorithms for Complex Systems and Social Good: March 3–7, 2025

Experimental Design, Sampling, and Optimization Strategies in Uncertainty Quantification: March 31–April 4, 2025

Uncertainty Quantification for Material Science and Engineering: April 21–25, 2025

Uncertainty Quantification and Machine Learning for Complex Physical Systems: May 19–23, 2025

Organizers: Mihai Anitescu, Argonne National Laboratory and University of Chicago; Derek Bingham, Simon Fraser University; Xinwei Deng, Virginia Tech; Donald Estep, Simon Fraser University; Robert B. Gramacy, Virginia Tech; Fred Hickernell, Illinois Institute of Technology; Roshan Joseph, Georgia Tech; Lulu Kang, University of Massachusetts– Amherst; C. Devon Lin, Queen's University; Guang Lin, Purdue University



#### Statistical Methods and Mathematical Analysis for Quantum Information Science September 16–December 13, 2024 iMSI, Chicago, USA

https://www.imsi.institute/activities/statistical-methodsand-mathematical-analysis-for-quantum-informationscience/

Quantum information science is a rapidly developing and broad field of research. It has made significant progress over the last decade, including the development of many promising applications such as efficient quantum computational algorithms, secure quantum communication protocols, and ultra-sensitive quantum sensors (to name just a few). Besides practical applications, quantum information science also sheds light on fundamental physics questions, including efficient descriptions of many-body systems, entanglement characterization of topological quantum systems, and quantum information scrambling of manybody systems. Novel mathematical tools and statistical models play a crucial role in investigating quantum systems. However, there are still many important open questions in quantum information science, which urgently need novel mathematical tools and statistical models. The aim of this program is to bring experts with different backgrounds of mathematics, control, statistics, physics, material, and computer science together, to spur transformational change in quantum information science.

Program workshops (for links see the website above): Quantum Algorithms: September 16–20, 2024 Quantum Networks: September 30–October 4, 2024 Quantum Sensing: October 14–18, 2024 Quantum Hardware: October 28–31, 2024

Quantum Error Correction: November 11–14, 2024

Organizers: Aashish Clerk, University of Chicago; Liang Jiang, University of Chicago; Mazyar Mirrahimi, Inria Paris; Pierre Rouchon, Mines Paris – PSL

## **Employment Opportunities**

#### Australia: Clayton, Victoria

Monash University School of Maths: Multiple positions as Lecturer / Senior Lecturer/ Associate Professor https://jobs.imstat.org/job//72154307

#### **China: Beijing**

**Center for Statistical Science, Tsinghua University** Assistant Professor and Lecturer https://jobs.imstat.org/job//72154319

#### **China: Shenzhen**

School of Data Science at The Chinese University of Hong Kong, Shenzhen (CUHK-SZ)

Faculty Openings: Tenured or tenure-track positions & Teaching-stream positions (all ranks) https://jobs.imstat.org/job//71817607

#### **China: Guangzhou**

The Hong Kong University of Science and Technology (Guangzhou): Financial Technology Thrust

Open-rank faculty positions in Fintech, Financial Engineering, Mathematical Finance, Operations Research, AI, Machine Learning, Statistics, and Data Science https://jobs.imstat.org/job//71060079

#### **United Kingdom: London**

Imperial College London Lecturer/Senior Lecturer in Statistics https://jobs.imstat.org/job//72114511

#### **United States: Phoenix, AZ**

Arizona State University Assistant/Associate/Full Professor in Biostatistics https://jobs.imstat.org/job//71893802

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**Georgia College and State University (GCSU)** Math Department Chair https://jobs.imstat.org/job//71833954

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The Mount Vernon School Middle School Math Instructor https://jobs.imstat.org/job//72241050

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**University of Chicago** Instructional Professor (open rank) in Data Science https://jobs.imstat.org/job//71599702

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University of Nebraska – Lincoln Department Head: Statistics https://jobs.imstat.org/job//71821844

#### United States: Kent, OH

Kent State University Full-time tenure-track assistant professor position in Applied Statistics https://jobs.imstat.org/job//71954972

#### **United States: Columbus, OH**

#### **The Ohio State University, Department of Statistics** Assistant Professor of Teaching Practice

https://jobs.imstat.org/job//72160990

## **International Calendar of Statistical Events**

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

#### **Online and Ongoing series**

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

Webinar series w https://www.niss.org/COPSS-NISS-covid-19-datascience-webinar-series

w https://warwick.ac.uk/fac/sci/statistics/news/upcomingseminars/abcworldseminar

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

**ONLINE** 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

#### March 2024

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

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

#### April 2024

April 19–21: Tallahassee, USA. Theory and Foundations of Statistics in the Era of Big Data w https://sites.google.com/view/ theory-and-foundations-of-stat/

April 22–26: London, UK. Modern Topics in Stochastic Analysis and Applications (in honour of Terry Lyons' 70th birthday) w https://www.imperial.ac.uk/events/168741/conference-onmodern-topics-in-stochastic-analysis-and-applications-in-honourof-terry-lyons-70th-birthday/

#### May 2024

May 3-5: Atlanta, USA. 9th Workshop on Biostatistics and

#### Bioinformatics w https://math.gsu.edu/yichuan/2024Workshop/

May 9–11: Washington DC, USA. Statistics in the Age of AI w https://statistics.columbian.gwu.edu/statistics-age-ai

May 15–17: Mexico City, Mexico. 2024 IAOS–ISI Conference w https://www.isi-next.org/conferences/iaos-isi-2024/

May 21–24: Orem, UT, USA. Eighth International Workshop in Sequential Methodologies w https://www.uvu.edu/math/events/ iwsm2024/index.html

#### June 2024

June 3–7: Lima, Peru. SAE 2023–2024 Conference w https://sae2023.pucp.edu.pe/

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

June 14–16: Nassau, Bahamas. Statistical Network Analysis and Beyond (SNAB2024). w https://sites.google.com/view/snab2024

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

June 30–July 3: Dijon, France. 44th International Symposium on Forecasting w https://isf.forecasters.org/

#### **July 2024**

July 1–4: Valletta, Malta. Control, Decision and Information Technologies (CoDIT 2024) w https://codit2024.com

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July 1–7: Venice, Italy. ISBA World Meeting 2024 NEW WEBSITE w https://www.unive.it/web/en/2208/home

July 1–26: Montreal, Canada. CRM–PIMS Summer School in Probability w https://secure.math.ubc.ca/Links/ssprob24/

Meeting w TBD

## International Calendar continued

#### July 2024 continued

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

July 9–10: Salzburg, Austria. Fifth International Workshop on the Statistical Analyses of Multi-Outcome Data w https://samworkshop.github.io/SAM\_2024/

July 15–19: Bristol, UK. Summer School on Symmetry and Randomness w https://heilbronn.ac.uk/2023/10/27/cmi-himrsummer-school-2024/

With July 19 & July 26 & August 4: online & at JSM Portland, USA. Writing Workshop for Junior Researchers 2024 w https:// www.niss.org/events/writing-workshop-junior-researchers-2024

#### August 2024

CANSSI joint event: Navigating different stages of a successful career in academia, industry, and beyond w TBD

w https://ww2.amstat.org/meetings/jsm/2024/

Congress in Probability and Statistics w https://www.bernoulliims-worldcongress2024.org/

August 18–23: Waterloo, Canada. MCQMC 2024 w https://uwaterloo.ca/monte-carlo-methods-scientific-computingconference/

August 18–23: Banff, Canada. BIRS Workshop on Causal Inference and Prediction for Network Data w https://www.birs.ca/ events/2024/5-day-workshops/24w5244

#### September 2024

September 2–5: Brighton, UK. Royal Statistical Society 2024 International Conference w https://rss.org.uk/training-events/ conference-2024/

September 2–6: Poprad, Slovakia. LinStat 2024 w https:// linstat2024.science.upjs.sk/

September 4–5: Birmingham, UK. Unlocking the potential: The IMA AI/ML Congress 2024 w https://ima.org.uk/23193/unlocking-the-potential-the-ima-ai-ml-congress-2024/

September 8–13: Ascona, Switzerland. Spatial and Temporal Statistical Modeling in Molecular Biology w https://spatialbio.net

September 16–December 13: iMSI, Chicago, USA. Long Program: Statistical Methods and Mathematical Analysis for Quantum Information Science w https://www.imsi.institute/ activities/statistical-methods-and-mathematical-analysis-forquantum-information-science/

#### December 2024

**Markov** December 16–21: Nice, France. **IMS International Conference on Statistics and Data Science** (ICSDS) **w** https:// sites.google.com/view/icsds2024

#### March 2025

March 3-May 23: iMSI, Chicago, USA. Long Program: Uncertainty Quantification and AI for Complex Systems w https://www.imsi.institute/activities/uncertainty-quantificationand-ai-for-complex-systems/

#### June 2025

June 23–27: Verona, Italy. 12th General AMaMeF conference w https://sites.google.com/view/amamef2025/

#### July 2025

July 13–17: The Hague, The Netherlands. 65th ISI World Statistics Congress w https://www.isi-wsc.org/

**MEW:** July 14–18: Wrocław, Poland. Stochastic Processes and their Applications 2025 w https://spa.pwr.edu.pl/

#### August 2025

**JSM 2025 w** www.amstat.org/meetings/joint-statistical-meetings

#### August 2026

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

#### Membership and Subscription Information: 2024

#### 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.

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The *IMS Bulletin* publishes articles and news of interest to IMS members and to statisticians and probabilists in general, as well as details of IMS meetings and an international calendar of statistical events. Views and opinions in editorials and articles are not to be understood as official expressions of the Institute's policy unless so stated; publication does not necessarily imply endorsement in any way of the opinions expressed therein, and the *IMS Bulletin* and its publisher do not accept any responsibility for them. The *IMS Bulletin* is copyrighted and authors of individual articles may be asked to sign a copyright transfer to the IMS before publication.

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4: June/July	May 1	May 15	June 1
5: August	July 1	July 15	August 1
6: September	August 15	September 1	September 15
7: Oct/Nov	September 15	October 1	October 15
8: December	November 1	November 15	December 1

## the **next April/May** 2024

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## **DEADLINES** submissions March 15, then May 1

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