April 2019 • Issue #502

AMSTATNEWS

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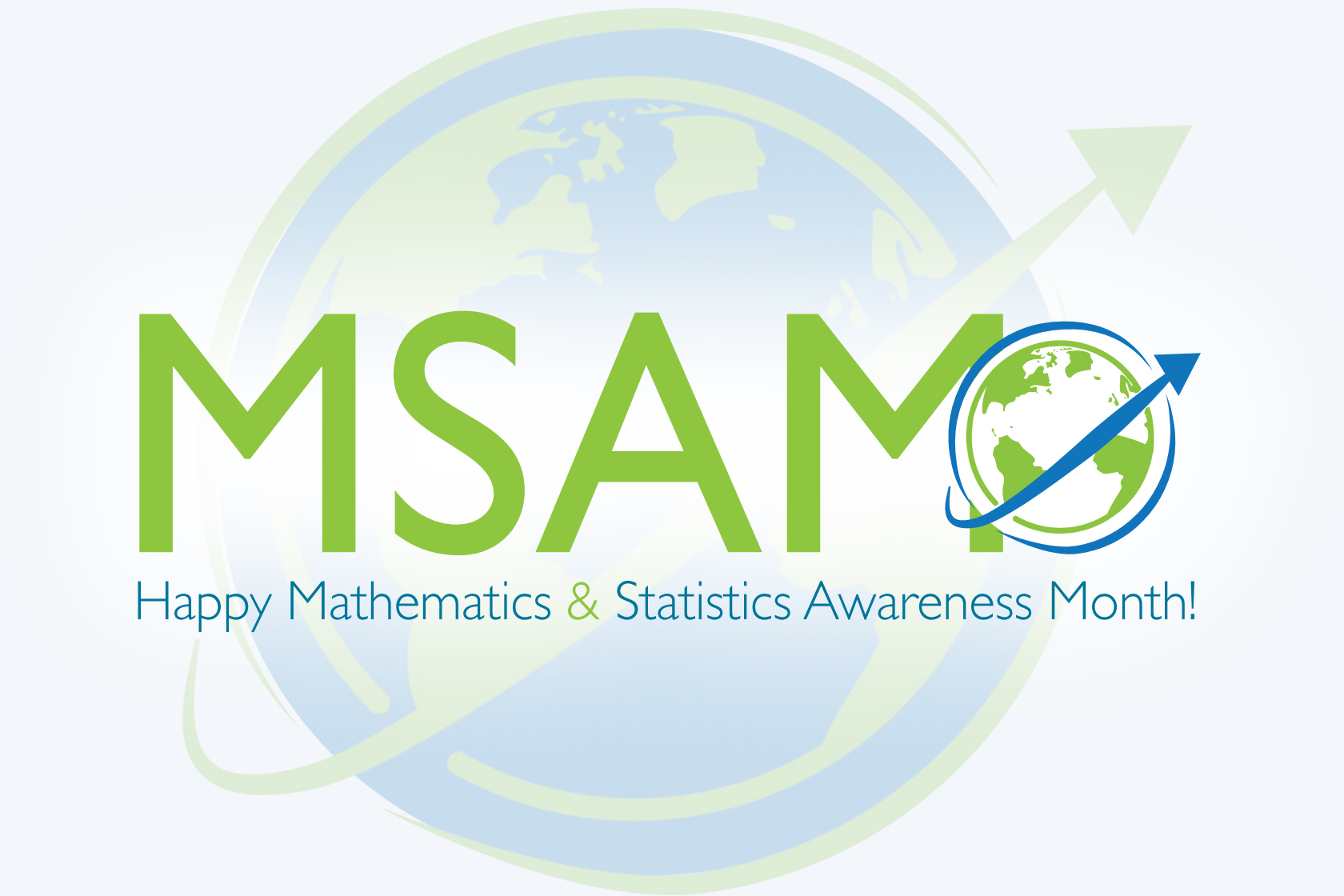

Happy Mathematics & Statistics Awareness Month!

ALSO:

Choose to Lead with Decision Analytics

Diversity Workshop to Focus on Developing Leaders, Growing Community, Ensuring Diverse Profession

MWM
Meeting Within a Meeting
a statistics workshop for math and science teachers

www.amstat.org/education/mwm

Based on the Common Core State Standards for Mathematics (***corestandards.org***)
and *Guidelines for Assessment and Instruction of Statistics Education (GAISE): A Pre-K–12 Curriculum Framework* (***www.amstat.org/education/gaise***)

Dates:	Tuesday, July 30, and Wednesday, July 31, 2019, 8:00 a.m. to 4:00 p.m.
Place:	Joint Statistical Meetings, Denver, Colorado (meeting room TBD)
Audience:	Middle- and high-school mathematics and science teachers. Multiple mathematics/science teachers from the same school are especially encouraged to attend.
Objectives:	Enhance understanding and teaching of statistics within the mathematics/science curriculum through conceptual understanding, active learning, real-world data applications, and appropriate technology
Content:	Teachers will explore problems that require them to formulate questions and collect, organize, analyze, and draw conclusions from data and apply basic concepts of probability. The MWM program will include examining what students can be expected to do at the most basic level of understanding and what can be expected of them as their skills develop and their experience broadens. Content is consistent with Common Core standards, *GAISE* recommendations, and *NCTM Principles and Standards for School Mathematics*.
Presenters:	*GAISE Report* authors and prominent statistics educators
Format:	Middle-school and high-school statistics sessions Activity-based sessions, including lesson plan development
Provided:	Refreshments Handouts Certificate of participation from the ASA certifying professional development hours Optional graduate credit available
Cost:	The course fee for the two days is $50. **Please note:** Course attendees do not need to register for the Joint Statistical Meetings* to participate in this workshop.
Follow up:	Follow-up activities and webinars (***www.amstat.org/asa/education/K-12-Statistics-Education-Webinars.aspx***) Network with statisticians and teachers to organize learning communities
Registration:	More information and online registration is available at ***www.amstat.org/education/mwm***. Space is limited. If interested in attending, please register as soon as possible.
Contact:	Rebecca Nichols, ***rebecca@amstat.org***; (703) 684-1221, Ext. 1877

* The Joint Statistical Meetings are the largest annual gathering of statisticians, where thousands from around the world meet to share advances in statistical knowledge. The JSM activities include statistics education sessions, posters sessions, and the exhibit hall.

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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.

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Tips on Building Your Networks

STAT*tr@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*.

33 **PASTIMES OF STATISTICIANS**
What Does Lawrence Lessner Like to Do When He Is Not Being a Statistician?

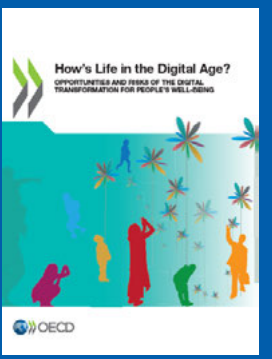
This column focuses on what statisticians do when they are not being statisticians. If you would like to share your pastime with readers, please email Megan Murphy, *Amstat News* managing editor, at *megan@amstat.org*.

34 **STATS4GOOD**
Data for Good in the Public Square

This column is written for those interested in learning about the world of Data for Good, where statistical analysis is dedicated to good causes that benefit our lives, our communities, and our world. If you would like to know more or have ideas for articles, contact David Corliss at *davidjcorliss@peace-work.org*.

HOW'S *Life?*

How's Life in the Digital Age?



How is the digital transformation affecting people's lives? A new Organisation for Economic Co-operation and Development report shows effects can be positive as digital technologies expand the boundaries of information availability and enhance human productivity, but can also imply risks for people's well-being, ranging from cyberbullying to the emergence of disinformation and cyberhacking.

Making digitalization work for people's well-being will require building equal digital opportunities, widespread digital literacy, and strong digital security. Continued research and efforts to improve statistical frameworks will be critical to fully understanding what effect digitalization will have on people's well-being.

Read the report and discover key findings at *bit.ly/HiL-Digital.*

Read the latest chapter news in

CHAPTER CHATTER

Chapter Chatter is the newsletter for and about ASA chapters. The Council of Chapters Governing Board established this publication to foster improved communication between the COCGB and chapters and among chapters by providing a forum for spreading news about ASA chapter initiatives and activities throughout the statistics community. Read the latest issue on the ASA's community site at *bit.ly/CChatter.*

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P-Values: To Own or Not to Own?

Karen Kafadar

The debate about the value of hypothesis testing and the over-reliance on *p*-values as a cornerstone of statistical methodology started well over a century ago, and it continues today. Many researchers, including statisticians, have commented about their use—and their abuse. Building on the presentations at the 2017 Symposium on Statistical Inference (*ww2.amstat.org/meetings/ssi/2017*), the ASA published the March 2019 issue of *The American Statistician* devoted entirely to this topic. (If you haven't done so already, I encourage you to read this issue. NPR, *Nature*, and many others commented on it the day the issue appeared.) The messages in the articles from that issue (all online) are not surprising to us: The "0.05 threshold" for *p*-values is arbitrary, and the notion of "$p < 0.05$" as "statistically significant" hardly makes sense in many (much less all) situations. Perhaps what is, or should be, surprising to us is where statisticians were when the "abuse" started to take hold.

Stephen Stigler notes this connection between *p*-values of 0.05 and "statistical significance" started well before Fisher: "Even in the 19th century, we find people such as Francis Edgeworth taking values 'like' 5%—namely 1%, 3.25%, or 7%—as a criterion for how firm evidence should be before considering a matter seriously" (*CHANCE* 21:4, 2008: doi: 10.1007/s00144-008-0033-3).

This sentence raises the central issue. How firm should evidence be "before considering a matter seriously"? The answer is one we statisticians have given frequently to our clients: "It depends." (Statisticians can be accused of using that phrase excessively.) How big is the study, how many inquiries do you plan to make of the data, how many analyses do you plan to run, what other data might bear on this study, what are the risks of false claims, …? In short, the answer requires us to *think*. (What a concept.)

Many years ago, I met a wonderful lady named Edith Flaster, a biostatistician from Columbia University. Throughout her life, Edith approached problems—in statistics and elsewhere—with sensible and practical solutions. Professionally, Edith had learned much from giants like Cuthbert Daniel and Fred Wood, who came through Columbia on numerous occasions. On one evening, she recalled the old days of computing on main frames, when every department had a computer budget and analyses cost real money. "Consequently," she said, "you had to think very carefully before you burned your computer budget on an analysis; you wanted to be sure the analysis made sense before you ran it. Today, computing is cheap, so people run hundreds of analyses, without even thinking before they run them. I don't care if you think before you run the analysis or after—but somewhere along the line you have to think." Calculating *p*-values does not relieve us of our duty to remind our collaborators we still have to think. And the more *p*-values we calculate, the more we have to think.

Many of us would agree that, if we were to remove all thresholds for deciding when to take a result seriously, we may find ourselves back in the days of the Wild West. (Some may fear we are already there, given the proliferation of journals and analyses they contain.) We, unlike a few journal editors, recognize that adherence to a fixed *p*-value in all situations is not the antidote. And it is not a substitute for thinking. How many times has your collaborator insisted you include "($p < 0.05$)" in the paper you are writing, "because the journal requires it"? Regrettably, stating the *p*-value (to several decimal places no less, as if anyone would believe them) has become a requirement for many journals.

On the other hand, we need some sort of structure. We agree that the fixed threshold of "$p < 0.05$," and its identification with the term "statistical significance", is not sensible. (Even Sir Ronald, who receives "credit" (or "blame") for popularizing the 5% threshold,

If anything, the continued controversy about p-values and statistical significance reminds us our job as statisticians is far from done.

was reported to have said he'd be more likely to trust a result where $p < 0.05$ in 10 experiments than a result where $p < 0.005$ in a single experiment.) But if we advise scientists to dismiss any notion of thinking in advance about a level beyond which we take a result seriously, our profession may run the risk of being dismissed altogether—especially when our clients can go to "data scientists," who won't bother them with p-values at all—or, in fact, with any firm statistical foundations for their "scientific findings."

The real question is, where were we statisticians, and where have we been, when our collaborators and journal editors set this limit as a criterion for publication? Many of us were conducting research that has allowed our profession to flourish. That's been terrific. But the well-intentioned editors of scientific journals either ignored any notion of "thresholds for evidence" or insisted on an "algorithm" or "golden rule"—like "$p < 0.05$." As we've reminded our colleagues in other professions, algorithms don't always lead us to "truth." Nonetheless, the structure of an algorithm can be useful in getting us to think.

Stigler ends his article in *CHANCE* with a thoughtful sentiment:

> One may look to Fisher's table for the F-distribution and his use of percentage points as leading to subsequent abuses by others. Or, one may consider the formatting of his tables as a brilliant stroke of simplification that opened the arcane domain of statistical calculation to a world of experimenters and research workers who would begin to bring a statistical measure to their data analyses. There is some truth in both views, but they are inextricably related, and I tend to give more attention to the latter, while blaming Fisher's descendants for the former.

Alas, we are the descendants. We must take responsibility for the situation in which we find ourselves today (and during the past decades) regarding the use—and abuse—of our well-researched statistical methodology. And we must also, therefore, take responsibility for trying to change it.

I fervently hope the articles in the special issue of *The American Statistician* will not be viewed as a call to dismiss an area of our profession that has served, and continues to serve, us and science so well. Rather, I hope the articles will inspire us to encourage our colleagues to think about the data analysis process and to speak up to editors who, in their desire to bring structure to the inference process, may have gone just a little overboard. If anything, the continued controversy about p-values and statistical significance reminds us that our job as statisticians is far from done and that we are needed more than ever in this era of "data science" that embraces algorithms (with appealing names) and shuns complicated statistical inference. As noted in the last two columns, the debate reminds us to do the following:

a. Showcase all our talents—logical thinking, identification of process steps, design of relevant data collection, analysis and inference, characterization of uncertainty, clear results

b. Seize opportunities to create the demands for our talents—and then meet the demands with hard thinking

c. Be prepared to use our skills to present reasonable approaches to solving problems and encourage hard thinking, rather than blind adherence to fixed thresholds.

Please share your experiences—and your successes—in our mission to bring "sound thinking" to your collaborators. I look forward to hearing about them!

Introducing the ASA Speakers Bureau

Laura Harmon, ASA Marketing and Online Community Coordinator

The ASA's Committee on Membership Retention and Recruitment (CMRR) reached out to ASA members this past fall for help establishing the ASA Speakers Bureau. Created specifically for the benefit of student chapters, smaller local ASA chapters, and geographically isolated groups of statisticians, the ASA Speakers Bureau officially launched in January 2019 and is off to a strong start.

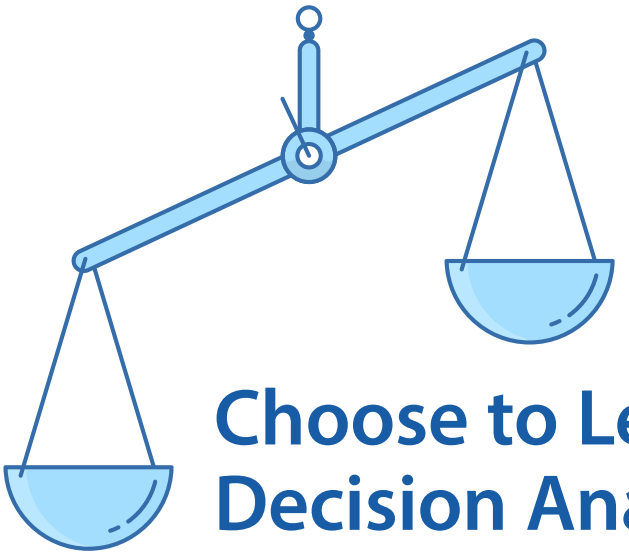
After receiving support via an ASA Member Initiative proposal, the CMRR collected speaker nominations and assembled a group of more than 50 ASA members willing to travel or present long-distance to students and isolated statisticians. In January, ASA staff reached out to the ASA's student chapter presidents to see who would like to be the first to take advantage of this new resource.

Lauren Clark, president of the University of Kansas Medical Center (UMKC) ASA Student Chapter, was the first to respond. After working to find a good match, the speakers bureau was able to connect her with Howard Hogan, chief demographer of the US Census Bureau (retired), who presented long-distance to UMKC students on January 24.

"[His] presentation was very informative and interesting, running from ancient censuses to the role of censuses in the Civil War to more modern developments in the Census-like sampling, imputation, and computer-generated graphics," said Clark. Hogan added that he very much enjoyed presenting.

A map of available speakers can be viewed at *bit.ly/SpeakersMap.*

As the spring 2019 semester continues, the bureau is working with three more student chapter presidents to match their chapters with speakers. If you are a student group or an isolated group that struggles to find presenters, email ASA Marketing and Online Community Coordinator Lara Harmon at *lara@amstat.org* at least three to four weeks ahead of when you hope to host a speaker for help. ■



Choose to Lead with Decision Analytics

Donna LaLonde, ASA Director of Strategic Initiatives and Outreach

Members of the Society for American Baseball Research (SABR) have come to be known as "sabermatricians" because they use analytics to inform decision-making in baseball. Now, members of the leadership cohort may come to be known as "leadermatricians," since they had the opportunity to explore the applications of decision analytics in leadership.

Beginning January 18, the cohort participated in a series of four two-hour virtual workshops investigating decision analytics. For this experience, the cohort gathered from 11 a.m. – 1 p.m. via Zoom video conference. The sessions were a combination of whole-group and small-group discussions. During the cultural competency workshop last October, there were many opportunities for small-group table discussions using Zoom's breakout room feature.

The goals for this series of virtual sessions were to develop the ability to identify key factors, information, and challenges in decision-making; examine the knowledge base of decision tools; and develop the ability to influence decisions and lead the decision-making process.

As one might guess from the mention of sabermatricians, the first session was centered on a case study of the *Moneyball* experience. Gary Sullivan presented the background and introduced the people who played a role in encouraging the use of analytics in baseball decision-making. This case study analysis was followed by small-group discussion of challenges faced by these leaders and the implications of the case study to the leadership situations and work of the cohort.

During the second session, Karen Price, senior research adviser at Eli Lilly, presented a case study on quantitative decision-making in drug development. Through the case study, Price showed how quantitative approaches improve decision-making and increase the probability of success. The group discussed the tremendous and often unexpected benefits of using decision analytics. Most importantly, these approaches provide an avenue for statistical leadership—ensuring statisticians have a "seat at the table."

One theme that emerged from the small-group discussions was the need to identify advocates to change culture and introduce quantitative approaches. These discussions provided an opportunity to revisit the topics explored during the first workshop on cultural competence. During the February 1 session, two groups shared leadership opportunities they were navigating. Their presentations reinforced the message Price shared—it is critical to ensure a shared vision of the critical success factors. To do this requires understanding the team's characteristics and what factors are essential.

The final session provided an opportunity for ASA Past-President Lisa LaVange to meet with the cohort and share her insights on decision analytics and leadership. She was joined by ASA Executive Director Ron Wasserstein, who updated the group on the follow-up from the 2017 Symposium on Statistical Inference and 2016 ASA Board Statement on Statistical Significance and *P*-Values. This discussion provided an opportunity to explore the opportunities for leadership as a part of professional service.

The cohort will meet again May 3–4 at the ASA Office for the final workshop. The topic for the final workshop is executive presence. In preparation, members of the cohort are focusing on identifying opportunities to apply the skills and knowledge gained from the workshops on cultural competence and decision analytics as they choose to lead! ■

Recognizing the ASA's Longtime Members

Each year, the ASA recognizes all members reaching a milestone of 35, 40, 45, or 50 years of membership. All members who joined 35 or more years ago are also extended an invitation to a reception at the annual JSM. If you believe you should appear in the list below but do not, please contact *asainfo@amstat.org* or call (703) 684-1221 to correct your record.

50+ Years

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Nell Sedransk
Daniel G. Seigel
Robert J. Serfling
Jolayne W. Service
Babubhai V. Shah
Nagambal Shah
Gary M. Shapiro
William F. Shaw
Iris M. Shimizu
Robert H. Shumway
Jon J. Shuster
Nozer D. Singpurwalla
Dennis E. Smith
William Boyce Smith
Ronald D. Snee
Mitchell Snyder
Daniel L. Solomon
Edward J. Spar
Douglas E. Splitstone
Randall K. Spoeri
Stephen M. Stigler
Jerrell T. Stracener
William E. Strawderman
George P. H. Styan
Nariaki Sugiura
Moon W. Suh
Michael Sutherland
D. Derk Swain
Paul Switzer
Douglas B. Tang
Elliot A. Tanis
Judith M. Tanur
Aaron Tenenbein
Leo J. Tick
Lowell H. Tomlinson
James Tonascia
Ram C. Tripathi
J. Richard Trout
Bruce E. Trumbo
Chris P. Tsokos
N. Scott Urquhart
Gerald van Belle
Willem R. Van Zwet
Lonnie C. Vance
James R. Veale
R. Lakshmi Vishnuvajjala
Ray A. Waller
James A. Walsh
William G. Warren
Edward J. Wegman
Bruce S. Weir
Herbert I. Weisberg
Raymond L. Wilder
George W. Williams
John Williams
William H. Williams
Othmar W. Winkler
Robert L. Winkler
John J. Wiorkowski
John E. Witcher
Janet Wittes
Douglas A. Wolfe
John Harmon Wolfe
Robert F. Woolson
Gooloo S. Wunderlich
Morty Yalovsky
Donald E. Young
Douglas A. Zahn
Ann Graham Zauber
Stuart O. Zimmerman
Calvin Zippin

45–49 Years

Robert D. Abbott
Judith Abrams
Lee R. Abramson
Chris Adcock
Frances J. Adox
Robert A. Agnew
Alan Agresti
Per A. T. Akersten
Arthur E. Albert
Mir Masoom Ali
Mukhtar M. Ali
Francis B. Alt
Stan Altan
Alfred Jerry Anderson
Dallas W. Anderson
Robert L. Andrews
Lawrence Annable
W. Tad Archambault Jr.
Steve Ascher
Taka Ashikaga
Corwin L. Atwood
Agustin F. Ayuso
Abdolrahman Azari
Saad T. Bakir
Vincent P. Barabba
William A. Barnett
John L. Barone
Richard A. Becker
Mary S. Beersman
Roger L. Berger
Timothy M. Bergquist
Kenneth N. Berk
Jose Miguel Bernardo
Wayne F. Bialas
Lynne Billard
David S. Birkes
Harvey Blumberg
Lennart Bodin
Robert J. Boik
James A. Bolognese
Dennis Boos
Gordon J. Brackstone
Ellen F. Brewer
Richard K. Burdick
Patricia L. Busk
Lawrence S. Cahoon
William L. Carlson
Raymond J. Carroll
Walter H. Carter Jr.
Frank C. Castronova
Judith-Anne W. Chapman
Yogendra P. Chaubey
Raj S. Chhikara
Joan Sander Chmiel
Jai Won Choi
William S. Cleveland
Timothy C. Coburn
Steven B. Cohen
James J. Colaianne
John R. Collins
Kimon J.E. Constas
Margaret D. Copenhaver
Robert J. Costello
Brenda G. Cox
Giles L. Crane
John R. Crigler
Andrew Joseph Cucchiara
Gary R. Cutter
Roberta W. Day
David L. DeMets
Susan J. Devlin
Thomas F. Devlin
Jay L. Devore
David A. Dickey
Dennis A. DuBose
Joseph W. Duncan
Brenda Kay Edwards
Janet D. Elashoff
Kathleen Louise Emery
Wil B. Emmert
Eugene P. Ericksen
James W. Evans
Milton C. Fan
Thomas B. Farver
Alan Fask
Robert E. Fay
Ronald S. Fecso
Martin Feuerman
David F. Findley
Alan C. Fisher
Nicholas I. Fisher
Andrew J. Flatt
Nancy Flournoy
Mary A. Foulkes
John D. Fox
Martin D. Fraser
David Frontz
Mark C. Fulcomer
Barbara A. Gabianelli
Mitchell H. Gail
Edward J. Gainer
Stephen J. Ganocy
Daniel J. Gans
Turkan K. Gardenier
Cynthia D. Gentillon
David E. Giles
Phyllis A. Gimotty
Howard Seth Gitlow
Dennis R. Givens
Marcia A. Glauberman
John R. Gleason
James H. Goodnight
Louis Gordon
Robert D. Gordon
Timothy A. Green
John Vic Grice
Marvin H. J. Gruber
Joseph A. Guarnieri
Victor M. Guerrero
Shelby J. Haberman
Hermann Habermann
Timothy O. Haifley
James L. Hall
Nancy R. Hall
Frank E. Harrell Jr.
Kenneth R. Hartmann
Richard M. Heiberger
Lance K. Heilbrun
Karl W. Heiner
James J. Higgins
Steven C. Hillmer
Klaus Hinkelmann
Jerry L. Hintze
David C. Hoaglin
Theodore R. Holford
Alan Hopkins
David C. Howell
Ina P. Howell
Mark Hudes
Dar-Shong Hwang
David N. Ikle
Ronald L. Iman
Allen E. Izu
Kirk A. Jackson
William E. Jackson III
Sreenivasa Rao Jammalamadaka
David Jaspen
Clifford L. Johnson
Ian T. Jolliffe
Paul K. Jones
David C. Jordan
Henry D. Kahn
John D. Kalbfleisch
William D. Kalsbeek
Howard S. Kaplon
Joseph D. Kasile
Daniel Kasprzyk
Richard W. Katz
Robert M. Katz
Sheryl F. Kelsey
James L. Kenkel
David L. Kimble (PSTAT)
Ignatius A. Kinsella
Roger E. Kirk
Nancy J. Kirkendall
Rudolf G. Kittlitz Jr.
Kenneth J. Koehler
Neal Koss
Abba M. Krieger
S. David Kriska
Robert Kushler
Alan H. Kvanli
John M. Lachin III
Nan Laird
Lynn Roy LaMotte
Carol J. Lancaster
J. Richard Landis
Kenneth D. Lawrence
Sheila M. Lawrence
Kelvin K. Lee
Kerry L. Lee
James D. Leeper
Stanley A. Lemeshow
Russell V. Lenth
Martin L. Lesser
Marcia J. Levenstein
Bruce Levin
Donald Lewin
Charles Lewis
David L. Libby
Gary L. Liberson
Lawrence I-Kuei Lin
Greta M. Ljung
Michael T. Longnecker
Thomas A. Louis
George W. Lynch
Charles F. Manski
Dennis R. Mar
Mary A. Marion
Donald L. Marx
Robert L. Mason
Takashi Matsui
Timothy A. Max
Joseph W. McKean
John D. McKenzie Jr.
Don L. McLeish
Jeff B. Meeker
William Q. Meeker Jr.
Cyrus R. Mehta
Robert J. Meier
Gayle T. Meltesen
Roy Mendelssohn
Terry G. Meyer
Richard O. Michaud
Mary-Jane Mietlowski
John A. Miller
Satish Chandra Misra
John Francis Monahan
Roderick Montgomery
Katherine L. Monti
David S. Moore
John K. Moore
David R. Morganstein
Max D. Morris
Robb J. Muirhead
Henry D. Muse
Wayne L. Myers
Subhash C. Narula
Elliott Nebenzahl
James W. Neill
Margaret A. Nemeth
H. Joseph Newton
Earl Nordbrock
Julia A. Norton
Marija J. Norusis
El-Sayed E. Nour
Ralph G. O'Brien
Michael W. O'Donnell Jr.
Bernard V. O'Neill Jr.
David Oakes
Morris Olitsky
Leonard Oppenheimer
Joyce Orsini
Willis L. Owen
Maurice E. B. Owens III
William S. Pan
Swamy A.V.B. Paravastu
Leonard J. Parsons
Van L. Parsons
N. Shirlene Pearson
Raymond C. Peck
Peter H. Peskun
Arthur V. Peterson Jr.
A. John Petkau
Charles G. Pfeifer
Philip J. Pichotta
Linda Williams Pickle
Dale J. Poirier
Stephen L. Portnoy
Dale L. Preston
Kevin Price
Thomas W. Pullum
John N. Quiring
Alfred W. Rademaker
Calyampudi R. Rao
Rose M. Ray
William J. Raynor Jr.
Kenneth J. Resser
Paula K. Roberson
Rosemary A. Roberts
Jeffrey A. Robinson
Frank W. Rockhold
Robert N. Rodriguez
Russell H. Roegner
John E. Rolph
Paul R. Rosenbaum
James L. Rosenberger
Bernard Rosner

Longtime members

Longtime members

N. Phillip Ross
Estelle Russek-Cohen
Carl T. Russell
Barbara J. Rutledge
John P. Sall
Francisco J. Samaniego
Allan R. Sampson
Douglas A. Samuelson
Thomas J. Santner
Patricia A. Scanlan
Nancy K. Schatz
Joyce A. Schlieter
Josef Schmee
David A. Schoenfeld
Friedrich W. Scholz
Eugene F. Schuster
Neil C. Schwertman
Stuart Scott
William L. Seaver
Joseph Sedransk
Subrata K. Sen
Jayaram Sethuraman
Glenn R. Shafer
Juliet Popper Shaffer
Paul Shaman
Walter Sloboda
Robert D. Small
Martyn R. Smith
William A. Sollecito
Bruce D. Spencer
M. K. Srirama
Robert R. Starbuck
John A. Stewart
Robert L. Stout
Miron L. Straf
Donna F. Stroup
Perla Subbaiah
Richard A. Sundheim
Robert D. Sutherland
Ajit C. Tamhane
Ronald A. Thisted
Hoben Thomas
John M. Thomas
Carol B. Thompson
Steven F. Thomson
Jerome D. Toporek
Robert D. Tortora
Alan R. Tupek
Bruce W. Turnbull
David L. Turner
Neil R. Ullman
Richard L. Valliant
Joseph G. Van Matre
Kerstin Vannman
Niels H. Veldhuijzen
Paul F. Velleman
Hrishikesh D. Vinod
Kenneth W. Wachter
Howard Wainer
Joseph J. Walker
Sylvan Wallenstein
Stephen D. Walter
Chao Wang
George H. Wang
James F. Ward
Sophronia W. Ward
Stanley Wasserman
William L. Weber
William E. Wecker
Thomas E. Wehrly
William W. S. Wei
Lynn Weidman
Daniel L. Weiner
Sanford Weisberg
K. Laurence Weldon
Jon August Wellner
Roy E. Welsch
Fredrick S. Whaley
James P. Whipple
Owen Whitby
David G. Whitmore
Howard L. Wiener
Rand R. Wilcox
Jean F. Williams
William J. Wilson
Lawrence C. Wolfe
Kirk M. Wolter
Marvin Yablon
Michael G. Yochmowitz
Eric R. Ziegel

40–44 Years

Sandra C. Abbott
John M. Abowd
Bovas Abraham
Mohammad Ahsanullah
James H. Albert
Jeanne M. Aldred
Robert W. Aldred
Melvin T. Alexander
Rich Allen
Wendy L. Alvey
Clifford W. Angstman
Thomas Arbutiski
Arlene S. Ash
Anthony C. Atkinson
Steven P. Bailey
Stephen P. Baker
Jim Baldwin
Chris M. Barker
Eileen J. Beachell
Moraye B. Bear
Mark P. Becker
Jay H. Beder
Steven Belle
Robert B. Bendel
Peter M. Bentler
James O. Berger
James S. Bergum
Catherine S. Berkey
Nancy Berman
David J. Bernklau
Charles C. Berry
Paul P. Biemer
Robert H. Bigelow
Richard A. Bilonick
Herbert L. Bishop Jr.
Richard M. Bittman
Jan F. Bjornstad
Mark M. Blanchard
Peter Bloomfield
Dan C. Boger
David E. Booth (PSTAT)
Richard C. Borden
Victor Marek Borun
Robert D. Bowser
Michael N. Boyd
John E. Boyer
Nancy J. Boynton
Norman M. Bradburn
Mary-Lynn Brecht
James E. Breneman
J. Michael Brick
David R. Bristol
Ron Brookmeyer
Roger L. Brown
Edward C. Bryant
Shelley B. Bull
Christine M. Bunck
Thomas E. Burk
Harry F. Bushar
Thomas J. Bzik
Patrick J. Cantwell
Lynda T. Carlson
Arthur Carpenter
B. Thomas Carr
Daniel B. Carr
John F. Carter
Aki N. Caszatt
Deborah A. Cernauskas
Amrut M. Champaneri
Promod K. Chandhok
John P. Chandler
Richard A. Chechile
Gina G. Chen
William W. S. Chen
Ching-Shui Cheng
Michael R. Chernick
Richard P. Chiacchierini
Vernon M. Chinchilli
Ronald Christensen
Peter D. Christenson
B. Christine Clark
Cynthia Z. F. Clark
Daren B. H. Cline
George W. Cobb
Mark E. Cohen
Michael L. Cohen
Michael P. Cohen
Stephen H. Cohen
Salvatore V. Colucci
Richard S. Conway Jr.
Bruce K. Cooil
Kennon R. Copeland
Charles D. Cowan
John R. Crammer
Keith N. Crank
James A. Creiman
William G. Cumberland
Leonard A. Cupingood
Estella Bee Dagum
Robin A. Darton
Bruce M. Davis
Charles S. Davis
Roger B. Davis
Thomas M. Davis
Virginia A. de Wolf
Angela M. Dean
Pierre C. Delfiner
Lorraine Denby
Wayne S. Desarbo
Marie Diener-West
E. Jacquelin Dietz
Ralph Digaetano
David P. Doane
Joseph R. Donovan
Bonnie P. Dumas
William D. Dupont
Harold E. Dyck
Jean L. Dyer
L. Marlin Eby
Robert G. Edson
Marlene J. Egger
Curtis S. Engelhard
Patricia A. English
A. Richard Entsuah
Samuel M. Epstein
Neil R. Ericsson
Mark A. Espeland
Sylvia R. Esterby
Michael J. Evans
David Fairley
Frederick W. Faltin
John P. Fazio
Michael B. Feil
Luisa T. Fernholz
Christopher A. Field
Dianne M. Finkelstein
Allen I. Fleishman
Hans-Theo Forst
Peter E. Fortini
Janet F. Fowler
Leroy A. Franklin
Anne E. Freeny
Larry D. Freese
Stephen A. Freitas
Arthur Fries
Paul Gallo
Michael A. Gates
Constantine Gatsonis
Edward E. Gbur Jr.
Malay Ghosh
John A. Gillespie
Michael E. Ginevan
Beth C. Gladen
Joseph Glaz
William J. Glynn
A. Blanton Godfrey
Alfred D. Godfrey
Avni Goeksel
Richard F. Goldstein
Barry I. Graubard
Janis G. Grechko
Stephanie J. Green
Joel B. Greenhouse
Susan Groshen
Leslie S. Grunes
Berton H. Gunter

Longtime members

Yesvy Gustasp
Perry D. Haaland
Michael Haber
Michael D. Hale
William A. Halteman
Katherine T. Halvorsen
Michael S. Hamada
David C. Hamilton
Janet M. Hanley
John B. Hannon Jr.
David Hardison
William V. Harper
Stephen P. Harris
Gary D. Hatfield
Maurine A. Haver
William D. Heavlin
Charles E. Heckler
Harold V. Henderson
Ellen Hertzmark
Thomas Herzog
Richard P. Heydorn
Susan M. Hinkins
Chihiro Hirotsu
Edward C. Hirschland
Douglas A. Hlavacek
Lorrie L. Hoffman
Thomas P. Hogan
Larry R. Holden
Carol C. House
Berne Martin Howard III
Marla L. Huddleston
Arthur L. Hughes Jr.
Allen C. Humbolt
Mohammad F. Huque
Deborah D. Ingram
John M. Irvine
Alan J. Izenman
Jean G. Jenkins
Linda W. Jennings
Gary R. Johnson
Paulette M. Johnson
Robert E. Johnson
Gerald A. Joireman
Albyn C. Jones
Michael P. Jones
Harmon S. Jordan
David R. Judkins
Karen Kafadar
Lee D. Kaiser
Leslie A. Kalish
Bruce A. Kaplan
John M. Karon
Theodore G. Karrison
Charles R. Katholi
Barry P. Katz
Darryl Katz
Jerome P. Keating
Elizabeth J. Kelly
Arthur J. Kendall
James L. Kepner
Meena Khare
Syed N. U. A. Kirmani
John C. Klensin
George J. Knafl
Edward L. Korn
Kallappa M. Koti
Kenneth J. Koury
Lawrence Krasnoff
Jeffrey P. Krischer
Alok Krishen
Pieter M. Kroonenberg
Katherine B. Krystinik
Naoto Kunitomo
Lynn Kuo
James R. Lackritz
Edward Lakatos
Mansum A. Lam
Kuang-Kuo Gordon Lan
Thomas P. Lane
Stephen S. Langley III
Lisa M. LaVange
Philip T. Lavin
Brian T. Leahy
Barbara A. Leczynski
Johannes Ledolter
Hyunshik J. Lee
Kwan R. Lee
Martin L. Lee
John J. Lefante Jr.
Greg M. Lepak
James M. Lepkowski
Donald K. Lewis
Richard A. Lewis
Steven A. Lewis
Wai K. Li
Barbara A. Lingg
Carol L. Link
Robert E. Little
George A. Livingston
Wei-Yin Loh
Roger Longbotham
Stephen W. Looney
Milton W. Loyer
Jay H. Lubin
Michael F. Macaluso
John MacIntyre
Jay Magidson
Linda C. Malone
Kanti V. Mardia
Ray L. Marr
Joe Matsuoka
LeRoy T. Mattson
Scott E. Maxwell
Fred M. Mayes Jr.
Charles Maynard
Michael J. Mazu
Donna K. McClish
Joseph P. McCloskey
Kenneth F. McCue
Peter McCullagh
Janet Elizabeth McDougall
Daniel L. McGee
Philip G. McGuire
Stephen A. McGuire
Geoffrey J. McLachlan
Christine E. McLaren
Kathleen A. Mellars
Michael Meredith
Samuel Merrill III
Michael M. Meyer
Joel E. Michalek
Eva R. Miller
Michael F. Miller
Renee H. Miller
David H. Moen
George E. Morgan
June Morita
Michael Joe Morton
Barbara G. Mroczkowski
Lawrence H. Muhlbaier
Nitis Mukhopadhyay
Keith E. Muller
Jay Munson
Bengt Muthen
Haikady N. Nagaraja
John C. Nash
Reinhard Neck
Dean V. Neubauer
David Butcher Nolle
Michael A. Nolte
Robert M. Norton
Tom S. Nunnikhoven
Barry D. Nussbaum
Kevin F. O'Brien
Judith Rich O'Fallon
Thomas W. O'Gorman
Patrick D. O'Meara
Terence John O'Neill
Walter W. Offen
Thomas H. Oliphant
Frank Olken
John A. Ondrasik
Soo Peter Ouyang
William J. Owen
Albert Palachek
Alberto Palloni
Mari Palta
Deborah L. Panebianco
Won J. Park
Mary R. Parker
Robert A. Parker
Robert E. Parson
Sharon M. Passe
Jeffrey S. Passel
Kevin Pate
Charles L. Paule
Karl E. Peace
Roxy L. Peck
Jane F. Pendergast
Elgin S. Perry
David W. Peterson
John J. Peterson
Joseph D. Petruccelli
Daniel Pfeffermann
John G. Phillips
Gregory F. Piepel
Joseph G. Pigeon
William E. Pollard
Chester H. Ponikowski
Darwin H. Poritz
Randall W. Potter
Paul N. Powell III
Manfred Precht
Louis H. Primavera
Howard M. Proskin
Lloyd P. Provost
Jamie K. Pugh
William M. Pugh
Clifford R. Qualls
Tony K. S. Quon
Volker W. Rahlfs
Gopa Ray
Domenic J. Reda
Mark R. Reiser
William K. Rice Jr.
Wasima N. Rida
Mark William Riggs
William J. Riley
Edwin L. Robison
David M. Rocke
Anthony M. Roman
Elvezio Ronchetti
Robin L. Rose
Gary L. Rosner
Peter J. Rousseeuw
Lawrence V. Rubinstein
Andrew L. Rukhin
David Ruppert
Roland T. Rust
Jim Rutherford
Michael S. Saccucci
William H. Sachs
Jerome Sacks
William M. Sallas
Ulderico Santarelli
Robert L. Santos
Adriano L. Sarmiento
Miles M. Sato
Nathan E. Savin
John W. Sawyer Jr.
William G. Saylor
Stephen Schacht
David J. Schaeffer
Kenneth Schechtman
Mark J. Schervish
Mark F. Schilling
Brian R. Schlain
Mark D. Schluchter
Timothy L. Schofield
Charles B. Schriver
John H. Schuenemeyer
Donald J. Schuirmann
Steven J. Schwager
Sidney H. Schwartz
Michael Schwarzschild
David W. Scott
Marilyn M. Seastrom
Teddy I. Seidenfeld
Joanne B. Severe
Thomas R. Sexton
Arvind K. Shah
Ramalingam Shanmugam
Steven J. Shapiro
Mohammed A. Shayib
Mack C. Shelley II
Weichung J. Shih
Lucy Shneyer
Gary L. Shoop
Patrick E. Shrout
Stanley A. Shulman
Andrew F. Siegel
Richard S. Sigman
Arthur R. Silverberg
Jeffrey S. Simonoff
Terry L. Sincich
Judith D. Singer
Joan H. Skurnick
Richard J. Smith
Richard L. Smith
Robert A. Smith
Tom A. B. Snijders
Jose Francisco Soares
Francisco P. Soler
Dan J. Sommers
Terence P. Speed
Clifford H. Spiegelman
Gene D. Sprechini
Nancy L. Spruill
Donald M. Stablein
Edward J. Stanek III
Richard M. Stanley
Joel H. Steckel
David W. Stewart
Robert A. Stine
Sandra S. Stinnett
Maura E. Stokes
S. Lynne Stokes

Longtime members

Michael A. Stoto
Walter W. Stroup
David A. Swanson
Yoshio Takane
Roy Noriki Tamura
Deborah L. Tasky
Robert L. Taylor
Marcia A. Testa
David M. Thissen
Hanspeter Thoeni
John H. Thompson
Mary E. Thompson
Theodore J. Thompson
Anthony D. Thrall
Luke-Jon Tierney
Richard B. Tiller
Naitee Ting
David C. Trindade
L. Claire Tsao
Ruey-Shiong Tsay
Kam-Wah Tsui
Thomas P. Turiel
Gregory W. Ulferts
Thomas J. Uryniak
Jessica M. Utts
Esa Ilkka Uusipaikka
Pamela M. Vacek
Richard Craig Van Nostrand
Stephen B. Vardeman
Denton R. Vaughan
Joseph S. Verducci
Steve P. Verrill
Joseph G. Voelkel
Joachim Vollmar
Edward F. Vonesh
Grace Wahba
Joel A. Waksman
Katherine K. Wallman
Lars Walloe
Herbert W. Ware
David L. Weimer
Clarice R. Weinberg
James G. Wendelberger
Robert M. Wharton
Andrew A. White
Glenn D. White Jr.
David C. Whitford
Dexter C. Whittinghill III
Priya J. Wickramaratne
Christopher John Wild
Leland Wilkinson
William E. Wilkinson
Jeffrey R. Wilson
Michael A. Wincek
Farroll T. Wright
Tommy Wright
Elizabeth R. Zell
Daniel Zelterman

35–39 Years

Michael A. Adena
Joseph Adwere-Boamah
Dorothee P. Aeppli
Sung K. Ahn
Christian M. Alaouze
Adelin I. Albert
Paul D. Allison
Dhammika Amaratunga
Yasuo Amemiya
Kathryn H. Anderson
John Angle
John E. Angus
Gerhard Arminger
Stephan Arndt
Sarah J. Arterburn
Babatunde J. Ayeni
Jenny A. Baglivo
John Bailer
Steven A. Bailey
Donald E. Bamber
David L. Banks
Andrew Lewis Baughman
Edward J. Bedrick
Alexander E. Belinfante
Stephen S. Bell
Michael E. Bellow
James Calvin Berry
Jonas V. Bilenas
Warren B. Bilker
Bruce Steven Binkowitz
Thomas R. Birkett
Paul K. Black
David K. Blough
Carol Joyce Blumberg
Mary Ellen Bock
Barry A. Bodt
Steven B. Boswell
Leonard E. Braitman
Craig C. Brandt
Rollin F. Brant
Pamela W. Broene
Thomas W. Broene
William J. Browning
Judith A. Buchino
Lawrence F. Burant
Carolee Bush
Kevin C. Cain
Carol Veum Caldwell
Charles A. Calhoun
Richard J. Caplan
Richard Raymond Carlson
Michael L. Carniello
Nancy J. Carter
John V. Castellana
N. Rao Chaganty
Subhabrata Chakraborti
Raymond L. Chambers
Charles W. Champ
Theodore C. Chang
Douglass S. Chapman
Robert L. Chastain
Jean Chesson
Yu-Kun Chiang
Christy Chuang-Stein
Constance F. Citro
Murray K. Clayton
Mario A. Cleves
Avital Cnaan
Paul E. Coffman Jr.
Richard D. Cohn
Michael Christopher Conlon
Margaret Conomos
Charles F. Contant Jr.
Nancy R. Cook
Peyton J. Cook
Germaine Cornelissen-Guillaume
Stephen R. Cosslett
Patricia S. Costello
Noel A. Cressie
Douglas E. Critchlow
David C. Cue
John L. Czajka
Mark Y. Czarnolewski
Veronica A. Czitrom
Marie Davidian
Richard A. Davis
Thomas C. Dawe
Pieter J. de Jongh
Richard D. De Veaux
Roger L. Deaton
Michael R. Delozier
Dipak K. Dey
James DiCanzio
David M. Dillard
John S. Dixon
Thomas W. Dobbins
Ken Grant Dodds
Jeff F. Doerzbacher
Gaylen W. Drape
Kevin Ward Drummey
Susan L. Durham
Kirk A. Easley
Don Edwards
Thomas Barry Edwards
Bruce P. Ekholm
Ronald K. Elswick Jr.
Brian John English
Eugene A. Enneking
Kent M. Eskridge
James T. Fagan
Dean H. Fearn
Gwyn R. Ferguson
Eric Jeffrey Feuer
Denzil G. Fiebig
Patrick E. Flanagan
Dean A. Follmann
Gosta Forsman
T. A. Foster
Floyd J. Fowler Jr.
Edward W. Frees
Jerome Frieman
Peter P. Gaccione
Shayne C. Gad
Lionel A. Galway
Joseph C. Gardiner
Mary E. Garvin
Jeffrey J. Gaynor
Philip M. Gbur
James Connell Gear
Joseph C. Gfroerer
Subir Ghosh
Robert D. Gibbons
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ASA Mentoring: An Update

Alex Hanlon and David Morganstein

If we were fortunate, we benefitted from someone who took an interest in our professional lives. Perhaps we met such a person when we were graduate students, or perhaps early on in our career as a statistician. While mentoring frequently happens organically, our association—along with its chapters and sections—offers a wide array of mentorship opportunities for both mentors and mentees and provides members with a way to honor outstanding mentors.

In 2014, ASA President-elect David Morganstein proposed that the Washington Statistical Society (WSS) start a mentoring program. Mentoring would become one of his presidential initiatives, bringing focus to existing programs, formalizing others, and initiating new ones. Such programs can be found within ASA committees, sections, and interest groups, including the Committee on Applied Statisticians, Committee on Minorities in Statistics, Statistics in Epidemiology Section, and Caucus for Women in Statistics. The ASA's annual Conference on Statistical Practice hosts a successful mentoring program for conference attendees. Much has been written about the various programs and activities offered within our organization, including an entire *TAS* issue dedicated to mentoring (*The American Statistician*, Volume 71, Issue 1, 2017).

Council Activities and Plans

At JSM in Vancouver last summer, the Council on Chapters (COC) Governing Board's Officers Appreciation Workshop—organized by Vice Chair Isaac Nuamah—focused on mentorship at the chapter level. Prior to JSM, an electronic survey was sent to all chapter officers to gain insight into ongoing mentoring activities and to gauge the level of interest in such programs or activities. Twenty-one chapters responded to the survey, with four reporting current engagement in mentorship programs and 10 expressing an interest in starting one.

During the workshop, the four chapters engaged in mentorship activities shared their experiences, including North Carolina (NC), represented by Elizabeth Mannshardt; Philadelphia, represented by Tom Short; Southern Ontario, represented by Wendy Lou; and WSS, represented by Mark Otto. In addition, Morganstein, Sujata Patil (Statistics in Epidemiology Section), and Ji-Hyun Lee (Caucus for Women in Statistics) shared their experiences.

North Carolina

Briefly, the NC Chapter hosted a speed mentoring session for students and early career statisticians in April 2018. The intent was to informally and quickly connect professionals in a small-group setting. The session was meant to foster short-term relationships with the potential to solidify long-term relationships. Mentors and mentees discussed networking, goal setting, and career development with targeted questions and activities. Future speed-mentoring events will likely be planned.

In November, the NC Chapter offered their first Mentoring and Early Career Development Workshop, featuring prominent statisticians and interactive sessions on goal-structuring and professional development. Workshop participants were given the opportunity to meet with then ASA President Lisa LaVange in a small-group setting and to network with the NC ASA community.

Philadelphia

In 2017, the Philadelphia Chapter mentoring program was initiated by surveying all chapter members about their interest in becoming a mentee or mentor. Mentors and mentees were matched based on their responses. Guidelines on starting relationships were provided to dyad participants, with periodic follow-up that included suggestions for interactions and tips for enhancing the relationship. The Philadelphia Chapter began with 26 participants, paired by specialty area. After the first year, the overall feeling was that the program was worthwhile, and thus it continued into a second year, starting in the fall of 2018.

Southern Ontario

Members of the Southern Ontario Chapter of the ASA and the Southern Ontario Regional Association of the Statistical Society of Canada (SORA) engage in mentorship both as mentors and/or mentees through the Mentorship Program for Accredited Statisticians of the Statistical Society of Canada (SSC). Mentoring also takes place through an annual career advice panel and indirectly through networking at various workshops held throughout the year. An innovative tool used to connect mentors and mentees is the "Ask Me" badges worn by potential mentors during such meetings; this approach to connection allows mentees to self-identify with mentors based on personal and professional interests.

Washington Statistical Society

The WSS started a mentoring program in 2015, entering their third year in the fall of 2018. The program is open to non-members; however, such participants would eventually become WSS members through this program. The premise is that membership offers many benefits beyond participating in the mentoring program—matching mentors and mentees provides a great opportunity for mentees to develop as statisticians, mentors to give back to newer members of our profession, and for everyone to stay connected to the WSS.

The WSS Mentorship Initiative was inspired by and draws from the mentoring initiative underway throughout the ASA that encourages chapters and sections to consider mentoring programs (*bit.ly/2TFScHK*). It also suggests the initiation of a regular acknowledgement, such as the annual selection of an outstanding mentor. The WSS is a leader in this regard, having co-sponsored the Jeanne Griffith Award more than a decade ago. The potential benefits of participating in the program are described well by the ASA Committee on Applied Statisticians (see *bit.ly/2VQIgIE*).

Following the JSM workshop presentation, active discussion ensued, with many questions focused on how to start a mentorship program. Details of the workshop were published in the Spring 2019 issue of *Chapter Chatter*. As a follow-up, the COCGB invited JSM presenters to engage in a moderated virtual workshop intended for chapters and students interested in mentorship activities or programs on March 18. For more information about the workshop, contact Alex Hanlon at *alhanlon@vt.edu*. ■

Happy MSAM

Mathematics & Statistics Awareness Month!

Lara Harmon, ASA Marketing and Online Community Coordinator

Photo by Lisa Wong

Doctoral students Alex Cloud, second from right, and Longshaokan Wang, third from right, work with undergraduate students on data analytics for the online game League of Legends as part of a Laber Labs project.

It's April! It's time to celebrate the warmer weather—*and statistics!*

Every April, the ASA and other institutions throughout the US celebrate Mathematics and Statistics Awareness Month.

To kick off the month, turn to the middle of this issue of Amstat News to find our pull-out poster celebrating the many ways statisticians and data scientists contribute to solving real-world problems. If you work with students, hang the poster up in your classroom or office to introduce them to the wide range of ways statistics affects the world every day.

We have a few more chances for students to learn about applications of statistics and data science this month. A different expert will explain how they use statistics to solve problems via a prerecorded screencast each week. After the presentation, students will be able to send in questions for the presenter. Here's our lineup for the month:

- Machine learning and video game AI (Eric Laber, associate professor of statistics, NC State University) – Monday, April 15, 12:00 p.m.
- Understanding athletes' performances (Stephanie Kovalchik, research fellow, Institute of Sport, Exercise, and Active Living, Victoria University) – Monday, April 22, 12:00 p.m.
- Caring for the environment (Erin Schliep, assistant professor, department of statistics, University of Missouri) – Monday, April 25, 12:00 p.m.

Have you planned any events or outreach for Mathematics and Statistics Awareness Month? Let us know how your plans turn out! Email Lara Harmon at *lara@amstat.org* about what you have done, and we may feature a look at your activities in a future issue of *Amstat News*. ■

Photo courtesy of Eric Laber
Alison Wu builds computer vision models for Laber Labs' robot, Nona.

Photo by Emily Gallagher/Drexel University
Drexel University doctoral student Ruby Bayliss (left) and associate professor Loni Tabb are biostatisticians.

SOCIAL CHATTER

Give **three words** that describe your work in statistics.

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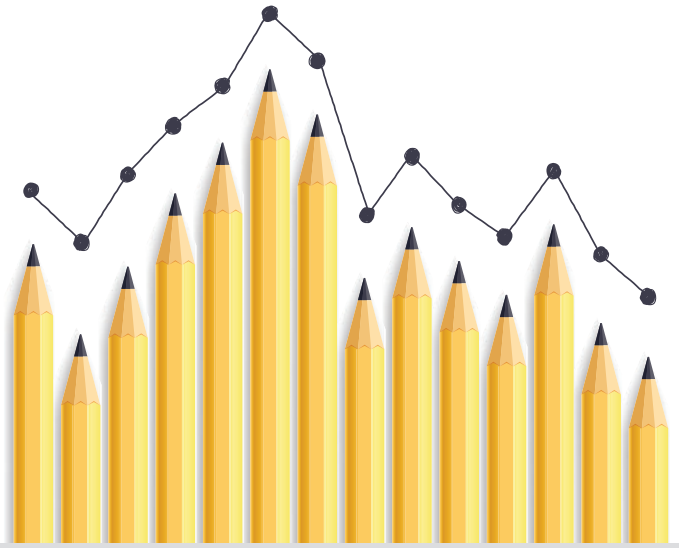
R or SAS?

James Love
We succeed together

Nitin Sharma
Uncertainty, assumption and zeal

Hojoon Lee
Seasonal Influenza Surveillance

Leonard S. Manullang
no spatiotemporal dynamics



Joyce Robbins • @jtrnyc
teaching many students

Daniela Witten • @daniela_witten
N too small

Ralph Winters • @RDub2
Definitely not normal

Jason Brinkley • @DrJasonBrinkley
Please don't crash. #ISayThisEveryDay #TerribleProgrammer

Jonathan Bleier • @jeble
Denial Anger Bargaining

Mario Cortina Borja • @cortina_borja
Analysing Data Collaboratively

Isabella R. Ghement • @IsabellaGhement
Solving interesting problems

Leslie McClure • @StatGirlLAM
So much fun!

Irwin Collier • @irwincollier
Specification before estimation

David • @DaveS002
Retired Retired Retired

Lydia Lucchesi
Population health metrics

Muzaffar Hussain Bhurgari
Game of prediction

Juha Ahokas
A hypothesis anybody?

Matteo Fontana
Nonparametric complex data

Kristen Behnke Lum
Putting patients first

Stanley Gorzelnik
Sadly misunderstood work

Ru Sun
Now you see

Jaidev Deshpande
Large p value

Filip Meissa
somebody help me

Kel Zou
Real World Evidence.

Next Month:
We'll ask our followers —
What do you remember most about your first JSM?

NEW MASTER'S OR DOCTORAL

DATA SCIENCE AND ANALYTICS PROGRAMS

The proliferation of master's and doctoral programs in data science and analytics continues, seemingly due to the insatiable demand of employers for data scientists. *Amstat News* started reaching out two years ago to those in the statistical community who are involved in such programs to find out more. Given their interdisciplinary nature, we identified programs involving faculty with expertise in different disciplines—including statistics, given its foundational role in data science—to jointly reply to our questions. We have profiled many universities, including a few in January's issue (*bit.ly/amstatjanuary19*); here are fi e more.

VIRGINIA TECH

Tom Woteki is professor of statistics at VA Tech and director of the MA program in data analysis and applied statistics in the National Capital Region. Previous positions include chief data scientist and chief technology officer for various corporations; chief information officer for the American Red Cross; and faculty appointments at Princeton and The University of Texas at San Antonio. His has a PhD in statistics and a BS and MS in mathematics, all from VA Tech.

Degree name: MA Data Analysis and Applied Statistics (DAAS)
www.stat.vt.edu

Year in which first students are expected to graduate: Summer 2021

Number of students currently enrolled: First admissions will be fall 2019

Partnering departments: Lead department is statistics

Program format: Eleven courses (33 credit hours), including a capstone project; four of 11 will be electives from partner departments emphasizing application in another discipline. Combination of online and in-person. Student profile is early to mid-career professional or government worker working full-time.

Describe the basic elements of your data science/analytics curriculum and how the curriculum was developed.

The curriculum comprises 11 three-credit courses. The core curriculum consists of seven courses that cover essential methods and tools in data analysis, applied statistics, computing, data visualization, and communication. These include three applied statistics courses that provide a solid foundation for developing, applying, and interpreting commonly used methods and a statistical computing course based on R. The four electives will include quantitative courses offered by other Virginia Tech academic departments so students can focus their data analysis skills on an area of interest to them or their employers (e.g., data science, economics, public health).

The data science option involves the four elective courses. These include two advanced courses that equip students with a wide variety of techniques considered a standard part of the data scientist's toolkit and an advanced statistical computing course, all of which can be taught by our statistics or computer science departments. The fourth course

details experimental design for standard situations such as A/B and multivariate testing, as well as providing best practices for planning cost-effective and efficient data-driven projects. We think this course is one that distinguishes our degree from other data science degrees we have seen.

What was your primary motivation(s) for developing a master's data science/analytics program? What's been the reaction from students so far?

As in many other parts of the country, there is a huge demand in the National Capital Region (NCR) for an analytically sophisticated workforce. Amazon's selection of the NCR as one of its two HQ2 locations has heightened the demand. The DAAS degree program responds to this demand and will be part of VA Tech's recently announced $1 billion innovation campus, which will be located in the NCR.

How do you view the relationship between statistics and data science/analytics?

In our view, contemporary applied statistics and data science are different aspects of the same discipline. The primary objective of both is to extract information and insights from data for evidence-based decision-making, predictions, and classification. Both require the ability to analyze and interpret data sets of various provenance, type, and size, and both share a wide variety of algorithms, methods, and visualization techniques, which, in turn, require significant computing and data management skills.

Grounding our degree in statistics with an emphasis on data science distinguishes it from other degrees that emphasize other aspects of the latter. Our program provides a strong statistical foundation so data scientists can be confident in their analyses. Graduates of this program will be able to analyze and mine data in all of its various forms using appropriate techniques.

What types of jobs are you preparing your graduates for?

Employers in the NCR include the federal government and companies focused on it; major corporations in the health care, financial, and consulting sectors; and a diverse array of startups in these and other sectors, including social media. Our program is designed to prepare students for successful careers with any of these employers.

What advice do you have for students considering a data science/analytics degree?

Students might consider whether they want a degree in "pure" data science/analytics or a degree program that provides them the opportunity to combine solid training in analytics with training in a field in which they would like to apply their data analytic skills. Our program, with its electives, allows them to pursue either path.

Describe the employer demand for your graduates/students.

We have reached out to prospective employers in both the public and private sectors seeking input on the design of our program. Indications are that the demand for our graduates will be very high.

Do you have any advice for institutions considering the establishment of such a degree?

We have taken the approach of building out from one of the core data science disciplines: statistics. Other common choices are mathematics and computer science. Including four elective courses in our curriculum gives us the flexibility to develop partnerships with other departments across VA Tech to tailor the degree to a wide variety of interests, both internal to the university and externally.

UNIVERSITY OF NOTRE DAME

Roger Woodard joined the University of Notre Dame in 2017 as the inaugural director of its new online MS-ACMS data science graduate program after spending 14 years at North Carolina State University. At NCSU, Woodard was a teaching professor in the department of statistics and, since 2013, director of online programs in the department of statistics. Woodard graduated *cum laude* from Culver Stockton College with a BA in mathematics in 1992. He earned a PhD in statistics from the University of Missouri.

Degree name: Master of Science in Applied and Computational Mathematics and Statistics: Data Science Specialization
datascience.nd.edu
Year in which first students are expected to graduate: 2019
Number of students currently enrolled: 73
Partnering departments: Applied and computational mathematics and statistics (with additional faculty from the Mendoza College of Business and the Office of Information Technology)
Program format: This is an online program with 30 credit hours. The students in our program are part-time and most have employment and other commitments on top of that.

Describe the basic elements of your data science/analytics curriculum and how the curriculum was developed.

The online master's program in data science at the University of Notre Dame was created with a great deal of input and advice from our industry partners. Several partners were surveyed about the desired content of the program as it relates to real-world application.

Prior to beginning the program, we suggest students have basic coding abilities; however, some students begin with little or no coding experience and succeed.

The curriculum was built to help students develop three major skill sets: technical expertise; communications; and ethics. The curriculum is designed to be lock-step so students take all courses with their cohort. This promotes cohort bonding and comradery that we find to be unique in an online program.

Programming in R and Python is woven into a majority of the courses in the program and supplemented by exposure to technologies such as SQL, Hadoop, and Tableau. Students are taught to have a strong conceptual understanding of statistical methods as they progress from basic probability and statistics through linear modeling, behavioral data science, generalized linear modeling, and time series courses. The students also complete a series of courses that expose them to machine learning, image analysis, and deep learning. The capstone course challenges students to use the skills they have developed to help a company with a real-world data problem. We think this is an excellent way for students to have a hands-on experience with the data science skills they have developed.

What was your primary motivation(s) for developing a master's data science/analytics program? What's been the reaction from students so far?

When Notre Dame's senior leadership decided on the online data science degree, they identified it as an exciting multidisciplinary field growing exponentially in social relevance and industry impact. Also identified was a need for highly skilled and multidimensional professionals. The senior leadership thought Notre Dame could provide a distinctive learning experience rooted in statistical and computational methods. In addition, and even more crucial, they thought Notre Dame could provide the ethical training and communication strategies necessary for long-term success in today's workforce.

Having our leadership working closely with visionary industry leaders such as AT&T's John Donovan enabled Notre Dame to build an online curriculum and program structure to serve the needs of working professional students located around the world.

How do you view the relationship between statistics and data science/analytics?

Statistics is one of the many disciplines that have come together in our program. We see that statistics brings in a vital set of tools for thinking about data. We work hard to help our students develop a strong conceptual understanding of sources of variability and their impact on models.

In the realm of big data, with millions of observations, traditional techniques like hypothesis testing may be less interesting, but thinking about sampling, sampling variability, and model fitting are still relevant.

In our program, we work hard to bring together statistics, computer science, behavioral sciences, communication, and ethics in a program that stresses conceptual understanding, not just techniques. By building this deeper understanding, we try to develop data scientists who can adapt to changes in technologies and methodologies.

What types of jobs are you preparing your graduates for?

We train our students to be "data scientists," though we realize this role will look very different depending on the industry and employer. We want our students to be able to apply various methodologies and consider the ethical impact their decisions have. We want them to be able to collaborate with different subject-matter experts and tell the story of the data they are working with.

The students in our program tend to be mid-career and thus have more corporate and industry experience than students in many other programs. This experience means our students are more likely to be able to obtain more senior and managerial positions once they graduate with their new skill sets.

Our program stresses flexibility and the collaborative nature of data science. It is preparing our students to adapt in any situation and use critical thinking in understanding data science methodologies. Data science is an ever-changing and always-evolving field, and we want our students to be prepared to handle any situation that comes their way.

What advice do you have for students considering a data science/analytics degree?

When considering a program, it is always beneficial to talk to the students who are in the program or have gone through the program. They can offer insight into what the daily life and culture is and how they balance it with other responsibilities.

You also want to look at the faculty and student interaction. We pride ourselves on the faculty and student interaction in our program. We know that, in an online program, there is the potential to feel isolated. We counter that with building close cohorts and fast response times from faculty and staff. It is important to learn from your faculty member, but it is also important to learn from your fellow classmates, as everyone brings something unique to the table.

Describe the employer demand for your graduates/students.

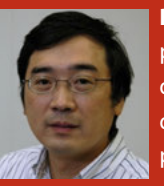
The field of data science is a quickly growing one. Currently, there is a high demand for data scientists. We graduate our first class this upcoming May and have already seen students accelerate in their careers. One of our corporate partners told us they have hundreds of job openings for data scientists and, once they fill them, they will have even more.

Do you have any advice for institutions considering the establishment of such a degree?

When we created this program, we knew we wanted it to be unique and we wanted it to offer the Notre Dame experience, even though the students are not on the main campus. We start their program with an orientation on campus so they can meet their classmates, faculty, and staff in person before they start classes. We think this sets the students up for success because they know they are part of a family. They know that, when they face adversity, they can reach out to classmates, their faculty, and our program staff for help.

We designed this curriculum specifically for this program, and it was created in a way that weaves together our mission throughout the courses. We custom built each and every course with our Office of Digital Learning and our faculty so the students would have a holistic experience. By creating a digital campus with our NeXus platform and other tools such as Zoom, we have been able to create a program that brings the Notre Dame tradition and experience to our students all over the world.

RUTGERS



Rong Chen is distinguished professor of statistics and director of the master's in data science (statistics track) program in the department of statistics at Rutgers University in New Brunswick. He specializes in nonlinear, nonparametric time series analysis; Monte Carlo methods; and statistical applications in bioinformatics, business, and engineering. He is a fellow of the ASA and Institute of Mathematical Statistics.

Degree name: Master of Statistics (Data Science)
https://msds-stat.rutgers.edu
Year in which first students graduated: 2017
Number of students currently enrolled: ~100
Partnering departments: Statistics and computer science
Program format: 10 in-person courses (30 credit hours), 8 required and 2 electives

Describe the basic elements of your data science/analytics curriculum and how the curriculum was developed.

The Rutgers Master's in Data Science (MSDS) program was developed by the statistics department in collaboration with the computer science department, resulting in two structurally separated subprograms under a unified Rutgers master's in data science program: the statistics track and computer science track. The statistics track, which awards the Master of Statistics degree, directs its focus toward the data analysis aspect of the data science field.

The MSDS (statistics) program is designed for highly motivated students with a bachelor's degree in mathematics, statistics, engineering, computer science, economics, finance, or a related quantitative field. Multivariate calculus, linear algebra, introduction to probability, theory of statistics, and statistical computing or advanced programming courses are prerequisites.

The program requires students to successfully complete 10 courses (30 credit hours), of which eight are required courses and two are electives. A comprehensive project report, which may be an extension of one or two course projects the student has done during the study, is also required for graduation. The program also contains a practical training requirement, which can be fulfilled via an internship, full-time employment in the field, on-campus research, or

participation in either the MSDS practitioner's seminar series or the MSDS career workshop series.

What was your primary motivation(s) for developing a master's data science/analytics program? What's been the reaction from students so far?

With increasing data collection and advanced computational abilities, the analysis of massive data and the extraction of useful information from it have become major emerging frontiers of computer science, statistics, and related fields. Analytical tools have become indispensable to industry and society in general, creating a strong surge in demand for professional data scientists.

The statistics faculty at Rutgers are actively engaged in state-of-the-art research in data science in both theoretical development and applications.

Rutgers is located in the tri-state area, with a vast number of companies seeking talent in data analytics. Rutgers is ideally positioned to offer a data science program that produces high-quality data science professionals to meet local and national demand. The number of applicants to the program has grown many folds since the inception of the program, and we expect the trend to continue.

What types of jobs are you preparing your graduates for?

The Rutgers MSDS (statistics) program trains students to become professional data scientists working in all industries, consulting firms, federal and local governments, and various organizations. They are highly trained in data collection and survey, data wrangling, statistical analysis, machine learning, information communication and visualization, and informed decision-making.

What advice do you have for students considering a data science/analytics degree?

An advanced degree is desired for a student who wishes to become a professional data scientist due to the interdisciplinary nature of the field and the vast range of tools needed to master. A good program should provide a mix of theoretical foundation, methods, and practical experiences. The program should not be a training program that only offers tools. A deep understanding of the state-of-the-art methods with extensive practice experiments on how the methods are used in practice and how the results are interpreted is vital. The program should also offer extensive career development services, with professional staff experienced with industry relationships and networking skills. Rutgers' MSDS program was designed under these considerations.

Describe the employer demand for your graduates/students.

Data scientist has been named the best job in America for three years running, according to Glassdoor's 2018 rankings. All our graduates have found high-paying jobs, with a small portion going to PhD programs. We see demand coming from financial services, technology, consulting, government, and pharmaceuticals, just to name a few.

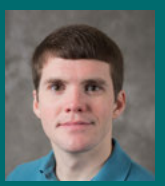
Do you provide career development services?

Yes. The MSDS (statistics) program at Rutgers is a professional master's degree program. A dedicated professional services office manages career development activities, industry relationship activities, and outreach activities. It assists students with résumé and cover letter writing, conducts mock interviews, and provides career advice. We have also established long-term strategic partnerships with companies in terms of internship positions and research collaborations.

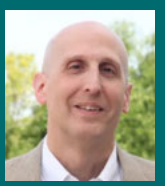
Do you admit part-time students?

Yes. The program is designed to fully accommodate part-time students. All classes are evening classes and meet once a week, so students can attend classes after work. Most of our part-time students complete the program in five or six semesters (including summer sessions).

UNIVERSITY OF ALABAMA



Nickolas Freeman is an assistant professor of operations management in the department of information systems, statistics, and management science in the Culverhouse College of Business. Freeman's research interests include health care operations management, supply chain management, and applied analytics.



John Mittenthal earned his doctorate in industrial and operations engineering at the University of Michigan – Ann Arbor. He applies his expertise in optimization to practical-based problems and is a member of The University of Alabama Business Analytics Symposium organizing committee.

Denise McManus earned her PhD from Auburn University. Prior to embarking on an academic career, McManus gained professional experience through development and delivery of information systems at Motorola, Boeing Computer Support Services, and International Business Machines (IBM).

Jan Jones, director of specialized master's programs, joined Culverhouse College of Business in 2005. She has served in both the management and marketing departments and Manderson Graduate School of Business. Jones earned her BBA with a minor in economics from the University of Mississippi.

Sharif Melouk is the associate dean of the Manderson Graduate School of Business and a professor of operations management at The University of Alabama. He earned his PhD from Texas A&M University and currently conducts research in health care operations and behavioral operations management.

Degree name: Master of Science in Business Analytics (MSBA)

http://culverhouse.ua.edu/msba

Year in which first students are expected to graduate: 2020

Number of students currently enrolled: Anticipate 20–25 in first cohort

Partnering departments: Information systems, statistics, and management science

Program format: The MSBA is a 36-credit hour, full-time program in which students progress as a cohort. All instruction is in person on The University of Alabama campus in Tuscaloosa. All classes include project work, with some projects spanning multiple classes.

Describe the basic elements of your data science/analytics curriculum and how the curriculum was developed.

The University of Alabama's MSBA program was developed with the needs of companies looking for analytics talent in mind. In particular, our curriculum planning was informed by survey responses from professionals involved in the assessment and acquisition of analytics talent at well-known companies. Based on insights regarding essential skills and trends garnered from the survey responses, our curriculum focuses on the following:

- Teaching students the principles of acquiring and managing data
- Providing students with hands-on experience in the use of cutting-edge analytics techniques by using data from, or inspired by, real-world problems
- Teaching students how to use software packages and programming languages commonly employed for analytics projects, including SAS, SQL, Python, Tableau, and R
- Teaching students how to interpret results, communicate results effectively, and use tools that promote reproducibility
- Making students aware of the ethical implications of analytics tasks
- Educating students about the landscape of the analytics community and the various opportunities for continued skill development throughout their career

Our program also includes 90 contact hours of seminars that will cover important new topics not covered in the core courses and provide more in-depth coverage of topics from the core courses. Faculty and experienced analytics professionals will teach these seminars. Furthermore, graduates from

the program will be given access to new seminar materials that have been developed after they have graduated from the program to enable their continued professional development.

What was your primary motivation(s) for developing a master's data science/analytics program? What's been the reaction from students so far?

Although we have seen an increase in the number of business analytics programs offered by degree-granting organizations, our survey of industry professionals—along with online sources of job market information—suggest there is still a substantial gap between the supply and demand for analytics talent. Moreover, we believe the long tradition of analytics education and research at the Culverhouse College of Business has provided experience and insight that allow us to offer an exceptional analytics educational program.

For example, through our Institute of Business Analytics, we host an annual symposium (*bit.ly/2HqKL0u*) that has featured speakers from General Motors, the US Centers for Disease Control and Prevention, the Public Broadcasting System, ESPN, Regions Bank, Deloitte, Proctor & Gamble, USAA, Booz Allen Hamilton, Overstock.com, SAS, Lockheed Martin, and others.

At this point, the reaction from students has been extremely positive.

How do you view the relationship between statistics and data science/analytics?

Statistics provides the theoretical foundation upon which data science and analytics build. Essentially, statistics provides the mathematical raw materials necessary for collecting, organizing, and analyzing data. Using the mathematical toolkit provided by statistics, data science and analytics seek to identify meaningful combinations and implementations of the tools that can solve important business problems at the scale required by today's companies.

What types of jobs are you preparing your graduates for?

We aim to produce graduates suited for entry-level analytics positions in manufacturing and service companies, as well as government institutions.

What advice do you have for students considering a data science/analytics degree?

First, we would advise students to use the many resources available online to fill any gaps in their mathematics and statistics knowledge.

Second, similar resources can be used to gain some level of familiarity with an open-source programming language applicable to statistical computations such as R or Python.

Third, students should seek out opportunities in which they can learn about the types of problems that can be addressed using data science/analytics. Several good podcasts such as Linear Digressions, the O'Reilly Data Show Podcast, and Not So Standard Deviations provide such exposure.

Also, competitions hosted by Kaggle provide a good perspective on problem types and possible data sources/formats. The posted kernels also provide insight into the skills students will need to gain to be competitive upon graduation.

Do you have any advice for institutions considering the establishment of such a degree?

Concerning the challenge of putting together an interdisciplinary program, the first step is clearly defining the mission of the program, which must be consistent with some existing or developing societal need. Once the mission is defined, it can be broken into steps that represent a road map.

Next, faculty who can contribute to the various milestones on the roadmap should be identified. It is worth noting at this point that the composition of the faculty team should emphasize not only expertise but also the potential for collaboration. The emphasis on collaborative potential is necessary because a successful analytics program will expose students to the end-to-end analytics process, from data acquisition to the communication of results and implementation. Faculty should design their courses and structure coursework and assignments in such a way that this end-to-end analytics process is clearly articulated and reproducible by the student upon graduation.

In preparation for program launch, we held several meetings with faculty to devise a program outline that streamlined coursework to minimize redundancies and identified potential data sets and projects that could be used across multiple courses.

COLORADO STATE UNIVERSITY

Jana Anderson is an associate professor and the director for the online learning and Master of Applied Statistics programs in the department of statistics at Colorado State University.

Degree name: Master of Applied Statistics – Data Science Specialization *mas.colostate.edu*
Year in which first students are expected to graduate: 2019
Number of students currently enrolled: 77
Program format: Offered both fully on campus and fully online. 30-31 credits are required. Consulting project required in place of thesis. Student type traditional, non-traditional, full-time, part-time, and continuing education. Internship program being developed. We currently require a consulting project with real client and real data. No assistantships are provided.

Please describe the basic elements of your data science/analytics curriculum and how the curriculum was developed.

We cover probability and statistical inference, both with applications, regression, generalized regression, design of experiments, quantitative reasoning, statistical learning, data mining, machine learning, programming, database management, and linear algebra. Elective courses include mixed models, multivariate analysis, Bayesian analysis, business intelligence, and data exploration. The final class is a consulting project.

What was your primary motivation(s) for developing a master's data science/analytics program? What's been the reaction from students so far?

We have seen an increasing need for our MAS graduates to have a solid background in programming and database skills. Exposure to SQL and Python in the master's program increases the number of options for students after graduation.

How do you view the relationship between statistics and data science/analytics?

Statistics provides a strong basis for studying data science. However, without coursework from other areas, the student's background for working in data science will be incomplete.

What types of jobs are you preparing your graduates for?

Data analyst, business analyst, statistical analyst

What advice do you have for students considering a data science/analytics degree?

Recognize the need for a solid background in calculus and linear algebra, and look for a program that includes courses on statistical inference, regression, experimental methods and statistical/machine learning. Also essential are data visualization, database, and programming skills.

Describe the employer demand for your graduates/students.

Based on prior experience with our Master of Applied Statistics – Statistical Science Specialization, we expect to have interest from industry, financial investment firms, internet service providers, and marketing firms, among others.

Do you have any advice for institutions considering the establishment of such a degree?

Consider the strengths of your department and other departments in your institution. Having a good working relationship with, for example, math and computer science departments, can make a big difference in developing a quality program, as will the ability to work with your dean or associate dean in developing a cross-disciplinary program. Try to avoid turning out students who are able to "plug and chug" through procedures, without understanding how those procedures work. ■

Statistics Honor Society Formed at George Mason

A local chapter of the US national statistics honor society, Mu Sigma Rho (ΜΣΡ), was recently formed at the Department of Statistics at George Mason University. Ilhan M. Izmirli, who spearheaded the application process, will be the faculty representative.

ΜΣΡ was founded in 1968 at Iowa State University, also the first school to house a statistical laboratory, which was established by the well-known statistician George W. Snedecor in 1934. The following are the main goals of ΜΣΡ:

- Promotion and encouragement of scholarly activities in statistics
- Recognition of exceptional achievements among the students and faculty in eligible academic institutions
- Advancement and reinforcement of intellectual accomplishments in the field

ΜΣΡ's endeavors include outreach and professional services. The society-sponsored events are designed to involve undergraduate students, graduate students, faculty, and professional statisticians. ■

Webinar: The Experiences of a Statistician in Industry

Have you ever wondered what a statistical consulting career in industry looks like? Don't miss an upcoming webinar sponsored by the Statistical Consulting Section titled, "The Experiences of a Statistician in Industry." The webinar registration is *free* for all ASA student members.

Title: The Experiences of a Statistician in Industry
Presenter: Philip Rocco Scinto, Senior Fellow, The Lubrizol Corporation
Date and Time: Wednesday, June 12, 2019, 12:00 p.m. – 1:30 p.m. Eastern
Sponsor: Section on Statistical Consulting
Registration deadline: June 10 at 12:00 p.m. Eastern

There are few jobs as rewarding and meaningful as a statistician in industry. The role presents a unique opportunity to enhance the capabilities of skilled scientists and engineers and have a meaningful impact on the organization's success.

The most successful industry statisticians are practical, use critical thinking skills, and focus on results. They possess both technical and communication skills, an unselfish focus on the customer, a deep understanding of the business, and a relentless desire to have a positive impact on the organization.

This webinar will highlight the necessary skills and traits through the experiences of a statistician practicing in industry for more than three decades.

Philip R. Scinto is a senior technical fellow for the Lubrizol Corporation, where he has been employed since 1989. He is also a fellow of the American Statistical Association. Scinto holds a BS from Cornell University and an MS in statistics from Carnegie Mellon University. He is known for applying innovative statistical solutions in industry, performing practical applied research in supersaturated designs and statistical engineering, and serving in leadership roles in the ASA. His role in the development and management of a comprehensive formulation modeling and optimization system, accessible on the Lubrizol Information Warehouse (Q.LIFE®), is among his proudest accomplishments.

Visit *bit.ly/WebinarsASA* to register.

2016 Diversity Workshop and Mentoring Program participants in Chicago, Illinois

Diversity Workshop to Focus on Developing Leaders, Growing Community, Ensuring Diverse Profession

The 2019 JSM Diversity Workshop and Mentoring Program will be held July 28–31, during the Joint Statistical Meetings (JSM) in Denver, Colorado.

This year marks the 10th anniversary of the program, which brings together historically under-represented minority (African/African-American, Hispanic/Latino, and Native American) statisticians and data scientists at early to mid-career levels (i.e., graduate, postdoctoral scholars, and professionals) with senior-level statisticians and data scientists from academia, government, and the private sector for a structured, interactive program of career skills development, networking, and one-to-one mentoring.

The workshop will include four days of interactive sessions, engaging small-group discussions, mentoring, and networking.

Sunday, July 28: Full-day workshop of interactive sessions

Monday, July 29 – Wednesday, July 31: Two-hour sessions (plus 1:1 mentoring for selected participants)

Interested students and professionals are encouraged to apply/register by June 1 for full consideration. Applications received after June 1 will be considered as space allows. Limited student travel funding support is available.

This program is provided by the American Statistical Association's Committee on Minorities in Statistics.

For more information, including application/registration details, visit *bit.ly/dwmp2019* or contact Dionne Swift at *swift.dp@pg.com*. ■

Curriculum Recommendations for Growing Number of Two-Year College Data Science Programs

Brad Thompson teaches statistics at Delaware Technical Community College and is an instructional designer with the Center for Creative Instruction and Technology (CCIT). Thompson assists CCIT's work to implement new teaching methods, curricula, and technologies aimed at improving student retention and learning.

In response to the growing interest in data science education at two-year colleges, the American Statistical Association (ASA) hosted the Two-Year College Data Science Summit (TYCDSS) in May 2018. The project was led by Rob Gould of the University of California, Los Angeles and Roxy Peck of the California Polytechnic State University in San Luis Obispo.

With support from the National Science Foundation (NSF), the summit assembled 72 educators, researchers, and practitioners in statistics, mathematics, computer science, and data science. Summit participants included faculty from two- and four-year colleges, along with representatives from industry, government, and nonprofits. In addition to Gould and Peck, the steering committee included Nicholas Horton, Randy Kochevar, Brian Kotz, Mary Rudis, and Brad Thompson.

A primary goal of the summit was to produce a report (*bit.ly/2018TYCDS*) with curricular guidelines and recommendations to assist two-year colleges in establishing and maintaining data science programs. This report is now complete and available.

The summit and report considered three types of data science programs: (1) associate degree programs for students who intend to transfer to a four-year institution; (2) associate degree programs for students aiming to go directly into the workforce; and (3) credit-bearing certificate programs. While these three types of programs may share many similarities, they are each unique in their program outcomes, curriculum, and challenges.

One of the primary features of the report is a set of recommended program outcomes viewed through the lens of each program type. These are broken into the following categories, each with its own set of objectives:

- Computational Foundations
- Computational Thinking
- Statistical Foundations
- Statistical Thinking
- Statistical Modeling
- Data Management and Curation
- Mathematical Foundations
- Productivity Foundations

These general program outcomes, along with their associated learning objectives (which can be found in the report), were developed with input from two days of discussion among summit participants. In addition, recent research and curricular frameworks from the Park City Math Institute Data Science Initiative and the National Academy of Sciences Committee on Envisioning the Data Science Discipline were consulted to help frame discussion and writing.

Data science education at two-year colleges remains a new and relatively unproven endeavor. The TYCDSS report accounts for this by addressing many of the unique challenges each type of data science program may encounter. These include faculty

TYCDSS Writing Teams

Certificate programs

Brian Kotz
Mary Rudis
Joyce Malyn-Smith

Associate degree for transfer programs

Nicholas Horton
Mark Daniel Ward
Julie Hanson

Associate degree for direct-to-work

Kathy Kubo
Rebecca Wong
Brad Thompson
Roxy Peck

Rob Gould served as an editor and supported the three groups.

preparedness and professional development, establishing partnerships with local industry, and a general lack of consensus on what exactly data science is and what specific qualifications are necessary to work in the field.

Because a primary goal of most community and two-year colleges is to prepare students to be competitive in the workforce, one of the most critical challenges to starting a new certificate or associate degree program in data science is to ensure the employability and marketability of graduates. While many job postings in data science and analytics may still list a bachelor's or graduate degree as a minimum requirement, an encouraging outcome of the summit was the consensus among industry professionals that there is definitely a need for "entry-level" data scientists and two-year colleges have a role and opportunity to help meet this demand.

The report provides recommendations to aid two-year colleges in preparing capable practitioners in data science who can demonstrate mastery and working knowledge of concepts including data cleaning, modeling, and visualization; statistical thinking and programming; and database management.

Similarly, two-year colleges developing programs for students intending to transfer to a four-year institution need to develop a program that also satisfies articulation agreements. This should be accomplished while providing sufficient general education, mathematics, statistics, and computer science coursework to prepare students to seamlessly transfer into their junior year of a data science bachelor's degree program.

To meet the intended program outcomes and learning objectives while also overcoming a variety of challenges, the TYCDSS writing team makes seven recommendations for two-year colleges developing new programs in data science. These are based on discussions held at the summit and subsequent deliberations. The report further elaborates on each recommendation by providing additional information, examples, and research to support them.

It is recommended by the TYCDSS committee that two-year colleges developing new programs in data science should do the following:

1. Create courses that provide students with a modern and compelling introduction to statistics that, in addition to traditional topics in inferential statistics, includes exploratory data analysis, the use of simulations, randomization-based inference, and an introduction to confounding and causal inference.
2. Ensure students have ample opportunities to engage with realistic problems using real data so they see statistics as an important investigative process useful for problem solving and decision-making.
3. Explore ways of reducing mathematics as a barrier to studying data science while addressing the needs of the target student populations and ensuring appropriate mathematical foundations. Consider a "math for data science" sequence that emphasizes applications and modeling.
4. Design courses so students solve problems requiring both algorithmic and statistical thinking. This includes frequent exposure to realistic problems that require engaging in the entire statistical investigative process and are based on real data.
5. Expose students to technology tools for reproducibility, collaboration, database query, data acquisition, data curation, and data storage while also requiring students to develop fluency in at least one programming language used in data science and encouraging learning a second language.
6. Infuse ethical issues and approaches throughout the curriculum in any program of data science.
7. Foster active learning and use real data in realistic contexts and for realistic purposes. Programs should consider portfolios as summative and formative assessment tools that both improve and evaluate student learning.

Along with compiling the work achieved at the summit and throughout the writing process, the TYCDSS report also provides a list of current data science programs at various two-year institutions and a brief examination of their curricula and program requirements. Previous efforts and existing research are also discussed as additional and beneficial resources for two-year colleges preparing to develop programs in data science. Links to these resources, along with the final report and a March 2019 webinar, are available on the TYCDSS website (*bit.ly/2YCDSS*). ■

STAT*tr@k*

Tips on Building Your Networks

Ron Wasserstein is the executive director of the American Statistical Association. Previously, he was vice president for academic affairs t Washburn University (2000–2007). Wasserstein earned his PhD and master's in statistics from Kansas State University and his BA in mathematics from Washburn University.

During my lifetime, "network" became a verb, but the concept no doubt has been around from the earliest days of human history. The ways to form personal and professional networks have changed over time, and like everything else in our lives, the pace of change has accelerated greatly in the internet era. LinkedIn, Xing, Meetup, and other online networking services provide unique ways to connect with others. Developing one's networks—professional and personal—is important not only to career advancement, but also to feelings of fulfillment and happiness.

However you choose to make connections, there are at least three networking principles that preceded social media. I'll discuss these principles in terms of professional networks, but they also can be applied to personal ones.

Principle #1: **Build your network with others in mind**. That is, as you consider ways to connect with specific people, ask yourself what you can bring to the relationship. For instance, when you are networking with peers in other workplaces, you are in position to give them advice and support, and they for you. You can let each other know when good opportunities become available. You can provide them a sounding board they may not have in their own workplace.

However, what about networking upward? What do you have to offer to someone more experienced and higher up the ladder? This upward networking requires a bit more thought on your part, but there are aspects that can make such a relationship a win for both parties.

For instance, your more-experienced colleague may be looking for people to nurture for the next career level, or he or she may value hearing your perspective. Meanwhile, you may be trying to find that next job, or simply to learn from people with more experience. Through this two-way exchange, you both win.

And that is principle #2: **People are people, not network nodes.** View the individuals you are trying to connect with from the perspective of how you might meet their needs, not just how they could meet yours. One of the most annoying types of person is the one who sees networking as collecting, who sees prospects instead of people, and who thinks only about getting. Don't be that person!

I have found that a practical way to follow the second principle is principle #3: **Volunteering makes for great network connections.** I have made many wonderful professional connections—and terrific friends—by volunteering in the neighborhood, at school, for my children's sports teams or dance clubs, at work, and at the ASA before I became its executive director.

There are multiple benefits to building your network this way. Not only do you meet people, but you learn from them and about them as you work side-by-side to accomplish a task. I learned how to run a meeting—and, more importantly, how not to—from my volunteer activities. I saw examples of how to effectively express gratitude to volunteers I hope I have modeled for others. Barriers come down and real openness often occurs in these settings, and networking happens organically in the process.

As the executive director of the ASA, I'd be remiss if I didn't emphasize how volunteering to serve in ASA chapters, sections, committees, and outreach groups is a tremendous way for you to build a professional network and make lifelong friends. (By the way, the address by 2014 ASA President Nat Schenker at *bit.ly/NS2014JSM* illustrates this valuable message well.) I have no doubt those 20 years of ASA volunteer work helped build the network that ultimately led me to this wonderful opportunity to serve the association as its chief executive.

The three principles I have explained here—learned from others in the ASA and in my career in academia—have been a solid guide along the way. ■

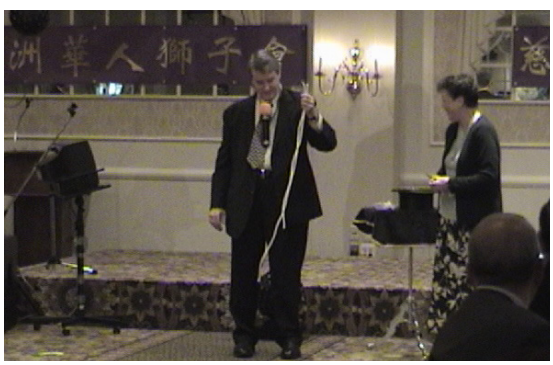
PASTIMES OF STATISTICIANS

What Does Lawrence Lessner Like to Do When He Is Not Being a Statistician?

Who are you, and what is your statistics position?

Lawrence Lessner, retired from the New York State Department of Health, teaching biostatistics for 10 years at SUNY Albany, and I am still affiliated with the Institute of Health and the Environment at SUNY Albany.

Lessner



Lessner performs for Chinese Lyons Club members in New Jersey.

Lessner performs during First Night in upstate New York.

I first saw magic after many years at the Magic Castle in Hollywood and was dismayed to find that all the magicians I saw were clown-like or comedic. My style is classical magic, and I take it seriously.

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

My hobby for 30 years has been to be a magician. I perform at many kinds of parties and events. Recently, I prepared for the stage magic competition at the International Brotherhood of Magicians Convention 2018.

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

I first saw magic after many years at the Magic Castle in Hollywood and was dismayed to find that all the magicians I saw were clown-like or comedic. My style is classical magic, and I take it seriously. Currently, I am developing a number of Chinese-style magic effects. ■

STATS4GOOD

Data for Good in the Public Square

With a PhD in statistical astrophysics, **David Corliss** leads a data science team at Fiat Chrysler. He serves on the steering committee for the Conference on Statistical Practice and is the founder of Peace-Work, a volunteer cooperative of statisticians and data scientists providing analytic support for charitable groups and applying statistical methods in issue-driven advocacy.

A couple weeks ago, I attended a regional meeting of a human trafficking task force. After a greeting and speaker presentation, we broke into groups—survivor support, housing, community partnerships, and so on. As usual, there wasn't a group for statistics and technology, so I went from one group to the next giving my Data for Good elevator speech and asking if anyone was interested in partnering with a statistical scientist. It's an idea most people I meet for the first time have never heard of.

Among the sciences, statistics often can be overlooked by the general public. For example, I ran the numbers on Google Trends for a variety of sciences—the standard list of departments one might find at a university. Statistics came in dead last in Google searches, with less than half the number for second-lowest astronomy. (I'm a statistical astrophysicist, embracing three of the bottom four in this informal survey …)

Most people think of us seldom and often have less understanding of what we do. As statisticians, we often don't get much of a reputation at all in the public square and what we get often isn't good, confused and conflated with others who misuse statistics for their own end. It's an image problem Data for Good advocates are doing so much to change.

One organization doing a great deal of good in the pubic square is Code for America (CfA, *www.codeforamerica.org*), whose Day of Civic Hacking was mentioned here in the February issue. Their mission is to make government work better and be more open, as well as leverage technology to help make that happen. CfA was founded by in 2009 by game industry executive Jennifer Pahlka, who spent a year as US deputy chief technology officer and continues to serve as Code for America's executive director. Much of CfA's work is done by *brigades*—local groups of coders and other technical experts working directly with local government. Code for America brigades have thousands of volunteers in more than 70 brigades across the county. You can connect with one though the Brigade Network page on their website.

With an overall objective to improve how government works, Code for America isn't specifically a Data for Good organization. Instead, D4G is one important tool it uses to help government serve people better. Through their hosting of civic hackathons and other projects, Code for America offers many opportunities for D4G to have an impact on communities and how their governments serve them.

As part of its mission to use technology, including statistical analysis, to help government function better, Code for America began an initiative to help identify people convicted of crimes in the past who are eligible to have their sentences modified—reduced or even erased.

CfA's Clear My Record project (*www.clearmyrecord.org*) recently partnered with the San Francisco District Attorney's Office to identify persons eligible for modified sentences for marijuana offences. When California changed their laws to permit recreational use of marijuana by adults in 2016, they made

Getting Involved

A number of organizations are accepting applications for summer programs in Data for Good. For example, Harvard's Strategic Data Project at the Center for Education Policy Research offers a summer institute July 16–19, training data leaders at educational institutions. Early application ends April 12, with the regular deadline being May 31. Learn more at *https://sdp.smapply.io*.

For those in the SAS community, I will be doing a Code Doctor session at SAS Global Forum at 11:00 a.m. April 28 with Data for Good as the area of expertise. This will be followed at 1:00 p.m. by a lunch roundtable discussing getting involved with Data for Good. I'm hoping to turn this opportunity into a D4G meetup and networking session. If SAS Global Forum is on your schedule, I hope to see you there.

sentence modification possible for some related offences. However, only a few dozen people hired a lawyer and applied for modification.

After CfA's Clear My Record project developed an algorithm to identify eligible individuals and created a web page and data pipeline to implement it, San Francisco cleared more than 8,000 convictions.

The impact for good is tremendous, with thousands of people who qualify under the new laws gaining access to more opportunities in employment, housing, and more.

Code for America isn't just changing how people see government. It's also changing how professional service in technology is seen as a force for good in the community. Through participation in the Data for Good movement, people can see statistics used to further peace, justice, and freedom. Analytics is applied in the service of health and wholeness. Mechanized statistics (a.k.a. machine learning) algorithms work to make stronger communities and a better world.

There are so many great organizations today—CfA, Statistics Without Borders, DataKind—along with thousands working as individuals on projects making an impact. In doing so, they are changing people's perception of statistics. Once the invisible science, Data for Good is playing a leading role in shaping—and reshaping—the public image of statistical science. ■

Biopharmaceutical Applied Statistics Symposium

The 26th meeting of the Biopharmaceutical Applied Statistics Symposium (BASS XXVI) will be held October 21–24, 2019, at the Hilton Charlotte University Place in Charlotte, North Carolina. One-hour tutorials on diverse topics pertinent to the research, clinical development, and regulation of pharmaceuticals will be presented by speakers from academia, the pharmaceutical industry, and the US Food and Drug Administration (FDA).

BASS will also offer a poster session and short courses, and Sally Morton will deliver the keynote address. Other popular features of BASS include the reception dinner and FDA/industry/academia session.

BASS is a nonprofit entity established to support graduate studies in biostatistics. It has supported more than 50 master's or doctoral degree graduate students in biostatistics.

For further information, visit *www.bass-conference.org* or contact the BASS registrar at *rewhitworth@gmail.com* or BASS chair, Tony Segreti, at (919) 417-5181 or *segretia@bellsouth.net.*

Enter JSM Data Art Show and Be Seen

Explore the "art" in data art by entering the JSM Data Art Show. The exhibition will take place in Hall D, inside the Colorado Convention Center, which is the site for JSM 2019.

JSM, taking place July 27 – August 1 this year, hosts thousands of professional statisticians from industry, government, and academia.

NOTE: *Artworks should be presented in a manner that would be appropriate for a mainstream art gallery, not a poster session or technical illustration.*

Submission Process

Applications should be submitted via email to *art.show.jsm@gmail.com*. A complete application will include the artist's contact information (name, email address, and phone number) and one image for each piece submitted. The name of the file must be in the following format: [LastName]_[FirstName]_[Title]_[Extension].

For each piece submitted, you should include the following:

- Title of the work
- Year the work was created
- Dimensions of the work
- Medium used for the work
- Brief description of the work (including the data set used)

You may submit up to three artworks. In the event the jury is forced to choose among submissions that received comparable scores (due to space restrictions), artworks will be selected in the order in which they appear.

Images should be JPEG files with a dimension of 1800 pixels in the larger direction, RGB format, and saved with maximum quality.

Nonconforming submissions will not be entered into the review process.

Submissions must be received by May 15. Notification of acceptance will be made via email by June 15. If you do not receive an email by June 15, your mail server is probably rejecting the emails.

Restrictions

Two-dimensional works will be limited in size to 20" x 28" (including frame), and three-dimensional works will be limited to 18" x 18" x 18". Exceptions may be made for existing artworks that exceed these dimensions.

There is a limit of three artworks per artist, including those that are collaborative work. An exception is a group of closely related small pieces that number no more than five pieces and occupy a total footprint of no more than 15" x 15", which can be submitted as a single piece.

Review Criteria

Jurors will review the following:

- Content (Is your data set compelling?)
- Artistic merit (We aren't looking for just data visualizations.)
- Medium (A variety of media will make for a more dynamic exhibit.)
- Craftsmanship (The level of skill and effort that goes into making an effective presentation of the idea.)
- Innovation and originality (Using data in new and original ways.)

Expectations Upon Acceptance

All artworks should be hand delivered to the art exhibit area by 11:00 a.m. Sunday, July 28. Participants are also responsible for picking up their works at the end of the conference (no later than 3:00 p.m. Wednesday, July 31) and will be expected to assist in set-up and tear-down of the art exhibition as needed.

The artworks will not be insured while on display. The conference will provide security for all exhibits, however.

Only accepted work, as shown in your submission, can be displayed. If you bring additional artworks or related materials, they will not be shown. You will be allowed to set out business cards or a single stack of postcards near your artwork.

You are strongly encouraged to attend the conference. If, for some reason, you are unable to attend, you will be responsible for shipping your artwork to and from the meeting at your expense, although a limited amount of funds may be available for reimbursement after the show. Instructions for shipping will be provided once the accepted pieces have been determined.

Questions related to the art exhibit should be sent to *art.show.jsm@gmail.com*. ■

Ron Fricker was recently named associate dean for faculty affairs and administration in the Virginia Tech College of Science. In his new role, he will assist in the recruitment, retention, and development of faculty.

Fricker

Prior to coming to Virginia Tech in 2015, Fricker was a professor in the operations research department at the Naval Postgraduate School in California. Fricker also served as associate director of the National Security Research Division and a senior statistician at the RAND Corporation. He has more than 20 years of statistics experience, including working in both corporate and academic settings and conducting research on Gulf War illnesses, military recruiting and retention, disease detection and surveillance, and body armor testing.

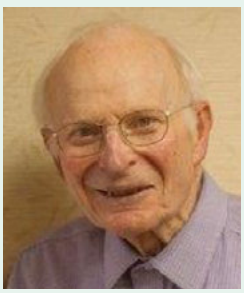
Fricker is a fellow of the ASA, former chair of the ASA Section on Statistics in Defense and National Security, and elected member of the International Statistical Institute.

Visit the Virginia Tech website at *bit.ly/RFricker* for details about Fricker's promotion. ■

Obituary

Mervin Muller

Mervin E. Muller, age 90, died peacefully at home in Columbus, Ohio, December 3, 2018.



Muller

Muller was born June 1, 1928, in Hollywood, California, the son of immigrants from Hungary. One of four brothers, Muller graduated from the University of California, Los Angeles (UCLA), receiving AB, MA, and PhD degrees in mathematics.

Muller had a long career in academia, development, and industry, and his substantive focus varied from statistics to information technology to international development. He worked for IBM in New York early in his career. Later, he spent 15 years at the World Bank in Washington, DC. In academia, he was a professor of computer science for seven years at the University of Wisconsin in Madison and finished his career at The Ohio State University, where he was chair of the computer science department, held the Robert Critchfield Professor of Engineering chair, and was director of the Performance Analysis Lab. Earlier in his career, he taught at UCLA, Cornell, Princeton, and George Mason University.

Muller authored 56 publications for professional journals and lectured or consulted in 37 countries. Among his professional honors were election as fellow of the American Statistical Association, election to the International Statistical Institute, and appointment as the founding president of the International Association of Statistical Computing.

In his retirement, Muller founded and hosted a nonfiction men's book club. He took modern bridge lessons and traveled to compete in duplicate bridge tournaments with his wife, Barbara, and participated in several social duplicate bridge groups. He loved Dixieland jazz and classical music and enjoyed concerts by the Columbus Symphony, the Carpe Diem quartet, and Chamber Music Columbus. He was a board member of Chamber Music Columbus. He was also a season ticket holder to Buckeye football games and climbed the 141 steps to his seat at age 89.

To read more about Muller, sign his online guestbook, or share a memory, visit *www.schoedinger.com*.

How Can We Help?

We want to help you share your own news with colleagues and showcase your latest successes.

It is important to us that everyone knows about your research, recent awards, and promotions!

If you have any news you would like to share, email *megan@amstat.org*.

NISS 2019 Jerome Sacks Award: Call for Nominations

Nominations are being sought for the 2019 National Institute of Statistical Sciences' (NISS) Jerome Sacks Award for Outstanding Cross-Disciplinary Research. The prize recognizes sustained, high-quality, cross-disciplinary research involving the statistical sciences.

An award of $1,000 will be presented during the NISS reception at the Joint Statistical Meetings in Denver, Colorado, July 27 – August 1.

For more information, including a list of previous award winners, visit *bit.ly/2FbLaT5*.

Procedure

To nominate an individual, submit as one PDF document the following information to *sacksaward@niss.org* by April 30:

1. Nomination letter (maximum two pages)
2. Supporting letters from two individuals (other than nominator)
3. Nominee's CV

Questions about the award or the nomination process can be sent to *sacksaward@niss.org*. To submit a nomination online, use *bit.ly/2HALIU3*. ■

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

Links Lecture Award	May 1, 2019	*awards@amstat.org*	Arthur B. Kennickell *arthur.kennickell@gmail.com*
Lester R. Curtin Award	Oct. 15, 2019	*awards@amstat.org*	Ronald L. Wasserstein *ron@amstat.org*
Lingzi Lu Memorial Award	Oct. 15, 2019	*awards@amstat.org*	Victoria Sides *victoriasides16@gmail.com*
Monroe. G. Sirken Award in Interdisciplinary Survey Methods Research	Oct. 15, 2019	*awards@amstat.org*	John L. Czajka *jczajka@mathematica-mpr.com*
Deming Lecturer Award	Nov. 15, 2019	*awards@amstat.org*	Roger W. Hoerl *roger.hoerl@gmail.com*
John J. Bartko Scholarship Award	Dec. 2, 2019	*awards@amstat.org*	Donna LaLonde *donnal@amstat.org*
Elizabeth L. Scott Award	Dec. 15, 2019	*community.amstat.org/copss/home*	

Students from Utah State's ASA Student Chapter work with ASA president-elect, Wendy Martinez, to review code submissions from Data Challenge 2016 at JSM in Chicago. From left are Wendy Martinez, Angie Merritt, Eric McKinney, Kristi Reutzel, Jill Lundell, and Brennan Bean. Not pictured: Chris Jones.

USU Data Analytics Club Reviews Code Submissions with ASA President-Elect

Brennan Bean, Utah State University Data Analytics Club President

Members of the Utah State University (USU) Data Analytics Club, an ASA student chapter, had the opportunity to work with ASA President-elect Wendy Martinez during her visit to the USU campus in Logan, Utah, in February of 2019. Together, they reviewed code submissions from Data Challenge 2016 at JSM in Chicago. Data challenge participants analyzed and visualized vehicle crash data provided by the US Department of Transportation.

The goal of the USU Data Analytics Club was to ensure that each participant's analyses and visualizations were fully reproducible prior to their publication in *Computational Statistics*. Club members formed teams to download and run project scripts available at *bit.ly/2UBqdpT*. Each team attempted to reproduce the described analyses and visualizations and commented on the quality and reproducibility of the ensuing results.

Students were able to identify elements in the various submissions that were easy to follow as outside viewers. The experience taught participating students powerful lessons about the "why" and "how" of reproducible research. Creating reproducible workflows are critical as rapid advancements in statistical software occasionally necessitate updates to old analyses. One student chapter member, Jill Lundell, said, "Reviewing code for the 2016 Data Expo was a great learning experience. Seeing what the participants did well and where they could improve helped me better organize my own code for sharing. I also picked up a few coding tricks."

In addition to learning best practices for reproducible research, the experience provided students the opportunity to interact with and learn from Martinez. Student chapter member Eric McKinney said, "Being with Wendy was a delight. She possesses years of experience and statistical prowess, yet she thrills to share it and empower others. It was an honor to meet her."

The USU Data Analytics Club meets regularly throughout the academic year. Meetings primarily consist of students helping other students learn and apply the tools of analytics through presentations, code sharing, and workshops. Specific examples of club meetings include a presentation on developing R packages, a workshop on developing websites using the blogdown package in R, and an illustrated implementation of deep learning for image recognition in Python. For details regarding club meetings, email *usudataanlytics@gmail.com*. ■

sectionnews

Quality and Productivity

The ASA Quality and Productivity Section will sponsor a continuing education course at JSM in Denver titled Big Data, Data Science, and Deep Learning for Statisticians. Ming Li, an established statistician and data scientist from Amazon.com will be the course instructor. The course is designed for a wide audience, covering traditional industry sectors, government agencies, and universities. Graduate students are especially encouraged to attend.

With the recent rise of the big data, data science, and deep learning revolution, enterprises ranging from FORTUNE 100 companies to startups across the world are hungry for data scientists and machine learning scientists to bring actionable insight from the vast amount of data collected. In the past few years, deep learning has gained traction in many application areas and become an essential tool in the data scientist's toolbox.

In this course, participants will develop a clear understanding of the big data cloud platform, acquire technical skills in data sciences and machine learning, and apply these skills to cases of deep learning through hands-on exercises. The course will also cover the "art" of data science and machine learning, teaching participants a typical agile data science project flow, how to avoid general pitfalls in data science and machine learning, and soft skills necessary to effectively communicate with business stakeholders.

The big data platform, data science, and deep learning overviews were specifically designed for audiences with a statistics education background. This course will prepare statisticians to be successful data scientists in various industries and business sectors.

Li is a senior data scientist at Amazon.com and adjunct faculty member in the department of marketing and business analytics at Texas A&M University - Commerce. He organized and presented the 2018 JSM introductory overview lecture "Leading Data Science: Talent, Strategy, and Impact" and was chair of the Quality and Productivity Section in 2017.

Prior to his position at Amazon, Li was a data scientist at Walmart and statistical leader at General Electric Global Research Center. He earned his PhD in statistics from Iowa State University in 2010. Possessing a deep statistics background and several years' experience in data science, he has trained and mentored numerous junior data scientists of varying backgrounds, including statisticians, programmers, software developers, database administrators, and business analysts. He is also an instructor at Amazon's internal Machine Learning University and was a key founding member of Walmart's Analytics Rotational Program, which bridges the skill gaps between new hires and productive data scientists. ■

Biometrics

The ASA Biometrics Section invites applications for funding to support projects developing innovative outreach projects focused on enhancing awareness of biostatistics among quantitatively talented US students. We are particularly interested in projects encouraging students to pursue advanced training in biostatistics.

We anticipate funding one project this year, with total funding of up to $3,000. The project timeline would be from 1.5–2 years.

All investigators are encouraged to apply.

Award recipients must be ASA and Biometrics Section members before project initiation.

How to Apply

A three-page application is due by May 31 and should be in the following format:

- Title, Objectives, and Specific Aims
- Background, Significance, and/or Rationale
- Design and Methods
- Deliverables/Products
- Budget

Expenditures such as 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. 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 July 1, 2019, and an end date no later than June 30, 2020, also should be specified.

Applications should be submitted electronically to the Strategic Initiatives Subcommittee chair, Tanya Garcia, at *tpgarcia@stat.tamu.edu.*

All investigators will be expected to submit a brief report at the conclusion of the project to the subcommittee chair.

Questions should be addressed to Garcia or subcommittee co-chair Milan Bimali at *MBimali@uams.edu.* ■

chapternews

Statistical Programmers and Analysts

The section on Statistical Programmers and Analysts (SSPA) is now accepting nominations for our new award for Innovations in Statistical Programming and Analytics (AISPA). This award recognize teams and individuals that have developed or introduced enhancements to tools, software, and methodology for the solution to problems in statistical programming and analytics or have made large contributions to the community of statistical programmers and analysts. This award is not limited to senior members, nor for career service. Instead, anyone that has a made a considerable contribution within this domain may be nominated.

It is encouraged that each nominee is a member of SSPA, but not required. However, each nominee (or at least one member of a nominated team) must be a current ASA member.

Presentation of the award will occur at JSM 2019 during the SSPA mixer. This includes a $300 honorarium (total) for all reward recipients and a framed citation to each recipient. The SSPA will also host a webinar given by the recipient(s) on a subject of their choosing. Travel to JSM is not required to receive the award, and the award can be presented to an appointed representative of the team or sent to the team by mail. Travel will not be provided for the award.

The recipients of AISPA will be determined by an awards committee of current and former SSPA officers. Selection criteria is determined by the significance of the candidates contribution to the categories: Improvement in software tools for statistical programming and analytics; Methodology to improve the efficiency of statistical programming and analytics; Outstanding contributions to the community of statistical programmers and analysts.

Please email questions and nominations to *jlisic@gmail.com* by May 15, 2019 with a nomination letter addressing the three selection criteria, the CV(s) of the nominee(s), and no more than four supporting letters. ■

Purdue Chapter

Members of the Purdue Student Chapter listened to a talk about PyTorch given by Jungeum Kim February 5. The chapter now has 212 members.

North Carolina

The ASA North Carolina Chapter kicked off its professional webinar series with Aric LaBarr presenting "What Does Data Science Mean to an Executive?" to more than 60 attendees February 22.

LaBarr

LaBarr, a faculty member in the Institute for Advanced Analytics at North Carolina State University, gave an engaging presentation about communication and data science geared toward data scientists and management.

When talking about getting a project started, LaBarr pointed out he's never had a project not be successful because he asked too many questions. He made many other interesting points about communication throughout the webinar, concluding that communication involves both the desire to communicate and the humility to learn.

LaBarr also discussed how deployment, data, return on investment, culture, and leadership all tie into communication and that mathematical successes do not automatically translate to business successes.

After the webinar, audience members were able to ask questions, which included how to develop soft skills, how to keep communication open, what to do about jargon, and how to address the idea that more data is better data.

The recording of this webinar is available on our YouTube channel (*https://youtu.be/Czko10HiNvc*) and information about upcoming webinars can be found on our website (*https://community.amstat.org/northcarolina/events/webinars*). ■

The following events are the latest additions to the ASA's online calendar of events. Announcements are accepted from education and not-for-profit organizations only. To view the complete list of statistics meetings and workshops, visit *www.amstat.org/dateline*.

* Indicates events sponsored by the ASA or one of its sections, chapters, or committees

›› Indicates events posted since the previous issue

2019

April

»*17—12th Annual UPENN Conference on Statistical Issues in Clinical Trials, Philadelphia, Pennsylvania
For more information, visit *bit.ly/2Hql93A* or contact Lauzhanine Tynes, 423 Guardian Drive, Philadelphia, PA 19104.

May

2–4—SIAM International Conference on Data Mining (SDM19), Calgary, Alberta, Canada
For more information, visit *bit.ly/SIAMsdm19* or contact Eva Donnelly, 3600 Market St., 6th Floor, Philadelphia, PA 19104; (215) 382-9800; *meetings@siam.org*.

»*3—Orange County ASA Biostatistics Symposium, Irvine, California
For details, contact Gajanan Bhat, 77 Field Poppy, Irvine, CA 92620; (978) 495-1351; *gajbhat@gmail.com*.

10–12—The 7th Workshop on Biostatistics and Bioinformatics, Atlanta, Georgia
For details, contact Yichuan Zhao, 1342, 25 Park Place, Atlanta, GA 30303; (404) 413-6446; *yichuan@gsu.edu*.

»*13—2nd Midwest Statistical Machine Learning Colloquium, Ames, Iowa
For more information, visit *bit.ly/2NRK0Pi* or contact Stephen Vardeman, 3022 Black Engineering, Ames, IA 50011-2030; (515) 294-9068; *vardeman@iastate.edu*.

13–17—NSF-CBMS Regional Conference on Topological Methods in Machine Learning and Artificial Intelligence, Charleston, South Carolina
For more information, visit *math.cofc.edu/CBMS-TDA2019* or contact Ben Cox, 66 George St., Charleston, SC 29424-0001; (843)953-4973; *coxbl@cofc.edu*.

»20–22—Annual Midwest Biopharmaceutical Statistics Workshop, Carmel, Indiana
For details, visit *mbswonline.com* or contact Melvin Munsaka, 1 North Waukegan Road, North Chicago, IL 60064; (847) 937-7098; *melvin.munsaka@abbvie.com*.

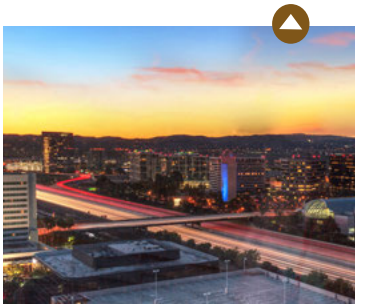
»26–31—ICORS-LACSC 2019, Guayaquil, Ecuador
For details, visit *icors-lacsc-2019.com* or contact Conference ICORS-LACSC 2019, Km. 30.5 Via Perimetral, Campus Gustavo Galindo, Guayaquil, International EC0953, Ecuador; +593 42 269 525; *contact@icors-lacsc-2019.com*.

SDSS
SYMPOSIUM ON
DATA SCIENCE & STATISTICS
BEYOND BIG DATA: BUILDING DATA TOOLS
BELLEVUE, WA • MAY 29 - JUNE 1, 2019

***29–6/1—2019 Symposium on Data Science & Statistics, Bellevue, Washington**
For more information, visit *bit.ly/SDSS2019* or contact ASA Meetings, 732 N. Washington St., Alexandria, VA 22314; (703) 684-1221; *meetings@amstat.org*.

June

»*2–4—Statistical Methods in Imaging 2019, Irvine, California
For more information, visit *sites.uci.edu/smi2019* or contact Michele Guindani, Bren Hall, Irvine, CA 92617; (949) 824-5968; *mguindan@uci.edu*.



»*2–5—SRCOS Summer Research Conference, Carrollton, Kentucky
For details, visit *www.srcos.org* or contact Arnold Stromberg, Department of Statistics, Lexington, KY 40536; (859) 257-6115; *astro11@email.uky.edu*.

»3–5—Nordic Baltic Biometrics Conference 2019 (NBBC19), Vilnius, Lithuania
For more information, visit *nbbc19.lt* or contact Ziad Taib, Barnhusgatan 11, Göteborg, International 41111, Sverige, +46707655471, *ziad.taib@astrazeneca.com*.

»6–9—27th International Workshop on Matrices and Statistics, IWMS-2019, Shanghai, China
For more information, visit *bit.ly/2Hl1qCu* or contact Jeffrey Hunter, Auckland University of Technology, Auckland, International 1142, New Zealand; +64 21 810 282; *jeffreyjhunter@gmail.com*.

***11–13—2019 Quality and Productivity Research Conference, Washington, DC**
For details, visit *bit.ly/2GhZkoe* or contact Emmanuel Yashchin, IBM T.J. Watson Research Center, Box 218, Yorktown Heights, NY 10598; (914) 945-1828; *yashchi@us.ibm.com*.

12–14—BISP11 - Eleventh Workshop on Bayesian Inference in Stochastic Processes, Madrid, Spain
For more information, visit *bit.ly/2TvC2Rb* or contact Fabrizio Ruggeri, Via Alfonso Corti 12, Milano, International 20133, Italy; +39 0223699532; *fabrizio@mi.imati.cnr.it*.

16–19—39th International Symposium on Forecasting, Thessaloniki, Greece
For details, visit *isf.forecasters.org* or contact Pamela Stroud, 53 Tesla Ave., Medford, MA 02155; (781) 234-4077; *isf@forecasters.org*.

»17–19—CISEA 2019, Abidjan, Ivory Coast
For more information, visit *www.confcisea.org* or contact Lewis Gakpa, Cocody Blvd. des Grandes Ecoles, Abidjan, International Abidjan, Cote d'Ivoire; +225 22 48 32 32; *cisea@ensea.ed.ci*.

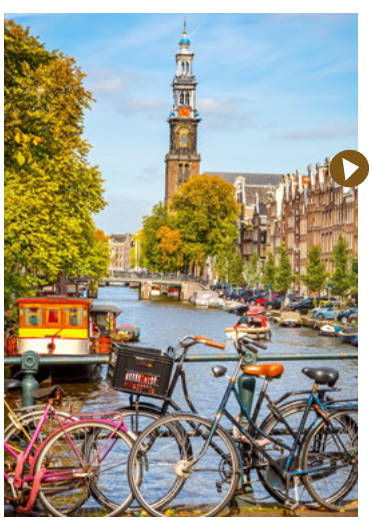
»*17–19—Nonclinical Biostatistics Conference, New Brunswick, New Jersey
For more information, visit *bit.ly/2IXJMHi* or contact Steve Novick, 1 MedImmune Way, Gaithersburg, MD 20878; (301) 398-1339; *novicks@medimmune.com*.

18–21—The 7th International Workshop in Sequential Methodologies, Binghamton, New York
For details, visit *bit.ly/IWSM2019* or contact Aleksey Polunchenko, 4400 Vestal Parkway East, Binghamton, NY 13902; (607) 777-6906; *iwsm2019@gmail.com*.

»19–20—SIAS 2019 - Reproducible Research with R and RStudio, Provo, Utah
For details, visit *bit.ly/2EHSnZt* or contact Amy Cetz, 2489 E 990 S, Spanish Fork, UT 84660; (801) 422-4506; *acetz@stat.byu.edu*.

July

3–5—ISSAT International Conference on Data Science in Business, Finance and Industry (DSBFI 2019), Da Nang, Vietnam
For more information, visit *bit.ly/2ETcHHB* or contact Michelle Pham, P.O. Box 281, Edison, NJ 08818; (732) 491-5870; *michelle@issatconferences.org*.



8–12—International Workshop on Statistical Modelling 2019 (IWSM2019), Guimarães, Portugal
For details, visit *www.iwsm2019.org* or contact Luís Machado, Department of Mathematics and Applications, University of Minho, Guimarães, International 4800-058, Portugal; 351253510443; *lmachado@math.uminho.pt*.

»8–12—2nd Corsican Summer School on Modern Methods in Biostatistics and Epidemiology, Corte, France
For details, visit *sesstim.univ-amu.fr/hearstat-2019* or contact Roch Giorgi, Faculté de Médecine, 27 bd Jean Moulin, 13005 Marseille, Marseille, International 13005, France; +33 491 324 600; *roch.giorgi@univ-amu.fr*.

»8–12—Research on Productivity, Trade, and Growth, Amsterdam, The Netherlands
For more information, visit *bit.ly/2tS6M08* or contact Christina Mansson, Gustav Mahlerplein 117, Amsterdam, International 1082 MS, The Netherlands; +31(0)10 40 88919; *summerschool@tinbergen.nl*.

»8–26—University of Washington Biostatistics Summer Institutes, Seattle, Washington
For more information, visit *biostat.washington.edu/suminst* or contact Deb Nelson, 4333 Brooklyn Ave. NE, T-15, Seattle, WA 98185; (206) 685-9323; *uwbiost@uw.edu*.

»10–12—Benford's Law for Fraud Detection: Foundations, Methods, and Applications, Stresa, Italy
For details, visit *bit.ly/2EFLVSM* or contact Lorena Marcaletti, Via Enrico Fermi, 2749, Ispra (VA), International 21027, Italy; *JRC-I-Events-Admin@ec.europa.eu*.

»17–20—International Symposium on Computational and Methodological Statistics and Biostatistics, Pretoria, South Africa
For details, visit *www.up.ac.za/symstat2019* or contact Johan Ferreira, IT Building 6-17, Pretoria, International 0002, South Africa; +27124202362; *symstat@up.ac.za*.

»22–26—Introduction in Genome-Wide Data Analysis, Amsterdam, The Netherlands
For more information, visit *bit.ly/2tTEPVL* or contact Christina Mansson, Gustav Mahlerplein 117, Amsterdam, International 1082 MS, The Netherlands; +31(0)10 40 88919; *summerschool@tinbergen.nl*.

22–26—European Meeting of Statisticians (EMS 2019), Palermo, Italy
For more information, visit *bit.ly/EMSPalermo2019* or contact Angelo Mineo, Viale delle Scienze, Ed. 13, Palermo, International 90128, Italy; *ems-2019@unipa.it*.

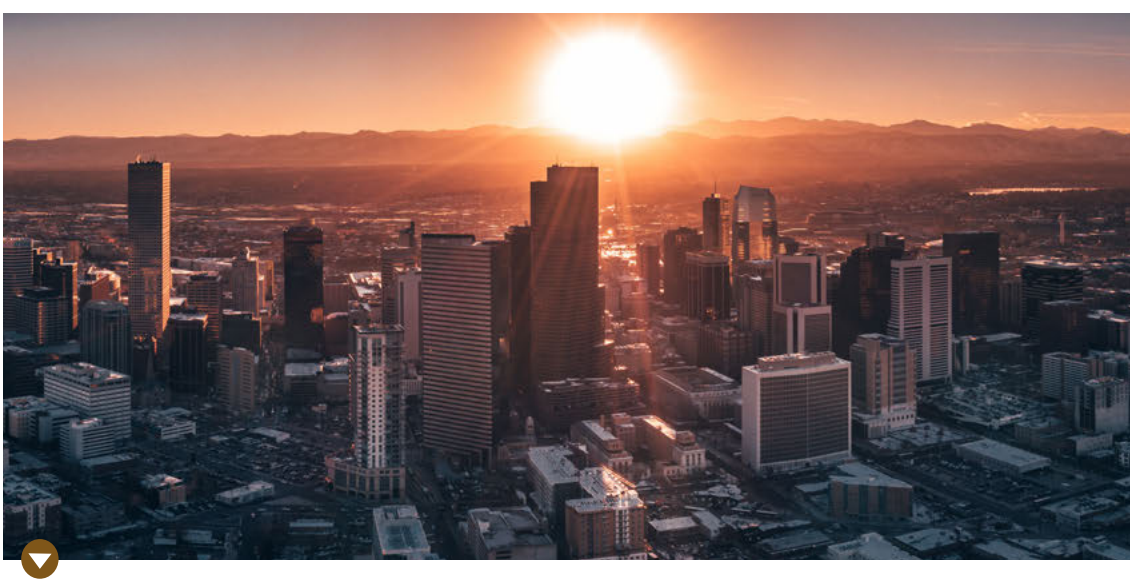
»*28–31—2019 JSM Diversity Workshop and Mentoring Program, Denver, Colorado
For more information, visit *bit.ly/2HsRo2v* or contact Dionne Swift, 411 Harpwood Dr., Franklin, OH 45005; (513) 622-3061, *swift.dp@pg.com*.

28–8/11—Summer Seminar in Philosophy of Statistics, Blacksburg, Virginia
For more information, visit *summerseminarphilstat.com* or contact Jean Miller, Philosophy Department, 229 Major Williams Hall (0126), Virginia Tech, Blacksburg, VA 24061; (540) 998-1123; *jemille6@vt.edu*.

»29–30—Global Summit on Clinical Nursing and Women Health, Singapore
For details, visit *larixconferences.com/nursing* or contact Eunice Lim, 10 Anson Road, International Plaza, #22-02, Singapore 079903, Singapore, International 09393, Singapore; +6531592112; *globalnursingsummit2019@gmail.com*.

17–19—The Fourth Workshop on Higher-Order Asymptotics and Post-Selection Inference (WHOA-PSI), St. Louis, Missouri
For more information, visit *bit.ly/WHOAPSI2019* or contact Todd Kuffner, 1 Brookings Drive, St. Louis, MO 63130; *kuffner@wustl.edu*.

19–23—NSF-CBMS Regional Research Conference: Fitting Smooth Functions to Data, Austin, Texas
For details, contact Arie Israel, 3925 W. Braker Lane, Suite 3.340, Austin, TX 78759-5316; (512) 471-6424; *arie@math.utexas.edu*.



***27–8/1—2019 Joint Statistical Meetings, Denver, Colorado**
For details, visit *bit.ly/JSM2019* or contact ASA Meetings, 732 North Washington St., Alexandria, VA 22314; (703) 684-1221; *meetings@amstat.org*.

August

1–3—ISSAT International Conference on Data Science and Intelligent Systems (DSIS 2019), Las Vegas, Nevada
For more informaion, visit *bit.ly/2XIrIEJ* or contact Michelle Pham, P.O. Box 281, Edison, NJ 08818; (732) 491-5870; *michelle@issatconferences.org*.

»22–23—13th World Biomarkers and Clinical Research Conference, Vienna, Austria
For details, visit *biomarkers.euroscicon.com* or contact Harrison Parker, 40 Bloomsbury Way, Lower Ground Floor, Vienna, Austria; +432033182512; *biomarkers@sciconmeetings.com*.

September

»2–6—Workshop on Simulation and Statistics, Salzburg, Austria
For more information, visit *bit.ly/2UCEZfR* or contact Andrea Baumgartner, *andrea.baumgartner@sbg.ac.at*.

»20–21—European Dental Summit and Dental Marketing, London, United Kingdom
For more information, visit *bit.ly/2SUX5IB* or contact Riya Sen, London UK, London, International 75062, UK; 7401034497; *Dentalsummit2019@gmail.com*.

***23–25—2019 ASA Biopharmaceutical Section Regulatory-Industry Statistics Workshop, Washington, DC**
For more information, visit *bit.ly/Biopharm2019* or contact ASA Meetings, 732 North Washington St., Alexandria, VA 22314; (703) 684-1221; *meetings@amstat.org*.

»*26–27—63rd Annual ASA/ASQ Fall Technical Conference, Gaithersburg, Maryland
For details, visit *falltechnicalconference.org* or contact Adam Pintar, 100 Bureau Drive, Gaithersburg, MD 20899; (301) 975-4554; *adam.pintar@nist.gov*.

October

10–12—The 3rd International Conference on Statistical Distributions and Applications (ICOSDA 2019), Grand Rapids, Michigan
For more information, visit *bit.ly/2V36AYo* or contact Felix Famoye, Department of Mathematics, Mt. Pleasant, MI 48859; (989) 774-5497; *felix.famoye@cmich.edu*.

December

»*2–6—75th Annual Deming Conference on Applied Statistics, Atlantic City, New Jersey
For details, visit *demingconference.org* or contact Din Chen, 325 Pittsboro St., Chapel Hill, NC 27599; (919) 843-2434; *dinchen@email.unc.edu*.

»12–15—11th International Conference on Multiple Comparison Procedures, Taipei, Taiwan
For more information, visit *mcp-conference.org* or contact Jason Hsu, 1 Health Plaza, East Hanover, NJ 07936; *mcp2019@mcp-conference.org*.

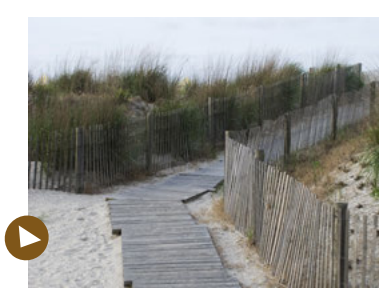
»26–30—International Indian Statistical Association 2019 Conference, Mumbai, India
For more information, visit *iisa2019.iisaconference.org* or contact Veera Baladandayuthapani, University of Michigan, Ann Arbor, MI 48109; (734) 764-5702; *IISA2019@intindstat.org*.

»27–29—2nd International Conference on Applied Statistics (ICAS) 2019, Dhaka, Bangladesh
For details, visit *bit.ly/2VKae8X* or contact Shafiqur Rahaman, Institute of Statistical Research and Training, Dhaka, International 1000, Bangladesh; *shafiq@isrt.ac.bd*.

2020

January

***6–8—2020 International Conference on Health Policy Statistics (ICHPS), San Diego, California**
For more information, visit *bit.ly/ICHPS2020* or contact ASA Meetings, 732 North Washington St., Alexandria, VA 22314; (703) 684-1221; *meetings@amstat.org*.



June

»21–23—The Fifth Workshop on Higher-Order Asymptotics and Post-Selection Inference (WHOA-PSI), St. Louis, Missouri
For details, visit *bit.ly/2Ut5t3g* or contact Todd Kuffner, 1 Brookings Drive, Campus Box 1146, Saint Louis, MO 63130; *kuffner@wustl.edu*.

24–27—5th International Workshop on Functional and Operatorial Statistics (IWFOS 2020), Brno, Czech Republic
For details, visit *iwfos2020.sci.muni.cz* or contact David Kraus, Kotlárská 2, Brno, International 611 37, Czech Republic; *david.kraus@mail.muni.cz*.

»25–27—Open Problems in Parametric Likelihood-Based Inference, St. Louis, Missouri
For details, visit *bit.ly/2Ut5t3g* or contact Todd Kuffner, 1 Brookings Drive, Campus Box 1146, Saint Louis, MO 63130; *kuffner@wustl.edu*.

July

»5–10—International Biometric Conference (IBC), Seoul, South Korea
For more information, visit *bit.ly/2TAKApW* or contact Kristina Wolford, 1120 20th St. NW, Suite 750, Washington, DC 20036; (202) 712-9049; *conference@biometricsociety.org*.

»6–10—International Conference on Robust Statistics (ICORS 2020), Vienna, Austria
For details, contact Peter Filzmoser, Wiedner Hauptstr. 8-10, Vienna, International 1040, Austria; 43-1-58801-10560; *P.Filzmoser@tuwien.ac.at*.

August

***1–6—2020 Joint Statistical Meetings, Philadelphia, Pennsylvania**
For more information, contact ASA Meetings, 732 North Washington St., Alexandria, VA 22314; (703) 684-1221; *meetings@amstat.org*. ■

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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*). 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.

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California

■ The Statistics Department at Cal Poly, San Luis Obispo, invites applications for full-time, academic-year lecturer positions to begin in September 2019. Responsibility is for teaching 3-4 sections of introductory statistics per quarter. Typical class size is 35 students. One-year appointment, with the possibility for renewal. For details and online application instructions visit *www.calpolyjobs.org*, and search/ apply to requisition #105187. Review date is April 1, 2019. EOE.

■ The UCLA Department of Biostatistics seeks an Assistant or Associate Professor In-Residence with evidence of outstanding potential for methodological research, teaching at the graduate level, and obtaining external funding. Experience in interdisciplinary research involving military veterans and their families would be highly desirable. All qualified applicants are encouraged to apply online at *https://recruit.apo.ucla.edu/apply/JPF04205* by April 30, 2019. EOE.

Florida

■ Nova Southeastern University has an open position at the assistant/ associate/full professor rank available as of August 2019 to teach courses in Decision Sciences Department, such as, management of information systems, management science, or business analytics/ statistics. QUALIFICATIONS: PhD, DBA, or ABD in Management of Information Systems, Management Science/ Business Statistics, or related field. Application must be submitted online at *www.nsujobs.com* to position #993896. EOE.

Idaho

■ Clinical Assistant Professor, Public Health Statistician (1189). The primary purpose of this position is to provide statistical assistance and consulting services to faculty, participate as a member of research teams for Kasiska Division of Health Sciences (KDHS) programs, and teach courses in basic epidemiology and biostatistics at the graduate level within the MPH Program and the KDHS. Apply online at *https://isu.csod.com/ats/careersite/JobDetails.aspx?id=602&site=1*. Idaho State University is an EOE.

Illinois

■ Join our growing company! Xeris Pharmaceuticals is looking for a Master's level Biostatistician to join our team in Chicago, IL. This position will support the Head of Biostatistics in leading all company efforts globally. Great opportunity to get in on the ground level and help build the Biostatistics department at Xeris! To learn more about our company and to apply directly, please visit *www.xerispharma.com.* EOE.

Maryland

■ Data Management Services, Inc., is currently seeking a Director for Statistical Consulting Services in Cancer and AIDS research to direct, plan organize, implement and perform statistical and mathematical consulting services to senior scientists, investigators and physicians at the National Cancer Institute at Frederick. Direct data scientists, programmers and other computer professionals. Please apply at *https://dmsinc.com/careers/*. We are an equal opportunity employer and maintain affirmative actions programs. In this regard, we do not discriminate against applicants on the basis of race, color, religion, natural origin, sex, age, marital status, disability or veteran status.

Texas

■ PhD Biostatistician, Assistant/Associate Professor (tenure track) to work in Division of Clinical and Translational Sciences, within Internal Medicine, at University of Texas Health Science Center at Houston (UTHealth). Will work closely with a multidisciplinary team of biostatisticians, epidemiologists and clinicians at UTHealth. Should have experience with NIH-style grants and manuscripts. Interested candidates should refer to the job posting at *http://p.rfer.us/UTH_la4CQ* (Requisition #190000G3) for more information. The University of Texas Health Science Center at Houston is an EO/AA employer. M/F/D/V. This is a security sensitive position and thereby subject to Texas Education Code § 51.215. A background check will be required for the final candidate. ■

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