

March 2018

## CONTENTS

- 1 **Bernard Silverman knighted**
- 2 **Members' news:** David Banks, Adrian Smith
- 3 **IMS Statement on Professional Conduct at Meetings; awards for ISI Director Bandyopadhyay**
- 4 **Medallion Lecture previews:** Richard Samworth, Thomas Mikosch
- 6 **Recent papers:** *Electronic Journal of Statistics; Statistics Surveys.* **Update:** *Observational Studies*
- 7 **Pro Bono Statistics:** Yoram Gat on Democracy and Statistical Sampling
- 9 **XL-Files:** It's hard to publish, but impossible to unpublish
- 10 **COPSS Presidents' Award winner Tyler VanderWeele**
- 13 **Student Puzzle Corner 20**
- 14 **Candidate statements for 2018 IMS Elections**
- 21 **Meetings**
- 26 **Employment Opportunities**
- 27 **International Calendar of Meetings**
- 31 **Information for Advertisers**

**Read it online:**  
[bulletin.imstat.org](http://bulletin.imstat.org)



## Knighthood for Bernard Silverman

Former IMS President, *Annals of Statistics* and *IMS Bulletin* editor **Bernard Silverman** was knighted in the UK's 2018 New Year Honours List for public service and services to Science. Bee Gees singer Barry Gibb and Beatles drummer Ringo Starr (among others) also received the same honour.

Sir Bernard Silverman's research has ranged widely across theoretical and practical aspects of statistics, and is recognized as a pioneer of computational statistics. He has published extensively, covering aspects from the fundamental mathematical properties of new methods to computer packages for their implementation, and has also collaborated with researchers in many other scientific fields and provided statistical consultancy in industry, commerce and Government.

Following the award of a Gold Medal at the 1970 International Mathematical Olympiad, Bernard studied Mathematics and then Statistics at Cambridge University. In parallel with his doctoral research into computational statistics, he co-designed the first pocket programmable calculator, the Sinclair Cambridge Programmable. He went on to senior academic and leadership posts at the Universities of Bath, Bristol and Oxford, and also spent substantial time as a visitor at Stanford and other universities. From 2010–2017 he worked as Chief Scientific Adviser to the UK Government's Home Office. He now works freelance, including research, charity trusteeship, consultancy, and advice to Government.

His main current research activity is in modern slavery, building on his work for the Home Office in producing the first scientific estimate of the prevalence of modern slavery in the UK. His estimate of 10,000 to 13,000 victims played a pivotal role in the launch of the strategy leading to the Modern Slavery Act 2015, and he is now involved in developing the methodology further and in applying it world-wide.

His other main interest is in security, as chair of the panel set up to give specialist advice to the senior judges who provide independent oversight of the use of investigatory powers by intelligence agencies, police forces and other public authorities. In addition, his concerns include the modernization of the census, research integrity, scientific matters relevant to public policy generally, and diversity and equality issues.

As well as being an IMS Fellow, Bernard (we should now say Sir Bernard) is a Fellow of the UK Royal Society and the Academy of Social Sciences, and a recipient of the COPSS Presidents' Award and the RSS Guy Medals in Silver and Bronze. He has been awarded the honorary degree of Doctor of Science by the Universities of St Andrews, Lancaster, Bath and Bristol.



Bernard Silverman



Cartoon: Neil Keiber (with permission)

## Contact information

*IMS Bulletin* Editor: Vlada Limic  
Assistant Editor: Tati Howell  
Contributing Editors: Anirban DasGupta, Yoram Gat, David Hand, Takis Konstantopoulos, Xiao-Li Meng, Regina Nuzzo, Dimitris Politis, Kavita Ramanan and Terry Speed

Contact the *IMS Bulletin* by email:

**e** [bulletin@imstat.org](mailto:bulletin@imstat.org)  
**w** <http://bulletin.imstat.org>  
**f** <https://www.facebook.com/IMSTATI>

Contact the *IMS* regarding your dues, membership, subscriptions, orders or change of address:

✉ **IMS Dues and Subscriptions Office**  
9650 Rockville Pike, Suite L3503A  
Bethesda, MD 20814-3998  
USA

**t** 877-557-4674 [toll-free in USA]  
**t** +1 216 295 5661 [international]  
**f** +1 301 634 7099  
**e** [staff@imstat.org](mailto:staff@imstat.org)

Contact the *IMS* regarding any other matter, including advertising, copyright permission, offprint orders, copyright transfer, societal matters, meetings, fellows nominations and content of publications:

✉ **Executive Director, Elyse Gustafson**  
IMS Business Office  
PO Box 22718, Beachwood  
OH 44122, USA

**t** 877-557-4674 [toll-free in USA]  
**t** +1 216 295 5661 [international]  
**f** +1 216 295 5661  
**e** [erg@imstat.org](mailto:erg@imstat.org)

## Executive Committee

**President:** Alison Etheridge  
[president@imstat.org](mailto:president@imstat.org)  
**President-Elect:** Xiao-Li Meng  
[president-elect@imstat.org](mailto:president-elect@imstat.org)  
**Past President:** Jon Wellner  
[president-past@imstat.org](mailto:president-past@imstat.org)  
**Treasurer:** Zhengjun Zhang  
[zjz@stat.wisc.edu](mailto:zjz@stat.wisc.edu)  
**Program Secretary:** Judith Rousseau  
[rousseau@ceremade.dauphine.fr](mailto:rousseau@ceremade.dauphine.fr)  
**Executive Secretary:** Edsel Peña  
[pena@stat.sc.edu](mailto:pena@stat.sc.edu)

## IMS Members' News

### David Banks named as new SAMSI Director

The Statistical and Applied Mathematical Sciences Institute (SAMSI) has announced the hiring of a new director. **David Banks**, Duke University, has assumed the role, replacing Richard Smith. SAMSI is one of eight mathematical sciences institutes created by the National Science Foundation, and it is the only one in which statistics plays a large role.

David Banks lays out his initial agenda below and asks for your feedback and suggestions about programs on subjects that interest you. He says, "SAMSI's future plan is to continue doing what it does well, which is fostering research and new careers at the interface of mathematics and statistics. But it will also move in some new directions.

First, we will place greater emphasis upon data science, and reach out to partner more closely with researchers in computer science and related fields. Secondly, we will explore moving towards shorter programs—instead of the year-long programs that are the current

practice, SAMSI intends to pursue some semester-long programs (similar to the Isaac Newton Institute). One consequence of this is that the number of programs will increase, creating more opportunities for scientists to propose and lead these initiatives.



"Currently, SAMSI is finishing two programs: one on **Mathematical and Statistical Methods for Climate and the Earth System**, and one on **Quasi-Monte Carlo and High Dimensional Sampling Methods for Applied Mathematics**. Next year, there will be two nine-month programs, one on **Statistical, Mathematical and Computational Methods for Precision Medicine**, and the other on **Model Uncertainty: Mathematical and Statistical**. After that, SAMSI will move towards shorter programs, and is currently entertaining proposals for programs on **Causal Inference** and on **Games, Risk, and Decision Theory**.

"Creating a good program requires significant forward planning. One needs to line up a small core of prominent researchers (often on sabbatical) who are willing to visit SAMSI and the three local universities (North Carolina State University, UNC–Chapel Hill, and Duke University) for extended periods of time, and to work with the SAMSI postdoctoral fellows. One also needs to enroll a large number of researchers who are willing to attend and present at SAMSI workshops, to help frame the research agenda and to get the appropriate conversations started. This is substantial work, but it can help build a career and be professionally gratifying. And SAMSI generally provides travel support to the workshops and a limited amount of support for long-term visitors, which helps with the recruitment."

He added, "But the real reasons to lead a research program are that, one, it is a unique opportunity to personally shape the future of the discipline, and two, it is a lot of fun!"

If you have any tentative ideas for a future program, please contact the SAMSI directorate: [dbanks@samsi.info](mailto:dbanks@samsi.info) or go to [www.samsi.info](http://www.samsi.info).



David Banks

# More News

## Adrian Smith appointed to lead UK's Alan Turing Institute

The Alan Turing Institute, the UK's national institute for data science, has appointed Professor Sir **Adrian Smith** FRS as Institute Director. Professor Smith, currently Vice-Chancellor at the University of London, will take up his new role later this year.

Howard Covington, Chair of The Alan Turing Institute, said: "I am delighted that Adrian has agreed to lead the Institute. He not only has a formidable academic record and a deep commitment to advancing scientific excellence but also a huge breadth of experience leading world-class research organisations and working with and within government."

Adrian Smith said: "The Alan Turing Institute has a unique role to play in ensuring that the UK fully exploits the potential of advances in data science and AI to transform business and social systems for the benefit of society." See <https://www.turing.ac.uk/>

## IMS Statement on Professional Conduct at Meetings

*"The Institute of Mathematical Statistics (IMS) is a society committed to the freedom of professional expression. The society wishes to foster a productive environment for the exchange of ideas and values participation of all members of the statistical community. The society, therefore, considers it essential that professional conduct is observed at all its functions. Accordingly, all attendees of IMS sponsored and co-sponsored events are expected to show respect and courtesy to other attendees. The society is currently devising specific rules of conduct and institutional mechanisms for enforcement of these rules. In the meantime, IMS members and attendees of IMS functions are advised that the society can and will take steps to guarantee a professional atmosphere and, in particular, will not tolerate harassment in any form."*

## Indian Statistical Institute Director Sanghamitra Bandyopadhyay receives awards

Sanghamitra Bandyopadhyay, the Director of the Indian Statistical Institute, has been awarded the 2017 Infosys Science Foundation prize and the 2017 TWAS prize in engineering sciences for the impact of her work in the field of computer and engineering sciences.

The Infosys award is given annually to recognize the best scientists and scholars to honor their current work. She was specifically recognized for her work on algorithmic optimization with applications in marker identification in genetics, Alzheimer's, HIV, and cancer research. The award carries \$100,000, a gold medal, and a citation. Nobel Laureate Kip Thorne presided over the award giving ceremony in Bangalore in January, 2018 [see photo].

The TWAS Prize (from The World Academy of Sciences) is given in recognition of excellence in research in the global south. The prize carries a plaque and a \$15,000 cash award. Dr. Bandyopadhyay is the first scientist from the Indian Statistical Institute to have been elected a TWAS Fellow, since the inception of the award in 1985. She will be presented with the award in the 2018 annual general conference of the academy.



Prof Sanghamitra Bandyopadhyay receiving the 2017 Infosys Prize from Nobel Laureate Prof Kip Thorne, with Chanc Khosla and Mr Batni

= access published papers online

## IMS Journals and Publications

**Annals of Statistics:** Ed George and Tailen Hsing

<http://imstat.org/aos>

<http://projecteuclid.org/aos>

**Annals of Applied Statistics:** Tilmann Gneiting

<http://imstat.org/aoas>

<http://projecteuclid.org/aoas>

**Annals of Probability:** Maria Eulalia Vares

<http://imstat.org/aop>

<http://projecteuclid.org/aop>

**Annals of Applied Probability:** Bálint Tóth

<http://imstat.org/aap>

<http://projecteuclid.org/aop>

**Statistical Science:** Cun-Hui Zhang

<http://imstat.org/sts>

<http://projecteuclid.org/ss>

## IMS Collections

<http://imstat.org/publications/imscollections.htm>

<http://projecteuclid.org/imsc>

**IMS Monographs and IMS Textbooks:** David Cox

<http://imstat.org/cup/>

## IMS Co-sponsored Journals and Publications

**Electronic Journal of Statistics:** Domenico Marinucci

<http://imstat.org/ejs>

<http://projecteuclid.org/ejs>

**Electronic Journal of Probability:** Andreas Kyprianou

<http://ejp.ejpecp.org>

**Electronic Communications in Probability:**

Giambattista Giacomini

<http://ecp.ejpecp.org>

**Current Index to Statistics:** George Styan

<http://www.statindex.org>

log into members' area at [imstat.org](http://imstat.org)

**Journal of Computational and Graphical Statistics:**

Diane Cook

<http://www.amstat.org/publications/jcgs>

log into members' area at [imstat.org](http://imstat.org)

**Statistics Surveys:** David Banks

<http://imstat.org/ss>

<http://projecteuclid.org/ssu>

**Probability Surveys:** Ben Hambly

<http://imstat.org/ps>

<http://www.i-journals.org/ps/>

## IMS-Supported Journals

**ALEA: Latin American Journal of Probability and Statistics:** Victor Perez Abreu

<http://alea.impa.br/english>

**Annales de l'Institut Henri Poincaré (B):** Gregory

Miermont, Christophe Sabot <http://imstat.org/aihpb>

<http://projecteuclid.org/aihpb>

**Bayesian Analysis:** Bruno Sansó

<http://ba.stat.cmu.edu>

**Bernoulli:** Holger Dette

<http://www.bernoulli-society.org/>

<http://projecteuclid.org/bj>

**Brazilian Journal of Probability and Statistics:**

Francisco Louzada Neto <http://imstat.org/bjps>

<http://projecteuclid.org/bjps>

## IMS-Affiliated Journals

**Observational Studies:** Dylan Small

<http://www.obsstudies.org>

**Probability and Mathematical Statistics:** K. Bogdan,

M. Musiel, J. Rosiński, W. Szczotka, & W.A. Woyczyński

<http://www.math.uni.wroc.pl/~pms>

**Stochastic Systems:** Shane Henderson

<http://www.i-journals.org/ssy/>



We introduce the first two in a series of IMS special lecture previews for 2018. Richard Samworth and Thomas Mikosch are two of this year's Medallion Lecturers. Both of them will be giving their Medallion Lecture at the IMS Annual Meeting in Vilnius, Lithuania, July 2–6, 2018: see [www.ims-vilnius2018.com](http://www.ims-vilnius2018.com). The program will be announced soon. We'll bring you more lecture previews in the next issues.



## Medallion preview: Richard Samworth



**Richard Samworth** is the Professor of Statistical Science and Director of the Statistical Laboratory at the University of Cambridge. He obtained his PhD in Statistics, also from the University of Cambridge, in 2004. His main research interests are in nonparametric and high-dimensional statistical inference. Particular topics include nonparametric function estimation problems (including under shape constraints), nonparametric classification, high-dimensional variable selection and dimension reduction.

Richard serves as an Associate Editor for the *Annals of Statistics* and *Statistical Science*, as well as the *Journal of the American Statistical Association*. He has been awarded the Adams Prize (2017, joint with Graham Cormode), a Leverhulme prize (2014), the Royal Statistical Society's Guy Medal in Bronze (2012) and Research prize (2008), and is an ASA Fellow (2015) and IMS Fellow (2014). Richard's Medallion Lecture will be given at the IMS Vilnius meeting, July 2–6, 2018.

### Efficient entropy estimation, independence testing and more... all with $k$ -nearest neighbour distances

Nearest neighbour methods are most commonly associated with classification problems, but in fact they are very flexible and can be applied in a wide variety of statistical tasks. They are conceptually simple, can be computed easily even in multivariate problems, and we will argue in this talk that they can lead to methods with very attractive statistical properties. Our main focus is on entropy estimation [1] and independence testing [2], though if time permits, we may discuss other applications.

It was the founding father of information theory, Claude Shannon, who recognised the importance as a measure of unpredictability of the density functional

$$H(f) = -\int f \log f.$$

The polymath John von Neumann advised him to call it “entropy” for two reasons: “In the first place your uncertainty function has been used in statistical mechanics under that name, so it already has a name. In the second place, and more important, no one really knows what entropy really is, so in a debate you will always have the advantage”! In statistical contexts, it is often the estimation of entropy from a random sample that is of main interest, e.g. in goodness-of-fit tests of normality or uniformity, independent component analysis and feature selection in classification.

Kozachenko and Leonenko [3] proposed an intriguing closed-form estimator of entropy based on  $k$ th nearest neighbour distances; it also involves both the volume of the unit ball in  $d$  dimensions and the digamma function. Remarkably, under appropriate conditions, it turns out that a weighted generalisation of this estimator is efficient in arbitrary dimensions.

Testing independence and estimating dependence are well-established areas of statistics, with the related idea of correlation dating back to Francis Galton's 19th century work, which was subsequently expanded upon by Karl Pearson. Mutual information, a close cousin of entropy, characterises the dependence between two random vectors  $X$  and  $Y$  in a particularly convenient way. We can therefore adapt our entropy estimator to propose a new test of independence, which we call MINT, short for Mutual INformation Test. As well as having guaranteed nominal size, our test is powerful in the sense that it can detect alternatives whose mutual information is surprisingly small. We will also show how modifications of these ideas can be used to provide a new goodness-of-fit test for normal linear models.

#### References:

- [1] Berrett, T.B., Samworth, R.J. and Yuan, M. (2018) Efficient multivariate entropy estimation via  $k$ -nearest neighbour distances. *Ann. Statist.*, to appear.
- [2] Berrett, T.B. and Samworth, R.J. (2017) Nonparametric independence testing via mutual information. <https://arxiv.org/abs/1711.06642>.
- [3] Kozachenko, L.F. and Leonenko, N.N. (1987) Sample estimate of the entropy of a random vector. *Probl. Inform. Transm.*, **23**, 95–101.



# Medallion preview: Thomas Mikosch

**Thomas Mikosch** received his PhD in Probability Theory at the University of Leningrad (St. Petersburg) in 1984. He is Professor of Actuarial Science at the University of Copenhagen. His scientific interests are at the interface of applied probability and mathematical statistics. In particular, he is interested in heavy-tail phenomena, extreme value theory, time series analysis, and random matrix theory.



He has published about 130 scientific articles and five books. Thomas is a member of the Bernoulli Society (BS), Danish Statistical Association, Danish Association of Actuaries, Danish Royal Society of Sciences and Letters, and is an IMS Fellow. He has (co-)organized numerous conferences, workshops and PhD schools. Currently, he is Associate Editor of various journals, Editor of *Bernoulli* and *European Actuarial Journal*, EiC of the *Extremes Journal*, and he was the EiC of *Stochastic Processes and their Applications* in 2009–2012. He is one of the editors of the Springer book series *Operations Research and Financial Engineering*. He has served on the Itô Prize Committee since 2009. In the BS he chairs the Publications Committee, is Publications Secretary and a member of the Executive Council. In 2018 he was awarded the Alexander von Humboldt Research Prize.

Thomas will also deliver his Medallion Lecture at the IMS Vilnius meeting, July 2–6, 2018.

## Regular variation and heavy-tail large deviations for time series

The goal of this lecture is to present some of the recent results on heavy-tail modeling for time series and the analysis of their extremes.

Over the last 10–15 years, research in extreme value theory has focused on the interplay between the serial extremal dependence structure and the tails of time series. In this context, heavy-tailed time series (as appearing in finance, climate research, hydrology, and telecommunications) have been studied in detail, leading to an elegant probabilistic theory and statistical applications.

Heavy tails of the finite-dimensional distributions are well described by multivariate regular variation: it combines power-law tails of the marginal distributions and a flexible dependence structure which describes the directions at which extremes are most likely to occur; see Resnick (2007) for an introductory text to multivariate regular variation.

A second line of research has continued through the years but attracted less attention: heavy-tail large deviations. In the 1960s and 1970s A.V. and S.V. Nagaev started studying the probability of the rare event that a random walk with iid heavy-tailed step sizes would exceed a very high threshold far beyond the normalization prescribed by the central limit theorem. In the case of subexponential (in particular regularly varying) distributions the tail of the random walk above high thresholds is essentially determined by the maximum step size. Later, related results were derived for time series models by Davis and Hsing (1995), Mikosch and Wintenberger (2014, 2016), among others. Here, the main difficulty is to take into account clustering effects of the random walk above high thresholds.

Regular variation and heavy-tail large deviations are two aspects of dependence modeling in an extreme world. They are similar

in the sense that they are closely related to the weak convergence of suitable point processes. Actually, both regular variation and heavy-tail large deviations are defined via the vague convergence of suitably scaled probability measures whose (infinite) limit measure has interpretation as the intensity measure of a Poisson process. In the heavy-tailed time series world this relationship opens the door to the Poisson approximation of extreme objects such as the upper order statistics of a univariate sample, the largest eigenvalues of the sample covariance matrix of a very high-dimensional time series, and to functionals acting on them.

## References:

- [1] Davis, R. A. and Hsing, T. (1995) Point process and partial sum convergence for weakly dependent random variables with infinite variance. *Ann. Probab.*, **23**, 879–917.
- [2] Mikosch, T. and Wintenberger, O. (2014) The cluster index of regularly varying sequences with applications to limit theory for functions of multivariate Markov chains. *Probab. Theory Rel. Fields*, **159**, 157–196.
- [3] Mikosch, T. and Wintenberger, O. (2016) A large deviations approach to limit theory for heavy-tailed time series. *Probab. Theory Rel. Fields*, **166**, 233–269.
- [4] Nagaev, A. V. (1969) Integral limit theorems for large deviations when Cramér’s condition is not fulfilled I, II. *Theory Probab. Appl.*, **14**, 51–64 and 193–208.
- [5] Nagaev, S. V. (1979) Large deviations of sums of independent random variables. *Ann. Probab.*, **7**, 745–789.
- [6] Resnick, S. I. (2007) *Heavy-Tail Phenomena: Probabilistic and Statistical Modeling*. Springer, New York.

# Recent papers: two co-sponsored journals

## *Electronic Journal of Statistics*

The *Electronic Journal of Statistics (EJS)* publishes research articles and short notes in theoretical, computational and applied statistics. The journal is open access. Articles are refereed and are held to the same standard as articles in other IMS journals. Articles become publicly available shortly after they are accepted. EJS is sponsored by IMS and the Bernoulli Society.

Read it at <https://projecteuclid.org/euclid.ejs>

### Volume 12: Number 1, 2018

Change detection via affine and quadratic detectors . . . . .	YANG CAO, ARKADI NEMIROVSKI, YAO XIE, VINCENT GUIGUES, AND ANATOLI JUDITSKY; 1 - 57
Confidence intervals for the means of the selected populations . . . . .	CLAUDIO FUENTES, GEORGE CASELLA, AND MARTIN T. WELLS; 58 - 79
On misspecifications in regularity and properties of estimators . . . . .	OLEG V. CHERNOYAROV, YURY A. KUTOYANTS, AND ANDREI P. TRIFONOV; 80 - 106
Locally stationary functional time series . . . . .	ANNE VAN DELFT AND MICHAEL EICHLER; 107 - 170
Cluster analysis of longitudinal profiles with subgroups . . . . .	XIAOLU ZHU AND ANNIE QU; 171 - 193

## *Statistics Surveys*

*Statistics Surveys* publishes survey articles in theoretical, computational, and applied statistics. The style of articles may range from reviews of recent research to graduate textbook exposition. The essential requirements are a well specified topic and target audience, together with clear exposition. *Statistics Surveys* is co-sponsored by IMS, the American Statistical Association, the Bernoulli Society, and the Statistical Society of Canada. The IMS Editor is David Banks. Read it at <https://projecteuclid.org/euclid.ssu>

### Volume 9, 2015

Semi-parametric estimation for conditional independence multivariate finite mixture models . . . . .	DIDIER CHAUVEAU, DAVID R. HUNTER, AND MICHAEL LEVINE; 1 - 31
MM-functionals of multivariate scatter . . . . .	LUTZ DÜMBGEN, MARKUS PAULY, AND THOMAS SCHWEIZER; 32 - 105
Some models and methods for the analysis of observational data . . . . .	JOSÉ A. FERREIRA; 106 - 208
Statistical inference for dynamical systems: A review . . . . .	KEVIN MCGOFF, SAYAN MUKHERJEE, AND NATESH PILLAI; 209 - 252
A unified treatment for non-asymptotic and asymptotic approaches to minimax signal detection. . . . .	CLÉMENT MARTEAU AND THEOFANIS SAPATINAS; 253 - 297

### Volume 10, 2016

A survey of bootstrap methods in finite population sampling . . . . .	ZEINAB MASHREGHI, DAVID HAZIZA, AND CHRISTIAN LÉGER; 1 - 52
Fundamentals of cone regression. . . . .	MARIELLA DIMICCOLI; 53 - 99
A comparison of spatial predictors when datasets could be very large . . . . .	JONATHAN R. BRADLEY, NOEL CRESSIE, AND TAO SHI; 100 - 131
Measuring multivariate association and beyond. . . . .	JULIE JOSSE AND SUSAN HOLMES; 132 - 167

### Volume 11, 2017

Basic models and questions in statistical network analysis . . . . .	MIKLÓS Z. RÁCZ AND SÉBASTIEN BUBECK; 1 - 47
--	---

### Volume 12, 2018

A design-sensitive approach to fitting regression models with complex survey data . . . . .	PHILLIP S. KOTTI; 1 - 17
---	--------------------------

## New website for *Observational Studies* journal

*Observational Studies*, an IMS-affiliated journal, has an updated website. Check it out at <https://obsstudies.org/>. *Observational Studies* is a peer-reviewed journal that publishes manuscripts on all aspects of observational studies. The journal is open access and has no publication charges. Papers are posted to the website rapidly when accepted.

# Pro Bono Statistics: Democracy and statistical sampling

Yoram Gat's third column considers whether democracy would be better served by sortition:

For about 2,500 years, statistical sampling was closely linked with democracy. "Selection by lot is natural to democracy, as that by choice [i.e., elections] is to aristocracy," asserted Aristotle in the 4th century BC, following his own first-hand experience at Athens and the conventional wisdom of his time. Montesquieu concurred in the first half of the 18th century. It was only in the last 200 years, as democracy displaced aristocracy as the legitimate organizing principle of politics, that *sortition*—the delegation of power by statistical sampling—had to be air-brushed out of history and political science. And so today, it is commonly claimed that delegation of power was unknown to the Athenians and that their government was a "direct democracy", governed solely by the mass body of the Athenian Assembly. Delegation of power, it is said, is a modern innovation that was necessitated by the much larger size of the modern polity.

This version of history is not only false (as the testimony of Aristotle shows), but *must be* false. A city with tens of thousands of citizens, as Athens was, could no more run its business without delegation than a country of millions can. Like the modern electorate, the Athenian Assembly could vote, but it could not write the proposals it voted on. Law-writing, as well as many other functions of government, cannot be "crowdsourced" and the only question is how those few who carry out those functions are selected. Some Greek cities, like Sparta, used the familiar selection mechanism of elections, but, as Aristotle indicates, those were considered oligarchical cities. Athens and other democratic cities had their law-writers statistically sampled (i.e., selected by lot) from the citizen body.

The idea that sortition is democratic while elections are oligarchical was so conventional, it seems, that despite being mentioned by multiple extant ancient texts, it is nowhere explicitly rationalized. As part of the attempt to dismiss sampling as a political device it is sometimes claimed today that its use in Athens was motivated by the superstition that randomization allowed the gods to make the selection. However, the historical record indicates that the main motivation behind the practice was the law of large numbers. It was expected that sortition would produce a group that would mirror the population in important respects. This was often stated as an expectation of resemblance between the population and the sample in terms of wealth and social status (i.e., that most members would be poor commoners) but it was taken for granted that these characteristics would be correlated with certain interests and beliefs.

In modern Western political ideology, there is significant equivocation regarding the desirability of having political power held by

a statistically representative sample. The American founding fathers explicitly rejected democracy as nothing but mob rule. Their elections-based system was not advertised as being a democracy but a republic, where government is for the people, but not by the people. Jefferson put it this way: "[T]here is a natural aristocracy among men. The grounds of this are virtue and talents. [...] May we not even say that that form of government is the best which provides the most effectually for a pure selection of these natural *aristoi* into the offices of government?" Thus, quite realistically, elections were not offered as a way to put in power average citizens, but instead, rather optimistically, as the way to select that "citizen whose merit may recommend him to the esteem and confidence of his country."

Over time, optimism about the ability and willingness of the natural aristocracy to hold power and to use it for the benefit the people at large became harder to sustain, and explicitly paternalistic positions such as Jefferson's were rejected. The term "republic" gave way to "democracy", and conventional political ideology has come to hold that each person is the best judge of their own interest. But while ideology progressed, political institutions remained largely unchanged, and the same system of government that was explicitly designed to be non-democratic was rebranded as the quintessence of democracy.

Today it is accepted that certain groups—such as those defined by gender, ethnicity and sexual orientation—should be present in a democratic government according to their proportion in the population. Again, it is taken for granted that those characteristics are correlated with certain interests and beliefs and those should be represented in government proportionally. And yet gross distortions in terms of other characteristics—for example, age, wealth, profession and education—are matter-of-factly accepted as natural, and possibly desirable. Undoubtedly, those characteristics are correlated with interests and beliefs as well, and unless Jefferson's premise—that some people are better off being represented by those who are naturally their betters—is accepted, then it is hard to understand how such a government could be considered democratic. Furthermore, since such distortions are unavoidable in any electoral system, and indeed in any deterministic selection system, it is hard to understand how any system in which representation is not based on statistical sampling could be considered democratic.

---

*Yoram would be happy to have a critical and skeptical conversation about the topics he discusses in this column. He invites readers to comment on this column at the Bulletin's website, <http://bulletin.imstat.org/category/pro-bono-statistics/> or you can email us at [bulletin@imstat.org](mailto:bulletin@imstat.org).*

---

# 12<sup>th</sup> International Vilnius Conference on Probability Theory and Mathematical Statistics

## 2018 IMS Annual Meeting on Probability and Statistics

Venue | Vilnius University Life Sciences Center

July 2 – 6, 2018 | Vilnius, Lithuania



■ **Wald Lectures – Luc Devroye**  
(McGill University Montreal)

■ **Le Cam Lecture – Ruth Williams**  
(UC San Diego)

■ **Neyman Lecture – Peter Bühlmann**  
(ETH Zurich)

■ **Schramm Lecture – Yuval Peres**  
(Microsoft Research Redmond)

■ **Vilnius Lecture – Liudas Giraitis**  
(Queen Mary University of London)

■ **Medallion Lecture – Jean Bertoin**  
(University of Zurich)

■ **Medallion Lecture – Svante Janson**  
(Uppsala University)

■ **Medallion Lecture – Thomas Mikosch**  
(University of Copenhagen)

■ **Medallion Lecture – Sonia Petrone**  
(Bocconi University Milan)

■ **Medallion Lecture – Richard Samworth**  
(University of Cambridge)

[www.ims-vilnius2018.com](http://www.ims-vilnius2018.com)



# XL-Files: It's hard to publish, but impossible to unpublish



**Xiao-Li Meng writes:**

My sabbatical orientation at Lugano (see the last *XL-Files*: <http://bulletin.imstat.org/2017/10/xl-files-isipta-ecsqaru-bfas-smps-whoa-psi/>) boosted my over-confidence into double digits. Anyone who asked about my sabbatical plan would get an ambitious answer: that I would complete 14 articles during my sabbatical year. The year is now (at the time of writing) 58.33% over. My accomplishment, you guessed it, is significantly lower—39.29% to be exact. In addition to the usual non-linear path of research progress, what slows me down are the never-ending errors I manage to create. Every morning I promised myself that this would be the day for the final proofreading. Yet I would retire in the evening with another 20–30 red circles on the draft. This happened on Dec 21, Dec 22, and Dec 23, a replay of *Groundhog Day*, undoubtedly pleasing card-carrying frequentists. I took a deep breath on Christmas Eve, forcing my fingers to plunge into the submission system faster than the rising temptation for yet another final proofreading. Finally, I could have a proofreading-free Christmas day.

Most of my errors are of a writing nature. Spellcheck has saved me thousands of times, but it cannot save me from confusing “a/an” with “the”, or mistaking “crispy” for “crisp”. It’s extremely frustrating as a non-native speaker, as I simply do not possess the kind of this-does-not-sound-right gut feeling. Far more time consuming,

however, is seeking an enticing flow for both novice and expert readers. I almost never get the flow right on the first few tries, and sometimes a “final” proofreading compels a major reorganization. It’s always an internal struggle between the impulse to have a fast publication and the desire to make it a well-written, long-lasting article. The mantra “It’s hard to publish, but impossible to unpublish” can be very helpful when conducting this internal dialogue.

Indeed, I wish I had understood this mantra when I was publishing my thesis work. I managed to publish quite a few papers out of my thesis, but at least one of them I wish now I could unpublish. To be sure, it contains no technical error that I am aware of, nor can it have many writing errors—after all, it was published in a top journal. I was proud because it represented the first idea for which I could claim full credit and genuine novelty simultaneously. Before that work, all hypothesis testing procedures with multiply imputed data sets were based on Wald-type test statistics. One day, I just had this cute idea of manipulating complete-data likelihood ratio functions to compute the multiple-imputation likelihood tests almost as effortlessly as the Wald-type tests. I established theoretical validity and demonstrated its satisfactory performance on a real dataset, which apparently convinced the reviewers.

Over the years, the procedure got into a software package, and then inquiries came in. Why did the software produce negative test statistic values, when the reference distribution is an F distribution? I knew the answer. The test was built on an asymptotic equivalence between Wald and likelihood-ratio statistics, and how soon the asymptotics kick in would depend on the parametrization. It thus came as no surprise that it could fail badly with small datasets.

I then asked a wonderful student, Keith Chan, to seek the optimal parametrization. Soon he reported back that the problem was much worse than I realized. The asymptotic equivalence I relied on is guaranteed only under the null hypothesis. But the procedure I proposed uses this equivalence to estimate a key nuisance parameter, the fraction of missing information (FMI). When the null fails, which we typically hope for, the FMI can be so badly estimated that the test may have essentially zero power!

How on earth did I not check for power? A consequence of rushing for publication? Carried away by one cute idea? A sign of research immaturity? All of the above! What depresses me the most is that all the defects of my proposal were automatically fixed by Keith’s “test of average” guided by the likelihood principle. In contrast, my cute idea relies on “average of tests”, guided by a computational trick rather than statistical principles. Computational convenience should always be an important consideration. But when it becomes the driving force, we must keep in mind that computationally convenient bad procedures can do more harm than computationally inconvenient bad (and good) procedures.

Apparently, I had not learned this lesson well when I set my sabbatical goal of completing 14 papers. It should have been to produce at least one paper that will still have positive impact in 140 years. Surely our professional reward systems cannot possibly rely on such long-term qualitative measures. But that is exactly the reason that we need to remind ourselves constantly of the impossibility of unpublishing, to combat the tendency to pursue quantity over quality. Read and revise eight times before submitting.

# Tyler VanderWeele: COPSS Presidents' Award

Bhramar Mukherjee from University of Michigan writes:

Congratulations to **Tyler J. VanderWeele** of the Harvard T.H. Chan School of Public Health, the recipient of the 2017 COPSS Presidents' Award. This award is presented annually to a young member of one of the participating societies of the Committee of Presidents of Statistical Societies (COPSS) in recognition of outstanding contributions to the profession of statistics. The award citation recognized Professor VanderWeele: "for fundamental contributions to causal inference and the understanding of causal mechanisms; for profound advancement of epidemiologic theory and methods and the application of statistics throughout medical and social sciences; and for excellent service to the profession including exceptional contributions to teaching, mentoring, and bridging many academic disciplines with statistics."

Tyler VanderWeele was born in Chicago, Illinois, and was subsequently raised in San Jose, Costa Rica, Bulgaria and Austria. He received his BA in Mathematics from University of Oxford in 2000 and also completed there the requirements for a second BA in Philosophy and Theology. He received an MA in Finance from the Wharton School, University of Pennsylvania in 2002, and his PhD in Biostatistics at Harvard University in 2006, with his dissertation entitled *Contributions to the Theory of Causal Directed Acyclic Graphs*, with James Robins as dissertation advisor. He began as an Assistant Professor of Biostatistics at the University of Chicago, Department of Health Studies (now Public Health Sciences) in 2006, returning to Harvard as Associate Professor of Epidemiology in the Departments of Epidemiology and Biostatistics in 2009. He was promoted to Full Professor with tenure at Harvard University in 2013, and was just appointed the John L. Loeb and Frances Lehman Loeb Professor of Epidemiology.

His research concerns methodology for distinguishing between association and causation in observational studies, and the use of statistical and counterfactual ideas to formalize and advance epidemiologic theory and methods. Within causal inference, he has made important contributions to theory and methods for mediation, interaction, and spillover effects; theory for causal directed acyclic graphs; methodologies for sensitivity analysis for unmeasured confounding; and philosophical foundations for causal inference. He has also made contributions to measurement error and misclassification, to the formalization of epidemiologic concepts, and to study design. His empirical research spans psychiatric, perinatal, and social epidemiology; the science of happiness and flourishing; and the study of religion and health, including both religion and population health and the role of religion and spirituality in end-of-life care. In the twelve years following the receipt of his PhD, he



Tyler VanderWeele (center) with Nick Horton and Amy Herring, at the COPSS Award ceremony at JSM last year

Eric Sampson/ASA

has published over 250 papers in peer-reviewed journals, including 140 first- or sole- author papers in premier statistics, biomedical, and social science journals; he is author of the book *Explanation in Causal Inference: Methods for Mediation and Interaction* (Oxford University Press). He has served on the editorial boards of *Annals of Statistics*, *Journal of the Royal Statistical Society Series B*, *Epidemiology*, *American Journal of Epidemiology*, and *Sociological Methods and Research*. He is co-founder and editor-in-chief of the journal *Epidemiologic Methods*. He also serves Co-Director of the Initiative on Health, Religion and Spirituality, faculty affiliate of the Harvard Institute for Quantitative Social Science, and Director of the Program on Integrative Knowledge and Human Flourishing at Harvard University. In addition to being the recipient of the 2017 COPSS Presidents' Award from the Committee of Presidents of Statistical Societies, he was the recipient of the 2013 Bradford Hill Memorial Lecture, the 2014 Mortimer Spiegelman Award, the 2015 Causality in Statistics Education Award, and the 2017 John Snow Award. He lives in Cambridge, Massachusetts, with his wife Elisabeth and their son Jonathan.

Read the interview with Tyler on the next page.



You can watch last year's COPSS Awards presentation ceremony, and the 2017 R.A. Fisher Lecture, at JSM Baltimore, at <http://ww2.amstat.org/meetings/jsm/2017/webcasts/index.cfm>

Continues on **page 11**

# Tyler VanderWeele: Q&A

*Tyler VanderWeele, 2017 COPSS Presidents' Award recipient, graciously agreed to respond to Bhramar Mukherjee's questions:*

## **What was your reaction to winning the prestigious COPSS Presidents' award?**

I was delighted, and in a state of shock! My wife jumped for joy. A happy, almost mindless, daze set in. It was a Sunday afternoon and we went on a beautiful walk with our son through Cambridge and Harvard Yard. It was a very happy afternoon and evening. As it turned out, however, I had also contracted norovirus the night before, so I will perhaps never know how much of the mindless daze was from COPSS or from... well, we won't go into the aftermath!

## **Which part of your job do you like the most?**

It would be a toss-up between having long stretches of time to think and to write (now sadly less frequent) and having such wonderful colleagues and students to work with. On the one hand, little makes me happier or more at peace than having an empty day to read, think, scribble out mathematics, or write. On the other hand, much of the deepest joy comes from the sharing of ideas, and developing them with colleagues and students. Unfortunately, the two increasingly seem to come into conflict due to limited time! I often wish there were 36 hours in a day.

## **What advice would you give to young people who are entering the profession as PhD students and assistant professors at this time?**

My doctoral dissertation advisor, Jamie Robins, has consistently said to just pursue what you love and are interested in. I think that was very good advice and I would offer the same. In soft money environments especially (which is what many biostatisticians at least have to deal with), it is all too easy for one's time and effort and creativity to be devoted to what is funded rather than what is important. I think it is essential not to confuse the means with the ends. The grants are meant to support research and the pursuit of knowledge; the pursuit of knowledge is not done for the sake of the grant! I think it is important to always be working on research questions that are significant and of interest and not just what happens to be around. I think it is also important to block out time to read broadly, to think deeply, to ponder the structure of our discipline and its relation to others. These things are essential in the choice of research questions. I have come to believe more and more strongly over my career that a substantial amount of time should be devoted to thinking about what is worthwhile pursuing and why. My hope is that universities and departments would do whatever they can to provide protected time for junior faculty (and all faculty!) to engage in deep reflective thought on important questions, whether those topics are funded or not.

## **Who are your most significant mentors? How did/do they impact your career?**

I have had a number of wonderful mentors throughout life, I am very grateful to them. Charles Batty, my Analysis tutor in Mathematics at St. John's College, Oxford, was an important mentor in encouraging careful, rigorous thought and probing the boundaries of concepts. Also at Oxford, my philosophy tutor Peter Hacker, an expert on Wittgenstein, taught me about the philosophy of language and about the drawing of distinctions between concepts, paying careful attention to how language is used. Believe it or not, that mentoring has been of tremendous value in trying to mathematically formalize and make more rigorous various epidemiologic concepts. At Harvard, Jamie Robins was a wonderful guide as I carried out original methodological research projects and he has constantly challenged me to think clearly and deeply about ideas and concepts, to focus on what seems most central and important. I have had many other important mentors throughout the years but in terms of my work in statistics, biostatistics and epidemiology, these would be the most important.

## **Why were you drawn to causal inference?**

Before I began studies in biostatistics, I was actually in a doctoral program in finance. We would fit regression models and then would seem to interpret all of the regression coefficients the same way, often with some vague notion that the interpretation might be causal. It made me very uncomfortable. I felt that we were not really justified in interpreting the regression coefficient as we did, but I also felt that I lacked the technical vocabulary to express my concerns. After a while, I decided to leave finance and took a course in epidemiology and came across the concept of "confounding" and realized immediately that this was the concept that I had wanted to employ in my critique of what we had been doing in empirical finance. The next semester I began doctoral studies in biostatistics at Harvard and my very first semester there I took a course with Donald Rubin on Causal Inference and was introduced to the potential outcomes notation, and immediately saw the concept of confounding could be mathematically formalized by using such potential outcomes notation. I knew at that point that I wanted to pursue causal inference. The next year I took another, more advanced, course on causal inference with Jamie Robins at the School of Public Health at Harvard, and was introduced to causal inference with time-varying exposures, causal diagrams, and questions of mediation, which have subsequently become some of the topics of my own methodological research, much of which is

summarized in my book *Explanation in Causal Inference: Methods for Mediation and Interaction*. I think having a formal framework to distinguish between association and causation is central. It is extremely important in the biomedical and social sciences. It is helpful, but perhaps not absolutely essential, when we are talking about the effects of a single exposure since, in that case, many of our intuitions and traditions that have been built up over the years work reasonably well. However, once we come to more nuanced inquiries concerning exposures that vary over time, or questions of mediation and mechanisms, or how we think about the causal effects on some secondary outcome in the presence of death that may precede our outcome measurement, it becomes extremely difficult to make progress in thinking about causality without a more formal framework. Counterfactuals and the potential outcomes model provide the necessary framework. The framework's capacity to clarify and evaluate assumptions and to provide much more precise and nuanced interpretation to our estimands is extraordinary. A lot of work, however, still needs to be done in making these approaches standard practice in empirical research. For example, methods for sensitivity analysis for unmeasured confounding have been around for decades but are still rarely used in practice. In thinking about how to encourage broader use, a few months ago, in a paper in the *Annals of Internal Medicine*, I introduced a new metric called the E-value to assess the robustness of associations to potential unmeasured confounding (essentially related to the evidence for causality) that I hope will help standardize and promote the use of sensitivity analysis throughout the biomedical and social sciences. The formal work in causal inference using counterfactuals has constituted a massive advance in our capacity to reason about causality, and in understanding our limits in being able to do so. It has been a joy to be able to contribute to this important field.

***Anything else you will like to share about our profession?***

I think that statistics as a discipline is under-appreciated in the university. It really provides the methodological foundation for so many other disciplines. It is interesting to go down the list of Departments in a university and think about how many of them use regression models, for example. Statistics has become one of academia's major epistemologies, one of the ways we come to knowledge. I think it needs to be better acknowledged as such throughout the university. At the same time, I think that the use of statistics is often not adequately scrutinized. In many disciplines, even in statistics itself, we will often blindly accept the interpretation of some analysis without thinking critically about the interpretation, the degrees of evidence, and the assumptions that underlie the conclusions. The field of causal inference is of course helpful in this regard. But I think that the concerns are even broader. How

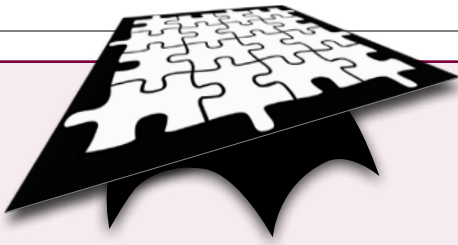
do our statistical analyses relate to the pursuit of knowledge? When are we willing as a community to say that we know something on the grounds of statistical analyses? When is it the case that the evidence is such that it seems impossible that it will be overturned? The much discussed of late "replication crisis" has I think helped bring these important issues up quite dramatically. I also think it is possible that we sometimes overuse and over-rely upon statistics. I am sometimes surprised how in some papers, a policy conclusion is thought to immediately follow from a particular statistical analysis, when a number of ethical and value-related questions must also go into decision-making. Because statistical analyses are quantitative they seem more objective, and we have perhaps become too weak at other forms of ethical and practical reasoning, so that we, at times, perhaps over-rely on statistics in our thinking. In my view, statistics, as a discipline, is thus paradoxically under-appreciated, over-utilized, and under-scrutinized. I think additional reflection, and also education in the broader academic community on how statistical analyses are ultimately related to knowledge, would help increase the appreciation of our discipline and at the same time lead to better and more appropriate interpretation. I hope to spend a fair bit of time thinking further about this task in the years ahead, and hope that other statisticians will do the same.

***Finally, what are your hobbies/interests beyond statistics?***

I very much enjoy classical music and playing the piano, and I try to attend concerts whenever possible, though with a two-year-old now that has become a little less frequent. More and more time has been devoted to my family life, which I have thoroughly enjoyed. I enjoy food and wine... perhaps too much! And I also very much enjoy tennis and, in times past (and hopefully future), skiing. I've been fairly involved in various church communities throughout my life and this has been an important part of the way I think about and understand the world, and more recently this has also been part of my academic work with empirical studies on religion and health. I still enjoy opportunities to read more in philosophy and theology and some of my more recent work has also been thinking about how ideas in philosophy and theology might inform empirical statistical research in the social and biomedical sciences and vice versa... but now I am talking about work once again. Probably more balance with other interests and hobbies, family and friends would be good!

***Congratulations, Tyler VanderWeele, on behalf of the community. We wish you continued success with your amazingly creative scholastic career in the years to come!***





# Student Puzzle Corner 20

**Following “guest puzzler” Stanislav Volkov’s rotating wheel probability puzzle (solution below), Anirban DasGupta sets a statistics puzzle:**

This is one of those quick-and-dirty methods, popularized by John Tukey, one that makes some intuitive sense, and can be very quickly implemented. This issue’s problem is about testing the equality of two absolutely continuous distributions on the real line. You may not have seen this *pocket test* before. Here is the exact problem.

Based on iid picks  $X_1, \dots, X_n$  from an absolutely continuous distribution  $F$  and an independent iid pick  $Y_1, \dots, Y_n$  from a possibly different absolutely continuous distribution  $G$ , we propose a test statistic for testing  $H_0 : F = G$ ; as stated above,  $F, G$  are distributions on the real line. Arrange the combined sample in an ascending order and suppose the overall sample maximum is a sample from  $F$ , and the overall sample minimum is a sample from  $G$ . Count the number of  $X$ -values larger than the largest  $Y$ -value and also count the number of  $Y$ -values smaller than the smallest  $X$ -value. The test statistic  $T_n$  is the sum of these two extreme runs counts. If the overall sample maximum and the overall sample minimum are both samples from the same distribution, define  $T_n$  to be zero.

- Give theoretical values or theoretical approximate values for the mean and the variance of  $T_n$  under the null.
- Give theoretical approximations to cut-off values for rejecting the null based on the test statistic  $T_n$ . This is close to asking what are theoretically justified approximations to the null distribution of  $T_n$ .
- Is this test *distribution-free* in the usual sense?
- What would be the approximate power of this test at level .05 if  $F = N(1, 1)$ ,  $G = N(0, 1)$ ,  $n = 100$ ? Be careful about the rejection region.

The Student Puzzle Corner contains problems in statistics or probability. Solving them may require a literature search.

Student IMS members are invited to submit solutions (to bulletin@imstat.org with subject “Student Puzzle Corner”). The deadline is **April 23, 2018**.

The names of student members who submit correct solutions, and the answer, will be published in the following issue. The Puzzle Editor’s decision is final.

**Deadline: April 23, 2018**

## Solution to Puzzle 19

We received correct solutions to Stanislav Volkov’s puzzle from **Mirza Uzair Baig** from the University of Hawai’i at Mānoa, **Jiashen Lu** from the University of Pittsburgh, and **Benjamin Stokell**, University of Cambridge. Well done! Stanislav explains:

Observe that the required probability equals

$$x := \mathbb{P}(Y_\infty = 0 \mid Y_0 = 0) = \sum_{k=0}^{\infty} \mathbb{P}(\text{the wheel rotates } 4k \text{ times}) \\ = \sum_{k=0}^{\infty} \sum_{j_1, \dots, j_{4k}} p_{j_1} \cdots p_{j_{4k}} \prod_{\ell \notin \{j_1, \dots, j_{4k}\}} (1 - p_\ell)$$

where  $j_n$  are distinct non-negative integers and  $\ell$  is a non-negative integer as well; additionally, we assume that the “empty” sum (when  $k=0$ ) equals 1. This can be somewhat simplified observing that

$$\frac{x}{\prod_{j=1}^{\infty} (1 - p_j)} = \sum_{k=0}^{\infty} \sum_{j_1, \dots, j_{4k} \geq 0} p_{j_1} \cdots p_{j_{4k}} =: S$$

where  $\rho_k = p_k / (1 - p_k)$ , the  $k$ th odds ratio. Now we are going to use a little trick, namely that

$$\prod_{j=1}^{\infty} (1 + \nu \rho_j) = \sum_{k=0}^{\infty} \nu^k \sum_{j_1, \dots, j_k} \rho_{j_1} \cdots \rho_{j_k}$$

Summing up the above expression for  $\nu=1$ ,  $i$ ,  $i^2=-1$ , and  $i^3=-i$ , respectively, where  $i = \sqrt{-1}$ , we get

$$\prod_{j=1}^{\infty} (1 + \rho_j) + \prod_{j=1}^{\infty} (1 + i\rho_j) + \prod_{j=1}^{\infty} (1 - \rho_j) + \prod_{j=1}^{\infty} (1 - i\rho_j) = 4S$$

since

$$1^k + i^k + (-1)^k + (-i)^k = \begin{cases} 1, & \text{if } k \bmod 4 = 0, \\ 0, & \text{otherwise.} \end{cases}$$

Consequently,

$$x = \frac{1}{4} \prod_{n=1}^{\infty} (1 - p_n) \left[ \prod_{n=1}^{\infty} (1 + \rho_n) + \prod_{n=1}^{\infty} (1 + i\rho_n) + \prod_{n=1}^{\infty} (1 - \rho_n) + \prod_{n=1}^{\infty} (1 - i\rho_n) \right].$$

Finally, in case  $p_n = 1/(2n^2+1)$ , one can use e.g. formulae 4.5.68–69 from “Handbook of Mathematical Functions” by Abramowitz and Stegun.

Note that this method can be easily generalized for a wheel with any number  $M \geq 2$ , by replacing  $i = \sqrt[4]{-1}$  with  $\sqrt[M]{-1} = e^{2\pi i/M}$ .



Mirza Uzair Baig



Jiashen Lu



Benjamin Stokell

# IMS Elections 2018: Meet your candidates

## President Elect Nominee: One candidate

### *Susan A. Murphy*

Professor of Statistics, Radcliffe Alumnae Professor at the Radcliffe Institute, Harvard University, and Professor of Computer Science at the Harvard John A. Paulson School of Engineering and Applied Sciences



w <http://people.seas.harvard.edu/~samurphy/>

#### Education

PhD, Statistics (1989), “Time-Dependent Coefficients in a Cox-Type Regression Model” (P.K. Sen, advisor), University of North Carolina, Chapel Hill, NC

B.S., Mathematics (1980), Louisiana State University, Baton Rouge, LA

#### Research Interests

- Reinforcement learning
- Causal inference for sequential treatment
- Clinical trial design for sequential experimentation
- Sequential decision making in mobile health
- Semiparametric inference.

#### Previous IMS Responsibilities

2013–16: Member, IMS Council

2011–12: Chair, Committee to Select Editors, *AOS*

2011: Member, Joint IMS/BS Publications Committee

2007–09: Co-editor of *The Annals of Statistics* (with Bernard Silverman)

June 2000–August 2003: IMS Program Secretary (duties included to oversee all IMS conferences, to select program chairs, to assist program chairs when there were organizational problems)

2000: IMS program chair for the year 2000 IMS/ENAR meeting, Chicago, IL

1997: Steering Committee for the IMS 1997 Western Regional Meeting, Taipei, Taiwan

April 1996–March 2000: Associate Editor, *The Annals of Statistics*

#### Brief Statement

If elected, I will focus my efforts on how IMS can assist new researchers in building effective careers. New researchers struggle with a wide variety of challenges. They must effectively make the difficult transition from solving problems to figuring out which problems are worthwhile to solve. They must figure out how to effectively network. They need to figure out how to publicize their work. All of these challenges are made more difficult if the new researcher did not have the benefit of highly visible mentors or mentorship at all or did not attend a prominent university. IMS can help all new researchers by providing opportunities that facilitate networking, enable greater recognition of work by new researchers and improve the ability of new researchers in selecting timely and relevant research problems that they find exciting. If elected, I'll devote myself to this goal to earn your trust.

### Council Nominees

This year there are ten candidates for five places on IMS Council. They are:

**Vivek S. Borkar**

**Vanja Dukic**

**Christina Goldschmidt**

**Ruth Heller**

**Susan Holmes**

**Xihong Lin**

**Richard Lockhart**

**Gabor Lugosi**

**Nicolai Meinshausen**

**Kerrie Mengersen**

Read about them on the following pages.

## Council Nominees: Ten candidates for six places on Council

### *Vivek S. Borkar*

Institute Chair Professor  
Department of Electrical Engineering,  
Indian Institute of Technology,  
Bombay, India



w <https://www.ee.iitb.ac.in/web/people/faculty/students/borkar>

#### Education

PhD, Electrical Engineering and Computer Science, University of California, Berkeley, 1980

M.S., Systems and Control Engineering, Case Western Reserve University, 1977

B.Tech., Electrical Engineering, Indian Institute of Technology, Bombay, 1976

#### Research Interests

Controlled Markov processes in discrete/continuous time or space; stochastic approximation algorithms; stochastic and evolutionary games; inference on networks; learning algorithms, especially reinforcement learning.

#### Previous service to the profession

- served on journal editorial boards such as *SIAM Journal of Control and Optimization*, *IEEE Transactions on Information Theory*, *Appliciones Mathematicae*, *Dynamic Games and Applications*, and more.
- served as member of Executive Committee of IEEE Mumbai Chapter, Executive Committee of International Society for Dynamic Games, several fellowship/award/advisory/conference committees in India and elsewhere

#### Brief Statement

The boundaries between the traditional domains under the purview of IMS and adjoining areas such as engineering and physical sciences are getting blurred like never before, particularly in domains such as signal processing and machine learning. I hope to bring to the table a view from these borders and the issues that this entails, and help further the synergy.

### *Vanja Dukic*

Professor  
Departments of Applied Mathematics  
(primary) and Economics (courtesy)  
University of Colorado at Boulder



w <http://amath.colorado.edu/faculty/vdukic/>

#### Education

PhD 2001, Brown University

#### Research Interests

- Infectious disease modeling
- IP surveillance and computational epidemiology
- Environmental and Ecological modeling
- Multi-resolution modeling
- Risk and insurance
- Bayesian inference and decision theory

#### Previous service to the profession

Associate Editor, *Bayesian Analysis*, 2016–present

Associate Editor, *Journal of the American Statistical Association*, 2007–12

Associate Editor, *Statistica Sinica*, 2005–11

ISBA Board of Directors, 2015–17

Lindley Prize Committee, ISBA, 2014

ISBA Program Council Chair, 2012

ISBA Junior Travel Award Committee Chair, 2012

SBSS Program Chair, American Statistical Association: Joint Statistical Meetings, 2011

SBSS Student Paper Competition committee Chair, American Statistical Association, 2010

SBSS Publication Officer, SBSS, American Statistical Association, 2006–08

JSM Invited and Contributed Posters Program Chair, American Statistical Association, 2004

Advisory Panel for the NSA Mathematical Sciences Program (MSP), 2013–14

NICHD (NIH) Data Safety Monitoring Board for the Reproductive Monitoring Network, 2008–12

#### Brief Statement

These are exciting times for statistics. We wear many hats, and

*Continues on page 16*

## Council Nominees: continued

*Vanja Dukic continued*

speak multiple languages. We are partners and leaders in a variety of disciplines. A society like IMS is in a unique position to serve as an umbrella society, and to reach far across fields and generations. I'd be honored to serve on its Council.

### Christina Goldschmidt

Professor  
Department of Statistics,  
University of Oxford, UK



w <http://www.stats.ox.ac.uk/~goldschm>

#### Education

B.A. (Hons) Mathematics, 1999, New Hall, University of Cambridge  
Part III Mathematics, 2000 (MMath awarded retrospectively 2011), New Hall, University of Cambridge  
PhD Mathematics, 2004, Statistical Laboratory, University of Cambridge

#### Research Interests

- Combinatorial stochastic processes, including processes of coalescence and fragmentation
- Random trees, random graphs
- Scaling limits of random discrete structures

#### Previous service to the profession

Associate editor, *Stochastic Processes and Their Applications*, 2012–15  
Associate editor, *Annals of Applied Probability*, 2016–  
Editorial board member, *London Mathematical Society Student Texts* book series, 2018–  
Member, Bernoulli Society Committee for Conferences on Stochastic Processes, 2013–  
Member, Institute of Mathematical Statistics Committee on Special Lectures, 2016–

#### Brief Statement

I am honoured to be nominated for a position on the IMS Council. I have been a member of the society since I was a graduate student, and it has been very important for my academic development. The IMS plays a crucial role in the probability and statistics

community, with its outstanding journals, conferences and support for young researchers. I hope to be able to give something back by serving on the Council.

### Ruth Heller

Associate Professor  
Department of Statistics  
and Operations Research  
Tel-Aviv University, Israel



w <http://www.math.tau.ac.il/~ruheller/>

#### Education

- PhD in Statistics, Tel-Aviv University, 2008.
- M.Sc. in Biostatistics, University of Washington, 1998.
- B.Sc. in Mathematics, McGill University, 1996.

#### Research interests

- Multiple comparisons methods.
- Non-parametric statistical tests.
- Observational studies.
- Post-selection inference.
- Replicability analysis.
- Statistical genetics.

#### Previous service to the profession

- Associate editor, *Annals of Statistics*, 2016–
- Council member of the Israel Statistical Association 2013–2015
- Pre-conference course at the 7th Meeting of the Eastern Mediterranean Region of the International Biometric Society (EMR-IBS).

#### Brief Statement

I thank the nominating committee for nominating me as candidate for the IMS Council. The statistics discipline is expanding due to the wonderful challenges modern scientific applications provide. I will endeavor to strengthen the links with neighboring disciplines such as applied mathematics and computer science. This will help the statistics discipline thrive. For example, attracting researchers in deep learning to publish works of statistical nature in the IMS journals, and inviting them to participate in conferences sponsored



by the IMS, can lead to more involvement of statisticians in this field that is at the cutting edge of modern research.

## Susan Holmes

Professor of Statistics  
Stanford University

w <http://statweb.stanford.edu/~susan/>



### Education

1976 M.Sc. in Mathematics, Montpellier, France  
1985 Ph D Thesis in Mathematics, section: Statistics, Montpellier, France: “Computer-Intensive Methods for Evaluation of Results after an Exploratory Analysis”

### Research interests

- Reproducible research and the problem of using statistics for testing biomedical hypotheses.
- Analyses of the human microbiome, including longitudinal multi domain challenges and community network analyses.
- The interface between geometry and statistics, in particular the use of differential geometry in the analyses of complex data such as images, networks and trees.
- Computer intensive methods for uncertainty quantification: bootstrap, Bayesian nonparametric methods using HMC and MCMC.

### Previous service to the profession

(partial)  
2007–present: Moderator arXiv (Statistics, stat.AP).  
2010–present: Associate editor of *BMC Bioinformatics*.  
2009–present: Editor, IMS-CUP Monograph series.  
2012–2017: JCGS Management Committee (chair), IMS representative.  
2008–2012: Chair of Science Board for NIMBioS (NSF, DHLS, NIH, UTK).  
2011–2015: Member, Science Board, Fields Institute.  
2012–2014: Associate editor of *Annals of Applied Statistics*.  
2005–2008: Elected IMS Council Member.  
2004–2005: Elected Program Chair for Statistical Computing Section of the ASA.  
2000–2003: Web editor for the IMS.  
2005–2009: Associate Editor for *Journal of the American Statistical*

*Association (JASA)*.

2005–2009: Associate Editor for *Statistics and Computing*.  
2001–2004: Associate Editor for *Journal of Computational and Graphical Statistics (JCGS)*.  
2001–2007: Associate Editor for *Journal of Statistical Software (JSS)*.  
2000–present Referee/Reviewer for NSF (Statistics program, KDI, DUE-CCD, Computational Biology, NIGMS, VIGRE, Developmental and Evolutionary Biology), *JASA*, *Psychometrika*, *Science*, *Data Analysis and Computational Statistics*, *Systematic Biology*, *ETH*, *Mathematical Biology*, *Journal of Theoretical Probability*, *Journal of Molecular Evolution*, *Bioinformatics*, *Journal of the International Clustering Society*, *Random Structures and Algorithms*, *Bulletin of the American Mathematical Society*, *Molecular Biology and Evolution*, *Annals of Statistics*, *Statistics in Medicine*.

### Brief Statement

If elected I would like to promote the development of publishing platforms and computational tools that strengthen the impact of statistics in all fields of applications. Statistical and probabilistic thinking, visualization and computational tools are all essential to our mission. Each of these uses mathematics and statistics as their basic languages. These provide interpretations and understanding of data which is not available through black box methods. Applied work and tool development should be recognized as essential components of the statistical and mathematical enterprise. I think this will benefit particularly women and our younger generation and keep the institute relevant.

## Xihong Lin

Chair and Henry Pickering Walcott  
Professor of Biostatistics and Professor of  
Statistics  
Department of Biostatistics and  
Department of Statistics,  
Harvard University



w <https://content.sph.harvard.edu/xlin/>

### Education

1994, PhD in Biostatistics, University of Washington  
1989, BS in Applied Mathematics, Tsinghua University, China

## Council Nominees: continued

*Xihong Lin continued*

### Research interests

- Statistical Inference for massive health science data
- Statistical genetics and genomics
- Analysis of Whole Genome Sequencing data in population and clinical sciences
- Integrative analysis of different types of data (Genome, Exposome and Phenome)
- Electronic Medical Records and large administrative databases
- Statistical methods for correlated (longitudinal/clustered, hierarchical and spatial) data
- Nonparametric (kernel and spline) and semiparametric regression methods
- Genetic Epidemiology, Environmental Genomics, Genes and Environment
- Measurement errors
- Missing data
- Observational Studies
- Causal mediation inference

### Previous service to the profession

- Chair, Committee of the Presidents of Statistical Societies (COPSS), 2010–2012
- Founding Chair of the Executive Committee, US Biostatistics Chair Group, 2016
- Chair, Statistical Genetics and Genomics Section, American Statistical Association, 2016
- Member, Noether Award Committee, American Statistical Association, 2014–
- Member, Regional Advisory Committee, ENAR, 2015–2017
- Member, Committee of Theoretical and Applied Statistics, US National Academy of Science (NAS), 2010–2015
- Member, Board of Directors, National Institute of Statistical Sciences, 2010–2012
- Council member, International Biometric Society, 2009–2014
- Editorial Representative, Executive Committee, International Biometric Society, 2004–2007
- Member, Board of Directors, International Chinese Statistical Association, 2004–2006
- Chair, Spiegelman Award Selection Committee, American Public Health Association (APHA), 2005
- Founding Chair, ENAR Junior Researcher Workshop, ENAR, 2001
- Editor, *Computational Biology Series*, Taylor and Francis, 2012–

- Coordinating Editor, *Biometrics*, 2003–2005
- Founding Co-Editor, *Statistics in Biosciences* (2009–2015)
- Associate Editor, *Journal of American Statistical Association, Applications and Case Studies*, (1999–2002, 2013–)
- Associate Editor, *American Journal of Human Genetics* (2013–2015)
- Associate Editor, *Biometrika* (2008–2011)
- Associate Editor, *Biometrics* (1997–2002)
- Associate Editor, *Biostatistics* (2000–2002)
- Member, Program Committee, IMP-Pacific Rim Conference
- Program Chair, 2000 ENAR Meetings, Chicago

### Brief Statement

IMS has a long-standing reputation as a leading statistical society in top-notch journals, meetings, education, supporting and mentoring junior researchers, promoting cutting-edge research in probability and statistical methods and applications, promoting open science, international and interdisciplinary outreach, and promotion of statistical practice in the society. This is an exciting time for our discipline in the era of data science. I would like to help the IMS enhance these activities and its impact in these dimensions in the statistics community and beyond, and strengthen its partnerships with other statistical and non-statistical societies to advance statistical science.

## *Richard Lockhart*

University Professor

Department of Statistics and Actuarial Science, Simon Fraser University

[w http://www.stat.sfu.ca/~lockhart](http://www.stat.sfu.ca/~lockhart)



### Education

- Ph.D - 1979, University of California, Berkeley
- M.A. - 1976, University of California, Berkeley
- B.Sc. - 1975, University of British Columbia

### Research interests

- Inference after model selection
- Goodness-of-fit
- Statistics in Physics
- Inference in stochastic processes

### Previous service to the profession

- President-Elect/President/Past President, Statistical Society of Canada (SSC) 1995–1998
- Member, COPSS, 1995–1998
- Chair, Joint Meetings Advisory Committee, 1999. Member 1997–1999.
- Program sub-chair for SSC, SSC/IMS joint meeting June 1995
- Associate Editor, *Canadian Journal of Statistics*, 1989–2000, 2004–present
- Editor, *Canadian Journal of Statistics*, 2001–2003
- Associate Editor, *Technometrics*, 2002–2007
- Editor (1 of 4), *Statistics Surveys*, 2007–present
- Executive Editor, *Journal of Multivariate Analysis*, 2016–present

### Brief Statement

It is a great privilege to be nominated to serve the IMS. If elected I would hope to bring a strong, sensible voice to the table to maintain the strength and relevance of our journals and meetings. I would hope to be an advocate for many sub-communities all of whom need the IMS to serve them and all of whom need the IMS to remain an active, forward looking, collectively self-aware society which is well-managed and stable for the very long term.

## Gabor Lugosi

ICREA Research Professor  
Department of Economics and Business  
Pompeu Fabra University and ICREA

✉ <http://84.89.132.1/~lugosi/>



### Education

PhD in Electrical Engineering, Hungarian Academy of Sciences, 1991

### Research interests

- statistical learning theory, random graphs and structures, nonparametric statistics, concentration inequalities

### Previous service to the profession

Editor and co-founder of *Mathematical Statistics and Learning* (2017–)

Associate editor of *Annals of Applied Probability* (2016–)  
Associate editor of *Probability Theory and Related Fields* (2015–)  
Action editor of *Journal of Machine Learning Research* (2005–)  
Member, editorial board of *Machine Learning Journal* (2006–)  
Associate editor of *TEST* (2002–)  
Associate editor of *ESAIM: Probability and Statistics* (2005–)  
Associate editor of *IEEE Transactions on Information Theory* (1999–2002)  
Associate editor of *Statistics & Decisions* (2002–2011)  
Associate editor of *Scandinavian Journal of Statistics* (2010–2015)  
Member of the editorial board of *Foundations and Trends in Machine Learning* (2007–)

### Brief Statement

It is a great honor to be nominated to the IMS Council. Both probability and statistics are booming largely thanks to the new challenges coming from data science, machine learning, bioinformatics, and other fields. IMS faces the challenge of keeping a leading role in this increasingly competitive environment and promoting rigorous thinking.

## Nicolai Meinshausen

Professor of Statistics  
Department of Mathematics  
ETH Zürich, Switzerland

✉ <http://stat.ethz.ch/~nicolai/>



### Education

PhD in Mathematics, ETH Zürich (2005)  
MSc in Applied and Computational Mathematics, University of Oxford (2002)  
Diploma in Physics, ETH Zürich (2001)

### Research interests

- Causality
- Machine Learning
- High-dimensional data
- Applications

## Council Nominees: continued

*Nicolai Meinshausen continued*

### Previous service to the profession

IMS committees:

IMS Nominations Committee (2014)

IMS Committee on special lectures (2015–)

Chair of IMS Committee on special lectures (2016, 2017)

Associate editor of:

*Journal of the Royal Statistical Society, Series B* (2009–2013 and 2015–)

*Annals of Statistics* (2013–2015)

*Journal of Machine Learning Research* (2013–2016)

*Journal of Computational and Graphical Statistics* (2008–2011)

*Biometrika* (2009–2011)

*Electronic Journal of Statistics* (2006–2010)

### Brief Statement

The nomination for IMS council is a great honour. The IMS provides invaluable services to the community via its high-quality journals and conferences. We must make every effort to maintain these standards. The most pressing and interesting challenge I currently see for IMS is to positively shape the developments in the fields of Machine Learning and Data Science by maintaining and encouraging strong ties between theory and applications.

**The Elections close May 20, 2018**

**All IMS members are eligible (and encouraged) to vote. You will receive**

**an email with voting instructions. If you prefer a paper ballot, or don't know your member ID, please contact Elyse**

**Gustafson, IMS Executive Director:  
erg@imstat.org.**

<http://www.imstat.org/elections/main.htm>

## *Kerrie Mengersen*

Distinguished Professor in Statistics  
School of Mathematical Sciences  
Queensland University of Technology,  
Qld, Australia

[w https://bragqut.wordpress.com/](https://bragqut.wordpress.com/)



Tony Phillips

### Education

PhD in Mathematical Statistics, 1989, University of New England, Australia

### Research interests

- Bayesian statistics
- Statistical computing
- Modern applied statistical methods
- Modelling and analysis of challenging data
- Applications in health, environment and industry

### Previous service to the profession

- Past President, International Society for Bayesian Analysis (ISBA)
- Past President, Statistical Society of Australia (SSA)
- Past Managing Editor of the *Australian and New Zealand Journal of Statistics*
- Executive roles in ISBA and International Biometrics Society

### Brief Statement

It's an exciting time to be a mathematical scientist. I have been an elected Fellow of the IMS since 2005 and would be honoured to serve the Society. The IMS plays a key role in creating an international community for mathematical sciences, encouraging excellence in research and promoting quality of practice. If elected, I would be pleased to support these endeavours, in particular: supporting early career professionals, particularly women and those in developing countries; taking an international leadership role in the development of a code of good conduct in mathematical sciences, including the promotion of a professional environment free from harassment of any kind; and strengthening networks with other national and international societies, including smaller local groups, to expand opportunities and meet common challenges.



# IMS meetings around the world

## Joint Statistical Meetings: 2018–2023

IMS sponsored meeting

### JSM 2018

**July 28–August 2, 2018. Vancouver, Canada**

<http://ww2.amstat.org/meetings/jsm/2018/>

Have you been to JSM before? If it's your first time, it can be a bit overwhelming because of its size. Read the First Time Attendees guide at <https://ww2.amstat.org/meetings/jsm/2018/firsttimeattendees.cfm> to help you find your feet. We hope you'll join us in Vancouver: with more than 6,000 attendees (including over 1,000 students) from 52 countries, and over 600 sessions, it's a busy few days! The theme this year is "Lead with Statistics."



IMS sponsored meetings: JSM dates for 2019–2023

<b>IMS Annual Meeting @ JSM 2019</b>	<b>JSM 2020</b>	<b>IMS Annual Meeting @ JSM 2021</b>	<b>2022 Joint Statistical Meetings</b>	<b>IMS Annual Meeting @ JSM 2023</b>
<b>July 27–August 1, 2019, Denver, CO</b>	<b>August 1–6, 2020 Philadelphia, PA</b>	<b>August 7–12, 2021, Seattle, WA</b>	<b>August 6–11, 2022 Washington, D.C.</b>	<b>August 5–10, 2023 Toronto, ON, Canada</b>

IMS-sponsored meeting



### 20th Meeting of New Researchers in Statistics and Probability July 26–28, 2018

**Simon Fraser University, Burnaby, Canada**

<http://groups.imstat.org/newresearchers/conferences/nrc.html>

The 20th Meeting of New Researchers in Statistics and Probability will be happening in Burnaby, British Columbia, right before (and close to) JSM in Vancouver. The purpose of the IMS New Researchers Meeting is to promote interaction and networking among new researchers in statistics and probability, and to provide them with valuable insights from leaders in the field.

The organizers are Liangliang Wang and Yunlong Nie, of Simon Fraser University. The meeting is graciously supported by the NSF, PIMS (Pacific Institute for the Mathematical Sciences) and CANSSI (the Canadian Statistical Sciences Institute).

**Invited Speakers:** IMS President **Alison Etheridge**, Oxford University; IMS President-Elect **Xiao-Li Meng**, Harvard University; **Marc Suchard**, University of California, Los Angeles; **Hongyu Zhao**, Yale University; **Jennifer Hill**, New York University.

**Eligibility:** Applications are accepted from anyone who received a PhD in or since 2014; or who expects to receive a PhD by the end of 2019. The number of participants is limited. The deadline for receipt of applications is **March 24, 2018**. By March 31st, applicants will be notified of whether they have been selected to attend. Women and minorities are encouraged to apply. Submit your application at the website above.

IMS co-sponsored meeting

### 2018 IMS Asia Pacific Rim Meeting June 26–29, 2018

**Singapore**

<https://ims-aprm2018.stat.nus.edu.sg/>

The fifth IMS Asia Pacific Rim meeting (IMS-APRM) will be held in Singapore from June 26–29, 2018. It will provide an excellent forum for researchers in Asia and the Pacific Rim, and promote communications and collaborations between researchers in this area and those from other parts of the world.

The program, covering a wide range of topics in statistics and probability, includes **Plenary Lectures** from Rick Durrett and Bin Yu, and many Distinguished Speakers.

IMS co-sponsored meeting

### Elastic Functional and Shape Data Analysis July 16–20, 2018

**Ohio State University, Columbus, OH, USA**

<https://stat.osu.edu/cbms-efsd>

NSF is funding one CBMS Regional Conference in statistics in 2018. The lecturer is Anuj Srivastava, Florida State.

## At a glance:

forthcoming  
IMS Annual Meeting and JSM dates

## 2018

**IMS Annual Meeting:** Vilnius, Lithuania, July 2–6, 2018

**JSM:** Vancouver, Canada, July 28–August 2, 2018

## 2019

**IMS Annual Meeting @ JSM:** Denver, CO, July 27–August 1, 2019

## 2020

**IMS Annual Meeting/ 10th World Congress:** Seoul, South Korea, August 17–21, 2020

**JSM:** Philadelphia, August 1–6, 2020

## 2021

**IMS Annual Meeting @ JSM:** Seattle, August 7–12, 2021

## 2022

**IMS Annual Meeting:** TBC

**JSM:** Washington, August 6–11, 2022

# More IMS meetings around the world

IMS co-sponsored meeting

NEW

## 2018 Seminar on Stochastic Processes

May 9–12, 2018

Brown University, Providence, RI, USA

[w](https://www.brown.edu/conference/stochastic-processes/home) <https://www.brown.edu/conference/stochastic-processes/home>

Some funding for junior researchers is available from NSF. For full consideration, funding applications should be received by **February 8, 2018**. But even if you do not need funding, the organizers would appreciate it if you register for the conference at the earliest, especially if you would like to give a talk or present a poster. Further information and registration can be found at the website above.

IMS co-sponsored meeting

NEW

## International Workshop in Applied Probability 2018 (IWAP 2018)

June 18–21, 2018. Eötvös Loránd University, Budapest, Hungary

[w](http://www.iwap2018.com) [www.iwap2018.com](http://www.iwap2018.com)

Abstract submission deadline **March 15**.

IWAP is a biennial series of conferences launched in 2002 with the aim of fostering exchange and cross-fertilization of ideas on applied probability. The numerous scientific and social events—including the gala dinner served on a cruise ship on the Danube—will present ample networking opportunities throughout the conference. Research presenters will be invited to submit for journal publication in a special issue of *Methodology and Computing in Applied Probability*. László Márkus and Joseph Glaz, Co-Chairs of IWAP2018, look forward to meeting you in Budapest.

IMS co-sponsored meeting

NEW

## 2018 ICSA China Conference on Data Science

July 2–5, 2018

Qingdao, China

[w](http://www.icsa.org/china/symposium/registration.html) <http://www.icsa.org/china/symposium/registration.html>

Registration is open for the 2018 ICSA China Conference with the Focus on Data Science. Early bird registration deadline:

**March 20, 2018**. The conference will take place in Shangri-La Hotel, Qingdao, Shandong, China. It is organized jointly by the International Chinese Statistical Association (ICSA) and Ocean University of China.

The program covers a wide range of topics in data science, presenting recent developments and the state of the art in a variety of modern research topics and applications. The program will include keynote speeches from John (Jack) Kalbfleisch and Kuang-Kuo Gordon Lan.

IMS co-sponsored meeting

UPDATED

## Frontier Probability Days

Corvallis, OR, USA. March 29–31, 2018

[w](http://www.math.utah.edu/~firas/FPD18/) <http://www.math.utah.edu/~firas/FPD18/>

Registration (required but free) deadline March 18.

Frontier Probability Days 2018 is a regional workshop, taking place at the Oregon State University in Corvallis. Plenary Speakers: Rabi Bhattacharya (University of Arizona); Sandra Cerrai (University of Maryland); Sourav Chatterjee (Stanford University); Michael Keane (Wesleyan University); Peter Kramer (Rensselaer Polytechnic Institute); Jonathan Mattingly (Duke University); Anthony Quas (University of Victoria); Nike Sun (University of California, Berkeley); Ruth Williams (University of California, San Diego); and Ilya Zaliapin (University of Nevada, Reno).

IMS co-sponsored meeting

NEW

## Southeastern Probability Conference

May 14–15, 2018

Durham, North Carolina, USA

[w](https://services.math.duke.edu/~rtd/SEPC2018/SEPC2018.html) <https://services.math.duke.edu/~rtd/SEPC2018/SEPC2018.html>

The speakers are: Megan Bernstein (Georgia Tech); Wei-Kuo Chen (Minnesota); Laura Eslava (Georgia Tech); Hanbaek Lyu (Ohio State); Sumit Mukherjee (Columbia); Elliot Paquette (Ohio State); Leo Petrov (Virginia).

IMS co-sponsored meeting

## ISNPS2018: The 4th Conference of the International Society for Non-Parametric Statistics

June 11–15, 2018. Salerno, Italy

[w](http://www.isnps2018.it/) <http://www.isnps2018.it/>

The ISNPS (International Society of Non-Parametric Statistics) conferences take place biennially. The Fourth Conference of ISNPS is scheduled to take place in Salerno, southern Italy. 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 posters on all areas of nonparametric statistics. A roundtable discussion on the constitution of ISNPS and future conferences will also take place.

Researchers who are interested in ISNPS and/or would like to participate in its Fourth Conference by giving a contributed talk or poster are encouraged to register online or contact ISNPS at the email: [isnps2018@unisa.it](mailto:isnps2018@unisa.it).

## IMS co-sponsored meeting

**40th Conference on Stochastic Processes and their Applications (SPA)****June 11–15, 2018. Gothenburg, Sweden****NEW** [w http://spa2018.org/](http://spa2018.org/)

The 40th Conference on Stochastic Processes and their Applications (SPA 2018) will be held June 11–15, 2018, at the Chalmers University of Technology in Gothenburg, Sweden.

Submission of proposals for contributed sessions, contributed talks and posters are welcomed! The organizers encourage early submissions to leave the accepted speakers plenty of time to make travel and funding arrangements. The submissions will be assessed and good proposals are accepted on a regular basis. Accepted contributed talks will be grouped into additional contributed sessions after the submission deadline, **March 2, 2018**.

**Plenary speakers:** Robert Adler, Francois Baccelli, Mia Deijfen, Alison Etheridge (Lévy lecture), Patricia Gonçalves, Kurt Johansson, Olav Kallenberg, Davar Khoshnevisan (IMS Medallion lecture), Anna De Masi (IMS Medallion lecture), Mikhail Menshikov, Annie Millet, Elchanan Mossel, Asaf Nachmias, Jeffrey Steif (Doob lecture), and Nike Sun.

## IMS co-sponsored meeting

**The 6th Workshop on Biostatistics and Bioinformatics****May 4–6, 2018. Atlanta, GA****w** <https://math.gsu.edu/yichuan/2018Workshop/>

The 6th Workshop on Biostatistics and Bioinformatics will take place May 4–6, 2018, in Atlanta. The goal of the workshop is to stimulate research and to foster the interaction of researchers in Biostatistics and Bioinformatics. It will provide the opportunity for faculty and graduate students to meet with top researchers in small groups, identify important directions for future research, and facilitate research collaboration.



The keynote speaker is **Hongyu Zhao**, the Ira V. Hiscock Professor of Biostatistics and Professor of Statistics and Genetics at Yale University, and recipient of the Mortimer Spiegelman Award. Invited sessions and a poster session are also part of the workshop.

Partial travel awards will be awarded to select conference participants as priority will be given to senior graduate students, post-graduate, recent PhDs, junior faculty, and under-represented groups.

## IMS co-sponsored meeting

**41st Conference on Stochastic Processes and their Applications (SPA)****July 8–12, 2019****Evanston, IL, USA****w** TBC

The 2019 Conference on Stochastic Processes and their Applications will be held in Evanston, Illinois. Details to follow.

## IMS sponsored meeting

**WNAR/IMS Meeting****June 24–27, 2018****Edmonton, Canada****w** <http://www.wnar.org/Meetings>

Next summer's WNAR/IMS meeting will be held June 24–27, 2018, at the University of Alberta, Edmonton, Canada. The local organizers are Bei Jiang and Linglong Kong. Details coming soon.

## IMS sponsored mtg

**2018 IMS Annual****Meeting & 12th****Vilnius Conference****on Prob. Theory &****Math. Statistics****July 2–6, 2018****Vilnius, Lithuania****NEW** **w** [http://ims-](http://ims-vilnius2018.com/)[vilnius2018.com/](http://ims-vilnius2018.com/)

Program Co-chairs

Peter Bühlmann

(IMS) and Vygantas

Paulauskas (Vilnius).

Local Chair is

Remigijus Leipus.

## IMS co-sponsored meeting

**SAE2018: Small Area Estimation and Other Topics of Current Interest in Surveys, Official Statistics, and General Statistics****June 16–18, 2018****East China Normal University, Shanghai, China****w** [www.sae2018.com](http://www.sae2018.com)

This conference includes a celebration of Professor Danny Pfeffermann's 75th Birthday.



## IMS sponsored meetings

**ENAR dates, 2018–2020****March 25–28, 2018: in Atlanta, GA****March 24–27, 2019: in Philadelphia, PA****March 22–25, 2020: in Nashville, TN****w** <http://www.enar.org/meetings/future.cfm>

The 2018 program is online. Rod Little is the Presidential Invited Speaker.

## IMS co-sponsored meeting

**Bernoulli/IMS 10th World Congress****in Probability and Statistics****August 17–21, 2020. Seoul, South Korea****w** TBC

The next World Congress in Probability and Statistics will be in Seoul, South Korea.

# Other meetings and events around the world

## Conference on Statistics and Modeling in Human and Social Sciences

**NEW DATE: April 3–5, 2018**

**Cairo, Egypt**

**w** <http://www.feps.edu.eg/en/departments/statistics/conference/>  
This conference, previously announced, is delayed for one week due to the presidential elections in Egypt: it will now be held April 3–5.

## First Midwest Statistical Machine Learning Colloquium

**NEW**

**May 9, 2018. Ames, Iowa, USA**

**w** <https://register.extension.iastate.edu/msmlc/about>  
This one-day meeting of statisticians, engineers, computer scientists, mathematicians, and practitioners interested in the theory and applications of Statistical Machine Learning is being organized by the ISU Departments of Statistics and Industrial & Manufacturing Systems Engineering. **Reduced price registration** is offered for students and all poster presenters.

## Symposium on Data Science and Statistics

**NEW**

**May 16–19, 2018**

**Reston, VA, USA.**

**w** <http://ww2.amstat.org/meetings/sdss/2018/index.cfm>  
*SDSS 2018 Registration and Housing Are Now Open!*  
SDSS offers a powerful new forum for data scientists, computer scientists, and statisticians who analyze and visualize complex data to share knowledge and establish new collaborations, so join your peers at SDSS 2018 in Reston, VA, May 16–19!

## Fourth Bayesian Young Statisticians Meeting (BAYSM2018)

**NEW**

**July 2–3, 2018. Coventry, UK**

**w** <https://warwick.ac.uk/baysm>  
BAYSM is dedicated to PhD Students, M.S. Students, Post-Docs, Young and Junior Researchers working in the field of Bayesian statistics, providing an opportunity to connect with the Bayesian community at large. Senior discussants will be present at each session, providing participants with advice and comments on their work.

## 48th Probability Summer School

**NEW**

**July 8–20, 2018. Saint-Flour, France**

**w** <http://recherche.math.univ-bpclermont.fr/stflour/stflour-en.php>  
This summer school is intended for PhD students, teachers and researchers who are interested in probability theory, statistics, and in applications of these techniques. The 2018 lecturers are Hugo Duminil-Copin, Asaf Nachmias and Balint Toth.

## Coastal Bend Mathematics and Statistics Conference

**NEW**

**March 31, 2018**

**Texas A&M University, Corpus Christi, Texas, USA**

**w** <https://sci.tamucc.edu/MATH/documents/word-flyer-v4.pdf>  
The Department of Mathematics and Statistics at Texas A&M University–Corpus Christi is pleased to announce its second annual Coastal Bend Mathematics and Statistics Conference in mathematics, statistics, and related area. The conference provides a leading forum for disseminating the latest research and brings together students, teachers, and industry professionals from the Coastal Bend community, South Texas region, Texas, and the nation. Please contact conference organizer Dr. Sunil Mathur [sunil.mathur@tamucc.edu](mailto:sunil.mathur@tamucc.edu) for more details.

## 2018 Data Science Innovation Lab: Mathematical Challenges of Single Cell Dynamics

**NEW**

**June 25–29, 2018. Bend, Oregon, USA**

**w** <https://bigdatau.ini.usc.edu/innovationlab2018>

**e** [bigdatau@ini.usc.edu](mailto:bigdatau@ini.usc.edu)

*Deadline to apply: Feb 28th 2018*

The Innovation Lab process entails participation in an intensive five-day residential workshop in order to facilitate the development of new teams of early-career biomedical and quantitative investigators who generate multidisciplinary cooperative research programs through a real-time and iterative mentoring process. The concept of the Innovation Lab program is to organize intensive multidisciplinary interactions involving around 30 participants, with the aim of developing new and bold approaches to address grand challenge questions for topics that could benefit from a fresh or divergent perspective.

## Workshop on Statistical Inference for Stochastic Process Models in Weather and Climate Science

**NEW**

**September 10–13, 2018. Leiden, The Netherlands**

**w** <http://www.lorentzcenter.nl/lc/web/2018/1012/info.php3?wsid=1012&venue=Snellius>

The workshop aims to bring together weather and climate scientists, on one hand, and statisticians on the other, specializing in the use of mathematical and statistical techniques for inference in stochastic processes, random dynamical systems and time series modelling. The principal goals are the exchange of ideas and information between the two groups about the kinds of problems and challenges they face in their research, and the techniques they employ for their solution.

## 2nd IMA Conference on Theoretical and Computational Discrete Mathematics NEW

September 14–15, 2018. Derby, UK

[w https://ima.org.uk/7775/2nd-ima-conference-theoretical-computational-discrete-mathematics/](https://ima.org.uk/7775/2nd-ima-conference-theoretical-computational-discrete-mathematics/)

The conference will showcase theoretical and computational advances in the general field of discrete mathematics. It is open to researchers working with mathematical structures and abstract constructs, and to those involved in the theory and practice of discrete algorithmic computing. The purpose of this event is to highlight progress in the field through the development of novel theories, methodologies and applications accordingly, and to inspire future work.

## Transport and localization in random media: theory and applications NEW

May 1–3, 2018. New York, NY, USA

[w http://www.ki-net.umd.edu/content/conf?event\\_id=843](http://www.ki-net.umd.edu/content/conf?event_id=843)

## 8th European Conference on Predictive, Preventive & Personalized Medicine and Molecular Diagnostics NEW

August 20–21, 2018. Rome, Italy

[w https://personalizedmedicine.conferenceseries.com/europe/](https://personalizedmedicine.conferenceseries.com/europe/)



### Symposium on Statistical Inference videos online

Some sessions at last October's ASA Symposium on Statistical Inference were filmed: View them at [ww2.amstat.org/meetings/ssi/2017/recordedsessions.cfm](http://ww2.amstat.org/meetings/ssi/2017/recordedsessions.cfm).

## Second Global Conference on Applied Physics, Mathematics and Computing (APMC-18) NEW

July 25–27, 2018  
Madrid, Spain

[w http://physicsmath.computing.com/](http://physicsmath.computing.com/) Creating an international forum for academics, researchers and scientists to discuss results.

## Bernard Harris Memorial Symposium: Risk in the 21st Century NEW

May 10–11, 2018  
Raleigh, NC, USA

[w http://www.harrissymposium.org/](http://www.harrissymposium.org/) This two day symposium, sponsored by the American Statistical Association's Section on Risk Analysis, will bring together the top minds within statistics and risk analysis communities to discuss analytic strategies in the age of big data. Participants will be challenged by leaders on diverse topics such as toxico/environmental-, economic-, terrorism/defense-, climate-, and genetic disease-risk. The program will consist of invited presentations, breakout sessions intended to forge new collaborations, and a contributed poster session.

## International Conference on Robust Statistics 2018

July 2–6, 2018. Leuven, Belgium

[w https://wis.kuleuven.be/events/icors18/](https://wis.kuleuven.be/events/icors18/) The International Conference on Robust Statistics (ICORS) has been an annual meeting since 2001. The aim is to bring together researchers and practitioners interested in robust statistics, data analysis and related areas. This includes theoretical and applied statisticians as well as data analysts from other fields, and leading experts as well as junior researchers and graduate students. Abstracts can be submitted up to **March 31, 2018**.

## Advances in Statistical Mechanics NEW

August 27–31, 2018. Marseille, France  
[w https://conferences.cirm-math.fr/1855.html](https://conferences.cirm-math.fr/1855.html) Statistical mechanics is one of the most active fields of research in probability and mathematical physics. The emphasis will be on fundamental issues of equilibrium and dynamics for classical and quantum mechanical systems, as well as on open problems of statistical mechanics related to probability, disordered systems, computer sciences, and biology.

## International Conference on Teaching Statistics 10 (ICOTS 10)

July 8–13, 2018. Kyoto, Japan

[w https://icots.info/10/](https://icots.info/10/)

The International Conference on Teaching Statistics (ICOTS) is held every four years in different parts of the world, organized by the ISI's International Association for Statistical Education.

## Bocconi Summer School in Advanced Statistics and Probability NEW

July 9–20, 2018  
Lake Como, Italy

[w http://asps.lakecomoschool.org](http://asps.lakecomoschool.org)

The aim of the Bocconi Summer School in Advanced Statistics and Probability is to establish a track of high level courses on advanced and cutting-edge topics in Statistics and Probability. The 2018 Summer School, on **Graphical Models**, offers lectures delivered by internationally leading scholars on the specific designated topic, and supervised tutorials.

## Royal Statistical Society 2018 International Conference

September 3–6, 2018. Cardiff, UK

[w http://www.rss.org.uk/conference2018](http://www.rss.org.uk/conference2018) The RSS Conference is one of the largest statistical conferences held annually in Europe, attracting over 600 statisticians and data scientists from all sectors and from over 30 countries, drawn to a varied programme of talks and workshops. Submissions are welcome for contributed and rapid-fire talks (deadline **5 April**) and poster presentations (deadline **30 June**).

## Symposium on Optimal Stopping NEW

June 25–29, 2018. Houston, Texas, USA

[w www.optimalstopping.com](http://www.optimalstopping.com)

The symposium will honor the work of Larry Shepp (1936–2013), who was one of the world's leading experts in the field of optimal stopping and in applied probability in general. Registration closes May 1, 2018.



# Employment Opportunities around the world

## Canada: Waterloo, ON

### University of Waterloo

Lecturer

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=38664452](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=38664452)

## Kazakhstan: Astana

### Nazarbayev University

Full-time positions in Applied Mathematics and Statistics

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=38888586](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=38888586)

## New Zealand: Christchurch

### University of Canterbury

Lecturer/Senior Lecturer/Associate Professor in Statistics or Data Science

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=38900475](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=38900475)

## Singapore

### ESSEC

Professor of Statistics

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=38910267](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=38910267)

## Singapore

### Nanyang Technological University, Singapore

Open Rank Professor Position in Operations Research

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=38942486](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=38942486)

## Switzerland: Lausanne

### EPFL Institute of Mathematics

Postdoctoral

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=38935620](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=38935620)

## Switzerland: Zürich

### ETH Zürich

Professor of Data Science

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=39040278](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=39040278)

## United Kingdom: London

### Imperial College London

Lecturer/Senior Lecturer/Reader/Chair in Biostatistics

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=39054585](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=39054585)

## Switzerland: Zürich



### Professor of Data Science

→ The Department of Mathematics ([www.math.ethz.ch](http://www.math.ethz.ch)) at ETH Zurich invites applications for the above-mentioned position.

→ Applicants demonstrate an internationally recognized research record to enhance and further strengthen collaborative research between the Department of Mathematics (D-MATH) and the Department of Computer Science (D-INFK) in mathematical and statistical foundations of Data Science at ETH Zurich. The new professor should have a strong background in mathematics, an affinity with computer science, a genuine interest in applications, excellent teaching skills, and a deep interest in Data Science both in research and teaching. The successful candidate is expected to teach undergraduate level courses (German or English) and graduate level courses (English) in statistics and mathematics for students of mathematics, engineering, and natural sciences as well as for courses in the Master in Statistics and in the Master in Data Science.

→ Please apply online: [www.facultyaffairs.ethz.ch](http://www.facultyaffairs.ethz.ch)

→ Applications should include a curriculum vitae, a list of publications, a statement of future research and teaching interests, and a description of the three most important achievements. The letter of application should be addressed to the **President of ETH Zurich, Prof. Dr. Lino Guzzella**. The closing date for applications is **30 June 2018**. ETH Zurich is an equal opportunity and family friendly employer and is responsive to the needs of dual career couples. We specifically encourage women to apply.

**United States: Berkeley, CA****UC Berkeley**

Lecturer

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=39102436](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=39102436)**United States: Champaign, IL****University of Illinois at Urbana-Champaign, Department of Statistics**

College of Liberal Arts &amp; Sciences: Clinical, Teaching &amp; Visiting Faculty (All Ranks), Department of Statistics

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=39187434](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=39187434)**United States: Cambridge, MA****Harvard University, Department of Statistics**

Concentration Advisor and Lecturer

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=39288991](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=39288991)**United States: New York, NY****Hunter College, The City University of New York**

Assistant Professor of Statistics

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=38457345](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=38457345)**United States: New York, NY****Future Laboratories LLC**

Associate Researcher of Applied Mathematics &amp; Statistics

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=39340545](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=39340545)**United States: Austin, TX****University of Texas at Austin**




Department Chair in Statistics and Data Sciences, University of Texas at Austin

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=38181129](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=38181129)**United States: College Station, TX****Texas A&M University**


Research Scientist

[http://jobs.imstat.org/c/job.cfm?site\\_id=1847&jb=39405730](http://jobs.imstat.org/c/job.cfm?site_id=1847&jb=39405730)

# 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: [erg@imstat.org](mailto:erg@imstat.org)

## March 2018

**March 2–3:** Athens, Greece. **ICQSBEI'18: 2nd International Conference on Quantitative, Social, Biomedical and Economic Issues with emphasis on New Technologies**  **w** <http://icqsbei2018.weebly.com/>


**March 4–8:** Spreewald, Germany. **6th Spring School: Structural Inference in Statistics** **w** <https://www.mathematik.hu-berlin.de/for1735/spring-school-2018>

 **March 25–28:** Atlanta, GA, USA. **ENAR Spring Meeting** **w** <http://www.enar.org/meetings/future.cfm>


**March 26–28:** Barcelona, Spain. **Bayes Comp 2018** **w** <https://www.maths.nottingham.ac.uk/personal/tk/bayescomp/>

**March 26–29:** Barcelona, Spain. **Bayes Comp 2018** **w** <https://www.maths.nottingham.ac.uk/personal/tk/bayescomp/>

  **March 29–31:** Corvallis, OR, USA. **Frontier Probability Days** **w** <http://www.math.utah.edu/~firas/FPD18/>

 **March 31:** Corpus Christi, Texas, USA. **Coastal Bend Mathematics and Statistics Conference** **w** <https://sci.tamucc.edu/MATH/documents/word-flyer-v4.pdf>

## April 2018


 **NEW DATES** **April 3–5:** Giza, Egypt. **30th Annual Conference on Statistics and Modeling in Human and Social Sciences** **w** <http://www.feps.edu.eg/en/departments/statistics/conference/index.html>

**April 24–26:** Leiden, The Netherlands. **Survival Analysis for Junior Researchers 2018 (SAfJR2018)** **w** <http://safjr2018.com>

Continues on page 28


# International Calendar *continued*

## April 2018 *continued*


 April 28–30, 2018: Cesme, Izmir, Turkey. 4th International Researchers, Statisticians and Young Statisticians Congress **w** <http://www.irsysc2018.com>

## May 2018


 May 1–3: New York, NY, USA. Transport and localization in random media: theory and applications **w** [http://www.ki-net.umd.edu/content/conf?event\\_id=843](http://www.ki-net.umd.edu/content/conf?event_id=843)

 May 4–6: Atlanta, GA, USA. 6th Workshop on Biostatistics and Bioinformatics **w** <https://math.gsu.edu/yichuan/2018Workshop/>

May 7–8: Ames, Iowa, USA. Conference on Predictive Inference and Its Applications **w** <https://predictiveinference.github.io/>

 May 9: Ames, Iowa, USA. First Midwest Statistical Machine Learning Colloquium **w** <https://register.extension.iastate.edu/msmlc/about>

  May 9–12: Brown University, Providence, RI, USA. 2018 Seminar on Stochastic Processes **w** <https://www.brown.edu/conference/stochastic-processes/home>

 May 10–11: Raleigh, NC, USA. Bernard Harris Memorial Symposium: Risk in the 21st Century. **w** <http://www.harrissymposium.org/>

  May 14–15: Durham, North Carolina, USA. Southeastern Probability Conference **w** <https://services.math.duke.edu/~rtd/SEPC2018/SEPC2018.html>

May 16–18: NIMBioS, Knoxville, TN, USA. Applications of Spatial Data: Ecological Niche Modeling **w** <http://www.nimbios.org/tutorials/SpatialDataENM>

May 16–19: Reston, VA, USA. Symposium on Data Science and Statistics **w** <https://ww2.amstat.org/meetings/sdss/2018/>

May 17–20: Gainesville, Florida, USA. IISA-2018: From Data to Knowledge, Working for a Better World **w** <http://iisa2018.biostat.ufl.edu/>

May 29–30: Munich, Germany. Econometrics in the Castle: Machine Learning in Economics and Econometrics **w** <http://tiny.cc/econ-in-the-castle>

## June 2018


June 3–6: McGill University, Montreal, Québec, Canada. Statistical Society of Canada 2018 Annual Meeting **w** <https://ssc.ca/en/meetings/2018-annual-meeting>


June 4–6: Durham, NC, USA. International Total Survey Error Workshop (ITSEW) **w** <https://dism.ssri.duke.edu/itsew-2018>

June 5–8: Rome, Italy. CHAOS2018: International Conference on Non-Linear Analysis and Modeling, Theory and Applications **w** <http://www.cmsim.org/>

June 6–7: Chicago, IL, USA. Midwest Machine Learning Symposium **w** <http://midwest-ml.org/>

June 11–13: Maastricht, The Netherlands. The 7th Symposium on Conformal and Probabilistic Prediction with Applications (COPA 2018) **w** <http://clrc.rhul.ac.uk/copa2018/index.html>

 June 11–15: Salerno, Italy. ISNPS2018: The 4th Conference of the International Society for Non-Parametric Statistics **w** <http://www.isnps2018.it/>

 June 11–15: Gothenburg, Sweden. 40th Conference on Stochastic Processes and their Applications (SPA 2018) **w** <http://spa2018.org/>

 June 16–18: Shanghai, China. SAE2018: Small Area Estimation and Other Topics of Current Interest in Surveys, Official Statistics, and General Statistics **w** [www.sae2018.com](http://www.sae2018.com)

June 17–20: Boulder, CO, USA. International Symposium on Forecasting **w** <https://isf.forecasters.org>

  June 18–21: Eötvös Loránd University, Budapest, Hungary. International Workshop in Applied Probability 2018 (IWAP 2018) **w** [www.iwap2018.com](http://www.iwap2018.com)

June 18–21: Georgia Tech in Atlanta, GA, USA. Recent Trends in Continuous and Discrete Probability **w** <https://pwp.gatech.edu/rtip/>

June 18–22: NIMBioS, Knoxville, TN, USA. NIMBioS Tutorial: The Search for Selection **w** <http://www.nimbios.org/tutorials/selection>

 June 24–27: Edmonton, Canada. WNAR/IMS Meeting **w** <http://www.wnar.org/Meetings>

June 24–29: Edinburgh, UK. ISBA 2018 World Meeting **NEW WEBSITE** **w** <https://bayesian.org/isba2018/>

**NEW** June 25–29: Houston, Texas, USA. **Symposium on Optimal Stopping** [w](http://www.optimalstopping.com) [www.optimalstopping.com](http://www.optimalstopping.com)


**NEW** June 25–29: Bend, Oregon, USA. **2018 Data Science Innovation Lab: Mathematical Challenges of Single Cell Dynamics** [w](https://bigdataui.ini.usc.edu/innovationlab2018) <https://bigdataui.ini.usc.edu/innovationlab2018>


 June 26–29: Singapore. **2018 IMS Asia Pacific Rim Meeting (IMS-APRM)**  
**NEW** [w](https://ims-aprm2018.stat.nus.edu.sg/) <https://ims-aprm2018.stat.nus.edu.sg/>

June 27–29: Edgbaston, UK. **Sixth IMA Conference on Numerical Linear Algebra and Optimization** [w](https://ima.org.uk/7149/6thIMANLAO/) <https://ima.org.uk/7149/6thIMANLAO/>

## July 2018

**NEW** July 2–3: Coventry, UK. **Fourth Bayesian Young Statisticians Meeting (BAYSM2018)** [w](https://warwick.ac.uk/baysm) <https://warwick.ac.uk/baysm>

**NEW**  July 2–5: Qingdao, China. **2018 ICSA China Conference on Data Science** [w](http://www.icsa.org/china/symposium/registration.html) <http://www.icsa.org/china/symposium/registration.html>

 July 2–6: Vilnius, Lithuania. **Joint 2018 IMS Annual Meeting and 12th International Vilnius Conference on Probability Theory and Mathematical Statistics** [w](http://ims-vilnius2018.com/) <http://ims-vilnius2018.com/>

**NEW** July 2–6: Leuven, Belgium. **International Conference on Robust Statistics 2018** [w](https://wis.kuleuven.be/events/icors18/) <https://wis.kuleuven.be/events/icors18/>

July 2–6: St Andrews, UK. **Sixth International Statistical Ecology Conference** [w](http://www.isec2018.org) <http://www.isec2018.org>


July 8–13: Kyoto, Japan. **ICOTS10: Tenth International Conference on Teaching Statistics** [w](http://icots.info/icots/10/) <http://icots.info/icots/10/>

**NEW** July 8–20: Saint-Flour, France. **48th Probability Summer School** [w](http://recherche.math.univ-bpclermont.fr/stflour/stflour-en.php) <http://recherche.math.univ-bpclermont.fr/stflour/stflour-en.php>

**NEW** July 9–20: Lake Como, Italy. **Bocconi Summer School in Advanced Statistics and Probability** [w](http://asps.lakecomoschool.org) <http://asps.lakecomoschool.org>

July 10–13: Delft, The Netherlands. **Harmonic Analysis for Stochastic PDEs** [w](http://fa.its.tudelft.nl/spde/) <http://fa.its.tudelft.nl/spde/>

July 12–14: University of Vienna, Austria. **Model Selection, Regularization and Inference** [w](http://www.univie.ac.at/seam/inference2018/) <http://www.univie.ac.at/seam/inference2018/>

 July 16–20: Columbus, OH, USA. **CBMS Regional Conference: Elastic Functional and Shape Data Analysis** [w](https://stat.osu.edu/cbms-efsd) <https://stat.osu.edu/cbms-efsd>

July 16–20: Bristol, UK. **33rd International Workshop on Statistical Modelling** [w](http://www.statmod.org/workshops.htm) <http://www.statmod.org/workshops.htm>

July 16–21: Guanajuato, Mexico. **28th Conference of the International Environmetrics Society (TIES 2018)** [w](http://ties2018.eventos.cimat.mx/) <http://ties2018.eventos.cimat.mx/>

July 22–26: Palermo, Italy **2018 European Meeting of Statisticians** [w](#) TBC

**NEW**  July 26–28: Simon Fraser University, Burnaby, Canada. **20th Meeting of New Researchers in Statistics and Probability [Deadline March 24]** [w](http://groups.imstat.org/newresearchers/conferences/nrc.html) <http://groups.imstat.org/newresearchers/conferences/nrc.html>

 July 28–August 2: Vancouver, Canada. **JSM 2018** [w](http://ww2.amstat.org/meetings/jsm/2018/) <http://ww2.amstat.org/meetings/jsm/2018/>

## August 2018

August 1–9: Rio de Janeiro, Brazil. **International Congress of Mathematicians 2018 (ICM 2018)** [w](http://www.icm2018.org/) <http://www.icm2018.org/>

**NEW** August 20–21: Rome, Italy. **8th European Conference on Predictive, Preventive & Personalized Medicine and Molecular Diagnostics** [w](https://personalizedmedicine.conferenceseries.com/europe/) <https://personalizedmedicine.conferenceseries.com/europe/>

August 25–27: Shahrood, Iran. **ISC14: Fourteenth Iranian Statistics Conference** [w](http://isc14.shahroodut.ac.ir) <http://isc14.shahroodut.ac.ir>

August 26–30: Melbourne, Australia. **Joint International Society for Clinical Biostatistics and Australian Statistical Conference 2018** [w](http://isbasc2018.com/) <http://isbasc2018.com/>

**NEW** August 27–31: Marseille, France. **Advances in Statistical Mechanics** [w](https://conferences.cirm-math.fr/1855.html) <https://conferences.cirm-math.fr/1855.html>

## September 2018

September 3–6: Cardiff, UK. **Royal Statistical Society International Conference** [w](http://www.rss.org.uk/conference2018) [www.rss.org.uk/conference2018](http://www.rss.org.uk/conference2018)

September 8–10: St Louis, Missouri, USA. **Third Workshop on Higher-Order Asymptotics and Post-Selection Inference (WHOA-PSI)** [w](http://www.math.wustl.edu/~kuffner/WHOA-PSI-3.html) <http://www.math.wustl.edu/~kuffner/WHOA-PSI-3.html>

# International Calendar *continued*

## September 2018 *continued*

**NEW** September 10–13: Leiden, The Netherlands. Workshop on Statistical Inference for Stochastic Process Models in Weather and Climate Science **w** <http://www.lorentzcenter.nl/lc/web/2018/1012/info.php3?wsid=1012&venue=Snellius>

**NEW** September 14–15: Derby, UK. 2nd IMA Conference on Theoretical and Computational Discrete Mathematics **w** <https://ima.org.uk/7775/2nd-ima-conference-theoretical-computational-discrete-mathematics/>

September 24–28: São Pedro, Brazil. Brazilian Symposium on Probability and Statistics **w** <http://www.sinape2018.com.br/>

## October 2018

October 18–20: Cincinnati, OH, USA. 2018 Women in Statistics and Data Science Conference **w** <https://ww2.amstat.org/meetings/wds/2018/>

October 25–27: Barcelona, Spain. Big Data Meets Survey Science **w** <https://www.bigsurv18.org/>

## December 2018

December 17–20: Jerusalem, Israel. Jerusalem Joint Statistical Event 2018 **w** <https://www.emr2018.com/>

## March 2019

**ims** March 24–27: Philadelphia, PA, USA. ENAR Spring Meeting **w** <http://www.enar.org/meetings/future.cfm>

## July 2019

July 1–9: Zagreb, Croatia. 11th International Conference on Extreme Value Analysis **w** <http://web.math.hr/eva2019>

**ims** July 8–12: Evanston, IL, USA. 41st Conference on Stochastic Processes and their Applications (SPA 2019) **w** TBC

July 14–18: Leuven, Belgium. 40th Conference of the International Society for Clinical Biostatistics **w** <http://www.icsb.info>

**ims** July 27–August 1: Denver, CO, USA. IMS Annual Meeting at JSM 2019 **w** <http://www.amstat.org/ASA/Meetings/Joint-Statistical-Meetings.aspx>

## August 2019

August 18–23: Kuala Lumpur, Malaysia. ISI2019: 62nd International Statistical Institute World Statistics Congress 2019 **w** <http://www.isi2019.org/>

## March 2020

**ims** March 22–25: Nashville, TN, USA. ENAR Spring Meeting **w** <http://www.enar.org/meetings/future.cfm>

## July 2020

July 5–11: Portoroz, Slovenia. 8th European Congress of Mathematics. **w** <http://www.8ecm.si/>

## August 2020

**ims** August 1–6: Philadelphia, PA, USA. JSM 2020 **w** <http://www.amstat.org/ASA/Meetings/Joint-Statistical-Meetings.aspx>

**ims** August 17–21: Seoul, Korea. Bernoulli/IMS World Congress on Probability and Statistics **w** TBC

## August 2021

**ims** August 7–12: Seattle, WA, USA. IMS Annual Meeting at JSM 2021 **w** <http://www.amstat.org/ASA/Meetings/Joint-Statistical-Meetings.aspx>

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 [erg@imstat.org](mailto:erg@imstat.org), or you can submit the details yourself at <http://www.imstat.org/submit-meeting.html>

We'll list them here in the Bulletin, and on the IMS website too, at [www.imstat.org/meetings/](http://www.imstat.org/meetings/)



## Membership and Subscription Information

### 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 \$89 is added to the dues of members for each scientific journal selected (\$53 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 2018 are available to *The Annals of Applied Probability* (\$204), *The Annals of Applied Statistics* (\$204), *The Annals of Probability* (\$204), *The Annals of Statistics* (\$204), *Statistical Science* (\$168), and *IMS Bulletin* (\$115). **General subscriptions** are for libraries, institutions, and any multiple-readership use. Institutional subscriptions for 2018 are available to *The Annals of Applied Probability*, *The Annals of Applied Statistics*, *The Annals of Probability*, and *The Annals of Statistics* (each title \$505 online only / \$559 print+online), *Statistical Science* (\$288/\$317), and *IMS Bulletin* (\$132 print). Airmail rates for delivery outside North America are \$149 per title.

### 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.

The *IMS Bulletin* (ISSN 1544-1881) is published eight times per year in January/February, March, April/May, June/July, August, September, October/November and December, by the Institute of Mathematical Statistics, 3163 Somerset Dr, Cleveland, Ohio 44122, USA. Periodicals postage paid at Cleveland, Ohio, and at additional mailing offices. Postmaster: Send address changes to Institute of Mathematical Statistics, 9650 Rockville Pike, Suite L3503A, Bethesda, MD 20814-3998.

Copyright © 2018 by the Institute of Mathematical Statistics. Printed by The Sheridan Press, 450 Fame Avenue, Hanover, PA 17331, USA.

## Information for Advertisers

**General information:** The *IMS Bulletin* and webpages are the official news organs of the Institute of Mathematical Statistics. The *IMS Bulletin*, established in 1972, is published 8 times per year. Print circulation is around 4,000 paper copies, and it is also free online in PDF format at <http://bulletin.imstat.org>, posted online about two weeks before mailout (average downloads over 8,000). Subscription to the *IMS Bulletin* costs \$115. To subscribe, call 877-557-4674 (US toll-free) or +1 216 295 2340 (international), or email [staff@imstat.org](mailto:staff@imstat.org). The IMS website, <http://imstat.org>, established in 1996, receives over 30,000 visits per month. Public access is free.

### Advertising job vacancies

A single 60-day online job posting costs just \$295.00. We will also include the basic information about your job ad (position title, location, company name, job function and a link to the full ad) in the *IMS Bulletin* at no extra charge. See <http://jobs.imstat.org>

### Advertising meetings, workshops and conferences

Meeting announcements in the *Bulletin* and on the IMS website at <http://imstat.org/meetings/> are free. Send them to Elyse Gustafson; see [http://www.imstat.org/program/prog\\_announce.htm](http://www.imstat.org/program/prog_announce.htm)

### Rates and requirements for display advertising

Display advertising allows for placement of camera-ready ads for journals, books, software, etc. A camera-ready ad should be sent as a grayscale PDF/EPS with all fonts embedded. Email your advert to Audrey Weiss, IMS Advertising Coordinator [admin@imstat.org](mailto:admin@imstat.org) or see <http://bulletin.imstat.org/advertise>

	Dimensions: width x height	Rate
1/3 page	4.9" wide x 4" high (125 x 102 mm)	\$260
1/2 page	7.5" wide x 4" high (190 x 102 mm)	\$325
2/3 page	4.9" wide x 8" high (125 x 203 mm)	\$380
Full page (to edge, including 1/8" bleed)	8.75" wide x 11.25" high (222 mm x 286 mm)	\$430
Full page (within usual <i>Bulletin</i> margins)	7.5" wide x 9.42" high (190 mm x 239 mm)	\$430

### Deadlines and Mail Dates for *IMS Bulletin*

Issue	Deadline	Online by	Mailed
1: January/February	<b>December 1</b>	December 15	January 1
2: March	<b>February 1</b>	February 15	March 1
3: April/May	<b>March 15</b>	April 1	April 15
4: June/July	<b>May 1</b>	May 15	June 1
5: August	<b>June 15</b>	July 1	July 15
6: September	<b>August 15</b>	September 1	September 15
7: Oct/Nov	<b>September 15</b>	October 1	October 15
8: December	<b>November 1</b>	November 15	December 1

\* Note that the August 2018 issue has an early deadline of June 15

the  
**next**  
issue is  
**April/May**  
**2018**

Read IMS Bulletin  
articles online at  
<http://bulletin.imstat.org>



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

Please see inside  
the back cover for  
subscription details  
and information for  
advertisers, including  
all our **deadlines and**  
**requirements**

**Journal**  
**alerts**

For alerts and special  
information on all the  
IMS journals, sign up  
at the IMS Groups site  
<http://lists.imstat.org>

The *purpose* of the *Institute* is to foster the  
**development and dissemination**  
of the **theory and applications of**  
**statistics and probability**



*IMS: Organized September 12, 1935*

1798 (print)  
1798 (online)  
**Ann. Prob. Jan 2018**  
<http://projecteuclid.org/euclid.aop>

THE ANNALS  
of  
PROBABILITY

AN OFFICIAL JOURNAL OF THE  
INSTITUTE OF MATHEMATICAL STATISTICS

Nonbacktracking spectrum of random graphs: Community detection and nonregular Ramanujan graphs . . . . .	CHARLES BORDENAVE, MARC LELARGE AND LAURENT MASSOULIÉ	1
Size biased couplings and the spectral gap for random regular graphs . . . . .	NICHOLAS COOK, LARRY GOLDSTEIN AND TOBIAS JOHNSON	72
Path-dependent equations and viscosity solutions in infinite dimension . . . . .	ANDREA COSSO, SALVATORE FEDERICO, FAUSTO GOZZI, MAURO ROSESTOLATO AND NIZAR TOUZI	126
An upper bound on the number of self-avoiding polygons via joining . . . . .	ALAN HAMMOND	175
Random planar maps & growth-fragmentations . . . . .	JEAN BERTOIN, NICOLAS CURIEN AND IGOR KORTCHEMSKI	207
Dimensional improvements of the logarithmic Sobolev, Talagrand and Brascamp–Lieb inequalities . . . . .	FRANÇOIS BOLLEY, IVAN GENTIL AND ARNAUD GUILLIN	261
Quenched invariance principle for random walks with time-dependent ergodic degenerate weights . . . . .	SEBASTIAN ANDRES, ALBERTO CHIARINI, JEAN-DOMINIQUE DEUSCHEL AND MARTIN SLOWIK	302
An $L^p$ theory of sparse graph convergence II: LD convergence, quotients and right convergence . . . . .	CHRISTIAN BORGES, JENNIFER T. CHAYES, HENRY COHN AND YUFEI ZHAO	337
Lattice approximation to the dynamical $\Phi_3^4$ model . . . . .	RONGCHAN ZHU AND XIANGCHAN ZHU	397
Random walks on the random graph . . . . .	NATHANAËL BERESTYCKI, EYAL LUBETZKY, YUVAL PERES AND ALLAN SLY	456
A class of globally solvable Markovian quadratic BSDE systems and applications . . . . .	HAO XING AND GORDAN ŽITKOVIĆ	491
Stochastic control for a class of nonlinear kernels and applications . . . . .	DYLAN POSSAMAÏ, XIAOLU TAN AND CHAO ZHOU	551