

November 2017 • Issue #485

# AMSTATNEWS

The Membership Magazine of the American Statistical Association • <http://magazine.amstat.org>

## CELEBRATING

# 20

## YEARS OF THE

# AP STATISTICS EXAM

### **ALSO:**

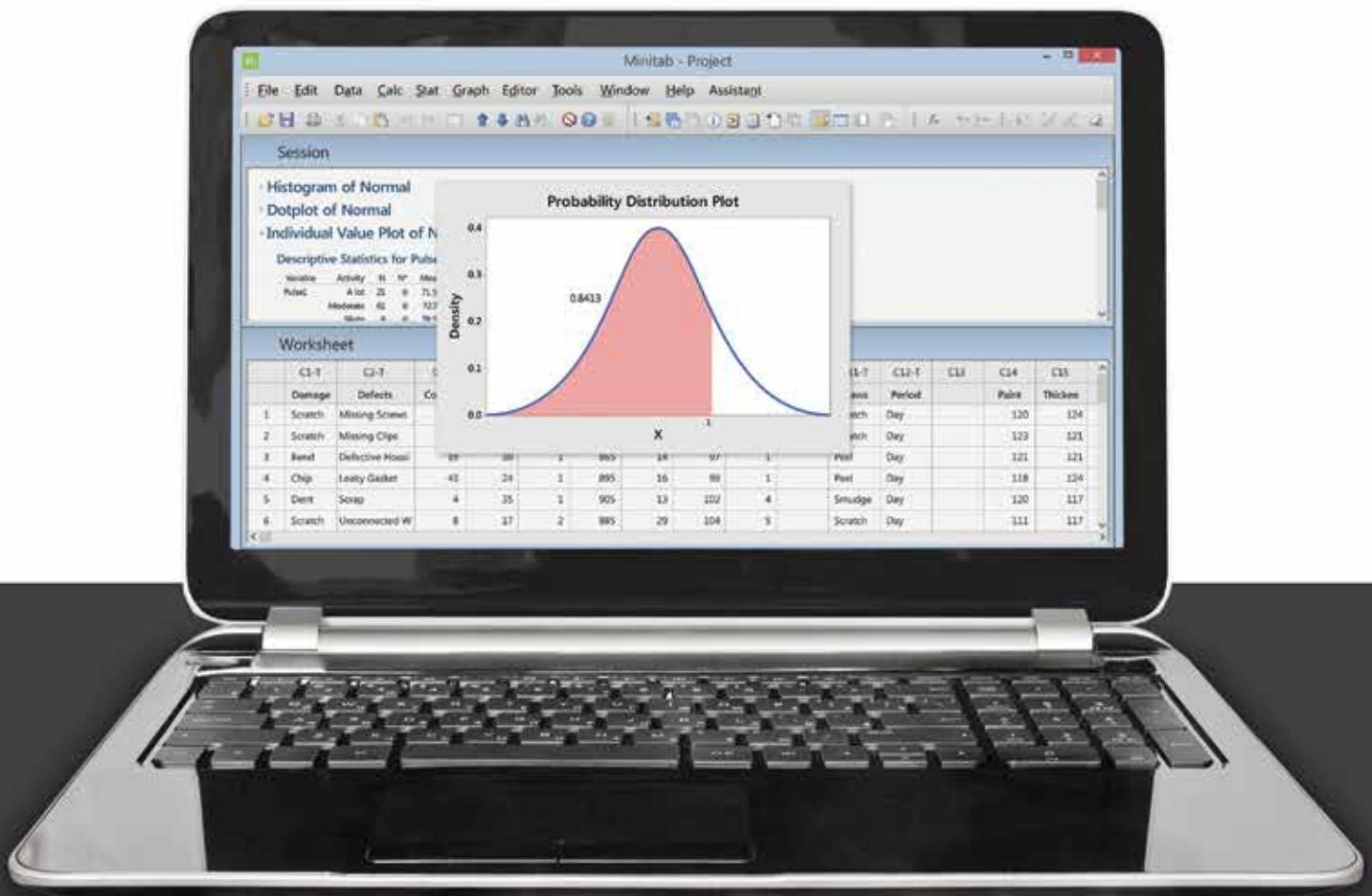
Become a Better  
Statistician by Actively  
Collaborating

Serving Your Community  
Through Data Analysis



# Minitab® 18

Prepare your students for a  
data-driven world.



Learn more

[www.minitab.com/academic](http://www.minitab.com/academic)

Minitab 

# AMSTATNEWS

NOVEMBER 2017 • ISSUE #485

## Executive Director

Ron Wasserstein: [ron@amstat.org](mailto:ron@amstat.org)

## Associate Executive Director and Director of Operations

Stephen Porzio: [steve@amstat.org](mailto:steve@amstat.org)

## Director of Science Policy

Steve Pierson: [pierson@amstat.org](mailto:pierson@amstat.org)

## Director of Strategic Initiatives and Outreach

Donna LaLonde: [donna@amstat.org](mailto:donna@amstat.org)

## Director of Education

Rebecca Nichols: [rebecca@amstat.org](mailto:rebecca@amstat.org)

## Managing Editor

Megan Murphy: [megan@amstat.org](mailto:megan@amstat.org)

## Production Coordinators/Graphic Designers

Sara Davidson: [sara@amstat.org](mailto:sara@amstat.org)

Megan Ruyle: [meg@amstat.org](mailto:meg@amstat.org)

## Publications Coordinator

Val Nirala: [val@amstat.org](mailto:val@amstat.org)

## Advertising Manager

Claudine Donovan: [claudine@amstat.org](mailto:claudine@amstat.org)

## Contributing Staff Members

Lara Harmon • Rebecca Nichols

Thierryyne Ntiranyuhura • Eric Sampson

*Amstat News* welcomes news items and letters from readers on matters of interest to the association and the profession. Address correspondence to Managing Editor, *Amstat News*, American Statistical Association, 732 North Washington Street, Alexandria VA 22314-1943 USA, or email [amstat@amstat.org](mailto:amstat@amstat.org). Items must be received by the first day of the preceding month to ensure appearance in the next issue (for example, June 1 for the July issue). Material can be sent as a Microsoft Word document, PDF, or within an email. Articles will be edited for space. Accompanying artwork will be accepted in graphics file formats only (.jpg, etc.), minimum 300 dpi. No material in WordPerfect will be accepted.

*Amstat News* (ISSN 0163-9617) is published monthly by the American Statistical Association, 732 North Washington Street, Alexandria VA 22314-1943 USA. **Periodicals postage paid** at Alexandria, Virginia, and additional mailing offices. POSTMASTER: Send address changes to *Amstat News*, 732 North Washington Street, Alexandria VA 22314-1943 USA. Send Canadian address changes to APC, PO Box 503, RPO West Beaver Creek, Rich Hill, ON L4B 4R6. Annual subscriptions are \$50 per year for nonmembers. *Amstat News* is the member publication of the ASA. For annual membership rates, see [www.amstat.org/foin](http://www.amstat.org/foin) or contact ASA Member Services at (888) 231-3473.

American Statistical Association  
732 North Washington Street  
Alexandria, VA 22314-1943 USA  
(703) 684-1221

**ASA GENERAL:** [asainfo@amstat.org](mailto:asainfo@amstat.org)

**ADDRESS CHANGES:** [addresschange@amstat.org](mailto:addresschange@amstat.org)

**AMSTAT EDITORIAL:** [amstat@amstat.org](mailto:amstat@amstat.org)

**ADVERTISING:** [advertise@amstat.org](mailto:advertise@amstat.org)

**WEBSITE:** <http://magazine.amstat.org>

Printed in USA © 2017  
American Statistical Association



The American Statistical Association is the world's largest community of statisticians. The ASA supports excellence in the development, application, and dissemination of statistical science through meetings, publications, membership services, education, accreditation, and advocacy. Our members serve in industry, government, and academia in more than 90 countries, advancing research and promoting sound statistical practice to inform public policy and improve human welfare.

## features

- 3 President's Corner
- 5 ASA, *New York Times* Learning Network Launch Monthly Statistics Feature
- 5 October *Significance* Features Great Migration of African Americans
- 6 Become a Better Statistician by Actively Collaborating
- 7 Canadian Statistical Sciences Institute Builds Worldwide Collaborations
- 8 First ASA Bachelor's Survey Provides Snapshot of 2016 Graduates
- 15 Communicating Technical Information Webinar in the Works

## columns

### 12 CONSULTANT'S CORNER Serving Your Community Through Data Analysis

This column is written for anyone engaged in or interested in statistical consulting. It includes articles ranging from what starting a consulting business would entail to what can be taught in a consulting course. If you have ideas for articles, contact the ASA's Section on Statistical Consulting publications officer, Mary Kwasny, at [m-kwasny@northwestern.edu](mailto:m-kwasny@northwestern.edu).

### 14 MASTER'S NOTEBOOK Musings of a Baby Boomer Data Science Learner

This column is written for statisticians with master's degrees and highlights areas of employment that will benefit statisticians at the master's level. Comments and suggestions should be sent to Megan Murphy, *Amstat News* managing editor, at [megan@amstat.org](mailto:megan@amstat.org).

### 16 STATtr@k My Thoughts on Certifications

STATtr@k is a column in *Amstat News* and a website geared toward people who are in a statistics program, recently graduated from a statistics program, or recently entered the job world. To read more articles like this one, visit the website at <http://stattrak.amstat.org>. If you have suggestions for future articles or would like to submit an article, please email Megan Murphy, *Amstat News* managing editor, at [megan@amstat.org](mailto:megan@amstat.org).

### 18 PASTIMES OF STATISTICIANS What Do Lucy D'Agostino McGowan and Ryan Jarrett Do When They Are Not Being Statisticians?

This column focuses on what statisticians do when they are not being statisticians. If you would like to share your pastime with readers, please email Megan Murphy, *Amstat News* managing editor, at [megan@amstat.org](mailto:megan@amstat.org).





In honor of the 2017 ASA Symposium on Statistical Inference, Lawrence Lesser of The University of Texas at El Paso rewrote the Bee Gees' Grammy-winning hit, *Stayin' Alive*, to inspire discussion about the use of p-values and the 0.05 cutoff.

## Point-Oh-Five

Lyric © 2017 Lawrence Mark Lesser; reprinted with permission

Well you can tell by the way some do a test  
 They're just lookin' for values blessed;  
 Draw a line and guard it strong  
 Against an error of Type One.  
 With point oh-four-nine, it's okay:  
 Their work may see the light of day.  
 We can try to understand  
 What makes results significant.  
 Z of more than 2 lets shaded tails accrue  
 below point-oh-five, point-oh-five.  
 That's what Fisher mused so everybody used  
 point-oh-five, point-oh-five.  
 Ah, ha, ha, ha, point-oh-five, point-oh-five  
 Ah, ha, ha, ha, point-oh-fiiiiiiiiiiiiiiiiive

### CALL FOR NOMINATIONS: ASA JOURNAL EDITORS

The American Statistical Association and its publishing partners are calling for nominations and applications for editor of the following journals:

- *JASA Applications and Case Studies*
- *Journal of Business & Economic Statistics* (co-editors)
- *Journal of Computational and Graphical Statistics*
- *Journal of Statistics Education*
- *Journal of Educational and Behavioral Statistics* (co-editors)
- *Journal of Nonparametric Statistics*
- *Journal of Survey Statistics and Methodology*
- *Statistics and Public Policy*
- *Technometrics*

For more information, including job descriptions and deadlines, email ASA Journals Manager Eric Sampson at [eric@amstat.org](mailto:eric@amstat.org).

## departments

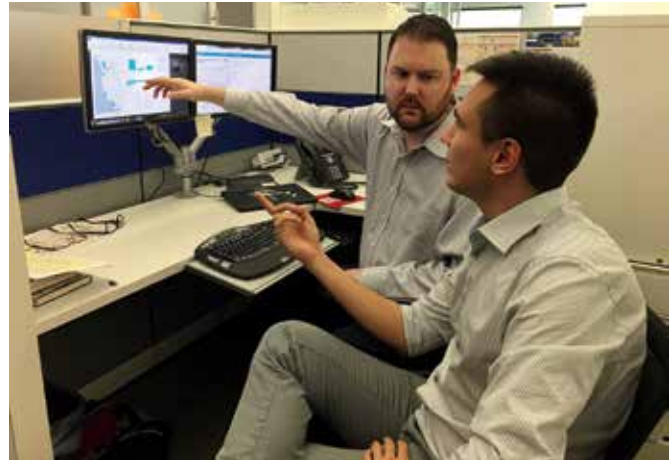


Photo by Regina Haas, Director of Marketing, LexisNexis Risk Solutions  
 Coworkers Reuben Hilliard, left, and Sepehr Piri met at a networking event during the 2017 Conference on Statistical Practice.

21 **meetings**  
 CSP: The Right Place for Meeting the Right People

22 **education**  
 Celebrating 20 Years of the AP Statistics Exam

## member news

- 32 Awards & Deadlines
- 34 People News
- 36 Section • Chapter • Committee News
- 38 Professional Opportunities



Follow us on Twitter  
[www.twitter.com/AmstatNews](http://www.twitter.com/AmstatNews)



Join the ASA Community  
<http://community.amstat.org>



Like us on Facebook  
[www.facebook.com/AmstatNews](http://www.facebook.com/AmstatNews)



Follow us on Instagram  
[www.instagram.com/AmstatNews](http://www.instagram.com/AmstatNews)



# Big Data, Big Concerns, and Shakespeare

As I tour campuses, the biggest concern I hear about our profession is the onslaught of big data. Many statistics departments are concerned that students, grants, and allocations are going to the quickly growing data analytics curricula. We also hear other terms used in place of big data such as data analytics, data mining (perhaps so yesterday), machine learning, data science, knowledge discovery, business intelligence, informatics, and even money science.

Typically, big data is identified by the three Vs of velocity, volume, and variety. I have been informed there are now up to 42 adjectives starting with V that describe it. I'm not sure I could think of 42 words starting with V. Apparently, many people do not like to use the term "big data," perhaps because it might be demeaning to work with the opposite. But I am also unsure what the opposite might be. What happens if you have huge volumes of data with lots of variety, but they don't necessarily come in with rapid speed? Does two out of three still let you join the big data club?

Now, I don't think statistics is going out of business. My conviction is because I am not as concerned about the velocity of data coming *in* as I am about the velocity and veracity of analyses going *out*. People, businesses, industry, and government all want rapid analysis of the data. This is the calling card of the statistics profession, and we should continue to be the guardian of it.

With the demand for instant analysis, it is tempting for nonstatisticians to run with the numbers, use one of many computational tools, and make their own conclusions. Most of the analyses using big data are basically correlation analyses. Our profession is certainly aware correlation does not imply causation, yet I watch how conclusion after conclusion is made from a finding of correlation. Worse yet, merging all types of data can lead to Simpson Paradox situations, which, in turn, lead to incorrect results. So what is a statistician to do?

We must not be complacent. We know proper analyses depend on appropriate viewing of suitable data. We can deliver the required and correct analyses and conclusions. We are being called upon to do this more and more quickly. To do this, we have to learn some of the techniques used to analyze big data such as Spark, Hadoop, and Tensor Flow.

I will readily admit I do not know these techniques, and they may well be out of date by the time I type the end of this sentence. But the point is we have to at least learn some of the new methods, along with their pros and cons. Familiarity with the new procedures will enable statisticians to effectively collaborate with teams studying a problem and successfully communicate the conclusions, as well as the strengths and weaknesses of the methodology. Remember, there is not much value in getting the wrong answer quickly. So quality must be our trump card.

One thing we cannot do is sit on the sidelines and complain about what the others are doing, even if they are doing it improperly. For years, we have begged the research community to consult with us early so we can work with them to design samples. Now is the time for us to invite ourselves in early to participate in the action, armed with newly understood tools, and become truly important members of the team.

This is well in line with the summary of the June 2016 workshop of the National Academy of Sciences. The workshop, titled "Refining the Concept of Scientific Inference When Working with Big Data," noted "decision-relevant knowledge can be derived from big data, but it hinges on making reliable inference. Further, the convenience or opportunistic method of sampling can lead to problems related to lack of controls, unidentified bias, missing or irregular data, and plenty of confounding factors."

In October of 2015, the ASA issued a statement, "The Role of Statistics in Data Science," which stressed collaboration in virtually every paragraph. Similarly, during JSM 2015, DJ Patil—the chief



Barry D. Nussbaum



Watch a message from then-US Chief Data Scientist DJ Patil to 2015 JSM attendees: <https://youtu.be/AHfxmdsJNyc>.

---

I am worried society would rather 'confess' to Google without thinking about what might happen to all that Google information stored in some cloud. One day, the cloud could burst and rain on many parades.

---

data scientist of the Obama administration—also stressed the importance of collaboration, but urged the statistician to get a seat at the table *early* in the problem analysis.

So, let's go that extra mile. The ASA is assisting. Conferences, guidelines, reports, journals, active learning experiences, and short courses are all offered by the ASA. A quick look at the titles of papers from JSM 2017 shows plenty of big data-related topics.

### A Bigger Concern

There is a new book, *Everybody Lies* by Seth Stephens-Davidowitz. The basic thesis of the book is that the public will lie to poll-takers and opinion seekers. Apparently, individuals are concerned about giving a socially correct answer to a human, so who will they trust with their true personal concerns? Google. Yup, Google, the totally impersonal information source.

I recognize many have uncovered some of the flaws in this kind of crowd sourcing. What concerns me is that with all the data being consumed, I find it hard to believe the ultimate source of representative information is the Google collection of inquiries. Stephens-Davidowitz has an interesting thesis (in fact, this was the basis of his doctoral dissertation), but I hope it ends there. If nothing else, in this time of increasing concern about privacy, I am worried society would rather "confess" to Google without thinking about what might happen to all that Google information stored in

some cloud. One day, the cloud could burst and rain on many parades.

### What's in a Name?

What would statistics be with a different name? Would that solve the big data problem? The idea of renaming statistics is not new. More than 50 years ago, John Tukey suggested "data analysis." Others have suggested data science might be more effective than just data analysis.

In a thoughtful recent essay distributed on the ASA Community, Donald B. Macnaughton expresses his thoughts regarding the name, suggesting data science may be more inclusive than statistics, as statistics could indeed have four definitions. He notes this may be more important now in the age of big data since "data science" would sound better than "statistics" in tackling big data. On the other hand, I have heard that adding "science" to a name usually means it is not scientific. Macnaughton's essay has certainly inspired some spirited comments among ASA members. The thread on the ASA Community has more than 40 comments as I write this column.

I have noticed Yale University has changed the name of their statistics department. They stated, "The amount of data flowing into the university increases on a daily basis. ... Reflecting that dramatic expansion and the growing need for teaching and research in data science, the department of statistics has been renamed the department of statistics and data science." I guess combining forces seems like a better idea than two departments at odds with one another. We'll have to see how it works out at Yale.

I also have some personal skin in this game. When I met my late wife, she was working on her dissertation in psychology. I became her statistician and, later, her husband. Would I have had that same charm asking her if I could assist with the data science on her dissertation? Also, I happen to have a degree in operations research. You may know it as analytics, systems analysis, managerial science, industrial engineering, or systems engineering. Yes, I have been through this name game before.

Significantly forward,  
Barry



# ASA, New York Times Learning Network Launch Monthly Statistics Feature

As interest in statistics coursework and programs continues to grow at high schools across the country, teachers now have a new activity to challenge the next generation of critical thinkers when it comes to analyzing and understanding data. The ASA has collaborated with *The New York Times* Learning Network to develop a unique exercise, titled “What’s Going On in This Graph?” (<http://nyti.ms/2z9jclG>)

“We hear from countless teachers that reaching today’s students, who are inundated with data at any given moment, requires outside-the-box thinking. We also know that students learn best through dynamic and hands-on application, rather than simple recitation,” said ASA President Barry D. Nussbaum. “This project brings statistics to life through a creative, intriguing delivery that is certain to increase awareness and excitement for statistics and data science throughout the K–12 community.”

With the activity spearheaded by ASA member Sharon Hessney, this partnership is modeled after the *Times’s* popular series, “What’s Going On in This Picture?” It is intended to inspire students to examine graphs, charts, or maps via a rich and robust supply of the *Times’s* infographics.

Each month, a different *New York Times* graph will be published on a topic suitable for a variety of subjects across the curriculum. Students will then be asked to use math and statistics thinking skills to answer the following questions:

- What do you notice?
- What do you wonder?
- What’s going on in this graph?

Under Hessney’s leadership, an ASA team will help select graphs to use each month, help moderate discussion and engage students, and provide

a “reveal” at the end of the week-long session that incorporates the graph’s original title and caption and related statistical concepts and vocabulary to help students transform the data into information.

“For years while teaching math, I have started my day with a cup of coffee and *The New York Times*, and very frequently, my eye caught an excellent graph, map, or chart,” said Hessney. “In math class, I would project the item on the board and ask, ‘So, what’s going on in this graph?’ It was a great class starter, and as a result, we covered so many timely topics and learned how to ‘read’ graphs.” ■

## October *Significance* Features Great Migration of African Americans

The October 2017 issue of *Significance* is out in print and digital formats. The cover story presents a graphical account of the Great Migration of African Americans in the century following their emancipation from slavery. The issue also features an article about the final resting place of William Playfair, who devised many of the statistical graphics in use today.

Elsewhere, you will find the story of Frances Wood, a chemist and medical statistician of the early 20th century who achieved much in a tragically short lifetime. Also included is the winning article of the magazine’s 2017 writing competition for early-career statisticians.

Access the digital version of *Significance* through Members Only or download and read the magazine on the go with the iOS and Android apps (<http://bit.ly/2y2Pt02>). If you are a print subscriber, your October issue will be arriving soon.

*Significance* is online at [www.significancemagazine.com](http://www.significancemagazine.com).



# Become a Better Statistician by Actively Collaborating

Amit Bhattacharyya, Committee on Applied Statisticians

Applied statisticians and data scientists must be—almost by definition—collaborative because they rarely author the studies they design or generate the data they analyze. However, essential collaboration skills are seldom taught as part of statistics graduate programs. With strong skills in effectively engaging with others, statisticians can proactively seek collaborators, work to develop research questions, design

analyses, and contribute fully to all parts of a project. As with nearly all research and scientific areas, it is important to bridge interactions with effective and influential teamwork, clear communication, negotiation, inclusion of diversity, and shared terminology. Clearly, to meaningfully collaborate requires multi-faceted skills and a lot of practice.

The ASA Committee on Applied Statisticians (CAS) is developing a collaboration training program to help ASA members recognize and acquire the skills needed to actively collaborate and become a successful partner on any multi-disciplinary team.

CAS recently kicked off program activities with a collaboration workshop of nearly 50 participants from ASA section leadership during JSM 2017 in Baltimore. The workshop was the first gathering of all section chairs and chairs-elect at JSM. Many ASA committees working on programs that enhance members' benefits and increase collaboration among sections also joined. Section leaders shared ongoing partnership experiences, and new opportunities were explored during the informal session. These include starting an online ASA leadership community among the section and committee leadership, sharing insights into career paths for statisticians, providing mentoring activities, and producing joint webinars.

As part of the collaboration journey within the ASA, leaders from various committees—Statistical Partnerships Among Academe, Industry, and Government Committee; Committee for Career

Development; Adhoc Leadership Development; Council of Sections Governing Board; ASA Membership Council—came together with CAS to form the Collaboration Network. The network generated many ideas, including the content for the workshop at JSM. Additionally, this group shared various resources and embarked on other collaboration initiatives both inside and outside of the ASA.

CAS members also developed a year-long series of webinars for all statisticians. These free, one-hour monthly webinars will enhance the important collaboration skills all statisticians need to succeed. Registration information is available at <http://community.amstat.org/cas/home>. Webinars include the following:

- “Structuring Effective Meetings”
- “Cultivating Productive Relationships”
- “Communicating Across Cultures”
- “Leading with Questions”
- “Embracing Change”
- “Conflict Resolution”
- “Negotiating”
- “Influence Without Authority”
- “Teamwork”
- “Statistical Collaboration: Putting the Pieces Together”

To further the reach of the collaboration program, CAS members are planning a train-the-trainer program for 2018–2019 so ASA chapters and other organizations can also disseminate these skills to statisticians across the country through traveling collaboration workshops.

To receive occasional announcements from CAS, add your email under the Friends of CAS section at <http://community.amstat.org/cas/home>. You can also offer feedback and suggestions through the Contact Us section of the website. ■



# Canadian Statistical Sciences Institute Builds Worldwide Collaborations

Nancy Reid, University Professor of Statistical Sciences

The Canadian Statistical Sciences Institute (CANSSI) is now in its third year of funding from the Natural Sciences and Engineering Research Council. The scientific flagship program continues to be the suite of collaborative research team (CRT) projects, designed to build sustainable collaborations between statisticians and scientists.

CANSSI provides partial funding for several workshops each year. In October of 2016, the International Conference on Statistical Distributions and their Applications—jointly organized by CANSSI and the Department of Mathematics at Central Michigan University—welcomed 190 participants from 26 countries to Niagara Falls, Canada, including many ASA members.

The institute also has a program of post-doctoral fellowships and provides funding for Canadian undergraduate students to attend the undergraduate research workshops at the Statistical and Applied Mathematical Sciences Institute (SAMSI). CANSSI leverages its funding by promoting thematic programs at Canada's mathematical sciences institutes. There is a program, "Risk in Complex Systems: Models, Applications, Perceptions, and Policy Implications," being held at the Centre de Recherches Mathématiques in Montréal through December.

The institute continues to work on developing international collaborations. It has close ties to SAMSI and the National Institute of Statistical Sciences, and the director of Norway's Big Insight—Arnoldo Frigessi—is a member of the board of directors. A goal is for there to be a national effort on data science in Canada with links to various organizations around the world.

CANSSI's new distinguished visitor program provides for special lectures by leading statistical scientists. The first distinguished visitor was Peter Guttorp, who gave a talk at the University of British Columbia-Okanagan in 2016 titled "Understanding the Local Impact of a Warming Planet." In November, Donald Rubin gave two lectures on causality and missing data at the Fields Institute as part of the CANSSI-supported

## CANSSI-Supported CRT Projects

Advancements to State-Space Models for Fisheries Science

Copula Dependence Modeling: Theory and Applications

Statistical Modeling of the World: Computer and Physical Models in Earth, Ocean, and Atmospheric Sciences

Evolved Marked Point Processes with Applications to Wildland Fire Regimes

Statistical Inference for Complex Surveys with Missing Observations

Modern Spectrum Methods in Time Series Analysis: Applications in Physical Science, Environmental Science, and Computer Modeling

Joint Analysis of Neuroimaging Data: High-Dimensional Problems, Spatiotemporal Models, and Computation

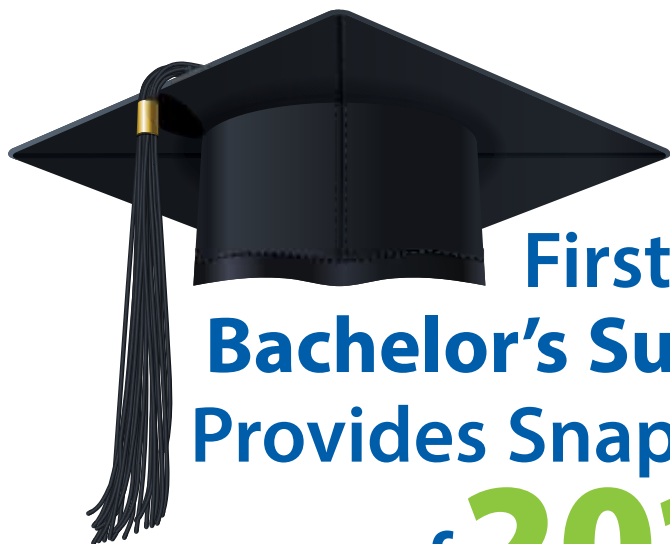
Rare DNA Variants and Human Complex Traits

Statistical Analysis of Administrative Health Databases

Distinguished Lecture Series in Statistics. This year, Richard Cook of the University of Waterloo visited the University of Calgary, Hilary Parker of StitchFix visited McGill University, and Philippe Soulier of the Université Paris-Nanterre visited the University of Ottawa.

CANSSI provides support to Canadian universities so they can participate in the ASA DataFest and other 'datathons,' after great success at the University of Toronto in 2016. The institute also launched a small program to enable statistical scientists to 'kick start' new collaborations with scientists. It has established a series of six health sciences collaborating centers across the country to strengthen links with provincial and national health agencies and highlight the many biostatistical training efforts with which colleagues around the country are engaged.

For further information about CANSSI, or to discuss how the institute might build linkages with you, contact Nancy Reid at [reid@utstat.utoronto.ca](mailto:reid@utstat.utoronto.ca). ■



# First ASA Bachelor's Survey Provides Snapshot of 2016 Graduates

Steve Pierson, ASA Director of Science Policy

The number of students earning bachelor's degrees in statistics in the US tripled from 2010 to 2016. To better understand this growth, the ASA conducted its first survey of statistics bachelor's graduates, starting with the class of 2016. The results should be helpful to the following three main audiences:

1. Current statistics students as they contemplate their remaining studies and plan for post-graduation
2. Potential statistics students as they decide on a major or majors
3. Faculty and administrators as they advise students, design curricula, and allocate resources

The findings reveal information that can be broadly characterized as illuminating undergraduate studies, post-graduate studies, and post-graduate employment. To highlight a few features in each category, starting with undergraduate studies, many students wished they had taken more computer science/programming/coding courses and mathematics courses and advised current students to do so.

Also, nearly one-third of respondents double-majored, with economics and mathematics being the most common majors. Such extensive double majoring is consistent with the advice of 2016 ASA President Jessica Utts, whose initiative promoting the theme “statistics plus” showed that students can combine statistics with almost any other interest.

The respondents who had jobs outnumbered those in graduate school almost two to one. Those with jobs found themselves in a variety of companies with an especially wide array of job titles, reinforcing the belief that a statistics degree is widely applicable—allowing one to play in anyone's backyard—and widely in demand. The median salary of \$55,000 is in line with that of mathematics and finance majors.

The survey also asked those with jobs about their most-used skills. Consistent with what the ASA has been hearing and sharing, communications and team skills top the list. For technical skills, the most-reported were data analysis, technical problem-solving, programming, and quality control.

While the preliminary survey findings reported here provide a new perspective to the recent discussions in the statistical community about preparing students for the 21st-century workforce, they also reinforce many of the current perspectives. For instance, the 2015 *Amstat News* article titled “Guidelines for Undergraduate Programs in Statistical Science Updated” states the guidelines “call for adaptations to the undergraduate curriculum to account for the increased importance of data analysis, teamwork, communications, and other relevant skills and experiences in today's practice of statistics.” Indeed, such themes are common in the pages of *Amstat News*, with a quick search finding Robert Starbuck and Paul Berg's 2012 piece, “Communication, Influence Keys to Success in Statistics.”

More recently, the whitepaper and accompanying videos of presentations by employers who attended the 2016 ASA chairs workshop also point to more communication, interpersonal, and related skills (see [www.amstat.org/ASA/Meetings/Department-Chairs-Workshop.aspx](http://www.amstat.org/ASA/Meetings/Department-Chairs-Workshop.aspx)). Also from that workshop was the notion that the statistics community needs to market itself and statistics more effectively. Statistics students may need to explain to potential employers what they bring to the table and why they should be hired.

The remainder of this article reports the survey's data, which the ASA will continue to examine and report further on. Your thoughts and impressions are welcome—particularly as the survey of 2017 bachelor's graduates is prepared. Send all comments to ASA Director of Science Policy Steve Pierson at [pierson@amstat.org](mailto:pierson@amstat.org).

**MORE ONLINE**  
For a list of participating universities and the raw survey data, visit <http://magazine.amstat.org/blog/2017/11/01/2016-bachelors-survey/>.

## Survey and Results

Participating in the survey distributed in the spring of 2017 were 271 graduates. They were asked about employment or graduate student status as of March 6, 2016. Of those 271, 215 answered the entire questionnaire. One hundred eighty three of the respondents reported being US citizens, and 32 reported being non-US citizens (17 from China, three from South Korea, and two from Canada.) The number of respondents, 271, is about 10% of the number of statistics and biostatistics graduates (2,790) as reported by the National Center for Education Statistics, 43% of whom are women. Of those providing gender identities, 87 were female, 125 male, and two “other.”

### Undergraduate Studies

Two-thirds of the respondents graduated from a statistics department/school, as seen in Table 1. Of the 220 who characterized their undergraduate field (Table 2), 60% listed statistics or biostatistics. Ninety-two of the respondents said they graduated with a double major, with the most common companion major being economics and mathematics (Table 3).

Fifty-two universities or colleges in 29 states were represented by the respondents, with the University of Illinois at Urbana-Champaign having the most survey participants (25). One hundred seventy nine of the respondents graduated from universities for which the highest degree offered was a PhD, 67 of the respondents graduated from universities for which the highest degree offered was a master’s, and 25 of the respondents graduated from universities for which the highest degree offered was a bachelor’s. One hundred eighty one graduated from a public university, and 90 graduated from a private university.

One hundred five of the 221 who responded to the question said they had taken AP Statistics.

For questions relating to work outside of class assignments, 70 said they did a thesis or capstone project, 96 said they did an off-campus internship or industrial co-op, 60 said they did on-campus research, 16 said they did an NSF Research Experience for Undergraduates, 24 said they did other summer research on another campus, and 20 said they did a DataFest or hackathon.

**Table 1**—Types of Departments Awarding Degrees

Mathematical Sciences	5
Statistical Science	9
Statistics and Biostatistics	8
Mathematics	22
Mathematics and Statistics	34
Statistics	182
Biostatistics	6
Math, Computer Science, and Statistics	1
Business Analytics and Statistics	4

**Table 2**—Characterization of Undergraduate Field

Field	<i>n</i>	%
General Statistics	124	56.4
Applied Statistics	24	10.9
Actuarial Science	16	7.3
Data Science	2	0.9
Biostatistics	7	3.2
Mathematics	11	5.0
Math with Stats Emphasis	30	13.6
Other	6	2.7
Respondents	220	

**Table 3**—Double Majors

Field	<i>n</i>	%
Mathematics	23	25.3
Economics	23	25.3
Other	10	11.0
Psychology	6	6.6
Political Science	5	5.5
Biochemistry	4	4.4
Finance	4	4.4
Physics	3	3.3
Biology	3	3.3
Computer Science	2	2.2

The following were each listed once: medicine; engineering, environmental; engineering, computer; engineering, general; anthropology; philosophy; communications; and business administration.

### GOOD TO KNOW

This survey was conducted by the Statistical Research Center of the American Institute of Physics (AIP). The ASA provided department names and contacts for the departments granting statistics or biostatistics degrees according to our records. The Statistical Research Center reached out to 123 departments, 41 of which provided names and email addresses of their 2015–2016 academic year graduates. The AIP received the names and contact information for 1,017 graduates.

The ASA plans to make this an annual survey and hopes to expand the survey to master’s degree graduates in the coming years.

**Table 4—Employment/Student Status**

	<i>n</i>	%
Student	80	29.5
Employed	157	57.9
Full-time volunteer	2	0.7
Unemployed seeking	10	3.7
Unemployed not seeking	2	0.7
Other	1	0.4
Left US	8	3.0
Full-time intern	3	1.1
Part-time intern	8	3.0

Regarding their job search, 115 respondents said their statistics department or the faculty provided career guidance; 104 said they did not. Similarly, 115 said they used their on-campus career counseling center; 104 said they did not. Of those who used a campus career counseling center, 73 found it useful.

In response to questions about how well their undergraduate program prepared them, 84% agreed or strongly agreed their program prepared them to effectively analyze and interpret data critically using statistical models, 79% agreed or strongly agreed their program prepared them to effectively analyze and interpret data critically using computational methods, and 78% agreed or strongly agreed their program prepared them to effectively communicate—both orally and in written form—results of statistical analyses to a variety of audiences.

When asked if they would do anything differently, 40 said they would have taken more computer science, programming, or coding courses, and 18 said they would have taken more

mathematics courses. Many also commented they wished they had applied themselves more to their studies, while others wished they had more research or hands-on experience.

In terms of advice for current statistics students, programming/coding skills were most frequently recommended, followed by gaining experience through internships and related activities. More mathematics, double majoring, and learning more statistical programming (e.g., R, SAS, SQL) were also recommended.

### *Postgraduate Work or Studies*

Of the 271 respondents, 157 (60%) listed themselves as employed, 80 (30%) listed themselves as students, and 10 (4%) listed themselves as unemployed (see Table 4). Eighty-five listed themselves in full-time degree programs, and another 32 of the employed said they were planning to begin a degree program in the future.

### *Employed*

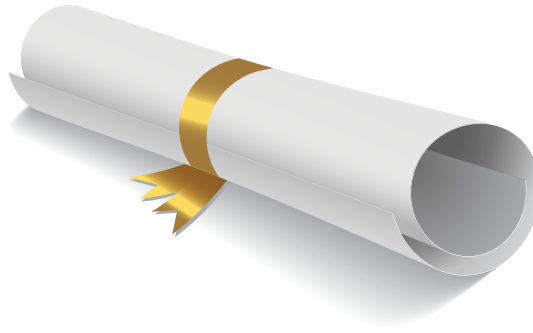
The 157 graduates who categorized themselves as employed had jobs in 29 states, and 67 had a job in the same state as the institution from which they graduated.

For the 130 who reported themselves as employed and responded to the question about number of job offers they received, 65 reported one job offer, 37 reported two, 14 reported three, six reported four, and four reported five or more job offers. Eighty-five percent of those employed and who answered the question thought their statistics or statistics-related major was very or somewhat influential in securing their current position. Eighty-one percent were very or somewhat satisfied with the position

**Table 5—Frequency of Technical Skills Used by Employees**

Use	Quality control	Solve technical problems	Statistics or advanced math	Data analysis	Use/develop stat models	Design experiments	Survey design	Programming	Comp. admin.
Rarely/ Never	42	14	28	9	49	103	100	32	79
Monthly	11	13	27	9	24	16	12	15	21
Weekly	30	25	41	24	28	6	4	21	7
Daily	45	76	32	85	27	2	11	57	19
Responses	128	128	128	127	128	127	127	125	126





**Table 6**—Frequency of Interpersonal, Communication, Management Skills Used by Employees

Use	Teamwork	Teaching	Public speaking	Work with clients	Manage			Writing	
					People	Projects	Budgets	Technical	Nontechnical
Rarely/ Never	7	72	57	51	89	35	94	44	41
Monthly	9	22	35	15	13	21	14	28	18
Weekly	33	24	26	26	14	33	7	30	29
Daily	80	9	10	34	12	37	11	26	38
Responses	129	127	128	126	128	126	126	128	126

they held as of March 6, 2017. Seventy-four percent were very or somewhat satisfied with their salary, 92% were very or somewhat satisfied with their job security, 77% were very or somewhat satisfied with the opportunity for advancement, 69% were very or somewhat satisfied with the intellectual challenge, and 83% were very or somewhat satisfied with their level of responsibility.

The median salary for those employed in data-related jobs and providing salaries is \$55,000, the 25th and 75th percentiles being \$47,500 and \$66,500. For an approximate comparison, see the graph from the American Institute of Physics at [www.aip.org/statistics/physics-trends/whats-bachelors-degree-worth](http://www.aip.org/statistics/physics-trends/whats-bachelors-degree-worth). Statistics tracks most closely with mathematics and finance. Table 7 shows the median salaries for the states with an *n* of five or greater. The median number of months between the reported month her/his job started and month of graduation was two.

There were 91 unique job titles among 127 job titles reported. The most common were analyst (9), data analyst (8), and actuarial analyst (8). One hundred five unique employers were listed, representing a wide range of sectors.

The questionnaire also asked those employed about the frequency in which they use many skills in their work. The use of more technical skills is shown in Table 5, where one can see technical problem-solving, programming, and data analysis are most often used and experimental and survey design are least often used. For interpersonal, communication, and management skills (Table 6), teamwork

**Table 7**—Median Salary by State

State	<i>n</i>	Median
CA	12	52,500
FL	5	64,000
IL	18	55,000
MA	13	55,000
MO	5	44,000
NC	6	58,100
NY	5	80,000
OH	6	51,600
US	110	55,000

is by far the most often and widely used skill, followed by working with clients, project management, and writing.

### Postgraduate Study

Seventy-four respondents reported being in a graduate program—30 in statistics, 10 in biostatistics, nine in data science, and the others in 15+ other programs (computer science and economics being the most common with three each). Seventeen of the graduates were enrolled in doctoral programs, while 49 were enrolled in master's. Twenty-two respondents said they plan to enroll in a degree program in the next two to three years—12 in a doctoral program and 17 in a statistics program. ■

## CONSULTANT'S CORNER

# Serving Your Community through Data Analysis



With a PhD in statistical astrophysics, **David Corliss** works in analytics architecture at Ford Motor Company while continuing astrophysics research on the side. He serves on the steering committee for the Conference on Statistical Practice and president-elect of the Detroit Chapter. He is the founder of Peace-Work, a volunteer cooperative of statisticians and data scientists providing analytic support for charitable groups and applying statistical methods to issue-driven advocacy in poverty, education, and social justice.

As small businesses providing a service, consultants often are deeply embedded in the communities they serve—whether defined by a local geographic area, industry, or other characteristic. One way in which a growing number of statistical consultants serve their communities today is through pro bono work for good causes and organizations.

In many professions, pro bono work is an ordinary—even expected—part of the job. While physicians and attorneys are well known for their professional commitment to volunteer work, many other professions have strong connections to serving their communities in this way. In recent years, volunteer work in statistics and data science have become much more common. This “Data for Good” movement has been embraced by individuals, companies, and professional associations.

There are many organizations working in Data for Good, including the ASA volunteer outreach group Statistics without Borders (<http://community.amstat.org/statisticswithoutborders/home>). Working with a volunteer organization offers many advantages: connecting people to volunteer projects and groups needing assistance and providing mentoring, software support, project planning, and opportunities to work on larger projects. However, working as a consultant offers substantial advantages.

Independent consultants have complete creative control of methodology and analytic practices, greater flexibility in which analytic tools are used, and the ability to work with a circle of friends in familiar surroundings. Individual volunteer projects can be less formal, without a definite timeline, and often can be put on the shelf for a while and restarted when more time is available.

After many years of volunteering as an individual consultant, I founded Peace-Work ([www.peace-work.org](http://www.peace-work.org)) to crowd-source volunteer hours within the statistics community to support projects in issue-driven advocacy. Many of Peace-Work's analyses focus on the ugly side of Data for Good—

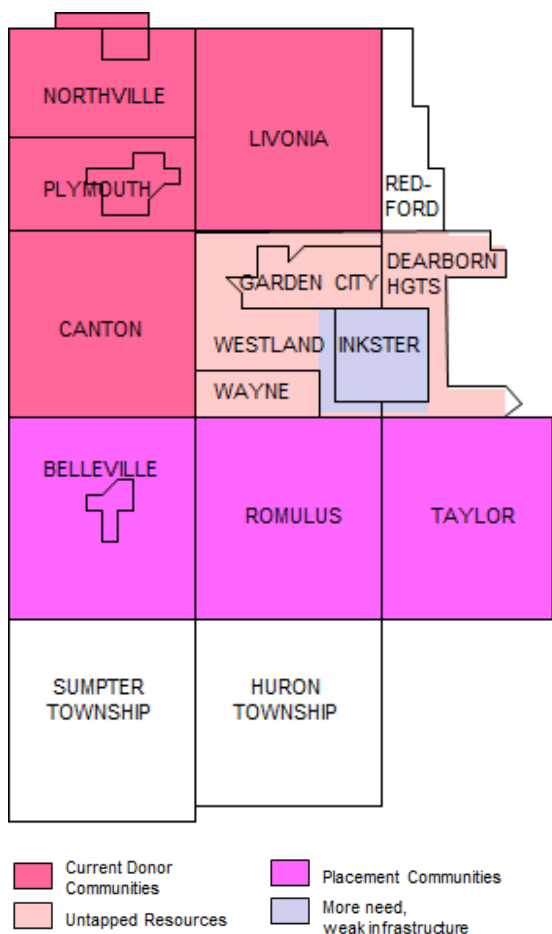
current projects include using mixed models to analyze human trafficking by state and mining hate speech in social media to predict violence. However, much of the work is a direct descendant of a consultant project on a more cheerful subject: helping a local Habitat for Humanity chapter find more volunteers and donors.

Individual consultants make up the largest part of the Data for Good movement. Often, a personal connection to a group needing statistical help is the most important factor in matching people and projects. The Habitat for Humanity project began in 2005 while I was consulting at Ford Motor Company, which has a long history of community involvement. One of the marketing managers and I volunteered for the local Habitat for Humanity chapter. After volunteering on a number of construction projects and getting to know the chapter's board of directors, a conversation began with my Ford colleague about how statistical analysis could help the organization.

Usually with statistical volunteering projects, an organization is doing really good things and has data, but not the analytic resources required to leverage it. The organization knows its mission, people, and data, but is unfamiliar with statistical methodology. They usually lack statistical software, so the consultant needs to bring this to the table. Also, because these charitable organizations need to focus their few hard dollars on other needs, paying to acquire additional data sources usually is not an option. This requires the consultant to blend the organization's data with publicly available sources.

The process with Habitat for Humanity was conducted in much the same way as for ordinary for-pay consulting projects. Discussion with the Habitat for Humanity team identified the points they were concerned about the most. Like many organizations, Western Wayne County Habitat for Humanity needed better ways to find more volunteers and donors. As a result, this case study may

## Western Wayne Community Clusters



be especially helpful to other organizations where statisticians can provide analytics support.

After showing the Habitat for Humanity team how to anonymize a contact list using mocked-up data, the team stripped PII (personally identifiable information) from their volunteer and donor lists and provided a copy. As the data never left the organization, this step may not have been strictly necessary, but it is strongly recommended as a best practice. Nothing can go wrong with the data you never receive. Summary counts of Habitat for Humanity construction volunteers and donors at the municipality level were combined with Census Bureau data.

Geographic analysis quickly revealed most of the support for the chapter came from a small portion of their geographic area, with many cities largely unreached. An affluence scale was

developed to combine demographics data into a single score that best correlated with the per capita number of donors and volunteers. A cluster analysis on this score binned the communities into three groups based on level of charitable need in the community and their ability to meet it. Looking at the entire area, instead of one small part where most of the board members lived, produced a list of communities to target where the organization had little presence.

In addition to finding places to recruit more donors and volunteers, the analysis revealed the houses were very poor, with weak infrastructure and especially poor schools, where the local Habitat for Humanity group was building. This produced a recommendation to build houses in a different, neighboring community, where the families would receive more support and the children would attend better schools—doing more good for the families in new homes, even if the land prices there were somewhat higher.

This project tells the story of how most statistical volunteering by consultants and other unaffiliated individuals happens: A person is already helping an organization in a nonstatistical way—working at the public library, walking dogs at the local animal shelter, or volunteering at a school, house of worship, or community center. Individual statistical volunteering happens when people with analytic skills know how those skills can be used to help the organizations and causes they already support.

Participation in the growing Data for Good movement provides opportunities to use our statistical skills to support the organizations, projects, and causes we care about the most. As the movement continues to grow, we can envision a day when pro bono activity becomes normative—an ordinary part of a statistical career. Participation from everyone is encouraged, from students to the most experienced and entry-level analytic workers to top executives. Sharing your skills for the greater good can be part of everyone's career journey. Where is your place? ■

## MASTER'S NOTEBOOK

# Musings of a Baby Boomer Data Science Learner



**Bill Bentley** is the owner and president of Value-Train, a consulting and training business. His Atlanta-area company was started in 2002 and provides data analytics and process improvement consulting and training. Primary training topics include Six Sigma, Lean, and applied quantitative methods. Besides his degrees, Bentley holds three SAS certifications, an R in data analytics certification, and an Informs Certified Analytics Professional (CAP) certification.

**W**hy did I put my successful consulting practice on simmer to go back to college? At my age—I'll admit to being over 50—what were my goals? Why did I join the growing number of seniors pursuing new college degrees? How did my university handle me and the few others close to my age?

In short, I am a curious person who is eager for new knowledge and experiences. I have a BS and MS in electrical engineering, I am one credit shy of an MBA, and I have a long and successful career doing advanced computer automation and engineering—later in management to the CEO level.

After 9/11, I built a successful process improvement training and consulting practice. Recent consulting jobs required building statistical models and doing other statistics-related work. One of the courses I regularly teach is Six Sigma Black Belt, which is essentially a less-detailed version of an applied statistics course. I have a natural understanding of statistical techniques and when to use them. My curiosity led me to check out the kinds of jobs available for those with degrees in applied statistics.

Jobs advertised by more than 350 companies in my city alone—using job titles such as data analyst; quantitative analyst; big data guru; data engineer; programmer in SAS, R, SQL, and Python; and sometimes just statistician—led me to believe an MS in applied statistics would be a worthwhile addition to my knowledge base.

After interviewing all the local programs, I chose Kennesaw State University near Atlanta, where I live. I decided their program was by far the best in the area for my purposes, even though the commute was terrible. Though giving up most of my own training and consulting to concentrate full time on the degree did take loss of income and guts on my part, I was excited and energized to be among others eager for knowledge and career advancement.

I am a lifelong learner, but hadn't gone for a degree in years. Professors weren't sure of my intentions, and some thought I was simply taking up space while filling my time. Half-way into the program, I made appointments with each professor and the department head to explain my purpose in



According to NBC news, the percent of older college students going back to school for degrees is rising faster than the growth rate of traditional college students pursuing a degree program.

being in their program. I will not say their eyes lit up with understanding, but some professors began to take me more seriously.

According to NBC news, the percent of older college students going back to school for degrees is rising faster than the growth rate of traditional college students pursuing a degree program. But do colleges know how to handle their senior students? If my experience is typical, they have a long way to go.

Had I been less motivated, I may have chosen to audit classes rather than continuing for the degree. Instead of becoming discouraged, I sat in the front row, paid attention, and asked most of the questions. I soon realized my younger, inexperienced fellow students didn't have business or life knowledge to ask certain questions and appreciated me being



in their class. I began to build study teams for my own and the younger students' benefit. I challenged myself and my professors every step of the way.

My goals were clear. I wanted to solve problems for companies while using my many skills. My maturity and experience are valuable. Working and contributing to society will keep me vital and active. I love to learn, I am not afraid of new experiences, and I feel more alive when I am working.

Unfortunately, a poorly hidden scourge in society and the workplace is age discrimination. I was surprised to find it in my college setting. Not from students, but from the professors. I thought professors would welcome an older, stable, and experienced student thirsting for knowledge. I thought they would admire my grit and determination.

Professors seemed ill-equipped to handle their older students. I received smiles and nodding heads. When I asked for help or direction in finding jobs needing my new degree, they had nothing useful to offer despite boasting of their high employment rate for graduates. Their focus and claims were only on full-time starter jobs for typical college graduates. Administration seemed oblivious to me and others in my age group. Faculty seemed to think us oddities. Job opportunities via the school were zero. Fortunately, while I hoped for more career support, I expected none and got none, so it's good I planned to tackle that task alone. So far, so good!

When asked by a professor if I was there to kill time in retirement, I was insulted at the lack of awareness and sensitivity. To put a successful self-employment business on hold to earn a degree and accomplish a strategic professional goal was an expensive decision. One observation I had was that some college programs may see re-educated seniors as competition for their own private and university consulting practices.

So, though many seniors are active, vibrant, capable, and wanting to work and contribute, my observation is that some traditional universities lag in ability to deal with those who want to learn at the college level. *The New York Times* had an interesting piece online that discussed how universities are preparing for a senior boom in enrollment. Some

universities are way ahead of others. Stanford has created a \$65,000 program for successful seniors who are returning to college to advance or re-invent themselves, simply to help them choose a direction to go in. Wow!

My education was not a waste of time or resources; it was inspiring and I'm glad I did it. I am confident my new MSAS degree and accompanying multiple SAS and other certifications will be valuable to my clients. Though I am on my own with my new degree, I am excited and optimistic. My university experience was mostly positive. In the future, though, when I next return to college, I hope my professors are better trained and more welcoming and understanding of seniors like me. And I hope the one senior-focused facility I found has better hours. They did have a room where 'mature learners' could study, use computers, and enjoy free coffee and tea. It closed at 5 p.m., but nearly all the graduate program classes started at 6:30 p.m. They got it right for the older undergraduates, but not for the advanced learners. Nice try though! ■

## Communicating Technical Information Webinar in the Works

Regina Nuzzo and Liberty Vittert will present the ASA Committee on Career Development's second 2017 webinar, which will discuss strategies for communicating technical information to nontechnical audiences. The webinar will broadcast on December 1 at 12 p.m. ET.

Nuzzo is a professor of mathematics at Gallaudet University in Washington, DC, and the 2014 recipient of the ASA's Excellence in Statistical Reporting Award.

Vittert is the Mitchell Lecturer at the University of Glasgow, as well as a chef and the host of STV's "Liberty's Great American Cookbook."

Registration and connection details will be announced through the ASA Community at <http://community.amstat.org/home>.

STATtr@k

# My Thoughts on Certifications



**Richard C. Zink** is principal research statistician developer in the JMP Life Sciences division at SAS Institute. Prior to SAS, he spent eight years in the pharmaceutical industry. He is publications officer, 2018 chair-elect, and host of the statistics podcast for the ASA Biopharmaceutical Section. He is also author of *Risk-Based Monitoring and Fraud Detection in Clinical Trials Using JMP and SAS* and co-editor of *Modern Approaches to Clinical Trials Using SAS: Classical, Adaptive, and Bayesian Methods*.

I was recently asked to share my thoughts about SAS certifications—whether I thought they were valuable and, if so, which certifications were the most important. This is an important question, though I think it can be considered more broadly.

First, I have more than 20 years of SAS programming experience, but I do not have any SAS certifications. For full transparency, I do not hold professional certifications of any kind (though I can claim 6–8 scuba diving certifications). Even though I have been coding with SAS for so long, I still learn things all the time—new functions, tricks, and coding efficiencies.

Certifications, whether for SAS or any other area, are documented proof that you have some level of proficiency in a particular skill. Technically, you can view college degrees in much the same way—you have an organization willing to vouch for your skills after completing a set of requirements. Otherwise, potential employers or clients have to rely on letters of recommendation from former professors or employers, past clients who are willing to recommend your services, or actual code that illustrates how savvy a coder you are (such as a customized SAS macro with a number of bells and whistles). SAS maintains a website (<http://bit.ly/2g6Mf4G>) where any employer can visit to verify you have the skills you say you do.

Which certifications you try to earn ultimately depends on the industry you are trying to enter. Of course, if you are entering the pharma industry, the Clinical Trials certification will make the most sense. Here, part of the exercise is the language, itself, but also an understanding of data and analysis conventions within this particular industry.

But how do you prioritize certifications versus other skills or credentials? Of course, if a certification is required for a particular job, you had better obtain it. Otherwise, part of this will depend on the industry you enter and any perceived areas you think you are underdeveloped in.

For example, let's say you have many years of R coding experience, but want to go into the pharmaceutical industry, where SAS is viewed favorably. Here, a SAS certification may be more important than SAS courses taken as part of a graduate program.

Or, suppose your initial career was in a nonstatistics field, but you go back to school to get a master's degree in statistics or biostatistics to follow a more quantitative path. Here, an ASA GStat accreditation ([www.amstat.org/accreditation](http://www.amstat.org/accreditation)) may be useful as a way to instill confidence in your skills. On the flip side, a PStat accreditation may be useful if you have been in the industry for a long time, as it documents you are making a concerted effort to maintain your skills and stay on the cutting edge of statistical science.

Certifications are one way to distinguish yourself from your peers. When entering the workforce, you are competing with other individuals to get a particular job. Most of us will get to check a master's or doctorate degree box, so the question then becomes how else are you going to distinguish yourself? There are a number of ways:

1. Certifications
2. Internships in a particular industry
3. Consulting projects with nonstatisticians
4. Research or teaching assistantships
5. Volunteering with the relevant sections of the ASA
6. Experience in a less-common form of methodology
7. Publishing
8. Presentation experience
9. Therapeutic experience

My opinion is that the single most important thing for young statisticians to do is to document in sufficient detail as much real data analysis experience as they have. This demonstrates the ability to apply what has been learned in the classroom, and, as many statisticians will tell you, the data is never as “nice” in real life as it is in the classroom.

I am also a big believer in developing a breadth of skills. For example, if you know one or two coding languages, you have documented that you have some capability with programming. Adding additional languages to your CV may not add extra value, since a lot of the differences in computer

languages are in language syntax (unless there are specific job requirements for particular languages). Instead of developing a list of computer languages a mile long, highlight that you have taken a technical writing course, participate in Toastmasters or some other form of public speaking, or give presentations at scientific conferences. Or describe how you have volunteered with an ASA section to support a new initiative or had a leadership role in a student chapter. Or use that coding experience to publish a paper in the *Journal of Statistical Software* ([www.jstatsoft.org/index](http://www.jstatsoft.org/index)) about a piece of software you developed. In short, communicate that you are well-rounded and have a diverse skill set.

Finally, don't let the absence of a particular skill or certification—or lack of experience in a particular area—prevent you from applying for a specific job. Employers tend to list requirements that are so

numerous and specific that the ideal candidate likely does not exist in real life. Describe the skills you do have. More importantly, highlight any skills or experience that make you unique and describe how they can benefit a potential employer. These other skills and experiences can often take a job or ongoing project in new and exciting directions—help the employer think outside the box! ■

**pstat**<sup>®</sup>  
Accredited Professional Statistician™

**gstat**  
Graduate Statistician

### Accreditations from the ASA

Both accreditations acknowledge the acquisition of substantial statistical knowledge via the completion of an advanced degree. GStat is an entry level of accreditation, preparatory for full PStat<sup>®</sup> accreditation. Find out more at [www.amstat.org/accreditation](http://www.amstat.org/accreditation).

JUST RELEASED



The image shows two hexagonal logos. The left one is blue and labeled 'nQuery Advanced'. The right one is grey and labeled 'nQuery Bayes Add-on'. A white plus sign is between them. The background is dark blue with a network of white and blue dots.

## nQuery Bayes - Expert Add-On Module For Alternative Sample Size Methods

- **Bayesian Assurance**  
 Get an informative answer on how likely it is to see a "positive" outcome from the trial and then make better decisions on what trials to back
- **Posterior Credible Intervals & Mixed Bayesian Likelihood**  
 Enable researchers to use prior information from pilot studies and other sources to make quicker and better decisions
- **Bonus Tables**  
 For n-of-1 trials & gamma regression

>
Statsols
statsols.com/amstat-nQuery-Bayes



# Vanderbilt Department of Biostatistics



Photo by Jonathan Chipman, Vanderbilt University

## Who are you, and what is your statistics position?

Lucy D'Agostino McGowan, above left, and Ryan Jarrett are PhD students in the biostatistics department at Vanderbilt University.

## PASTIMES OF STATISTICIANS

# What Do Lucy D'Agostino McGowan and Ryan Jarrett Do When They Are Not Being Statisticians?

## Tell us about what you like to do for fun when you are not being a statistician.

We are working on building a life-size replica of BB-8 [below right, an android character from the movie *Star Wars: The Force Awakens*]. We founded the Tennessee Chapter of the BB-8 Builders Club ([www.facebook.com/groups/TNBB8Builders](http://www.facebook.com/groups/TNBB8Builders)) and have been working with a growing international online community (<https://bb8builders.club>) toward this optimistic goal.

## What drew you to this hobby, and what keeps you interested?

Lucy stumbled upon the community shortly before the release of *The Force Awakens* and was immediately hooked. The project involves a lot of skill we didn't have, but were excited to learn (CAD, 3D printing, robotics, engineering, BB-8 pun-making, wooing the 3D printing lab to join in on our passion, etc.). This project has been particularly enjoyable because it is the perfect nerdy amalgamation of creativity and mathematics. We would say it's BB-Great! ■







# International Conference on Health Policy Statistics

January 10–12, 2018  
Charleston, South Carolina

**REGISTER  
TODAY**

**Health  
Statistical Science  
Care | Policy | Outcomes**



**PLENARY SPEAKER**

**Suchi Saria**

*The Johns Hopkins University*



**KEYNOTE SPEAKER**

**Robert M. Califf**

*Duke University*



# SDSS

## SYMPOSIUM ON DATA SCIENCE & STATISTICS

*Analytics, Computational Statistics, and Visualization*

Sessions will be centered on  
the following topic areas:

STATISTICAL  
MACHINE  
LEARNING



DATA  
VISUALIZATION



DATA  
SCIENCE



APPLICATIONS



COMPUTATIONAL  
STATISTICS



COMPUTING  
SCIENCE



## PARTICIPATE

**Contributed Paper and Poster Abstract**

**Submission:** December 5, 2017 – January 18, 2018

## ATTEND

**Online Registration and Housing Open:** February 1

**Speaker Registration Deadline:** March 15

**Early Registration Deadline:** April 5

**Housing Reservation Deadline:** April 23

**Online Registration Deadline:** May 15

**Onsite Registration:** May 16–19

Learn more at [ww2.amstat.org/sdss](http://ww2.amstat.org/sdss).

## BEYOND BIG DATA: LEADING THE WAY

RESTON, VIRGINIA • MAY 16–19, 2018



# CSP: The Right Place for Meeting the Right People

Sara Davidson, ASA Graphic Designer, Production Coordinator



Photo by Regina Haas, director of marketing at LexisNexis Risk Solutions. Reuben Hilliard, left, and Sepehr Piri met at a networking event during the 2017 Conference on Statistical Practice in Jacksonville, Florida. Hilliard and Piri now work together at LexisNexis Risk Solutions.

In August, ASA member Sepehr Piri became a data modeler for LexisNexis Risk Solutions, all because of a connection he made at the 2017 Conference on Statistical Practice.

While CSP does not have a formal onsite Career Service like the Joint Statistical Meetings does, the conference's smaller size and numerous networking opportunities make it easy for attendees to connect.

It was during one of these events—a student poster presentation—that Piri met Reuben Hilliard, a statistical modeler for LexisNexis Risk Solutions.

"I have attended a number of large conferences," Hilliard said. "But the intended smaller setting allowed me to see the same faces every day and make lasting connections."

The two chatted about Hilliard's position with the data and analytics solutions company and how he applies statistics in his day-to-day tasks.

"We exchanged LinkedIn contacts," Piri said. "Later on, when I was searching for jobs, I connected with him. He informed me of this opening and referred me for it."

Now the two men have neighboring desks at the company's Georgia office. The 2017 conference—which took place in Jacksonville, Florida—was the first CSP for both men, but both are already planning to attend the 2018 meeting this February in Portland, Oregon.

"It is amazing how meeting the right person at the right place can shape your future," Piri said. "CSP is definitely the right place for meeting the right people!" ■



## REGISTER NOW!

Registration for the 2018 Conference on Statistical Practice is open now. Discounted early registration will close January 10, and regular registration will open January 11. See [www.amstat.org/csp](http://www.amstat.org/csp) for more information.

# CELEBRATING 20 YEARS OF THE AP STATISTICS EXAM

This year marked 20 years since the first AP Statistics exam was given in 1997 (and the 21st exam). In that time, the number of students taking the exam grew to 217,000, matching the growth of Calculus AB from about 100,000 to 300,000 in the same period.

*Amstat News* commemorates these 20 years with the following Q&As with AP Statistics teachers and readers/leaders. Here, they share their memories of and passions and lessons for teaching statistics while looking forward to another 20 years.



**Heather Overstreet**

has taught AP Statistics for 14 years and has been teaching high-school mathematics for the past 20 years. She has three children and loves watching them play sports.

## AP LEADERS

### Heather Overstreet

FRANKLIN COUNTY HIGH SCHOOL

Years serving as an AP reader/leader: 10

**How many times have you been an AP Statistics reader/leader? When did you start?**

I have been an AP reader for the past 10 years: seven as a reader and three as a table leader. My first year was 2008.

**What do you enjoy most about being a reader?**

There are many things I love about being a reader—collaborating with other math teachers, attending the professional development, and especially being part of a process that assesses students' abilities from a global standpoint.

**What changes have you seen over the years in terms of your fellow readers, the exam questions, and the students taking the exam?**

One of the major changes is the number of students who are taking the AP Statistics exam. When I began in 2008, I think there were just over 70,000 students taking the exam. This past year, there were well over 200,000 students taking the exam.

**Please share some favorite memories of being a reader.**

One of my favorite memories was being part of the acorn skit for the closing night party. Another favorite memory was realizing how many people shared my love for math and educating students. I have had some great conversations with fellow teachers that I have carried back to my own classroom. I have not found any other experience as a teacher as unique as this.



## Julia Sharp

COLORADO STATE UNIVERSITY

Years serving as an AP reader/leader: 7

**How many times have you been an AP Statistics reader/leader? When did you start?**

I served as an AP Statistics reader for five years and as an AP Statistics table leader for two years. I began in 2008.

**What do you enjoy most about being a reader?**

It is hard to choose just one thing I enjoy “most.” I enjoy the professional and personal development opportunities the reading has to offer. Getting to learn different ways of teaching introductory statistics and networking with professionals in the field has been deeply rewarding. I enjoy returning year after year to reconnect with friends I met at my very first reading or just last year.

**What changes have you seen over the years in terms of your fellow readers, the exam questions, and the students taking the exam?**

The number of readers and students taking the exam each year has increased substantially since my first year.

**Please share some favorite memories of being a reader.**

The reading has been in several venues since I began participating. Most recently, the reading has been in Kansas City, which has been surprisingly interesting and entertaining. My favorite location was Daytona Beach, of course. One year, two of my friends and I got a room that opened up near the beach area. Having a location that is interesting outside of the reading is great to refresh after a long day’s work!

**Is there anything else you would like to share?**

When people hear about the logistics and size of the reading, they cannot imagine the reading to be so rewarding. I have met and reconnected with life-long friends at the reading and learned about statistics training in high schools and other universities, among other important professional and personal developments. I strongly encourage those [who are] interested to become an AP Statistics reader!



**Julia Sharp** is an associate professor and director of the Graybill Statistical Laboratory in the Department of Statistics at Colorado State University. She is currently serving as the chapter representative to the ASA Board of Directors.

## Calvin L. Williams

CLEMSON UNIVERSITY

Years serving as an AP reader/leader:  
20 (only missed one year)

**How many times have you been an AP Statistics reader/leader? When did you start?**

Too many to count. I was at the very first reading at Trenton State (I still have a T-shirt with their logo on it). It eventually became The University of New Jersey or something like that. I have been to every reading except one. I had an assignment at the National Science Foundation that year that took precedent over my attending.

**What do you enjoy most about being a reader?**

When the exam was much smaller, being able to read the students’ responses and, AP Statistics being so new, watching the development of statistical thinking of the students and, more importantly, the growth of their teachers. I also have enjoyed seeing folks year after year who have the same goal in mind: developing a more statistically and quantitatively literate society. Also, it’s great to see so many friends year after year at the reading.

**What changes have you seen over the years in terms of your fellow readers, the exam questions, and the students taking the exam?**

Readers have grown in number, obviously, with the growth of the exam. They have become more knowledgeable about statistics.

The exam has obviously grown in its coverage of statistics, as well as its provocativeness. Students are expected to be more statistically savvy than before (in the early days). This growth is expected since teachers have become more statistically savvy.

The students’ abilities have grown with the growth of the exam. More polished responses, or more reasoned and thought-out responses, now appear more often.

**Please share some favorite reader memories.**

My great friend Dennis (from Vermont) that ran every morning. Dennis once said he had run every morning for the last 50 years or something like that. Missed him at the reading the last few years.

Being in Nebraska. That was fun. The racetrack and the Friday night races. Bob Schmid (from Cal Poly) using his statistical knowledge in picking horses.

Playing basketball with friends after a hard day of reading.

Discussions I have had with my colleagues, the classroom activities I have learned, and—most importantly—the friends I have made are invaluable.



**Calvin Williams** is director of the Center of Excellence for Mathematics and Science Education at Clemson University. He is a professor of mathematical sciences with interests in biostatistics and statistical computing. In addition to serving as an AP Statistics Question Leader, he has been involved as a mathematics judge in the Siemens Competition.



**Jonathan Duggins** is a teaching assistant professor and coordinator of the Undergraduate Professional Partnership Program in the department of statistics at NC State University. Prior to his time there, he worked in industry as a biostatistician for several contract research organizations. He has always been dedicated to education, and that is his main role at NCSU, where he teaches several courses with an emphasis on statistical programming languages.



**Paul Rodriguez** has taught AP Statistics since 1997 and currently teaches at Troy High School. He has been involved with the AP reading since 2004 as a reader, table leader, and rubric member. Paul loves learning and sharing ideas from other readers.

## Jonathan W. Duggins

NORTH CAROLINA  
STATE UNIVERSITY

**Years serving as an AP reader/leader: 11**

**How many times have you been an AP Statistics reader/leader? When did you start?**

My first year as a reader was in 2007, and I've served as a reader or table leader every year since!

**What do you enjoy most about being a reader?**

Easy question—the professional collaboration. This experience has been the most professionally rewarding aspect of my career.

**What changes have you seen over the years in terms of your fellow readers, the exam questions, and the students taking the exam?**

The students have improved their ability to think critically about data. As a result, the questions have been able to evolve without changing the content being assessed. In particular, it has provided the opportunity to expose students to questions about simulations that tie concepts of probability and inference in a way I don't recall in the earlier exams I was part of.

As for my fellow readers, they've stayed amazing. (Is that a cop out?) We've adapted to the growth in the program by growing the support networks we maintain. From email lists to websites full of high-quality resources, there has been an explosion of resources available. The fact that it is almost always a teacher providing help above and beyond the expectations of their "day job" just makes it more impressive.

**Please share some favorite reader memories.**

Oh, man, there are too many to list. The statistics readers are very fond of our chief readers and one way we show that fondness is through impersonations. Getting to watch the impersonations of Chris Franklin, Alan Rossman, and Jessica Utts is certainly one of the fondest memories. Another was the year the roof started leaking and there was, quite literally, a waterfall that suddenly appeared in the middle of the convention center. It was remarkable that the readers knew to protect the exams first; that was devotion!

As far as professional memories go, the one that sticks with me is from my first year. During some downtime, a reader at my room casually mentioned they weren't confident about a statistical concept that was beyond the scope of the AP curriculum, but which students occasionally asked about. I and another reader helped explain the concept and worked with the AP teacher until they felt more comfortable answering questions. That feeling of

collegiality is certainly one of my favorites. (Second only to the waterfall one!)

**Is there anything else you would like to share?**

I've made great friends and learned a tremendous amount from the AP reader community; join us!

## Paul Rodriguez

TROY HIGH SCHOOL

**Years serving as an AP reader/leader: 14**

**How many times have you been an AP Statistics reader/leader? When did you start?**

I have been a reader or a table leader for the past 13 years. I started in 2004 in Lincoln, Nebraska, and was a reader for six years. I have been a table leader for the past seven years, including five years as a rubric team member. I am currently serving in my fourth year as the co-chair of the Test Development Committee, which is responsible for writing the exam questions.

**What do you enjoy most about being a reader?**

The best part of a being involved is meeting teachers from around the country and sharing teaching strategies and best practices. Also, learning about new activities to use in my classroom, including having conversations with the authors of the textbook I use. I have never gone to a reading, a conference, or other gathering of statistics teachers where I have not learned something to make me a better teacher.

**What changes have you seen over the years in terms of your fellow readers, the exam questions, and the students taking the exam?**

When I started in 2004, there was approximately 248 readers and 36 table leaders. That year, we graded almost 68,000 exams. Last year, there were more than 900 readers and table leaders who graded more than 210,000 exams. The course continues to grow, and I am proud to be part of it.

**Please share some favorite reader memories.**

There are so many great memories over the past 13 years, almost too many to count. Last year, almost 20 teachers shared activities at our Best Practices Night.

**Is there anything else you would like to share?**

Becoming an AP reader was the best decision I made in my 24-year teaching career. The discussions I have had with my colleagues, the classroom activities I have learned, and—most importantly—the friends I have made are invaluable.

## AP STATISTICS TEACHERS

### Paul Buckley

GONZAGA COLLEGE HIGH SCHOOL

Years teaching AP Statistics: 16

#### How did you become an AP Statistics teacher?

I took over our honors statistics class toward the end of one year because the woman teaching it went on maternity leave. The next year, she didn't want the course, so I took it over, just still as an honors statistics course. At the end of the year, I realized the guys could be taking the AP Statistics exam, so I asked our administration if we could make it an AP course, and we did. So thus I became an AP Statistics teacher.

#### What most excites you about teaching statistics?

I love the activities we get to use to highlight some of the concepts. They are incredibly engaging and fun for the class. I also enjoy how the kids take to the material, especially when they see how useful it is and it is in everything they see and do. It makes them buying into the course that much easier.

#### What are the biggest challenges of teaching AP Statistics?

One of the biggest challenges is deciding which cool activities to do and which ones have to be left out—there is only so much time, and you can't do them all. The other tricky part is the disparity in mathematical ability. Unlike in other upper-level math courses, my students come from a wide range of algebraic backgrounds. Some are coming from Algebra 2, some have already passed AP Calculus BC. So having that disparity makes it tricky sometimes—making sure I reach everyone while also keeping everyone interested.

#### Describe how your time as an AP Statistics teacher has affected your mindset as an educator.

I am much more in tune with how and why I assess, and in trying to give really good summative assessment questions. I also look for more ways to make the material applicable to them—it is easy to do in AP Statistics, less so in other courses. But I try to bring that mindset into those other courses.

#### Please share any personal stories about students or AP Statistics teachers.

I have had numerous students come up to me to tell me this was either their favorite math class or their favorite class overall. I also hear back from kids in college who tell me they are now acing their college-level statistics class.

I have a group of AP Statistics teacher friends who are some of my best friends—we talk all the time, trading ideas about classes and AP Statistics specifically. I get some of my best ideas from them and they have helped me become a better teacher overall. They care about what they do, and that is infectious and challenges me to be a better teacher. I think AP Statistics teachers are a pretty special group of educators, and I am honored to be a part of them.

#### What are your favorite AP Statistics lessons/activities?

- The German Tank Problem
- Hershey's Kisses
- The Parking Lottery
- Which Putter Would You Use?
- The Reese's Pieces applet

So many—and more are being created all the time!

#### What has changed the most for the AP Statistics course while you've been teaching it? What changes would you like to see in the future?

The emphasis on true understanding of the thought process, rather than just plugging generic answers into a bland template. The encouragement of thoughtful discourse, rather than rote regurgitation. The students are much more being challenged to think, to decide, and then to defend that decision. I think this bodes well for them in the future, as they will be more accomplished and more thoughtful decision makers.

#### What advice do you have for new AP Statistics teachers or schools starting to offer AP Statistics? For AP Statistics students?

**For teachers:** Get connected. There is a great social network of statistics teachers out there who can offer support, resources, and ideas to new AP Statistics teachers/programs. Do a Summer Institute offered by AP—I did two of them and they gave me the head start I needed. Join the AP Statistics listserv. Become an AP Statistics reader—that is the biggest thing. Find other AP Statistics teachers out there and learn from them—they are there to help, and they are able and willing to do so.

**For students:** Take AP Statistics—it could very well be the most valuable course you take in high school—don't miss out. And don't be surprised when you see how relevant and how much fun it is. I would hate to say I told you so, but ...



**Paul Buckley** has been teaching math for 24 years. For 20 years, he has taught at and started the AP Statistics program at his alma mater, Gonzaga College High School in Washington, DC. He has been a reader and table leader for the AP Statistics exam for 10 years and has consulted on multiple statistics textbooks.

## Mary R. Simons

SMYRNA HIGH SCHOOL

Years teaching AP Statistics: 11



**Mary Simons** recently moved to Richmond, Virginia, with her husband and two sons, Logan and Levi. In her free time, she watches Clemson football, reads, and cooks. She is currently in training to become a court-appointed special advocate for children.

### How did you become an AP Statistics teacher?

In 2005, I was teaching at Paint Branch High School in Burtonsville, Maryland, when our department head asked if anyone would be willing to attend AP training over the summer and take over AP Statistics from one of our department members who was transferring to another school in the district. Having been on the statistics curriculum development and textbook adoption committee in my previous district, I jumped at the chance! I was able to attend an amazing week-long AP training at the College of William and Mary in Williamsburg, Virginia, taught by Monica Brogan (who I would get the chance to reintroduce myself to eight years later when I happened to sit next to her at breakfast one morning during the AP reading).

### What most excites you about teaching statistics?

I love the accessible nature of the course. I have been fortunate to teach in three school districts that have open enrollment policies for AP courses. In AP Statistics in particular, that means I could end up with a classroom of students from widely different math backgrounds—from on-level Algebra II to AP BC Calculus!

As anyone who has taken or taught the course knows, it is unlike anything else the vast majority of students have ever experienced. As such, it is also the first time most of my students have been on equal footing in a math class since they were in elementary school. AP Statistics is a great equalizer in a way that few academic classes are in high school. There is no guarantee anymore that the BC Calculus kids are going to outperform the Algebra II kids (especially not if the latter are working overtime as if they have something to prove). That shift in the power dynamic of the typical intellectual pecking order allows me to start to create cognitive dissonance from the time the class begins. This struggle is necessary to stimulate intellectual curiosity and growth and facilitate my students becoming independent quantitative investigators.

### What are the biggest challenges of teaching AP Statistics?

In my experience, some students register for the course because they have run out of math classes to take or they are trying to avoid “real” math classes, as they put it. AP Statistics, however, is not as simple as students expect! While the required level of theoretical mathematical knowledge is not as intense as [it is for] AP Calculus, the nuanced level of sophistication required in communicating free response answers or synthesizing strategy for an investigative task is a brand-new ball game.

### Please share any personal stories about students or AP Statistics teachers.

I have spent one week during each of the last five summers “reading” AP Statistics exams with 850 of my closest friends in Kansas City, Missouri. As I sit here trying to choose just one or two things to share, I find I can’t narrow it down. Anyone reading this month’s *Amstat News* must be a fellow statistics geek or related to me (hi, Mom!). So, 99.99% of you will understand what I mean when I say there is just something about statistics people. Now imagine getting to spend an entire week at summer camp (yes, we do grade exams all day, but that’s really beside the point) with 850 other adults who are as awesome and weird and fun as you are! The depth of camaraderie among the readers, level of professional development in the trainings, strength of the friendships I’ve made, and sheer ridiculousness of our social shenanigans are all beyond compare.

### What advice do you have for new AP Statistics Teachers or schools starting to offer AP Statistics? For AP Statistics students?

My biggest piece of advice for new AP Statistics teachers would be to recognize up front that you are going to spend a lot of time feeling uncomfortable with the subject matter and, therefore, questioning yourself and your ability to do well with the course. This is okay! The AP Statistics teacher community is huge, welcoming, and a great source of materials and information. Use that to your advantage. Don’t feel like you have to create assessments and activities from scratch. (There are so many resources available that sometimes you may have trouble sifting through them all and deciding what to use.) Just remember to stay organized, push through the discomfort of a new curriculum, and enjoy learning and growing alongside your students. Trust the process!



## Sammy Gutierrez

### BOSTON COMMUNITY LEADERSHIP ACADEMY

**Years teaching AP Statistics:** 7

**What most excites you and other AP Statistics teachers (e.g., biggest rewards) about teaching statistics?**

What excites me most about teaching AP Statistics is that it is everywhere. Open up a newspaper or news link and you're looking at statistics. Being able to teach students what this information means and how to dig through what is meaningful is unlike any other course.

**What are AP Statistics teachers' biggest challenges?**

The biggest challenge I face is getting our top-performing students to take AP Statistics, as these students are more likely to take AP Calculus. Then, when I do get these students, I spend countless hours counseling them that they are indeed learning math in statistics.

**What has changed the most for AP Statistics teachers over the last 20 years?**

I feel that growth of AP Statistics has changed the most. AP Statistics always seemed like a secondary course in the past, while now it is a course guidance counselors and colleges are pushing students to take.

**Please share any personal stories about students or AP Statistics teachers.**

When I first started teaching AP Calculus 10 years ago, I also taught a non-AP section. Within this non-AP course, I found that most all of these students fell into one of two categories. The students could have been successful and passed AP Calculus, or calculus was too demanding for the students, even though they were great students with great study habits. By introducing AP Statistics into our school, the students who would once take non-AP Calculus and struggle day to day are now flourishing in AP Statistics.

**What are your favorite AP Statistics lessons/activities?**

While there are many activities I enjoy that get the students into the collection of data, nothing beats the end-of-year activity where students are able to put together everything they've learned to study a topic personal to them.

**What has changed the most for AP Statistics while you've been teaching it? What needs to change?**

In the time I have been teaching AP Statistics, the biggest change has been the collaboration between teachers not only within my school district but on the national level, as well. If I have a question on a topic, be it understanding or an idea of an activity, I can reach out to the AP Statistics community and have 20 responses before the day is done.

**What advice do you have for new AP Statistics teachers or students?**

The best advice I can give new teachers is to attend personal development lessons and work with current and former AP Statistics teachers, especially those who have attended the AP reading. Textbooks and online lessons are great, but nothing is more amazing than going to a training and having the author of your textbook work with you on the curriculum. Finally, as soon as you possibly can, apply to be an AP reader, as you will get more out of one reading than years upon years of teaching.



**Sammy Gutierrez** is an MIT graduate with 12 years as a Boston Public Schools teacher at Boston Community Leadership Academy (10 years AP Calculus; seven years AP Statistics). He has been an AP Statistics reader for the past three years.

## Doug Tyson

### CENTRAL YORK HIGH SCHOOL

**Years teaching AP Statistics:** 15

**How did you become an AP Statistics teacher?**

Like many other high-school statistics teachers, I started teaching AP Statistics because there was a need, not because I had a burning interest in the course. Our previous AP Statistics teacher left for another job, and the math department needed someone to take over. When a volunteer was asked to step forward, the rest of the department took one step backward. I stood still, so I was the teacher. The important thing to note here was that I started teaching AP Statistics through indecisiveness. It was the best non-decision I've ever made about my teaching career. I now teach only statistics courses and I love it!

**What most excites you about teaching statistics?**

Data and context. I'm interested in the world around me, and I find my students are, too. Data are everywhere and in everything my students like to do, so we look at data from all kinds of contexts that interest them.



**Doug Tyson** has been teaching for more than 25 years and currently teaches AP Statistics, Introduction to Statistics, and Statistical Reasoning in Sports. He serves on the ASA / NCTM Joint Committee on Curriculum in Statistics and Probability, works as a table leader at the AP Statistics reading, and runs workshops and teacher training events.

Teaching statistics gives me a huge advantage as a teacher because curiosity is built right into the curriculum. If you just get out of the way of the data, students are engaged. Ask the right questions and students are fascinated.

### What are the biggest challenges of teaching AP Statistics?

Readers of *Amstat News* know statistics is a big field and growing bigger. The AP Statistics curriculum is also very big. The greatest challenge of teaching AP Statistics is figuring out how to get so many good statistical habits and concepts into one course without overwhelming students. The curriculum includes data collection, descriptive statistics, probability and random variables, basic inference for means and proportions, and inference for associations between two variables. Students are expected to write clearly and justify their reasoning. I like to describe the course as the intersection of mathematics, science, and technical writing. That's a lot to put into one course, but it's a great course!

### Describe how your time as an AP Statistics teacher has affected your mindset as an educator.

Statistics is both an art and a science, so I try to maintain a mindset that reflects this reality. Data are often subtle. Statistics offers rules-of-thumb more than iron-clad laws. As a teacher, I have shifted my mindset to encourage even more inquiry in my classes. Because my class is based on almost entirely real data, I foster a sense of wonder and interest in the larger world.

### Please share any personal stories about students or AP Statistics teachers.

My favorite stories are about students who aren't sure they can handle AP Statistics. I have had many of these students, and I am professionally rewarded when they do well in the course. For many, it's their first AP course and they're not sure if they can handle the workload and content. AP Statistics requires no calculus, so it's accessible to many students. I love it when students tell me, "I never thought I could do well in an AP math course." And yes, I make sure they understand that it's not exactly a mathematics course.

### What are your favorite AP Statistics lessons/activities?

Two of my favorites are "Smelling Parkinson's Disease" and "Show Me the Money." The first question on the first day of class is "Can Joy Milne smell Parkinson's Disease?" Joy claims she can smell it. To test her claim, researchers gave Joy 12 identical

shirts, six of which were worn by Parkinson's patients and six of which were worn by people without Parkinson's Disease. We use a simulation to conduct a randomization test. The conclusion is, yes, Joy can smell Parkinson's Disease (and I'd bet my next paycheck on it). There is also a really nice surprise in the lesson: It appears Joy identified 11 of the shirts correctly when she in fact identified 12 correctly. That lesson gets students hooked on the importance of the subject and the power of statistical methods to shed light on situations involving uncertainty and chance. If you would like to try this lesson with your students, see my video and accompanying resources at <http://mrtysonstats.com/apstats/apstats.html>.

The "Show Me the Money" lesson is about the importance of random sampling. The context is the top 200 movies (by box office ticket sales) of the previous year. Movies are fun, so students get excited. The activity works in an early look at a simulated sampling distribution—on Day 2 of the course no less! I would be remiss if I didn't mention that the spirit of this activity was drawn from the teaching style and ideas of Allan Rossman and Beth Chance. They are amazing statistics educators.

### What has changed the most for the AP Statistics course while you've been teaching it? What changes would you like to see in the future?

The course description and topic outline haven't changed. That is a testament to the original designers of the course. I think the most recent significant change has been an increased emphasis on the difference between random sampling and random assignment and how that affects the kinds of inferential conclusions that can be drawn. Past exams generally asked about inference only for sampling, while more recent exams have included inference for experiments. This is a huge conceptual difference and an important one for even the most casual user of statistics.

In the future, the course would do well to address re-randomization in inference. I was slow to adopt this view, but I've been convinced that these are important tools and should have some place in an introductory course. The idea of randomization tests is already in the curriculum, but not the idea of bootstrapping. I'd like to see a little more attention to these ideas.

One other area is the idea of multiple predictors. It's natural for students to think about multiple predictors, and we never really address it. Just acknowledging the existence of multiple regression and showing [the students] such a model might suffice. They could make some predictions using the

model and calculate residuals. We don't need to go too far down that trail, though. For example, the problem of multicollinearity would be far too much for a first course in statistics.

### What advice do you have for new AP Statistics Teachers or schools starting to offer AP Statistics? For AP Statistics students?

To teachers, I would offer the following advice:

- Don't be afraid to admit to yourself, other AP teachers, and your students that some of the material is subtle and you're still learning statistics.
- Real data are subtle and often break rules-of-thumb. Be wary of inviolate rules in statistics, as they are often really rules-of-thumb in disguise.
- Think deeply about the ideas. Get your students to do the same.
- Ask questions on the AP Statistics Teacher Community. It's a safe place to learn. There are lots of really knowledgeable people there; I know some of them, and they're really nice people. And they were all new statistics teachers at one point in their lives.
- Read everything about statistics you can get your hands on, even if you don't yet understand all of it.
- Develop a sense of wonder about the world around you. Develop the same in your students. Statistics (in one view) is about understanding the world based on measurable evidence. The world is your laboratory and playground. Have fun!

To students, I would offer this advice:

- Go beyond calculation. Think about the interpretations of the numbers and what they mean in context.
- Work hard on your writing. Explaining technical information in a way that others can understand is a very valuable skill.
- Ask questions. Don't worry that you don't have perfect answers to those questions right away.
- Read everything about statistics you can get your hands on, even if you don't yet understand all of it.
- Develop a sense of wonder about the world around you. Statistics (in one view) is about

understanding the world based on measurable evidence. The world is your laboratory and playground. Have fun!

Yes, the last two listed for teachers and students are the same. And why shouldn't they be?

## Vicki A. Lyons

LONE PEAK HIGH SCHOOL

Years teaching AP Statistics: 18

### What most excites you and other AP Statistics teachers (e.g., biggest rewards) about teaching statistics?

Practicality. Nowadays, the world of competitive advantage runs on statistics. To stay viable and current, modern companies and organizations must not only meet the needs of their constituency, but they must also be able to predict what their members and those they serve or produce for will want in the future. These organizations must be able to refine their competitive advantage and, to do that, they need to understand and be able to analyze data. In other words, they need to know statistics! Thus, no matter what field my students pursue in their careers, they will need to understand and be able to use statistics.

I feel I have the great opportunity to help my students gain a strong statistical foundation that will effectively benefit their potential. I truly feel my students will "see" statistics just about every day for the rest of their lives. It will always be an advantage to them to be able to use the knowledge they gain from their AP Statistics course not only in their future careers, but also as citizens to help them analyze evidence and make sense of important issues and as consumers to help them use their resources to make wise plans and decisions. Thus, for my students, the statistical knowledge they gain has great practicality for their future.

From a more immediate perspective, my former students will many times come visit me and tell [me] that, during their college/university years, they used the statistical knowledge they gained in their AP Statistics class more than any other subject they studied while in high school. The statistics they understood was relevant to many subjects, from biology and the sciences to education, computer programming, sports, psychology, political science, and business. Just about every subject they studied used data and statistical knowledge in significant and practical ways.



**Vicki Lyons** is in her 24th year teaching mathematics and statistics. She is a Presidential Awardee (Utah 2015) and a BYU Distinguished Mathematics Educator (2016). Her focus is helping students develop strong logical foundations through relevant understanding and practiced skill.

### What are AP Statistics teachers' biggest challenges?

My biggest challenge in teaching statistics is the wide variety of backgrounds my students have. Some of my students scored a five on the AP Calculus BC exam the year before taking my statistics class, and other students barely passed their algebra class. Some of my students have strong analytical skills, and other students have a hard time writing a sensible paragraph. This diversity makes it a challenge for me to meet the academic needs of all my students at the same time and from the same perspective. I constantly work to involve all my students in activities that are accessible to their readiness to learn and that will help them make wise, appropriate, and useful sense of statistical practices.

### What has changed the most for AP Statistics teachers over the last 20 years?

From my perspective, the AP Statistics course has become more specific and particular. Nowadays, students must be exacting and careful as they write their answers on their assignments and exams. When I first started teaching AP Statistics, students still needed to be careful when writing their solutions, but specific wording was not looked for as much as it is on current exams. These days, students must critically analyze situations and be precise in their descriptions.

I am happy the AP Statistics course and exam seem more and more to demand this high level of expertise from my students, since I want my students to be better prepared for the practicality and usefulness of statistics in the “real” world. Thus, by demanding high levels of statistical analysis, I think the AP Statistics course is becoming more and more useful to my students in a real and modernly useful way. Successful completion of the course and earning high levels of credit demands that my students obtain a high-level critical proficiency.

### Please share any personal stories about students or AP Statistics teachers.

Many of my students do not enjoy statistics. They liked the mathematical certainty of the calculus they took the year previous, and they find all the writing and analysis in statistics to be tedious. However, by the end of the year, when we have finished statistical inference, most of my students have a greater sense of the value of statistics and are grateful for the knowledge they have gained.

I remember one student in particular who could not have been happier when she was finished with the AP Statistics course and felt so much that it had been such a waste of her time, even though she passed

the AP Statistics exam and earned college credit. She was a student who did not enjoy statistics the entire year of her coursework and was happy to let everyone know how much she resented taking statistics. Four years later, this same student came running up to greet me at a local Costco. She couldn't wait to tell me how she had majored in biology and just got accepted for an advanced degree in a biostatistics program at a major university. She went on and on about how important statistics was in the biological field and how excited she was to continue her studies. She was so very, very grateful for the statistics she learned in high school. That knowledge gave her ready insights into her college biology classes and she found herself intrigued by biological research. Sometimes, you just never know your students' possibilities.

### What are your favorite AP Statistics lessons/activities?

I have so many favorite AP Statistics lessons and activities. From a workshop with Christine Franklin, I learned an activity that I adopted and currently helps my students develop a concrete understanding of deviations, the mean absolute deviation, and standard deviations. From a workshop with Gail Burrill, I learned an activity that I always use with my students to help them understand margins of error and confidence intervals. We do several activities from *Workshop Statistics*, which are all so pertinent and fun. In fact, during most class periods, my students do some activity that helps them make better sense of statistics.

### What has changed the most for AP Statistics while you've been teaching AP Statistics? What needs to change?

One thing that has changed the most since I began teaching AP Statistics is access to great textbooks and materials to help high-school teachers teach statistics. When I first started teaching statistics, there were good college-level textbooks, but these books had little appeal to high-school students. Now, we have excellent texts to help our students learn statistics. Current texts have great examples that appeal to teenagers, practical exercises to help our students practice their skills, references to technology skills, and colorful, contemporary pages that entice our students to study and learn.

### What advice do you have for new AP Statistics teachers, schools starting to teach AP Statistics, or students?

Get involved in the online AP Statistics Teacher Community. Also, attend lectures and workshops



and learn from the very best AP Statistics teachers and leaders. AP Statistics teachers are a welcoming community, and they are always willing to share great lessons and activities. There is so very much great information and good ideas to help AP Statistics teachers. Find activities and lessons that can involve your students in important ways that help them make good sense of statistical practices. Try out these ideas and activities with your students. Find what works best for you and your students and incorporate these into your curriculum on behalf of your students. Teaching AP Statistics can be rewarding and so fun as you help your students become capable and successful users of valuable and practical statistical knowledge.

## Daren Starnes

THE LAWRENCEVILLE SCHOOL

**Years teaching AP Statistics:** 21

### How did you become an AP Statistics teacher?

I volunteered in a department meeting back in the spring of 1996 to launch AP Statistics at Charlotte Country Day School in lieu of teaching a section of repeat Algebra 1. What a great decision that turned out to be!

### What most excites you about teaching statistics?

The fact that we are preparing our students to make informed decisions based on data, risk, and statistical studies in their adult lives.

### What are the biggest challenges of teaching AP Statistics?

Helping students communicate sound statistical reasoning precisely and concisely. AP Statistics requires students to think carefully and to construct effective arguments using appropriate evidence.

### Describe how your time as an AP Statistics teacher has affected your mindset as an educator.

Because my undergraduate and graduate degrees were both in pure mathematics, AP Statistics has represented a big step outside my comfort zone. Over 21 years teaching the course, I've consistently found the need to learn more about what lies just beyond the edges of the AP Statistics syllabus. Getting involved in AP Statistics has helped me model lifelong learning for my students.

### Please share any personal stories about students or AP Statistics teachers.

I have been truly blessed by the many outstanding students who have taken my AP Statistics class since the course was launched in 1996–1997. Their curiosity, enthusiasm, and desire to learn has motivated me to become a better teacher—and to keep learning more myself.

### What are your favorite AP Statistics lessons/activities?

I still love introducing students to the Central Limit Theorem. Using an online applet, students can uncover this amazing result for themselves. Especially when they start with their own “custom” population distribution, students are genuinely amazed as they watch the sampling distribution of  $\bar{x}$  approach a normal distribution as the sample size increases.

I'm equally fond of having students use hands-on simulations to determine whether an observed difference between two experimental groups is statistically significant.

### What has changed the most for the AP Statistics course while you've been teaching it? What changes would you like to see in the future?

What has changed: (1) The availability of high-quality, web-based applets for analyzing data, performing simulations, and investigating statistical concepts; (2) the emergence of data science and Big Data as adjuncts to statistics.

Changes I would like to see: (1) More emphasis on having students use statistical software to analyze data in the process of answering a question of interest; (2) increased use of simulation-based inference techniques.

### What advice do you have for new AP Statistics Teachers or schools starting to offer AP Statistics? For AP Statistics students?

For teachers/schools: Teacher training is especially important in AP Statistics because so many of those who are asked to teach the course do not have extensive backgrounds in statistics. A College Board–approved AP Summer Institute is a terrific launch pad for new AP Statistics teachers.

To the students: AP Statistics will be the most useful math course you have ever taken. It will open your eyes and your mind to how people make important decisions in the face of uncertainty. ■



**Daren Starnes** is mathematics department chair at The Lawrenceville School and the coauthor of two popular high-school statistics texts. He has led more than 100 workshops for AP Statistics teachers and been an AP Statistics exam reader since 1998.

### Call for Nominations: 2018 Don Owen Award

The San Antonio Chapter is accepting nominations from ASA chapters in North America for the 2018 Don Owen Award, which is presented to a statistician who embodies the three-fold accomplishments of Donald B. Owen: excellence in research, statistical consultation, and service to the statistical community.

Nominees must be a member of the ASA, but are not required to be a member of the nominating chapter. In addition to a cover letter highlighting the accomplishments of the nominee, the nomination packet must contain the following supporting information:

1. Name of the nominee
2. Degrees (titles, dates, schools)
3. Present position(s), followed by significant former positions (with dates)
4. List of major publications having statistical content
5. List of activities related to teaching and dissemination of statistical knowledge
6. List of consulting activities related to statistical problems or editorial contributions
7. List of activities supporting the mission of the ASA and related professional organizations

To submit a nominee, send the nomination packet in PDF format via email to [victor.deoliveira@utsa.edu](mailto:victor.deoliveira@utsa.edu), writing "Owen Award" in the subject field.

Alternatively, six copies of the nomination packet can be mailed to Victor De Oliveira, Department of Management Science and Statistics, University of Texas at San Antonio, One UTSA Circle, San Antonio, TX 78249.

The deadline for nominations is February 2, 2018.

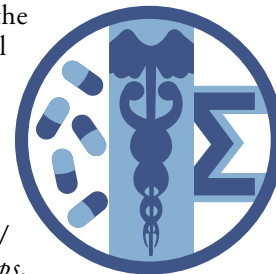
Before his death in 1991, Owen was distinguished professor of statistics at

Southern Methodist University in Dallas. He authored seven textbooks, seven monographs, and more than 75 articles in refereed journals; trained 19 doctoral and master's students; served as an applied statistician for 10 years at the Sandia Corporation; and operated a private consulting firm that specialized in quality control. Owen was editor of *Communications in Statistics* for both Series A and B, associate editor of *Technometrics* and *JASA*, and editor of more than 50 textbooks. ■

### Biopharmaceutical Section Creates Scholarship Award

*Richard C. Zink, JMP Life Sciences*

Beginning in 2018, the Biopharmaceutical Section will offer a scholarship of \$1,000 to three students annually as part of the ASA awards program ([www.amstat.org/ASA/Your-Career/Awards-and-Scholarships.aspx](http://www.amstat.org/ASA/Your-Career/Awards-and-Scholarships.aspx)). The goal of this award



is to recognize notable research, academic achievement, and applied project work related to biopharmaceutical statistics. In addition, the award will consider general academic performance, leadership, volunteering, and service.

Eligible applicants must have a bachelor's degree and be enrolled in a master's or doctoral program in statistics or biostatistics. Further, while membership in the Biopharmaceutical Section is not required (though membership is free for students), ASA membership is a requirement.

Students can download an application and find submission instructions at <http://community.amstat.org/biop/awards/scholarship>. Applications may be submitted from January 1 to March 15 each year.

Winners will be announced in mid-April and included in the ASA awards program at the Joint Statistical Meetings. ■

## Deadlines and Contact Information for ASA National Awards, Special Lectureships, and COPSS Awards

AWARD	DEADLINE	NOMINATIONS	QUESTIONS
ASA Deming Lectureship	November 15, 2017	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Roger W. Hoerl</b> <a href="mailto:roger.hoerl@gmail.com">roger.hoerl@gmail.com</a>
COPSS Fisher Lectureship and Award	December 15, 2017	<a href="http://bit.ly/2y9MWPI">http://bit.ly/2y9MWPI</a>	
ASA Noether Senior and Young Scholar Awards	December 15, 2017	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Ray Carroll</b> <a href="mailto:carroll@stat.tamu.edu">carroll@stat.tamu.edu</a>
ASA Monroe. G. Sirken Award in Interdisciplinary Survey Methods Research	December 15, 2017	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>John L. Czajka</b> <a href="mailto:jczajka@mathematica-mpr.com">jczajka@mathematica-mpr.com</a>
COPSS Presidents' Award	January 15, 2018	<a href="http://bit.ly/2y9MWPI">http://bit.ly/2y9MWPI</a>	
COPSS F.N. David Award	January 15, 2018	<a href="http://bit.ly/2y9MWPI">http://bit.ly/2y9MWPI</a>	
COPSS Snedecor Award	January 15, 2018	<a href="http://bit.ly/2y9MWPI">http://bit.ly/2y9MWPI</a>	
ASA Karl E. Peace Award for Outstanding Statistical Contributions for the Betterment of Society	February 1, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Paul S. Albert</b> <a href="mailto:albertp@mail.nih.gov">albertp@mail.nih.gov</a>
ASA W. J. Dixon Award for Excellence in Statistical Consulting	February 1, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Frank Harrell</b> <a href="mailto:f.harrell@vanderbilt.edu">f.harrell@vanderbilt.edu</a>
ASA Causality in Statistics Education Award	February 15, 2018	<a href="mailto:educinfo@amstat.org">educinfo@amstat.org</a>	<a href="mailto:educinfo@amstat.org">educinfo@amstat.org</a>
ASA Harry V. Roberts Statistical Advocate of the Year Award	February 15, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Pandurang Kulkarni</b> <a href="mailto:kulkarni_pandurang_m@lilly.com">kulkarni_pandurang_m@lilly.com</a>
ASA Samuel S. Wilks Memorial Medal	February 15, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Steven G. Heeringa</b> <a href="mailto:sheering@isr.umich.edu">sheering@isr.umich.edu</a>
ASA Waller Distinguished Teaching Career Award	February 15, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Bradley A. Hartlaub</b> <a href="mailto:hartlaub@kenyon.edu">hartlaub@kenyon.edu</a>
ASA Waller Education Award	February 15, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Bradley A. Hartlaub</b> <a href="mailto:hartlaub@kenyon.edu">hartlaub@kenyon.edu</a>
ASA W. J. Youden Award in Interlaboratory Testing	February 15, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Blaza Toman</b> <a href="mailto:blaza.toman@nist.gov">blaza.toman@nist.gov</a>
ASA Statistics in Physical and Engineering Sciences Award	February 20, 2018	<b>Ming Li</b> <a href="mailto:mli@alumni.iastate.edu">mli@alumni.iastate.edu</a>	<b>Ming Li</b> <a href="mailto:mli@alumni.iastate.edu">mli@alumni.iastate.edu</a>
ASA Gertrude M. Cox Scholarship	February 23, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Eloise E. Kaizar</b> <a href="mailto:ekaizar@stat.osu.edu">ekaizar@stat.osu.edu</a>
ASA Edward C. Bryant Scholarship	March 1, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Jill (Montaquila) DeMetteis</b> <a href="mailto:JillDemetteis@westat.com">JillDemetteis@westat.com</a>
ASA Excellence in Statistical Reporting Award	March 1, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Alan R. Tupek</b> <a href="mailto:alan.tupek@gmail.com">alan.tupek@gmail.com</a>
ASA Fellows	March 1, 2018	<a href="http://www.amstat.org/awards">www.amstat.org/awards</a>	<b>Paul Gallo</b> <a href="mailto:paul.gallo@novartis.com">paul.gallo@novartis.com</a>
ASA Mentoring Award	March 1, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Barry Nussbaum</b> <a href="mailto:statisticsbarry@gmail.com">statisticsbarry@gmail.com</a>
ASA Outstanding Statistical Application Award	March 1, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Jung-Ying Tzeng</b> <a href="mailto:jyatzeng@stat.ncsu.edu">jyatzeng@stat.ncsu.edu</a>
Statistical Partnerships among Academe, Industry, and Government (SPAIG) Award	March 1, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Kelly Zou</b> <a href="mailto:Kelly.Zou@pfizer.com">Kelly.Zou@pfizer.com</a>
ASA Founders Award	March 15, 2018	<a href="mailto:awards@amstat.org">awards@amstat.org</a>	<b>Barry Nussbaum</b> <a href="mailto:statisticsbarry@gmail.com">statisticsbarry@gmail.com</a>
ASA Biopharmaceutical Section Scholarship Award	March 15, 2018	<a href="http://bit.ly/2kBDPUg">http://bit.ly/2kBDPUg</a>	



Ann Cannon accepts the Warde Award from Barry Nussbaum during this year's JSM in Baltimore.

**Ann Russey Cannon** from Cornell College was named the 2017 recipient of the William D. Warde Statistics Education Award, which is presented by Mu Sigma Rho, the national honorary society for statistics. The annual award is given to a faculty member who has demonstrated excellence in classroom teaching in the statistics discipline and a lifetime devotion to statistics education.

Working within the intense schedule of Cornell's one-course-at-a-time academic calendar, Cannon is nonetheless able to connect with each student. One student described her experience as follows:

Class with Professor Ann Cannon is like being at my family's Thanksgiving dinner. There is always that really cool aunt who everyone wants to talk to because of her passionate, interesting life and career. All [throughout] dinner, I devote my efforts to making conversation with this aunt, trying to soak in every word said so I can someday apply what she is saying to my own life. These conversations are never boring. They aren't forced. They may only happen a few times a year, but they always leave a lasting impression on me. Ann Cannon is this cool aunt at Cornell. Her lectures are these conversations.

Outside the classroom, Cannon has made major contributions to statistical education. Whether it is her service to the Section on Statistical Education or her position as assistant chief reader for AP Statistics, she advocates for quality statistical education and the needs of students. In everything, Cannon is student centered.

The award is named in honor of William Douglas Warde, who passed away unexpectedly in August 2010. Warde was a faculty member at Oklahoma State University for 42 years and a long-time national officer of Mu Sigma Rho. His energy and enthusiasm for the promotion of the discipline to students was second to none.

Mu Sigma Rho invites academic institutions to nominate outstanding teaching faculty for the 2018 Mu Sigma Rho William D. Warde Statistics Education Award. The recipient must have evidence of excellence in classroom teaching in the statistics discipline and a lifetime devotion to statistics education.

Each academic institution is allowed one nomination per year. In the event that more than one nomination is received from a single institution in a year, only the first will be considered. Any college or institution may nominate a potential recipient, regardless of whether the institution has an active Mu Sigma Rho chapter.

Each nomination should include the following:

- A cover letter
- The nominee's curriculum vitae
- A summary of the nominee's teaching and educational activities
- A draft of a citation briefly describing the nominee's accomplishments
- At least three, but no more than six, letters supporting the nomination (at least two from present or former students and one from a colleague)

If a nominee is not selected for the award, the nomination will remain active for three years after the initial submission, unless the institution chooses to put forward another nominee.

Nominations should be sent to Lisa Kay at [Lisa.Kay@eku.edu](mailto:Lisa.Kay@eku.edu) by February 15, 2018. All nomination material should be sent in a single PDF document.

The recipient of the award will be notified on or before March 15, 2018, and be presented with a plaque during the Sunday awards ceremony at JSM 2018 in Vancouver, British Columbia, Canada. Questions regarding this award should be emailed to Kay. ■



**MORE ONLINE**  
Past winners of the William D. Warde Statistics Education Award can be viewed at [www.stat.purdue.edu/~mccabe/msr](http://www.stat.purdue.edu/~mccabe/msr).



The Penn State Department of Statistics honored **Donald B. Rubin**, John L. Loeb Professor of Statistics at Harvard University, with the 2017 C. R. and Bhargavi Rao Prize during the Rao Prize Conference on May 12. Also honored were Paul R. Rosenbaum of The Wharton School and Satish Iyengar of the University of Pittsburgh, who gave the 2017 C. G. Khatri Lecture and 2017 P. R. Krishnaiah Lecture, respectively.

Rubin is one of the most-cited authors in both mathematics and economics, according to ISI Science Watch and Highly Cited Economists. He is an elected fellow/member/honorary member of the Woodrow Wilson Society, John Simon Guggenheim Memorial Foundation, Alexander von Humboldt Foundation, American Statistical Association, Institute of Mathematical Statistics, International Statistical Institute, American Association for the Advancement of Science, American Academy of Arts and Sciences, European Association of Methodology, British Academy, and National Academy of Sciences. Additionally, he has received the Samuel S. Wilks Medal, Parzen Prize for Statistical Innovation, Fisher Award and Lectureship, and George W. Snedecor Award.

Rubin, Iyengar, and Rosenbaum gave the plenaries at the conference, which also featured invited speakers Samuel Kou of Harvard University, Kari Lock Morgan of Penn State, Joseph Schafer of the US Census Bureau, and Dylan Small of The Wharton School. More information about the conference can be



James L. Rosenberger presents the 2017 C. R. and Bhargavi Rao Prize to Donald B. Rubin.

found at <http://stat.psu.edu/Events/2017-Rao-Prize>.

The C. R. and Bhargavi Rao Prize is awarded in odd years and was established to recognize outstanding and influential innovations in the theory and practice of mathematical statistics, international leadership in directing statistics research, and pioneering contributions by a recognized leader in the field of statistics. The C. G. Khatri Memorial Lectureship and P. R. Krishnaiah Memorial Lectureship honor the memory of C. G. Khatri and P. R. Krishnaiah by inviting outstanding researchers in statistics to deliver lectures at Penn State. Details are available at <http://stat.psu.edu/information/prizes-and-memorial-lectures>. ■

The Statistics Division of the American Society for Quality (ASQ) recently honored **Joanne Wendelberger** with the 2017 William G. Hunter Award.

The award was established by the Statistics Division in 1987 to recognize the many contributions of its founding chair at promoting the use of applied statistics and statistical thinking. The attributes that characterize Bill Hunter's career—consultant, educator for practitioners, communicator, and integrator of statistical thinking into other disciplines—are used to help decide the recipient.

Wendelberger joined the Statistical Sciences Group at Los Alamos National Laboratory in 1992 as a technical staff member. She served in multiple leadership roles as a research and development manager for the Statistical Sciences Group and Computer, Computational, and Statistical Sciences Division prior to her current position as a senior-level scientist. Prior to working at Los Alamos National Laboratory, Wendelberger worked as a

## Obituary

### Jayanta K. Ghosh

*Written by Anirban Dasgupta*

Jayanta K. Ghosh—emeritus professor of statistics at Purdue University, former director of the Indian Statistical Institute, and former president of the International Statistical Institute—passed away on September 30; he was 80 years old. Ghosh was born on May 23, 1937.

Over a period of nearly 60 years, Ghosh made timely and insightful contributions to a wide swath of theoretical statistics. His earliest work was

influenced by Abraham Wald's invention of the SPRT. As a 20-something in 1960, he studied the ASN and efficiency of the sequential t-test as a part of his Calcutta University PhD dissertation under the supervision of H.K. Nandi.

In a clearly distinguished career, Ghosh influenced the work of various spectra of statisticians at different times, was an undisputed leader of Indian statistics, did his part as an administrator and editor, and succeeded in producing an enviable number of successful students.

Read the complete obituary online at <http://bit.ly/2ycglbw>.

statistical consultant at the General Motors Research Laboratories.

Earning her PhD in statistics in 1991 from the University of Wisconsin-Madison, Wendelberger was influenced by quality leaders Bill Hunter, George Box, and Brian Joiner. Her research has been motivated by the need to develop solutions to complex interdisciplinary problems, with a growing focus on the interface between statistics and computer science. Her current research interests include statistical experimental design and test planning, statistical bounding and uncertainty, materials degradation modeling, sampling and analysis in large-scale computation and visualization, probabilistic computing, and education modeling. She has published on these topics extensively.

Wendelberger is a Fellow of the American Statistical Association and a senior member of the ASQ. She was selected as the W.J. Youden Memorial Address speaker for the 2016 Fall Technical Conference and has served as an associate editor for *Technometrics* and ASQ representative for the Technometrics Management Committee.

In addition to her professional career contributions, Wendelberger has sought opportunities to inspire the use of statistics in her local community. Following the lead of Hunter, she has encouraged the use of statistical concepts and effective problem solving techniques for a number of community organizations and forums, including a cooperative preschool, a gymnastics school, a soccer league, a scholarship committee, a community discussion of alternative school calendars, and numerous educational outreach activities. ■

## sectionnews

### Biometrics

*Edited by Zheyu Wang, Biometrics Section Publications Officer*

The Biometrics Section held its annual business committee meeting at JSM 2017 in Baltimore. Following are the highlights:

- Sheng Luo was appointed chair-elect (chair 2019)
- Dipankar Bandyopadhyay was appointed Council of Sections representative
- Seventy-one invited session proposals were submitted to ENAR, with 46 accepted. The section sponsored or co-sponsored 24 (more than half) of these sessions.
- The Biometrics Section sponsored four invited sessions selected from 20 proposals. In addition, the section sponsored 18 topic-contributed sessions.
- The Biometrics Section had seven of 11 continuing education courses accepted for JSM 2017 (compared to five in 2016 and two in 2015). More information is at <http://bit.ly/2zd3Mgq>.
- As of June 1, the section had \$31,269. At this time last year, the section had \$35,192. Since JSM last year, the section sponsored one post-PhD training award (\$3,000) and three strategic initiatives (\$14,995). It also co-sponsored the JSM Diversity Mentoring Program (\$1,000) and paid out \$11,000 in student awards.
- The section received eight applications for strategic initiatives, and the following three recipients were selected:
  - Lillian Prince** (Cuyahoga Falls)
  - Kristen McQuerry** (University of Kentucky)
  - Stacia DeSantis** (The University of Texas School of Public Health)
- The executive committee discussed the feasibility of success metrics for funded projects and pursuing an *Amstat News* piece on this year's awardees.
- The section received 59 submissions and selected nine travel award winners and one Byar Award winner. The executive committee discussed the possibility of switching to a double-blind review process as other ASA sections have. They will pursue the feasibility of this for 2018.
- The Biometrics website will transition to being hosted exclusively on the official Amstat.org website. It currently appears on [www.bio.ri.ccf.org/Biometrics](http://www.bio.ri.ccf.org/Biometrics) and <http://bit.ly/2zd1hut>.

### Call for Proposals: Developing the next generation of biostatisticians

The Biometrics Section invites applications for funding to support projects developing innovative outreach projects focused on enhancing awareness of biostatistics among quantitatively talented US students. Of particular interest are projects that will encourage

students to pursue advanced training in biostatistics.

The section anticipates funding up to three projects this year, with total funding of \$3,000–\$5,000 per project. The project timelines would be 1.5–2 years. All investigators are encouraged to apply. Award recipients must be an ASA member and Biometrics Section member before project initiation.

A three-page application is due by December 11 and should be in the following format:

- Title, objectives, and specific aims
- Background, significance, and/or rationale
- Design and methods
- Deliverables/products
- Budget

Supplies, domestic travel (when necessary to carry out the project), professional expertise (e.g., instructional designer or webmaster), and cost of computer time are allowed expenditures. Secretarial/administrative personnel, tuition, foreign travel, and honoraria and travel expenses for visiting lecturers to the investigator's home institution are not allowed.

A project period with a start date no earlier than January 1, 2018, and an end date no later than December 31, 2019, also should be specified.

Applications should be submitted electronically to the Strategic Initiatives Subcommittee chair, Page Moore, at [pmoore@uams.edu](mailto:pmoore@uams.edu). All investigators will be expected to submit a brief report to Moore at the conclusion of the project. Questions should be addressed to Moore or subcommittee co-chair, Tanya Garcia, at [tpgarcia@sph.tamhsc.edu](mailto:tpgarcia@sph.tamhsc.edu).

### Graph of the Month

This month's graph is contributed by section members David Shera and Christopher Tong. You can view the graph at <https://goo.gl/o7DJxv> (after logging in).

If you have created or encountered an interesting data visualization that you would like to share with members of the Biometrics Section, email Zheyu Wang ([wangzy@jhu.edu](mailto:wangzy@jhu.edu)) or Rebecca Hubbard ([rhubb@upenn.edu](mailto:rhubb@upenn.edu)). ■

### Government Statistics

The Government Statistics Section, Business and Economic Statistics Section, and Washington Statistical Society will sponsor the 2nd Seasonal Adjustment Practitioners Workshop (SAPW 2018). The workshop will take place April 26, 2018, at the Bureau of Labor Statistics in Washington, DC.

This workshop provides an opportunity for those who work with official statistics and seasonal adjustment to present interesting issues, problems, and applied research to a knowledgeable audience. Organized by the US Census Bureau and Bureau of Labor Statistics, it is a one-day conference for public employees (and others) actively involved in seasonal adjustment. This is your opportunity to do the following:

- Share experiences in producing seasonal adjustments
- Give details of interesting problems and possible solutions
- Discuss best practices in seasonal adjustment and time series modeling
- Share lessons learned, tips, and shortcuts
- Present applied research in seasonal adjustment practice

A call for papers and registration information is forthcoming. Send an email to [esmd.seasonal.workshop@census.gov](mailto:esmd.seasonal.workshop@census.gov) for more information or to volunteer to be on the program committee. ■

### Physical and Engineering Sciences

*Jennifer Kensler, SPES Awards Chair*

The Section on Physical and Engineering Sciences honored the following presenters with the Outstanding Presentation Award at JSM 2017 in Baltimore:

#### Outstanding Presentation Award

**Jin Tao**, University of Florida, for "A Statistical Framework for Power Theft Detection in Smart Grid Networks"

#### Runner-Up Outstanding Presentation Award

**Martin Bezener**, Stat-Ease, Inc., for "Strategies for Mixture-Design Space Augmentation"

#### Honorable Mentions

**Jiayu Peng**, Penn State University, for "Design of Order-of-Addition Experiments Under the Pairwise-Order Framework"

**Jonathan Stallings**, North Carolina State University, for "Designing for What's Important: A Comparison of Bayesian and General Weighted Optimality Criteria"

The outstanding presentation awards encourage excellence in presentation and have helped raise the SPES contributed sessions to a higher level. All awards are based on audience evaluations of each speaker. Winners receive a certificate and a cash award. The awards for the 2017 JSM best presentations will be presented at the SPES mixer during the 2018 meetings in Vancouver, British Columbia. ■

Professional Opportunity listings may not exceed 65 words, plus equal opportunity information. The deadline for their receipt is the 20th of the month two months prior to when the ad is to be published (e.g., May 20 for the July issue). Ads will be published in the next available issue following receipt.

Listings are shown alphabetically by state, followed by international listings. Vacancy listings may include the institutional name and address or be identified by number, as desired.

Professional Opportunities vacancies also will be published on the ASA's website ([www.amstat.org](http://www.amstat.org)). Vacancy listings will appear on the website for the entire calendar month. Ads may not be placed for publication in the magazine only; all ads will be published both electronically and in print.

**Rates:** \$320 for nonprofit organizations (with proof of nonprofit status), \$475 for all others. Member discounts are not given. For display and online advertising rates, go to [www.amstat.org/ads](http://www.amstat.org/ads).

Listings will be invoiced following publication. All payments should be made to the American Statistical Association. All material should be sent to *Amstat News*, 732 North Washington Street, Alexandria, VA 22314-1943; fax (703) 684-2036; email [advertise@amstat.org](mailto:advertise@amstat.org).

Employers are expected to acknowledge all responses resulting from publication of their ads. Personnel advertising is accepted with the understanding that the advertiser does not discriminate among applicants on the basis of race, sex, religion, age, color, national origin, handicap, or sexual orientation.

Also, look for job ads on the ASA website at [www.amstat.org/jobweb](http://www.amstat.org/jobweb).

## Arizona

■ Arizona State University's School of Mathematical & Statistical Sciences is accepting applications for an assistant professor position in statistics. Please find more information and apply at [www.mathjobs.org/jobs/jobs/10752](http://www.mathjobs.org/jobs/jobs/10752). EOE.

■ The School of Mathematical and Statistical Sciences (SoMSS) and the Biodesign Center for Mechanisms of Evolution (CME) at Arizona State University invite applications for one tenure-eligible position in statistics. Please find more information and apply at [www.mathjobs.org/jobs/jobs/10819](http://www.mathjobs.org/jobs/jobs/10819). EOE.

■ Northern Arizona University invites applications for a tenure-track Assistant Professor in Statistics available August 2018. Minimum qualifications include a doctorate in Statistics or Biostatistics expected by August 20, 2018 and teaching experience at the college level. Evidence of high quality teaching and strong potential for a productive research program are preferred. Review of applications begins October 02,

2017. See [nau.edu/Human-Resources/Careers/Faculty-and-Administrator-Openings](http://nau.edu/Human-Resources/Careers/Faculty-and-Administrator-Openings) for complete details. AA/EEO/M/W/D/V employer.

## California

■ California State University, Fullerton - Statistics Position. Tenure-track faculty position in statistics at the Assistant Professor level beginning August 2018. A PhD in statistics or related field required. Appointment Date is August 16, 2018. Applicants must submit their materials through [www.mathjobs.org](http://www.mathjobs.org). Application Deadline by December 3, 2017. EEO employer. Reasonable accommodations will be provided for qualified applicants with disabilities who self-disclose.

## Colorado

■ The Department of Applied Mathematics and Statistics (AMS) at Colorado School of Mines invites applications for multiple tenured/tenure track positions at any rank (assistant, associate, or full professor) with a start date of Fall 2018. Apply Here: [www.Click2apply.net/4757xrkfjg3xs4mbb](http://www.Click2apply.net/4757xrkfjg3xs4mbb) EOE.

## Florida

■ The Department of Statistics at Florida State University invites applications for an Assistant Professor position in Biostatistics and an Assistant/Associate Position in Statistics starting August 2018. A PhD in Statistics, Biostatistics, or a related field is required. Please apply at <https://jobs.fsu.edu> (job ID 42342 for Statistics, and 42317 for Biostatistics). Review of applications will begin November 15 and continue until the position is filled. EOE.

## Georgia

■ The Department of Behavioral Sciences and Health Education at Emory University's Rollins School of Public Health is seeking forward-looking scholars for tenure and non-tenure track faculty at the rank of Assistant, Associate, or Full Professor to join our dynamic department. We encourage candidates with expertise in advanced statistics, multi-level modeling, structural equation modeling, and spatial methods to apply. [www.sph.emory.edu/BSHEsearch.pdf](http://www.sph.emory.edu/BSHEsearch.pdf). EOE.

■ Tenure-track assistant professorship, Department of Statistics, University of Georgia, starting August 2018. Requires PhD in statistics or related discipline by 8/1/2018. To apply, visit <http://facultyjobs.uga.edu/postings/2745>. Applications received by 11/26/2017, are assured consideration. EOE.

■ Academic Professional, Department of Statistics, University of Georgia, starting August 2018. Requires PhD in statistics or related discipline by 8/1/2018. To apply, visit <http://facultyjobs.uga.edu/postings/2761>. Applications received by 11/26/2017 are ensured consideration. EOE.

## Indiana

■ Indiana University's Department of Statistics, Bloomington campus, invites applications for a tenure track assistant professor. A PhD in statistics or a related field is required. Applicant's research program should complement department's existing strengths in machine learning, computational statistics, and Bayesian



inference. Applicants should also have a demonstrated commitment to teaching excellence. Apply by November 15 at PeopleAdmin: <http://indiana.peopleadmin.com/postings/4260>. Address questions to Kelly Hanna [khanna@indiana.edu](mailto:khanna@indiana.edu). EOE.

■ The Purdue University Department of Statistics invites applications for two tenure-track faculty positions beginning August 2018 at the rank of Assistant Professor in the area of data science and machine learning. Please visit <http://www.stat.purdue.edu/hiring> to apply. A background check will be required for employment in this position. Review of applications will begin on December 1, 2017 and will continue until the position is filled. Purdue University's Department of Statistics is committed to advancing diversity in all areas of faculty effort, including scholarship, instruction, and engagement. Candidates should address at least one of these areas in their cover letter, indicating their past experiences, current interests or activities, and/or future goals to promote a climate that values diversity, and inclusion. EOE

## Iowa

■ The Department of Statistics at Iowa State University invites applications for a tenure-track Assistant Professor position, beginning 8/16/2018. Duties include undergraduate and graduate teaching, graduate student advising, and developing and sustaining a high-impact research program that can compete for external funding. A PhD or equivalent degree in statistics or a closely related discipline is required. To ensure consideration, applications must be received by 11/27/2017. [www.iastatejobs.com/postings/28404](http://www.iastatejobs.com/postings/28404). EOE.

■ The University of Iowa is seeking an Assistant Professor of computational statistics to begin August 15, 2018. Applicants must have PhD in statistics or related area by start date. See the complete position description and application information at <http://jobs.uiowa.edu/faculty/view/71519> and apply by November 15. EOE/AA. Check out our department at [www.stat.uiowa.edu](http://www.stat.uiowa.edu). EOE/AA.

## Maryland

■ GSK R&D center in Rockville is looking for an Epidemiology Statistician. The candidate would hold PhD or Master's degree in Biostatistics or Epidemiology, w/ experience in observational studies and have excellent communication skills in international multi-functional environment. Responsibilities include providing input on protocols, study set-ups, defining adequate study design and statistical methodologies, writing statistical analysis plans, performing and interpreting statistical analyses and communicating results. Information: [www.gsk.com/en-gb/careers](http://www.gsk.com/en-gb/careers). EOE.

## Massachusetts

■ Applications are invited for a tenure-track position in statistics at Amherst College to begin July 2018: See the full ad and requirements at MathJobs.org. We seek faculty with broad intellectual interests, a strong commitment to research, and a passion about teaching statistics and data science to undergraduates. Applications received by October 8, 2017, will be guaranteed consideration. Questions can be addressed to [mathstats@amherst.edu](mailto:mathstats@amherst.edu). Amherst College is an equal opportunity employer and encourages women, persons of color, and persons with disabilities to apply. The college is committed to enriching its educational experience and its culture through the diversity of its faculty, administration, and staff.

■ The Department of Mathematical Sciences at Bentley University—an independent, private business-oriented university located in suburban Boston—invites applications for a tenure track position beginning Fall 2018. The rank and salary will be commensurate with experience. Senior appointments will be considered. Must hold a PhD in Statistics or related discipline. Application Instructions: In order to apply to this position, please submit an online application directly to [jobs.bentley.edu/postings/3200](http://jobs.bentley.edu/postings/3200). Bentley University is an Equal Opportunity Employer, building strength through diversity. The University is committed to building a community of talented students, faculty and staff who reflect the diversity of global business. We strongly encourage applications from persons from underrepresented groups, individuals with

## DEPARTMENT OF STATISTICS COLUMBIA UNIVERSITY

### Limited-term Faculty Positions Starting Fall 2018

The Department of Statistics invites applications for four-year term positions at the rank of Assistant Professor to begin July 1, 2018. A PhD in statistics or a related field is required, as is a commitment to high quality research and teaching in statistics and/or probability. Candidates will be expected to sustain an active research and publication agenda and to teach in the departmental undergraduate and graduate programs. Candidates with expertise in machine learning, big data, mathematical finance and probability area particularly encouraged to apply.

The department currently consists of 30 faculty members, 50 PhD students, and over 300 MA students. The department has been expanding rapidly and, like the University itself, is an extraordinarily vibrant academic community. We are especially interested in candidates who, through their research, teaching and/or service will contribute to the diversity and excellence of the academic community. Women and minorities are especially encouraged to apply. For further information about the department and our activities, centers, research areas, and curricular programs, please go to our web page at: [www.stat.columbia.edu](http://www.stat.columbia.edu).

All applications must be submitted through Columbia's online Recruitment of Academic Personnel System (RAPS) at <https://academicjobs.columbia.edu/applicants/Central?quickFind=65223>.

The application must include a cover letter, curriculum vitae, teaching statement, research statement and the names of 3 references. References will be asked to upload letters of recommendation in RAPS.

Inquiries may be made to [dk@stat.columbia.edu](mailto:dk@stat.columbia.edu).

Review of applications begins on **December 1, 2017**, and will continue until the position is filled.

Columbia University is an Equal Opportunity/Affirmative Action employer.

disabilities, covered veterans and those with diverse experiences and backgrounds. We strive to create a campus community that welcomes the exchange of ideas, and fosters a culture that values differences and views them as a strength in our community.

## Michigan

■ Tenure-stream open-rank faculty position. The Department of Statistics and Probability at MSU plans to fill one open rank tenure-stream faculty position, to begin in August 2018. Excellent candidates are sought in strong growth areas in the core of modern statistical theory and methods. Online application is required through MathJobs at [www.mathjobs.org](http://www.mathjobs.org). Deadline is Dec 4, 2017, or until position is filled. Email [STTSearch2017@stt.msu.edu](mailto:STTSearch2017@stt.msu.edu) for questions. Michigan State University is an affirmative action, equal opportunity employer and is committed to achieving excellence through cultural diversity. The University actively encourages applications and/or nominations of women, persons of color, veterans and persons with disabilities. We endeavor to

facilitate employment assistance to spouses or partners of candidates for faculty and academic staff positions. Job applicants are considered for employment opportunities without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, disability, or veteran status.

## Mississippi

■ Assistant/Associate Professor requirements include a doctoral degree in statistics or biostatistics, commitment to effective graduate/undergraduate teaching and demonstrated success in research. Apply online [www.msujobs.msstate.edu](http://www.msujobs.msstate.edu) (PARF496261), and attach a curriculum vitae/resume and cover letter addressed to Chair, Statistics Search Committee, Department of Mathematics and Statistics, Mississippi State, MS 39762. Submit transcripts, a summary of research plans, a statement of teaching philosophy, and three letters of recommendation. MSU is an equal opportunity employer, and all qualified applicants will receive consideration for employment without regard to race, color, religion, ethnicity,

sex (including pregnancy and gender identity), national origin, disability status, age, sexual orientation, genetic information, protected veteran status, or any other characteristic protected by law. We always welcome nominations and applications from women, members of any minority group, and others who share our passion for building a diverse community that reflects the diversity in our student population.

## Missouri

■ Washington University School of Medicine in St. Louis invites applications for a co-leader of the Biostatistics Shared Resource, a tenure-track/tenured position at the rank of Associate or Full Professor. We are particularly interested in candidates with biostatistics expertise in cancer and application of state of the art methods across the cancer care continuum. Learn more at [publichealthsciences.wustl.edu/About-Us/Job-Openings](http://publichealthsciences.wustl.edu/About-Us/Job-Openings). EOE.

## New York

■ Department of Statistics, Neuroscience and MBBI, Columbia University. The

# NC STATE UNIVERSITY

## DEPARTMENT OF STATISTICS

### Tenure-Track Assistant Professor Positions

The Department of Statistics at North Carolina State University seeks to hire two tenure-track Assistant professors to begin in August 2018. Exceptional candidates at the Associate and Full Professor ranks will also be considered.

Applicants with interests and expertise in theoretical or methodological research in any area of statistics or biostatistics will be considered. Candidates with interests in modern methods of data analysis are especially encouraged to apply. The ability and desire to supervise graduate student research and to pursue excellence in teaching are essential.

To apply, please visit <http://jobs.ncsu.edu/postings/91326> or <http://jobs.ncsu.edu/postings/91342>.

The Department provides a dynamic environment for teaching, research and collaborations across disciplines. Inclusiveness and diversity are academic imperatives and are university goals. We are particularly interested in candidates who have experience working with students from diverse backgrounds and a demonstrated commitment to improving access to higher education for students from underrepresented groups. The Department's location in the Research Triangle provides rich opportunities for interactions with industry; other universities, including Duke University and the University of North Carolina at Chapel Hill; and government agencies. Faculty enjoy collaborations with medical researchers at Duke, environmental scientists at the EPA research facility, pharmaceutical researchers at Glaxo-SmithKline, and software developers at SAS Institute, among many others. The Department is also a founding cooperator of the NSF-funded Statistical and Applied Mathematical Sciences Institute (SAMSI), located nearby in Research Triangle Park.

All applicants must have a Ph.D. in Statistics or Biostatistics by the time of employment. Processing of applications will begin **November 2017**, and continue until the position is filled. Questions about the position may be directed to the Search Committee Chair ([stat\\_search@stat.ncsu.edu](mailto:stat_search@stat.ncsu.edu)).

Please submit recent transcripts as part of the application process. **Please upload the names and contact information for your three letters of reference at [www.stat.ncsu.edu/references](http://www.stat.ncsu.edu/references)** so we can track the letters received from your references. All reference letters will be made available for review by the departmental voting faculty.

*NC State University is an equal opportunity and affirmative action employer. Women and members of other underrepresented groups are encouraged to apply. In addition, NC State University welcomes all persons without regard to sexual orientation or genetic information.*

## Tenured/Tenure-track Faculty Positions

Cornell University's School of Operations Research and Information Engineering (ORIE) seeks to fill multiple tenured/tenure-track faculty positions for its Ithaca campus. We will primarily consider applicants with research interests in the areas of integer programming and financial engineering, though we welcome strong applicants from all research areas represented within ORIE, especially those in resonance with the College of Engineering Strategic Areas: [www.engineering.cornell.edu/research/strategic](http://www.engineering.cornell.edu/research/strategic).

Requisite is a strong interest in the broad mission of the School, exceptional potential for leadership in research and education, an ability and willingness to teach at all levels of the program, and a Ph.D. in operations research, mathematics, statistics, or a related field by the start of the appointment. Salary will be appropriate to qualifications and engineering school norms.

Cornell ORIE is a diverse group of high-quality researchers and educators interested in probability, optimization, statistics, simulation, and a wide array of applications such as e-commerce, supply chains, scheduling, manufacturing, transportation systems, health care, financial engineering, service systems, and network science. We value mathematical and technical depth and innovation, and experience with applications and practice. Ideal candidates will have correspondingly broad training and interests.

Please apply online at <https://academicjobs.columbia.edu/ajob/jobs/9654> with a cover letter, CV, statements of teaching and research interests, sample publications, at least three reference letters and, for junior applicants, a Doctoral transcript. We strongly encourage applicants attending the INFORMS annual meeting to submit all application materials by October 15, 2017. All applications completed by November 15, 2017 will receive full consideration, but we urge candidates to submit all required material as soon as possible. We will accept applications until we fill the positions.

ORIE and the College of Engineering at Cornell embrace diversity and seek candidates who can contribute to a welcoming climate for students of all races and genders. Cornell University seeks to meet the needs of dual career couples, has a Dual Career program, and is a member of the Upstate New York Higher Education Recruitment Consortium to assist with dual career searches.

Visit [www.unyherc.org/home](http://www.unyherc.org/home) to see positions available in higher education in the upstate New York area.



*Diversity and Inclusion are a part of Cornell's heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities. We strongly encourage qualified women and minority candidates to apply.*

Department of Statistics, Neuroscience and MBBI invites applications for (tenured or tenure-track) at the assistant or associate professor level positions to begin July 1, 2018. Applicants please initiate the application process and obtain further instructions at: <https://academicjobs.columbia.edu/applicants/Central?quickFind=65242>. Inquiries may be made to [dk@stat.columbia.edu](mailto:dk@stat.columbia.edu). Review begins December 1, 2017 and continues until the position is filled. EOE.

■ Department of Statistics, Columbia University. The Department of Statistics invites applications for the newly created Distinguished Postdoctoral Fellowship to begin July 1, 2018. Applicants please initiate the application process and obtain further instructions at: <https://academicjobs.columbia.edu/applicants/Central?quickFind=65253>. Inquiries may be made to [dk@stat.columbia.edu](mailto:dk@stat.columbia.edu). Review begins January 15, 2018, and continues until the position is filled. EOE.

■ Department of Statistics, Columbia University. The Department of Statistics

invites applications for a tenure track Assistant Professor position to begin July 1, 2018. Applicants please initiate the application process and obtain further instructions at: <https://academicjobs.columbia.edu/applicants/Central?quickFind=65221>. Inquiries may be made to [dk@stat.columbia.edu](mailto:dk@stat.columbia.edu). Review begins December 1, 2017, and continues until the position is filled. EOE.

■ Department of Statistics and The School of Professional Studies, Columbia University. The Department of Statistics and SPS invites applications for Lecturer in discipline to Senior Lecturer in Discipline positions to begin July 1, 2018. Applicants please initiate the application process and obtain further instructions at: <https://academicjobs.columbia.edu/applicants/Central?quickFind=65243>. Inquiries may be made to [dk@stat.columbia.edu](mailto:dk@stat.columbia.edu). Review begins January 15, 2018 and continues until the position is filled. EOE.

■ Department of Statistics, Columbia University. The Department of Statistics invites applications for four year

## THE SCHOOL OF PROFESSIONAL STUDIES COLUMBIA UNIVERSITY

### Lecturer in Discipline Positions Starting Fall 2018

The School of Professional Studies (SPS) at Columbia University invites applications for appointments in its Actuarial Science Program, which is administered jointly with Columbia's Department of Statistics. The positions may be filled at any rank from lecturer in discipline to senior lecturer in discipline and are effective July 1, 2018. These are full-time, non-tenure-track appointments with multi-year renewal contingent on successful reviews.

Candidates at the rank of Senior Lecturer in Discipline are expected to have substantial experience and accomplishments, and a superlative record of teaching as a lecturer, and documented evidence of pedagogical excellence in carrying out administrative or other department responsibilities.

Candidates at the rank of Lecturer in Discipline are expected to have teaching experience, documented evidence of pedagogical excellence, and evidence of professional growth and activity in the given field.

Candidates must have a degree in actuarial science or a related field, preferably post-graduate, and must demonstrate potential for excellence in teaching at the graduate level. Applicants with an earned PhD in actuarial science or statistics and professional actuarial credentials are especially encouraged to

apply. Duties include teaching, advising and curriculum design. Other duties include: program development; student mentoring, and in particular, providing academic and career advice to students as they transition to practicing actuaries; and participation in the vision and direction of the actuarial science program.

The Actuarial Science program seeks individuals with a vibrant portfolio of academic study, experience and publications in one or more of the following disciplines as they relate to actuarial science:

- Life insurance
- Health insurance
- Pensions and retirement systems
- Property and Casualty insurance
- Reinsurance

Review of applications begins on **January 15, 2018**, and will continue until the position is filled.

All applications must be submitted through Columbia's online Recruitment of Academic Personnel System (RAPS) at <https://academicjobs.columbia.edu/applicants/Central?quickFind=65243>.

*Columbia University is an Equal Opportunity/Affirmative Action employer.*

ACADEMIA SINICA  
**INSTITUTE OF  
STATISTICAL SCIENCE**

*Regular Research Positions*

The Institute of Statistical Science, Academia Sinica, is seeking candidates for tenure-track/tenured research positions at the level of assistant, associate or full research fellow available in 2018. Candidates should have a Ph.D. degree in statistics or related areas. Application materials must include (1) a curriculum vita, (2) three letters of recommendation, and (3) representative publications and/or technical reports. Additional supporting materials such as transcripts for new Ph.D. degree recipients may also be included. Electronic submissions are encouraged. Applications should be submitted to

**Dr. Yi-Hau Chen**

Chair of the Search Committee  
Institute of Statistical Science, Academia Sinica  
128 Sec. 2 Academia Road, Taipei 11529,  
Taiwan, R.O.C.  
Fax: +886-2-27831523  
E-mail: [recruit2017@stat.sinica.edu.tw](mailto:recruit2017@stat.sinica.edu.tw)

Application materials should be received by  
**December 28, 2017** for consideration, but early  
submissions are encouraged.



An Employee-Owned Research Corporation\*

EOE

## Statistical Career Opportunities with Westat

Westat is an employee-owned corporation headquartered in Rockville, Maryland. We provide statistical consulting and survey research to the agencies of the U.S. Government and to a broad range of business and institutional clients. With a strong technical and managerial staff and a long record of quality research, Westat is a leader in the statistical services field.

We are currently recruiting for the following position:

### Survey Sampling Statistician

This position requires a master's degree or Ph.D. in statistics with coursework in survey sampling or a master's or Ph.D. in survey sampling. Candidates with a master's must have at least 8 years of experience in sample survey design, selection, or weighting and a Ph.D. with 6 years' experience. Although not required to do programming, candidates would benefit from knowing SAS and other statistical software packages. Qualified candidates must have excellent written and oral communication skills, strong organizational skills, and the ability to handle multiple tasks simultaneously.

Westat is an Equal Opportunity Employer and does not discriminate on the basis of race, creed, color, religion, sex, age, national origin, veteran status, disability, marital status, sexual orientation, citizen status, genetic information, gender identity, or any other protected status under applicable law. To apply, go to [www.westat.com/careers](http://www.westat.com/careers).

[www.westat.com](http://www.westat.com)

*Distinguished Postdoctoral Fellow in Statistics*

## COLUMBIA UNIVERSITY

The Department of Statistics invites applications for the newly created Distinguished Postdoctoral Fellowship in Statistics. The fellowship seeks to bring exceptional scientists of outstanding potential to Columbia University. This two-year fellowship, with no teaching obligations, is to begin between July and September 2018. The Fellow will hold the rank of postdoctoral research scientist in the Department of Statistics. A competitive annual salary will be supplemented with generous funding for conference travel and research support.

Applications in all areas of statistics and probability will be considered: the primary selection criterion will be the candidate's exceptional promise to produce high quality and visible research. Candidates must have a PhD in statistics or related field by the date of appointment. The Fellow will be expected to pursue a vigorous research agenda and to participate actively in the intellectual life of the Department.

The Department currently consists of 30 faculty members, 50 PhD students, and over 300 MA students. The department has been expanding rapidly and, like the University itself, is an extraordinarily vibrant academic community. We are especially interested in candidates who, through their research, teaching and/or service will contribute to the diversity and excellence of the academic community. Women and minorities are especially encouraged to apply. For further information about the department and our programs, please go to our web page at: [www.stat.columbia.edu](http://www.stat.columbia.edu).

All applications must be submitted through Columbia's online Recruitment of Academic Personnel System (RAPS) at <https://academicjobs.columbia.edu/applicants/Central?quickFind=65253>

The application must include the following:

- A cover letter that explains your motivation for applying for this position and indicates your choice of mentors from the statistics faculty
- A curriculum vitae (including a list of publications)
- A brief research statement that summarizes current research interests, past accomplishments, and future research goals. It should contain a short proposal for the research activities you plan to conduct while at Columbia.
- The names of 3 references--references will be asked to upload letters of recommendation in RAPS.

Inquiries may be made to [dk@stat.columbia.edu](mailto:dk@stat.columbia.edu). Review of applications begins on **January 15, 2018**, and will continue until the position is filled.

*Columbia University is an Equal Opportunity/Affirmative Action employer.*





# VCU

VIRGINIA COMMONWEALTH UNIVERSITY

## OPEN RANK TENURE-ELIGIBLE FACULTY POSITIONS DEPARTMENT OF BIostatISTICS

*Positions #F56570 and #F56580*

The Department of Biostatistics at Virginia Commonwealth University (VCU) is seeking to fill two tenured/tenure-eligible faculty positions at the level of assistant, associate, or full professor. We are seeking applicants with training and research interest in the design and statistical analysis of high-throughput genomic data (e.g., microarray, next generation sequencing, proteomics and other 'omics' technologies, and the microbiome), bioinformatics, computational biology, computer science, or in closely related areas. The candidate should also have interdisciplinary research interests, with the potential for [RS1] seeking external funding and scholarship that complements existing expertise in the department, which includes (but is not limited to) Bayesian statistics, computational genomics and epigenomics, data mining, longitudinal and hierarchical modeling, nonparametric methods, survival analysis and statistical computing. Faculty are expected to maintain extramural grant support, teach and advise graduate students, and provide departmental and university service.

The Department of Biostatistics has a 40+ year history in the VCU School of Medicine and is committed to excellence in both biostatistical research and graduate education. The department offers both M.S. and Ph.D. programs in Biostatistics, including concentrations in Genomic Biostatistics and a M.S. in Clinical Research and Biostatistics. Our biostatistics faculty, students, and staff collaborate with clinical investigators in the Schools of Medicine, Dentistry, Pharmacy, Nursing, and Allied Health in a wide variety of biomedical research projects. There also exists ample opportunities to collaborate with genomics researchers from the VCU's Massey Cancer Center and the Virginia Institute for Psychiatric and Behavioral Genetics. Located in Richmond, Virginia, VCU has established long-term relationships with the Virginia Department of Health, as well as local and regional health departments. In addition to other computational resources available at VCU, our department supports its own high-performance computing cluster.

**Qualifications:** For all levels, candidates should have a Ph.D. in biostatistics, statistics, bioinformatics, or a related field. Applicants must demonstrate an established track record in one or more of the focus areas, working in collaborative research endeavors, teaching and mentoring students at the graduate level, or at least exhibit strong potential for doing so. Applicants at Associate and Full Professor levels must also have developed national or international prominence in their area of expertise and demonstrated success obtaining extramural research support. All candidates should have demonstrated experience working in and fostering a diverse faculty, staff, and student environment or commitment to do so as a faculty member at VCU.

**Instructions:** Apply by visiting: <https://www.vcujobs.com/postings/66111> or searching for position numbers F56570 and F56580 at [www.vcujobs.com](http://www.vcujobs.com). Application deadline: **November 30, 2017**. Attach a cover letter/letter of application, statement of research and teaching philosophy, curriculum vitae, and contact information for three professional references.

*Virginia Commonwealth University is an urban, research intensive institution with a diverse university community and a commitment to multicultural opportunities. VCU is an equal opportunity/affirmative action employer. Women, minorities and persons with disabilities are encouraged to apply.*

term Assistant Professor positions to begin July 1, 2018. Applicants please initiate the application process and obtain further instructions at: <https://academicjobs.columbia.edu/applicants/Central?quickFind=65223>. Inquiries may be made to [dk@stat.columbia.edu](mailto:dk@stat.columbia.edu). Review begins December 1, 2017 and continues until the position is filled. EOE.

### Ohio

■ Applications are invited for a tenure-track Assistant Professorship in Statistics. See detailed ad at [www.mathjobs.org](http://www.mathjobs.org). The appointment will begin August 15, 2018. Completed applications, per the detailed ad, should be submitted on [www.mathjobs.org/jobs/jobs/10884](http://www.mathjobs.org/jobs/jobs/10884). Applicants should also submit a CV, cover letter and a statement on diversity and inclusion on UC's application system (link in mathjobs ad). Review of applications will begin December 1, 2017. EOE.

### Oklahoma

■ Department of Statistics at Oklahoma State University invites applications for a tenure track assistant professor position. PhD in statistics or biostatistics required. Dedication to teaching and strong research program with the potential to attract external funding also required. Apply online at [mathjobs.org](http://mathjobs.org). Screening of applicants will begin January 31, 2018, and continue until the position is filled. OSU is an AA/EEO/E-Verify Employer.

### Pennsylvania

■ The Wharton Statistics Department, University of Pennsylvania, seeks applicants for a full-time, tenure-track Assistant Professor position, appointment beginning July 2018. Applicants must show outstanding capacity and achievement in research, along with excellent teaching skills. Applicants must have a PhD (expected completion by June 30, 2019, is acceptable) from an accredited institution. Please visit our website to apply: <https://statistics.wharton.upenn.edu/recruiting/facultypositions>. Questions can be sent to [statistics.recruit@wharton.upenn.edu](mailto:statistics.recruit@wharton.upenn.edu). EOE.

■ Bloomsburg University of Pennsylvania Department of Mathematical and Digital Sciences - AA#53-7-86: Tenure-track

assistant professor position beginning fall 2018. Strong background in Data Science or Computational Statistics preferred. PhD in Mathematics, Statistics, Computer Science, Data Science or a closely related field required by August 17, 2018. Application deadline for full consideration: November 1, 2017. For a full position description, including application procedures, visit [www.bloomu.edu/jobs](http://www.bloomu.edu/jobs) AA/EEO.

### Rhode Island

■ The Center for Statistical Sciences at Brown University has immediate openings for staff Biostatisticians for studies of imaging and diagnostic test evaluation. Candidates should have masters or doctorate in Biostatistics, Statistics, or Data Science, and exposure to health care research. Excellent verbal and written communication skills, and experience in data analysis and the use of statistical packages required. Apply online for position #REQ131501 at <https://brown.wd5.myworkdayjobs.com/staff-careers-brown/jobs>. EOE.

### Texas

■ Rice University intends to hire multiple tenure-track faculty members whose research focus is data science. We seek candidates for employment as early as July 1, 2018. All new hires will have an appointment in one or more relevant department. For details and to apply, please visit <http://jobs.rice.edu/postings/11380>. Applications will be evaluated beginning on September 15, 2017 and will be accepted until all positions are filled. EOE.

■ The Dept. of Mathematics and Statistics, Sam Houston State University invites applications for two tenure-track Asst. Professor positions in Statistics beginning Fall 2018. Requirement: PhD in Statistics, excellent communications skills, strong commitment to quality teaching, scholarly and research activities, and service. Review begins Nov. 2017. Applicants must submit a cover letter, CV, teaching, and research statement online at <http://shsu.peopleadmin.com/postings/18243>. EOE/M/F/Vet/Disability.

### Utah

■ Full-time tenure-track or tenured appointments at the level of Assistant, Associate, or Full Professor in all areas of statistics. These positions are part of a

## DEPARTMENT OF STATISTICS COLUMBIA UNIVERSITY

*Faculty Positions in Statistics, Neuroscience and MBBI Starting Fall 2018*

The Department of Neuroscience, the Department of Statistics, and the Mortimer B. Zuckerman Mind Brain Behavior Institute at Columbia University invite applications for two positions (tenured or tenure-track) at the assistant or associate professor level, to begin in 2018. The position in the Department of Neuroscience will focus on theoretical neuroscience. The position in the Department of Statistics will focus on the application of statistics to neuroscience with an appointment in the Department of Statistics. Both positions will include appointments as well as office and laboratory space in the Theory Center and Grossman Center of the Statistics of Mind within the Mortimer B. Zuckerman Mind Brain Behavior Institute housed in the Jerome L. Greene Science Center at Columbia.

We are seeking dynamic scientists interested in exploiting the multidisciplinary environment provided by the Zuckerman Institute and interacting with Zuckerman Institute faculty, as well as with others in the Columbia neuroscience, biological sciences, physical sciences, statistics, and machine learning communities, including the Data Science Institute.

The Zuckerman Institute brings together scientists from diverse backgrounds whose research focuses on brain function, wiring, and development. Zuckerman Institute faculty will function as full members of their home departments, and tenure will be granted by the home department.

Candidates will be expected to show expertise and an ability to lead a research program in theoretical and/or statistical neuroscience. Applicants are expected to have a strong record of scientific achievement and to demonstrate the ability to engage in innovative research and teaching. Applicants should hold a PhD in neuroscience, statistics, or a related area.

Candidates will contribute to teaching in their home departments and the Zuckerman Institute.

For further information about the departments and our activities, centers, research areas, and curricular programs, please go to our web pages at: [www.stat.columbia.edu](http://www.stat.columbia.edu); <http://neuroscience.columbia.edu> and <http://zuckermaninstitute.columbia.edu>.

To apply for the position in **Statistics**, please apply through the following link: <https://academicjobs.columbia.edu/applicants/Central?quickFind=65242>

To apply for the position in **Neuroscience**, please go to the link: <https://academicjobs.columbia.edu/applicants/Central?quickFind=65051>

The application must include a cover letter, curriculum vitae, statement of teaching philosophy, research statement, the names of 3 references and writing sample/publication. References will be asked to upload letters of recommendation in RAPS.

Review of applications will begin December 1, 2017 and continue until the position is filled.

*Women and minorities are strongly encouraged to apply.*

*Columbia University is an Equal Opportunity/Affirmative Action employer.*

## Faculty Position in Operations Research and Information Engineering (ORIE)

Operations Research and Information Engineering (ORIE) is available at the Cornell Tech campus in New York City

A faculty position in Operations Research and Information Engineering (ORIE) is available at the Cornell Tech campus in New York City. The position is part of the Jacobs Technion-Cornell Institute, and we particularly encourage candidates whose work fits into Jacobs Institute application-domain emphases in the areas of digital-physical systems (especially in urban environments) and digital health technology.

The position is within Cornell University's School of ORIE, and applicants with research interests represented within Cornell ORIE are welcome at all levels, including tenured and tenure-track. The School consists of a diverse group of high-quality researchers and educators interested in probability, optimization, statistics, simulation, and a wide array of applications such as e-commerce, supply chains, scheduling, manufacturing, transportation systems, health care, financial engineering, service systems and network science. Cornell ORIE spans both the Ithaca and New York City campuses, but the successful candidate's teaching and research will be based in New York City. (Interested candidates can apply for a Cornell Tech in NYC position, a Cornell Ithaca ORIE position, or both, but the two campuses have different application sites; please see the Cornell Ithaca ad for the Ithaca application URL.)

Candidates must hold a Ph.D. in operations research, mathematics, statistics, or a related field by the start of the appointment, and have demonstrated an ability to conduct outstanding research at the level of tenure-track or tenured faculty in Cornell ORIE. They must also have a strong commitment to engagement outside of academia in ways that foster significant commercial or societal impact, as aligned with the mission of the Cornell Tech campus. The successful candidate will be expected to pursue an active research program, to teach Master's and Ph.D.-level graduate courses, and to supervise graduate students.

To ensure full consideration, applications should be received by December 1, 2017, but will be accepted until the position is filled. Applicants should submit a curriculum vitae, brief statements of research and teaching interests, and the names and contact information of at least three references. They should also identify one or two top publications to which they have made significant contributions. A distinguishing characteristic of research at Cornell Tech, in addition to world-class academic work, is that it engages deeply with external communities, organizations, K-12 education, and industry to address real-world problems and contexts that amplify the direct commercial and societal impact of our research. Accordingly, within a clearly identified subsection of the research statement, the candidate should address prior accomplishments and future plans related to this kind of direct commercial and/or societal impact of their research.

Applications are on-line at <https://academicjobsonline.org/ajo/jobs/9778>  
Inquiries about your application may be directed to [slm339@cornell.edu](mailto:slm339@cornell.edu).



*Diversity and Inclusion are a part of Cornell University's heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities.*

## DEPARTMENT OF STATISTICS COLUMBIA UNIVERSITY

Faculty Position Starting Fall 2018

The Department of Statistics invites applications for a tenure-track Assistant Professor position to begin July 1, 2018. A Ph.D. in statistics or a related field is required. Candidates will be expected to sustain an active research and publication agenda and to teach in the departmental undergraduate and graduate programs. The field of research is open to any area of statistics and probability.

The Department currently consists of 30 faculty members, 50 PhD students, and over 300 MA students. The Department has been expanding rapidly and, like the University itself, is an extraordinarily vibrant academic community. We are especially interested in candidates who through their research, teaching and/or service will contribute to the diversity and excellence of the academic community. Women and minorities are especially encouraged to apply.

For further information about the Department and our programs, please go to our webpage at: [www.stat.columbia.edu](http://www.stat.columbia.edu).

All applications must be submitted through Columbia's online Recruitment of Academic Personnel System (RAPS) at <https://academicjobs.columbia.edu/applicants/Central?quickFind=65221>.

The application must include a cover letter, curriculum vitae, teaching statement, research statement and the names of 3 references. References will be asked to upload letters of recommendation in RAPS.

Inquiries may be made to [dk@stat.columbia.edu](mailto:dk@stat.columbia.edu).

Review of applications begins on **December 1, 2017**, and will continue until the position is filled.

*Columbia University is an Equal Opportunity/Affirmative Action employer.*

## Williams

The Williams College Department of Mathematics and Statistics invites applications for a tenure-track position in Statistics, beginning fall 2018, at the rank of assistant professor (a more senior appointment is possible under special circumstances). The candidate should have a Ph.D. in Statistics or a closely related field by the time of appointment. We are seeking candidates who show evidence and/or promise of excellence in teaching students from diverse backgrounds and a strong research program that can engage undergraduate students. The candidate will become the sixth tenure-track statistician in the department, joining a vibrant and innovative group of statisticians with an established statistics major. For more information on the Department of Mathematics and Statistics, visit <http://math.williams.edu/>.

At Williams, we are committed to building a diverse and inclusive community where members from all backgrounds can live, learn, and thrive. In your application materials, we ask you to address how your teaching, scholarship, mentorship and/or community service might support our commitment to diversity and inclusion. Candidates may apply via <http://apply.interfolio.com/43065> by uploading a cover letter addressed to Professor Klingenberg, a curriculum vitae, a teaching statement, a description of your research plans, and three letters of recommendation on teaching and research.

Expectations: The teaching load is two courses per 12-week semester and a winter term course every other January. The candidate will be expected to teach introductory statistics, core courses for the statistics major, and electives in their area of expertise. The successful candidate will establish an independent research program that results in scholarly publications. Williams College provides broad support for start-up funds, funding for student research assistants, faculty professional development funds, and a shared computer cluster for parallel computation.

Review of applications will begin on or after November 1st and will continue until the position is filled. All offers of employment are contingent upon completion of a background check. Further information is available at <https://faculty.williams.edu/prospective-faculty/background-check-policy/>.

Williams College is a coeducational liberal arts institution located in the Berkshire Hills of western Massachusetts with easy access to the culturally rich cities of Albany, Boston, and New York City. The College is committed to building and supporting a diverse population of approximately 2,000 students, and to fostering an inclusive faculty, staff and curriculum. Williams has built its reputation on outstanding teaching and scholarship and on the academic excellence of its students. Please visit the Williams College website, <http://www.williams.edu/>.

university-wide cluster hiring effort in statistics, with particular emphasis in mathematics, computer science, and bio-engineering. Successful candidates will have strong interdisciplinary interests. Please see our website at [www.math.utah.edu/positions](http://www.math.utah.edu/positions) for application requirements. Applications must be completed through [www.mathjobs.org/jobs/Utah](http://www.mathjobs.org/jobs/Utah). Veterans' preference is extended to qualified veterans. Reasonable disability accommodations will be provided with adequate notice. For additional information about the University's commitment to equal opportunity and access see: [www.utah.edu/nondiscrimination](http://www.utah.edu/nondiscrimination). EOE/AA.

## Virginia

■ Old Dominion University - The Department of Mathematics and Statistics is seeking two tenure-track Assistant Professors starting Fall 2018 in Computational Statistics or Data Science. A PhD in Statistics, Biostatistics or related fields and serve the university's new initiative in Big Data Analytics and Data Science. Apply at <https://jobs.odu.edu>. Review of the applications will begin

December 15, 2017 and continue until the positions are filled. EOE.

■ The Department of Mathematics and Statistics at James Madison University invites applications for a tenure track faculty position in statistics starting August 2018. To apply or for information visit: [www.mathjobs.org/jobs/jobs/10632](http://www.mathjobs.org/jobs/jobs/10632). James Madison University is a comprehensive public institution located in the heart of Virginia's beautiful Shenandoah Valley. See [www.jmu.edu/mathstat](http://www.jmu.edu/mathstat). Review of applications begins November 10, 2017. Apply by that date to guarantee full consideration. EOE.

## Wisconsin


■ Assistant/Associate Professor in Statistics. The Department of Mathematical Sciences at the University of Wisconsin-Milwaukee invites applications to fill a tenure-track or tenured faculty position in Statistics. The appointment start date is 08/20/2018. Review of applications will start 11/15/2017 and continue until the position is filled. Applications received after this date may

not receive full consideration. For the full posting and more information, please visit <http://jobs.uwm.edu/postings/25882>. EOE.

## Ontario

■ The Department of Statistics and Actuarial Science, University of Waterloo invites applications for 3 tenure-track positions in Statistics or Biostatistics. A PhD in Statistics, Biostatistics, or related areas is required. Apply through ([www.mathjobs.org/jobs](http://www.mathjobs.org/jobs)). Include cover letter, CV, research/teaching statements, up to three reprints/preprints and three reference letters. Full advertisement <https://uwaterloo.ca/statistics-and-actuarial-science/available-positions>. Closing: December 1, 2017. EOE.

■ The Department of Statistics and Actuarial Science, University of Waterloo invites applications for one or two tenure-track or tenured positions in Actuarial Science. A PhD in Actuarial, Statistical or Mathematical Sciences or Mathematical Finance is required. Apply through ([www.mathjobs.org/jobs](http://www.mathjobs.org/jobs)). Include cover letter, CV, research/teaching statements, up to three reprints/preprints

UNITED STATES POSTAL SERVICE® (All Periodicals Publications Except Requester Publications)		
1. Publication Title Amstat News		
2. Publication Number 0 1 6 3 - 9 6 1 7		3. Filing Date 9/15/2017
4. Issue Frequency Monthly		5. Number of Issues Published Annually 12
6. Annual Subscription Price \$50 non members		7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+®)
American Statistical Association, 732 North Washington Street, Alexandria, VA 22314-1943		
8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer)		
American Statistical Association, 732 North Washington Street, Alexandria, VA 22314-1943		
9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank)		
Publisher (Name and complete mailing address) American Statistical Association, 732 North Washington Street, Alexandria, VA 22314-1943		
Editor (Name and complete mailing address) Megan Murphy, 732 North Washington Street, Alexandria, VA 22314-1943		
Managing Editor (Name and complete mailing address) Megan Murphy, 732 North Washington Street, Alexandria, VA 22314-1943		
10. Owner (Do not leave blank. If the publication is owned by a corporation, give the name and address of the corporation immediately followed by the names and addresses of all stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, give the names and addresses of the individual owners. If owned by a partnership or other unincorporated firm, give its name and address as well as those of each individual owner. If the publication is published by a nonprofit organization, give its name and address.)		
Full Name	Complete Mailing Address	
American Statistical Association	732 North Washington Street, Alexandria VA, 22314-1943	
11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box <input checked="" type="checkbox"/> None		
Full Name	Complete Mailing Address	
12. Tax Status (For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one) The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes: <input checked="" type="checkbox"/> Has Not Changed During Preceding 12 Months <input type="checkbox"/> Has Changed During Preceding 12 Months (Publisher must submit explanation of change with this statement)		
PS Form 3526, September 2007 (Page 1 of 3) (Instructions Page 3) PSN 7530-01 000-9931 PRIVACY NOTICE: See our privacy policy on www.usps.com		
13. Publication Title Amstat News		14. Issue Date for Circulation Data Below September 2017
15. Extent and Nature of Circulation		
Average No. Copies Each Issue During Preceding 12 Months		No. Copies of Single Issue Published Nearest to Filing Date
a. Total Number of Copies (Net press run)		18536
(1) Mailed Outside-County Paid Subscriptions Stated on PS Form 3541 (include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)		16634
(2) Mailed In-County Paid Subscriptions Stated on PS Form 3541 (include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)		0
(3) Paid Distribution Outside the Mail Including Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Paid Distribution Outside USPS®		1747
(4) Paid Distribution by Other Classes of Mail Through the USPS (e.g. First-Class Mail®)		0
c. Total Paid Distribution (Sum of 15b (1), (2), (3), and (4))		18380
(1) Free or Nominal Rate Outside-County Copies included on PS Form 3541		0
(2) Free or Nominal Rate In-County Copies included on PS Form 3541		0
(3) Free or Nominal Rate Copies Mailed at Other Classes Through the USPS (e.g. First-Class Mail)		0
(4) Free or Nominal Rate Distribution Outside the Mail (Carriers or other means)		0
e. Total Free or Nominal Rate Distribution (Sum of 15c (1), (2), (3) and (4))		0
f. Total Distribution (Sum of 15c and 15e)		18380
g. Copies not Distributed (See Instructions to Publishers #4 (page #3))		743
h. Total (Sum of 15f and g)		19123
i. Percent Paid (15c divided by 15f times 100)		100
16. Publication of Statement of Ownership <input checked="" type="checkbox"/> If the publication is a general publication, publication of this statement is required. Will be printed in the November 2017 issue of this publication. <input type="checkbox"/> Publication not required.		
17. Signature and Title of Editor, Publisher, Business Manager, or Owner  Associate Executive Director and Director of Operations		Date 9/14/17
I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).		
PS Form 3526, September 2007 (Page 2 of 3)		





# Strength in Numbers

Join the 300+ strong and diverse community of U.S. Census Bureau mathematical statisticians—at the heart of the statistical quality of our demographic and economic census, surveys, and research.

## Your Work as a Mathematical Statistician at the Census Bureau

- Design sample surveys and analyze the data collected.
- Design and analyze experiments to improve survey questionnaires and interview procedures.
- Improve statistical methods for modeling and adjustment of seasonal time series.
- Perform research on statistical methodology that will improve the quality and value of the data collected.
- Publish research papers and technical documentation of your work.

## Requirements

- U.S. citizenship
- Bachelor's, Master's, or Ph.D with at least 24 semester hours in math and statistics (see Web site for more specifics on required coursework)

Apply at [www.census.gov](http://www.census.gov), click on Census Careers, Type of Position, Professional/Scientific/Technical, Math Statistician

*The U.S. Census Bureau is an Equal Opportunity Employer.*



U.S. Department of Commerce  
Economics and Statistics Administration  
U.S. CENSUS BUREAU  
[census.gov](http://census.gov)

and three reference letters. Full advertisement <https://uwaterloo.ca/statistics-and-actuarial-science/available-positions> Closing: December 1, 2017. EOE.

## International

■ Applications are invited for faculty positions at any level in data science. A PhD in Statistics or related field is required. Applicants should send an application letter, CV, a research and teaching statement and arrange for three reference letters to be sent to: Search Committee on Data Science, Dept. of Statistics and Applied Probability, National University of Singapore, Email: [stasec@nus.edu.sg](mailto:stasec@nus.edu.sg). More information at website: [www.stat.nus.edu.sg/index.php/about-us/people/faculty-openings](http://www.stat.nus.edu.sg/index.php/about-us/people/faculty-openings). EOE. ■

# AMSTATNEWS

## ADVERTISING DIRECTORY

Listed below are our display advertisements only. If you are looking for job-placement ads, please see the professional opportunities section. For more job listings or more information about advertising, please visit [www.amstat.org](http://www.amstat.org).

## misc. products and services

Virginia Tech ..... centerfold

## professional opportunities

Columbia University.....	p. 39, 41, 42, 44, 45
Cornell University.....	p. 41, 45
Institute of Statistical Science.....	p. 42
North Carolina State University .....	p. 40
US Census Bureau .....	p. 47
Vanderbilt University .....	centerfold
Virginia Commonwealth University .....	p. 43
Westat.....	p. 42
Williams College .....	p. 45

## software

JMP Software from SAS.....	cover 3
Minitab.....	cover 2
SAS Institute Inc.....	cover 4
Statsols.....	p. 17

# SOCIAL CHATTER

## FOLLOW US



community.  
amstat.org



www.facebook.  
com/AmstatNews



@AmstatNews



www.instagram.  
com/AmstatNews

**NEXT  
MONTH:**  
Have a  
favorite  
math- or  
statistics-  
related blog?  
Tag us at  
**@AmstatNews**  
and tell us  
what it is and  
why you like it!

## TELL US

# What is your favorite statistics word?

In October, we asked you about your favorite statistics word and got more feedback than ever—so much that we stopped counting at 300+ replies.

### The overwhelming winner?

# HETEROSCEDASTICITY



**Mario Vela** **heteroscedasticity**.. never learned how to pronounce it correctly the first time... someday... someday...

**Alvin Beltramo** **heteroscedasticity** - how can you not like a word with so many syllables?

**Surendar Chandra** **heteroscedasticity** - I am not sure if you remember but you taught me that (and my very first paper proved a published paper wrong because of it!!)

**Ray Shaw** Looks like **heteroscedasticity** is a popular choice! An annoying, self righteous grad TA chastised my class for our test performance, but couldn't pronounce that word. I laughed out loud.

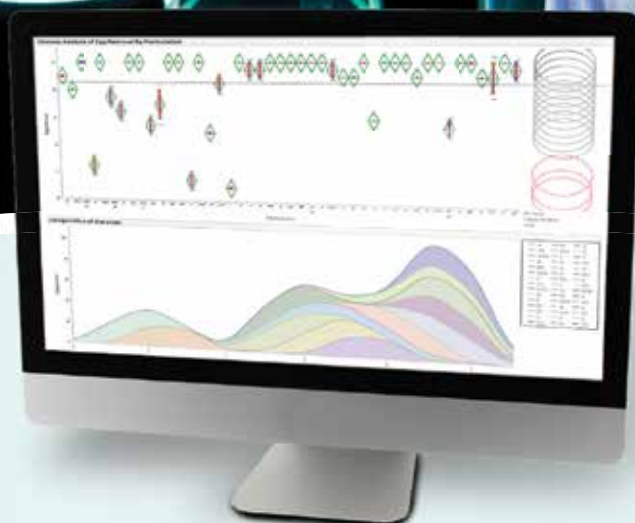
Other frontrunners?

## ANOVA, OUTLIER, PROBABILITY, AND SIGNIFICANCE



**Jaime O'Connell** I would have said Data but Grant Reinman got to it first. My second choice would be **significance** because it means something so exact to us and so much more nebulous and ambiguous to the rest of the world!

**Jim Dailey** Global Technical Key Account Manager, BASF Care Chemicals



## Great software in the right hands can change the world.

At BASF, chemists created a breakthrough dishwashing formulation with Trilon® M chelate that is free of phosphates and delivers superior performance. Now clean is also green.

Read about BASF's success, and find out how JMP can help you change your world:

[www.great.jmp](http://www.great.jmp)

**jmp**

Statistical Discovery.™ From SAS.



# Statistics

The latest release of SAS/STAT® is now available. SAS/STAT 14.2 enriches numerous analyses and adds two more procedures to your portfolio.

## SAS/STAT 14.2 Highlights

Propensity score analysis.

Estimation of causal treatment effects.

Time-dependent ROC curves for Cox regression.

Two-stage fully efficient fractional imputation and fractional hot-deck methods for survey data.

Balanced bootstrap and sequential Poisson methods for selecting random samples.

## Recent SAS/STAT Highlights

Generalized additive models by penalized likelihood estimation.

LASSO method for selecting generalized linear models.

Classification and regression trees.

Weighted GEE methods.

Proportional hazards regression models for interval-censored data.

Bayesian choice models.

To learn more.

[support.sas.com/statnewreleases](http://support.sas.com/statnewreleases)

