



Solving Scientific Problems in a Lab with No Microscopes

If data is the language of science, then those who can parse and analyze tomes of that language are essential to scientific discovery. On the second floor of the historic Statistics Building, in the College of Natural Sciences, lives a laboratory that does just that. Unlike most labs at Colorado State University, there are no safety goggles required – nor are there test tubes or high-power microscopes. The Franklin A. Graybill Statistical Laboratory runs on brain power, computing power, and creativity.

Showcasing the land-grant mission of education, research, and service, the “Stat Lab” offers statistical consulting to faculty, students, and staff, while also using these opportunities to impart statistical knowledge to its own graduate students as well as to scientific collaborators.

“We provide statistical expertise for the benefit of advancing the quality of scientific research at CSU and beyond, while educating the next generation of applied statisticians,” said Stat Lab Director and Associate Professor Julia Sharp, who joined the university at the end of 2016. The Stat Lab hopes to extend their work to more researchers on campus – as well as to non-profits, institutions, and businesses off campus.

The Statistical Laboratory, housed in the Department of Statistics, is also one of CSU’s campus-wide Foundational Core Facilities, along with the Microscope Imaging Network, Central Instrument Facility, and Proteomics and Metabolomics Facility, and is funded in part through the Office of the Vice President for Research.

Statistics has long been the quiet workhorse of the scientific process. But in recent decades, with the proliferation of truly massive amounts of data and interest in complex systemic interactions, advanced statistical methods and programs – and the people who can think creatively about how and when to use them – have become essential. Today’s scientific statistics goes far beyond p-values and can shape how data are collected and how investigations are conducted.

And faculty in the Stat Lab truly do it all, Sharp said. “From equine reproduction to looking at the impacts of yoga on aging populations,” she said. “That’s the coolest part of the job. Yesterday, there was one [consulting appointment] about identifying outliers in soil temperatures from soil sensors that were placed on mountain peaks.” Sometimes the wind, weather, or critters will dig up the sensors, leading to erroneous temperature readings. Statistical modeling allowed them to “be able to dig a little bit deeper and find the signal away from the noise,” she explained.

The goal of work in the Stat Lab, Sharp said, is “to help others do quality scientific research – to really add value to the domain science.” To do that, she said, “we work with the scientist throughout the project so that, not only do we understand what their objectives are, but also so there is an understanding about why a statistical method would be preferred over another method.” This collaborative work “is more like teaching one-on-one than in the classroom,” she said.

Read the full article [here](#).



MESSAGE FROM THE CHAIR



Dear Alumni and Friends,

Since becoming chair of the department in January, time has passed in a blur. As I try to meet high standards that Professor Jean Opsomer set in this role, I realize that I never showered enough gratitude on him for the excellent job he did. Several initia-

tives started under his leadership are maturing, making for exciting times.

The number of students pursuing undergraduate degrees in statistics is growing rapidly while the number of non-majors taking statistics courses is exploding. Part of the reason is the modernization of the undergraduate curriculum led by Professor Mary Meyer. The graduate and undergraduate students founded an undergraduate majors' club called the STAT Alliance. We are also developing a program to involve statistics majors in tutoring and undergraduate teaching.

The graduate program is thriving. Over the last few years, we have been revamping the Ph.D. program in order to provide the knowledge and skills needed for modern statistical research while making it possible for students to start research in their second year. The Masters in Applied Statistics has become enormously successful under Associate Professor Jana Anderson's direction. A recent survey of alumni provided heartwarming reading about the MAS degree improving the professional lives of its graduates.

Department news: The Graybill Conference on Statistical Ge-

nomics and Genetics in June had 170 external attendees and 80 participants from CSU; Associate Professor Julia Sharp joined the department in January to take on the directorship of the Graybill Statistical Laboratory, and we are working together to grow the Lab's operations; finally, Professor Jay Breidt was appointed to be the Reviews Editor of *The Journal of the American Statistical Association* and *The American Statistician*.

The department faculty have won several awards since the last newsletter. Professor Jennifer Hoeting and Associate Chair Dan Cooley were appointed as Professor Laureates of the College of Natural Sciences. Meyer won the College of Natural Sciences Faculty Excellence Award in Graduate Teaching. Associate Professor Mevin Hooten was awarded the The International Environmental Society Presidential Lectureship and appointed Fellow of the American Statistical Association. The Center for Interdisciplinary Mathematics and Statistics won designation as a University Program of Research and Scholarly Excellence. And the department is growing, with plans to hire numerous faculty members in partnership with other units on campus.

I am out of room, and there is so much more. The Statistics Success Center, revamping of the undergraduate service courses, new concentrations in the MAS program, the annual college Probability Casino...next time!

Don Estep, Ph.D.
University Distinguished Professor and Chair

DEPARTMENT HIGHLIGHTS



New Statistics Department Student Organization Formed—STAT Alliance

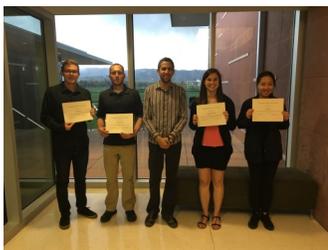
Welcome to STAT Alliance, CSU's new Statistics Club! STAT Alliance is open to everyone, not just statistics majors or minors. Our goal is to create a gathering of students who are looking to learn more about statistics and enjoy playing with data. We will have guest speakers and provide information on jobs and other opportunities within the industry of statistics. Check out our [website](#) and upcoming meeting schedule, and let us know if you would like to get involved.



2017 Graybill Conference

In June, the department hosted the 14th Graybill Conference. This year's theme was "Statistical Genomics and Genetics." The conference was organized locally by Assistant Professor Wen Zhou and Professor Jay Breidt. The conference had about 250 attendees. Xihong Lin of Harvard University, Kathryn Roeder of Carnegie Mellon University, and John Storey of Princeton University were the keynote speakers this year. See the full list of invited speakers [here](#).

Statistics Students Awarded College Honors and High Honors at CURC



Throughout the year, students enrolled at CSU are invited to participate in a variety of events that recognize and honor their achievements and showcase what they have learned as a result of their scholarly research, scientific inquiry, and creative endeavors.

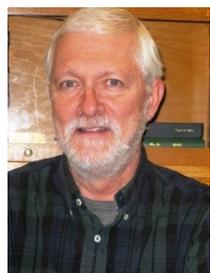
Among the most visible is the annual Celebrate Undergraduate Research and Creativity (CURC) Showcase held each April. Culminating in an awards ceremony that recognizes all participants and honors award winners from events throughout the year, this juried showcase features outstanding performers from eve-

ry discipline. Two of the student groups from STAT 472 were awarded with College Honors and High Honors at CURC this year:

"The Study of People's Preferred News Sources for Equine Disease Information" was awarded College Honors. Participating students were Yao Shi, Ziqian Fu, Michael Ingram, and Mitchell Lane. The graduate student mentor was Zheyuan Wang.

"Budding Monkeyflower Moisture Content Threshold" was awarded High Honors. Participating students were Sydney Soetaert, Zachary Goodenow, Jose Amaya Santanach, Zhiming Guo, and Doran Wood. The graduate student mentor was Xiaoming Xu.

New Statistics Award Marks zumBrunnen's Retirement



Emeritus Professor Jim zumBrunnen has provided statistical expertise to CSU researchers for more than four decades. The longtime Department of Statistics staff member is establishing an award to support outstanding statistics students for years to come.

Until his retirement, zumBrunnen was associate director of the Franklin A. Graybill Statistics Laboratory which provides general statistical consulting to researchers all over the University.

The Stat Lab conducts approximately 1,000 consulting sessions per year, with advice ranging from the planning and design of experiments to complicated statistical analyses and interpretation of statistical results. Project disciplines range from agriculture to zoology and beyond, with clients coming from more than 40 University departments annually.

ZumBrunnen established the award in appreciation for the 41 years that undergraduate and graduate students in the department have worked with him in these consultations and collaborations. "I expect that the award, which will be given annually, will help encourage a statistics student to continue to provide statistical collaboration to researchers in other disciplines," zumBrunnen said. "The department is very grateful and honored by this generous gift established by Jim and Jo zumBrunnen," said Professor and former Department Chair Jean Opsomer. "To students in the department, the new award highlights the crucial role of statistical consulting in fostering research excellence across campus."

The James R. zumBrunnen Statistical Collaboration Award will recognize an outstanding student who has made a "significant contribution through collaboration with CSU researchers." Recipients can range from undergraduate to Ph.D. students in statistics, and they must demonstrate aptitude for statistics collaborations with other disciplines. To learn more about the scholarship or to donate, click [here](#).

Hooten Awarded TIES Presidential Lectureship and Elected ASA Fellow



Associate Professor Mevin Hooten was awarded The International Environmetrics Society (TIES) Presidential Lectureship for his opening plenary lecture at the TIES 2016 meeting in Edinburgh, Scotland. His lecture was titled, "A progression in G: Time series, spatial statistics, and the trajectories of ecological particles." Additionally, at the 2017 Joint Statistical Meetings, Mevin Hooten became an American Statistical Association Fellow. Hooten joins current faculty Jay Breidt, Jean Opsomer, and Jennifer Hoeting as ASA fellows.

ASA's Section on Statistics on Statistics and the Environment Winner



Ph.D. Student Josh Hewitt was one of four winners in the American Statistical Association's Section on Statistics and the Environment student paper competition. His paper is titled "A geostatistical approach to modeling climate teleconnections" and is coauthored by Professor Jennifer Hoeting and collaborators from the National Center for Atmospheric Research. This marks the seventh straight year that a CSU statistics student has won ASA's Section on Statistics and the Environment student paper award or been named as honorable mention.

Don Estep Recognized as University Distinguished Professor



Don Estep, chair of and professor in the Department of Statistics in the College of Natural Sciences, has been named a University Distinguished Professor.

This award is the highest academic recognition awarded by Colorado State University. The award was given to Estep for

his outstanding scholarship and achievement and will be recognized for the remainder of his time working with CSU.

Estep, who received his B.A. from Columbia University and a Ph.D. in applied mathematics at the University of Michigan in 1987, was the first at Colorado State University to become a University Interdisciplinary Research Scholar.

Estep's work symbolizes a commitment to CSU and all he has achieved thus far. Estep is recognized nationally and internationally for his research on the influence of uncertainty quantification for differential equations modeling biological, engineering systems, and physical systems. He has also contributed significant

research in error estimation and solution of complex scientific models.

Along with the University Distinguished Professor title, Estep has received numerous professional honors including: the Computational and Mathematics Methods in Science and Engineering Prize, the College of Natural Sciences Teaching Award for Graduate Education, the Oliver P. Pennock Distinguished Service Award, the CSU Scholarship Impact Award, the Chalmers University Jubilee Professorship, and appointment as fellow of the Society for Industrial and Applied Mathematics.

"Professor Estep is one of the most outstanding faculty members at Colorado State University," wrote College of Natural Sciences Dean Jan Nerger in her nomination letter. He is "a standout among a very elite group of scholars," she noted, adding that, "the impact of his research is substantial."

Estep has been with CSU since 2000, first with an appointment in the mathematics department before transitioning full-time to the Department of Statistics in 2014. He was named chair of the department in January.

FACULTY NEWS



Dan Cooley Named Professor Laureate

The designation of Professor Laureate is the highest professorial title awarded by the College of Natural Sciences. It is intended not only to honor the individual, but also to provide role models to the college and to publicly acknowledge the contributions of some of our most accomplished faculty to the entire campus. Associate Professor Dan Cooley, Department of Statistics, and Associate Professor Melissa Reynolds, Department of Chemistry, both were named professor Laureates this year. Cooley's research is primarily in extreme value analysis, which aims to characterize the tail of the distribution. Specifically, his research has focused on describing and modeling extremal dependence both in the multivariate and spatial cases. Much of his research is motivated by quantifying risk of extreme weather events, and Cooley has collaborated with atmospheric scientists at institutions such as the National Center for Atmospheric Research and the Berkeley National Labs.



Breidt Appointed to Reviews Editor of JASA/ TAS

Professor Jay Breidt was recently appointed reviews editor for the *Journal of the American Statistical Association* and *The American Statistician*. His term will be 2017-2019.

SUPPORT THE DEPARTMENT

Your support of the department is incredibly valuable. Please consider making a difference to today's students, faculty, facilities, and programs—at whatever level is right for you. Thank you!

For more information on giving, contact Simone Clasen, Executive Director of Development and Operations

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