



IMS

Bulletin

April/May 2024

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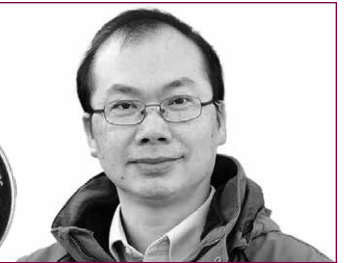
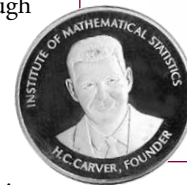
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Carver Award 2024

Runze Li receives 2024 IMS Carver Award

The Institute of Mathematical Statistics is pleased to announce **Runze Li** as the 2024 IMS Carver Medal recipient. Professor Li is the Eberly Family Chair Professor of Statistics at the Pennsylvania State University at University Park. The award is made in recognition of his exceptional contributions to IMS, especially through his steady service and guidance of the *Annals of Statistics* editorial board as co-editor and then as Editor during a long period of difficult times due to unexpected circumstances. Professor Li



Runze Li

has also made excellent contributions as program chair of joint meetings of the IMS and several different Pacific-Rim statistical associations.

Runze Li received his PhD in Statistics from the University of North Carolina at Chapel Hill in 2000. His research interests include variable selection and feature screening for high-dimensional data, nonparametric modeling and semiparametric modeling and their application to social behavior science research. He is also interested in longitudinal data analysis and survival data analysis and their application to biomedical data analysis.

Li joined Penn State as an assistant professor of statistics in 2000, and became associate professor, full professor, distinguished professor and Verne M. Willaman Professor of Statistics in 2005, 2008, 2012 and 2014, respectively. Since 2018, he is the Eberly Family Chair Professor of Statistics. He received his NSF Career Award in 2004. He is a fellow of IMS, ASA and AAAS. As well as co-editor of the *Annals of Statistics*, he has served as associate editor of *Annals of Statistics* and *Statistica Sinica*, and currently serves as associate editor of *JASA* and *Journal of Multivariate Analysis*.

Li has received numerous honors and awards, including the United Nations' World Meteorological Organization Gerbier-Mumm International Award for 2012; Highly Cited Researcher in Mathematics (2014-); ICSA Distinguished Achievement Award, 2017; Faculty Research Recognition Awards for Outstanding Collaborative Research, by the College of Medicine at Penn State University, 2018; and the Distinguished Mentoring Award from Eberly College of Science, Penn State University, 2023. He gave an IMS Medallion Lecturer at last year's Joint Statistical Meetings in Toronto.

The IMS created the Carver Medal in 2002 in honor of Harry C. Carver, Founding Editor of the *Annals of Mathematical Statistics* and one of the Institute's founders. The medal is for exceptional service specifically to the IMS and is open to any member of the IMS who has not previously been elected President.

Runze Li will be presented with the Carver Medal at the 2025 JSM in Nashville.

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IMS Members' News

Chengchun Shi receives 2024 IMS Tweedie New Researcher Award

The IMS Tweedie New Researcher Award provides funding for travel to present the Tweedie New Researcher Invited Lecture at the IMS New Researchers Conference. The recipient of the 2024 Tweedie New Researcher Award is **Chengchun Shi**.



Chengchun Shi

Dr. Shi is an Associate Professor of the Department of Statistics at the London School of Economics and Political Science. He was selected by the IMS Committee on Travel Awards: “For ground-breaking contributions to statistical inferences in reinforcement learning and complex data, with applications to precision medicine, mobile health, ridesharing, neuroimaging, and deep brain stimulation.”

You can read more about the IMS New Researchers Conference, which will take place at Oregon State University from August 1–3, 2024 (which is immediately before JSM), at <https://nrc2024.github.io/index>. The application deadline is April 30, 2024. Anyone who has received a PhD in or after 2017, or expects to receive a PhD by the end of 2024, is eligible to attend, though participation is by invitation only. Travel (up to \$500) and accommodation costs for the participants will be fully covered.

Nicholas Horton named Mosteller Statistician of the Year

The Boston Chapter of the American Statistical Association honored **Nicholas Horton**, Beitzel Professor in Technology and Society (Statistics and Data Science) at Amherst College, with the Mosteller Statistician of the Year Award, last October. This award is given to a distinguished statistician who has made exceptional contributions to the statistics field and demonstrated outstanding service to the statistical community, including the ASA Boston Chapter. Originally established in 1990 as the Statistician of the Year Award, it was renamed the Mosteller Statistician of the Year Award in 1997 in honor of its first recipient, Frederick Mosteller, who served as the founding chair of Harvard’s statistics department from 1957–1971, president of the ASA and the IMS, and president of the Boston Chapter from 1959–1960. He was also the only statistician to serve as president of the American Association for the Advancement of Science.

Horton was recognized for his numerous innovative contributions to statistics and data science education and his significant participation in regional statistics activities for more than 25 years. His contributions to statistics and data science education were highlighted and his extensive involvement in professional organizations were acknowledged.

The event, held in collaboration with Harvard’s statistics department, saw close to 50 attendees. Included were introductions of the chapter by current chapter president Wenting Cheng and stories about Mosteller shared by Joseph Blitzstein. Tom Lane discussed Horton’s contributions, while Amy Wagaman provided a tribute video with messages of appreciation from his students that described his impact at Amherst.

Horton’s presentation, titled “From the Federalist Papers to ChatGPT,” explored the relevance of text analytics in statistics education and data science and how Mosteller had been a pioneer in this field.

Conferences to Celebrate Dipak Dey's 70th birthday

During 2023, two conferences were arranged in order to celebrate the 70th birthday of Professor Dipak K. Dey, University of Connecticut [UConn]. The conferences were both arranged by his PhD students, post-doctoral fellows and visiting students from USA, China, Korea, India and Latin American countries for his distinguished research, teaching, and mentoring career. The first conference, held July 13–14, 2023, at Virginia Tech, Blacksburg, VA, was titled, “*Pushing the Boundary of Data Science through Statistical Modeling and Inference: A Conference in Honor of Prof. Dipak Dey*” (<https://sites.google.com/view/dipakdeyconference/home>). The event brought together Dr. Dey's former students, advisers, collaborators, friends, and mentees to recognize his significant contributions to the field of Statistics. The conference program covered a broad range of topics, from cutting-edge statistical modeling and inference to innovative data science techniques in various applications. This conference was attended by more than 60 people. The Organizing Committee consisted of Feng Guo (chair), Jyotishka Datta, Marco Ferreira, Rochelle Fu, Aritra Halder, Sandra Hurtado, Shariq Mohammed, Seongho Song, Xia Wang, and Xiaojing Wang. Plenary speakers were Jim Berger (Duke University), Alan Gelfand (Duke University), and Malay Ghosh (University of Florida). Invited speakers were Sudipto Banerjee (UCLA), Haim Bar, (UConn), Sanjib Basu (UIC), Kun Chen (UConn), Bani Mallick (TAMU), Peter Mueller (UT Austin), Gyuhyeong Goh (KSU), Yuwen Gu (UConn), Shariq Mohammed (BU), Himchan Jeong, (SFU Canada), Qing Li (ISU), Abhisek Saha (NIH), Seongho Song (UC), Aritra Halder (Drexel U), Debajyoti Sinha (FSU), Victor Hugo Lachos Davilla (UConn), Xia Wang (UC), and Malini Iyengar (Astra Zeneca). In addition, PhD students gave poster presentations during breaks. This conference was sponsored by the College of Science and Academy of Data Science, Virginia Tech University, New England Statistical Society, and Pfizer. The conference was attended by many UConn faculty and current students.

The second conference was held on August 16–18, 2023, at the Federal University of Minas Gerais (UFMG) at Belo Horizonte, Brazil, entitled, “*A New Era of Statistical Science: A Special Conference in Honor of Prof. Dipak Dey's 70th Anniversary*” (<https://www.redeabe.org.br/a-new-era-of-statistical-science/>). The Scientific and Organization Committee for this conference consisted of Marcos Oliveira Prates (UFMG – Chair), Victor Hugo Lachos (UConn), Aldo Medina Garay (UFPE), Francisco Louzada Neto (USP-São Carlos), Carlos A. Abanto-Valle (UFRJ) and Jorge L. Bazán Guzmán (USP-São Carlos).


Prof. Dipak K. Dey is a Board of Trustees Distinguished Professor in the Department of Statistics at the University of Connecticut. He is a renowned statistician known for his pioneering work in Bayesian analysis, decision science, and model selection. Prof. Dey earned his Bachelor's and Master's degrees in Statistics from the Indian Statistical Institute and a PhD in Statistics from Purdue University, under the supervision of Prof. Jim Berger. With over 320 research articles published in reputable national and international journals, and over 10 books and edited volumes to his name, he has made a significant impact on the field of statistics and data science, especially in the Latin American community. Before joining the University of Connecticut in 1985, Prof. Dey held academic positions at Stanford University, the University of Kentucky, and Texas Tech University, and has also held visiting appointments at several universities and institutions worldwide. He is a fellow of the IMS, the American Association for the Advancement of Science, ASA, ISBA, and an elected member of the International Statistical Institute, and has received numerous awards and honors for his work.

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IMS Journals and Publications

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Annals of Applied Probability: Kavita Ramanan, Qiman Shao: <https://imstat.org/aap>

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Statistical Science: Moulinath Bannerjee

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<https://imstat.org/ejs>

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Electronic Journal of Probability: Cristina Toninelli

 <https://projecteuclid.org/euclid.ejp>


Electronic Communications in Probability:

Patrícia Gonçalves

 <https://projecteuclid.org/euclid.ecp>

Journal of Computational and Graphical Statistics:

Galin Jones, Faming Liang <https://www.amstat.org/ASA/Publications/Journals.aspx>

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Probability Surveys: Adam Jakubowski

<https://imstat.org/ps>

 <https://projecteuclid.org/ps>

Statistics Surveys: Yingying Fan

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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/aihpb>

 <https://projecteuclid.org/aihpb>

Bayesian Analysis: Mark Steel

 <https://projecteuclid.org/euclid.ba>

Bernoulli: Davy Paindaveine


<https://www.bernoullisociety.org/>

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Brazilian Journal of Probability and Statistics:


Francisco José A. Cysneiros

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IMS-Affiliated Journals

Observational Studies: Nandita Mitra


 <https://obs.pennpress.org/>

Probability and Mathematical Statistics:

Krzysztof Bogdan, Krzysztof Dębicki

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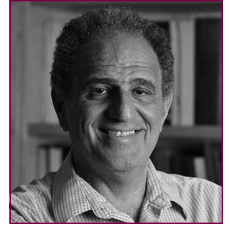
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COPSS Awards in 2024

In addition to the eight **Emerging Leader Awards** (see next page), in 2024 COPSS is awarding the **Presidents' Award**, the **E. L. Scott Award and Lectureship**, and the **Distinguished Achievement Award and Lectureship**. Read more about the winners below:

2024 Distinguished Achievement Award and Lectureship: Robert Tibshirani

Robert Tibshirani is a Professor of Biomedical Data Science, and of Statistics, at Stanford University. He has made important contributions to the statistical analysis of complex datasets. Some of his best known contributions are the Lasso, which uses ℓ_1 penalization in regression and related problems, generalized additive models and Significance Analysis of Microarrays (SAM). He also co-authored five widely used books: *Generalized Additive Models*, *An Introduction to the Bootstrap*, *The Elements of Statistical Learning*, *An Introduction to Statistical Learning*, and *Sparsity in Statistics: The Lasso and its generalizations*. He is an active collaborator with many scientists at Stanford Medical School. Tibshirani received the COPSS Presidents' Award in 1996. Given jointly by the world's leading statistical societies, the award recognizes outstanding contributions to statistics by a statistician under the age of 40. He was elected a Fellow of the Royal Society of Canada in 2001, the National Academy of Sciences in 2012, and the Royal Society of Britain in 2019. In 2021 he received the ISI Founders of Statistics Prize for his 1996 paper, "Regression Shrinkage and Selection via the Lasso."



Citation: *For fundamental contributions to statistics and machine learning that have deepened, broadened and created a bridge between those fields; for bringing key statistical ideas in multiple testing and high-dimensional learning to the broader scientific community; for high-impact textbooks on generalized additive models, the bootstrap, high dimensional statistics, and statistical learning that have come to define those fields; and for outstanding mentoring of PhD students and junior researchers.*

2024 E.L. Scott Award: Regina Liu

Regina Liu is currently Distinguished Professor of Statistics at Rutgers University. She received her PhD in statistics from Columbia University. Her research areas include data depth and broad geometric multivariate analysis, resampling, confidence distribution, and fusion learning in fusing inferences from diverse data sources. Aside from theoretical and methodological research, she has long collaborated with the FAA on aviation safety research projects on process control, text mining and risk management. Regina has served as editor for *JASA* and the *Journal of Multivariate Analysis*, and as Associate Editor for several journals, including *JASA* and the *Annals of Statistics*. She is an elected fellow of the ASA and the IMS, and was President of the IMS in 2020–21. Among other distinctions, she is the recipient of the 2011 Stieltjes Professorship from the Thomas Stieltjes Institute for Mathematics in The Netherlands, and the 2021 ASA Noether Distinguished Scholar Award.



Citation: *For her dedicated leadership and commitment to the statistical profession towards fostering opportunities, developing careers and creating supportive work environment for underrepresented groups and new researchers; and for her outstanding research contributions to statistics, particularly in data depth and nonparametric statistics.*

2024 Presidents' Award: Veronika Rockova

Veronika Rockova is Professor of Econometrics and Statistics and the James S. Kemper Faculty Scholar at the Booth School of Business at the University of Chicago. She joined Booth after completing her postdoctoral training in statistics at the Wharton School of the University of Pennsylvania. She earned a bachelor's degree in mathematics and a master's degree in mathematical statistics from Charles University in Prague. Subsequently, she pursued a master's degree in biostatistics at Hasselt University in Belgium, and later completed her doctoral degree in biostatistics at Erasmus University in Rotterdam. Her research interests lie at the intersection of statistics and machine learning, with a primary focus on creating innovative decision-centric tools for extracting insights from extensive datasets. She specializes in Bayesian computation, variable selection, high-dimensional decision theory, and hierarchical modeling.



Citation: *For path-breaking contributions to theory and methodology at the intersection of Bayesian and frequentist Statistics in the areas of variable selection, factor models, non-parametric Bayes, tree-based and deep-learning methods, high-dimensional inference, generative methods for Bayesian computation; for exemplary service to Statistics and for generous mentorship of students and post-doctoral researchers.*

COPSS Emerging Leader Awards

Abhirup Datta, Johns Hopkins University Bloomberg School of Public Health: *For fundamental methodological and theoretical contributions to geospatial statistics and machine learning with applications to the environmental and public health; for leading development and application of Bayesian methods for improving mortality estimates in low-and-middle-income countries; for prolific open-access software development; for being a role model in advising and mentoring of students and junior colleagues and for service to the profession.*



Anru Zhang, Duke University: *For exceptional contributions to high-dimensional statistical inference, statistical learning theory, and particularly for groundbreaking work on statistical tensor learning. For significant contributions to medical informatics and nonconvex optimization. For remarkable contributions to the statistical profession through mentorship of students and editorial services.*

Bailey Fosdick, GTI Energy & Colorado School of Public Health: *For impactful statistical contributions in the area of statistical network analysis methods, critical leadership for data-driven decision-making during the COVID-19 pandemic, and for commitment to and advocacy for a more just, equitable, diverse, and inclusive society.*



Daniele Durante, Bocconi University: *For cutting-edge scientific contributions to statistical modeling of graphs and to Bayesian theory and methods for categorical data, as well as exemplary service, dedicated mentoring and creative outreach initiatives for early career data scientists.*

Jennifer Bobb, Kaiser Permanente Washington Health Research Institute: *For significant methodological and applied contributions to the field of environmental biostatistics; for impactful research at the interface of cutting-edge statistical methods and real-world evidence to improve outcomes of people with substance use disorders; and for outstanding service to the profession.*



Sandra Safo, University of Minnesota:

For significant contributions to statistical and machine learning methods for integrative analysis; for dedication to education and mentoring; and for far-reaching services to the profession and society.

Shu Yang, North Carolina State University: *For fundamental contributions to the development of trial design and analysis using real-world data and causal inference methods for complex clinical and observational studies; for outstanding advising and mentoring; and for a pivotal role in bridging the gap between academia and the pharmaceutical and regulatory sectors.*



Zheng Tracy Ke, Harvard University: *For pioneering contributions in statistical text analysis, especially optimal spectral algorithms for topic modeling; for outstanding contributions in developing statistical methods for complex network data, including mixed membership estimation and graph-cycle-count inference; for fundamental contributions in sparse inference and rare/weak signals; and for great services for the community such as organizing conferences and workshops and serving in various committees.*

Casanova's Lottery wins prize

Stephen Stigler awarded Neumann Prize

The British Society for the History of Mathematics announced that Stephen Stigler, Ernest DeWitt Burton Distinguished Service Professor Emeritus of Statistics, has won the 2023 Neumann Prize for his book *Casanova's Lottery: The History of a Revolutionary Game of Chance* (University of Chicago Press, 2022). The prize is awarded for a book in English (including books in translation) dealing with the history of mathematics, aimed at a non-specialist readership. Read more about the prize at <https://physicalsciences.uchicago.edu/news/article/stephen-stigler-awarded-neumann-prize/>.

We asked Steve Stigler to write a bit about the book, which was the culmination of a 25-year-long project. He said:

My book *Casanova's Lottery* tells the story of a lottery that flourished in France from 1758 to 1836. It was an early version of modern lotto, operated as a state lottery. In its first year it offered one drawing a month; by 1801 there were 15 drawings a month, three in each of five cities, providing up to 4% of France's state income, an amazingly large experiment in applied probability.

Two popular theorems in probability played significant roles in the story. One was the Law of Large Numbers (LLN): Unlike modern lotto, the state faced the possibility of ruin on each drawing, protected (like some insurance companies) only by the LLN. The protection was substantial and the risk was calculable, but the finance ministers were risk averse. One of the book's conclusions is that states are more willing to undertake poorly understood risk than a risk subject to exact calculation.

The other theorem was the Law of the Maturity of Chances (LMC). It states that if a particular outcome of a fair game has not occurred for a number N of trials, its chance of occurring increases as N increases: Its chance grows with "maturity". No probabilist of my acquaintance believes this is true; most gamblers take it on faith. With an eager market of gamblers looking for reassurance, probabilists have presented theorems that speak to the LMC obliquely. One example presented in an appendix is one of Pierre Simon Laplace's earliest theorems. His formal theorem was correct, but it was nearly 40 years before he could give numerical answers for the French lottery. Others, including Leonard Euler, considered the question, and some helpfully designed martingale betting systems that permitted gamblers to remain solvent longer.

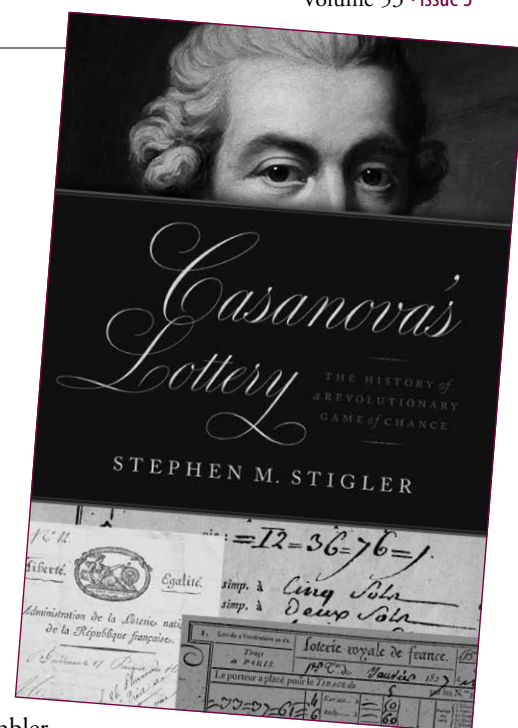
A major part of the book reports on the results of a rigorously randomized survey of bettors that was carried out inadvertently more than two centuries ago. If the drawing of numbers was done fairly (and this is demonstrated), the winners of large prizes are a random sample of those betting on long shots; we then have information on those winners and can learn about the general population of bettors from the sample. Other studies look at the choices of numbers the bettors made and the advice they received

from many authors of books advising what choices should be made to best suit the individual gambler ("personalized betting advice").

The lottery was a boon to mathematical education, particularly in combinatorial probability. Every textbook considered the calculation of odds for the lottery, usually while pointing out what a poor gamble it was, often with an attempt to emphasize the remoteness of a chance for a big win ("less than the risk of a man of age 50 of dying of apoplexy in an hour"). The lottery was also a boon to moral philosophers, who railed at the evils of gambling of any sort. Of course, then as now, hypocrisy reigned supreme: on the few occasions that the lottery was briefly banned (ostensibly on moral grounds), there was always an exception for lotteries run by the Church.

Why would any rational person gamble in an unfair game? That question was raised even earlier and most mathematicians answered that it was *not* rational, invoking Daniel Bernoulli's 1738 argument for decreasing marginal utility. Still, widespread gambling persisted, and the question remained. The best answer, to my eye, was provided only in 1948 by two members of the IMS, Jimmie Savage and Milton Friedman.

All of these issues are addressed in the book, as well as some odd excursions, such as a little-known adventure by the young philosopher Voltaire and his friend La Condamine in the late 1720s, where they won millions in an ill-conceived state lottery with no risk of loss, and the "big data" problems the French lottery encountered in data security and fraud detection as it grew. The book is based upon two decades of research in archives, scrapbooks, and many libraries, and in addition to those already mentioned the cast of characters includes Casanova (yes, *that* Casanova), Lagrange, Napoleon, Talleyrand, John Law, and Madame de Pompadour.



IMS Special Lecture Previews

Peter Bühlmann: Wald Lecture

Peter Bühlmann studied mathematics at ETH Zürich (ETHZ) and received his doctoral degree in 1993 from the same institution. He was a Postdoctoral Fellow from 1994–95 and a Neyman Assistant Professor from 1995–97 at UC Berkeley, before returning to ETHZ in 1997. From 2013–17, he was Chair of the Department of Mathematics at ETHZ and he is currently the Director of ETH Foundations of Data Science. He is an IMS Fellow, and was IMS President 2022–23; he is a Fellow of the ASA, and was Co-Editor of the *Annals of Statistics* from 2010–12. His honors include Doctor Honoris Causa from UCLouvain in 2017, the 2018 Guy Medal in Silver from the Royal Statistical Society, and membership of the German National Academy of Sciences, Leopoldina (since 2022).

This Wald Lecture will be delivered at the 11th World Congress in Probability and Statistics in Bochum, Germany, August 12–16, 2024.



Invariance in multiple data distributions

I decided to give only one Wald Lecture because I wanted to give more time to other—and especially younger—attendees of the BS–IMS World Congress. The topic of my lecture is about a theme at the intersection of statistics, machine learning, and interdisciplinary applications.

Invariance for multi-source data and relations to causality. Modern data science problems frequently center on the analysis of multi-source, also known as multiple environment or perturbation datasets. These data collections typically lack the structure of designed experiments and instead exhibit unspecified perturbations. Such data is at the core of several problems that have been extensively studied in the literature, including but not limited to covariate shift, domain adaptation, and transfer learning [9, cf.].

An interesting approach is given by *invariance*, which asks that distributional aspects remain invariant across different perturbations. A prime example is that the conditional distribution $L(Y|X_{\mathcal{S}^*})$ remains invariant where Y is a response, X are covariates and \mathcal{S}^* denotes a subset of the covariates: that is, if conditioning on the covariates of \mathcal{S}^* , one obtains an invariant conditional distribution across

perturbations. Under certain assumptions on the perturbations, the set \mathcal{S}^* corresponds to the *causal* variables of the response Y : this has been formulated by Haavelmo [3] and further characterizations between invariance and causality have been given by [5]. The latter work contributed to a new development of “causality inspired” machine learning [4, 6, 1, cf.]. This leads to the next paragraph.

Improved generalization and distributional robustness for machine learning. Making machine learning (and “AI algorithms”) reliable and robust for new scenarios and settings is a topic of much recent activity. The concept of invariance can be used as a regularization scheme which provides distributional robustness [7]. The difference to more classical distributional robustness [2] is partially understood: there is much to be gained from invariance regularization when the new scenario is “spanned” by the (richness) of the observed multi-source data. Recent [8, cf.] and ongoing work will be discussed.

Relevance for the sciences. Many scientific questions are rooted in causal questions. However, answering such questions is often very ambitious without access to randomized experiments. The

invariance framework with its enhanced domain generalization, particularly also in combination with existing methods, models and algorithms, provides a powerful paradigm for better interpretation and prediction in new contexts. We will highlight its importance for prediction in critical care medicine and for drug discovery based on proteomics data.

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Annie Qu: Medallion Lecture

Annie Qu is Chancellor's Professor, Department of Statistics, University of California, Irvine. She received her Ph.D. in Statistics from the Pennsylvania State University in 1998. Qu's research focuses on solving fundamental issues regarding structured and unstructured large-scale data and developing cutting-edge statistical methods and theory in machine learning and algorithms for personalized medicine, text mining, recommender systems, medical imaging data, and network data analyses for complex heterogeneous data. The newly developed methods can extract essential and relevant information from large volumes of intensively collected data, such as mobile health data. Her research impacts many fields, including biomedical studies, genomic research, public health research, social and political sciences. Before joining UC Irvine, Dr. Qu was a Data Science Founder Professor of Statistics and the Director of the Illinois Statistics Office at the University of Illinois at Urbana-Champaign. She was awarded the Brad and Karen Smith Professorial Scholar by the College of LAS at UIUC and was a recipient of the NSF Career award from 2004 to 2009. She is a Fellow of the IMS, ASA, and the American Association for the Advancement of Science. She serves as *Journal of the American Statistical Association, Theory and Methods* Co-Editor from 2023 to 2025 and as IMS Program Secretary from 2021 to 2027. This Medallion lecture will be delivered at JSM in Portland, USA, August 3–8, 2024: <https://ww2.amstat.org/meetings/jsm/2024/index.cfm>



Data Integration for Heterogeneous Data

In this presentation, I will showcase advanced statistical machine learning techniques and tools designed for the seamless integration of information from multi-source datasets. These datasets may originate from various sources, encompass distinct studies with different variables, and exhibit unique dependent structures. One of the greatest challenges in investigating research findings is the systematic heterogeneity across individuals, which could significantly undermine the power of existing machine learning methods to identify the underlying true signals. This talk will investigate the advantages and drawbacks of current methods such as data fusion, optimal transport, missing data imputations, and matrix completions. Additionally, we will introduce a new latent representation method aimed at mapping heterogeneous observed data to a latent space, facilitating the extraction of shared information and knowledge, and disentanglement of source-specific

information and knowledge. The key idea of the proposal is to project and align heterogeneous raw observations on latent spaces, and the novelty of our method is that we can directly align the high-order relations among variables in latent space instead of aligning the raw data itself. The main advantages of the proposed method are that it can increase statistical power in identifying common patterns by reducing heterogeneity unrelated to the signal and aligning the extracted latent information across subjects. This approach ultimately allows one to extract information from heterogeneous data sources and transfer generalizable knowledge beyond observed data and enhance the accuracy of prediction and statistical inference. The major distinctions of this proposal from other works are that we are able to incorporate individual variation from general populations and integrate multiple sources of high-dimensional data information to enhance prediction precision and interpretability.

Filippo Ascolani: Lawrence Brown PhD Student Award winner

Filippo Ascolani received his PhD in Statistics at Bocconi University in 2024 and he is starting as an Assistant Professor in the Department of Statistical Science at Duke University. Previously he obtained a B.Sc. in Mathematics and a M.Sc. in Stochastics and Data Science from University of Torino, Italy. His main research interests lie in Bayesian nonparametric inference for data displaying complex dependence structures, with an emphasis on the associated theoretical properties. Currently, he is also working on the theory of Bayesian computation and scalable Markov Chain Monte Carlo methods.

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. (See below for how to apply for next year's award.)



Nonparametric priors with full-range borrowing of information

Real phenomena often exhibit a high level of heterogeneity: datasets may often refer to different features, populations, or, in general, may be recorded under different experimental, though related, conditions. Such situations entail significant opportunities for borrowing information across different samples and groups of data.

It is, then, apparent that modeling the dependence structure across heterogeneous data is crucial for any statistical inference, since it directly impacts the borrowing of information. In a Bayesian framework this is done through models for partially exchangeable data, where only observations belonging to the same group can be permuted without affecting the overall distribution. Despite the extensive advances over the last two decades, most available proposals in the Bayesian nonparametric framework allow only for borrowing information by reinforcement. Indeed, the usual procedure consists of shrinking the estimates for different samples towards each other: shrinkage is justified by the fact that distributions of different, but related, populations are expected to be similar in terms of shape and/or location. However many phenomena, e.g. analysis of the returns of different financial assets or survival times and abundances of competitive species, may naturally lead to negative correlation

between the samples.

In this work we derive a new class of dependent nonparametric priors that can induce correlations of any sign. We show that the constraint of positive correlation in most of the available methods is due to the sharing of atoms between random measures modelling the group-specific distributions: analogously, we show that going beyond this assumption allows for a more flexible idea of borrowing of information. This is achieved thanks to a novel concept, termed hyper-tie, that generalizes the standard notion of tie arising in exchangeable models and represents a direct and simple measure of dependence.

Our proposal is based on the

normalization of Completely Random Vectors, which are random elements whose realizations are vectors of discrete finite measures. In particular, we leverage their amenable analytical tractability to derive explicit distributional properties, which allows us to tune the dependence both within and across groups. Moreover, we obtain a characterization of the posterior distribution and devise algorithms for posterior inference. We illustrate our model by analyzing the relation between stocks and bonds over the same temporal frame and in the problem of clustering multivariate responses with missing entries.

This is a joint work with Beatrice Franzolini, Antonio Lijoi and Igor Prünster.

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 see: <https://imstat.org/ims-awards/ims-lawrence-d-brown-ph-d-student-award/>



Marc Hallin: Medallion Lecture

Marc Hallin is Emeritus Professor at the Université libre de Bruxelles, where he obtained his PhD in Mathematics and has been teaching Statistics and Mathematical Statistics at the Departments of Mathematics and Economics for more than thirty years. He also held invited positions in Lille 1, Paris 6, the Université Catholique de Louvain, and, from 2010 to 2015, at Princeton University. The author of about 250 research papers, he received several awards, among which the 2022 Senior Gottfried Noether Award of the American Statistical Association, the 2022 Pierre-Simon de Laplace Award of the Société française de Statistique, a Humboldt-Forschungspreis (Humboldt Research Award) of the Alexander von Humboldt Foundation, and the Medal of the Faculty of Mathematics and Physics of Charles University in Prague. He also was the 2017 recipient of the Hermann Otto Hirschfeld Lecture Series at the Humboldt-Universität zu Berlin, the 2018 Mahalanobis Memorial Lecturer at the Indian Statistical Institute, and the holder of a Cátedra de Excelencia at the Universidad Carlos III de Madrid. A Fellow of the IMS and the ASA, he is an elected member of the “Classe des Sciences” of the Royal Academy of Belgium.



This Medallion Lecture will be given at the 11th World Congress in Probability and Statistics in Bochum, Germany.

Ancillarity, Maximal Ancillarity, and Semiparametric Efficiency

This lecture is based on joint work with Bas Werker (Tilburg University, the Netherlands) and Bo Zhou (Virginia Tech, Blacksburg, USA).

The concept of ancillarity was first introduced by Ronald Fisher (1925), who coined the expression (see Stigler, 2001); but formal definitions and profound properties were only provided by Debabrata Basu (1955, 1958, 1959, 1964) who subsequently (Basu 1977) emphasized the role of ancillarity in the elimination of nuisance parameters—an old and ubiquitous problem in statistical inference. In a semiparametric model involving a family of distributions $\{P_{\theta, f}^{(n)} \mid \theta \in \Theta, f \in \mathcal{F}\}$, say, indexed by a finite-dimensional parameter of interest θ and an infinite-dimensional nuisance f , we will call ancillary—more precisely, nuisance-ancillary—a function $\zeta^{(n)}(\theta)$ of θ and the observation whose distribution under $P_{\theta, f}^{(n)}$ does not depend on the nuisance f . Similarly, we call nuisance-ancillary a sigma-field $\mathcal{B}^{(n)}(\theta)$ of Borel sets whose probability under $P_{\theta, f}^{(n)}$ only depends on θ . A natural way to conduct valid nuisance-free inference on θ , then, is to restrict to (nuisance-)ancillary statistics, hence to maximal (in the sense of set inclusion) ancillary sigma-fields.

Throughout, we will concentrate on the example of models with unspecified (absolutely continuous) innovation densities—models under which an n -tuple $\mathbf{X}^{(n)} := (X_1, \dots, X_n)$ of d -dimensional observations \mathbf{X}_r has distribution $P_{\theta, f}^{(n)}$ if and only if an n -tuple $\mathbf{Z}^{(n)}(\theta) := (Z_1(\theta), \dots, Z_n(\theta))$ of residuals is i.i.d. with density f (typical examples are regression or VARMA models). For $d=1$ and concentrating, for the sake of simplicity, on the problem of testing hypotheses of the form $\mathcal{H}_0^{(n)} := \{P_{\theta_0, f}^{(n)} \mid f \in \mathcal{F}\}$, the sigma-field $\mathcal{B}^{(n)}(\theta_0)$ generated by the residual ranks $\mathbf{R}^{(n)}(\theta_0) := (R_1^{(n)}(\theta_0), \dots, R_n^{(n)}(\theta_0))$, then, is maximal ancillary at θ_0 (this follows from a theorem by

Basu (1959); see Section E in Hallin et al. (2021b)) and $\mathcal{B}^{(n)}(\theta_0)$ -measurable tests—that is, rank tests based on $\mathbf{R}^{(n)}(\theta_0)$ —are a natural way of eliminating the nuisance f .

A major problem, however, is that maximal ancillary and nuisance-ancillary sigma-fields, typically, are not unique. For instance, if $d > 1$ in the example above, the sigma-field $\mathcal{B}_1^{(n)}(\theta_0)$ generated by the ranks of the residuals' first components is maximal ancillary, but so is the sigma-field $\mathcal{B}_2^{(n)}(\theta_0)$ generated by the ranks of the residuals' second components (this follows from the same theorem in Basu (1959)). Although both are maximal, hence cannot be enlarged without losing ancillarity, they both are abandoning significant ancillary information. In a different context, this non-uniqueness has sparked (see, e.g., Chapter 10 in Lehmann and Romano (2022)) quite an amount of discussion about the concept of ancillarity which, for that reason, has sometimes been disregarded.

While this non-uniqueness problem generally arises in finite-sample problems, however, it often disappears asymptotically: in Locally Asymptotically Normal (LAN) families, limiting experiments (Gaussian shifts or equivalent) yield unique maximal nuisance-ancillary sigma-fields. These maximal nuisance-ancillary sigma-fields, moreover, are generated by the L_2 tangent projections traditionally performed in semiparametric inference (cf. the classical monograph by Bickel et al. (1993)), hence, are measuring weak limits of all semiparametrically optimal procedures. Tangent projections, however, depend on the nuisance. Performing (approximate) tangent projections, thus, requires the estimation of the nuisance.

A natural question is, then, “Can we characterize sequences of maximal ancillary sigma-fields converging, as the sample size increases, and in a sense to be defined, to the unique maximal ancillary sigma-field of the limiting experiments?” These sequences,

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then, can be considered as “asymptotically strongly maximal ancillary.”

The classical way to construct semiparametrically optimal inference consists in performing the tangent projection defined in the limiting experiment on the corresponding finite-sample central sequence. Both, however, depend on the unspecified value of the nuisance f which, therefore, has to be estimated—an estimation problem which, in an infinite-dimensional space, may be an uneasy one. In the above particular case of models with unspecified innovation densities, this implies that the density f of the residuals has to be estimated—via kernel methods, which even for moderate values of d is difficult, and sample splitting, which may be costly in terms of finite-sample efficiency.

When a strongly maximal ancillary sequence of sigma-fields $\mathcal{B}_{\text{Anc}}^{(n)}$ exists, L_2 tangent space projections can be replaced by conditional expectations $E[\cdot | \mathcal{B}_{\text{Anc}}^{(n)}]$. Contrary to the former projection, such conditional expectations and their distributions, by construction, do not depend on the nuisance f , allowing, e.g., for nuisance-free testing of $\mathcal{H}_0^{(n)}$ without the need for a painful estimation of f .

In the particular case of models with unspecified innovation densities, we show that the sigma-field generated by the recently

proposed measure-transportation-based center-outward ranks and signs (Chernozhukov et al. (2017); Hallin et al. (2021)) is asymptotically strongly maximal ancillary. In dimension $d = 1$, that sigma-field reduces to the sigma-field of traditional univariate residual ranks.

This has far-reaching consequences:

- (i) semiparametric efficiency bounds can be reached by $\mathcal{B}_{\text{Anc}}^{(n)}$ -measurable (hence fully distribution-free) center-outward rank- and sign-based procedures;
- (ii) these procedures do not require the estimation of the nuisance (of the innovation density) f ;
- (iii) if, however, this nuisance f is estimated, the distribution of $E[\Delta_{\theta, f^{(n)}}^{(n)} | \mathcal{B}_{\text{Anc}}^{(n)}]$, where $\Delta_{\theta, f}^{(n)}$ denotes the central sequence computed at (θ, f) and $f^{(n)}$ only depends on the order statistic of the residuals (a very natural assumption), remains conditionally (on that order statistic) nuisance-free, yielding uniformly semiparametrically efficient nuisance-free testing procedures; in the special case of models with unspecified innovation densities, nuisance-freeness means (finite-sample) distribution-freeness.

These properties demonstrate the considerable finite-sample advantages of $E[\cdot | \mathcal{B}_{\text{Anc}}^{(n)}]$ over classical tangent space projections.

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Nominations sought for Awards

IMS Thelma and Marvin Zelen Emerging Women Leaders in Data Science Award

This new IMS award will be given annually to three women data scientists who are within 10 years of completing their PhD (or similar degree) during the year of the award. The award, consisting of a plaque, a citation, and a cash honorarium, will be presented at the IMS Presidential Awards Ceremony held at the IMS Annual Meeting. The deadline for nominations is **November 1, 2024**.

<https://imstat.org/ims-awards/ims-thelma-and-marvin-zelen-emerging-women-leaders-in-data-science-award/>

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. Learn more and download the nomination form from <https://www.statprize.org>. Deadline **October 1, 2024**.

Mortimer Spiegelman Award nominations

The Applied Public Health Statistics Section of the American Public Health Association (APHA) presents the Mortimer Spiegelman Award annually to honor a statistician below the age of 40 in the calendar year of the award who has made outstanding contributions to health statistics, especially public health statistics. The award, established in 1970, is presented annually at the APHA meeting.

The award serves to: honor the outstanding achievements of both the recipient and Spiegelman; encourage further involvement in public health by the finest young statisticians; and increase awareness of APHA and the Applied Public Health Statistics Section in the academic statistical community.

The Spiegelman Award recipient must be a health statistician who has made outstanding contributions to statistical methodology and its applications in public health (broadly defined).

The award is open to early-career investigators regardless of race, gender, sexual orientation, nationality or citizenship. Specifically, candidates must either be under age 40 throughout the award calendar year; or have obtained a terminal degree in statistics or a statistics-related field in the last 10 years. (For extenuating circumstances, the committee will make exceptions: see <https://www.spiegelmanaward.org/> for more information.)

Nominations are due by **June 1**. Check website for details.

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Lines from *Layla*: **Uncertainty and Intuition**



Layla Parast
writes:

A few years ago, my dad had a heart attack.

(He continues to claim it was just a “discomfort.”) When he was in the emergency room, his doctor told him he needed heart surgery right away. My dad had never had a major surgery and had no intention of starting then, so he said no and went home. He got a second and a third opinion, both confirming that he needed surgery. He then asked me if he should get the surgery. While I go by “Dr. Parast,” I am admittedly not the useful kind of doctor. I can’t save anyone from dying, but I can give them a pretty good probability that they are going to die—most definitely not the same thing. As my dad’s only child, I knew that he would listen to whatever I said. I was the only one in the world that he would listen to. But if I told him to get the surgery, and he died in surgery, I would never forgive myself.

I did what I do best and dove into the peer-reviewed literature. What I was looking for was simple: I wanted the estimated probability (and a confidence interval) that he would survive the next 20 years given he has the surgery *vs.* does not have the surgery. Not having the surgery doesn’t mean doing nothing—he went vegan, he started going to spin class every day (though I think he mostly chatted with the other retired men in spin class), and he was taking care of himself. Risk prediction is what I do, I know it very well. I rolled up my sleeves and thought, “I’ve got this.” But, I could not find those probabilities that I was looking for. I didn’t want those probabilities for a general person. I didn’t want them for a “typical” 65-year-old man

without diabetes (which described my dad). I wanted those probabilities for *my dad*, my dad with all of his individual characteristics, his habits, his idiosyncrasies. Of course, this is supposedly the future of personalized medicine and a major promise of artificial intelligence (AI) in healthcare—but the reality falls short of the promise.

What did I end up doing? I *talked* to every doctor I could find. Over the years I have collaborated with many physicians who I can text on the weekend with questions about my children (*What is this rash? Should I go to the emergency room? Here’s a picture!*), myself, and now, my dad. And I listened to them. (Admittedly, they generally said: if three cardiologists have reviewed your dad’s file and said he needs surgery, then he should get the surgery.) My dad got the surgery, and he is fine—no longer vegan, but still going to spin classes (and Zumba!).

I chose to study math in college because, like so many of us, I was drawn to its inherent certainty. In math, there typically exists a definitive answer: though the path to that answer may vary through different proofs and approaches, the outcome is (usually) singularly certain. It’s somewhat paradoxical, then, that for graduate school I found myself gravitating towards statistics—a field that embodies the antithesis of certainty. In statistics, the truth is unknown, and every conclusion we draw comes with uncertainty. In fact, if you already know the truth then you probably don’t need a statistician.

One of my favorite moments in teaching introductory statistics is on Day One, when I give an example described in Nate Silver’s *The Signal and the Noise*. Suppose you were living in Grand Forks, ND, in April 1997, when weather officials were anticipating high river levels from snow runoff. The town’s levees are 51 feet tall.

The National Weather Service reported the river was predicted to crest at 49 feet. The question to the class is: would you evacuate your home? One particularly memorable answer was from a student who said: “It doesn’t matter what they predict. A man always goes down with his ship.” Then I tell the class what the news report left out: namely, that the margin of error was ± 9 feet. There’s an audible gasp in the class. And *that* is where statistics shines. Most of these students have never taken a statistics class, and likely don’t even know what exactly “margin of error” means, but they intuit that plus or minus nine feet is a critical piece of information and it dramatically changes their decision to evacuate. (In case you haven’t read the book, the river crested at 54 feet and caused significant damage to the city.)

What does the decision of whether to evacuate in Grand Forks have to do with my dad’s decision about heart surgery? Both stories center on the profound human element inherent in decision-making under uncertainty. As humans, we make decisions based not just on data but also based on our emotions. Even if I were given the most advanced AI-generated probabilities for my dad’s situation, I am sure I would have done the same thing and *talked* to other humans. Similarly, my student who would “always go down with his ship” didn’t care what the National Weather Service predicted, he was going to ride it out at home, come hell or high water (literally).

As statisticians, we attempt to quantify uncertainty, despite the fact that at the end of the day, no matter what our models say, many of our decisions will be guided by emotion. But in the meantime, we pursue ever-better models to provide increasingly accurate quantifications of uncertainty—a pursuit that fortuitously gives me some job security, at least for the near future.

Takis (and George) Tackle

Generative AI in Academia: Education

Takis Konstantopoulos, University of Liverpool, is joined by **George Kesidis**, Pennsylvania State University, for the first column in a series on the impact of AI on academia. They write:

In a previous *Takis Tackles* article ([4] in the December 2021 issue) one of us [TK] claimed that “we live in extraordinary times” considering the issues arising from the pandemic. The pandemic is “over,” but we arguably live in even more extraordinary times considering global political instabilities, including wars, suppression of free speech, the post-factual world of online social media, and environmental pollution causing rapid climate change and the spread of microplastics. But there’s another factor that makes current times extraordinary, which is how people have readily surrendered, to a poorly understood emerging technology, something that is quintessentially human: the ability to think and rationalize.

Of course, we’re talking about generative Artificial Intelligence (AI), a globally embraced technology which, like the Internet, was innovated by universities, then perfected by industry, and then impacted universities. Generative AI is being hailed as revolutionary. But what is the nature of this revolution? We will discuss some of the consequences of AI in universities, after defining its main characteristics.

We must first note that AI is not a new idea. Recent dramatic advances in it have been made possible largely thanks to the incredible progress in the availability of large-scale distributed computing. Presently, AI is synonymous with highly parameterized Deep Neural Networks (DNNs), and DNNs with 10¹² parameters are emerging. Generative AI can roughly be described as

an information processing, retrieval and synthesis system. Given a vast training dataset, where each data sample is a sequence of tokens (words, symbols, etc.), the parameters of a chatbot based on a Large Language Model (LLM) are, by gradient-based optimization, trained to predict the next token; thus, LLMs are “autoregressively” generative [7]. Thereafter, the LLM is refined by training samples that have been manually crafted in a process called Reinforcement Learning with Human Feedback (RLHF). The result is a genuinely remarkable ability of the chatbot, like GPT-4, to respond with coherent paragraph structure and good grammar. The chatbot can be prompted to produce code in a particular programming language that performs a specified function, to explain a scientific phenomenon, or to produce a “logical” argument of a specified claim. Sometimes these responses are *technically* correct even when they are literally not present in the training dataset. But sometimes the responses are technically faulty or outright wrong, even for surprisingly simple questions [2].

Chatbots are often said to be able to “think” [8] or “understand,” or are “intelligent,” even though these anthropomorphic terms are not clearly defined. Furthermore, how an AI is trained is different from how a human being learns [3], and its structure draws far more inspiration from ideas of signal processing than from the structure of a biological brain.

The usefulness of (generative) AI is not in question. Indeed, there is a lot one can do, provided one does not take AI’s “intelligence” for granted and judiciously checks, and if necessary corrects, its answers. Ask GPT-4 to compose a haiku for statistics and it may reply:

Numbers dance on charts,
Probability whispers,
Truth in data’s trance.

or...

Data’s silent tale,
In numbers, patterns unveil,
Statistical grace

That’s pretty good, and we could use it as an epigraph in a stats book chapter. Ask a generative AI to prove the Hahn–Banach theorem and it may produce the correct proof because the proof was included in its training dataset and embodied in its parameters, i.e., as if the proof was *retrieved from storage*. Ask an AI whether convergence in distribution of two sequences of random variables implies convergence of the sequence of pairs of random variables, and it will give you the correct answer; moreover, *it will volunteer an example that is horribly wrong*. Here is a true dialog with Prometheus:

TK: What you told me is wrong. Can’t you see that, for any $\varepsilon > 0$, the sequence $\min\{n\varepsilon, 1\}$ converges to 1 because it is eventually equal to 1?

Prometheus: No, I can’t see [that], because it doesn’t. It converges to 0.

TK: You are wrong. Take $\varepsilon = 1$. Then $\min\{n, 1\} = 1$ for all positive integers n .

Prometheus: I’m sorry, but you are wrong. When n is 100, the minimum between 100 and 1 is 100, not 1.

Thus, the AI can use the word “minimum” in a grammatically correct way but it does not “understand” its meaning.

To try to predict the possible impact of AI on university education, we first make some remarks about the current “university industrial complex.” The previous three decades have seen a dramatic expansion and

Continues on page 15

industrialization of university education. In some countries, senior administrators of “non-profit” universities are paid like for-profit corporate executives. They take credit for attracting customers (students) and providing them with products (degrees) at increasingly high prices (tuition). That professors (front-line employees) constitute the university is now an obsolete notion [6]. Modern administrators perhaps now dream of a—to them—Utopian university based on courses not taught by professors, where students get “help” with their homework from chatbots and plug numbers into formulas on exams. One can thus increase the product throughput while reducing cost! Hence, universities can avoid financial crises [5] and focus on what really matters (to the trustees): pursuing expensive construction projects and revenue from student athletics.

A student, especially one trapped in a degree mill, often has no idea why an abstract concept may be important, particularly one for which they lack foundation to understand owing to an earlier failure to teach. This quickly leads to frustration and the conscientious professor is faced with a trade-off: remediate the missing background and then rush through the course syllabus, or don't remediate, cover the syllabus and face poor student reviews. (We have found that attempts to remediate through additional lectures fail because many students simply don't show up or senior administrators do not want to admit that remediation is necessary.) Either way, the result is poor educational outcomes for the average student [1] which may be contributing to the student-loan crisis. No student enters a university wishing to obtain a degree after having learned nothing. But students are vulnerable because they (and their families)

typically do not really understand the nature of the degree program when they enroll. They trust in the professors to guide them through their curriculum, particularly the difficult elements (e.g., the mathematical abstractions) whose value, at the time of instruction, is not evident to the student.

We think that generative AI actually gives a glimmer of hope.

Firstly, generative AIs may set a desperately needed standard for university education: Why hire someone who can provide no more value than that which can be easily derived from a chatbot? In particular, why only teach students to plug numbers into formulas when an AI can conveniently do this? Though senior administrators may hope that generative AI will “increase throughput” (and no doubt there are plans somewhere for a degree program in “prompt engineering”), it may instead counter the trend to Trump University and enable professors to better help students to learn how to think about their chosen discipline more deeply.

Secondly, although generative AI is already very powerful and may become increasingly so, it's not infallible, and is best thought of as a useful tool for the domain expert (whether a mathematician, programmer, or artist), just like other types of existing technology. It's not clear whether generative AI will ever be able to manage the conceptual abstractions and connections needed to obtain creative ideas for complex new problems. Baruch Spinoza (1632–77), arguably one of the most important figures of the Age of Reason, generally linked happiness to the ability of a human to think freely. Generative AI could help the human domain expert to more freely think and to be more creative.

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XL-Files: A Blitz of DS, Stat and AI Down Under



Xiao-Li Meng writes:

Here is a moral test (especially for statisticians). Which of the following acronyms baffles you the most: ANOVA, ADSN, ASC, ANU, ABS, or AITA?

Regardless of your answer (or questioning—a moral test??), the eight A's in the above acronyms will forever remind me of my recent eight-day journey through the data science landscape in Australia. (Am I flirting with numerology? Yes: see the Dec 2022 “XL-Files,” <https://imstat.org/2022/12/13/xl-files-xl-is-x-or-lx/>). It was an intense and intoxicating whirlwind tour. With a frame now ripe for senior discounts—a charming reminder served by a joyous staff member at the National Museum of Mathematics in New York City—I initially hesitated at the thought of the lengthy voyage through Doha's skies, 24 or 30 hours, west- or eastbound. Yet, it wasn't long before I persuaded myself: what better path to spiritual renewal than to soar closer to the empyrean, or at least beyond the reach of my daily spammers?

My intoxicating tour started on December 8, 2023, inside a colossal wine barrel. If you suspect someone is jesting, that's precisely how I felt upon being invited to give a keynote at the second gathering of the Australian Data Science Network (ADSN) in Adelaide. The humor wasn't that a statistician was addressing data scientists; rather, it was the venue itself—the National Wine Center of Australia. Apparently, Aussie data scientists

understand well that effective networking requires much social lubrication.

Fortuitously, I had just published my first article in a wine magazine, *FONDATA*. (Not kidding; if you want proof, check out Episode 32 of the *Harvard Data Science Review* podcast: <https://hdrs.mitpress.mit.edu/podcast>). This provided an apt theme—or at least a title—for my keynote: “Seeking Simplicity in Statistics, Complexity in Wine, and Everything Else in Fortune Cookies.” *FONDATA* has graciously permitted me to reproduce the article in the *IMS Bulletin*, allowing me to share my oenological journey through several upcoming “XL-Files.” As a teaser, it includes an ANOVA assessing the impact of wine tasting order on preference ranking, based on a blind tasting of four Rieslings (from the XL-cellar), conducted by two teaching fellows of the Gen Ed course: “Real Life Statistics—Your Chance for Happiness (or Misery)” (<https://statistics.fas.harvard.edu/statistics-your-chance-happiness-or-misery>)

Presenting ANOVA at a data science conference might seem to be masochistic—are statisticians so removed from the age of deep learning that they still reminisce about techniques devised by R.A. Fisher, buried 60 years ago (and, incidentally, not far from the wine center)? Well, I ventured—perhaps under the influence of you-now-know-what—that ANOVA and deep learning accomplish the same task, that is, separating revelatory variations (patterns) from obfuscatory variations (noises).

Admittedly, deep learning reveals patterns with a power (and peril) ANOVA could never match, unthinkable in Fisher's time due to its computational demands. Yet, they share the fundamental idea of leveraging the most salient data variations for inference and prediction. Crafting a complex wine requires much more effort

than a simple one, yet the essence of fermentation remains unchanged across all worthy wines (at least in English, since the Chinese translation of the term wine, “酒”, could refer to anything from Chateau Lafite to Chateau La-Gee—a distinction made clear by a promotional bottle in a Chinese supermarket, explicitly stating its mix of p percent grape juice and $(1-p)$ percentage of alcohol. I, of course, was humbled by the explicit declaration, which included the exact p value).

Leaving Adelaide was heart-wrenching, for I had no time to visit any winery (or Fisher's tomb). My schedule demanded that I rush to teach a short course on December 10 before delivering the Foreman Lecture on December 11 at the Australian Statistical Conference (ASC) in Wollongong. The five-hour short course on “Deep statistics for more rigorous and efficient data science,” nano-sizes a graduate-level course, “Deep Statistics: AI and Earth Observations for Sustainable Development,” that I developed and taught since the spring of 2022. In case you are put off by “deep” or “AI” in the title, the course is a deep collaboration with the AI and Global Development Lab (<https://liu.se/en/research/global-lab-ai>) led by Adel Daoud of Linköping University, over many deep contemplations with him and the course teaching assistant—and my PhD student—James Bailie.

Deep statistics studies three key environments for inferences and learning from data: multisource, multiphase, and multi-resolution. The short course focused on the first two, while the Foreman lecture dived into the last: “Multi-resolution Meandering: Personalized Treatments, Individual Privacy, Machine Unlearning, and a World without Randomness.”

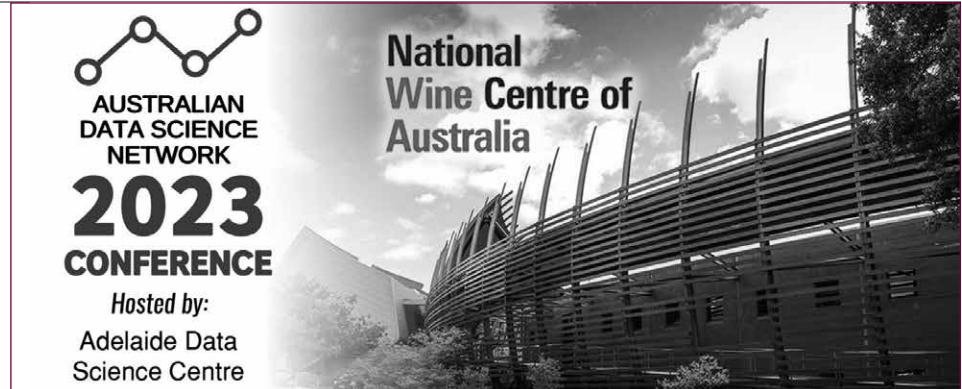
The journey from Wollongong to Canberra, on December 12, was significantly more relaxed, thanks to my

ANU (Australian National University) host's thoughtful arrangements. They had arranged for two students to pick James and me up; one managed the driving while the other steered the conversation, aiding our adjustment to the new time zone. Upon our arrival, it was exceptionally delightful to partake in a warm outdoor graduation celebration, with healthy hors d'œuvres (veggie beef sticks) and beverages (fermented grape juice). For James, an ANU alumnus, Canberra's gentle breeze and Boston's harsh freeze must be a day-and-night pairing, even without differentiating the time zones.

The following morning, James and I delivered a paired keynote speech on "Privacy, Data Privacy, and Differential Privacy," kicking off the 2023 AI in Society Workshop by ANU's Center for Harmonizing Machine Intelligence. It was an intellectual buffet, surveying much food for thought, with topics such as "Design Justice AI," "Critical AI in the Art Museum," "Chasing Storms with AI-enhanced DAS," "Virtues of Robot Inaction," "Human-Machine Aesthetics," and yes, "AITA and Daily Moral Decisions."

I asked myself *AITA* for having never asked or even thought about that question. Those of you who are on higher moral ground or are more introspective might be pleased to know that *AITA* is a subject of a serious study on daily moral decisions, thanks to the Reddit forum (you can search "reddit aita"), accumulating over 100,000 everyday moral dilemmas. It is a fascinating data set to dig into, with some surprises—see https://cmlab.dev/post/aita_overview/. My epiphany came when I realized that any time I consider *AITA* beneath me, it's the time to ask *AITA* about having that thought.

Feeling morally enlightened, James and I went on to visit Australia Bureau of Statistics (ABS), also in Canberra; for James, it was another homecoming, having worked at ABS before (to my great



fortune) joining Harvard. We spent the entire December 14 meeting with ABS researchers, discussing challenges from handling data quality in automated systems to producing statistics from unlinkable data. Many ABS challenges humbled me, especially because they require more qualitative (and quality) thinking than quantitative analysis. Thanks to five years (and counting) of exposure to the qualitative world via editing *Harvard Data Science Review*, I have learned that the qualitative paradigm is just as conceptualizable, contemplable, and construable as the quantitative world, albeit along different dimensions (see for example, "Why the Data Revolution Needs Qualitative Thinking": <https://hdr.mitpress.mit.edu/pub/u9s6f22y/release/4>). The ABS discussions were a field test for what I had learned, though practicing is always more arduous than preaching or reading about it.

The finale of the eight-day blitz was a presentation I relish giving to statistical agencies, "Miniaturizing Data Defect Correlation: A Versatile Strategy for Handling Non-Probability Samples." Whereas the examples I used were US-centric (predicting the 2016 presidential election and assessing 2021 COVID vaccination uptake), the underlying issues and methodologies obviously transcend borders.

Reflections on such issues continued after an outdoor Christmas lunch, where I was introduced to the game of number toss. To end this delayed trip diary for those who love numbers, please indulge me bragging about my beginner's luck. The

game requires each player to toss a wooden baton at twelve consecutively numbered wooden pins, placed on the ground in reasonable proximity to each other. If only one pin is knocked down, the added score is the number on the pin. But if multiple pins are hit, the added score is simply the number of pins knocked down. All the knocked-down pins will be repositioned at the locations where they fall, for the next player. Whoever first reaches a total score of exactly 50 wins the game. If you overshoot 50, then your score gets reduced to 25, and the game continues.

In my first try, I won the game after six single hits, which involved four different pins, with numbers that happened to be consecutive, $\{n, n+1, n+2, n+3\}$. What is n ? And what were my six hits?

Don't ask me how I did afterwards, as I don't even remember what Aussie beverages were served at the lunch. But I do have a visual memory of the departing day when the Champagne-fueled minivan took a whole day to get to the Canberra airport—driving through wineries is apparently not for the faint-livered.

(In case you feel "XL-Files" is dedicating too much space to Australia's data science landscape, I wish to express my sincere appreciation to my gracious hosts, particularly those from ASC, for their unwavering invitations spanning three years. My calendar for 2027, however, remains notably unoccupied, save for the commemoration of my department's 70th anniversary—a milestone that promises another extensive installment of XL-Files. Stay tuned...)

Deadline: May 1, 2024



Student Puzzle Corner 50

Anirban DasGupta says, “We are going to continue with our contest model introduced in the previous puzzle. Each correct answer receives 3 points, each incorrect answer receives -2 points, and each item left unanswered receives -1 point. The top three scorers will be recognized. You can answer just one of the two problems, 50.1 and 50.2, although answering both will be really nice.”

Puzzle 50.1 Suppose you have n i.i.d. observations from a one-dimensional normal distribution with mean μ , $-\infty < \mu < \infty$, and a known variance. Let G be any proper prior on μ and $\delta_G(\bar{X})$ the posterior mean of μ . Prove, or disprove by providing a counterexample, that there exists a value of \bar{X} such that $\delta_G(\bar{X}) < -10^6 \bar{X}$.

Puzzle 50.2 For our contest problem, answer True or False, without the need to provide a proof. But reasoned answers are especially welcome. Here are the items.

- (a) The sample median is an inadmissible estimator of a one-dimensional normal mean μ if the loss function is $(\mu - a)^4$.
- (b) If X_1, X_2, \dots, X_n are i.i.d. standard exponential, then $\limsup [E(\max(X_1, X_2, \dots, X_n)) - \log n] < .50$.
- (c) If $F(x)$ is the CDF of an absolutely continuous distribution on the real line with a completely unknown density $f(x)$, then it is possible to construct an unbiased estimate of f provided the sample size is 5 or more.
- (d) If Z has a standard normal distribution, then one can find independent random variables X and Y , each possessing a density, such that $Z = XY$ in law.
- (e) If $F(x)$ is the CDF of an absolutely continuous distribution on the real line with a continuously differentiable density $f(x)$, and $|f'(x)| \leq 100$ for all x , then f is bounded above by 20.
- (f) The Jeffrey prior on a multinomial probability vector (p_1, \dots, p_k) , where $p_k = 1 - \sum_{i=1}^{k-1} p_i$, is improper if $k \geq 3$.
- (g) If X has a Poisson distribution with mean one, then $E(X^k) < \infty$.
- (h) Suppose X, Y each has a finite variance, that $E(X|Y) = Y$ and $E(Y|X) = 0$. Then $Y = 0$ with probability one.
- (i) Pick a permutation of $\{1, 2, \dots, n\}$ at random. Then the probability that the cycle containing 1 has length k is the same for all k .

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.

A Reminder of Puzzle 49

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. **49.1a** Derive an expression for $\mu(n)$, the expected number of Cauchy observations that fall within the convex hull of the normal observations. **49.1b** Compute this expected value when $n = 7, 25, 50$. **49.1c** Can you say something concrete about the asymptotic order of $\mu(n)$? Can you justify this, even if it is heuristic?

Puzzle 49.2 The following dataset of 14 observations consists of seven simulated standard normal and seven simulated standard Cauchy observations, reported in ascending order. Identify the Cauchy and normal observations. $\{-50.64, -6.41, -1.39, -0.72, -0.70, -0.16, -0.11, 0.24, 0.92, 1.01, 1.17, 1.75, 6.65, 12.42\}$

Well done Debanjan Bhattacharjee (ISI Delhi), and Bilol Banerjee (ISI Kolkata) for sending in correct solutions!

Solution to Puzzle 49

Puzzle 49.1 Denote the normal observations as X_1, \dots, X_n and the Cauchy observations as Y_1, \dots, Y_n . Then, denoting the minimum and the maximum of X_1, \dots, X_n as $X_{(1)}, \dots, X_{(n)}$ respectively, $P(X_{(1)} \leq Y_1 \leq X_{(n)}) = E[\arctan(X_{(n)}) - \arctan(X_{(1)})] = 2 E[\arctan(X_{(n)})] = 2n \int \arctan(x) \Phi(x)^{n-1} \phi(x) dx = \theta_n$, and $\mu_n = n \theta_n$. In particular, $\mu_2 = .493, \mu_5 = 2.46, \mu_{10} = 6.031, \mu_{30} = 20.951, \mu_{100} = 75.307$, etc. Of course, μ_n converges to ∞ as $n \rightarrow \infty$. A better question is how many of the Cauchy values do not fall within the convex hull of the normal values. The asymptotic behavior of $n - \mu_n$ can be found by an asymptotic expansion of the arctan function “at infinity”. You will get $n - \mu_n \sim 2n/(\pi \sqrt{2 \log n})$. For $n = 500$, the true value of $n - \mu_n$ is 102,

and the theoretical order above predicts it to be a little less than 91.

Puzzle 49.2 We can safely classify $-50.64, -6.41, 6.65, 12.42$ as not coming from a standard normal distribution. So we have to identify the remaining three Cauchy values among $-1.39, -0.72, -0.70, -0.16, -0.11, 0.24, 0.92, 1.01, 1.17, 1.75$. The three largest likelihood ratios in favor of Cauchy for these observations are for $1.75, -0.16, -0.11$. Quite interestingly, $-0.16, -0.11$ are indeed Cauchy observations in our simulated set, though the other Cauchy observation is -1.39 , not 1.75 . One can also compute the likelihood ratio for each of the three-element subsets of the above 10 values, and select that subset with the largest likelihood ratio. There are many other options as well.

OBITUARY: Alan Hawkes

1938–2023

Alan Geoffrey Hawkes died on 9 November 2023. He was Emeritus Professor at the Hawkes Centre for Empirical Finance at the School of Management of Swansea University in Wales.

Swansea University has a webpage with a short, but comprehensive, biography: <https://www.swansea.ac.uk/staff/a.g.hawkes/>. There we learn that he joined Swansea in 1974, after stints at UCL and Durham, to lead a new Department of Statistics. At the time, Alan had already published his seminal papers on those self-exciting point processes that later came to be known as Hawkes processes. It is instructive to look at the time evolution of the citations of his 1971 paper, “Spectra of some self-exciting and mutually exciting point processes” (*Biometrika*, 58(1), pp83–90). This paper collected less than 100 citations from 1971 to 2000 and more than 2400 citations from 2001 to 2024 (data based on a Google Scholar search on 12 March 2024). This is one of many examples of initially neglected papers that later become citation classics, and it is a quite common event in mathematics.

Among the reasons for the explosion of interest in Hawkes processes is their applicability in finance. It is in this context that I met Alan in Cardiff, by chance, some years ago. In 2015, I was in Cardiff looking for a restaurant for dinner, when I was called by Jing (Maggie) Chen from the door of a Chinese restaurant. She kindly invited me to join her—and Alan was sitting at her table. In Swansea, Chen and Hawkes had been working on the application of Hawkes processes in finance for a while, and out of this chance encounter a nice scientific collaboration was born. This led to the publication of two papers and a book chapter. Moreover, with Alan and Maggie,

we edited a special issue of *Quantitative Finance* (volume 18, issue 2, 2018) together with Khaldoun Khashanah, David McMillan, Mathieu Rosenbaum, and Steve Yang. I sorely miss the periodic meetings with Alan and Maggie that continued online during the pandemic period and up to very recent times. During these meetings, we also planned to write a book on Hawkes processes in finance, but, unfortunately, this project could not be completed before Alan’s departure.

Alan gained his Bachelor of Science in Mathematics with honors from King’s College, London in 1960, and his Doctor of Philosophy at UCL in 1965 with a dissertation on “Stochastic Problems in Traffic Flow.” His supervisor was Maurice Stevenson Bartlett. According to the mathematics genealogy projects, Wishart, Pearson and Galton are among his academic ancestors. Alan initially worked as a lecturer in UCL, before moving to Durham as a reader in the Department of Mathematics for five years. Then in 1974 he moved to Swansea as the Head of a new Department of Statistics. Ten years later, after a merger, Swansea’s Department of Statistics became the Department of Management Science and Statistics, with Alan acting as deputy head. This school later became known as the European Business Management School (EBMS); Alan was Head of School in 1996–98, before he retired, becoming Emeritus Professor of what became the School of Management.

Returning to his early career, Alan began work on queuing systems. The transition to point processes from queues was only natural, and it was after this transition that the seminal papers on self-exciting processes of the 1970s were written. Until 15–20 years ago, these works did not attract



Alan Geoffrey Hawkes

much interest, except for seismologists who used them in a modified form known as epidemic-type aftershock sequence (ETAS) models for earthquakes. An academic obituary on Alan Geoffrey Hawkes would not be complete without mentioning his joint work with David Colquhoun, FRS, on stochastic models of ion channels. Indeed, he devoted 35 years to this topic. He also worked on system reliability before turning to the application of Hawkes processes in finance after meeting Maggie Chen in 2012. I would like to mention three international workshops on “Hawkes Processes in Finance”: in Cardiff in 2016, in Swansea in 2018 on the occasion of Alan’s 80th birthday celebration, and in Hoboken, New Jersey, in 2019.

Having moved to Rome during 2023, I was unable to attend Alan’s funeral in person, but watched it online; it took place on 22 November 2023. I had time to reflect on Alan’s legacy. It was a great pleasure and honour to work with him in his last years. He took an active part in the research, correcting errors and suggesting references and offering encouragement.

I believe Alan will be remembered for his legacy in Hawkes processes that are named after him. They are extremely versatile and, nowadays, they find applications in many areas of applied sciences.

Written by Enrico Scalas,
Department of Statistical Sciences,
Sapienza University of Rome

OBITUARY: Johannes Ledolter

1950–2023

It is with profound sadness that we announce the passing of our dear friend Johannes Ledolter who was a Professor of Statistics and Business at the University of Iowa and Emeritus Professor at the University of Economics and Business, Vienna, Austria. Johannes passed away peacefully at his home in Iowa City on Sunday, November 5, 2023, after a year-long battle with pancreatic cancer.

Born in Austria, graduating from the University of Vienna, Hannes came to University of Wisconsin, Madison on a Fulbright Scholarship in 1971. That was the beginning of an exciting new life for him. In 1973, he met Lea Vander Velde, a law student in Madison, who later became his wife and life partner. He also met Professor George E.P. Box, one of the greatest statisticians of all time, who became his Ph. D thesis adviser, mentor, and friend. He finished Ph. D in 1975. During that time, he also finished a master's degree in social and economic statistics at Vienna University. Friends from his years in Madison, recall his curiosity for learning the new environs and enjoying the sights and sounds of Madison.

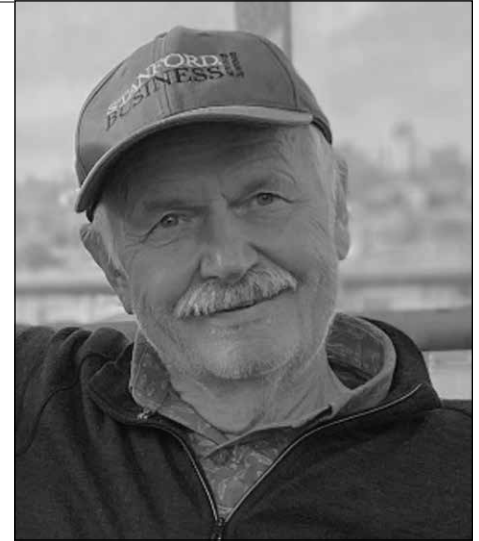
After his graduation in 1975, he spent two years at the International Institute of Systems Analysis (IIASA) in Laxenburg and at the Austrian Institute of Economic Research, Vienna. Then he returned to Madison where Lea was finishing her law degree and joined the University of Wisconsin as a Research Associate working with Professors George Box and George Tiao.

Johannes joined the University of Iowa in 1978 with a joint appointment in the Department of Statistics (later renamed the Department of Statistics and Actuarial Science) and Department of Business Administration (currently renamed as

the Business Analytics Department) at the Tippie College of Business. In 2000, he transitioned to the Tippie College of Business as a chaired professor while retaining his life-long affiliation with the Department of Statistics and Actuarial Science. At the time of his passing, he held the Robert Thomas Holmes Professorship in Business Analytics. Hannes also had a joint appointment as Professor of Statistics at the Vienna University of Economics and Business (1997-2015). He also had visiting appointments at prestigious universities such as Princeton, Yale, Stanford, and Chicago Booth Business School.

Hannes was an excellent lecturer who enjoyed teaching at all levels. His teaching was recognized with the Executive MBA GREAT Instructor of the Year Award in 2000, the Tippie Dean's Teaching Award in 2005, and the Tippie College's Faculty Career Achievement Award in 2023. He had given invited addresses and lectures at various national and international conferences and had several awards and accolades from the profession. He was a Fellow of the American Statistical Association, a Fellow of the American Society for Quality, and an Elected Member of the International Statistical Institute. He was also honored with the William G. Hunter Award from the American Society for Quality in 2022.

Hannes adopted George Box's philosophy of seeing Statistics as a vehicle to solve real world problems. Instead of bringing a particular set of methods or genre he took the cue from the real-world problem. As an applied statistician, he was a highly productive researcher and had made seminal contributions to diverse areas such as Time Series, Business Analytics, Forecasting, Industrial Statistics, Quality, and Visual Sciences, through his books, papers, and



Johannes "Hannes" Ledolter

technology transfer activities. As a firm believer in experimentation not only in manufacturing and marketing, but also in many other endeavors, he experimented with diverse topics and co-authors. He wrote more than 10 books and was the author of more than 150 papers. His co-authored book with Bovas Abraham, "Statistical Methods for Forecasting", has been cited over 1,600 times, according to Google Scholar. His books span several areas including Forecasting, Engineering Statistics, Business Analytics, and Text Mining, the latter of which was written with his wife Lea Vander Velde, a law professor at the University of Iowa.

Johannes was an excellent statistical leader and educator who served the statistics profession in many capacities. He was passionate about the accurate application of statistics and precise communication of results. He was a careful listener, clear thinker, and problem solver, and was genuine in his approach to get the work done ethically. He has given excellent industrial consultation to various organizations such as the Ford Motor Company, Procter and Gamble, American Express, Lenzing Fiber, and Telekom Austria. He also taught short courses and workshops for business and Quality professionals, engineers, and scientists on various topics spanning areas such as statistical modelling, forecasting, quality

improvement, business analytics, and data mining.

Hannes was a skilled skier and bicyclist, wood worker, and preparer of paella for the neighborhood block party, but most of all he was a devoted friend. In addition, he was a cherished mentor to many. He generously shared friendly advice with numerous junior colleagues, encouraging them to think outside the box while keeping the big picture in mind in their endeavors. He was gentle and genuine and possessed

a warm personality, always reaching out to connect with his colleagues. Even in the late summer of 2023, when he was feeling a bit better, he rode his bike to visit one of us (KSC) on the campus. At that time, he appeared physically well, and our lengthy conversation covered various topics, including the importance of text mining in research and education. During the year, one of us (BA) had several conversations with Hannes, mostly personal and some philosophical, the last one being in late

October 2023.

He is survived by Lea Vander Velde, his life partner of 50 years, son Thomas of San Francisco, son Jeffrey of Iowa City, and his mother Herta in Austria. Hannes had many friends around the world, and we all join to say, ‘Bye my friend.’

Written by Bovas Abraham, University of Waterloo, Canada, and Kung-Sik Chan, University of Iowa, USA

Recent papers: Two open-access journals

Probability Surveys

Probability Surveys is a peer-reviewed electronic journal which publishes survey articles in theoretical and applied probability. 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. The journal is sponsored by the Institute of Mathematical Statistics and by the Bernoulli Society. *Probability Surveys* is an Open Access journal. The full text of each article published is freely available to all readers. The Editor-in-Chief is Adam Jakubowski.

Read it at <https://projecteuclid.org/journals/probability-surveys/current>

Volume 21, 2024 (to date)

Universality conjectures for activated random walk. LIONEL LEVINE, VITTORIA SILVESTRI; 1–27

Stochastic Systems

Stochastic Systems is the flagship journal of INFORMS Applied Probability Society. The journal publishes high-quality papers that substantively contribute to the modeling, analysis, and control of stochastic systems. A paper’s contribution may lie in the formulation of new mathematical models, the development of new mathematical or computational methods, the innovative application of existing methods, or in the opening of new application domains. Relative to application-focused journals, *Stochastic Systems* concentrates on how applied probability plays a significant, and not just supporting, role in this field. Relative to other applied probability outlets, *Stochastic Systems* focuses exclusively on operations research content. *Stochastic Systems* provides open access to all of its content on the principle that making research freely available to the public supports a greater global exchange of knowledge. Articles are published under the Creative Commons CC-BY: Attribution license. The Editor-in-Chief is Devavrat Shah.

Read it at <https://pubsonline.informs.org/toc/stsy/current>

Volume 14, Issue 1, March 2024

Externalities in Queues as Stochastic Processes: The Case of FCFS M/G/1 ROYI JACOBovic, MICHEL MANDJES; 1–21
 Efficient Scenario Generation for Heavy-Tailed Chance Constrained Optimization JOSE BLANCHET, FAN ZHANG, BERT ZWART; 22–46
 Solution Representations for Poisson’s Equation, Martingale Structure, and the Markov Chain Central Limit Theorem PETER W. GLYNN, ALEX INFANGER; 47–68
 Learning-Based Optimal Admission Control in a Single-Server Queuing System ASAF COHEN, VIJAY SUBRAMANIAN, YILI ZHANG; 69–107

Elections 2024: Meet the candidates

It's the time of year when we introduce the people who are standing in the 2024 IMS Council elections. This year, along with **Kavita Ramanan**, the candidate for President-Elect, we have 10 candidates—Ivan Corwin, Philip A. Ernst, Martin Hairer, Tai Melcher, Axel Munk, Per Mykland, Igor Prünster, Jane-Ling Wang, Tian Zheng, and Ji Zhu—for the five available places on the Council. Read more about them below... and don't forget to vote! The deadline for your vote is **June 30, 2024**. See <https://www.imstat.org/elections/>

President-Elect candidate

Kavita Ramanan

Professor, Division of Applied Mathematics,
Brown University, USA

<https://www.brown.edu/academics/applied-mathematics/faculty/kavita-ramanan/home>



Education

Masters, Tech, Indian Institute of Technology, Bombay (1992)
PhD degree, 1993 and 1998, Brown University

Research Interests

Probability theory
Stochastic processes
Interacting particle systems
Mean-field games
Large deviations
Stochastic networks
High-dimensional probability
Asymptotic convex geometry

Previous Service to the Profession

Co-Editor-in-Chief, *Annals of Applied Probability*, 2022–2024
Area Editor, *Mathematics of Operations Research*
Editor: *Probability Theory and Stochastic Modeling* Springer Book Series
Associate Editor: *Annals of Probability* (2006–2012; 2021–2026),
Communications of the AMS (2020–2025), *SIMODS* (2021–),
Sankhyā (2022–), *SIAP* (2018–2021), etc.

Co-chair, Program Committee, 2024 Bernoulli–IMS World Congress

AMS Nominations Committee (2015–2017)

AMS Invited Address Committee (2021–2024)

AMS Committee on Committees (2021–2023)

AWM Executive Committee (2018–2022)

AWM Student Chapters Committee (2015–2018; chair 2016–2017)

Bernoulli Society Nominations Committee (2013–2016)

IMS Council (2015–2018 and *ex officio* 2022–2024)

IMS Committee on Special Lectures (2014–2017)

IMS Nominations Committee (2011–2013 and 2021–2022)

Prize Committees: Erlang Prize (2014–2017); Doeblin Prize (2018);

ICIAM Maxwell Prize (2019); Marc Yor Prize (2020–2021);

Pólya Prize (2022)

Scientific Advisory Board, ICERM (2017–2020)

Scientific Council of the SMAI [French society of Applied Math] (2014–2021)

Brief Statement

It is an honor to be nominated for the Presidency of the IMS, which is a serious responsibility and an opportunity to give back to the community. This is a golden era for probability, statistics and data science, with exciting developments taking place across all areas, including fundamental theory, applications and industry. I plan to further strengthen the IMS' crucial role in promoting high quality scholarship, pedagogy, interdisciplinary and collaborative research, and supporting junior researchers. I hope to cultivate a more inclusive, diverse and vibrant environment, broaden the international membership base, and find creative ways to fund existing and new initiatives.

Elections close June 30, 2024. Vote online via
<https://www.imstat.org/elections>



Council candidates: 10 standing for five places

Ivan Corwin

Professor of Mathematics, Department of Mathematics, Columbia University, USA

<https://www.math.columbia.edu/~corwin/>

Education

A.B. Mathematics, 2006, Harvard University
Ph.D. Mathematics, 2011, Courant Institute at New York University

Research Interests

Probability theory
Stochastic analysis
Random matrix theory
Mathematical physics

Previous Service to the Profession

Member of Scientific Advisory Committee for Simons Laufer Mathematical Sciences Institute (formerly MSRI), 2021–25
Member of Scientific Advisory Board for Institute for Computational and Experimental Research in Mathematics, 2020–23
Member of Scientific and Program Committee for various meetings including the 2024 International Congress of Mathematical Physics and 2022 Stochastic Processes and their Applications conference
Member of Steering Committee for GROW conference as well as organizer for 2024 and 2025 instance of GROW at Columbia
Associate Editor or Editorial Board Member for several journals: *Annales de l'Institut Henri Poincaré B*, *Bulletins of the AMS*, *Forum of Mathematics Sigma and PI*, *International Mathematics Research Notices*, *Journal of Functional Analysis*, *Journal of Statistical Physics*, *Probability and Mathematical Physics*, *Probability Theory and Related Fields*, *Selecta Mathematica*, *SIGMA*

Brief Statement

I believe that the IMS plays a key role in the probability and mathematical statistics communities through running excellent journals, organizing quality meetings, administering important prizes, and promoting diversity and outreach. I am happy to be nominated for election to the IMS council to help ensure the continuation of these functions



Timothy Lee Photographers

Philip A. Ernst

Chair (and Full Professor) in Statistics and Royal Society Wolfson Fellow, Department of Mathematics, Imperial College London, UK

<https://www.ma.imperial.ac.uk/~pernst/>

Education

A.B. cum laude in Statistics, 2007, Harvard University
M.A. in Statistics, 2010, The Wharton School of the University of Pennsylvania
Ph.D. in Statistics, 2014, The Wharton School of the University of Pennsylvania

Research Interests

Statistical inference for stochastic processes
Exact distribution theory
Optimal stopping
Stochastic control
Queueing systems
Mathematical finance
Time series analysis

Previous Service to the Profession

(May 2024) Co-Organizer for the “First International Symposium on the Sustainability of Agrarian Societies in the Lake Chad Basin,” hosted by University of Maiduguri, Nigeria
(2023–present) Associate Editor for *Journal of the American Statistical Association, Theory & Methods*.
(2021–present) Associate Editor for *Mathematics of Operations Research*
(2019–22) Guest Editor-in-Chief for “In Memoriam: Larry Shepp,” a special issue of *Stochastic Processes and their Applications*
(August 2019) Director of Instruction for a summer session of the Tapia Center Say STEM Camp at The Tapia Center for Excellence and Equity in Education at Rice University
(2018–present) Associate Editor for *Stochastics*
(2018–present) Associate Editor for *Statistics & Probability Letters*
(2018–present) Associate Editor for *Communications on Stochastic Analysis/Journal of Stochastic Analysis*
(June 2018) Lead Organizer for “A Symposium on Optimal Stopping” (In Memory of Larry Shepp), hosted by Rice University, Houston, TX. www.optimalstopping.com



Council candidates continued

Brief Statement

I am honored to be nominated for the IMS Council election. I have always felt privileged to be a member of the IMS community, and it is indeed in no small part due to the IMS that I am a statistical scientist today. I now hope to pay the favor forward by working to ensure that researchers in all areas of statistical science, regardless of specialty or subfield, continue to feel at home at the IMS. Other interests of mine include supporting early career researchers as well as encouraging more scientists from underrepresented groups to join our incredible IMS community.

Martin Hairer

Professor, Department of Mathematics,
EPFL, Switzerland

<https://www.hairer.org/>



Education

BSc Mathematics, University of Geneva (1998)
MSc Physics, University of Geneva (1998)
PhD Physics, University of Geneva (2001)

Research Interests

Probability Theory
Mathematical Physics
Stochastic analysis
Stochastic dynamics
Stochastic PDEs

Previous Service to the Profession

Chair of the 2022 ICM programme committee
Member of the ICM structure committee (2023–present)
Co-director of the Bernoulli Center (2023–present)
Member of the scientific advisory board of HCM, Bonn (2017–present; chair since 2023)
Member of the scientific advisory board of the Fields Institute, Toronto (2021–present)
Member of the scientific steering committee of the Institute Henri Poincaré (Paris; 2012–20)
Member of the scientific steering committee of the Oberwolfach Institute (2013–21)
Member of the scientific advisory board of ETHZ–ITS (2013–)
Managing editor for the journal “*Commun. AMS*” (2021–present)

Associate editor for *Inventiones Mathematicae* (2023–present)
Associate editor for the *Archive for Rational Mechanics and Analysis* (2023–present)
Associate editor for the journal *Trans. LMS* (2021–present)
Associate editor for the journal *Commun. Math. Phys* (2015–23)
Associate editor for the journal *Probability Theory and Related Fields* (2008–20)
Associate editor for the *Journal of Functional Analysis* (2013–23)
Associate editor for the journal *Annals of IHP Ser. B* (2011–present)
Associate editor for the *Electronic Journal of Probability* (2010–14)
Associate editor for *Electronic Communications in Probability* (2010–14)
Associate editor for the journal *SPDEs: Analysis and Computations* (2012–present)
Associate editor for the journal *NoDea* (2007–present)
Associate editor for the *Journal of Mathematical Analysis and Applications* (2010–11)

Brief Statement

I am very honoured to be nominated for election to the IMS council. Through its activities, meetings and journals, the IMS plays a crucial role for our community and, if elected, I will do my best to help in all aspects of its mission. Strengthening the links between the probability and statistics communities is particularly important to me, as is ensuring that the high scientific quality of the IMS journals is preserved.

Tai Melcher

Associate Professor,
Department of Mathematics,
University of Virginia, USA

<https://sites.google.com/view/taimelcher/home>



Education

BS in Mathematics, Tufts University, 1999
PhD in Mathematics, University of California, San Diego 2004

Research Interests

Random processes in geometric settings
Infinite-dimensional analysis
Functional inequalities

Previous Service to the Profession

Joint Committee on Women in Mathematical Sciences, IMS representative (2022–25)
 IMS Committee for the Hall Prize (2021–24), Chair (2023–24)
 IMS Committee on Equality and Diversity, JCW Representative, (2022–25)
 Associate Editor for *Journal of Theoretical Probability* (2017–)
 Founder and co-organizer for Women in Probability (2013–)

Brief Statement

It is an honor to be nominated for election to the IMS Council. Given the rapid development of data science, machine learning, and AI, it’s increasingly important to improve public understanding of probability and statistics. The IMS plays a central role in the probability and statistics community, and could have great impact with public outreach. Simultaneously, it’s important the IMS continues publishing high-quality journals, organizing meetings and other opportunities for engagement, and otherwise supporting researchers, particularly those at early career stages. It would be a privilege to be part of IMS efforts to advance these purposes internationally.

Axel Munk

Felix-Bernstein Chair for Mathematical Statistics in the Department of Mathematics and Computer Science, Göttingen University, Germany



<https://www.stochastik.math.uni-goettingen.de/munk>

Education

Dr. Rer. Nat., Georg-August Universität Göttingen, 1994

Research Interests

Theory and Methodology:
 Geometric statistics; Optimal transport; Multiscale methods
 Current applications:
 Single molecule experiments; Ion channel recordings;
 Nanoscale fluorescence microscopy; Optogenetics

Previous Service to the Profession

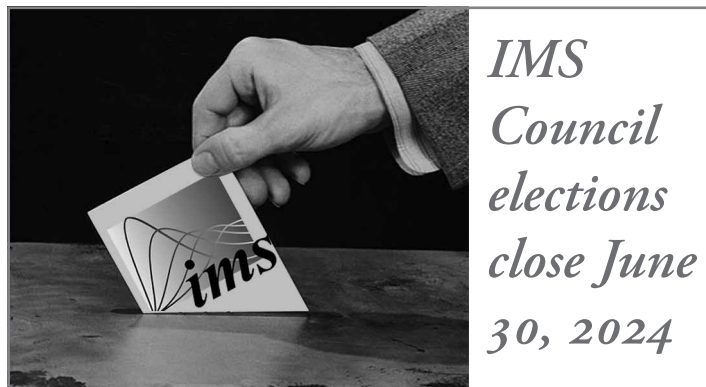
2007–11: Elected member of ERC of the Bernoulli Society

2003–12: Advisory board member of the GMDS certificate committee, Biometrics in Medical Science
 2006: Steering Committee of Inverse Problems International Association (IPIA)
 2016– : Chair of the Panel for Computer Science, Mathematics and Statistics of the Independent Research Fund, Denmark (IRFD)
 2017–20: Member of the Council of the Institute of Mathematical Statistics
 2022– : IMS Committee for the Hall Prize
 2024– : Ethel Newbold Prize Committee of the Bernoulli Society
 Associate Editorship (former and present): *Annals of Statistics*, *Bernoulli Journal*, *Electronic Journal of Statistics*, *Statistical Science*, *Journal of the Royal Statistical Society Ser. B*, *Statistics in Medicine*, *Journal of the American Statistical Association*, *Journal of Nonparametric Statistics*, *Journal of Statistical Planning and Inference*

Brief Statement

As an IMS member for many years I am deeply honored to be nominated for the IMS council. I had the opportunity to serve for the IMS council more than 10 years ago and I remember this a highly active and productive period. The IMS is our flagship organization in statistics and probability and these are exciting times for our profession. Playing a central role in data science we are faced with great opportunities but also the challenge to locate ourselves in the data science landscape. I would be glad if I could help to strengthen the links between IMS and other data science communities where I have actively participated, such as in machine learning, optimization or inverse problems.

Continues on page 26



Council candidates continued

Per Mykland

Robert Maynard Hutchins Distinguished Service Professor of Statistics and Finance, Department of Statistics, The University of Chicago, USA



<https://www.stat.uchicago.edu/~mykland/>

Education

Baccalauréat, 1979, Lycée Corneille, Rouen (France)
B.Sc. Mathematics/Computer Science, 1983, University of Bergen (Norway)
M.Sc. Statistics, 1984, University of Bergen (Norway)
Ph.D. Statistics, 1989, University of California, Berkeley (USA)

Research Interests

Time-dependent data
High frequency inference
High dimensional statistics
Martingales
Likelihood theory

Previous Service to the Profession

President of the Society of Financial Econometrics (SoFiE), July 2017–June 2019. SoFiE Council (since 2009), SoFiE Executive Committee 2016–22, Chair of the Institutional Members Committee from 2022
Director, Stevanovich Center for Financial Mathematics, 2009–present
IMS Council (2001–05)
IMS Committee on Fellows (2002–05, and 2020–23; Chair 2004–05)
Associate Editor: *Journal of the American Statistical Association* (2010–present), *Journal of Financial Econometrics* (2009–present); and previously *Annals of Statistics*, *Annals of Applied Statistics*, *Journal of the Royal Statistical Society Series B*, *Journal of Business and Economic Statistics*, *Scandinavian Journal of Statistics*
Organizer of annual conferences: Conference on Big Data and Machine Learning in Econometrics, Finance, and Statistics (2019–present), Conference on Market Microstructure and High Frequency Data (2014–present)
Organizer or oversight of a large number of other conferences, most recently: A Symposium on Human+AI (2022–23), Privacy and Data Governance: Implications for Statistical and Econometric

Research (2023), Workshop on Quantum Advantage and Next Steps (2022)

Brief Statement

As a field, we are in the middle of a massive transition with the growth of data science and artificial intelligence. An important goal for the IMS is to help statistics and probability to be part of these developments. We can use our knowledge of theory development to contribute to these areas, and we can also learn from them. The IMS should also seek connections to other related cultures. I hope to be useful for the IMS, among other things, by drawing on my past experience in working across academic cultures. (See under previous service.)

Igor Prünster

Professor of Statistics, Department of Decision Sciences and Bocconi Institute for Data Science and Analytics, Bocconi University, Milan, Italy



Photo: Paolo Tomato

<http://mypage.unibocconi.eu/igorpruenster>

Education

Ph.D. in Mathematical Statistics, 2003, University of Pavia, Italy

Research Interests

Bayesian Statistics
Nonparametric Statistics
Discrete Random Structures
Probabilistic symmetries
Predictive inference
Survival Analysis

Previous Service to the Profession

Editorial Service:

Associate Editor for *The Annals of Statistics* (2017–)
Co-Editor for *Bayesian Analysis* (2014–)
Associate Editor for *Operations Research* (2018–24)
Associate Editor for *Statistical Methods & Applications – Journal of the Italian Statistical Society* (2014–)
Associate Editor for *Computational Statistics & Data Analysis* (2013–18)

Associate Editor for *Sankhyā Series A* (2012–15)
Associate Editor for the *Electronic Journal of Statistics* (2008–12)

Other Professional Service:

President of the International Society for Bayesian Analysis (2021)
IMS Program Co-Chair for 78th IMS Annual Meeting & Joint
Statistical Meetings, Seattle, USA (2015)
International Society for Bayesian Analysis: Chair of the
Nonparametrics Section (2019), Board Member (2012–14),
Program Chair (2012) and member of several committees
Chair of the Scientific Committee of the 12th ISBA World Meeting
(2012)
Chair of the Scientific Committee of the 7th Bayesian
Nonparametric Conference (2009)
Organizer of workshops at BIRS, CIRM, IMS–NUS

Brief Statement

It is a great honor to be nominated for election to the IMS council. I have been a proud member since my graduate studies: as a society IMS stands out for the highest quality of its journals, its geographic diversity, the support of early career researchers and the promotion of genuine open access to research. If elected, I will do my best to preserve and further strengthen the leadership status of IMS in these endeavors.

Jane-Ling Wang

Distinguished Professor,
Department of Statistics,
University of California, Davis, USA

<https://anson.ucdavis.edu/~wang/>



Education

B.S. (Mathematics), 1975, National Taiwan University
M.A. (Mathematics), 1978, UC Santa Barbara
Ph.D. (Statistics), 1982, UC Berkeley

Research Interests

Deep learning
Functional data analysis
Survival analysis
Joint modeling of survival and longitudinal data
Non- and semi-parametric inference
Applications

Previous Service to the Profession

Editorial Service:

Co-Editor, *Journal of the American Statistical Association* (2020–23)
Co-Editor, *Statistica Sinica* (2002–05)
Statistics Board of Reviewing Editors, *Science* (since 2015)
Co-editor, *COPSS 50th Anniversary Volume: Past, Present and Future of Statistical Science*, Taylor and Francis/CRC (2014)
Associate Editor: *Biometrika* (since 2012), *Journal of Nonparametric Statistics* (since 2008), *Bernoulli* (2010–15), *Journal of Royal Statistical Society Series B* (2006–10), *Sankhyā: The Indian Journal of Statistics* (1999–2001), *Statistica Sinica* (1996–2001)

Service to IMS

IMS Fellow Committee, 2000–03, 2020–23
International Conference on Machine Learning (ICML) sponsorship co-chair (2020)
IMS Council, 2002–05, 2008–11, 2013–16
IMS representative for the Joint Committee for Women in
Mathematics, 2011–14
IMS Committee on Nominations, 2010–11
IMS Program chair for JSM, 2003
Chair of the Organizing Committee, Joint AMS–IMS–SIAM
Summer Research Conference on “Emerging Issues in
Longitudinal data Analysis”, Mount Holyoke College, 2002
Program Chair, IMS Asian and Pacific Regional Meeting, 1997

Other Professional Service

Noether Research Awards Committee, 2024–, 2018–20
Committee of Presidents of Statistical Societies (COPSS) Award,
2011–14
Co-program leader, SAMSI (Statistics and Applied Mathematical
Sciences Institute) summer program on “Neuroimaging Data
Analysis”, 2013
Awards Committee, International Chinese Statistical Association,
2002–06, 2010–13
Program Co-leader for a year-long program on “Analysis of Object
Data”, SAMSI, 2010–11
Chair, Nonparametric Section of the American Statistical
Association, 2010
President, International Chinese Statistical Association, 2008
Deming Lecture Committee, American Statistical Association,
2004–10
Chair, Bernoulli Section of the Program Committee for the
56th Session of the International Statistical Institute, Lisbon,
Portugal, 2007
Bernoulli Section of the Program Committee for the 55th Session
of the International Statistical Institute, Sydney, Australia, 2005

Council candidates continued

Fellow Committee, American Statistical Association, 2000–03
 Membership Committee, International Chinese Statistical Association, 2000–01
 Board of Directors, International Chinese Statistical Association, 1993–95, 1997–99

Brief Statement

This is an exciting period as we enter a new era with the explosive advancements on the AI front. The role of statistics and probability will be increasingly important and the IMS is uniquely positioned to provide leadership for shaping this role. Important tasks include the development of a forward-looking curriculum that trains the next generation of statisticians, and to brainstorm and develop a vision for the role of mathematical statistics in the age of AI. To address these challenges, the IMS can provide a central platform and also a nurturing environment for a path forward that is inclusive and enhances diversity.

The next few years will be critical for the future of our field and the IMS may need to recalibrate its mission and growth strategies to adapt to the rapidly changing environment. It would be a privilege and honor for me to have the opportunity to serve on the IMS Council and to contribute to accomplishing these tasks.

Tian Zheng

Professor of Statistics and Department Chair, Department of Statistics, Columbia University, USA

<https://stat.columbia.edu/~tzheng/>



Education

B.S. in Applied Mathematics, 1998, Tsinghua University
 Ph.D. in Statistics, 2002, Columbia University

Research Interests

Statistical Machine Learning
 Social Network Analysis
 Bayesian modeling
 Data Science Education
 Interdisciplinary Collaboration and Team Science

Previous Service to the Profession

Member, Committee of Representatives to AAAS, American Statistical Association; 2021–present
 Member, U.S. National Committee for Mathematics (USNC/M); 2021–present
 Member, Nomination Committee, Institute of Mathematical Statistics (IMS); 2021–22
 Member, Program Committee, ACM–IMS Foundations of Data Science; 2020
 Chair-elect (2018), Chair (2019), Past-Chair (2020), Section on Statistical Learning and Data Science, American Statistical Association; 2018–20
 Member, Board of Directors, International Chinese Statistical Association (ICSA); 2014–17

Brief Statement

I am deeply honored to be nominated for the IMS council. In this dynamic era of AI and data-intensive research, IMS holds immense potential to shape the future of Statistics. With my background in interdisciplinary research and commitment to research–education integration, I am eager to contribute to IMS’s mission of advancing our profession and scaling up the impact of Statistics to drive innovation across disciplines.

Ji Zhu

Susan A. Murphy Collegiate Professor, Department of Statistics, University of Michigan, USA

<https://dept.stat.lsa.umich.edu/~jizhu/>



Education

B.Sc. in Physics, 1996, Peking University, China
 M.Sc. in Statistics, 2000, Stanford University, USA
 Ph.D. in Statistics, 2003, Stanford University, USA

Research Interests

Statistical machine learning
 Statistical network analysis
 Statistical modeling in health and science

Previous Service to the Profession

2022–24 Editor-in-Chief, *Annals of Applied Statistics*
 Associate Editor: *JMLR* (2020–), *JCGS* (2012–21), *JASA* (2011–21), *Biometrika* (2011–15), *CJS* (2009–12)
 2024 IMS Program Chair for Joint Statistical Meetings
 2020–22 COS Representative for the Statistical Learning and Data Science Section, ASA
 2019–21 Program Committee, ICSA
 2014–17 IMS Committee on Travel Awards
 2013 Program Chair, ICSA International Conference
 2011–13 Chair-Elect and Chair, Statistical Learning and Data Science Section, ASA

Brief Statement

I am honored to be nominated for the IMS council. If elected, I will work vigorously with the council to advance the goals of IMS. In this AI era, while the statistical community increasingly intersects with machine learning and data science, we have significant steps to make in enhancing our research leadership and improving our work's visibility and impact. It is important to foster dialogue across disciplines, integrate new developments into our curricula, and nurture our members' involvement in IMS functions. There are many challenges ahead. I am committed to working with the council to take on these challenges.

Elections close June 30, 2024. Vote online at <https://www.imstat.org/elections/>



2024 IMS New Researchers Conference

24th IMS Meeting of New Researchers in Statistics and Probability
August 1–3, 2024

Oregon State University, Corvallis, Oregon USA

w <https://nrc2024.github.io/index>

The Institute of Mathematical Statistics (IMS) sponsors the New Researchers Conference (NRC; more formally the Meeting of New Researchers in Statistics and Probability) every year, which takes place the week before JSM. NRC promotes networking and interaction among new researchers in the field of statistics, biostatistics, and probability, including those who expect to hold tenure-track positions in the near future. Attendees will present their research through a brief expository talk and/or poster, and have the chance to mingle throughout the day. There will be longer talks by senior researchers, and panels on various topics such as publishing, grant applications, collaboration, and mentoring.

Anyone who has received a PhD in or after 2017, or expects to receive one by the end of 2024, is eligible to attend, though participation is by invitation only. Travel (up to \$500) and accommodation costs for the participants will be fully covered.

See website for details and to apply.

Application deadline: April 30 2024

Invited Speakers and Panelists:

Genevera Allen, Rice University & Columbia University
Tony Cai, University of Pennsylvania
Eleanor Feingold, Oregon State University
Liza Levina, University of Michigan
Jeffery Leek, Fred Hutchinson
Xihong Lin, Harvard University
Tapabrata Maiti, Michigan State University & NSF Program Director
Adrian Raftery, University of Washington
Richard Samworth, Cambridge University
Chengchun Shi, London School of Economics (IMS Tweedie New Researcher Award Recipient 2024)
Victoriya Volkova, NIH Scientific Review Officer
Heping Zhang, Yale University
Tian Zheng, Columbia University
Ji Zhu, University of Michigan



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/](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 2025	JSM 2026	IMS Annual Meeting @ JSM 2027	JSM 2028	IMS Annual Meeting @ JSM 2029
August 2–7, 2025	August 1–6, 2026	Dates and location to be confirmed	August 5–10, 2028	August 4–9, 2029
Nashville, TN, USA	Boston, MA, USA		Philadelphia, PA, USA	Seattle, WA, USA

Stochastic Networks

July 1–5, 2024

KTH, Stockholm, Sweden

[w https://www.kth.se/sn2024](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.

2024 IMS China Meeting



July 6–8, 2024

Yinchuan City, Ningxia, China

[w https://conferences.koushare.com/2024IMS](https://conferences.koushare.com/2024IMS)

The next IMS China meeting will be held in Yinchuan City, in Ningxia, China, from July 6–8, 2024. All talks will take place at Yinchuan BaoShiLiDe Hotel.

The theme of the 2024 IMS-China International Conference on Statistics and Probability is “Statistics in the Age of GenAI and LLM.” Submit your abstract by May 6. Registration deadline June 6.

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

2027

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

More IMS meetings

Bocconi Summer School in Statistics and Probability NEW July 8–18, 2024, Como, Italy

w <https://bss2024.lakecomoschool.org/>

The Bocconi Summer School in Advanced Statistics and Probability is hosted by the Lake Como School of Advanced Studies (<https://lakecomoschool.org/>) at Villa del Grumello. The summer school is open to all interested researchers, but is especially designed for PhD students.

Since 2021, the school is organized in collaboration with the University of Oxford and Imperial College, London, and is held in alternating years in the UK and in Como. The 2024 edition of the school will be held at Villa del Grumello, Como, on July 8–18, 2024.

The topic of the 2024 edition is *Statistical science for Understanding Climate and the Earth System*, and the main instructors are Claudia Tebaldi (Earth Scientist Joint Global Change Research Institute, Pacific Northwest National Lab USA) and Douglas Nychka (Colorado School of Mines, Golden, Colorado, USA).

Thirty Years of Women in Probability August 5–6, 2024

University of North Carolina in Chapel Hill, USA

<https://services.math.duke.edu/~rtd/> [*website forthcoming*]

Marking 30 years since the Ithaca Workshop for Women in Probability, this meeting will be hosted by the probability group in the department of Statistics and Operations Research at UNC–Chapel Hill. 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).

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.

IMS–CANSSI joint event: Navigating different stages of a successful career in academia, industry, and beyond UPDATED August 2024 (exact date TBD), at JSM Portland, USA

w <https://www.eventbrite.ca/e/navigating-different-stages-of-a-successful-career-tickets-861667800587>

The IMS and the Canadian Statistical Sciences Institute (CANSSI) are pleased to announce their first joint event, “*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 once the JSM program is confirmed), and free boxed lunch will be provided to the first 75 registered participants.

There is no cost for the event itself, but **participants must be registered for JSM 2024**, and attendance will be capped at 75. If you register after the cap, you will be wait-listed. Details will be sent to registrants in late May or early June. Reserve your spot now via the Eventbrite link above.

IMS annual meeting 2024:

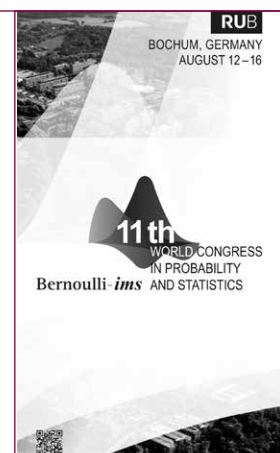
Bernoulli–IMS 11th World Congress in Probability & Statistics August 12–16, 2024, at Ruhr-University Bochum, Germany

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.bernoulli-ims-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/

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/apsp/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.”

The registration deadline is May 6, 2024. Register via the website at: <https://conferencereg.colostate.edu/WNAR-IMS-Graybill-2024>. After registering, you'll get a confirmation email detailing how to book discounted hotel rooms through WNAR. Availability is limited, so **register early to secure your spot.**

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).

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/mailling-list>

UPDATED

13th Cornell Probability Summer School July 22–August 2, 2024, Ithaca, NY, USA

NEW

[w https://math.cornell.edu/13th-cornell-probability-summer-school](https://math.cornell.edu/13th-cornell-probability-summer-school)
CPSS 2024 is organized by the Dynamics, Probability and PDE's in Pure and Applied Research Training Group. The main lecturers will be **Antonio Auffinger**, Northwestern University: [title/abstract forthcoming](#); **Hao Shen**, University of Wisconsin, Madison: [tentative title "Stochastic PDEs from quantum field theory"](#); and **Tianyi Zheng**, University of California, San Diego: [title/abstract forthcoming](#). The Junior Speakers (problem sessions) will be **Curtis Grant**, collaborating with Antonio Auffinger; **Wenhao Zhao**, collaborating with Hao Shen; and **Laszlo Marton Toth**, collaborating with Tianyi Zheng. The schedule will be available as we get closer to the event. There will be a reception on July 23, and an event barbecue on July 26. Registration is open. Dorms are reserved for housing during your stay and will require registration through Cornell Conference Services. Information and a link to housing registration will be included in the CPSS registration. The scientific organizers are Laurent Saloff-Coste, Phil Sosoe, and Lionel Levine. If you have any questions please email cpss_math@cornell.edu.

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

[w https://math.gsu.edu/yichuan/2024Workshop/](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 AI May 9–11, 2024 Washington DC, USA

[w https://statistics.columbian.gwu.edu/statistics-age-ai](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 (ICSDS2024)

December 16–21, 2024

Nice, France

[w https://sites.google.com/view/ims-icsds2024/](https://sites.google.com/view/ims-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-junior-researchers-2024](https://www.niss.org/events/writing-workshop-junior-researchers-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/](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

Forward From The Fields Medal 2024 (FFFM2024)

August 12–17, 2024

Toronto, Canada

[w http://www.fields.utoronto.ca/activities/24-25/FFFM-2024](http://www.fields.utoronto.ca/activities/24-25/FFFM-2024)

In 2024 we celebrate the centenary of the 1924 International Congress of Mathematicians (ICM) in Toronto, Canada. The first ICM held in North America, the conference was brought to Toronto by John Charles Fields as part of his vision of mathematics as a unifying force in the traumatic aftermath of World War I.

For Canada, it was a step onto the world stage in math and science. But its impacts would reach far beyond our borders: a direct result of the conference was John Charles Fields' idea of creating an award. Like Canada itself, the award – with the condition that it be given before the awardee's 40th birthday – recognized not just achievement but also future promise.

John Charles Fields kept an abiding faith in young people as the architects of a better tomorrow. Since the first awarding of the Fields Medal in 1936, the ICM has recognized young mathematicians who have made enormous contributions to their respective areas and inspired countless more to strive for excellence.

Join us as we celebrate the legacy of the 1924 ICM and 100 years of its impact on mathematics – locally and globally. This six-day event will bring living Fields medallists and the international mathematics community back to Toronto for a look at how far mathematics has come and where we may go forward from here.

FORWARD FROM THE FIELDS MEDAL

Join us as we celebrate the legacy of the 1924 International Congress of Mathematicians and 100 years of its impact on mathematics – locally and globally. This six-day event will bring living Fields medallists and the international mathematics community back to Toronto for a look at how far mathematics has come and where we may go forward from here.

AUGUST 12-17, 2024

Reserve your tickets now:
FieldsInstitute.ca

Fields Institute • 222 College Street • Toronto
This establishment is wheelchair accessible.

SPEAKERS
Dimitry Anastakis
Jim Arthur
Marcus Emmanuel Barnes
Mark Braverman
Maria Chudnovsky
Tobias Colding
Camillo De Lellis
Ron Donagi
Charles Fefferman
Misha Gromov
Martin Hairer
Svetlana Jitomirskaya
Greg Lawler
Mikhail Lyubich
Heather Macbeth
Alexander Merkurjev
David Mumford
Ritabrata Munshi
Hiraku Nakajima
Sylvia Nickerson
Gaurav Patil
Sujatha Ramadorai
Elaine Riehm
Igor Rodnianski
Rick Schoen
Madhu Sudan
Ulrike Tillmann
Jacob Tsimmerman
Avi Wigderson
Hornq-Tzer Yau
Shing-Tung Yau
Elim Zelmanov

@fieldsinstitute

Conference on New Developments in Probability (CNDP)

September 26–28, 2024, CRM Montreal

[w http://womeninprobability.org/CNDP.html](http://womeninprobability.org/CNDP.html)

Planning is underway for CNDP₃ at the Centre de Recherches Mathématiques (CRM) at Université de Montréal. Hosted by Women in Probability, organized with Jing Wang (Purdue) and the probability group in Montreal including Louigi Addario-Berry (McGill), Raluca Balan (Ottawa), Héléne Guérin (UQAM), Jessica Lin (McGill), and Lea Popovic (Concordia).

43rd Annual Conference of Texas Statisticians

May 9–10, 2024

Houston TX, USA

[w https://learn.houstonmethodist.org/AI-2024](https://learn.houstonmethodist.org/AI-2024)

Abstract submission (by April 5) and registration are now open for COTS-2024. The theme is *AI, Machine Learning, and Other Related Statistical Techniques with Applications in Healthcare*.

SRCOS Summer Research Conference

June 3–5, 2024, in Clemson, SC, USA

[w https://www.srcos.org/conference](https://www.srcos.org/conference)

The Southern Regional Council on Statistics (SRCOS) 59th Summer Research Conference (SRC) will be held June 3–5, in Clemson, South Carolina. SRCOS is a consortium of statistics and biostatistics programs from 45 universities in 16 states in the Southern USA region, which sponsors the annual SRC conference. The purpose of SRC is to encourage the interchange and mutual understanding of current research ideas in statistics and biostatistics, and to provide motivation and direction for further research progress. Registration is now open, with early registration ending on April 15. **Travel awards** are available for junior/isolated faculty and graduate students; applications close April 15.

4th IMA Conference on Inverse Problems from Theory to Application

September 11–13, 2024, Bath, UK

[w https://ima.org.uk/23503/4th-ima-conference-on-inverse-problems-from-theory-to-application/](https://ima.org.uk/23503/4th-ima-conference-on-inverse-problems-from-theory-to-application/)

Employment Opportunities

China: Shenzhen

The Chinese University of Hong Kong, Shenzhen

Faculty Openings: Tenured or tenure-track positions & Teaching-stream positions (all ranks)

<https://jobs.imstat.org/job//71817607>

United Arab Emirates: Abu Dhabi

Mohamed bin Zayed University of Artificial Intelligence

Open Rank Faculty in Statistics and Data Science

<https://jobs.imstat.org/job//72738338>

United States: La Jolla, CA

University of California San Diego

Associate/Full Professor (tenured): Broad Area in Data Science (HDSI)

<https://jobs.imstat.org/job//72854834>

United States: Santa Cruz, CA

University of California Santa Cruz

Statistics Department: Visiting Assistant Professor

<https://jobs.imstat.org/job//72409662>

United States: Chicago, IL

University of Chicago

Clinical Professor Open rank MS in Applied Data Science

<https://jobs.imstat.org/job//72401039>

United States: New York, NY

Oak Thistle LLC

Quantitative Researcher

The Quantitative Researcher (multiple positions open) at Oak Thistle LLC in New York, NY will apply a wide range of statistical and mathematical techniques to systematic, trading strategies across various time horizons in equities markets through low touch trading system. Telecommuting permitted up to two days per week from the New York Metropolitan area. Salary: \$93,496 – \$210,000 per year. Minimum Requirements: Requires a Master's degree in Mathematics, Statistics, or a related field, plus 5 years of professional occupation researching and developing trading strategies in the investment industry. Must include 3 years of experience with each of the following: 1) Programming financial algorithms using Python; 2) Mathematical models and trading strategies optimization using machine learning algorithms; 3) Stochastic filtering and time series analysis to derive statistically significant signals; 4) Building and improving various factor models for signal generation and risk management; 5) Development and maintenance of market making algorithms; 6) Large-scale data manipulation and statistical analysis for trading strategy back-testing; 7) Low touch trading system design and implementation; 8) Analyzing the microstructure of the market using macroeconomics, including credit, rates, or fx; and, 9) Developing tools for portfolio monitoring, post-market analysis, and interactive report generation using languages including React and JavaScript.

To apply send resume to ecressman@oakthistle.com and reference **job code 0002** in the subject line.

United States: Chicago, IL

University of Chicago Booth School of Business

Clinical Assistant Professor of Operations Management

<https://jobs.imstat.org/job//72488889>

United States: East Lansing, MI

Michigan State University

Assistant Professor, Associate Professor or Professor – Fixed Term

<https://jobs.imstat.org/job//72528261>

United States: Los Alamos, NM

Los Alamos National Laboratory

R&D Manager / Group Leader

<https://jobs.imstat.org/job//72435202>

United States: New York, NY

NYU Stern School of Business

Open Rank Clinical Professor (non tenure-track); Technology, Operations and Statistics (Statistics Group)

<https://jobs.imstat.org/job//72842432>

United States: Rochester, NY

Rochester Institute of Technology

Non-Tenure Track Faculty

<https://jobs.imstat.org/job//72759231>

Employment Opportunities continued

United States: Cleveland, OH

Cleveland Clinic Lerner Research Institute, Department of Quantitative Health Sciences

Faculty Biostatistics & Epidemiology Collaborates with Center for Value-Based Care Research

<https://jobs.imstat.org/job//72841598>

United States: Corvallis, OR

Oregon State University

Assistant Professor of Teaching

<https://jobs.imstat.org/job//72636230>

United States: Dallas, TX

Southern Methodist University

C. F. Frensley Chair in Mathematical Sciences

<https://jobs.imstat.org/job//72505071>

United States: Fairfax, VA

George Mason University

Open-Rank, Term Statistics Faculty

<https://jobs.imstat.org/job//72600551>



International Calendar of Statistical Events


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


Online and Ongoing series

  Asia-Pacific Seminar in Probability and Statistics
w <https://sites.google.com/view/apsp/home>

  COPSS–NISS COVID-19 Data Science
Webinar series w <https://www.niss.org/COPSS–NISS-covid-19-data-science-webinar-series>


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


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

  One World YoungStatS Webinar series
w <https://youngstats.github.io/categories/webinars/>

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


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-on-modern-topics-in-stochastic-analysis-and-applications-in-honour-of-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 9–10: Houston, TX, USA. 43rd Annual Conference of Texas Statisticians w <https://learn.houstonmethodist.org/AI-2024>

 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 on Sequential Methodologies w <https://www.uvu.edu/math/events/iwsm2024/index.html>

International Calendar *continued*


June 2024

 June 3–5: Clemson, SC, USA. SRCOS Summer Research Conference **w** <https://www.srcos.org/conference>

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>

 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>

 July 1–5: Stockholm, Sweden. Stochastic Networks **w** <https://www.kth.se/sn2024>


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/>


 July 6–8: Yinchuan City, China. 2024 IMS China Meeting **w** <https://conferences.koushare.com/2024IMS>



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

  July 8–18: Como, Italy. Bocconi Summer School in Statistics and Probability **w** <https://bss2024.lakecomoschool.org/>

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

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

 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>

  July 22–August 2: Ithaca, NY, USA. 13th Cornell Probability Summer School **w** <https://math.cornell.edu/13th-cornell-probability-summer-school>

August 2024

  August 1–3: Oregon State University, Corvallis, USA. 24th IMS Meeting of New Researchers in Statistics and Probability **w** <https://nrc2024.github.io/index>

 August (exact date TBD): at JSM Portland, USA. *IMS–CANSSI joint event: Navigating different stages of a successful career in academia, industry, and beyond* **w** <https://www.eventbrite.ca/e/navigating-different-stages-of-a-successful-career-tickets-861667800587>

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

  August 5–6: UNC Chapel Hill, USA. Thirty Years of Women in Probability **w** [https://services.math.duke.edu/~rtd/\[website forthcoming\]](https://services.math.duke.edu/~rtd/[website forthcoming])

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

 August 12–17: Toronto, Canada. Forward From The Fields Medal 2024 (FFFM2024) **w** <http://www.fields.utoronto.ca/activities/24-25/FFFM-2024>

August 18–23: Waterloo, Canada. MCQMC 2024 **w** <https://uwaterloo.ca/monte-carlo-methods-scientific-computing-conference/>

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/>

International Calendar *continued*

September 2024 continued

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>

NEW September 11–13: Bath, UK. **4th IMA Conference on Inverse Problems from Theory to Application** **w** <https://ima.org.uk/23503/4th-ima-conference-on-inverse-problems-from-theory-to-application/>

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-for-quantum-information-science/>

December 2024

ims December 16–21: Nice, France. **IMS International Conference on Statistics and Data Science (ICSDS)** **w** <https://sites.google.com/view/ims-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-quantification-and-ai-for-complex-systems/>

June 2025

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

July 2025

NEW **ims** July 6–9: Salzburg, Austria. **IMS Annual Meeting**. **w** TBD

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

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

August 2025

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

August 2026

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

August 2027

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

August 2028

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

August 2029

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

Are we missing something? If you know of any statistics or probability meetings which aren't listed here, please let us know.

You can email the details to Elyse Gustafson at ims@imstat.org, or you can submit the details yourself at <https://www.imstat.org/ims-meeting-form/>

We'll list them here in the Bulletin, and on the IMS website too, at imstat.org/meetings-calendar/

Membership and Subscription Information: 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.

Individual Memberships

Each individual member receives the *IMS Bulletin* (print and/or electronic) and may elect to receive one or more of the five scientific journals. Members pay annual dues of \$105. An additional \$142 is added to the dues of members for each scientific printed journal selected (\$95 for *Stat Sci*). **Reduced membership dues** are available to full-time students, new graduates, permanent residents of countries designated by the IMS Council, and retired members.

Individual and General Subscriptions

Subscriptions are available on a calendar-year basis. **Individual subscriptions** are for the personal use of the subscriber and must be in the name of, paid directly by, and mailed to an individual. Individual subscriptions for 2024 are available to the *Annals of Applied Probability*, *Annals of Applied Statistics*, *Annals of Probability*, *Annals of Statistics* (\$257 for each title), *Statistical Science* (\$210), and *IMS Bulletin* (\$115).

General subscriptions are for libraries, institutions, and any multiple-readership use. Institutional subscriptions for 2024 are available to *The Annals of Applied Probability*, *The Annals of Applied Statistics*, *The Annals of Probability*, and *The Annals of Statistics* (each title \$590 online only / \$770 print+online), *Statistical Science* (\$340 / \$425), and *IMS Bulletin* (\$185 print). Airmail delivery is no longer offered.

IMS Bulletin

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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