

ENAR 2015

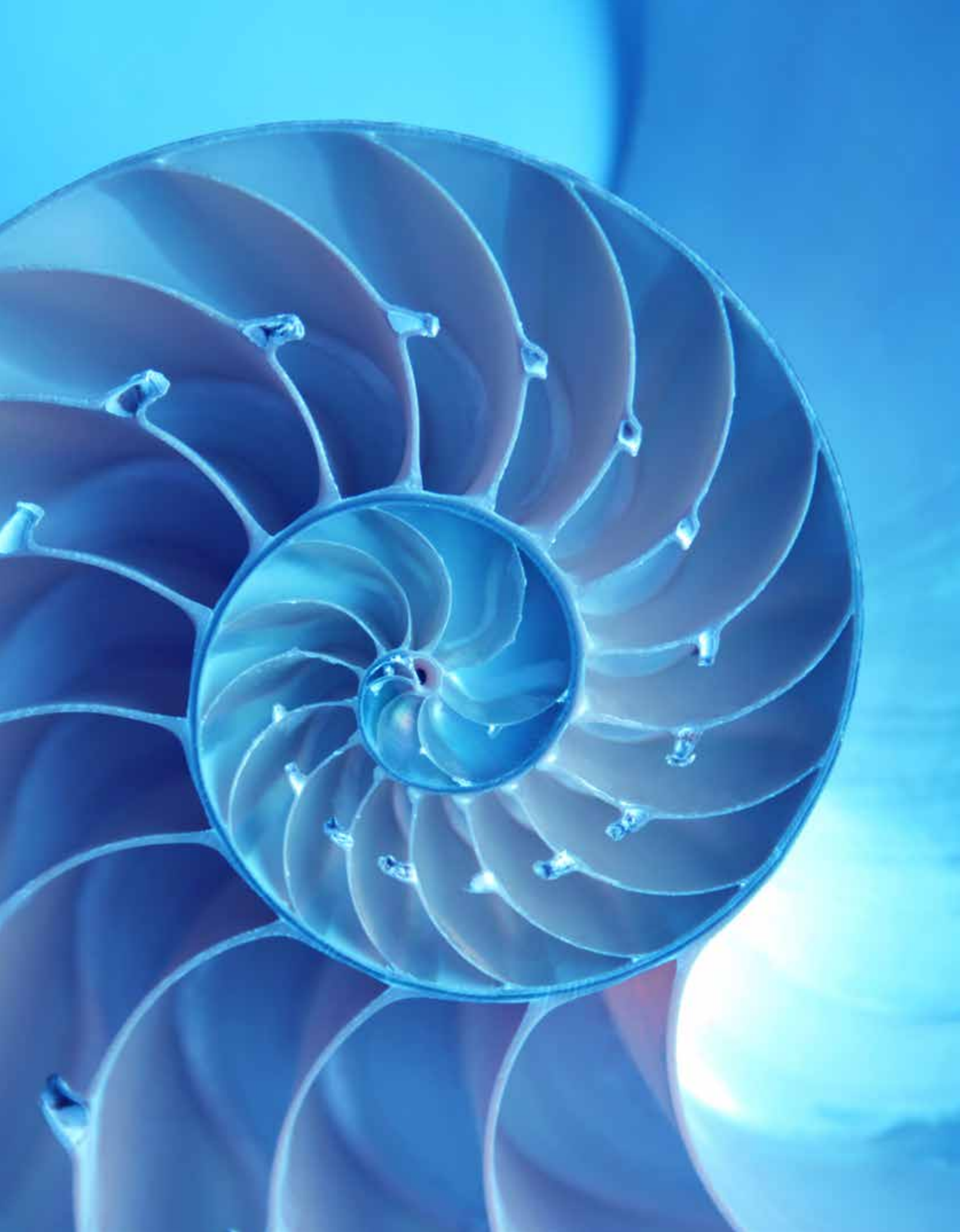
SPRING MEETING

With IMS & Sections of ASA

MARCH 15–18

Hyatt Regency Miami | Miami, FL

FINAL PROGRAM



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WELCOME

¡Bienvenidos a Miami! It is my great pleasure to introduce the 2015 ENAR Spring Meeting to be held at the Hyatt Regency Miami, in Miami, FL, from March 15-18. The ENAR Spring Meeting brings together researchers and practitioners from academia, industry and government, connected through a common interest in Biometry. It offers a unique opportunity for learning new exciting methods and software, hearing about interesting and impactful applications, meeting new people (including prospective employers and job candidates), reconnecting with friends, and, this year, getting a break from the cold and snowy winter. The ENAR Spring Meeting only happens through the diligent work of a large number of people who organize and contribute to the program, plan and oversee the meeting logistics, and help with sponsorship – my heartfelt gratitude to all of them.

Scientific Program: Through the leadership of Program Chair Mithat Gönen, of Memorial Sloan-Kettering Cancer Center, and Associate Chair Brisa Sánchez, of the University of Michigan School of Public Health, and with contributions from many of you, the Program Committee (with representatives from different ASA sections) has created an outstanding invited program. The sessions cover a wide range of topics of great interest to both researchers and practitioners, such as, data sciences (big data), genomics, clinical trials, neuroimaging, biomarkers, health policy, electronic health records, ecology, and epidemiology. The IMS invited program, assembled under the leadership of IMS Program Chair Lurdes Inoue, of the University of Washington, also features an exciting array of sessions that nicely complement and promote synergies with the ENAR invited program.

Poster presentations will, once again, be a vibrant part of the scientific program. In addition to contributed and invited posters (the latter first featured in the 2014 meeting), the 2015 ENAR Spring Meeting introduces a novelty: **Contributed oral poster sessions**, in which presenters will be able to give a two-minute elevator-speech on the highlights of their posters. The contributed oral sessions, to be held on Monday, will be organized by themes, will feature two invited posters from well-known researchers, and will run parallel to the rest of the sessions in the scientific program. As in previous years, the regular contributed and invited posters will be presented Sunday evening, during the Opening Mixer. The highly popular ENAR Regional Advisory Board (RAB) poster competition will include contributed posters from the Sunday session only.

Educational Program: Be sure to take advantage of the unique and varied learning opportunities that the 2015 ENAR Spring Meeting has to offer through its superb program of short courses, tutorials and roundtables, assembled by the Educational Advisory Committee. Presented by well-known experts in their respective fields, the short courses and tutorials will cover a variety of topics of great interest to meeting attendees, including: Bayesian methods in drug development, personalized medicine trial designs, analysis of brain imaging data, data sciences and high performance statistical computing, early phase clinical trials, statistical leadership and influence, graphics for clinical trial data, and software applications for group sequential and adaptive designs, Bayesian modeling and analysis, and multiplicity problems. A favorite of many who come to the meeting, roundtable luncheons will also be featured in the program. Distinguished statisticians from academia, government, and industry will lead the luncheon discussions on topics ranging from how to publish without perishing to innovations in drug development to Bayesian evidence synthesis.

Keynote Lectures: The Presidential Invited Address and the IMS Medallion Lecture are two of the high points of the ENAR Spring Meeting program, delivered by highly accomplished thought leaders in Biometry. I am honored to introduce Dr. David L. DeMets, Max Halperin Professor of Biostatistics and former Chair of the Department of Biostatistics and Medical Informatics at the University of Wisconsin – Madi-

son, as the 2015 Presidential Invited Speaker. His lecture will be on “Big Data, Big Opportunities, Big Challenges.” Prof. DeMets has been an inspirational role model for more than a generation of biostatisticians working in clinical research across academia, government, and industry. His pioneering and highly impactful research in group sequential designs during his tenure at the National Heart, Lung and Blood Institute, at NIH, the creation of the Department of Biostatistics at the University of Wisconsin, and his seminal work in establishing statistical leadership in drug regulatory sciences and practice (including, literally, writing the book on Data Monitoring Committees), are just a few of his many achievements. He is a past-president of ENAR and the Society for Clinical Trials, as well as an Elected Fellow of the International Statistics Institute, the American Statistical Association, the Association for the Advancement of Science, the Society for Clinical Trials and the American Medical Informatics Association. In 2013, he was elected as a member of the Institute of Medicine.

The IMS Medallion Lecture, entitled “Uncertainty Quantification in Complex Simulation Models Using Ensemble Copula Coupling,” will be presented by Dr. Tilmann Gneiting, Group Leader at the Heidelberg Institute for Theoretical Studies (HITS) and Professor of Computational Statistics at the Karlsruhe Institute of Technology (KIT) in Germany. Prof. Gneiting has held faculty positions in the Department of Statistics at the University of Washington, where he remains affiliate faculty, and at the Institute for Applied Mathematics at Heidelberg University. He serves as Editor for Physical Science, Computing, Engineering, and the Environment at the Annals of Applied Statistics.

Additional Meeting Activities: The 2015 ENAR Spring Meeting will feature a host of other activities in addition to the scientific and educational programs. On Saturday, March 14, there will be the Junior Researchers Workshop, organized under the leadership of Kimberly Drews, George Washington, University. The Fostering Diversity in Biostatistics Workshop, organized by Simone Gray, of the Centers for Disease Prevention and Control, and Sean Simpson, of Wake Forest School of Medicine, will be held on Sunday,

The Student Mixer on Monday evening and the Tuesday luncheon event organized by the Council of Emerging and New Statisticians (CENS) will provide ample networking opportunities for students and recent graduates. Meeting attendees seeking employment and prospective employers will benefit from the vibrant Career Placement Center. Be sure to visit the exhibitors’ area to browse the latest books and software in your field.

A perennial favorite among many attendees, the **Tuesday night social event** for the 2015 meeting will take place at sea: a dinner cruise aboard the Biscayne Lady yacht. We will be picked up by boat at the Riverwalk in front of the hotel and will enjoy a memorable evening of breathtaking views of the Miami skyline, great food, nice conversation, music and dancing. Boat cruises have sold out quickly in previous ENAR meetings held in Florida, so sound statistical inference suggests that you should get your tickets early.

Meeting Venue: The conference will be held at the Hyatt Miami Regency hotel located by the Miami Riverwalk, in the downtown area. The hotel is within walking distance from the bustling Mary Brickell district, with its shops, restaurants, and nightlife. South Beach, showcasing beautiful Art Deco architecture, is a short cab drive away and so is Calle Ocho, in the heart of Little Havana.

Acknowledgements:

This meeting would not happen without the dedication and leadership of Kathy Hoskins, the ENAR Executive Director. Kathy is the institutional memory of ENAR and each year patiently guides incoming presidents-elect, like myself, on the how-to's of organizing the Spring Meeting. My heartfelt thanks to Kathy and the ENAR team, Challee Blackwelder and Katie Earley, for all the great work they have put into the meeting organization.

I am also very grateful to the Local Arrangements Committee, led (for a second time) by Tulay Koru-Sengul, of the University of Miami Miller School of Medicine, for their critical work towards the success of the ENAR meeting.

Welcome to the 2015 ENAR Spring Meeting!

Sincerely,

José Pinheiro
2015 ENAR President

Kathy Hoskins
ENAR Executive Director



ENAR would like to Acknowledge the Generous Support of the 2015 Local Arrangements Committee, chaired by Tulay Koru-Sengul, University of Miami, and our Student Volunteers.

We Gratefully Acknowledge NIH, and in Particular the:

National Cancer Institute
National Heart, Lung, & Blood Institute
National Institute of Environmental Health Sciences
National Institute of Allergy and Infectious Diseases

For their Generous Support of the ENAR Junior Researchers Workshop

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ENAR
2015
SPRING MEETING



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Associate Chair | **Brisa Sánchez**

Local Arrangements | **Tulay Koru-Sengul**

ENAR
2016
Spring Meeting

With IMS & Sections of ASA



2016 Spring Meeting | Austin, TX

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Joint Statistical Meetings | 2015 | Olga Marchenko | 2016 | Bin Nan

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website

www.enar.org

*as a resource for
all ENAR activities.*



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Lu Mao, University of North Carolina, Chapel Hill
Christine Mauro, Columbia University
Peibei Shi, University of Illinois, Urbana-Champaign
Thomas Stewart, University of North Carolina
Yichi Zhang, North Carolina State University
Yi Zhao, Brown University
Yan Zhou, University of Michigan

2015 Fostering Diversity in Biostatistics Workshop

Co-Chair | **Simone Gray**, Centers for Disease Control

Co-Chair | **Sean Simpson**, Wake Forest School of Medicine

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ENAR 2015

SPRING MEETING





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Welcome to Miami!

Miami is a global metropolis with booming international business, vibrant culture, and some of the best beaches in the world.

MIAMI HIGHLIGHTS



Much of Miami's appeal is due to its diverse neighborhoods, which range from the towering skyscrapers of downtown Miami to the Cuban community of Little Havana or to the trendy Miami Beach neighborhood of South Beach. People from all over the world come to enjoy the sunny weather, spicy nightlife and fine dining!

Miami has a cuisine that is uniquely its own. With the diversity of its people comes a blend of flavors – Latin, Caribbean and US – known as Floribbean. Miami also has outstanding restaurants of every kind, from Italian to Thai. If you're feeling barbeque, try a nostalgic and delicious landmark next door to Datran Center Skyscrapers, Shorty's Bar-B-Q. When touring South Beach, take a rest and people-watch for a while at the News Café while enjoying their twenty-four hour breakfast and decadent desserts. If you're willing to wait (no reservations!), satisfy your seafood desire by going to Joe's Stone Crab, a restaurant famous for stone crab claws and claims to be the place where this tasty treat was first discovered. Can't decide? Then take a Miami Culinary Tour – a Miami food tour adventure tasting delicious foods around the city's historic neighborhoods.



No matter what kind of entertainment grabs your interest, Miami has it covered. Fulfill your desire for cultural programs at the Adrienne Arsht Center for the Performing Arts; Broadway shows, dance productions and concerts are on the schedule at this beautiful facility located less than two miles from the Hyatt Regency Miami. Head across the Bay to South Beach to experience the Art Deco District, where the largest collection of Art Deco architecture in the world can be found. Experience a different kind of pool at Coral Gables Venetian Pool, the only swimming pool on the National Register of Historic Places that's chlorine-free and fed with cool spring water.

Of course, there is always the beach – take an afternoon and find a spot along Miami's gorgeous shoreline and soak up the sun!

Blessed with a warm climate and unrivaled ocean access, America's southernmost resort city is also a sought-after international recreation destination. Miami caters to action-oriented visitors from around the globe with some of the world's top golf, tennis and sporting facilities. Add sparkling waters that are a magnet for boating enthusiasts, fishermen, divers and water sports aficionados to the equation and it is easy to see why Miami is a number one choice for active travelers of all ages and skill levels. So to really experience South Florida, you must get out on the water! Rent a boat, see manatees in the wild at Coral Gables, swim with dolphins, or take a windsurfing lesson — **it's all here!**



Brickell

Miami's financial district, just south of Downtown, offers some of the best nightlife and dining the city has to offer. Visit some of the neighborhood's best restaurants like Pericone's, Brickell Burger and Beer, and La Lupita. See the high rises and condo complexes of Miami's young professionals or check out Blue Martini or Fado Irish Pub for drinks and dancing. You don't want to miss the 'Manhattan of the South'.

Bayside Market

Experience the best food, fun, and shopping Miami has to offer! You will certainly enjoy the open-air feeling of this Miami shopping mall, a short walk or Metromover ride from the Hyatt, with over 150 stores while walking



under the palm trees. One of the most interesting features of this Downtown Miami location is probably the Biscayne Bay and Miami Skyline view you will get, so even if your purpose is not to spend a big amount of money, go by and check it out. It's also ideal for finding boat tour operators, enjoying live night entertainment, and taking tours to Miami's celebrities' homes.

Jungle Queen Riverboat Cruise

For more than 50 years, visitors have traveled on this



stately riverboat. Tours sail past estates while an entertaining monologue by the captain points out the homes of the famous and the infamous. On three-hour

day tours or four-hour dinner voyages you can sail to an island where you will dine amid tropical foliage. Evening cruises feature a dinner of barbecued ribs and shrimp, with a variety revue and sing-along cruising back. There may even be a sighting of macaws and rare birds from all over the world, alligator wrestling, and Seminole Indians. The 550 passenger riverboat also includes a stop off at the Jungle Queen Indian Village, a beautiful tropical island.

Vizcaya Museum And Gardens

Vizcaya is one of South Florida's leading attractions. Built by agricultural industrialist James Deering, Vizcaya Museum & Gardens features a main house, ten acres of formal gardens, a rockland hammock (native forest), and soon-to-be-restored historic village. Its art and furnishings portray 400 years of European history and provide a window to both the history of Miami, graced by the villa since its completion in 1916; and to the Italian Renaissance, represented in the Museum's architecture. First, you'll pass through Vizcaya's lush subtropical forest and approach the Main House along a walkway lined with fountains and foliage. The inside of the house is filled with treasures from around the world. Hear Vizcaya's 1917 pipe organ played Monday through Friday from 12 noon to 12:30 pm. Outside, you'll enjoy spectacular views of Biscayne Bay, colorful orchids in the David A. Klein Orchidarium, and the serene gardens and the statues that inhabit them. Located in the southern side of Miami in Coconut Grove, Vizcaya welcomes visitors every day except Tuesdays from 9:30 am to 4:30 pm.

Coral Castle Museum

Located near Homestead, the castle is comprised of numerous coral stones, each weighing several tons. Many of the castle structures are notable, including machines to tell time, home-made air conditioners, and a nine-ton revolving door. To this day, no one knows how Edward Leedskalnin created the Coral Castle. Built under the cover of night and in secret, at a time when there were no modern construction conveniences, Ed would only say that he knew "the secret of the pyramids." Visit this site and try to figure out the mystery.

Everglades National Park

This national park protects the southern 25 percent of the original everglades and has a subtropical climate, a broad, shallow river, and a variety of plant and animal life that makes this a must visit. Wildlife species include the Florida Panther, American Crocodile, and West Indian Manatee. If you enter through the Flamingo Main Entrance, make sure to stop and take the 45-minute walk around the Anhinga Trail, a partially paved trail with a boardwalk that stretches out over the water. Or, rent a bike and take the 15 mile trail around Shark Valley. These are both good spots to see alligators in their natural habitat!



Presidential Invited Speaker



David L. DeMets, Ph.D.

Max Halperin Professor of Biostatistics
University of Wisconsin-Madison

Big Data, Big Opportunities, Big Challenges

Since the 1950's, biostatisticians have been successfully engaged in biomedical research, from laboratory experiments to observational studies to randomized clinical trials. We owe some of that success to the early pioneers,

especially those biostatisticians who were present at the National Institutes of Health (NIH). They created a culture of scientific collaboration, working on the methodology as needed to solve the biomedical research problems in design, conduct and analysis. Over the past 5 decades, we have experienced a tremendous increase in computational power, data storage capability and multidimensionality of data, or "big data". Some of this expansion has been driven by genomics.

At present, we have the opportunity to contribute to the design and analysis of genomic data, data stored in the electronic health record and continued needs of clinical trials for greater efficiency. However, with these opportunities, we have serious challenges starting with the fact that we need to develop new methodology to design and analyze the "big data" bases. The demand for quantitative scientists exceeds the supply and there is no strategic national plan to meet these demands.

Federal funding for biomedical research has been flat and likely to remain so for several years, impacting both the ability to train additional quantitative scientists and provide them with research funding for new methodologies. We face new or more public scrutiny, demanding that our data and analysis be shared earlier and earlier, even as the data are being gathered such as in clinical trials. Litigation is now part of our research environment. We will examine some of these issues and speculate on ways forward.

Biography

David L. DeMets, PhD is currently the Max Halperin Professor of Biostatistics and former Chair of the Department of Biostatistics and Medical Informatics at the University of Wisconsin - Madison. He received his PhD in biostatistics in 1970 from the University of Minnesota. Following a postdoctoral appointment at the National Institutes of Health (1970-72), he spent ten years (1972-1982) at the National Heart, Lung and Blood Institute at the National Institutes of Health where he was a member of and later became chief of the Biostatistics Branch. In 1982, he joined the University of Wisconsin and founded the Department of Biostatistics and Medical Informatics which he chaired until 2009.

He has co-authored four texts, *Fundamentals of Clinical Trials*, *Data Monitoring in Clinical Trials: A Case Studies Approach* and *Data Monitoring Committees in Clinical Trials: A Practical Perspective*, and *Statistical Methods for Clinical Trials*. He has served on numerous NIH and industry-sponsored Data Safety and Monitoring Committees for clinical trials in diverse disciplines. He served on the Board of Directors of the American Statistical Association, as well as having been President of the Society for Clinical Trials and President of the Eastern North American Region (ENAR) of the Biometric Society. In addition he was Elected Fellow of the International Statistics Institute in 1984, the American Statistical Association in 1986, the Association for the Advancement of Science in 1998, the Society for Clinical Trials in 2006 and the American Medical Informatics Association in 2008. In 2013, he was elected as a member of the Institute of Medicine. His research interests include the design, data monitoring and analysis of clinical trials, especially large Phase III randomized clinical trials. He is well known for his work on sequential statistical methods for monitoring interim data for early evidence of intervention benefit or possible harm.

IMS Medallion Lecture



Tilmann Gneiting, Ph.D.

Heidelberg Institute for Theoretical Studies (HITS)
Karlsruhe Institute of Technology (KIT)

Uncertainty Quantification in Complex Simulation Models Using Ensemble Copula Coupling

Critical decisions frequently rely on high-dimensional output from complex computer simulation models that

show intricate cross-variable, spatial and/or temporal dependence structures, with weather and climate predictions being key examples. There is a strongly increasing recognition of the need for uncertainty quantification in such settings, for which we propose and review a general multi stage procedure called ensemble copula coupling (ECC), proceeding as follows.

1. Generate a raw ensemble, consisting of multiple runs of the computer model that differ in the inputs or model parameters in suitable ways.
2. Apply statistical postprocessing techniques, such as Bayesian model averaging or nonhomogeneous regression, to correct for systematic errors in the raw ensemble, to obtain calibrated and sharp predictive distributions for each univariate output variable individually.
3. Draw a sample from each postprocessed predictive distribution.
4. Rearrange the sampled values in the rank orderstructure of the raw ensemble, to obtain the ECC postprocessed ensemble.

The use of ensembles and statistical postprocessing have become routine in weather forecasting over the past decade. We show that seemingly unrelated, recent advances can be interpreted, fused and consolidated within the framework of ECC, the common thread being the adoption of the empirical copula of the raw ensemble. In some settings, the adoption of the empirical copula of historical data offers an attractive alternative. In a case study, the ECC approach is applied to predictions of temperature, pressure, precipitation, and wind over Germany, based on the 50-member European Centre for Medium-Range Weather Forecasts (ECMWF) ensemble. This is joint work with Roman Schefzik and Thordis Thorarinsdottir.

Biography

Tilmann Gneiting is Group Leader at Heidelberg Institute for Theoretical Studies (HITS) and Professor of Computational Statistics at Karlsruhe Institute of Technology (KIT) in Germany. In 1997, he obtained a PhD in Mathematics at Bayreuth University with Peter Huber as supervisor. Subsequently, he held faculty positions in the Department of Statistics at the University of Washington (1997-2009), where he remains affiliate faculty, and at the Institute for Applied Mathematics at Heidelberg University (2009-2013). Tilmann's research focuses on the theory and practice of forecasting, and spatial and spatio-temporal statistics, with applications to meteorological, hydrologic, and economic problems, among others. His work on probabilistic forecasting is supported by an Advanced Grant from the European Research Council. Tilmann also serves as Editor for Physical Science, Computing, Engineering, and the Environment at the Annals of Applied Statistics (2011-2014).



Short Courses

SC1: Bayesian Clinical Trials FULL DAY | 8:00 am to 5:00 pm Tuttle (Terrace Level)

David Draper
University of California, Santa Cruz

Overview

Experiments that would today be recognized as clinical trials have been performed at least since the 1740s (with James Lind's demonstration that citrus fruits cure scurvy). From the late 19th century through the 1990s, sound inferential design and analysis of clinical trials has largely been based on the frequentist probability paradigm, but there has been a recent recognition that Bayesian methods can offer significant advantages in both design and analysis.

The course

- Optimal Bayesian design of clinical trials: sequential designs, adaptive designs; the use of Bayesian decision theory for optimal design
- Optimal Bayesian analysis of clinical trial outcomes: what optimal analysis is, when it can be achieved, and how to achieve it when it's possible

- Well-calibrated Bayesian clinical trial analyses; appropriate use of prior distributions
- Drawing valid causal conclusions with Bayesian analyses of observational clinical studies
- Bayesian meta-analysis for combining information

SC2: Statistical Methods for fMRI and EEG Data Analysis

FULL DAY | 8:00 am to 5:00 pm
Brickell (Terrace Level)

Martin Lindquist
Johns Hopkins School of Public Health

Hernando Ombao
University of California, Irvine

Overview

This course will cover the state-of-the-art techniques and statistical approaches for analyzing fMRI and EEG data. Though there are many types of brain imaging modalities, these two are the most common. This course will be scheduled for 4 hours and will be divided into 2 parts: the first devoted to analyzing fMRI data and the second to EEG data.

The topics in the fMRI section include:

- (a) an overview of the acquisition and reconstruction of fMRI data
- (b) overview of the physiological basis of the fMRI signal
- (c) common experimental designs
- (d) pre-processing steps
- (e) methods for localizing areas activated by a task
- (f) connectivity analysis
- (g) prediction and brain decoding.

The topics for the EEG section are:

- (a) overview of the physiological basis of the EEG signal
- (b) common experimental designs
- (c) pre-processing steps including artifact rejection and filtering
- (d) spectral analysis
- (e) coherence and connectivity analysis
- (f) statistical approaches to modeling variation across trials and subjects
- (g) source localization.

SC3: Design Considerations in Early Phase Clinical Trials: Phase I, Phase I/II Trials

FULL DAY | 8:00 am to 5:00 pm

Flagler (Terrace Level)

Ken Cheung

Columbia University

Alexia Iasonos

Memorial Sloan Kettering Cancer Center

Overview

This course will cover design considerations specific to Phase I and Phase I/II clinical trials, dose finding studies in humans (not in healthy volunteers), in various disease settings. The topic is receiving increased attention in the statistical literature and as a result there exist several new designs that can be made use of in any given situation. The workshop will start with a review of the aims of Phase I trials, Phase I trials with expansion cohorts, Ph I/II trials and provide a link between the aims, designs, and

methods of analysis. The workshop will focus on more advanced statistical topics such as studies involving more than one drug or schedule, patient heterogeneity, and bridging studies. Monitoring safety and efficacy simultaneously in dose expansion cohorts or as part of a Phase I/II trial will also be discussed as Phase I trials are increasingly including aiming to further characterize the toxicity and efficacy profile. Illustrations on how to use model based designs, implement and carry out a model based Phase I trial in practice will be provided based on actual studies from oncology. Computational considerations and available software will also be discussed.

The course

- Overview of Phase I designs
- Basic theory of model based designs
- How good can a design be? Defining optimal performance
- Approaches to non-binary outcomes
- More complex problems: drug combinations, patient heterogeneity
- Dose expansion cohorts
- Phase I/II; estimating toxicity and efficacy in the presence of bivariate endpoints
- Statistical Theory (retrospective vs. prospective analysis, convergence, model robustness)
- Protocol development, review of available software

SC4: Personalized Medicine and Dynamic Treatment Regimes

HALF DAY | 8:00 am to 12:00 noon

Monroe (Terrace Level)

Marie Davidian

North Carolina State University

Butch Tsiatis

North Carolina State University

Overview

Personalized medicine is focused on making treatment decisions for an individual patient based on his/her genetic/genomic, clinical, and other characteristics. Traditional approaches to this goal seek to develop new treatments that are tailored to specific subgroups of patients with unique characteristics. An alternative objective is to determine the best treatment for each patient, not only those in a small subgroup, to the benefit of the entire patient population.

This course will take this point of view and introduce basic concepts and methods for discovery of dynamic treatment regimes based on data. In the simplest case of a single treatment decision, a dynamic treatment regime is a rule that assigns treatment to patients based on their own characteristics, and the goal is to find the optimal regime, that leading to the greatest benefit if followed by all patients. In chronic diseases and disorders such as cancer, treatment decisions may be made at multiple time points. In this setting, a dynamic treatment regime is a set of sequential such decision rules corresponding to each decision point, and the optimal regime is the set of rules that would lead to greatest benefit if followed over the entire course of decision making by all patients.

SC5: Data Science and High- Performance Statistical Computing

HALF DAY | 1:00 pm to 5:00 pm
Monroe (Terrace Level)

Marc A. Suchard
UCLA School of Public Health

Martijn J. Schuemie
Johnson & Johnson

Overview

Healthcare data are a prime research target for the Data Sciences because most databases are not only massive in size, but also very highly complex due to issues in sampling, the recording process, dependency through time and across individuals, and privacy in biomedicine. The size and complexity of these data present challenges to traditional statistical analysis that require novel method development and high-performance computing for scalability.

This course explores recent advances in large-scale statistical inference in healthcare as an example of Big Data in the Data Sciences. The course takes 4 hours and is divided into didactic lectures and hands-on, computing tutorials. Topics include massive observational healthcare databasing and wrangling, scaling inference tools that incorporate complex data structure, and high-performance implementation using emerging computing technology. To this end, participants will use and develop open-source R packages, learn important design patterns for statistical computing, and discuss delegation of performance dependent hot-spots to C/C++ with multi-core and many-core parallelization (including on graphics processing units).



Tutorials

Monday, March 16

T1: **Group Sequential Designs Using the gsDesign R Package and Web Interface**

8:30 am – 10:15 am

Flagler (Terrace Level)

Keaven Anderson

Merck Research Laboratories

Description

Group sequential design is the most widely-used and well-accepted form of adaptive design for confirmatory clinical trials. It controls Type I error for multiple analyses of a primary endpoint during the course of a clinical trial and allows early, well-controlled evaluation of stopping for strong efficacy results or futility. This tutorial will review the basics of group sequential theory and demonstrate common applications of the method. The R package gsDesign and its graphical user interface will be demonstrated to provide the user with an easy-to-use, open source option for designing group sequential clinical trials. The user should leave the tutorial with an ability to propose effective group sequential design solutions to confirmatory clinical trial design. Topics covered include: application of spending functions for selection of appropriate timing and levels of evidence for early stopping; confidence intervals; conditional power,

predictive power and prediction intervals; time-to-event endpoints, including stratified populations and power for meta-analyses; binomial endpoints; superiority and non-inferiority designs; information-based sample size re-estimation and conditional power designs for sample size re-estimation; generation of publication-quality tables, figures and documents describing designs.

T2: **Graphics for Clinical Trials**

10:30 am to 12:15 pm

Flagler (Terrace Level)

Frank E. Harrell Jr.

Vanderbilt University School of Medicine

Description

This tutorial deals with some of the graphical displays that are useful for reporting clinical trial results and for data monitoring committee reports. Emphasis is placed on replacing tables with graphics, new graphical displays for adverse events, longitudinal data, subject enrollment and exclusions, and reproducible reporting using R, LaTeX, and knitr. The philosophy of the approach is that tables should only support graphics, and they should be hyperlinked to graphics rather than appearing in the main report. Information that supports graphics such as definitions and sample sizes are pop-ups in the pdf report. More details are available at biostat.mc.vanderbilt.edu/Greport.



T3: **Statistical Leadership in Research and the Important Role of Influence**

1:45 pm – 3:30 pm

Flagler (Terrace Level)

Bill Sollecito

University of North Carolina, Chapel Hill

Lisa LaVange

Food and Drug Administration

Description

This tutorial will first define leadership and its importance for statisticians; various leadership styles and skills will be introduced. The concept of emergent leadership will be illustrated using the research team environment as an example of how statisticians can develop leadership skills. The important role of influence as a leadership skill will be given special emphasis as a way to develop leadership abilities and as a way to have a greater impact on the teams and organizations in which statisticians work.

T4:

A Tutorial for Multisequence Clinical Structural Brain MRI

3:45 pm – 5:30 pm

Flagler (Terrace Level)

Ciprian Crainiceanu, Ani Eloyan,

Elizabeth Sweeney, and John Muschelli

Johns Hopkins University

Description

High resolution structural magnetic resonance imaging (sMRI) is used extensively in clinical practice, as it provides detailed anatomical information of the living organism, is sensitive to many pathologies, and assists in the diagnosis of disease. Applications of sMRI cover essentially every part of the human body from toes to brain and a wide variety of diseases from stroke, cancer, and multiple sclerosis (MS), to internal bleeding and torn ligaments. Since the introduction of MRI in the 1980s, the noninvasive nature of the technique, the continuously improving resolution of images, and the wide availability of MRI scanners have made sMRI instantly recognizable in the popular literature. Indeed, when one is asked to have an MRI in a clinical context it is almost certainly an sMRI. These images are fundamentally different from functional MRI (fMRI) in size, complexity, measurement target, type of measurement, and intended use. While fMRI aims to study brain activity, sMRI reveals anatomical information. This distinction is important as the scientific problems and statistical techniques for fMRI and sMRI analysis differ greatly, yet confusion between the two continues to exist in the statistical literature and among reviewers. Despite the enormous practical importance of sMRI, few biostatisticians have made research contributions in this field. This may be due to the subtle aspects of sMRI, the relatively flat learning curve, and the lack of contact between biostatisticians and the scientists working in clinical neuroimaging. Our goal is reduce the price of entry, accelerate learning, and provide the information required to progress from novice to initiated sMRI researcher. This tutorial will provide a gentle introduction to high resolution multisequence structural MRI (sMRI) using several data sets. The tutorial will provide hands-on training in a variety of image processing techniques including: data structure and visualization, data storage and management, inhomogeneity correction, spatial interpolation, skull stripping, spatial registration, intensity normalization, lesion segmentation and mapping, and cross-sectional and longitudinal analysis of images. The tutorial will use R and several other free specialized brain imaging software.

Tuesday, March 17

T5: Bayesian Computation using PROC MCMC

1:45 pm – 3:30 pm

Jasmine (Terrace Level)

Fang Chen

SAS Institute Inc.

Description

The MCMC procedure is a general purpose Markov chain Monte Carlo simulation tool designed to fit a wide range of Bayesian models, including linear or nonlinear models, multi-level hierarchical models, models with nonstandard likelihood function or prior distributions, and missing data problems. This tutorial provides a quick and gentle introduction to PROC MCMC and demonstrates its use with a series of applications, such as Monte Carlo simulation, various regression models, sensitivity analysis, random-effects models, and predictions.

Increasingly, Bayesian methods are being used by statisticians in the pharmaceutical field to handle industry-specific problems. This tutorial will also present a number of pharma-related data analysis examples and case studies, including network meta-analysis, power prior, and missing data analysis. This tutorial is intended for statisticians who are interested in Bayesian computation. Attendees should have a basic understanding of Bayesian methods (the tutorial does not allocate time covering basic concepts of Bayesian inference) and experience using the SAS language. This tutorial is based on SAS/STAT 13.2.

T6: Graphical Approaches to Multiple Test Problems

3:45 pm – 5:30 pm

Jasmine (Terrace Level)

Dong Xi

Novartis Pharmaceuticals

Description

Methods for addressing multiplicity are becoming increasingly more important in clinical trials and other applications. In the recent past, several multiple test procedures have been developed that allow one to map the relative importance of different study objectives as well as their relation onto an appropriately tailored multiple test procedure, such as fixed-sequence, fallback, and gate keeping procedures. In this tutorial we focus on graphical approaches that can be applied to common multiple test problems, such as comparing several treatments with a control, assessing the benefit of a new drug for more than one endpoint, and combined non-inferiority and superiority testing. Using graphical approaches, one can easily construct and explore different test strategies and thus tailor the test procedure to the given study objectives. The resulting multiple test procedures are represented by directed, weighted graphs, where each node corresponds to an elementary hypothesis, together with a simple algorithm to generate such graphs while sequentially testing the individual hypotheses. We also present several case studies to illustrate how the approach can be used in clinical practice. In addition, we briefly consider power and sample size calculation to optimize a multiple test procedure for given study objectives. The presented methods will be illustrated using the graphical user interface from the gMCP package in R, which is freely available on CRAN.



Roundtables

Monday, March 16 | 12:15pm – 1:30pm

Monroe (Terrace Level)

R1: **Survival Strategies for Junior Researchers: Can You Have It All?**

Bhramar Mukherjee

University of Michigan School of Public Health

Description

As soon as you get a “real job” after completing your doctoral or post-doctoral training, the expectations and responsibilities from your employer increase dramatically. Unfortunately, this critical time window of establishing yourself in the profession also coincides with the phase when demands from your personal life escalate. I will share some useful strategies for time management, carefully selecting research problems as a junior researcher, establishing independence from your advisor, prioritizing in terms of teaching, research, collaboration and professional service opportunities and ultimately for trying to strike a work-life balance.

It is a complex multi-dimensional optimization problem with non-linear constraints, and while there is no uniform and obvious solution that works for everybody, we can take advantage of shared experiences and existing resources to maximize our chance of success, in both personal and professional terms. This discussion will be relevant for senior graduate students, post-doctoral researchers, junior researchers in both industry and academia who are planning to enter/have recently entered the work force.

R2: **New Trends and Innovations in Science and Practice of Clinical Trials**

Olga Marchenko

Quintiles

Description

The intent of this roundtable discussion is to highlight, share, and discuss the views on some new trends and innovations in science and practice of clinical trials. Specific topics of this discussion will include:

- Innovative designs (e.g., adaptive designs, biomarker-driven designs) where are we today?
- Statistical and PK/PD applications on smart phones to collect data (e.g., patient diary), to adjust doses (e.g., a dose for diabetes patients), to analyze data (e.g., simple summaries and graphics) just an idea or the reality?
- Statistical and operational simulations why do we need them?
- Predictive analytics to improve operational support should we statisticians step up?

R3:

The Role of Statisticians at the FDA

Dionne L. Price

Food and Drug Administration

Description

The Food and Drug Administration (FDA) is composed of seven centers which collectively employ over 250 statisticians. Statisticians at the FDA are an integral part of multidisciplinary teams dedicated to assuring the safety and efficacy of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics, and products that emit radiation. Statisticians analyze and evaluate data, provide leadership, promote innovation in study designs and statistical techniques, and conduct methodological research aimed at addressing the many complex issues that arise in a regulatory environment. FDA statisticians utilize their statistical training and knowledge to directly impact the public health. Roundtable participants will learn the role of statisticians at the FDA and potential paths to successful careers with the Agency.

R4:

Applying Bayesian Evidence Synthesis in Comparative Effectiveness Research

David Ohlssen

Novartis Pharmaceuticals

Description

Motivated by the use of evidence based medicine to evaluate health technology, there has been an enormous increase in the use of quantitative techniques that allow data to be combined from a variety of sources. In a drug development setting, there have been a number of recent key works: The recommendations on the use and application of network meta-analysis were recently presented by the ISPOR task force; From a regulatory perspective, the work of the Canadian Agency (Indirect Evidence: Indirect Treatment Comparisons in Meta-Analysis) and the UK NICE Evidence synthesis series have recently been published; Further, the FDA also started a number of recent projects on comparative effectiveness research as part of a plan to enhance regulatory science. By drawing on examples from a drug development setting, this roundtable aims to discuss these recent advances.

R5:

Survival Skills for Biostatisticians in Academic Medical Centers

Mithat Gönen

Memorial Sloan-Kettering Cancer Center

Description

Biostatisticians in academic medical centers face different challenges than their counterparts in universities and academia. This will be an informal discussion of these challenges. Possible topics to be covered include the double-edged nature of collaborative work, managing the collaborations to sustain funding, find intellectual fulfillment and stimulation for one's own methodological work, avoiding being overwhelmed and demotivated by the amount and nature of collaborations, gaining acceptance as an intellectual contributor (as opposed to being a p-value generator) from one's collaborators and striking work-life balance.

R6:

Working as a Statistician at the Center for Devices at the FDA

Telba Irony

Food and Drug Administration

Description

In this round table, I will discuss the life of statistician at the Center for Devices and Radiological Health, highlighting the fact that the statistician is a problem solver, who must be interested in science and teaching, and could aspire to leadership positions.

R7:

Writing Collaborative Grant Applications: Tips and Strategies

Brisa Sánchez

University of Michigan School of Public Health

Description

One of the key aspects of a biostatistics career in academia undoubtedly includes participation in collaborative research and writing grant proposals to support that research. In this round table we will discuss the range of contributions statisticians make to the grant writing process, share tips and strategies to make the process more efficient, and discuss how participation in collaborative grant proposals can enhance the biostatistician's methodological research.

R8: **Interplay Between Adaptive Design Features and Complex Study Subjectives, Case Studies and Tools**

Yevgen Tymofyeyev

Janssen Research & Development

Description

The current state of available commercial implementations of adaptive designs software covers substantial practical needs. On the other hand, there are also practical situations where a need exists for custom-made programming to satisfy requirements and special features of a particular study or program. Such cases are hard to envision up-front in order to warrant a commercial off-the-shelf tool. An example could be a study with multiple doses of the active drug, multiple comparators and several primary endpoints, where the corresponding multiple tests can be organized into some logical structure resolved by the application of a gatekeeping-type procedure, to address the multiple testing problem. This roundtable is intended to share experiences of interesting case studies addressing not only statistical design and simulation components, but also logistical implementation issues and interactions with regulatory agencies.

R9: **Publishing Without Perishing: Strategies for Success in Publishing in (Bio)statistical Journals**

Marie Davidian

North Carolina State University

Description

Contributing to the advance of our discipline through publication of articles in peer-reviewed journals is a fundamental expectation for both junior and not-so junior biostatistical researchers alike. Success in publishing one's work ensures that it will be widely disseminated to researchers and practitioners who stand to benefit. In addition, funding agencies and academic institutions place considerable importance on a successful record of publication. Accordingly, understanding the peer review and editorial processes of top journals and mastering the art of writing an effective journal article are keys to success in publishing. How does one determine the best outlet for one's work? What are the essential elements of a successful journal article? How does one maximize the chance of acceptance? What strategies can ensure that a published paper is read and cited? How does one make optimal use of limited space and additional supplementary material in conveying the message? What are the roles of the editor, associate editor, and referees? What considerations do editors use when evaluating a paper? This roundtable will provide a forum for candid discussion of these and other questions.



Program Summary

SATURDAY, MARCH 14

9:00 am – 9:00 pm	WORKSHOP FOR JUNIOR RESEARCHERS	<i>Hibiscus B (Terrace Level)</i>
3:30 pm – 5:30 pm	CONFERENCE REGISTRATION	<i>Lower Promenade (Terrace Level)</i>

SUNDAY, MARCH 15

7:30 am – 6:30 pm	CONFERENCE REGISTRATION	<i>Lower Promenade (Terrace Level)</i>
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8:00 am – 12:00 pm	SHORT COURSES	
	SC4: Personalized Medicine and Dynamic Treatment Regimes	<i>Monroe (Terrace Level)</i>

8:00 am – 5:00 pm	SHORT COURSES	
	SC1: Bayesian Clinical Trials	<i>Tuttle (Terrace Level)</i>
	SC2: Statistical Methods for fMRI and EEG Data Analysis	<i>Brickell (Terrace Level)</i>
	SC3: Design Considerations in Early Phase Clinical Trials: Phase I, Phase I/II Trials	<i>Flagler (Terrace Level)</i>

12:30 am – 5:30 pm	DIVERSITY WORKSHOP	<i>Orchid CD (Terrace Level)</i>
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1:00 pm – 5:00 pm	SHORT COURSES	
	SC5: Data Science and High-Performance Statistical Computing	<i>Monroe (Terrace Level)</i>
3:00 pm – 6:00 pm	EXHIBITS OPEN	<i>Lower Promenade (Terrace Level)</i>
4:30 pm – 7:00 pm	ENAR EXECUTIVE COMMITTEE MEETING (by Invitation Only)	<i>Orchid A (Terrace Level)</i>
4:00 pm – 6:30 pm	PLACEMENT SERVICE	<i>Hibiscus A (Terrace Level)</i>
7:30 pm – 8:00 pm	NEW MEMBER RECEPTION	<i>Riverfront Ballroom (Terrace Level)</i>
8:00 pm – 11:00 pm	SOCIAL MIXER AND POSTER SESSION	
	<i>Riverfront Ballroom (2nd Floor)</i>	
	1. Posters: Latent Variable and Mixture Models	
	2. Posters: Imaging Methods and Applications	
	3. Posters: Clinical Trials, Adaptive Designs and Applications	
	4. Posters: Survival Analysis	
	5. Posters: Causal Inference	
	6. Posters: Statistical Genetics, GWAS, and 'omics Data	
	7. Posters: Methodology and Applications in Epidemiology, Environment, and Ecology	
	8. Posters: Variable Selection and Methods for High Dimensional Data	
	9. Posters: Bayesian Methods and Computational Algorithms	

MONDAY, MARCH 16

7:30 a.m – 5:00 pm	CONFERENCE REGISTRATION	<i>Lower Level Promenade (Terrace Level)</i>
7:30 am – 5:00 pm	SPEAKER READY ROOM	<i>Azalea B (Terrace Level)</i>
9:00 am – 5:00 pm	PLACEMENT SERVICE	<i>Hibiscus A (Terrace Level)</i>
8:30 am – 5:30 pm	EXHIBITS OPEN	<i>Lower Promenade (Terrace Level)</i>

8:30 am – 10:15 am

TUTORIAL

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| T1: Group Sequential Designs Using the gsDesign R Package and Web Interface | <i>Flagler (Terrace Level)</i> |
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SCIENTIFIC PROGRAM

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| 10. Advances in Patient-Centered Outcomes (PCOR) Methodology | <i>Ashe Auditorium (3rd Floor)</i> |
| 11. Looking Under the Hood: Assumptions, Methods and Applications of Microsimulation Models to Inform Health Policy | <i>Brickell (Terrace Level)</i> |
| 12. Optimal Inference for High Dimensional Problems | <i>Miami Lecture Hall (3rd Floor)</i> |
| 13. Lifetime Data Analysis Highlights | <i>Johnson (3rd Floor)</i> |
| 14. Recent Advances and Challenges in the Design of Early Stage Cancer Trials | <i>Foster (3rd Floor)</i> |
| 15. Large Scale Data Science for Observational Healthcare Studies | <i>Tuttle (Terrace Level)</i> |
| 16. Contributed Papers: Competing Risks | <i>Ibis (3rd floor)</i> |

17.	Contributed Papers: Applications and Methods in Environmental Health	<i>Pearson I (3rd Floor)</i>
18.	Contributed Papers: Statistical Methods for Genomics	<i>Orchid C (Terrace Level)</i>
19.	Contributed Papers: Spatial and Spatio-Temporal Methods and Applications	<i>Merrick II (3rd Floor)</i>
20.	Contributed Papers: Case Studies in Longitudinal Data Analysis	<i>Pearson II (3rd Floor)</i>
21.	Contributed Papers: Meta Analysis	<i>Gautier (3rd Floor)</i>
22.	Contributed Papers: Semi-Parametric Methods	<i>Stanford (3rd Floor)</i>

9:30 am – 4:30 pm	PLACEMENT SERVICE	<i>Hibiscus A (Terrace Level)</i>
10:15 am – 10:30 am	REFRESHMENT BREAK WITH OUR EXHIBITORS	<i>Lower Promenade (Terrace Level)</i>

10:30 am – 12:15 pm	TUTORIAL	
	T2: Graphics for Clinical Trials	<i>Flagler (Terrace Level)</i>

	SCIENTIFIC PROGRAM	
23.	Trends and Innovations in Clinical Trial Statistics: “The Future ain’t What it Used to be”	<i>Tuttle (Terrace Level)</i>
24.	Causal Inference in HIV/AIDS Research	<i>Foster (3rd Floor)</i>
25.	Open Problems and New Directions in Neuroimaging Research	<i>Merrick II (3rd Floor)</i>
26.	Statistical Methods for Understanding Whole Genome Sequencing	<i>Johnson (3rd Floor)</i>
27.	Doing Data Science: Straight Talk from the Frontline	<i>Brickell (Terrace Level)</i>

28.	IMS Medallion Lecture	<i>Ashe Auditorium (3rd Floor)</i>
29.	In Memory of Marvin Zelen: Past, Present and Future of Clinical Trials and Cancer Research	<i>Miami Lecture Hall (3rd Floor)</i>
30.	Contributed Papers: Methods for Clustered Data and Applications	<i>Pearson I (3rd Floor)</i>
31.	Contributed Papers: GWAS	<i>Ibis (3rd Floor)</i>
32.	Contributed Papers: Applications, Simulations and Methods in Causal Inference	<i>Pearson II (3rd Floor)</i>
33.	Contributed Papers: Adaptive Designs and Dynamic Treatment Regimes	<i>Gautier (3rd Floor)</i>
34.	Contributed Papers: Survival Analysis and Cancer Applications	<i>Stanford (3rd Floor)</i>

INVITED AND CONTRIBUTED ORAL POSTERS

35.	Oral Posters: Methods and Applications in High Dimensional Data and Machine Learning	<i>Jasmine (Terrace Level)</i>
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12:15 pm – 1:30 pm	ROUNDTABLE LUNCHEONS	<i>Monroe (Terrace Level)</i>
12:30 pm – 4:30 pm	REGIONAL ADVISORY BOARD (RAB) LUNCHEON MEETING <i>(by Invitation Only)</i>	<i>Hibiscus B (Terrace Level)</i>



1:45 pm – 3:30 pm

TUTORIAL

T3: Statistical Leadership in Research and the Important Role of Influence

Flagler (Terrace Level)

SCIENTIFIC PROGRAM

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| 36. Recent Research in Adaptive Randomized Trials with the Goal of Addressing Challenges in Regulatory Science | <i>Ashe Auditorium (3rd Floor)</i> |
| 37. Statistical Innovations in Functional Genomics and Population Health | <i>Johnson (3rd Floor)</i> |
| 38. Big Data: Issues in Biosciences | <i>Miami Lecture Hall (3rd Floor)</i> |
| 39. Recent Advances in Statistical Ecology | <i>Foster (3rd Floor)</i> |
| 40. New Analytical Issues in Current Epidemiology Studies of HIV and Other Sexually Transmitted Infections | <i>Brickell (Terrace Level)</i> |
| 41. Statistical Advances and Challenges in Mobile Health | <i>Tuttle (Terrace Level)</i> |
| 42. Contributed Papers: Survey Research | <i>Pearson I (3rd Floor)</i> |
| 43. Contributed Papers: Graphical Models | <i>Pearson II (3rd Floor)</i> |
| 44. Contributed Papers: Joint Models for Longitudinal and Survival Data | <i>Merrick II (3rd Floor)</i> |
| 45. Contributed Papers: Functional Data Analysis | <i>Gautier (3rd Floor)</i> |
| 46. Contributed Papers: Methods in Causal Inference: Instrumental Variable, Propensity Scores and Matching | <i>Ibis (3rd Floor)</i> |
| 47. Contributed Papers: Covariates Measured with Error | <i>Stanford (3rd Floor)</i> |

INVITED AND CONTRIBUTED ORAL POSTERS

48. Oral Posters: Clinical Trials

Jasmine (Terrace Level)

3:30 pm – 3:45 pm

REFRESHMENT BREAK WITH OUR EXHIBITORS

*Lower Promenade
(Terrace Level)*

3:45 pm – 5:30 pm

TUTORIAL

T4: A Tutorial for Multisequence Clinical Structural Brain MRI

Flagler (Terrace Level)

SCIENTIFIC PROGRAM

49. CENS Invited Session — Careers in Statistics: Skills for Success

Ashe Auditorium

50. Analysis Methods for Data Obtained from Electronic Health Records

Tuttle (Terrace Level)

51. Statistical Challenges of Survey and Surveillance Data in US Government

Foster (3rd Floor)

52. Reconstructing the Genomic Landscape from High-Throughput Data

Johnson (3rd Floor)

53. Statistical Methods for Single Molecule Experiments

*Miami Lecture Hall
(3rd Floor)*

54. Subgroup Analysis and Adaptive Trials

Brickell (Terrace Level)

55.	Contributed Papers: Methods to Assess Agreement	<i>Pearson I (3rd Floor)</i>
56.	Contributed Papers: Methylation and RNA Data Analysis	<i>Stanford (3rd Floor)</i>
57.	Contributed Papers: New Developments in Imaging	<i>Ibis (3rd Floor)</i>
58.	Contributed Papers: Latent Variable and Principal Component Models	<i>Pearson II (3rd Floor)</i>
59.	Contributed Papers: Developments and Applications of Clustering, Classification, and Dimension Reduction Methods	<i>Gautier (3rd Floor)</i>
60.	Contributed Papers: Survival Analysis: Methods Development and Applications	<i>Merrick II (3rd Floor)</i>

INVITED AND CONTRIBUTED ORAL POSTERS

61.	Oral Posters: GWAS and Meta Analysis of Genetic Studies	<i>Jasmine (Terrace Level)</i>
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5:30 pm – 6:30 pm	CENS STUDENT MIXER	<i>Monroe (Terrace Level)</i>
6:30 pm – 7:30 pm	PRESIDENT'S RECEPTION <i>(by Invitation Only)</i>	<i>Riverwalk Outdoor Terrace</i>



TUESDAY, MARCH 17

7:30 am – 5:00 pm	CONFERENCE REGISTRATION	<i>Lower Promenade (Terrace Level)</i>
7:30 am – 5:00 pm	SPEAKER READY ROOM	<i>Azalea B (Terrace Level)</i>
8:30 am – 5:30 pm	EXHIBITS OPEN	<i>Lower Promenade (Terrace Level)</i>
9:30 am – 3:30 pm	PLACEMENT SERVICE	<i>Hibiscus A (Terrace Level)</i>

8:30 am – 10:15 am

SCIENTIFIC PROGRAM

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|------------|---|---|
| 62. | Statistical Inference with Random Forests and Related Ensemble Methods | <i>Hibiscus B (Terrace Level)</i> |
| 63. | Mediation and Interaction: Theory, Practice and Future Directions | <i>Ashe Auditorium
(3rd Floor)</i> |
| 64. | Motivation and Analysis Strategies for Joint Modeling of High Dimensional Data in Genetic Association Studies | <i>Orchid C (Terrace Level)</i> |
| 65. | Recent Developments on Inference for Possibly Time-Dependent Treatment Effects with Survival Data | <i>Johnson (3rd Floor)</i> |
| 66. | <i>Journal of Agricultural, Biological and Environmental Statistics (JABES)</i> Highlights | <i>Foster (3rd Floor)</i> |
| 67. | Estimation and Inference for High Dimensional and Data Adaptive Problems | <i>Miami Lecture Hall
(3rd Floor)</i> |
| 68. | Contributed Papers: Novel Methods for Bioassay Data | <i>Merrick I (3rd Floor)</i> |



	69. Contributed Papers: Infectious Disease	<i>Pearson I (3rd Floor)</i>
	70. Contributed Papers: Variable Selection	<i>Pearson II (3rd Floor)</i>
	71. Contributed Papers: Modeling Health Data with Spatial or Temporal Features	<i>Gautier (3rd Floor)</i>
	72. Contributed Papers: Advances in Longitudinal Modeling	<i>Merrick II (3rd Floor)</i>
	73. Contributed Papers: Causal Inference: Average and Mediated Effects	<i>Ibis (3rd Floor)</i>
	74. Contributed Papers: Variable Selection with High Dimensional Data	<i>Stanford (3rd Floor)</i>
10:15 am – 10:30 am	REFRESHMENT BREAK WITH OUR EXHIBITORS	<i>Lower Promenade (Terrace Level)</i>
10:30 am – 12:15 pm	75. PRESIDENTIAL INVITED ADDRESS	<i>Regency Ballroom (Terrace Level)</i>
12:30 pm – 4:30 pm	REGIONAL COMMITTEE LUNCHEON MEETING (by Invitation Only)	<i>Hibiscus B (Terrace Level)</i>

1:45 pm – 3:30 pm

TUTORIAL

T5: Bayesian Computation Using Proc MCMC

Jasmine (Terrace Level)

SCIENTIFIC PROGRAM

- | | | |
|------------|--|---------------------------------------|
| 76. | Recent Advances in Dynamic Treatment Regimes | <i>Ashe Auditorium (3rd Floor)</i> |
| 77. | Predictive Models for Precision Medicine | <i>Miami Lecture Hall (3rd Floor)</i> |
| 78. | Electronic Health Records: Challenges and Opportunities | <i>Orchid C (Terrace Level)</i> |
| 79. | Cost-Effective Study Designs for Observational Data | <i>Tuttle (Terrace Level)</i> |
| 80. | Advanced Machine Learning Methods | <i>Johnson (3rd Floor)</i> |
| 81. | Statistical Analysis for Deep Sequencing Data in Cancer Research: Methods and Applications | <i>Foster (3rd Floor)</i> |
| 82. | Spatial and Spatio-Temporal Modeling | <i>Merrick II (3rd Floor)</i> |
| 83. | Contributed Papers: Study Design and Power | <i>Stanford (3rd Floor)</i> |
| 84. | Contributed Papers: Missing Data | <i>Gautier (3rd Floor)</i> |
| 85. | Contributed Papers: Innovative Methods for Clustered Data | <i>Ibis (3rd Floor)</i> |
| 86. | Contributed Papers: Biopharmaceutical Applications and Survival Analysis | <i>Pearson II (3rd Floor)</i> |
| 87. | Contributed Papers: Computational Methods | <i>Pearson I (3rd Floor)</i> |

3:30 pm – 3:45 pm

REFRESHMENT BREAK WITH OUR EXHIBITORS

Lower Promenade (Terrace Level)



3:45 pm – 5:30 pm

TUTORIAL

T6: Graphical Approaches to Multiple Test Problems

Jasmine (Terrace Level)

SCIENTIFIC PROGRAM

- | | | |
|------------|--|---------------------------------------|
| 88. | Biostatistical Methods for Heterogeneous Genomic Data | <i>Tuttle (Terrace Level)</i> |
| 89. | Innovative Approaches in Competing Risk Analysis | <i>Orchid C (Terrace Level)</i> |
| 90. | Biomarker Evaluation in Diagnostics Studies with Longitudinal Data | <i>Johnson (3rd Floor)</i> |
| 91. | Solving Clinical Trial Problems by Using Novel Designs | <i>Foster (3rd Floor)</i> |
| 92. | Ensuring Biostatistical Competence Using Novel Methods | <i>Miami Lecture Hall (3rd Floor)</i> |
| 93. | Methodological Frontiers in the Analysis of Panel Observed Data | <i>Ashe Auditorium (3rd Floor)</i> |
| 94. | Contributed Papers: Ordinal and Categorical Data | <i>Stanford (3rd Floor)</i> |
| 95. | Contributed Papers: Statistical Genetics | <i>Merrick II (3rd Floor)</i> |
| 96. | Contributed Papers: Ecology and Forestry Applications | <i>Pearson I (3rd Floor)</i> |
| 97. | Contributed Papers: Pooled Biospecimens and Diagnostic Biomarkers | <i>Pearson II (3rd Floor)</i> |
| 98. | Contributed Papers: Multiple Testing and Variable Selection | <i>Ibis (3rd Floor)</i> |
| 99. | Contributed Papers: Parameter Estimation in Hierarchical and Non Linear Models | <i>Gautier (3rd Floor)</i> |

5:30 pm – 6:30 pm

ENAR BUSINESS MEETING
(Open to all ENAR Members)

Orchid C (Terrace Level)

6:30 pm – 9:30 pm

TUESDAY NIGHT EVENT
Dinner Cruise on the Biscayne Lady

WEDNESDAY, MARCH 18

7:30 am – 12:00 noon	SPEAKER READY ROOM	<i>Azalea B (Terrace Level)</i>
7:30 am – 9:00 am	PLANNING COMMITTEE BREAKFAST MEETING (by Invitation Only)	<i>Orchid A (Terrace Level)</i>
8:00 am – 12:30 pm	CONFERENCE REGISTRATION	<i>Lower Promenade (Terrace Level)</i>
8:00 am – 12:00 pm	EXHIBITS OPEN	<i>Lower Promenade (Terrace Level)</i>

8:30 am – 10:15 am	SCIENTIFIC PROGRAM	
100.	New Statistical Methods in the Environmental Health Sciences	<i>Miami Lecture Hall (3rd Floor)</i>
101.	Novel Phase II and III Clinical Trial Designs for Cancer Research that Incorporate Biomarkers and Nonstandard Endpoints	<i>Pearson (3rd Floor)</i>
102.	Novel Statistical Methods to Decipher Gene Regulation Using Sequence Data	<i>Jasmine (Terrace Level)</i>
103.	Flow Cytometry: Data Collection and Statistical Analysis	<i>Foster (3rd Floor)</i>
104.	Statistical Methods in Chronic Kidney Disease	<i>Johnson (3rd Floor)</i>
105.	Challenging Statistical Issues in Imaging	<i>Merrick I (3rd Floor)</i>
106.	Statistical Methods for Predicting Subgroup Level Treatment Response	<i>Ashe Auditorium (3rd Floor)</i>
107.	Contributed Papers: ROC Curves	<i>Ibis (3rd Floor)</i>
108.	Contributed Papers: Personalized Medicine and Biomarkers	<i>Merrick II (3rd Floor)</i>
109.	Contributed Papers: Time Series Analysis and Methods	<i>Stanford (3rd Floor)</i>

10:15 am – 10:30 am

REFRESHMENT BREAK WITH OUR EXHIBITORS

*Lower Promenade
(Terrace Level)*

10:30 am – 12:15 pm

SCIENTIFIC PROGRAM

- | | | |
|-------------|---|---------------------------------------|
| 110. | Incorporating Biological Information in Statistical Modeling of Genome-Scale Data with Complex Structures | <i>Jasmine (3rd Floor)</i> |
| 111. | Emerging Issues in Clinical Trials and High Dimensional Data | <i>Ashe Auditorium (3rd Floor)</i> |
| 112. | Advances in Repeated Measures and Longitudinal Data Analysis | <i>Pearson (3rd Floor)</i> |
| 113. | Advances in Modeling Zero-Inflated Data | <i>Johnson (3rd Floor)</i> |
| 114. | New Developments in Missing Data Analysis: from Theory to Practice | <i>Merrick II (3rd Floor)</i> |
| 115. | Environmental Methods with Deterministic and Stochastic Components | <i>Foster (3rd Floor)</i> |
| 116. | Bayesian and non-parametric Bayesian Approaches to Causal Inference | <i>Miami Lecture Hall (3rd Floor)</i> |
| 117. | Design of Multiregional Clinical Trials: Theory and Practice | <i>Merrick I (3rd Floor)</i> |
| 118. | Contributed Papers: Multivariate Survival Analysis | <i>Ibis (3rd Floor)</i> |
| 119. | Contributed Papers: Constrained Inference | <i>Stanford (3rd Floor)</i> |
| 120. | Contributed Papers: Nonparametric Methods | <i>Gautier (3rd Floor)</i> |







Scientific Program

SUNDAY, MARCH 15

8:00 am – 11:00 pm

POSTER PRESENTATIONS

Riverfront Ballroom (2nd Floor)

1. POSTERS:

Latent Variable and Mixture Models

Sponsor: **ENAR**

1a. INVITED POSTER:

**Assessment of Dimensionality Can Be Distorted by Too Many Zeroes:
An Example from Psychiatry and a Solution Using Mixture Models**

Melanie M. Wall*, Columbia University
Irini Moustaki, London School of Economics

1b. Local Influence Diagnostics for Hierarchical Count Data Models with Overdispersion and Excess Zeros

Trias Wahyuni Rakhmawati*, Universiteit Hasselt
Geert Molenberghs, Universiteit Hasselt and Katholieke Universiteit Leuven
Geert Verbeke, Katholieke Universiteit Leuven and Universiteit
Hasselt Christel Faes, Universiteit Hasselt and Katholieke Universiteit Leuven

1c. Finite Multivariate Mixtures of Skew-t Distributions with Collapse Clusters with Application in Forestry

Josef Hoefler* and **Donna Pauler Ankerst**, Technical University Munich

1d. Weibull Mixture Regression for Zero-Heavy Continuous Substance Use Outcomes

Mulugeta Gebregziabher, **Delia Voronca*** and **Abeba Teklehaimanot**,
Medical University of South Carolina
Elizabeth J. Santa Ana, Ralph H. Johnson Department of Veterans
Affairs Medical Center

1e. Model-Free Estimation of Time-Varying Correlation Coefficients and their Confidence Intervals with an Application to fMRI Data

Maria A. Kudela* and **Jaroslav Harezlak**, Indiana University
Richard M. Fairbanks School of Public Health, Indianapolis
Martin Lindquist, Johns Hopkins Bloomberg School of Public Health

1f. Zero-and-One Inflated Beta Regression with Mixed Effects for Modeling Relative Frequency of Condom Use in Men Who Have Sex with Men (MSM) in Ghana

Nanhua Zhang*, Cincinnati Children's Hospital Medical Center
Yue Zhang, University of Cincinnati
LaRon E. Nelson, University of Rochester

1g. Inference for the Number of Topics in the Latent Dirichlet Allocation Model via a Pseudo-Marginal Metropolis-Hastings Algorithm

Zhe Chen* and Hani Doss, University of Florida

1h. Applying a Stochastic Volatility Model to US Stock Markets with a UMM Undergraduate Student

Jong-Min Kim* and Li Qin, University of Minnesota, Morris

1i. A Mixture Model of Heterogeneity in Treatment Response

Hongbo Lin* and Changyu Shen, Indiana University School of Medicine and Richard M. Fairbanks School of Public Health, Indianapolis

1j. Bayesian Random Graph Mixture Model for Community Detection in Weighted Networks

Christopher Bryant*, Mihye Ahn, Hongtu Zhu and Joseph Ibrahim, University of North Carolina, Chapel Hill

1k. Time Series Forecasting Using Model-Based Clustering and Model Averaging

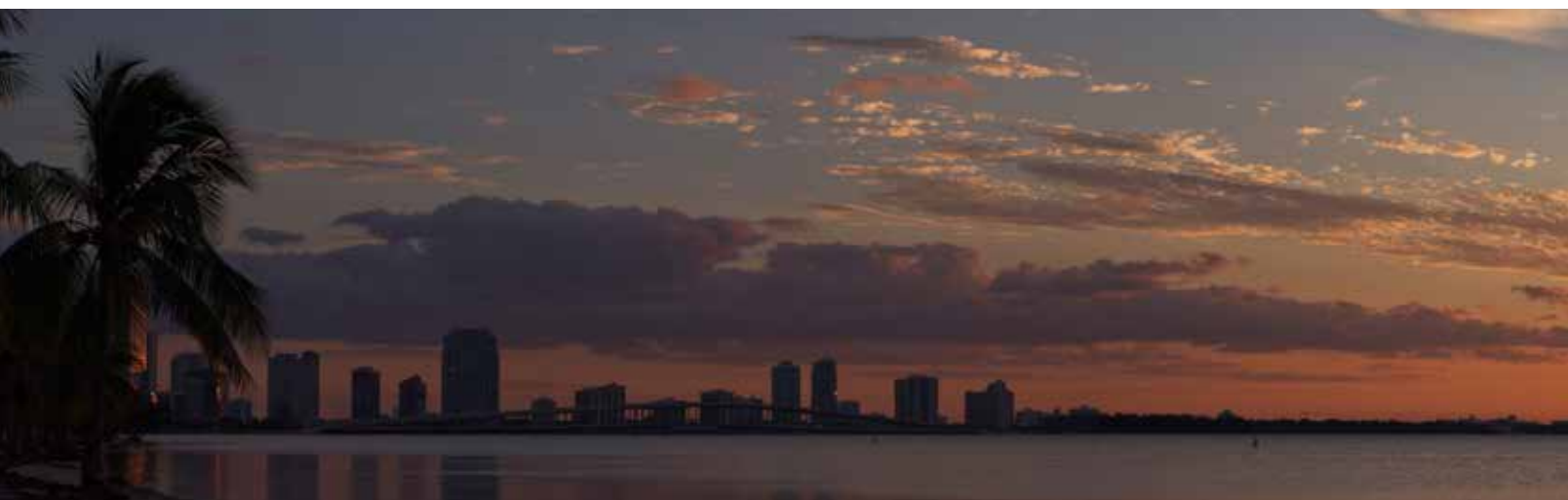
Fan Tang* and Joseph Cavanaugh, University of Iowa

1l. Multilevel Functional Principal Components Analysis of Surfaces with Application to CT Image Data of Pediatric Thoracic Shape

Lucy F. Robinson*, Jonathan Harris and Sriram Balasubramanian, Drexel University

1m. A New Approach for Treatment Noncompliance with Structural Zero Data

Pan Wu*, Christiana Care Health System



2. POSTERS: Imaging Methods and Applications

Sponsor: ENAR

2a. INVITED POSTER:

Determining Multimodal Neuroimaging Markers of Parkinson's Disease

DuBois Bowman*, Columbia University

Weingiong Xue, Boehringer Ingelheim

Daniel Drake, Columbia University

2b. Segmentation of Intracerebral Hemorrhage in CT Scans Using Logistic Regression

John Muschelli*, Johns Hopkins Bloomberg School of Public Health

Natalie Ullman and Daniel Hanley, Johns Hopkins School of Medicine

Ciprian M. Crainiceanu, Johns Hopkins Bloomberg School of Public Health

2c. Relating Multi-Sequence Longitudinal Data from MS Lesions on Structural MRI to Clinical Covariates and Outcomes

Elizabeth Sweeney*, Johns Hopkins Bloomberg School of Public Health

Blake Dewey and Daniel Reich, National Institute of Neurological Disease and Stroke, National Institutes of Health

Ciprian M. Crainiceanu, Johns Hopkins Bloomberg School of Public Health

Russell Shinohara, University of Pennsylvania

Ani Eloyan, Johns Hopkins Bloomberg School of Public Health

2d. Using Multiple Imputation to Efficiently Correct Magnetic Resonance Imaging Data in Multiple Sclerosis

Alicia S. Chua*, Svetlana Egorova, Mark C. Anderson,

Mariann Polgar-Turcsanyi, Tanuja Chitnis, Howard L. Weiner,

Charles R. Guttmann, Rohit Bakshi and Brian C. Healy, Brigham and Women's Hospital, Boston

2e. Background Adjustment and Voxelwise Inference for Template-Based Gaussian Mixture Models

Meng Li* and Armin Schwartzman, North Carolina State University

2f. Fast, Fully Bayesian Spatiotemporal Inference for fMRI

Donald R. Musgrove*, John Hughes and Lynn E. Eberly, University of Minnesota

2g. Bayesian Spatial Variable Selection for Ultra-High Dimensional Neuroimaging Data: A Multiresolution Approach

Yize Zhao*, Statistical and Applied Mathematical Sciences Institute

Jian Kang and Qi Long, Emory University

2h. Analysis of High Dimensional Brain Signals in Designed Experiments Using Penalized Threshold Vector Autoregression

Lechuan Hu* and Hernando Ombao, University of California, Irvine

2i. Spatially Weighted Reduced-Rank Framework for Neuroimaging Data with Application to Alzheimer's Disease

Mihye Ahn*, University of Nevada, Reno
Haipeng Shen and Chao Huang, University of North Carolina, Chapel Hill
Yong Fan, University of Pennsylvania
Hongtu Zhu, University of North Carolina, Chapel Hill

2j. Highly Adaptive Test for Group Differences in Brain Functional Connectivity

Junghi Kim* and Wei Pan, University of Minnesota

2k. Pre-Surgical fMRI Data Analysis Using a Spatially Adaptive Conditionally Autoregressive Model

Zhuqing Liu* and Veronica J. Berrocal, University of Michigan
Andreas J. Bartsch, University of Heidelberg
Timothy D. Johnson, University of Michigan

2l. Semiparametric Bayesian Models for Longitudinal MR Imaging Data with Multiple Continuous Outcomes

Xiao Wu*, University of Florida
Michael J. Daniels, University of Texas, Austin

2m. Improving Reliability of Subject-Level Resting-State Brain Parcellation with Empirical Bayes Shrinkage

Amanda F. Mejia*, Mary Beth Nebel and Haochang Shou,
Johns Hopkins University
Ciprian M. Crainiceanu, Johns Hopkins Bloomberg School of Public Health
James J. Pekar, Johns Hopkins University School of Medicine
Stewart Mostofsky, Brian Caffo and Martin Lindquist, Johns Hopkins University

**3. POSTERS:
Clinical Trials, Adaptive Designs and Applications**

Sponsor: ENAR

3a. INVITED POSTER:

The Role of Statisticians in Regulatory Drug Safety Evaluation

Clara Kim* and Mark Levenson, U.S. Food and Drug Administration

3b. Analyzing Multiple Endpoints in a Confirmatory Randomized Clinical Trial: An Approach that Addresses Stratification, Missing Values, Baseline Imbalance and Multiplicity for Strictly Ordinal Outcomes

Hengrui Sun*, University of North Carolina, Chapel Hill
Atsushi Kawaguchi, Kyoto University, Japan
Gary Koch, University of North Carolina, Chapel Hill

3c. Comparing the Statistical Power of Analysis of Covariance after Multiple Imputation and the Mixed Model in Testing the Treatment Effect for Pre-Post Studies with Loss to Follow-Up

Wenna Xi*, Michael L. Pennell, Rebecca R. Andridge and Electra D. Paskett,
The Ohio State University

3d. Extending Logistic Regression Likelihood Ratio Test Analysis to Detect Signals of Vaccine-Vaccine Interactions in Vaccine Safety Surveillance

Kijoeng Nam*, U.S. Food and Drug Administration
Nicholas C. Henderson, University of Wisconsin, Madison
Patricia Rohan, Emily Jane Woo and **Estelle Russek-Cohen**,
U.S. Food and Drug Administration

3e. Dose-Finding Approach Based on Efficacy and Toxicity Outcomes in Phase I Oncology Trials for Molecularly Targeted Agents

Hiroyuki Sato*, Pharmaceuticals and Medical Devices Agency
Akihiro Hirakawa, Nagoya University Graduate School of Medicine
Chikuma Hamada, Tokyo University of Science

3f. Effect Size Measures and Meta-Analysis for Alternating Treatment Single Case Design Data

D Leann Long*, Mathew Bruckner, **Regina A. Carroll** and **George A. Kelley**,
West Virginia University

3g. Clinical Trials with Exclusions Based on Race, Ethnicity, and English Fluency

Brian L. Egleston*, **Omar Pedraza**, **Yu-Ning Wong**, **Roland L. Dunbrack Jr.**,
Eric A. Ross and **J. Robert Beck**, Fox Chase Cancer Center, Temple University

3h. Comparing Four Methods for Estimating Optimal Tree-Based Treatment Regimes

Aniek Sies* and **Iven Van Mechelen**, Katholieke Universiteit Leuven

3i. Comparing Methods of Adjusting for Center Effects Using Pediatric ICU Glycemic Control Data

Samantha Shepler*, **Scott Gillespie** and **Traci Leong**, Emory University

3j. Bayesian Dose Finding Procedure Based on Information Criterion

Lei Gao*, Sanofi
William F. Rosenberger, George Mason University
Zorayr Manukyan, Pfizer Inc.

3k. The Relationship among Toxicity, Response, and Survival Profiles Ultimately Influence Calling a Beneficial Experimental Drug Favorable Under Standard Phase I, II, and III Clinical Trial Designs

Amy S. Ruppert* and **Abigail B. Shoben**, The Ohio State University

3l. Dose-Finding Using Hierarchical Modeling for Multiple Subgroups

Kristen May Cunanan* and **Joseph S. Koopmeiners**, University of Minnesota

3m. Detecting Outlying Trials in Network Meta-Analysis

Jing Zhang*, University of Maryland
Haoda Fu, Eli Lilly and Company
Bradley P. Carlin, University of Minnesota

**3n. INVITED POSTER:
Subgroup Analysis in Confirmatory Clinical Trials**

Brian Millen*, Eli Lilly and Company

4. POSTERS: Survival Analyses

Sponsor: ENAR

4a. INVITED POSTER:

Time Dependent Covariates in the Presence of Left Truncation

Rebecca A. Betensky*, Harvard School of Public Health

4b. On the Estimators and Tests for the Semiparametric Hazards Regression Model

Seung-Hwan Lee*, Illinois Wesleyan University

4c. A Martingale Approach to Estimating Confidence Band with Censored Data

Eun-Joo Lee*, Millikin University

4d. Novel Image Markers for Non-Small Cell Lung Cancer Classification and Survival Prediction

Hongyuan Wang*, University of Kentucky
Fuyong Xing and Hai Su, University of Florida
Arnold Stromberg, University of Kentucky
Lin Yang, University of Florida

4e. Generalized Estimating Equations for Modeling Restricted Mean Survival Time Under General Censoring Mechanisms

Xin Wang* and Douglas E. Schaebel, University of Michigan

4f. Generalized Accelerated Failure Time Spatial Frailty Model

Haiming Zhou*, Timothy Hanson and Jiajia Zhang, University of South Carolina

4g. Penalized Variable Selection in Competing Risks Regression

Zhixuan Fu*, Yale University
Chirag R. Parikh, Yale University School of Medicine
Bingqing Zhou, Yale University

4h. Statistical Modeling of Gap Times in Presence of Panel Count Data with Intermittent Examination Times: An Application to Spontaneous Labor in Women

Ling Ma* and Rajeshwari Sundaram, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health

4i. Competing Risks Model of Screening and Symptoms Diagnosis for Prostate Cancer

Sheng Qiu* and Alexander Tsodikov, University of Michigan

4j. Joint Modeling of Recurrent Event Processes and Intermittently Observed Time-Varying Binary Covariate Processes

Shanshan Li*, Indiana University Richard M. Fairbanks School of Public Health, Indianapolis

4k. Composite Outcomes Versus Competing Risks

Paul Kolm*, Christiana Care Health Systems

4l. Quantile Regression Models for Interval-Censored Failure Time Data

Fang-Shu Ou*, **Donglin Zeng** and **Jianwen Cai**, University of North Carolina, Chapel Hill

4m. Empirical Likelihood Confidence Bands for the Difference of Survival Functions Under the Proportional Hazards Model

Mai Zhou and **Shihong Zhu***, University of Kentucky

5. POSTERS: Causal Inference

Sponsor: **ENAR**

5a. INVITED POSTER:

A Causal Framework for Meta Analyses

Michael E. Sobel*, **David Madigan** and **Wei Wang***, Columbia University

5b. The Principal Direction of Mediation

Oliver Chen*, **Elizabeth Ogburn**, **Ciprian Crainiceanu**, **Brian Caffo** and **Martin Lindquist**, Johns Hopkins Bloomberg School of Public Health

5c. Dynamic Marginal Structural Models to Test the Benefit of Lung Transplantation Treatment Regimes

Jeffrey A. Boatman* and **David M. Vock**, University of Minnesota

5d. A Model Based Approach for Predicting Principal Stratum Membership in Environmental Interventions

Katherine E. Freeland*, Johns Hopkins Bloomberg School of Public Health

5e. Propensity Score Approach to Modeling Medical Cost Using Observational Data

Jiaqi Li* and **Nandita Mitra**, University of Philadelphia
Elizabeth Handorf, Fox Chase Cancer Center
Justin Bekelman, University of Philadelphia

5f. Generalizing Evidence from Randomized Trials Using Inverse Probability of Selection Weights

Ashley L. Buchanan*, **Michael G. Hudgens** and **Stephen R. Cole**, University of North Carolina, Chapel Hill

5g. Racial Disparities in Cancer Survival: A Causal Inference Perspective

Linda Valeri*, **Jarvis Chen**, **Nancy Krieger**, **Tyler J. VanderWeele** and **Brent A. Coull**, Harvard School of Public Health

6. POSTERS: Statistical Genetics, GWAS, and 'Omics Data

Sponsor: ENAR

6a. A Data-Adaptive SNP-Set-Based Association Test of Longitudinal Traits

Yang Yang* and **Peng Wei**, University of Texas Health Science Center at Houston
Wei Pan, University of Minnesota

6b. Genetic Analysis of Data from Structured Populations

Yogasudha Veturi* and **Gustavo de los Campos**, University of Alabama at Birmingham

6c. Mapping Disease Susceptibility Loci for Multiple Complex Traits with U-Statistics

Ming Li*, University of Arkansas for Medical Sciences
Changshuai Wei, University of North Texas
Qing Lu, Michigan State University

6d. Permutation-Based Test Statistics for Intermediate Phenotypes in Genome-Wide Association Studies

Wei Xue* and **Eric Bair**, University of North Carolina, Chapel Hill

6e. Statistics for Genetic Association in the Presence of Covariates — Genome Scanning Considerations

Hui-Min Lin*, **Eleanor Feingold** and **Yan Lin**, University of Pittsburgh

6f. Power and Sample Size Determination for Time Course Microarray Differential Expression Studies: A False Discovery Rate and Permutation-Based Simulation Method

Joanne C. Beer*, University of Pittsburgh
Thuan Nguyen, **Kemal Sonmez** and **Dongseok Choi**, Oregon Health & Science University

6g. Functional Random Field Models for Association Analysis of Sequencing Data

Xiaoxi Shen*, Michigan State University
Ming Li, University of Arkansas for Medical Sciences
Zihuai He, University of Michigan
Qing Lu, Michigan State University

6h. Quantifying Uncertainty in the Identification of Proteins, Post-Translational Modifications (PTMs) and Proteoforms

Naomi C. Brownstein* and **Xibei Dang**, Florida State University National High Magnetic Field Lab
Eric Bair, University of North Carolina, Chapel Hill
Nicolas L. Young, Florida State University National High Magnetic Field Lab

6i. A Statistical Pipeline for Studying Co-Regulated Genes Using Single-Cell RNA-Seq Data

Ning Leng* and **Li-Fang Chu**, Morgridge Institute for Research
Yuan Li, University of Wisconsin, Madison
Peng Jiang, **Chris Barry**, **Ron Stewart** and **James Thomson**, Morgridge Institute for Research
Christina Kendzierski, University of Wisconsin, Madison



6j. Outlier Detection for Quality Control in Flow Cytometry Using Compositional Data Analysis

Kipper Fletez-Brant*, Johns Hopkins University
 Josef Spidlen and Ryan Brinkman, BC Cancer Agency
 Pratip Chattopadhyay, National Institutes of Health

6k. Power Analysis for Genome-Wide Association Study in Biomarker Discovery

Wenfei Zhang*, Yuefeng Lu, Yang Zhao, Vincent Thuillier, Jeffrey Palmer,
 Sherry Cao, Jike Cui, Stephen Madden and Srinivas Shankara, Sanofi

6l. Differential Dynamics in Single-Cell RNA-Seq Experiments

Keegan D. Korthauer* and Christina Kendzierski,
 University of Wisconsin, Madison

6m. Experimental Design for Bulk Single-Cell RNA-Seq Studies

Rhonda L. Bacher* and Christina Kendzierski,
 University of Wisconsin, Madison

6n. A Hierarchical Mixture Model for Joint Prioritization of GWAS Results from Multiple Related Phenotypes

Cong Li*, Yale University
 Can Yang, Hong Kong Baptist University
 Hongyu Zhao, Yale School of Public Health

6o. Nonparametric Tests for Differential Enrichment Analysis with Multi-Sample ChIP-Seq Data

Qian Wu*, BioStat Solution
 Kyoung-Jae Won and Hongzhe Li, University of Pennsylvania

6p. Analysis of Mass Spectrometry Data and Preprocessing Methods for Metabolomics

Leslie Myint* and Kasper Hansen, Johns Hopkins University

6q. INVITED POSTER:

Accounting for Measurement Error in Genomic Data and Misclassification of Subtypes in the Analysis of Heterogeneous Tumor Data

Daniel Nevo, Hebrew University, Jerusalem, Israel
 David Zucker*, Hebrew University, Jerusalem, Israel
 Molin Wang, Harvard School of Public Health
 Donna Spiegelman, Harvard School of Public Health

7. POSTERS: Methodology and Applications in Epidemiology, Environment, and Ecology

Sponsor: ENAR

7a. INVITED POSTER:

Carpe Diem! Biostatisticians Impacting the Conducting and Reporting of Clinical Studies

Sally Morton*, University of Pittsburgh

7b. On Stratified Bivariate Ranked Set Sampling with Optimal Allocation for Naive and Ratio Estimators

Lili Yu, Hani Samawi, Daniel Linder, Arpita Chatterjee, Yisong Huang*
and **Robert Vogel**, Georgia Southern University

7c. Comparisons of the Cancer Risk Estimates between Excess Relative Risk and Relative Risk Models: A Case Study

Shu-Yi Lin*, Taipei City Hospital, Taiwan

7d. A Regression Based Spatial Capture-Recapture Model for Estimating Species Density

Purna S. Gamage*, Souparno Ghosh, Philip S. Gipson and
Gregory Pavur, Texas Tech University

7e. Application of the Use of Percentage Difference from Median BMI to Overcome Ceiling Effects in Adiposity Change in Children

Christa Lilly* and **Lesley Cottrell**, West Virginia University
Karen Northrup and **Richard Wittberg**, Wood County School System

7f. A Multi-Pathogen Hierarchical Bayesian Model for Spatio-Temporal Transmission of Hand, Foot and Mouth Disease

Xueying Tang*, Nikolay Bliznyuk, Yang Yang and **Ira Longini**,
University of Florida

7g. Evaluating Risk-Prediction Models Using Data from Electronic Health Records

Le Wang*, Pamela A. Shaw, Hansie Mathelier, Stephen E. Kimmel
and **Benjamin French**, University of Pennsylvania

7h. A Bayesian Model for Identifying and Predicting the Spatio-Temporal Dynamics of Re-Emerging Urban Insect Infestations

Erica Billig*, Michael Levy, Michelle Ross and **Jason Roy**, University
of Pennsylvania

7i. Semi-Markov Models for Interval Censored Transient Cognitive States with Back Transitions and a Competing Risk

Shaoceng Wei* and **Richard Kryscio**, University of Kentucky

7j. Growth Curves for Cystic Fibrosis Infants Vary in the Ability to Predict Lung Function

Yumei Cao* and **Raymond G. Hoffmann**, Medical College of Wisconsin
Evans M. Machogu, Indiana University School of Medicine
Praveen S. Goday and **Pippa M. Simpson**, Medical College of Wisconsin

7k. An Examination of the Concept of Frailty in the Elderly

Felicia R. Griffin*, **Daniel L. McGee** and **Elizabeth H. Slate**,
Florida State University

7l. Efficiencies from Using Entire United States Responses in Predicting County Level Smoking Rates for West Virginia Using Publicly Available Data

Dustin M. Long* and **Emily A. Sasala**, West Virginia University

7m. Optimally Combined Estimation for Tail Quantile Regression

Kehui Wang*, North Carolina State University
Huixia Judy Wang, The George Washington University

8. POSTERS:

Variable Selection and Methods for High Dimensional Data

Sponsor: **ENAR**

8a. Bayes Factor Consistency Under g-prior Linear Model with Growing Model Size

Ruoxuan Xiang*, **Malay Ghosh** and **Kshitij Khare**, University of Florida

8b. Variable Selection for Cox Proportional Hazard Frailty Model

Ioanna Pelagia* and **Jianxin Pan**, The University of Manchester,
United Kingdom

8c. Fused Lasso Approach to Assessing Data Comparability with Applications in Missing Data Imputation

Lu Tang* and **Peter X.K. Song**, University of Michigan

8d. Multiple Imputation Using Sparse PCA for High-Dimensional Data

Domonique Watson Hodge* and **Qi Long**, Emory University

8e. Topic Modeling for Signal Detection of Safety Data from Adverse Event Reporting System Database

Weizhong Zhao*, **Wen Zou** and **James J. Chen**, U.S. Food
and Drug Administration

8f. Building Risk Models with Calibrated Margins

Paige Maas*, National Cancer Institute, National Institutes of Health
Yi-Hau Chen, Academia Sinica
Raymond Carroll, Texas A&M University
Nilanjan Chatterjee, National Cancer Institute, National Institutes of Health

8g. Categorical Predictors and Pairwise Comparisons in Logistic Regression via Penalization and Bregman Methods

Tian Chen* and **Howard Bondell**, North Carolina State University

8h. Comparison of Step-Wise Variable Selection, BlmmLasso, and GMMBoost for Identification of Predictor Interactions Associated with Disease Outcome

Yunyun Jiang* and **Bethany Wolf**, Medical University of South Carolina

8i. Shrinkage Priors for Bayesian Learning from High Dimesional Genetics Data

Anjishnu Banerjee*, Medical College of Wisconsin

8j. Functional Principal Component Analysis to Fifty-Eight Most Traded Currencies Based on Euro

Jong-Min Kim, University of Minnesota, Morris

Ali H. AL-Marshadi, King Abdulaziz University

Junho Lim*, University of Minnesota, Morris

9. POSTERS:
Bayesian Methods and Computational Algorithms

Sponsor: **ENAR**

9a. INVITED POSTER:

Nonparametric Bayes Models for Modeling Longitudinal Change in Association among Categorical Variables

Tsuyoshi Kunihama, Duke University

Amy Herring*, University of North Carolina, Chapel Hill

David Dunson, Duke University

Carolyn Halpern, University of North Carolina, Chapel Hill

9b. Regression Model Estimation and Prediction Incorporating Coefficients Information

Wenting Cheng*, **Jeremy M.G. Taylor** and **Bhramar Mukherjee**,
University of Michigan

9c. Cross-Correlation of Change Point Problem

Congjian Liu*, Georgia Southern University

9d. Bayesian Network Models for Subject-Level Inference

Sayantana Banerjee*, **Han Liang** and **Veerabhadran Baladandayuthapani**,
University of Texas MD Anderson Cancer Center

9e. Algorithms for Constrained Generalized Eigenvalue Problem

Eun Jeong Min* and **Hua Zhou**, North Carolina State University

9f. CycloPs: A Cyclostationary Algorithm for Automatic Walking Recognition

Jacek K. Urbanek* and **Vadim Zipunnikov**, Johns Hopkins Bloomberg School of Public Health

Tamara B. Harris, National Institute on Aging, National Institutes of Health

Nancy W. Glynn, University of Pittsburgh

Ciprian Crainiceanu, Johns Hopkins Bloomberg School of Public Health

Jaroslav Harezlak, Indiana University School of Medicine

9g. Simulation-Based Estimation of Mean and Variance for Meta-Analysis via Approximate Bayesian Computation (ABC)

Deukwoo Kwon* and **Isildinha M. Reis**, University of Miami

9h. The Effects of Sparsity Constraints on Inference of Biological Processes in Stochastic Non-Negative Matrix Factorization of Expression Data

Wai S. Lee*, **Alexander V. Favorov** and **Elana J. Fertig**, Johns Hopkins University
Michael F. Ochs, The College of New Jersey

9i. Bayesian Sample Size Determination for Hurdle Models

Joyce Cheng*, **David Kahle** and **John W. Seaman**, Baylor University

9j. Fast Covariance Estimation for Sparse Functional/Longitudinal Data

Luo Xiao*, Johns Hopkins University

David Ruppert, Cornell University

Vadim Zipunnikov and **Ciprian Crainiceanu**, Johns Hopkins Bloomberg School of Public Health

9k. Prior Elicitation for Logistic Regression with Data Exhibiting Markov Dependency

Michelle S. Marcovitz* and **John Seaman Jr.**, Baylor University

Biostatistics

**Statistical
Genetics**

**Infectious
Diseases**

Big Data

Clinical Trials

Epidemiology

**Biomarker
Evaluation**

R and Python

**Genetics &
Genomics**

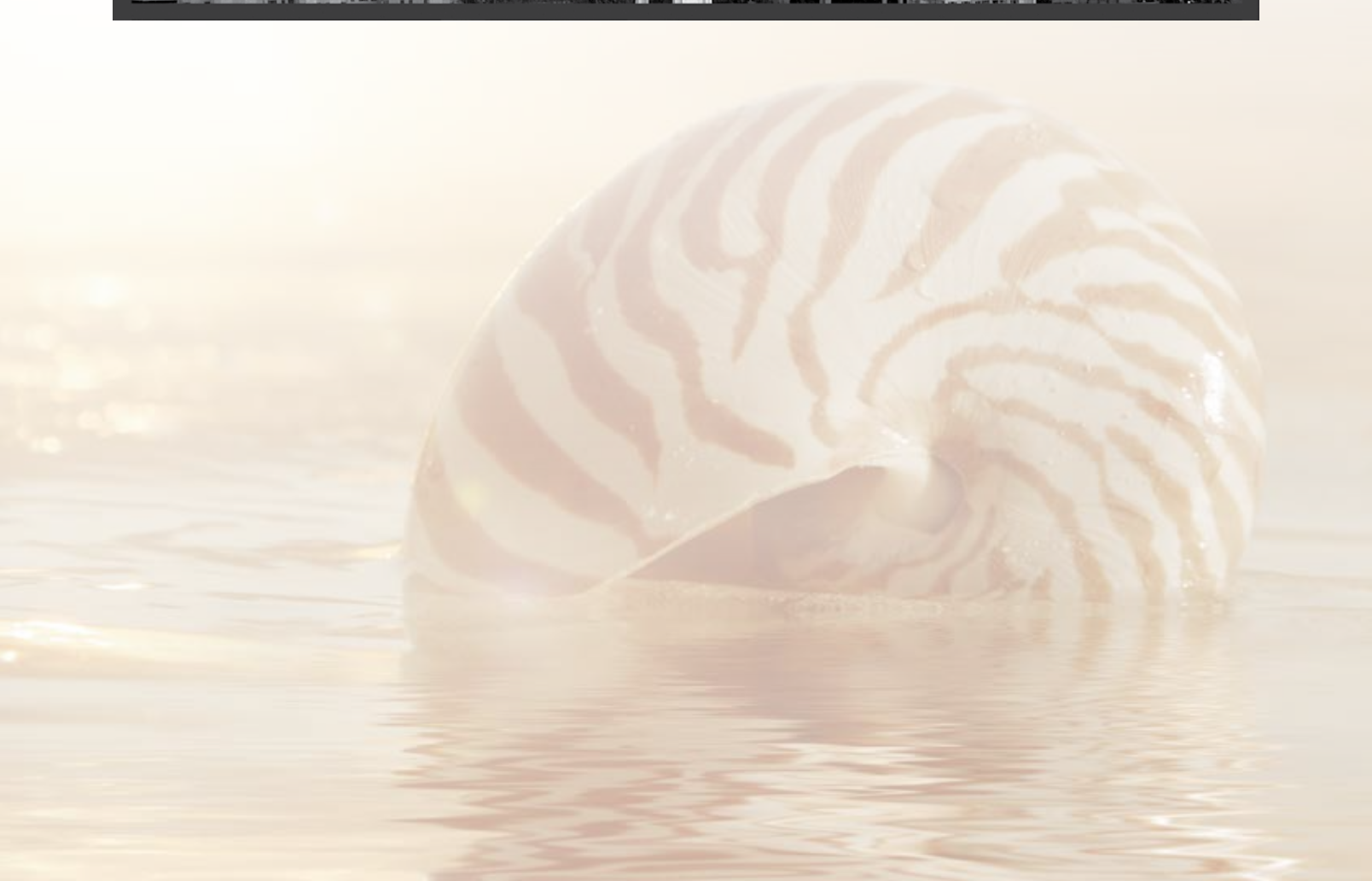
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SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON



MONDAY, MARCH 16

8:30 am – 10:15 am

10. Advances in Patient-Centered Outcomes (PCOR) Methodology

Ashe Auditorium
(3rd Floor)

Sponsors: **ENAR**, **ASA Biometrics Section**, **ASA Section on Statistics in Epidemiology**

Organizers: **Qi Long**, Emory University and **Jason Gerson**, Patient-Centered Outcomes Research Institute

Chair: **Qi Long**, Emory University

8:30 **PCORI Funding Opportunities for Biostatisticians**

Jason Gerson*, Patient-Centered Outcomes Research Institute (PCORI)

8:55 **Causal Inference for Effectiveness Research in Using Secondary Data**

Sebastian Schneeweiss*, Harvard University

9:20 **Optimal, Two Stage, Adaptive Enrichment Designs for Randomized Trials, Using Sparse Linear Programming**

Michael Rosenblum*, Johns Hopkins Bloomberg School of Public Health
Xingyuan Fang and **Han Liu**, Princeton University

9:45 **Treatment Effect Inferences Using Observational Data when Treatments Effects are Heterogeneous Across Outcomes: Simulation Evidence**

John M. Brooks* and **Cole G. Chapman**, University of South Carolina

10:10 Floor Discussion



11. Looking Under the Hood: Assumptions, Methods and Applications of Microsimulation Models to Inform Health Policy

Brickell (Terrace Level)

Sponsors: **ENAR**, **ASA Section on Statistics in Epidemiology**

Organizer: **Ann Zaubers**, Memorial Sloan Kettering Cancer Center

Chair: **Eric (Rocky) Feuer**, National Cancer Institute, National Institutes of Health

8:30 Introduction to the CISNET Program and Population Comparative Modeling

Eric J. Feuer*, National Cancer Institute, National Institutes of Health

8:50 Microsimulation Modeling to Inform Health Policy Decisions on Age to Begin, Age to End, and Intervals of Colorectal Cancer Screening

Ann G. Zaubers*, Memorial Sloan Kettering Cancer Center

9:10 Role of Calibration and Validation in Developing Microsimulation Models

Carolyn M. Rutter*, RAND Corporation

9:30 Using Microsimulation to Assess the Relative Contributions of Screening and Treatment in Observed Reductions in Breast Cancer Mortality in the United States

Donald A. Berry*, University of Texas MD Anderson Cancer Center

9:50 Synthesis of Randomized Controlled Trials of Prostate Cancer Screening to Assess Impact of PSA Testing Using Microsimulations

Ruth Etzioni* and **Roman Gulati**, Fred Hutchinson Cancer Research Center

Alex Tsodikov, University of Michigan

Eveline Heijnsdijk and **Harry de Koning**, Erasmus University

10:10 Floor Discussion

12. Optimal Inference for HighDimensional Problems

Miami Lecture Hall
(3rd Floor)

Sponsors: **ENAR, ASA Biometrics Section**

Organizer: **Jelena Bradic**, University of California, San Diego

Chair: **Jelena Bradic**, University of California, San Diego

8:30 **A Non-Parametric Natural Image for Decoding Visual Stimuli from the Brain**

Yuval Benjamini*, Stanford University

Bin Yu, University of California, Berkeley

8:55 **Does ℓ_q Minimization Outperform ℓ_1 Minimization?**

Arian Maleki*, Columbia University

9:20 **Inference in High-Dimensional Varying Coefficient Models**

Mladen Kolar*, University of Chicago

Damian Kozbur, ETH, Zurich

9:45 **Feature Augmentation via Nonparametrics and Selection (FANS) in High Dimensional Classification**

Jianqing Fan, Princeton University

Yang Feng, Columbia University

Jiancheng Jiang, University of North Carolina, Charlotte

Xin Tong*, University of Southern California

10:10 **Floor Discussion**

13. Lifetime Data Analysis Highlights

Johnson (3rd Floor)

Sponsors: **ENAR, ASA Biometrics Section, Lifetime Data Analysis**

Organizer: **Mei-Ling Ting Lee**, University of Maryland

Chair: **Ruth Pfeiffer**, National Cancer Institute, National Institutes of Health

8:30 **Modeling the “Win Ratio” in Clinical Trials with Multiple Outcomes**

David Oakes*, University of Rochester

8:55 **A Model for Time to Fracture with a Shock Stream Superimposed on Progressive Degradation: The Study of Osteoporotic Fractures**

Xin He*, University of Maryland, College Park

G. A. Whitmore, McGill University

Geok Yan Loo, University of Maryland, College Park

Marc C. Hochberg, University of Maryland, Baltimore

Mei-Ling Ting Lee, University of Maryland, College Park

9:20 Joint Rate Models for Bivariate Recurrent Events with Frailty Processes

Mei-Cheng Wang*, Johns Hopkins University

9:45 Efficient Estimation of the Cox Model with Auxiliary Landmark Time Survival Information

Chiung-Yu Huang*, Johns Hopkins University

Jing Qin, National Institute of Allergy and Infectious Diseases, National Institutes of Health

Huei-Ting Tsai, Georgetown University

10:10 Floor Discussion

14. Recent Advances and Challenges in the Design of Early Stage Cancer Trials

Foster (3rd Floor)

Sponsors: **ENAR, ASA Biopharmaceutical Section**

Organizer: **Ken Cheung**, Columbia University

Chair: **Ken Cheung**, Columbia University

8:30 Motivating Sample Sizes in One- and Two-Agent Phase I Designs via Bayesian Posterior Credible Intervals

Thomas M. Braun*, University of Michigan

8:55 Beyond the MTD: Personalized Medicine and Clinical Trial Design

Daniel Normolle*, **Brenda Diergaarde** and **Julie Bauman**, University of Pittsburgh

9:20 Understanding the Toxicity Profile of Novel Anticancer Therapies

Shing M. Lee*, Columbia University

9:45 Simple Benchmark for Planning and Evaluating Complex Dose Finding Designs

Ken Cheung*, Columbia University

10:10 Floor Discussion

15. Large Scale Data Science for Observational Healthcare Studies

Tuttle (Terrace Level)

Sponsor: **IMS**

Organizers: **Marc Suchard**, University of California, Los Angeles and
David Madigan, Columbia University

Chair: **Martijn J. Schuemie**, Johnson & Johnson

8:30 **Honest Inference from Observational Database Studies**

David Madigan*, Columbia University

8:55 **Interpretable Feature Creation and Model Uncertainty in Observational Medical Data**

Tyler McCormick*, and **Rebecca Ferrell**, University of Washington

9:20 **Beyond Crude Cohort Designs: Pharmacoepidemiology at Scale**

Marc A. Suchard*, University of California, Los Angeles

9:45 **Safety Analysis Strategies for Comparing Two Cohorts Selected from Healthcare Data using Propensity Scores**

William DuMouchel* and **Rave Harpaz**, Oracle Health Sciences

10:10 **Floor Discussion**

16. CONTRIBUTED PAPERS: Competing Risks

Ibis (3rd Floor)

Sponsor: **ENAR**

Chair: **Domonique Watson Hodge**, Emory University

8:30 **Extending Fine and Gray's Model: General Approach for Competing Risks Analysis**

Anna Bellach*, University of Copenhagen and University of North Carolina, Chapel Hill

Jason Peter Fine, University of North Carolina, Chapel Hill

Ludger Rüschendorf, Albert Ludwigs University of Freiburg im Breisgau

Michael R. Kosorok, University of North Carolina, Chapel Hill

8:45 **Non-Parametric Cumulative Incidence Estimation Under Misclassification in the Cause of Failure**

Giorgos Bakoyannis*, Indiana University

Menggang Yu, University of Wisconsin

Constantin T. Yiannoutsos, Indiana University

Constantine Frangakis, Johns Hopkins University

9:00 Efficient Estimation of Semiparametric Transformation Models for the Cumulative Incidence of Competing Risks

Lu Mao  and **Danyu Lin**, University of North Carolina, Chapel Hill

9:15 Joint Dynamic Modeling of Recurrent Competing Risks and a Terminal Event

Piaomu Liu* and **Edsel Peña**, University of South Carolina, Columbia

9:30 Dynamic Prediction of Subdistribution Functions for Data with Competing Risks

Qing Liu* and **Chung-Chou H. Chang**, University of Pittsburgh

9:45 Competing Risks Regression using Pseudo-Values Under Random Signs Censoring

Tianxiu Wang* and **Chung-Chou H. Chang**, University of Pittsburgh

10:00 Kernel Score Test for Progression Free Survival

Matey Neykov* and **Tianxi Cai**, Harvard University

17. CONTRIBUTED PAPERS:
Applications and Methods in Environmental Health

Pearson I (3rd Level)

Sponsor: **ENAR**

Chair: **Yang Yang**, University of Texas Health Science Center at Houston

8:30 Methodology for Quantifying the Change in Mortality Associated with Future Ozone Exposures Under Climate Change

Stacey E. Alexeeff*, **Gabriele G. Pfister** and **Doug Nychka**, National Center for Atmospheric Research

8:45 Estimation of Environmental Exposure Distribution Adjusting for Dependence between Exposure Level and Detection Limit

Yuchen Yang*, **Brent Shelton** and **Tom Tucker**, University of Kentucky
Li Li, Case Western Reserve University
Richard Kryscio and **Li Chen**, University of Kentucky

9:00 Spatial Confounding, Spatial Scale and the Chronic Health Effects of Coarse Thoracic Particulate Matter

Helen Powell* and **Roger D. Peng**, Johns Hopkins Bloomberg School of Public Health

9:15 Estimating the Causal Effect of Coal Burning Power Plants on CO2 Emissions

Georgia Papadogeorgou*, **Corwin Zigler** and **Francesca Dominici**, Harvard School of Public Health

9:30 Temporal Aspects of Air Pollutant Measures in Epidemiologic Analysis: A Simulation Study

Laura F. White* and **Jeffrey Yu**, Boston University
Bernardo Beckerman and **Michael Jerrett**, University of California, Berkeley
Patricia Coogan, Boston University

9:45 Bayesian Models for Multiple Outcomes in Domains with Application to the Seychelles Child Development Study

Luo Xiao, Johns Hopkins Bloomberg School of Public Health
Sally W. Thurston*, University of Rochester
David Ruppert, Cornell University
Tanzy M.T. Love and Philip W. Davidson, University of Rochester

10:00 Analysis of 26 Million Area VOC Observations for the Prediction of Personal THC Exposure Using Bayesian Modeling

Caroline P. Groth*, University of Minnesota
Sudipto Banerjee, University of California, Los Angeles
Gurumurthy Ramachandran and Ian Reagen, University of Minnesota
Richard Kwok, National Institute of Environmental Health Sciences, National Institutes of Health
Aaron Blair, National Cancer Institute, National Institutes of Health
Dale Sandler and Lawrence Engel, National Institute of Environmental Health Sciences, National Institutes of Health
Mark Stenzel and Patricia Stewart, Stewart Exposure Assessments, LLC

**18. CONTRIBUTED PAPERS:
Statistical Methods for Genomics**

*Orchid C
(Terrace Level)*

Sponsor: **ENAR**

Chair: **Wenna Xi**, The Ohio State University

8:30 Identification of Consistent Functional Modules

Xiwei Chen*, David L. Tritchler, Jeffrey C. Miecznikowski and Daniel P. Gaile, State University of New York at Buffalo

8:45 A Mediation-Based Integrative Genomic Analysis of Lung Cancer

Sheila Gaynor* and Xihong Lin, Harvard University

9:00 Nonparametric Failure Time Analysis with Genomic Applications

Cheng Cheng*, St. Jude Children's Research Hospital

9:15 An Omnibus Test for Differential Abundance Analysis of Microbiome Data

Jun Chen*, Mayo Clinic, Rochester
Emily King, Iowa State University
Diane Grill and Karla Ballman, Mayo Clinic, Rochester



9:30 Sparse Analysis for High Dimensional Data with Application to Data Integration

Sandra Addo Safo*, Emory University
Jeongyoun Ahn, University of Georgia

9:45 Robust Inference of Chromosome 3D Structure Using Hi-C Chromatin Interaction Data

Kai Wang* and Kai Tan, University of Iowa

10:00 Floor Discussion

**19. CONTRIBUTED PAPERS:
Spatial and Spatio-Temporal Methods
and Applications**

Merrick II (3rd Floor)

Sponsor: **ENAR**

Chair: **Anjana Grandhi**, New Jersey Institute of Technology

8:30 A Semiparametric Approach for Spatial Point Process with Geocoding Error in Case-Control studies

Kun Xu* and Yongtao Guan, University of Miami

8:45 Semiparametric Nonseparable Spatial-Temporal Single Index Model

Hamdy Fayez Farahat Mahmoud* and Inyoung Kim, Virginia Tech

9:00 Statistical Analysis of Feed-Forward Loops Arising from Aging Physiological Systems

Jonathan (JJ) H. Diah*, Feiran Zhong and Arindam RoyChoudhury, Columbia University

**9:15 Bayesian Computation for Log-Gaussian Cox Processes:
A Comparative Analysis of Methods**

Ming Teng*, University of Michigan
Farouk S. Nathoo, University of Victoria
Timothy D. Johnson, University of Michigan

9:30 The Joint Asymptotics for Estimating the Smoothness Parameters of Bivariate Gaussian Random Process

Yuzhen Zhou* and Yimin Xiao, Michigan State University

9:45 Covariance Tapering for Anisotropic Nonstationary Gaussian Random Fields with Application to Large Scale Spatial Data Sets

Abolfazl Safikhani* and Yimin Xiao, Michigan State University

10:00 Dynamic Nearest Neighbor Gaussian Process Models for Large Spatio-Temporal Datasets

Abhirup Datta*, University of Minnesota
Sudipto Banerjee, University of California, Los Angeles
Andrew O. Finley, Michigan State University

20. CONTRIBUTED PAPERS: Case Studies in Longitudinal Data Analysis

Pearson II (3rd Floor)

Sponsor: ENAR

Chair: Yajuan Si, University of Wisconsin-Madison

8:30 Using the Sigmoid Mixed Models for Longitudinal Cognitive Decline

Ana W. Capuano*, Robert S. Wilson and Sue E. Leurgans, Rush University Medical Center

Jeffrey D. Dawson, University of Iowa

Donald Hedeker, University of Chicago

8:45 Short-Term Blood Pressure Variability over 24 hours Using Mixed-Effects Models

Jamie M. Madden*, Xia Lee, Patricia M. Kearney and Anthony P. Fitzgerald, University College Cork, Ireland

9:00 A Longitudinal Modelling Case Study in Renal Medicine and an Associated R Package

Ozgur Asar*, Lancaster University

Peter J. Diggle, Lancaster University and University of Liverpool

James Ritchie and Philip A. Kalra, University of Manchester

9:15 A Likelihood Ratio Test for Nested Proportions

Yi-Fan Chen*, University of Illinois, Chicago

Jonathan Yabes and Maria Brooks, University of Pittsburgh

Sonia Singh, Royal Children's Hospital

Lisa Weissfeld, Statistics Collaborative Inc.

9:30 Bayesian Nonparametric Quantile Regression Models: An Application to a Fetal Growth Study with Ultrasound Measurements

Sungduk Kim* and Paul S. Albert, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health

9:45 Modeling Repeated Labor Curves in Consecutive Pregnancies: Individualized Prediction of Labor Progression from Previous Pregnancy Data

Olive D. Buhule* and Paul S. Albert, Eunice Kennedy Shriver National Institute

of Child Health and Human Development, National Institutes of Health

Alexander C. McLain, University of South Carolina

Katherine Grantz, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health

10:00 An Example of Unconstrained Model for Covariance Structure for Multivariate Longitudinal Data: Major League Baseball Batter's Salary with the Weighted Offensive Average

Chulmin Kim*, University of West Georgia

21. CONTRIBUTED PAPERS: Meta Analysis

Gautier (3rd Floor)

Sponsor: ENAR

Chair: **Joanne C. Beer**, University of Pittsburgh

**8:30 Meta-Analysis Sparse K-Means Framework for Disease Subtype
Discovery When Combining Multiple Transcriptomic Studies**

Zhiguang Huo* and **George Tseng**, University of Pittsburgh

**8:45 Meta Analysis: A Causal Framework, with Application to Randomized
Studies of Vioxx**

Michael E. Sobel*, **David Madigan** and **Wei Wang**, Columbia University

**9:00 A Bayesian Hierarchical Model for Network Meta-Analysis
of Diagnostic Tests**

Xiaoye Ma  and **Haitao Chu**, University of Minnesota
Yong Chen, University of Texas Health Science Center, Houston
Joseph Ibrahim, University of North Carolina, Chapel Hill

**9:15 Inference for Correlated Effect Sizes Using Multiple
Univariate Meta-Analyses**

Yong Chen, **Yi Cai*** and **Chuan Hong**, University of Texas Health
Science Center, Houston
Dan Jackson, Cambridge Institute of Public Health

**9:30 Detecting Outlying Studies in Meta-Regression Models Using
a Forward Search Algorithm**

Dimitris Mavridis, University of Ioannina
Irini Moustaki*, London School of Economics
Melanie Wall, Columbia University
Georgia Salanti, University of Ioannina

**9:45 Comparing Multiple Imputation Methods for Systematically
Missing Subject-Level Data**

David M. Kline*, **Eloise E. Kaizar** and **Rebecca R. Andridge**,
The Ohio State University

10:00 Floor Discussion

22. CONTRIBUTED PAPERS: Semi-Parametric Methods

Stanford (3rd Floor)

Sponsor: **ENAR**

Chair: **Laura H. Gunn**, Stetson University

8:30 Understanding Gaussian Process Fits Using an Approximate Form of the Restricted Likelihood

Maitreyee Bose* and **James S. Hodges**, University of Minnesota

8:45 Mitigating Bias in Generalized Linear Mixed Models: The Case for Bayesian Nonparametrics

Joseph L. Antonelli , **Sebastien Haneuse** and **Lorenzo Trippa**,
Harvard School of Public Health

9:00 An Estimated Likelihood Estimator by Extracting Auxiliary Information under Outcome Dependent Sample Design

Wansuk Choi* and **Haibo Zhou**, University of North Carolina, Chapel Hill

9:15 Estimation, IID Representation and Inference for the Average Outcome Under Stochastic Intervention on Dependent Data

Oleg Sofrygin* and **Mark J. van der Laan**, University of California, Berkeley

9:30 Empirical Likelihood-Based Inference for Partially Linear Models

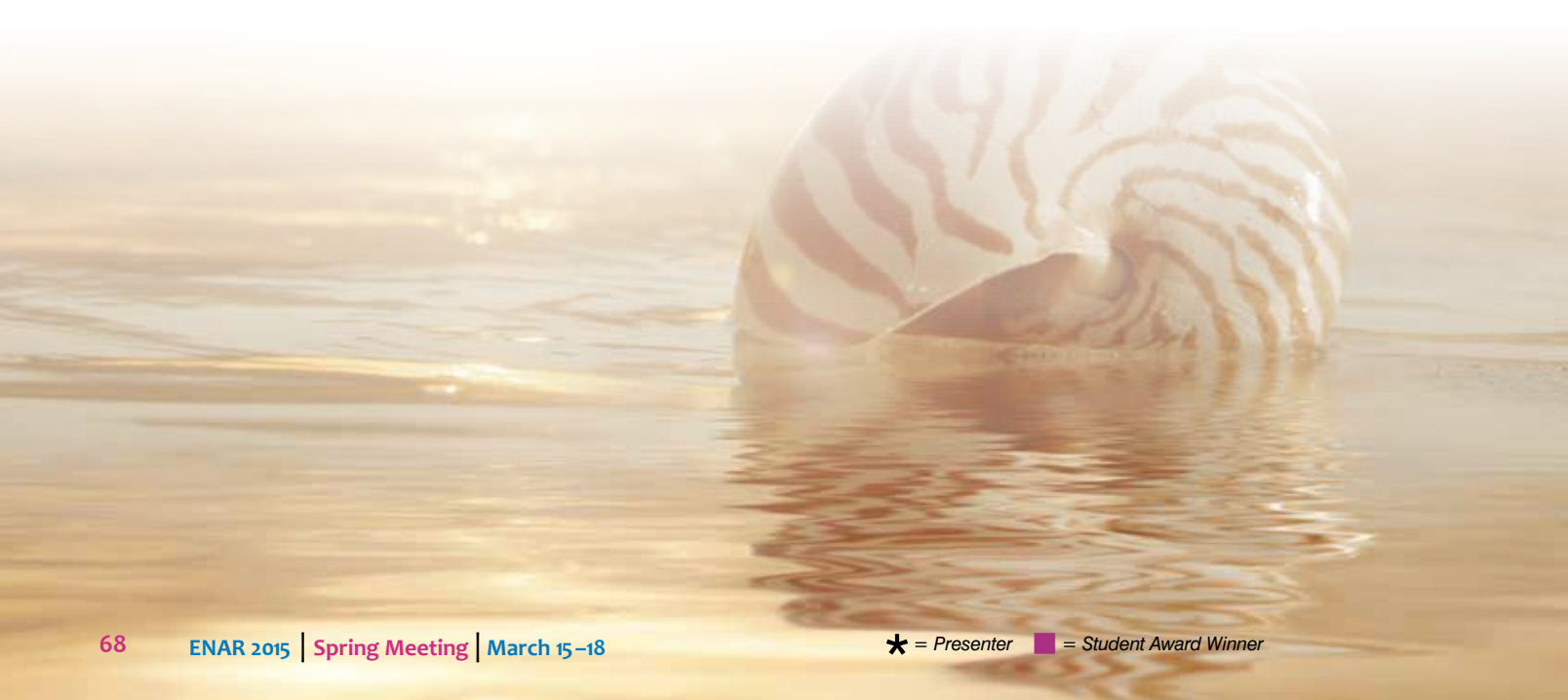
Haiyan Su*, Montclair State University

9:45 Bayesian Nonparametric Methods for Testing Shape Constraint for Longitudinal Data

Yifang Li*, North Carolina State University
Sujit Ghosh, North Carolina State University & Statistical and Applied
Mathematical Sciences Institute

10:00 Hypothesis Testing in Semi-Parametric Discrete Choice Model

Yifan Yang* and **Mai Zhou**, University of Kentucky



MONDAY, MARCH 16

10:15 – 10:30 pm — Refreshment Break with Our Exhibitors

*Lower Promenade
(Terrace Level)*

10:30 am – 12:15 pm

23. Trends and Innovations in Clinical Trial Statistics: “The Future ain’t What it Used to be”

Tuttle (Terrace Level)

Sponsors: **ENAR, ASA Biopharmaceutical Section**

Organizer: **Olga Marchenko**, Quintiles

Chair: **Olga Marchenko**, Quintiles

**10:30 “The Future Ain’t What it Used to be” (Yogi Berra).
Have Statisticians Received the Memo?**

Nevine Zariffa*, AstraZeneca Pharmaceuticals

11:00 Panelists:

Sara Hughes, GlaxoSmithKline

Dominic Labriola, Bristol-Myers Squibb

Lisa LaVange, U.S. Food and Drug Administration

Shiferaw Mariam, Janssen R&D

Jerry Schindler, Merck

Venkat Sethuraman, Bristol-Myers Squibb

Frank Shen, AbbVie

Anastasios (Butch) Tsiatis, North Carolina State University

12:00 Floor Discussion

24. Causal Inference in HIV/AIDS Research

Foster (3rd Floor)

Sponsors: **ENAR, ASA Section on Statistics in Epidemiology**

Organizer: **Michael Hudgens**, University of North Carolina, Chapel Hill

Chair: **Michael Hudgens**, University of North Carolina, Chapel Hill

10:30 **Representing Unmeasured Confounding in Causal Models for Observational Data**

Joseph W. Hogan*, Brown University

Dylan Small, University of Pennsylvania

10:55 **Inverse Probability of Censoring Weights under Missing Not at Random with Application to CD4 Outcomes in HIV-Positive Patients in Kenya**

Judith J. Lok*, Harvard School of Public Health

Constantin T. Yiannoutsos, Indiana University Fairbanks School of Public Health
Agnes Kiragga, Infectious Diseases Institute, Kampala, Uganda

Ronald J. Bosch, Harvard School of Public Health

11:20 **Doubly Robust Instrumental Variable Estimation for Outcome Missing Not at Random**

BaoLuo Sun*, **Lan Liu**, **James Robins** and **Eric Tchetgen Tchetgen**,
Harvard School of Public Health

11:45 **Estimating Prevention Efficacy Among Compliers in HIV Pre-Exposure Prophylaxis (PrEP) Trials**

James Dai* and **Elizabeth Brown**, Fred Hutchinson Cancer Research Center
and University of Washington

12:10 **Floor Discussion**

25. Open Problems and New Directions in Neuroimaging Research

Merrick II (3rd Floor)

Sponsors: **ENAR, ASA Mental Health Statistics Section,**

ASA Section on Statistics in Imaging

Organizers: **Hernando Ombao**, University of California, Irvine and

Martin Lindquist, Johns Hopkins University

Chair: **Timothy Johnson**, University of Michigan

10:30 **Problems in Structural Brain Imaging: Wavelets and Regressions on Non-Euclidean Manifolds**

Moo K. Chung*, University of Wisconsin-Madison

10:55 **Open Problems and New Directions in Modeling Electroencephalograms**

Hernando Ombao*, University of California, Irvine

11:20 Open Problems and New Directions in functional Magnetic Resonance Imaging (fMRI)

Martin A. Lindquist*, Johns Hopkins University

11:45 Empirical Bayes Methods Leveraging Heritability for Imaging Genetics

Wesley Kurt Thompson*, University of California, San Diego

12:10 Floor Discussion

26. Statistical Methods for Understanding Whole Genome Sequencing

Johnson (3rd Floor)

Sponsors: **ENAR, ASA Biometrics Section**

Organizer: **Jeffrey Leek**, Johns Hopkins University

Chair: **Ingo Ruczinski**, Johns Hopkins University

10:30 Group Association Test Using a Hidden Markov Model for Sequencing Data

Charles Kooperberg*, **Yichen Cheng** and **James Y. Dai**, Fred Hutchinson Cancer Research Center

10:55 Variant Calling and Batch Effects in Deep Whole-Genome Sequencing Data

Margaret A. Taub*, Johns Hopkins University

Suyash S. Shringarpure, Stanford University

Rasika A. Mathias and **Ingo Ruczinski**, Johns Hopkins University

Kathleen C. Barnes, Johns Hopkins University and The CAAPA Consortium

11:20 Flexible Probabilistic Modeling of Genetic Variation in Global Human Studies

John Storey*, Princeton University

11:45 Allele Specific Expression to Identify Causal Functional QTLs

Barbara Englehardt*, Princeton University

12:10 Floor Discussion

27. Doing Data Science: Straight Talk from the Frontline

Brickell (3rd Floor)

Sponsors: **ENAR, ASA Statistical Programmers Section**

Organizer: **Bhramar Mukherjee**, University of Michigan

Chair: **Bhramar Mukherjee**, University of Michigan

10:30 **Doing Data Science**

Rachel Schutt*, Newscorp

11:00 Discussant:

Sumanta Basu, University of California, Berkeley

11:30 Discussant:

Beka Steorts, Carnegie Mellon University

12:00 Floor Discussion

28. IMS Medallion Lecture

Ashe Auditorium
(3rd Floor)

Sponsor: **IMS**

Organizer: **Lurdes Y.T. Inoue**, University of Washington

Chair: **Lurdes Y.T. Inoue**, University of Washington

10:30 **Uncertainty Quantification in Complex Simulation Models Using Ensemble Copula Coupling**

Tilmann Gneiting*, Heidelberg Institute for Theoretical Studies (HITS) and Karlsruhe Institute of Technology (KIT)

Roman Schefzik, Heidelberg University

Thordis L. Thorarinsdottir, Norwegian Computing Center



29. Panel Discussion: In Memory of Marvin Zelen: Past, Present and Future of Clinical Trials and Cancer Research

*Miami Lecture Hall
(3rd Floor)*

Sponsor: **ENAR**

Organizer: **Xihong Lin**, Harvard University

Chair: **Xihong Lin**, Harvard University

- 10:30** **Colin Begg**, Memorial Sloan Kettering Cancer Center
Ross Prentice, Fred Hutchison Cancer Center
Victor De Gruttola, Harvard Chan School of Public Health

12:00 Floor Discussion

30. CONTRIBUTED PAPERS: Methods for Clustered Data and Applications

Pearson I (3rd Floor)

Sponsor: **ENAR**

Chair: **Sung Won Han**, New York University

10:30 **Multivariate Modality Inference with Application on Flow Cytometry**

Yansong Cheng*, GlaxoSmithKline
Surajit Ray, University of Glasgow

10:45 **Estimation of the Prevalence of Disease Among Clusters Using Random Partial-Cluster Sampling**

Sarah J. Marks*, **John S. Preisser**, **Anne E. Sanders** and **James D. Beck**,
University of North Carolina, Chapel Hill

11:00 **Testing Homogeneity in a Contaminated Normal Model with Correlated Data**

Meng Qi* and **Richard Charnigo**, University of Kentucky

11:15 **On the Use of Between-within Models to Adjust for Confounding due to Unmeasured Cluster-Level Covariates**

Babette A. Brumback* and **Zhuangyu Cai**, University of Florida

11:30 **Estimating the Effects of Center Characteristics on Center Outcomes:
A Symbolic Data Approach**

Jennifer Le-Rademacher*, Medical College of Wisconsin

11:45 **A Robust and Flexible Method to Estimate Association for Sparse Clustered Data**

Lijia Wang* and John J. Hanfelt, Emory University

12:00 Floor Discussion

31. CONTRIBUTED PAPERS: GWAS

Ibis (3rd Floor)

Sponsor: **ENAR**

Chair: **Luis G. Neon-Novelo**, University of Louisiana at Lafayette

10:30 **Gene-Disease Associations via Sparse Simultaneous Signal Detection**

Sihai Dave Zhao*, University of Illinois at Urbana-Champaign
Tony Cai and Hongzhe Li, University of Pennsylvania

10:45 **Statistical Tests for the Detection of Shared Common Genetic Variants between Heterogeneous Diseases Based on GWAS**

Julie Kobie*, University of Pennsylvania
Sihai Dave Zhao, University of Illinois at Urbana-Champaign
Yun R. Li, Hakon Hakonarson and Hongzhe Li, University of Pennsylvania

11:00 **Testing Class-Level Genetic Associations Using Single-Element Summary Statistics**

Jing Qian*, Eric Reed and Sara Nunez, University of Massachusetts, Amherst
Rachel Ballentyne, Liming Qu and Muredach P. Reilly, University of Pennsylvania
Andrea S. Foulkes, Mount Holyoke College

11:15 **Set-Based Tests for Genetic Association in Longitudinal Studies**

Zihuai He*, Min Zhang, Seunggeun Lee and Jennifer A. Smith, University of Michigan
Xiuqing Guo, Harbor-UCLA Medical Center
Walter Palmas, Columbia University
Sharon L.R. Kardia, Ana V. Diez Roux and Bhramar Mukherjee, University of Michigan

11:30 GPA: A Statistical Approach to Prioritizing GWAS Results by Integrating Pleiotropy and Annotation

Dongjun Chung*, Medical University of South Carolina
Can Yang, Hong Kong Baptist University
Cong Li, Joel Gelernter and **Hongyu Zhao**, Yale University

11:45 Optimum Study Design for Detecting Imprinting and Maternal Effects Based on Partial Likelihood

Fangyuan Zhang*, The Ohio State University
Abbas Khalili, McGill University
Shili Lin, The Ohio State University

12:00 Analysis of Genomic Data via Likelihood Ratio Test in Composite Kernel Machine Regression

Ni Zhao* and **Michael C. Wu**, Fred Hutchinson Cancer Research Center

**32. CONTRIBUTED PAPERS:
Applications, Simulations and Methods
in Causal Inference**

Pearson II (3rd Floor)

Sponsor: **ENAR**

Chair: **Luojun Wang**, The Pennsylvania State University

10:30 Estimating the Fraction who Benefit from a Treatment, Using Randomized Trial Data

Emily J. Huang* and **Michael A. Rosenblum**, Johns Hopkins University

10:45 Sensitivity Analyses in the Presence of Effect Modification in Observational Studies

Jesse Y. Hsu*, **Dylan S. Small** and **Paul R. Rosenbaum**,
University of Pennsylvania

11:00 The Causal Effect of Gene and Percentage of Trunk Fat Interaction on Physical Activity

Taraneh Abarin*, Memorial University

11:15 A Simulation Study of a Multiply-Robust Approach for Causal Inference with Binary or Continuous Missing Covariates

Jia Zhan*, **Changyu Shen** and **Xiaochun Li**, Indiana University
School of Medicine and Richard M. Fairbanks School of Public Health
Lingling Li, Harvard Medical School and Harvard Pilgrim
Health Care Institute

-
- 11:30 **The Impact of Unmeasured Confounding in Observational Studies**
Zugui Zhang* and Paul Kolm, Christiana Care Health System
-
- 11:45 **Flexible Models for Estimating Optimal Treatment Initiation Time for Survival Endpoints: Application to Timing of cART Initiation in HIV/TB Co-Infection**
Liangyuan Hu* and Joseph W. Hogan, Brown University
-
- 12:00 **Double Robust Goodness-of-Fit Test of Coarse Structural Nested Mean Models with Application to Initiating HAART in HIV-Positive Patients**
Shu Yang* and Judith Lok, Harvard School of Public Health
-

33. CONTRIBUTED PAPERS: Adaptive Designs and Dynamic Treatment Regimes

Gautier (3rd Floor)

Sponsor: ENAR

Chair: Xiaoqing Zhu, Michigan State University

-
- 10:30 **A Bayesian Optimal Design in Two-Arm, Randomized Phase II Clinical Trials with Endpoints from Exponential Families**
Wei Jiang*, Jo A. Wick, Jianghua He, Jonathan D. Mahnken and Matthew S. Mayo, University of Kansas Medical Center
-
- 10:45 **A Novel Method for Estimating Optimal Tree-Based Treatment Regimes in Randomized Clinical Trials**
Lisa L. Doove*, Katholieke Universiteit Leuven
Elise Dusseldorp, Leiden University
Katrijn Van Deun, Tilburg University
Iven Van Mechelen, Katholieke Universiteit Leuven
-
- 11:00 **Longitudinal Bayesian Adaptive Designs for the Promotion of more Ethical Two Armed Randomized Controlled Trials: A Novel Evaluation of Optimality**
Jo Wick*, University of Kansas Medical Center
Scott M. Berry, Berry Consultants
Byron Gajewski, Hung-Wen Yeh, Won Choi, Christina M. Pacheco and Christine Daley, University of Kansas Medical Center
-
- 11:15 **Identifying a Set that Contains the Best Dynamic Treatment Regimes**
Ashkan Ertefaie*, University of Pennsylvania
Tianshuang Wu and Inbal Nahum-Shani, University of Michigan
Kevin Lynch, University of Pennsylvania
-
- 11:30 **Optimal Dynamic Treatment Regimes for Treatment Initiation with Continuous Random Decision Points**
Yebin Tao* and Lu Wang, University of Michigan
Haoda Fu, Eli Lilly and Company
-

11:45 Statistical Inference for the Mean Outcome Under a Possibly Non-Unique Optimal Treatment Strategy

Alexander R. Luedtke* and **Mark J. van der Laan**, University of California, Berkeley

12:00 Sequential Advantage Selection for Optimal Treatment Regime

Ailin Fan*, **Wenbin Lu** and **Rui Song**, North Carolina State University

34. CONTRIBUTED PAPERS: Survival Analysis and Cancer Applications

Stanford (3rd Floor)

Sponsor: **ENAR**

Chair: **James Lymp**, Genentech

10:30 Regression Analysis of Informative Current Status Data Under Cure Rate Model

Yeqian Liu*, University of Missouri, Columbia
Tao Hu, Capital Normal University, China
Jianguo Sun, University of Missouri, Columbia

10:45 The Historical Cox Model

Jonathan E. Gellar*, Johns Hopkins Bloomberg School of Public Health
Fabian Scheipl, LMU Munich
Mei-Cheng Wang, Johns Hopkins Bloomberg School of Public Health
Dale M. Needham, Johns Hopkins School of Medicine
Ciprian M. Crainiceanu, Johns Hopkins Bloomberg School of Public Health

11:00 Bayesian Analysis of Survival Data Under Generalized Extreme Value Distribution with Application in Cure Rate Model

Dooti Roy*, University of Connecticut
Vivekananda Roy, Iowa State University
Dipak Dey, University of Connecticut

11:15 Joint Semiparametric Time-to-Event Modeling of Cancer Onset and Diagnosis When Onset is Unobserved

John D. Rice* and **Alex Tsodikov**, University of Michigan

11:30 A Multiple Imputation Approach for Semiparametric Cure Model with Interval Censored Data

Jie Zhou*, **Jiajia Zhang**, **Alexander C. McLain** and **Bo Cai**, University of South Carolina, Columbia

11:45 A Flexible Parametric Cure Rate Model with Known Cure Time

Paul W. Bernhardt*, Villanova University

12:00 Change-Point Proportional Hazards Model for Clustered Event Data

Yu Deng*, **Jianwen Cai** and **Donglin Zeng**, University of North Carolina, Chapel Hill
Jinying Zhao, Tulane University

35. INVITED AND CONTRIBUTED ORAL POSTERS: Methods and Applications in High Dimensional Data and Machine Learning

Jasmine (Terrace Level)

Sponsor: **ENAR**

Chair: **Sarah Ratcliff**, University of Pennsylvania

35a. INVITED POSTER:

Machine Learning Methods for Constructing Real-Time Treatment Policies in Mobile Health

Susan Murphy* and **Yanzhen Deng***, University of Michigan

35b. INVITED POSTER:

Predicting Strokes Using Relational Random Forests

Zach Shahn, **Patrick Ryan** and **David Madigan***, Columbia University

35c. Network-Constrained Group LASSO for High Dimensional Multinomial Classification with Application to Cancer Subtype Prediction

Xinyu Tian*, Stony Brook University

Jun Chen, Mayo Clinic

Xuefeng Wang, Stony Brook University

35d. Two Sample Mean Test in High Dimensional Compositional Data

Yuanpei Cao*, University of Pennsylvania

Wei Lin, Peking University

Hongzhe Li, University of Pennsylvania

35e. Classifications Based on Active Set Selections

Wen Zhou*, Colorado State University

Stephen Vardeman, **Huaiqing Wu** and **Max Morris**, Iowa State
University

35f. Application of a Graph Theory Algorithm in Soft Clustering

Wenzhu Mowrey*, Albert Einstein College of Medicine

George C. Tseng, University of Pittsburgh

Lisa A. Weissfeld, Statistics Collaborative, Inc.

35g. Testing for the Presence of Clustering

Erika S. Helgeson* and **Eric Bair**, University of North Carolina,
Chapel Hill

35h. Variable Selection and Sufficient Dimension Reduction for High Dimensional Data

Yeonhee Park* and **Zhihua Su**, University of Florida

35i. Variable Selection for Treatment Decisions with Scalar and Functional Covariates

Adam Ciarleglio*, New York University School of Medicine

Eva Petkova, New York University School of Medicine
and Nathan S. Kline Institute for Psychiatric Research

R. Todd Ogden, Columbia University

Thaddeus Tarpey, Wright State University

35j. MOPM: Multi-Operator Prediction Model Based on High-Dimensional Features

Hojin Yang*, **Hongtu Zhu** and **Joseph G. Ibrahim**, University of North Carolina, Chapel Hill

35k. Structured Sparse CCA for High Dimensional Data Integration

Sandra Safo* and **Qi Long**, Emory University

35l. SPARC: Optimal Estimation and Asymptotic Inference Under Semiparametric Sparsity

Yang Ning* and **Han Liu**, Princeton University

35m. Local-Aggregate Modeling for Big-Data via Distributed Optimization: Applications to Neuroimaging

Yue Hu■, Rice University

Genevera I. Allen, Rice University, Baylor College of Medicine and Texas Children's Hospital

35n. Residual Weighted Learning for Estimating Individualized Treatment Rules

Xin Zhou* and **Michael R. Kosorok**, University of North Carolina, Chapel Hill

35o. Integrative Multi-Omics Clustering for Disease Subtype Discovery by Sparse Overlapping Group Lasso and Tight Clustering

SungHwan Kim■, **YongSeok Park** and **George Tseng**, University of Pittsburgh

35p. Identifying Predictive Markers for Personalized Treatment Selection

Yuanyuan Shen* and **Tianxi Cai**, Harvard University



MONDAY, MARCH 16

12:15 – 1:30 pm — Roundtable Luncheons

Monroe (Terrace Level)

1:45 – 3:30 pm

36. Recent Research in Adaptive Randomized Trials with the Goal of Addressing Challenges in Regulatory Science

*Ashe Auditorium
(3rd Floor)*

Sponsors: **ENAR, ASA Biopharmaceutical Section**

Organizer: **Michael Rosenblum**, Johns Hopkins University

Chair: **Michael Rosenblum**, Johns Hopkins University

1:45 Adaptive Enrichment with Subpopulation Selection at Interim

Sue-Jane Wang* and **Hsien-Ming James Hung**, U.S. Food and Drug Administration

2:10 Post-Trial Simulation of Type I Error for Demonstration of Control of Type I Error

Scott M. Berry*, Berry Consultants

2:35 Bayesian Commensurate Prior Approaches for Pediatric and Rare Disease Clinical Trials

Bradley P. Carlin* and **Cynthia Basu**, University of Minnesota

Brian Hobbs, University of Texas MD Anderson Cancer Center

3:00 Identifying Subpopulations with the Largest Treatment Effect

Iván Díaz* and **Michael Rosenblum**, Johns Hopkins Bloomberg School of Public Health

3:25 Floor Discussion

37. Statistical Innovations in Functional Genomics and Population Health

Johnson (3rd Floor)

Sponsor: **ENAR**

Organizers: **Hua Tang**, Stanford University and **Lihong Qi**, University of California, Davis

Chair: **Marc Coram**, Stanford University

1:45 Quality Preserving Databases: Statistically Sound and Efficient Use of Public Databases for an Infinite Sequence of Tests

Saharon Rosset*, Tel Aviv University

Ehud Aharoni and **Hani Neuvirth**, IBM Research

2:05 Fused Lasso Additive Model

Ashley Petersen*, **Daniela Witten** and **Noah Simon**,
University of Washington

2:25 Imputing Transcriptome in Inaccessible Tissues in and Beyond the GTEx Project via RIMEE

Jiebiao Wang, **Dan Nicolae**, **Nancy Cox** and **Lin S. Chen***,
University of Chicago

2:45 A Bayesian Method for the Detection of Long-Range Chromosomal Interactions in Hi-C Data

Zheng Xu and **Guosheng Zhang**, University of North Carolina, Chapel Hill

Fulai Jin, Ludwig Institute for Cancer Research

Mengjie Chen and **Patrick F. Sullivan**, University of North Carolina,
Chapel Hill

Zhaohui Qin, Emory University

Terrence S. Furey, University of North Carolina, Chapel Hill

Ming Hu, New York University

Yun Li*, University of North Carolina, Chapel Hill

3:05 Fine Mapping of Complex Trait Loci with Coalescent Methods in Large Case-Control Studies

Ziqan Geng, University of Michigan

Paul Scheet, University of Texas MD Andersen Cancer Center

Sebastian Zöllner*, University of Michigan

3:25 Floor Discussion

38. Big Data: Issues in Biosciences

*Miami Lecture Hall
(3rd Floor)*

Sponsors: **ENAR, ICSA**

Organizers: **Charmaine Dean**, University of Western Ontario,
Zhezhen Jin, Columbia University and **Hongyu Zhao**, Yale University

Chair: Charmaine Dean, University of Western Ontario

1:45 **Big Genomics Data Analytics**

Haiyan Huang* and **Bin Yu**, University of California, Berkeley

2:15 **Recalculating the Relative Risks of Air Pollution to Account for Preferential Site Selection**

James V. Zidek*, University of British Columbia

Gavin Shaddick, University of Bath

2:45 **Functional Data Analysis for Quantifying Brain Connectivity**

Hans-Georg Mueller* and **Alexander Petersen**, University of California, Davis

Owen Carmichael, Louisiana State University

3:15 **Floor Discussion**

39. Recent Advances in Statistical Ecology

Foster (3rd Floor)

Sponsor: **ENAR**

Organizer: **Mahlet Tadesse**, Georgetown University

Chair: **Mahlet Tadesse**, Georgetown University

1:45 **Efficient Spatial and Spatio-Temporal False Discovery Rate Control**

Ali Arab*, Georgetown University

2:10 **Mixture of Inhomogeneous Matrix Models for Species-Rich Ecosystems**

Frederic Mortier*, CIRAD — Tropical Forest Goods and Ecosystem Services Unit

2:35 **Spatio-Temporal Modeling of Multiple Species Migration Flow**

Trevor Oswald* and **Christopher K. Wikle**, University of Missouri, Columbia

3:00 **Statistical Modeling of Spatial Discrete and Continuous Data in Ecology**

Jun Zhu*, University of Wisconsin, Madison

3:25 **Floor Discussion**

40. New Analytical Issues in Current Epidemiology Studies of HIV and Other Sexually Transmitted Infections

Brickell (Terrace Level)

Sponsor: **ENAR**

Organizer: **Xiangrong Kong**, Johns Hopkins University

Chair: **Kellie Archer**, Virginia Commonwealth University

- | | |
|------|---|
| 1:45 | A Framework for Quantifying Risk Stratification from Diagnostic Tests: Application to HPV Testing in Cervical Cancer Screening
Hormuzd Katki* , National Cancer Institute, National Institutes of Health |
| 2:05 | Combining Information to Estimate Adherence in Trials of Pre-Exposure Prophylaxis for HIV Prevention
James Hughes* , University of Washington |
| 2:25 | Analysis of Longitudinal Multivariate Outcome Data from Couples Cohort Studies: Application to HPV Transmission Dynamics
Xiangrong Kong* , Johns Hopkins University |
| 2:45 | Sample Size Methods for Estimating HIV Incidence from Cross-Sectional Surveys
Jacob Moss Konikoff* and Ron Brookmeyer , University of California, Los Angeles |
| 3:05 | Development of Accurate Methods to Estimate HIV Incidence in Cross-Sectional Surveys
Oliver B. Laeyendecker* , National Institute of Allergy and Infectious Diseases, National Institutes of Health |
| 3:25 | Floor Discussion |

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2015

41. Statistical Advances and Challenges in Mobile Health

Tuttle (Terrace Level)

Sponsor: **IMS**

Organizer: **Susan Murphy**, University of Michigan

Chair: **Elizabeth Sweeney**, Johns Hopkins University

1:45 **Supporting Health Management in Everyday Life with Mobile Technology**

Predrag Klasnja*, **Susan A. Murphy** and **Ambuj Tewari**,
University of Michigan

2:10 **Measuring Stress and Addictive Behaviors from Mobile Physiological Sensors**

Santosh Kumar*, University of Memphis
Emre Ertin, The Ohio State University
Mustafa al'Absi, University of Minnesota
David Epstein and **Kenzie Preston**, National Institute on Drug Abuse,
National Institutes of Health
Annie Umbricht, Johns Hopkins University

2:35 **Not Everybody, but Some People Move Like You**

Ciprian M. Crainiceanu*, Johns Hopkins Bloomberg School of Public Health

3:00 **Micro-Randomized Trials and mHealth**

Peng Liao, **Pedja Klasjna**, **Ambuj Tewari** and **Susan Murphy***,
University of Michigan

3:25 **Floor Discussion**

42. CONTRIBUTED PAPERS: Survey Research

Pearson I (3rd Floor)

Sponsor: **ENAR**

Chair: **Stacey E Alexeeff**, National Center for Atmospheric Research

1:45 **Ordinal Bayesian Instrument Development: New Kid on the Patient Reported Outcome Measures Block**

Lili Garrard*, University of Kansas Medical Center
Larry R. Price, Texas State University
Marjorie J. Bott, University of Kansas
Byron J. Gajewski, University of Kansas Medical Center

2:00 **Quantifying Parental History in Survey Data**

Rengyi Xu*, **Sara B. DeMauro** and **Rui Feng**, University of Pennsylvania

2:15 **Bayesian Nonparametric Weighted Sampling Inference**

Yajuan Si*, University of Wisconsin, Madison
Natesh S. Pillai, Harvard University
Andrew Gelman, Columbia University

2:30	How to Best Compute Propensity Scores in Complex Samples in Relation to Survey Weights Keith W. Zirkle* and Adam P. Sima, Virginia Commonwealth University
2:45	Multiple Imputation of the Accelerometer Data in the National Health and Nutrition Examination Survey Benmei Liu*, Mandi Yu, Barry I. Graubard and Richard Troiano, National Cancer Institute, National Institutes of Health Nathaniel Schenker, National Center for Health Statistics, Centers for Disease Control and Prevention
3:00	Split Questionnaire Survey Design in the Longitudinal Setting Paul M. Imbriano* and Trivellore E. Raghunathan, University of Michigan
3:15	Floor Discussion

43. CONTRIBUTED PAPERS: Graphical Models

Pearson II (3rd Floor)

Sponsor: **ENAR**

Chair: **Sheila Gaynor**, Harvard University

1:45	Regression Analysis of Networked Data Yan Zhou [■] and Peter X.K. Song, University of Michigan
2:00	Integrative Analysis of Genetical Genomics Data Incorporating Network Structure Bin Gao* and Yuehua Cui, Michigan State University
2:15	Estimating a Graphical Intra-Class Correlation Coefficient (GICC) Using Multivariate Probit-Linear Mixed Models Chen Yue*, Shaojie Chen, Haris Sair, Raag Airan and Brian Caffo, Johns Hopkins University
2:30	Estimation of Directed Subnetworks in Ultra High Dimensional Data for Gene Network Problem Sung Won Han* and Hua (Judy) Zhong, New York University
2:45	Longitudinal Graphical Models: Optimal Estimation and Asymptotic Inference Quanquan Gu*, Yuan Cao, Yang Ning and Han Liu, Princeton University
3:00	Jointly Estimating Gaussian Graphical Models for Spatial and Temporal Data Zhixiang Lin* and Tao Wang, Yale University Can Yang, Hong Kong Baptist University Hongyu Zhao, Yale University
3:15	Floor Discussion

44. CONTRIBUTED PAPERS: Joint Models for Longitudinal and Survival Data

Merrick II (3rd Floor)

Sponsor: **ENAR**

Chair: **Kun Xu**, University of Miami

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|------|---|
| 1:45 | Joint Modeling of Bivariate Longitudinal and Bivariate Survival Data in Spouse Pairs
Jia-Yuh Chen* and Stewart J. Anderson , University of Pittsburgh |
| 2:00 | Joint Model of Bivariate Survival Times and Longitudinal Data
Ke Liu* and Ying Zhang , University of Iowa |
| 2:15 | Dynamic Prediction of Acute Graft-versus-Host Disease with Time-Dependent Covariates
Yumeng Li* and Thomas M. Braun , University of Michigan |
| 2:30 | The Joint Modelling of Recurrent Events and Other Failure Time Events
Luojun Wang* and Vernon M. Chinchilli , The Pennsylvania State University |
| 2:45 | A Bayesian Approach for Joint Modeling of Longitudinal Menstrual Cycle Length and Fecundity
Kirsten J. Lum* , Johns Hopkins University and Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health
Rajeshwari Sundaram and Germaine M. Buck Louis , Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health
Thomas A. Louis , Johns Hopkins University and U.S. Census Bureau |
| 3:00 | Joint Analysis of Multiple Longitudinal Processes and Survival Data Measured on Nested Time-Scales Using Shared Parameter Models: An Application to Fecundity Data
Rajeshwari Sundaram* , Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health
Somak Chatterjee , George Washington University |

3:15 Floor Discussion

45. CONTRIBUTED PAPERS: Functional Data Analysis

Gautier (3rd Floor)

Sponsor: ENAR

Chair: Ana W. Capuano, Rush University Medical Center

1:45 Generalized Multilevel Function-on-Scalar Regression and Principal Component Analysis

Jeff Goldsmith*, Columbia University

Vadim Zipunnikov and Jennifer Schrack, Johns Hopkins University

2:00 Inference on Fixed Effects in Complex Functional Mixed Models

So Young Park* and Ana-Maria Staicu, North Carolina State University

Luo Xiao and Ciprian Crainiceanu, Johns Hopkins Bloomberg School of Public Health

2:15 Generalized Function-on-Function Regression

Janet S. Kim*, Ana-Maria Staicu and Arnab Maity, North Carolina State University

2:30 Variable Selection in Function-on-Scalar Regression

Yakuan Chen*, Todd Ogden and Jeff Goldsmith, Columbia University

2:45 Bayesian Adaptive Functional Models with Applications to Copy Number Data

Bruce D. Bugbee*, Veera Baladandayuthapani and Jeffrey S. Morris, University of Texas MD Anderson Cancer Center

3:00 Functional Bilinear Regression with Matrix Covariates via Reproducing Kernel Hilbert Space with Applications in Neuroimaging Data Analysis

Dong Wang, University of North Carolina, Chapel Hill

Dan Yang*, Rutgers University Haipeng Shen and Hongtu Zhu, University of North Carolina, Chapel Hill

3:15 Simultaneous Confidence Bands for Derivatives of Dependent Functional Data

Guanqun Cao*, Auburn University

46. CONTRIBUTED PAPERS: Methods in Causal Inference: Instrumental Variable, Propensity Scores and Matching

Ibis (3rd Floor)

Sponsor: **ENAR**

Chair: **Ozgur Asar**, Lancaster University

-
- 1:45** **Methods to Overcome Violations of an Instrumental Variable Assumption: Converting a Confounder into an Instrument**
Michelle Shardell*, National Institute on Aging, National Institutes of Health
-
- 2:00** **Assessing Treatment Effect of Thiopurines on Crohn's Disease from a UK Population-Based Study Using Propensity Score Matching**
Laura H. Gunn*, Stetson University
Sukhdev Chatu, St. George's University Hospital London
Sonia Saxena and **Azeem Majeed**, Imperial College London
Richard Pollok, St. George's University Hospital London
-
- 2:15** **Semiparametric Causal Inference in Matched Cohort Studies**
Edward H. Kennedy  and **Dylan S. Small**, University of Pennsylvania
-
- 2:30** **Revisiting the Comparison of Covariate Adjusted Logistic Regression versus Propensity Score Methods with Few Events per Covariate**
Fang Xia*, **Phillip J. Schulte** and **Laine Thomas**, Duke University School of Medicine
-
- 2:45** **Bayesian Latent Propensity Score Approach for Average Causal Effect Estimation Allowing Covariate Measurement Error**
Elande Baro*, **Yi Huang** and **Anindya Roy**, University of Maryland Baltimore County
-
- 3:00** **Comparative Performance of Multivariate Matching Methods that Select a Subset of Observations**
Maria de los Angeles Resa* and **Jose R. Zubizarreta**, Columbia University
-
- 3:15** **Improving Treatment Effect Estimation in the Presence of Treatment Delay through Triplet Matching**
Erinn M. Hade* and **Bo Lu**, The Ohio State University
Hong Zhu, University of Texas Southwestern Medical Center
-

47. CONTRIBUTED PAPERS: Covariates Measured with Error

Stanford (3rd Floor)

Sponsor: **ENAR**

Chair: **Xiaoye Ma**, University of Minnesota

1:45 Locally Efficient Semiparametric Estimators for Proportional Hazards Models with Measurement Error

Yuhang Xu* and **Yehua Li**, Iowa State University
Xiao Song, University of Georgia

2:00 Separating Variability in Practice Patterns from Statistical Error: An Opportunity for Quality Improvement

Laine Thomas* and **Phillip J. Schulte**, Duke University

2:15 Goodness-of-Fit Testing of Error Distribution in Linear Errors-in-Variables Model

Xiaoqing Zhu*, Michigan State University

2:30 Estimating Recurrence and Incidence of Preterm Birth in Consecutive Pregnancies Subject to Measurement Error in Gestation: A Novel Application of Hidden Markov Models

Paul S. Albert*, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health

2:45 Multi-State Model with Missing Continuous Covariate

Wenjie Lou*, **Richard J. Kryscio** and **Erin Abner**, University of Kentucky

3:00 Weighted l1-Penalized Corrected Quantile Regression for High Dimensional Measurement Error Models

Abhishek Kaul* and **Hira L. Koul**, Michigan State University

3:00 Floor Discussion

48. INVITED AND CONTRIBUTED ORAL POSTERS: Clinical Trials

Jasmine (Terrace Level)

Sponsor: **ENAR**

Chair: **Reneé Moore**, North Carolina State University

48a. INVITED POSTER:

Split-Sample Based and Multiple Imputation Estimation and Computation Methods for Meta-Analysis of Clinical Trial Data and Otherwise Hierarchical Data

Geert Molenbergs*, Universiteit Hasselt

Geert Verbeke, Katholieke Universiteit Leuven

Michael G. Kenward, London School of Hygiene and Tropical Medicine

Wim Van der Elst and **Lisa Hermans**, Universiteit Hasselt

Vahid Nassiri, Katholieke Universiteit Leuven

48b. INVITED POSTER:

Over-Parameterization in Adaptive Dose-Finding Studies

John O'Quigley, Universite Pierre et Marie Curie

Nolan A. Wages and **Mark R. Conaway**, University of Virginia

Ken Cheung, Columbia University

Ying Yuan, University of Texas MD Anderson Cancer Center

Alexia Iasonos*, Memorial Sloan Kettering Cancer Center

48c. Improving Some Clinical Trials Inference by Using Ranked Axillary Covariate

Hani Samawi*, **Rajai Jabra**, **Robert Vogel** and **Daniel Linder**,
Georgia Southern University

48d. Direct Estimation of the Mean Outcome on Treatment when Treatment Assignment and Discontinuation Compete

Xin Lu*, Emory University

Brent A. Johnson, University of Rochester

48e. Bayesian Interim Analysis Methods for Phase Ib Expansion Trials Enable Earlier Go/No-Go Decisions in Oncology Drug Development

James Lymp*, **Jane Fridlyand** and **Hsin-Ju Hsieh**, Genentech

Daniel Sabanes Bove and **Somnath Sarkar**, F. Hoffmann-La Roche

48f. Unified Additional Requirement in Consideration of Regional Approval for Multi-Regional Clinical Trials

Zhaoyang Teng*, Boston University

Yeh-Fong Chen, The George Washington University

Mark Chang, AMAG Pharmaceuticals and Boston University

48g. Efficiencies of Bayesian Adaptive Platform Clinical Trials

Ben Saville* and **Scott Berry**, Berry Consultants

48h. A Bayesian Semiparametric Model for Interval Censored Data with Monotone Splines

Bin Zhang, Cincinnati Children's Hospital Medical Center

Yue Zhang*, University of Cincinnati

**48i. Comprehensive Evaluation of Adaptive Designs for Phase I
Oncology Clinical Trials**

Sheau-Chiann Chen*, Vanderbilt University
Yunchan Chi, National Cheng Kung University
Yu Shyr, Vanderbilt University

**48j. Statistical Inference for Composite Outcomes Based
on Prioritized Components**

Ionut Bebu* and **John M. Lachin**, The George Washington University

**48k. The Impact of Covariate Misclassification Using Generalized
Linear Regression Under Covariate-Adaptive Randomization**

Liqiong Fan* and **Sharon D. Yeatts**, Medical University
of South Carolina

48l. Non-Inferiority Test Based on Transformations

Santu Ghosh*, Wayne State University
Arpita Chatterjee, Georgia Southern University
Samiran Ghosh, Wayne State University

**48m. Methods Accounting for Mortality and Missing Data
in Randomized Trials with Longitudinal Outcomes**

Elizabeth A. Colantuoni*, Johns Hopkins Bloomberg School of Public
Health **Chenguang Wang**, Johns Hopkins School of Medicine
Daniel O. Scharfstein, Johns Hopkins Bloomberg School
of Public Health

**48n. A Semiparametric Bayesian Approach Using Historical Control
Data for Assessing Non-Inferiority in Three Arm Trials**

Arpita Chatterjee*, Georgia Southern University
Santu Ghosh and **Samiran Ghosh**, Wayne State University

**48o. Design Parameters and Effect of the Delayed-Start Design
in Alzheimer's Disease**

Guoqiao Wang* and **Richard E. Kennedy**, University of Alabama,
Birmingham
Lon S. Schneider, University of Southern California
Gary R. Cutter, University of Alabama, Birmingham

MONDAY, MARCH 16

3:30 – 3:45 pm — Refreshment Break with Our Exhibitors

*Lower Promenade
(Terrace Level)*

3:45 – 5:30 pm

49. CENS Invited Session — Careers in Statistics: Skills for Success

*Ashe Auditorium
(3rd Floor)*

Sponsor: **ENAR**

Organizer: **Vivian Shih**, AstraZeneca

Chair: **Michael McIsaac**, Queen's University

3:45 How to be Successful in Oral and Written Communications as a Biostatistician

Peter Grant Mesenbrink*, Novartis Pharmaceuticals Corporation

4:15 Navigating the Academic Jungle Without Going Bananas

Amy H. Herring*, University of North Carolina, Chapel Hill

4:45 What am I Going to be When I Grow Up? Evolving as a Statistician

Nancy L. Geller*, National Heart, Lung and Blood Institute,
National Institutes of Health

5:15 Floor Discussion

50. Analysis Methods for Data Obtained from Electronic Health Records

Tuttle (Terrace Level)

Sponsors: **ENAR, ASA Biometrics Section, ASA Section on
Statistics in Epidemiology**

Organizer: **Sebastian Haneuse**, Harvard University

Chair: **Sebastian Haneuse**, Harvard University

3:45 Improving the Power of Genetic Association Tests with Imperfect Phenotype Derived from Electronic Medical Records

Jennifer A. Sinnott* and **Wei Dai**, Harvard School of Public Health

Katherine P. Liao and **Elizabeth W. Karlson**, Brigham and Women's Hospital

Isaac Kohane, Harvard Medical School

Robert Plenge, Merck Research Laboratories

Tianxi Cai, Harvard School of Public Health

4:15 Nonparametric Estimation of Patient Prognosis with Application to Electronic Health Records

Patrick J. Heagerty* and **Alison E. Kosel**, University of Washington

4:45 Mining EHR Narratives for Clinical Research

Enedia Mendonca*, University of Wisconsin, Madison

5:15 Floor Discussion

51. Statistical Challenges of Survey and Surveillance Data in US Government

Foster (3rd Floor)

Sponsors: **ENAR**, **ASA Section on Statistics in Defense and National Security**,
ASA Survey Research and Methodology Section

Organizer: **Simone Gray**, Centers for Disease Control and Prevention

Chair: **Simone Gray**, Centers for Disease Control and Prevention

3:45 Using Venue-Based Sampling to Recruit Hard-to-Reach Populations

Maria Corazon B. Mendoza*, **Chris Johnson**, **Brooke Hoots** and **Teresa Finlayson**, Centers for Disease Control and Prevention

4:10 Development of Guidelines for the Presentation of Data from the National Health and Nutrition Examination Survey

Margaret Devers Carroll*, National Health and Nutrition Examination Survey,
Centers for Disease Control and Prevention

4:35 Data Swapping Methods for Statistical Disclosure Limitation

Guangyu Zhang*, **Joe Fred Gonzalez**, **Anna Oganyan** and **Alena Maze**,
National Center for Health Statistics, Centers for Disease Control
and Prevention

5:00 Practical Approaches to Design and Inference Through the Integration of Complex Survey Data and Non-Survey Information Sources

John L. Eltinge*, U.S. Bureau of Labor Statistics
Rachel M. Harter, RTI International

5:25 Floor Discussion

52. Reconstructing the Genomic Landscape from High-Throughput Data

Johnson (3rd Floor)

Sponsors: **ENAR, ASA Biometric Section**

Organizers: **Adam Olshen**, University of California, San Francisco and
Ronglai Shen, Memorial Sloan Kettering Cancer Center

Chair: **Adam Olshen**, University of California, San Francisco

3:45 **Copy Numbers in Circulating Tumor Cells (CTCs) Using DNA-Seq**

Henrik Bengtsson*, University of California, San Francisco

4:10 **DNA Copy Number Analyses for Family Based Designs**

Ingo Ruczinski*, Johns Hopkins University

4:35 **Reconstructing 3-D Genome Configurations: How and Why**

Mark Robert Segal*, University of California, San Francisco

5:00 **A Latent Variable Approach for Integrative Clustering of Multiple Genomic Data Types**

Ronglai Shen*, Memorial Sloan-Kettering Cancer Center

5:25 **Floor Discussion**

53. Statistical Methods for Single Molecule Experiments

Miami Lecture Hall
(3rd Floor)

Sponsors: **ENAR, ASA Biometric Section**

Organizer: **Ying Hung**, Rutgers University

Chair: **Ying Hung**, Rutgers University

3:45 **Walking, Sliding, and Detaching: Time Series Analysis for Cellular Transport in Axons**

John Fricks*, **Jason Bernstein** and **William Hancock**, The Pennsylvania State University

4:10 **Analyzing Single-Molecule Protein-Targeting Experiments via Hierarchical Models**

Samuel Kou* and **Yang Chen**, Harvard University

4:35 **Bimolecular Reaction, Data Types, and an Alternative Model to the Smoluchowski Theory**

Hong Qian*, University of Washington

5:00 **Hidden Markov Models with Applications in Cell Adhesion Experiments**

Jeff C. F. Wu, Georgia Institute of Technology
Ying Hung*, Rutgers University

5:25 **Floor Discussion**

54. Subgroup Analysis and Adaptive Trials

Brickell (Terrace Level)

Sponsor: **IMS**

Organizer: **Donatello Telesca**, University of California, Los Angeles

Chair: **Donatello Telesca**, University of California, Los Angeles

3:45 **A Bayes Rule for Subgroup Reporting — Bayesian Adaptive Enrichment Designs**

Peter Mueller*, University of Texas, Austin

4:15 **Subgroup-Based Adaptive (SUBA) Designs for Multi-Arm Biomarker Trials**

Yanxun Xu, University of Texas, Austin

Lorenzo Trippa, Harvard University

Peter Mueller, University of Texas, Austin

Yuan Ji*, NorthShore University HealthSystem and University of Chicago

4:45 **Detection of Cancer Subgroup Associated Alternative Splicing**

Jianhua Hu*, University of Texas MD Anderson Cancer Center

Xuming He, University of Michigan

5:15 **Floor Discussion**

55. CONTRIBUTED PAPERS: Methods to Assess Agreement

Pearson I (3rd Floor)

Sponsor: **ENAR**

Chair: **Yansong Cheng**, GlaxoSmithKline

3:45 **Kappa Statistics for Correlated Matched-Pair Categorical Data**

Zhao Yang*, University of Tennessee Health Science Center

Ming Zhou, Bristol-Myers Squibb

4:00 **Sample Size Methods for Constructing Confidence Intervals for the Intra-Class Correlation Coefficient**

Kevin K. Dobbin* and **Alexei C. Ionan**, University of Georgia

4:15 **Statistical Methods for Assessing Reproducibility in Multicenter Neuroimaging Studies**

Tian Dai* and **Ying Guo**, Emory University

4:30 **Nonparametric Regression of Agreement Measure Between Ordinal and Continuous Outcomes**

AKM F. Rahman*, **Limin Peng**, **Ying Guo** and **Amita Manatunga**, Emory University

- 4:45 **Inter-Observer Agreement for a Mixture of Data Types**
Shasha Bai*, University of Arkansas for Medical Sciences
Marcelo A. Lopetegui, The Ohio State University
-
- 5:00 **Assessing Reproducibility of Discrete and Truncated Rank Lists in High-Throughput Studies**
Qunhua Li*, The Pennsylvania State University
-
- 5:15 **Exponentiated Lindley Poisson Distribution**
Mavis Pararai* and **Gayan Liyanag**, Indiana University of Pennsylvania
Broderick Oluyede, Georgia Southern University
-

56. CONTRIBUTED PAPERS: Methylation and RNA Data Analysis

Stanford (3rd Floor)

Sponsor: **ENAR**

Chair: **Babette A Brumback**, University of Florida

- 3:45 **Identify Differential Alternative Splicing Events from Paired RNA-Seq Data**
Cheng Jia* and **Mingyao Li**, University of Pennsylvania
-
- 4:00 **Functional Normalization of 450k Methylation Array Data Improves Replication in Large Cancer Studies**
Jean-Philippe Fortin ■, Johns Hopkins Bloomberg School of Public Health
Aurelie Labbe, McGill University
Mathieu Lemire, Ontario Institute of Cancer Research
Brent W. Zanke, Ottawa Hospital Research Institute
Thomas J. Hudson, Ontario Institute of Cancer Research
Elana J. Fertig, Johns Hopkins School of Medicine
Celia M. T. Greenwood, Jewish General Hospital Montreal
Kasper D. Hansen, Johns Hopkins Bloomberg School of Public Health
-
- 4:15 **Detecting Differentially Methylated Regions (DMRs) by Mixed-Effect Logistic Model**
Fengjiao Hu* and **Hongyan Xu**, Georgia Regents University
-
- 4:30 **Penalized Modeling for Variable Selection and Association Study of High-Dimensional MicroRNA Data with Repeated Measures**
Zhe Fei*, University of Michigan
Yinan Zheng, Northwestern University
Wei Zhang, University of Illinois, Chicago
Justin B. Starren and **Lei Liu**, Northwestern University
Andrea A. Baccarelli, Harvard School of Public Health
Yi Li, University of Michigan
Lifang Hou, Northwestern University
-

-
- 4:45** **Comparison of Paired Tumor-Normal Methods for Differential Expression Analysis of RNA-Seq Data**
Janelle R. Noel*, **Alice Wang**, **Rama Raghavan** and **Prabhakar Chalise**,
University of Kansas Medical Center
Byunggil Yoo, Childrens Mercy Hospital Kansas City
Sumedha Gunewardena, Kansas Intellectual and Developmental Disabilities
Research Center
Jeremy Chien and **Brooke L. Fridley**, University of Kansas Medical Center
-
- 5:00** **Detecting Differential Alternative Splicing with Biological Replicates between Two Groups from RNA-Seq Data**
Yu Hu*, **Cheng Jia**, **Dwight Stambolian** and **Mingyao Li**,
University of Pennsylvania
-
- 5:15** **Functional Region-Based Test for DNA Methylation**
Kuan-Chieh Huang* and **Yun Li**, University of North Carolina, Chapel Hill
-

57. CONTRIBUTED PAPERS: New Developments in Imaging

Ibis (3rd Floor)

Sponsor: **ENAR**

Chair: **Sihai Dave Zhao**, University of Illinois

-
- 3:45** **Estimating Dynamics of Whole-Brain Functional Connectivity in Resting-State fMRI by Factor Stochastic Volatility Model**
Chee-Ming Ting*, Universiti Teknologi Malaysia, Malaysia
Hernando Ombao, University of California, Irvine
Sh-Hussain Salleh, Universiti Teknologi Malaysia, Malaysia
-
- 4:00** **Kernel Smoothing GEE for Longitudinal fMRI Studies**
Yu Chen*, **Min Zhang** and **Timothy D. Johnson**, University of Michigan
-
- 4:15** **A Hierarchical Bayesian Model for Studying the Impact of Stroke on Brain Motor Function**
Zhe Yu*, University of California, Irvine
Raquel Prado, University of California, Santa Cruz
Erin Burke Quinlan, **Steven C. Cramer** and **Hernando Ombao**,
University of California, Irvine
-
- 4:30** **Source Estimation for Multi-Trial Multi-Channel EEG Signals: A Statistical Approach**
Yuxiao Wang* and **Hernando Ombao**, University of California, Irvine
Raquel Prado, University of California, Santa Cruz
-
- 4:45** **An Exploratory Data Analysis of EEGs Time Series: A Functional Boxplots Approach**
Duy Ngo* and **Hernando Ombao**, University of California, Irvine
Marc G. Genton and **Ying Sun**, King Abdullah University of Science
and Technology
-

- 5:00 A Bayesian Functional Linear Cox Regression Model (BFLCRM) for Predicting Time to Conversion to Alzheimer's Disease**
Eunjee Lee , **Hongtu Zhu** and **Dehan Kong**, University of North Carolina, Chapel Hill
Yalin Wang, Arizona State University
Kelly Sullivan Giovanello and **Joseph Ibrahim**, University of North Carolina, Chapel Hill

5:00 Floor Discussion

58. CONTRIBUTED PAPERS: Latent Variable and Principal Component Models

Pearson II (3rd Floor)

Sponsor: **ENAR**

Chair: **Jesse Y Hsu**, University of Pennsylvania

- 3:45 A Latent Variable Model for Analyzing Correlated Ordered Categorical Data**
Ali Reza Fotouhi*, University of The Fraser Valley
- 4:00 Estimation of Branching Curves in the Presence of Subject Specific Random Effects**
Angelo Elmi*, The George Washington University
Sarah J. Ratcliffe and **Wensheng Guo**, University of Pennsylvania
- 4:15 Composite Large Margin Classifiers with Latent Subclasses for Heterogeneous Biomedical Data**
Guanhua Chen , Vanderbilt University
Yufeng Liu and **Michael R. Kosorok**, University of North Carolina, Chapel Hill
- 4:30 Evaluation of Covariate-Specific Accuracy of Biomarkers without a Gold Standard**
Zheyu Wang*, Johns Hopkins University
Xiao-Hua Zhou, University of Washington
- 4:45 Linear Mixed Model with Unobserved Informative Cluster Size: Application to a Repeated Pregnancy Study**
Ashok K. Chaurasia*, **Danping Liu** and **Paul S. Albert**, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health
- 5:00 A Semiparametric Model of Estimating Non-Constant Factor Loadings**
Zhenzhen Zhang* and **Brisa Sanchez**, University of Michigan
- 5:15 Nested Partially-Latent Class Models (npLCM) for Estimating Disease Etiology in Case-Control Studies**
Zhenke Wu* and **Scott L. Zeger**, Johns Hopkins University

59. CONTRIBUTED PAPERS: Developments and Applications of Clustering, Classification, and Dimension Reduction Methods

Gautier (3rd Floor)

Sponsor: ENAR

Chair: Taraneh Abarin, Memorial University

3:45 Separable Spatio-Temporal Principal Component Analysis

Lei Huang , Johns Hopkins University

Philip T. Reiss, New York University School of Medicine

Luo Xiao, Vadim Zipunnikov, Martin A. Lindquist and Ciprian Crainiceanu,
Johns Hopkins University

4:00 Penalized Clustering Using a Hidden Markov Random Field Model: Detecting State-Related Changes in Brain Connectivity

Yuting Xu* and Martin Lindquist, Johns Hopkins University

4:15 Clustering of Brain Signals Using the Total Variation Distance

Carolina Euán*, Centro de Investigación en Matemáticas (CIMAT), A.C.

Hernando Ombao, University of California, Irvine

Joaquin Ortega, Centro de Investigación en Matemáticas (CIMAT), A.C.

Pedro Alvarez-Esteban, Universidad de Valladolid, Spain

4:30 Impact of Data Reduction on Accelerometer Data in Children

Daniela Sotres-Alvarez* and Yu Deng, University of North Carolina, Chapel Hill

Guadalupe X. Ayala, San Diego State University

Mercedes Carnethon, Northwestern University

Alan M. Delamater, University of Miami

Carmen R. Isasi, Albert Einstein College of Medicine

Sonia Davis and Kelly R. Evenson, University of North Carolina, Chapel Hill

4:45 Learning Logic Rules for Disease Classification: With an Application to Developing Criteria Sets for the Diagnostic and Statistical Manual of Mental Disorders

Christine M. Mauro , Columbia University

Donglin Zeng, University of North Carolina, Chapel Hill

M. Katherine Shear and Yuanjia Wang, Columbia University

5:00 Characterizing Types of Physical Activity: An Unsupervised Way

Jiawei Bai*, Luo Xiao, Vadim Zipunnikov and Ciprian M. Crainiceanu,
Johns Hopkins University

5:15 Simultaneous Model-Based Clustering and Variable Selection: Extension to Mixed-Distribution Data

Katie Evans, Dupont

Tanzy M.T. Love* and Sally W. Thurston, University of Rochester

60. CONTRIBUTED PAPERS: Survival Analysis: Methods Development and Applications

Merrick II (3rd Floor)

Sponsor: **ENAR**

Chair: **Jo Wick**, University of Kansas Medical Center

**3:45 Predictive Model and Dynamic Prediction for Recurrent Events
with Dependent Termination**

Li-An Lin*, **Sheng Luo** and **Barry Davis**, University of Texas Health Sciences
Center at Houston

4:00 An Extended Self-Triggering Model for Recurrent Event Data

Jung In Kim*, **Feng-Chang Lin** and **Jason Fine**, University of North Carolina,
Chapel Hill

**4:15 A Pairwise-Likelihood Augmented Estimator for the Cox Model
Under Left-Truncation**

Fan Wu* and **Sehee Kim**, University of Michigan
Jing Qin, National Institute of Allergy and Infectious Diseases,
National Institutes of Health
Yi Li, University of Michigan

**4:30 Rank-Based Testing Based on Cross-Sectional Survival Data
with or without Prospective Follow-Up**

Kwun Chuen Gary Chan*, University of Washington
Jing Qin, National Institute of Allergy and Infectious Diseases,
National Institutes of Health

4:45 Computation Efficient Models for Fitting Large-Scale Survival Data

Kevin He*, **Yanming Li**, **Ji Zhu** and **Yi Li**, University of Michigan

**5:00 Multiple Imputation for Interval Censored Data with Time-Dependent
Auxiliary Variables Using Incident and Prevalent Cohort Data**

Wen Ye* and **Douglas Schaubel**, University of Michigan

**5:15 Model Flexibility for Regression Analysis of Survival Data with
Informative Interval Censoring**

Tyler Cook* and **Jianguo Sun**, University of Missouri, Columbia

61. INVITED AND CONTRIBUTED ORAL POSTERS: GWAS and Meta Analysis of Genetic Studies

Jasmine (Terrace Level)

Sponsor: **ENAR**

Chair: **Mary Sammel**, University of Pennsylvania

61a. INVITED POSTER:

Hypothesis Testing for Sparse Signals in Genetic Association Studies

Xihong Lin*, Harvard University

61b. INVITED POSTER:

Meta-Analysis of Gene-Environment Interaction in Case-Control Studies by Adaptively Using Gene-Environment Correlation

Bhramar Mukherjee*, **Shi Li**, **John D. Rice**, **Jeremy MG Taylor**,
Heather Stringham and **Michael L. Boehnke**, University of Michigan

61c. Partial Linear Varying Index Coefficient Model for Gene-Environment Interactions

Xu Liu* and **Yuehua Cui**, Michigan State University

61d. Tree-Based Model Averaging Approaches for Modeling Rare Variant Association in Case-Control Studies

Brandon J. Coombes* and **Saonli Basu**, University of Minnesota
Sharmistha Guha, Fair Isaac Corporation
Nicholas Schork, J. Craig Venter Institute

61e. A Functional Approach to Association Testing of Multiple Phenotypes in Sequencing Studies

Sneha Jadhav* and **Qing Lu**, Michigan State University

61f. Analysis of Sequence Data Under Multivariate Trait-Dependent Sampling

Ran Tao*, **Donglin Zeng**, **Nora Franceschini** and **Kari E. North**,
University of North Carolina, Chapel Hill
Eric Boerwinkle, University of Texas Health Science Center
Dan-Yu Lin, University of North Carolina, Chapel Hill

61g. Meta-Analysis of Complex Diseases at Gene Level by Generalized Functional Linear Models

Ruzong Fan* and **Yifan Wang**, Eunice Kennedy Shriver National
Institute of Child Health and Human Development, National Institutes
of Health
Haobo Ren, Regeneron Pharmaceuticals, Inc.
Yun Li, University of North Carolina, Chapel Hill
Christopher Amos, Dartmouth Medical School
Wei Chen, University of Pittsburgh
Momiao Xiong, University of Texas, Houston
Jason Moore, Dartmouth Medical School

61h. Gene Level Meta-Analysis of Quantitative Traits by Functional Linear Models

Yifan Wang* and **Ruzong Fan**, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health

Michael Boehnke, University of Michigan

Wei Chen, University of Pittsburgh

Yun Li, University of North Carolina, Chapel Hill

Momiao Xiong, University of Texas, Houston

61i. A New Estimating Equation Approach for Secondary Trait Analyses in Genetic Case-Control Studies

Xiaoyu Song*, **Iuliana Ionita-Laza** and **Ying Wei**, Columbia University

61j. Novel Statistical Model for GWAS Meta-Analysis and Its Application to Trans-Ethnic Meta-Analysis

Jingchunzi Shi* and **Seunggeun Lee**, University of Michigan

61k. Multiple Phenotype Association Testing Based on Summary Statistics in Genome-Wide Association Studies

Zhonghua Liu* and **Xihong Lin**, Harvard School of Public Health

61l. A New Approach for Detecting Gene-by-Gene Interactions Through Meta-Analyses

Yulun Liu*, University of Texas, Health Science Center at Houston

Paul Scheet, University of Texas MD Anderson Cancer Center

Yong Chen, University of Texas, Health Science Center at Houston

61m. Genome-Wide Association Studies for Functional Valued Traits

Han Hao* and **Rongling Wu**, The Pennsylvania State University

61n. Kernel-Based Testing for Nonlinear Effect of a SNP-Set under Multiple Candidate Kernels

Tao He*, **Ping-Shou Zhong** and **Yuehua Cui**, Michigan State University

61o. A General Framework of Gene-Based Association Tests for Correlated Case-Control Samples

Han Chen*, **Chaolong Wang** and **Xihong Lin**, Harvard School of Public Health

61p. Algorithm to Compute the Identity Coefficients at a Particular Locus Given the Marker Information

J Concepcion Loredó-Ostí* and **Haiyan Yang**, Memorial University

61q. Estimating the Empirical Null Distribution of Maxmean Statistics in Gene Set Analysis

Xing Ren* and **Jeffrey Miecznikowski**, University at Buffalo, SUNY

Song Liu and **Jianmin Wang**, Roswell Park Cancer Institute

61r. USAT: A Unified Score-Based Association Test for Multiple Phenotype-Genotype Analysis

Debashree Ray* and **Saonli Basu**, University of Minnesota

8:30 – 10:15 am

62. Statistical Inference with Random Forests and Related Ensemble Methods

Hibiscus B (Terrace Level)

Sponsor: **ENAR**

Organizer: **Giles Hooker**, Cornell University

Chair: **Giles Hooker**, Cornell University

8:30 **Consistency of Random Forests**

Gerard Biau*, **Erwan Scornet** and **Jean-Philippe Vert**, Pierre and Marie Curie University

8:55 **Asymptotic Theory for Random Forests**

Stefan Wager*, Stanford University

9:20 **Detecting Feature Interactions in Bagged Trees and Random Forests**

Lucas K. Mentch* and **Giles Hooker**, Cornell University

9:45 **Variable Selection with Bayesian Additive Regression Trees**

Shane T. Jensen*, **Justin Bleich**, **Adam Kapelner** and **Edward I. George**, University of Pennsylvania

10:10 **Floor Discussion**

63. Mediation and Interaction: Theory, Practice and Future Directions

Ashe Auditorium (3rd Floor)

Sponsors: **ENAR**, **ASA Biometrics Section**, **ASA Section on Statistics in Epidemiology**

Organizers: **Brisa Sanchez**, University of Michigan and **Melody Goodman**, Washington University in St. Louis

Chair: **Brisa Sanchez**, University of Michigan

8:30 **A Unification of Mediation and Interaction: A Four-Way Decomposition**

Tyler J. VanderWeele*, Harvard University

9:00 **Partial Identification of the Pure Direct Effect Under Exposure-Induced Confounding**

Caleb Miles* and **Eric Tchetgen Tchetgen***, Harvard University

9:30 **Integrative Analysis of Complex Genetic, Genomic and Environmental Data Using Mediation Analysis**

Xihong Lin*, Harvard University

10:00 **Discussant:**

Bhramar Mukherjee, University of Michigan



ENAR
2015

64. Motivation and Analysis Strategies for Joint Modeling of High Dimensional Data in Genetic Association Studies

Orchid C (Terrace Level)

Sponsors: **ENAR, ASA Biometrics Section**

Organizer: **Saonli Basu**, University of Minnesota

Chair: **Weihua Guan**, University of Minnesota

8:30 **Region-Based Test for Gene-Environment Interactions in Longitudinal Studies**

Zihuai He, **Min Zhang***, **Seunggeun Lee** and **Jennifer Smith**,
University of Michigan
Xiuqing Guo, Harbor-UCLA Medical Center
Walter Palmas, Columbia University
Sharon L.R. Kardia, **Ana V. Diez Roux** and **Bhramar Mukherjee**,
University of Michigan

8:55 **Strategies to Improve the Power of Pathway Analysis in Genetic Association Studies**

Kai Yu*, **Han Zhang**, **Jianxin Shi** and **Nilanjan Chatterjee**, National Cancer
Institute, National Institutes of Health

9:20 **A Unified Test for Population-Based Multiple Correlated Phenotype-Genotype Association Analysis**

Saonli Basu* and **Debashree Ray**, University of Minnesota

9:45 **Modelling Multiple Correlated Genetic Variants**

Sharon R. Browning*, University of Washington

10:10 **Floor Discussion**

65. Recent Developments on Inference for Possibly Time-Dependent Treatment Effects with Survival Data

Johnson (3rd Floor)

Sponsors: **ENAR, ASA Biometrics Section**

Organizer: **Song Yang**, National Heart, Lung and Blood Institute,
National Institutes of Health

Chair: **Song Yang**, National Heart, Lung and Blood Institute,
National Institutes of Health

8:30 **Threshold Regression for Lifetime Data**

Mei-Ling Ting Lee*, University of Maryland, College Park
George A. Whitmore, McGill University, Canada

8:55 **Hypothesis Testing for an Extended Cox Model with Time-Varying Coefficients**

Ying Q. Chen*, Fred Hutchinson Cancer Research Center

9:20 **Time-Dependent Cut Point Selection for Biomarkers in Censored Survival Data**

Zhezhen Jin*, Columbia University

9:45 **Inference on the Summary Measures of Treatment Effect with Survival Data When There is Possibly Treatment by Time Interaction**

Song Yang*, National Heart, Lung and Blood Institute, National Institutes of Health

10:10 **Floor Discussion**

66. Journal of Agricultural, Biological and Environmental Statistics (JABES) Highlights

Foster (3rd Floor)

Sponsors: **ENAR, JABES**

Organizer: **Montserrat Fuentes**, North Carolina State University

Chair: **Murali Haran**, The Pennsylvania State University

8:30 Limited-Information Modeling of Loggerhead Turtle Population Size

John M. Grego* and **David B. Hitchcock**, University of South Carolina

8:55 Nonlinear Varying-Coefficient Models with Applications to a Photosynthesis Study

Damla Senturk*, University of California, Los Angeles

Esra Kurum, Medeniyet University

Runze Li, The Pennsylvania State University

Yang Wang, China Vanke

9:20 Multilevel Latent Gaussian Process Model for Mixed Discrete and Continuous Multivariate Response Data

Erin M. Schliep*, Duke University

Jennifer A. Hoeting, Colorado State University

9:45 Analysis of Variance of Integro-Differential Equations with Application to Population Dynamics of Cotton Aphids

Jianhua Huang*, Texas A&M University

10:10 Floor Discussion

67. Estimation and Inference for High Dimensional and Data Adaptive Problems

Miami Lecture Hall
(3rd Floor)

Sponsor: **IMS**

Organizer: **Noah Simon**, University of Washington

Chair: **Michael Wu**, Fred Hutchinson Cancer Research Center

8:30 False Discovery Rate Control for Spatial Data

Alexandra Chouldechova*, Carnegie Mellon University

8:55 Conditional or Fixed? Different Philosophies in Adaptive Inference

Max Grazier-G'sell* and **Ryan Tibsharani**, Carnegie Mellon University

9:20 Inference for Regression Quantiles After Model Selection

Jelena Bradic*, University of California, San Diego

Mladen Kolar, University of Chicago

9:45 A Flexible Framework for Sparse Additive Modeling Conditional or Fixed? Different Philosophies in Adaptive Inference

Noah Simon*, University of Washington

10:10 Floor Discussion

68. CONTRIBUTED PAPERS: Novel Methods for Bioassay Data

Merrick I (3rd Floor)

Sponsor: **ENAR**

Chair: **Wen Yu**, University of Michigan

8:30 **drLumi: Tools for the Analysis of the Multiplex Immunoassays in R**

Hector Sanz* and **John Aponte**, Universitat de Barcelona, Spain

Jaroslav Harezlak and **Magdalena Murawska**, Indiana University Fairbanks

School of Public Health, Indianapolis

Ruth Aguilar, **Gemma Moncunill** and **Carlota Dobaño**, Universitat de Barcelona, Spain

Clarissa Valim, Harvard School of Public Health

8:45 **A Bayesian Analysis of Bioassay Experiments**

Luis G. Leon-Novelo*, University of Louisiana at Lafayette

Andrew Womack, Indiana University

Hongxiao Zhu and **Xiaowei Wu**, Virginia Polytechnic Institute and State University

9:00 **Compound Ranking Based on a New Mathematical Measure of Effectiveness Using Time Course Data from Cell-Based Assays**

Francisco J. Diaz*, University of Kansas Medical Center

9:15 **Nonparametric Classification of Chemicals using Quantitative High Throughput Screening (qHTS) Assays**

Shuva Gupta*, National Institute of Environmental Health Sciences, National Institutes of Health

Soumendra Lahiri, North Carolina State University

Shyamal Peddada, National Institute of Environmental Health Sciences, National Institutes of Health

9:30 **Robust Bayesian Methods for the Inverse Regression with an Application to Immunoassay Experiments**

Magdalena Murawska, Indiana University Fairbanks School of Public Health, Indianapolis

Hector Sanz, **Ruth Aguilar**, **Gemma Moncunill**, **Carlota Dobaño** and **John Aponte**, Universitat de Barcelona, Spain

Clarissa Valim, Harvard School of Public Health

Jaroslav Harezlak*, Indiana University Fairbanks School of Public Health, Indianapolis

9:45 **Estimating the Prevalence of Multiple Diseases via Two-Stage Hierarchical Pooling**

Md S. Warasi* and **Joshua M. Tebbs**, University of South Carolina

Christopher McMahan, Clemson University

10:00 **A Ballooned Beta Regression Model and Its Application to Bioassay Data**

Min Yi* and **Nancy Flournoy**, University of Missouri, Columbia

69. CONTRIBUTED PAPERS: Infectious Disease

Pearson I (3rd Floor)

Sponsor: ENAR

Chair: **Jean-Philippe Fortin**, Johns Hopkins Bloomberg School of Public Health

8:30 **Viral Genetic Linkage Analysis in the Presence of Missing Data**

Shelley Han Liu* and **Gabriel Erion**, Harvard University

Vladimir Novitsky and **Victor DeGruttola**, Harvard School of Public Health

8:45 **A Bayesian Approach to Estimating Causal Vaccine Effects on Binary Post-Infection Outcomes**

Jincheng Zhou*, Minneapolis Medical Research Foundation,
University of Minnesota

Haitao Chu, University of Minnesota

Michael G. Hudgens, University of North Carolina, Chapel Hill

M. Elizabeth Halloran, Fred Hutchinson Cancer Research Center
and University of Washington

9:00 **Exploring Bayesian Latent Class Models as a Potential Statistical Tool to Estimate Sensitivity and Specificity in Presence of an Imperfect or No Gold Standard.**

Jay Mandrekar*, Mayo Clinic

9:15 **Modeling and Inference for Rotavirus Dynamics in Niger**

Joshua Goldstein*, **Murali Haran** and **Matthew Ferrari**,

The Pennsylvania State University

9:30 **Comparison of Group Testing Algorithms for Case Identification in the Presence of Dilution Effect**

Dewei Wang*, University of South Carolina

Christopher S. McMahan and **Colin M. Gallagher**, Clemson University

9:45 **Cholera Transmission in Ouest Region of Haiti: Dynamic Modeling and Prediction**

Alexander Kirpich*, **Alex Weppelmann**, **Yang Yang** and **Ira Longini**,
University of Florida

10:00 **Floor Discussion**

70. CONTRIBUTED PAPERS: Variable Selection

Pearson II (3rd Floor)

Sponsor **ENAR**

Chair: **Angelo Elmi**, The George Washington University

**8:30 Weak Signal Identification and Inference in
Penalized Model Selection**

Peibei Shi  and **Annie Qu**, University of Illinois, Urbana-Champaign

**8:45 Feature Screening for Time-Varying Coefficient Models Ultra-High
Dimensional Longitudinal Data**

Wanghuan Chu*, **Runze Li** and **Matthew Reimherr**, The Pennsylvania
State University

**9:00 A Regularized Approach for Simultaneous Estimation and Model
Selection for Single Index Models**

Longjie Cheng*, Purdue University
Peng Zeng, Auburn University
Yu Zhu, Purdue University

9:15 Multi-Step LASSO

Haileab Hilafu*, University of Tennessee

**9:30 Bayesian Hierarchical Variable Selection Incorporating Multi-Level
Structural Information**

Changgee Chang*, Emory University
Yize Zhao, Statistical and Applied Mathematical Sciences Institute
Qi Long, Emory University

**9:45 Model Selection for Protein Copy Numbers in Populations of
Microorganism**

Burcin Simsek*, **Hanna Salman** and **Satish Iyengar**, University of Pittsburgh

**10:00 Globally Adaptive Quantile Regression with Ultra-High
Dimensional Data**

Qi Zheng* and **Limin Peng**, Emory University
Xuming He, University of Michigan

71. CONTRIBUTED PAPERS: Modeling Health Data with Spatial or Temporal Features

Gautier (3rd Floor)

Sponsor: ENAR

Chair: **Guanhua Chen**, Vanderbilt University

8:30 Modeling of Correlated Objects with Application to Detection of Metastatic Cancer Using Functional CT Imaging

Yuan Wang*, **Brian Hobbs**, **Jianhua Hu** and **Kim-Anh Do**,
University of Texas MD Anderson Cancer Center

8:45 A Spatially Varying Coefficient Model with Partially Unknown Proximity Matrix for the Detection of Glaucoma Progression Using Visual Field Data

Joshua L. Warren*, Yale School of Public Health
Jean-Claude Mwanza, University of North Carolina, Chapel Hill
Angelo P. Tanna, Northwestern University
Donald L. Budenz, University of North Carolina, Chapel Hill

9:00 Mapping and Measuring the Effect of Privatization on Alcohol and Violence: Does it Really Matter?

Loni Philip Tabb* and **Tony H. Grubestic**, Drexel University

9:15 Modeling Adolescent Health Data Using a Binary Spatial-Temporal Generalized Method of Moments Approach

Kimberly Kaufeld*, Statistical and Applied Mathematics Institute and
North Carolina State University

9:30 A Piecewise Exponential Survival Model with Change Points for Evaluating the Temporal Association of World Trade Center Exposure with Incident Obstructive Airway Disease

Charles B. Hall*, Albert Einstein College of Medicine
Xiaoxue Liu, **Rachel Zeig-Owens**, **Mayris P. Webber**, **Jessica Weakley**
and **Theresa M. Schwartz**, Montefiore Medical Center
David J. Prezant, Fire Department of the City of New York

9:45 Distributed Lag Models: Examining Associations between the Built Environment and Health

Jonggyu Baek*, **Brisa N. Sanchez** and **Veronica J. Berrocal**,
University of Michigan
Emma V. Sanchez-Vaznaugh, San Francisco State University

10:00 Cluster Detection Test in Spatial Scan Statistics: ADHD Application

Ahmad Reza Soltani* and **Suja Aboukhamseen**, Kuwait University

72. CONTRIBUTED PAPERS: Advances in Longitudinal Modeling

Merrick II (3rd Floor)

Sponsor: ENAR

Chair: Li-An Lin, University of Texas Health Science Center, Houston

8:30 Conditional Modeling of Longitudinal Data with Terminal Event

Shengchun Kong*, Purdue University

Bin Nan and Jack Kalbfleisch, University of Michigan

8:45 A Marginalized Multilevel Model for Bivariate Longitudinal Binary Data

Gul Inan* and Ozlem Ilk Dag, Middle East Technical University, Turkey

9:00 Augmented Beta Rectangular Regression Models: A Bayesian Perspective

Jue Wang* and Sheng Luo, University of Texas Health Science Center, Houston

9:15 Rank-Based Regression Models for Longitudinal Data

Rui Chen, Tian Chen* and Xin Tu, University of Rochester

9:30 Markov Chains and Continuous Time Multi-State Markov Models Comparisons in Longitudinal Clinical Analysis

Lijie Wan*, Richard J. Kryscio and Erin Abner, University of Kentucky

9:45 Applications of Multiple Outputation for the Analysis of Longitudinal Data Subject to Irregular Observation

Eleanor M. Pullenayegum*, Hospital for Sick Children

10:00 A Hidden Markov Model Approach to Analyze Longitudinal Ternary Outcome Disease Stage Change Subject to Misclassification

Julia Benoit*, University of Houston

Wenyaw Chan, University of Texas Health Science Center School of Public Health



73. CONTRIBUTED PAPERS:

Causal Inference: Average and Mediated Effects

Ibis (3rd Floor)

Sponsor: **ENAR**

Chair: **Jeff Goldsmith**, Columbia University

8:30 Instrumental Variable Estimation of the Marginal Average Effect of Treatment on the Treated

Lan Liu*, **Baoluo Sun**, **James Robins** and **Eric Tchetgen Tchetgen**,
Harvard University

8:45 Within-Subject Designs for Causal Mediation Analysis

Yenny Webb-Vargas*, **Martin A. Lindquist** and **Elizabeth A. Stuart**,
Johns Hopkins Bloomberg School of Public Health
Michael E. Sobel, Columbia University

9:00 Mediation Analysis of a Set of Correlated Predictors Using Weighted Quantile Sum Regression Method

Bhanu Murthy Evani* and **Robert A. Perera**, Virginia
Commonwealth University
Chris Gennings, Icahn School of Medicine at Mount Sinai

9:15 Bayesian Semiparametric Latent Mediation Model

Chanmin Kim*, Harvard University
Michael J. Daniels, University of Texas, Austin
Yisheng Li, University of Texas MD Anderson Cancer Center

9:30 Accounting for Uncertainty in Confounder Selection when Estimating Average Causal Effects in Generalized Linear Models

Chi Wang*, University of Kentucky
Corwin Matthew Zigler, Harvard School of Public Health
Giovanni Parmigiani, Dana-Farber Cancer Institute and Harvard
School of Public Health
Francesca Dominici, Harvard School of Public Health

9:45 Variable Selection for Estimating Average Causal Effects

Douglas Galagate*, U.S. Census Bureau

10:00 Estimating Mediation Effects Under Correlated Errors with an Application to fMRI

Yi Zhao and **Xi Luo**, Brown University

74. CONTRIBUTED PAPERS: Variable Selection with High Dimensional Data

Stanford (3rd Floor)

Sponsor: **ENAR**

Chair: **Tanujit Dey**, Cleveland Clinic

8:30 **Empirical Likelihood Tests for Coefficients in High Dimensional Linear Models**

Honglang Wang*, **Ping-Shou Zhong** and **Yuehua Cui**, Michigan State University

8:45 **TPRM: Tensor Partition Regression Models with Applications in Imaging Biomarker Detection**

Michelle F. Miranda*, **Hongtu Zhu** and **Joseph G. Ibrahim**, University of North Carolina, Chapel Hill

9:00 **A Boosting-Based Variable Selection Method for Survival Prediction with Genome-Wide Gene Expression Data**

Yanming Li*, **Kevin He**, **Yi Li** and **Ji Zhu**, University of Michigan

9:15 **Statistical Inference in High-Dimensional M-Estimation**

Hao Chai* and **Shuangge Ma**, Yale University

9:30 **Augmented Weighted Support Vector Machines for Missing Covariates**

Thomas G. Stewart , **Michael C. Wu** and **Donglin Zeng**, University of North Carolina, Chapel Hill

9:45 **Variable Selection on Model Spaces Constrained by Heredity Conditions**

Andrew Womack, Indiana University, Bloomington
Daniel Taylor-Rodriguez*, Statistical and Applied Mathematics Institute and Duke University
Claudio Fuentes, Oregon State University

10:00 Floor Discussion

ENAR
2015

TUESDAY, MARCH 17

10:15 – 10:30 am — Refreshment Break with Our Exhibitors

*Lower Promenade
(Terrace Level)*

10:30 am – 12:15 pm

75. Presidential Invited Address

*Regency Ballroom
(Terrace Level)*

Sponsor: **ENAR**

Organizer/Chair: **José Pinheiro**, Johnson & Johnson PRD

10:30 Introduction

10:35 Distinguished Student Paper Awards

10:45 **Big Data, Big Opportunities, Big Challenges**

David L. DeMets, Ph.D., Max Halperin Professor of Biostatistics,
University of Wisconsin, Madison

1:45 – 3:30 pm

76. Recent Advances in Dynamic Treatment Regimes

*Ashe Auditorium
(3rd Floor)*

Sponsors: **ENAR, ASA Biometrics Section**

Organizer: **Yingqi Zhao**, University of Wisconsin, Madison

Chair: **Yingqi Zhao**, University of Wisconsin, Madison

1:45 **The LIBERTI Trial for Discovering a Dynamic Treatment Regimen
in Burn Scar Repair**

Jonathan Hibbard and **Michael R. Kosorok***, University of North Carolina,
Chapel Hill

2:10 **From Idealized to Realized: Estimating Dynamic Treatment
Regimens from Electronic Medical Records**

Erica EM Moodie* and **David A. Stephens**, McGill University

2:35 **Adaptive Treatment and Robust Control**

Robin Henderson*, Newcastle University, UK

3:00 **Methods to Increase Efficiency of Estimation When a Test Used
to Decide Treatment Has No Direct Effect on the Outcome**

James M. Robins*, Harvard University

3:25 Floor Discussion

77. Predictive Models for Precision Medicine

Miami Lecture Hall
(3rd Floor)

Sponsors: **ENAR, ASA Biometrics Section, ASA Mental Health Statistics Section, ASA Statistical Programmers Section**
Organizers: **Suchi Saria**, Johns Hopkins University and **Peter Mueller**, University of Texas, Austin
Chair: Peter Mueller, University of Texas, Austin

1:45 The Power of Electronic Medical Records as Data-Gathering Tools for the Creation of (a) Longitudinal Personalized Near-Real-Time Predictions of Adverse Outcomes and (b) Data-Driven Advice Systems for Medical Decision-Making
David Draper*, University of California, Santa Cruz and eBay Research Labs

2:10 Assessing Illness Severity from Electronic Health Data
Suchi Saria*, Johns Hopkins University

2:35 Toward Individualizing Health Care: Statistical Opportunities
Yates Coley, Zhenke Wu and Scott L. Zeger*, Johns Hopkins University

3:00 Dancing with Black Swans: A Computational Perspective on Suicide Risk Detection
Truyen Tran*, Deakin University and Curtin University, Australia
Santu Rana, Wei Luo, Dinh Phung and Svetha Venkatesh, Deakin University, Australia
Richard Harvey, Barwon Health, Australia

3:25 Floor Discussion

78. Electronic Health Records: Challenges and Opportunities

Orchid C (Terrace Level)

Sponsors: **ENAR, ASA Biometrics Section, ASA Section on Statistics in Epidemiology**
Organizer: **Paramita Saha Chaudhuri**, Duke University
Chair: **Paramita Saha Chaudhuri**, Duke University

1:45 Trials and Tribulations in Trials Using EHR Data
Meredith Nahm Zozus*, Duke University

2:10 Statistical Methods for Dealing with Non-Random Observation of Laboratory Data in EHRs
Jason A. Roy*, University of Pennsylvania

2:35 Extending Bayesian Networks to Estimate Conditional Survival Probability Using Electronic Health Data

David M. Vock*, Julian Wolfson, Sunayan Bandyopadhyay, Gediminas Adomavicius and **Paul E. Johnson**, University of Minnesota
Gabriela Vazquez-Benitez and **Patrick J. O'Connor**, HealthPartners Institute for Education and Research

3:00 Tracking and Predicting Disease from the Electronic Medical Record

Joseph Edward Lucas*, Duke University

3:25 Floor Discussion

79. Cost-Effective Study Designs for Observational Data

Tuttle (Terrace Level)

Sponsor: **ENAR**

Organizer: **Patrick Heagerty**, University of Washington

Chair: **Patrick Heagerty**, University of Washington

1:45 Design and Analysis of Retrospective Studies for Longitudinal Outcome Data

Jonathan S. Schildcrout* and **Nathaniel D. Mercaldo**, Vanderbilt University School of Medicine

2:15 On the Analysis of Hybrid Designs that Combine Group- and Individual-Level Data

Sebastien Haneuse* and **Elizabeth Smoot**, Harvard School of Public Health

2:45 Test-Dependent Sampling Design and Semi-Parametric Inference for the ROC Curve

Haibo Zhou*, University of North Carolina, Chapel Hill
Beth Horton, University of Virginia

3:15 Discussant:

Paul Rathouz, University of Wisconsin, Madison

80. Advanced Machine Learning Methods

Johnson (3rd Floor)

Sponsors: **ENAR, ASA Statistical Learning and Data Mining Section**

Organizer: **Peiyong (Annie) Qu**, University of Illinois, Champaign-Urbana

Chair: **Peiyong (Annie) Qu**, University of Illinois, Champaign-Urbana

1:45 **A New Approach to Variable Selection via Algorithmic Regularization Paths**

Yue Hu, Rice University

Genevera I. Allen*, Rice University and Baylor College of Medicine

2:10 **Link Prediction for Partially Observed Networks**

Yunpeng Zhao, George Mason University

Yun-Jhong Wu, Elizaveta Levina and Ji Zhu*, University of Michigan

2:35 **Graphical Regression**

Hsin-Cheng Huang, Academia Sinica, Taiwan

Xiaotong Shen* and **Wei Pan**, University of Minnesota

3:00 **Penalized Maximum Likelihood Estimation on a Two-Layered Network**

George Michailidis*, University of Michigan

3:25 **Floor Discussion**

81. Statistical Analysis for Deep Sequencing Data in Cancer Research: Methods and Applications

Foster (3rd Floor)

Sponsor: **ENAR**

Organizer: **Li-Xuan Qin**, Memorial Sloan Kettering Cancer Center

Chair: **Yen-Tsung Huang**, Brown University

1:45 **A Statistical Method for Detecting Differentially Expressed Mutations Based on Next-Generation RNAseq Data**

Pei Wang*, Icahn School of Medicine at Mount Sinai

Rong Fu, University of Washington

Ziding Feng, University of Texas MD Anderson Cancer Center

2:10 **Accounting for Differential Coverage in Comparing Mutation Prevalence**

George W. Wright*, National Cancer Institute, National Institutes of Health

2:35 Scalable Bayesian Nonparametric Learning for High-Dimensional Lung Cancer Genomics Data

Chiyu Gu and **Subharup Guha***, University of Missouri
Veerabhadran Baladandayuthapani, University of Texas
MD Anderson Cancer Center

3:00 Understanding MicroRNA Sequencing Data Distribution

Li-Xuan Qin*, Memorial Sloan Kettering Cancer Center
Tom Tuschl, Rockefeller University
Sam Singer, Memorial Sloan Kettering Cancer Center

3:25 Floor Discussion

82. Spatial and Spatio-Temporal Modeling

Merrick II (3rd Floor)

Sponsor: **IMS**

Organizer: **Jonathan Stroud**, The George Washington University

Chair: **Jonathan Stroud**, The George Washington University

1:45 Multivariate Spatial Modeling of Conditional Dependence in Microscale Soil Elemental Composition Data

Joseph Guinness*, **Montserrat Fuentes**, **Dean Hesterberg** and
Matthew Polizzotto, North Carolina State University

2:10 Spatial Local Gradient Models of Biological Invasions

Joshua Goldstein, **Murali Haran*** and **Ottar N. Bjornstad**, The Pennsylvania
State University
Andrew M. Liebhold, U.S. Forest Services

2:35 A Generalized Conditionally Autoregressive (CAR) Model

Veronica J. Berrocal*, University of Michigan
Alan E. Gelfand, Duke University

3:00 Gaussian Process Models for Emulating Spatial Computer Model Output

Dave M. Higdon*, Los Alamos National Laboratory and Virginia Tech
Mengyang Gu, Duke University

3:15 Floor Discussion

83. CONTRIBUTED PAPERS: Study Design and Power

Stanford (3rd Floor)

Sponsor: ENAR

Chair: **Shelley Han Liu**, Harvard University

- | | |
|------|---|
| 1:45 | Comparison of Risk Estimates Derived from Full Cohort, Sub-Sample, and Nested Case-Cohort Methodologies
Kathleen A. Jablonski* and Madeline M. Rice , The George Washington University |
| 2:00 | Power Estimation for Ordinal Categorical Data in the Presence of Non Proportional Odds
Roy N. Tamura* and Xiang Liu , University of South Florida |
| 2:15 | Single Arm Phase II Cancer Survival Trial Designs
Jianrong John Wu* , St. Jude Children's Research Hospital |
| 2:30 | Empirical Determination of Statistical Power and Sample Size for RNA-Seq Studies
Milan Bimali* , Jonathan D. Mahnken and Brooke L. Fridley , University of Kansas Medical Center |
| 2:45 | Functional Signal-to-Noise Ratio Analysis with Applications in Quantitative Ultrasound
Yeonjoo Park* and Douglas G. Simpson , University of Illinois, Urbana-Champaign |
| 3:00 | Analysis of a Non-Mortality Outcome in Clinical Trial of a Potentially Lethal Disease
Roland A. Matsouaka* , Duke University
Rebecca Betensky , Harvard University |
| 3:15 | Sample Size Determination Based on Quantile Residual Life
Jong Hyeon Jeong* , University of Pittsburgh |



84. CONTRIBUTED PAPERS: Missing Data

Gautier (3rd Floor)

Sponsor: ENAR

Chair: Shengchun Kong, Purdue University

-
- 1:45 A Mixed Effects Model for Incomplete Data with Experiment-Level Abundance-Dependent Missing-Data Mechanism**
Lin S. Chen and Jiebiao Wang*, University of Chicago
Xianlong Wang, Fred Hutchinson Cancer Research Center
Pei Wang, Icahn Medical School at Mount Sinai
-
- 2:00 Multiple Imputation for General Missing Patterns in the Presence of High-Dimensional Data**
Yi Deng* and Qi Long, Emory University
-
- 2:15 A Mixed-Effects Model for Nonignorable Missing Longitudinal Data**
Xuan Bi* and Annie Qu, University of Illinois, Urbana-Champaign
-
- 2:30 EM Algorithm in Gaussian Copula with Missing Data**
Wei Ding* and Peter X.K. Song, University of Michigan
-
- 2:45 On Identification Issues with Binary Outcomes Missing Not at Random**
Jiwei Zhao*, University at Buffalo, SUNY
-
- 3:00 Kenward-Roger Approximation for Linear Mixed Models with Missing Covariates**
Akshita Chawla* and Tapabrata Maiti, Michigan State University
Samiran Sinha, Texas A&M University
-
- 3:15 Nonparametric Sequential Multiple Imputation for Survival Analysis with Missing Covariates**
Paul Hsu, University of Arizona
Mandi Yu*, National Cancer Institute, National Institutes of Health
-

85. CONTRIBUTED PAPERS: Innovative Methods for Clustered Data

Ibis (3rd Floor)

Sponsor: ENAR

Chair: **Jonggyu Beak**, University of Michigan

-
- 1:45** **Correlation Structure Selection Penalties for Improved Inference with Generalized Estimating Equations**
Philip M. Westgate* and **Woodrow W. Burchett**, University of Kentucky
-
- 2:00** **Handling Negative Correlation and/or Overdispersion in Gaussian and Non-Gaussian Hierarchical Data**
Geert Molenberghs*, Hasselt University and Leuven University
-
- 2:15** **Reflecting the Orientation of Teeth in Random Effects Models for Periodontal Outcomes**
Rong Xia*, **Thomas M. Braun** and **William V. Giannobile**, University of Michigan
-
- 2:30** **Detecting Heterogeneity Based on Effect Size of Response Measures**
Xin Tong*, University of South Carolina, Columbia
-
- 2:45** **Statistical Methods for Manifold-Valued Data from Longitudinal Studies**
Emil A. Cornea*, **Hongtu T. Zhu** and **Joseph G. Ibrahim**, University of North Carolina, Chapel Hill
-
- 3:00** **Analyzing Dependent Data using Empirical Likelihood and Quadratic Inference Function**
Chih-Da Wu*, University of North Carolina, Chapel Hill
Naisyin Wang, University of Michigan
-
- 3:15** **Fast Estimation of Regression Parameters in a Broken Stick Model for Longitudinal Data**
Ritabrata Das*, **Moulinath Banerjee** and **Bin Nan**, University of Michigan
-

86. CONTRIBUTED PAPERS: Biopharmaceutical Applications and Survival Analysis

Pearson II (3rd Floor)

Sponsor: ENAR

Chair: **Chanmin Kim**, Harvard University

-
- 1:45** **Pseudo-Value Approach for Testing Conditional Residual Lifetime for Dependent Survival and Competing Risks Data**
Kwang Woo Ahn* and **Brent R. Logan**, Medical College of Wisconsin
-
- 2:00** **Fallback Type FDR Controlling Procedures for Testing a Priori Ordered Hypotheses**
Anjana Grandhi*, **Gavin Lynch** and **Wenge Guo**, New Jersey Institute of Technology
-
- 2:15** **Parametric Inference on Quantile Residual Life**
Kidane B. Ghebrehawariat*, **Ying Ding** and **Jong-Hyeon Jeong**, University of Pittsburgh
-

2:30 Study Design Issues in Precision Study for Optical Coherence Tomography Device

Haiwen Shi*, U.S. Food and Drug Administration

2:45 Modeling Gap Times between Recurrent Infections after Hematopoietic Cell Transplant

Chi Hyun Lee* and Xianghua Luo, University of Minnesota
Chiung-Yu Huang, Johns Hopkins University

3:00 Assessing Treatment Effects with Surrogate Survival Outcomes Using an Internal Validation Subsample

Jarcy Zee*, Arbor Research Collaborative for Health
Sharon X. Xie, University of Pennsylvania

3:15 Inference Concerning the Difference between Two Treatments in Clinical Trials

Krishna K. Saha*, Central Connecticut State University

**87. CONTRIBUTED PAPERS:
Computational Methods**

Pearson I (3rd Floor)

Sponsor: **ENAR**

Chair: **Sonja Grill**, Technische Universität München

1:45 DNase2TF: An Efficient Algorithm for Footprint Detection

Songjoon Baek*, Myong-Hee Sung and Gordon L. Hager, National Cancer Institute, National Institutes of Health

2:00 Spectral Properties of MCMC Algorithms for Bayesian Linear Regression with Generalized Hyperbolic Errors

Yeun Ji Jung* and James P. Hobert, University of Florida

2:15 Group Fused Multinomial Regression

Brad Price*, University of Miami
Charles J. Geyer and Adam J. Rothman, University of Minnesota

2:30 Analysis of MCMC Algorithms for Bayesian Linear Regression with Laplace Errors

Hee Min Choi*, University of California, Davis

2:45 On the Use of Cauchy Prior Distributions for Bayesian Binary Regression

Joyee Ghosh*, University of Iowa
Yingbo Li, Clemson University
Robin Mitra, University of Southampton

3:00 Fast, Exact Bootstrap Principal Component Analysis for $p > 1$ million

Aaron Fisher*, Brian Caffo, Brian Schwartz and Vadim Zipunnikov, Johns Hopkins University

3:15 Floor Discussion

3:30 – 3:45 pm — Refreshment Break with Our Exhibitors

*Lower Promenade
(Terrace Level)*

3:45 – 5:30 p.m

88. Biostatistical Methods for Heterogeneous Genomic Data

Tuttle (Terrace Level)

Sponsor: **ENAR**

Organizer: **Wei Sun**, University of North Carolina, Chapel Hill

Chair: **Wei Sun**, University of North Carolina, Chapel Hill

3:45 Investigating Tumor Heterogeneity to Identify Etiologically Distinct Sub-Types

Colin B. Begg*, Memorial Sloan Kettering Cancer Center

4:10 Statistical Challenges in Cancer Research: Heterogeneity in Functional Imaging and Multi-Dimensional Omics Data

Kim-Anh Do*, **Thierry Chekouo**, **Francesco Stingo**, **Brian Hobbs**, **Yuan Wang** and **Jianhua Hu**, University of Texas MD Anderson Cancer Center

James Doecke, CSIRO, Australian e-Health Research Centre, Brisbane, Australia

4:35 Accounting for Cellular Heterogeneity is Critical in Epigenome-Wide Association Studies

Rafael Irizarry*, Harvard University

5:00 Modelling Sources of Variability in Single-Cell Transcriptomics Data

Sylvia Richardson*, MRC Biostatistics Unit Cambridge, UK

Catalina Vallejos, MRC Biostatistics Unit Cambridge and European Bioinformatics Institute, Hinxton, UK

John Marioni, European Bioinformatics Institute, Hinxton, UK

5:25 Floor Discussion

89. Innovative Approaches in Competing Risk Analysis

Orchid C (Terrace Level)

Sponsors: **ENAR, ASA Biometrics Section**

Organizer: **Xu Zhang**, University of Mississippi Medical Center

Chair: **Xu Zhang**, University of Mississippi Medical Center

3:45 **Flexible Modeling of Competing Risks and Cure Rate**

Qi Jiang and **Sanjib Basu***, Northern Illinois University

4:15 **Competing Risks Prediction in Two Time Scales**

Jason Fine*, University of North Carolina, Chapel Hill

4:45 **Checking Fine and Gray's Subdistribution Hazards Model with Cumulative Sums of Residuals**

Jianing Li, Medical College of Wisconsin

Thomas H. Scheike, University of Copenhagen

Mei-Jie Zhang*, Medical College of Wisconsin

5:15 **Floor Discussion**

90. Biomarker Evaluation in Diagnostics Studies with Longitudinal Data

Johnson (3rd Floor)

Sponsors: **ENAR, ASA Biometrics Section, ASA Mental Health Statistics Section, ASA Statistical Programmers Section**

Organizer: **Zheyu Wang**, Johns Hopkins University

Chair: **Zheyu Wang**, Johns Hopkins University

3:45 **Combination of Longitudinal Biomarkers with Missing Data**

Danping Liu*, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health

4:05 **Measures to Evaluate Biomarkers as Predictors of Incident Cases**

Chao-Kang Jason Liang* and **Patrick J. Heagerty**, University of Washington

4:25 **Prediction Accuracy of Longitudinal Marker Measurement**

Paramita Saha Chaudhuri*, McGill University

Patrick Heagerty, University of Washington

4:45 **Estimating Time-Dependent Accuracy Measures for Survival Outcome Under Two-Phase Sampling Designs**

Dandan Liu*, Vanderbilt University

Tianxi Cai, Harvard University

Anna Lok, University of Michigan

Yingye Zheng, Fred Hutchinson Cancer Research Center

**5:05 Compression of Longitudinal Genomic Biomarkers
for Diagnosis Study**

Le Bao* and **Xiaoyue Niu**, The Pennsylvania State University
Kayee Yeung, University of Washington

5:25 Floor Discussion

91. Solving Clinical Trial Problems by Using Novel Designs

Foster (3rd Floor)

Sponsors: ENAR, ASA Biopharmaceutical Section

Organizer: Anastasia Ivanova, University of North Carolina, Chapel Hill

Chair: Gheorge Doros, Boston University

**3:45 Some Design Approaches to Address Missing Data Due
to Early Discontinuation in Clinical Trials**

Sonia M. Davis*, University of North Carolina, Chapel Hill

4:15 Introduction to the Sequential Enriched Design

Yeh-Fong Chen*, U.S. Food and Drug Administration

Roy Tamura, University of South Florida

**4:45 Integrity and Efficiency of Enrichment and Adaptive Trial
Design and Analysis Options to Enable Accurate and Precise
Signal Detection**

Marc L. de Somer*, PPD

5:15 Discussant:

Anastasia Ivanova, University of North Carolina, Chapel Hill

92. Ensuring Biostatistical Competence Using Novel Methods

*Miami Lecture Hall
(3rd Floor)*

Sponsor: **ENAR**

Organizer: **Lisa Sullivan**, Boston University

Chair: **Lisa Sullivan**, Boston University

3:45 **What do Non-Biostatistics Concentrators Need from the Introductory Biostatistics Course?**

Jacqueline N. Milton*, Boston University

4:15 **Creating the Integrated Biostatistics-Epidemiology Core Course: Challenges and Opportunities**

Melissa D. Begg*, **Roger D. Vaughan** and **Dana March**, Columbia University

4:45 **Meeting Public Health Career Goals: Course Options in Biostatistics and Epidemiology**

Marie Diener-West*, Johns Hopkins Bloomberg School of Public Health

5:15 Discussant:

Lisa Sullivan, Boston University

93. Methodological Frontiers in the Analysis of Panel Observed Data

*Ashe Auditorium
(3rd Floor)*

Sponsor: **IMS**

Organizer: **Rebecca Hubbard**, University of Pennsylvania

Chair: **Rebecca Hubbard**, University of Pennsylvania

3:45 **Multi-State Models: A Variety of Uses**

Vern Farewell*, MRC Biostatistics Unit, Cambridge, UK

4:10 **Modeling Cognitive States in the Elderly: The Analysis of Panel Data Using Multi-State Markov and Semi-Markov Processes**

Richard J. Kryscio*, University of Kentucky

4:35 **Second-Order Models of within-Family Association in Censored Disease Onset Times**

Yujie Zhong* and **Richard J. Cook**, University of Waterloo

5:00 **Computationally Simple State Occupancy Probability Estimates for Multi-State Models Under Panel Observation**

Andrew Titman*, Lancaster University

5:25 **Floor Discussion**

94. CONTRIBUTED PAPERS: Ordinal and Categorical Data

Stanford (3rd Floor)

Sponsor: ENAR

Chair: **Haileab Hilafu**, University of Tennessee

3:45 Explicit Estimates for Cell Counts and Modeling the Missing Data Indicators in Three-Way Contingency Table by Log-Linear Models

Haresh D. Rochani*, **Robert L. Vogel**, **Hani M. Samawi**
and **Daniel F. Linder**, Georgia Southern University

4:00 Additive Interactions and the Metabolic Syndrome

Matthew J. Gurka* and **Baqiyyah N. Conway**, West Virginia University
Michael E. Andrew and **Cecil M. Burchfiel**, National Institute for
Occupational Safety and Health (NIOSH)
Mark D. DeBoer, University of Virginia

4:15 Flexible Link Functions in Nonparametric Binary Regression with Gaussian Process Priors

Dan Li* and **Xia Wang**, University of Cincinnati
Lizhen Lin, University of Texas, Austin
Dipak K. Dey, University of Connecticut

4:30 Penalized Non-Linear Principal Components Analysis for Ordinal Variables

Jan Gertheiss*, Georg August University, Germany

4:45 Covariance Estimation of Proportion for Missing Dichotomous and Ordinal Data in Randomized Longitudinal Clinical Trial

Siying Li* and **Gary Koch**, University of North Carolina, Chapel Hill

5:00 Bayesian Nonparametric Multivariate Ordinal Regression

Junshu Bao* and **Timothy E. Hanson**, University of South Carolina

5:15 Floor Discussion

ENAR
2015

95. CONTRIBUTED PAPERS: Statistical Genetics

Merrick II (3rd Floor)

Sponsor: ENAR

Chair: **Chi Wang**, University of Kentucky

3:45 **Testing Calibration of Risk Models at Extremes of Disease Risk**

Minsun Song*, National Cancer Institute, National Institutes of Health
Peter Kraft and **Amit D. Joshi**, Harvard School of Public Health
Myrto Barrdahl, German Cancer Research Center (DKFZ)
Nilanjan Chatterjee, National Cancer Institute, National Institutes of Health

4:00 **PLEMT: A Novel Pseudolikelihood Based EM Test for Homogeneity in Generalized Exponential Tilt Mixture Models**

Chuan Hong  and **Yong Chen**, University of Texas School of Public Health, Houston
Yang Ning, Princeton University
Shuang Wang, Columbia University
Hao Wu, Emory University
Raymond J. Carroll, Texas A&M University

4:15 **Regression-Based Methods to Map Quantitative Trait Loci Underlying Function-Valued Phenotypes**

Il Youp Kwak*, University of Minnesota
Karl W. Broman, University of Wisconsin, Madison

4:30 **A Framework for Classifying Relationships Using Dense SNP Data and Putative Pedigree Information**

Zhen Zeng* and **Daniel E. Weeks**, University of Pittsburgh
Wei Chen, Children's Hospital of Pittsburgh of UPMC
Nandita Mukhopadhyay and **Eleanor Feingold**, University of Pittsburgh

4:45 **A Negative Binomial Model-Based Method for Differential Expression Analysis Based on NanoString nCounter Data**

Hong Wang*, **Arnold Stromberg** and **Chi Wang**, University of Kentucky

5:00 **Two-Stage Bayesian Regional Fine Mapping of a Quantitative Trait**

Shelley B. Bull*, University of Toronto and Lunenfeld-Tanenbaum Research Institute
Zhijian Chen, Lunenfeld-Tanenbaum Research Institute
Radu V. Craiu, University of Toronto

5:15 **Optimal Ranking Procedures in Large-Scale Inference: Thresholding Families and the r-value**

Nicholas C. Henderson* and **Michael A. Newton**,
University of Wisconsin, Madison

96. CONTRIBUTED PAPERS: Ecology and Forestry Applications

Pearson I (3rd Floor)

Sponsor: **ENAR**

Chair: **Min Wang**, Michigan Technological University

**3:45 A Statistical Framework for the Genetic Dissection of Evolution
Induced by Ecological Interactions**

Cong Xu*, The Pennsylvania State University
Libo Jiang and **Meixia Ye**, Beijing Forestry University
Rongling Wu, The Pennsylvania State University

**4:00 Analysis of Variance of Integro-Differential Equations
with Application to Population Dynamics of Cotton Aphids**

Xueying Wang, Washington State University
Jiguo Cao*, Simon Fraser University
Jianhua Huang, Texas A&M University

**4:15 New Insights into the Usefulness of Robust Singular
Value Decomposition in Statistical Genetics: Robust AMMI
and GGE Models**

Paulo Canas Rodrigues*, Federal University of Bahia, Brazil
Andreia Monteiro and **Vanda M. Lourenço**, Nova University
of Lisbon, Portugal

**4:30 A Robust Mixed Linear Model for Heritability Estimation
in Plant Studies**

Vanda M. Lourenço*, Nova University of Lisbon, Portugal
Paulo C. Rodrigues, Federal University of Bahia, Brazil
Miguel S. Fonseca and **Ana M. Pires**, University of Lisbon, Portugal

4:45 Cancer Incidence and Superfund Sites in Florida

Emily Leary*, University of Missouri
Alexander Kirpich, University of Florida

5:00 Floor Discussion

97. CONTRIBUTED PAPERS: Pooled Biospecimens and Diagnostic Biomarkers

Pearson II (3rd Floor)

Sponsor: ENAR

Chair: **Qingning Zhou**, University of Missouri

3:45 Hierarchical Group Testing for Multiple Infections

Peijie Hou  and **Joshua M. Tebbs**, University of South Carolina
Christopher R. Bilder, University of Nebraska, Lincoln

4:00 Keeping Risk Calculators Current

Donna Pauler Ankerst*, Technical University Munich and University of Health Science Center at San Antonio
Andreas Strobl, Technical University Munich

4:15 Evaluation of Multiple Biomarkers in a Two-Stage Group Sequential Design with Early Termination for Futility

Nabihah Tayob*, **Kim-Anh Do** and **Ziding Feng**, University of Texas MD Anderson Cancer Center

4:30 Flexible and Accessible Semi-Parametric Methods for Analyzing Pooled Biospecimens

Emily M. Mitchell*, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health
Robert H. Lyles and **Amita K. Manatunga**, Emory University
Enrique F. Schisterman, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health

4:45 Estimating Individualized Diagnostic Rules in the Era of Personalized Medicine

Ying Liu  and **Yuanjia Wang**, Columbia University
Chaorui Huang, Cornell University
Donglin Zeng, University of North Carolina, Chapel Hill

5:00 Analysis of Unmatched Pooled Case-Control Data

Neil J. Perkins*, **Emily M. Mitchell** and **Enrique F. Schisterman**, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health

5:15 Estimating TP53 Mutation Carrier Probability in Families with Li-Fraumeni Syndrome Using LFSpro

Gang Peng* and **Jasmina Bojadzieva**, University of Texas MD Anderson Cancer Center
Mandy L. Ballinger, Peter MacCallum Cancer Centre, Melbourne, Australia
David M. Thomas, The Kinghorn Cancer Centre and Garvan Institute, Sydney, Australia
Louise C. Strong and **Wenyi Wang**, University of Texas MD Anderson Cancer Center

98. CONTRIBUTED PAPERS: Multiple Testing and Variable Selection

Ibis (3rd Floor)

Sponsor: **ENAR**

Chair: **Lee H Dicker**, Rutgers University

3:45 **Bayes Factor Approaches for Hypothesis Testing in ANOVA Models**

Min Wang*, Michigan Technological University

4:00 **A Multifunctional Bayesian Procedure for Detecting Copy Number Variations from Sequencing Read Depths**

Yu-Chung Wei*, U.S. Food and Drug Administration and National Chiao Tung University, Taiwan

Guan-Hua Huang, National Chiao Tung University, Taiwan

4:15 **Inferring the Global Genetic Architecture of Gene Transcripts from Ultrahigh-Dimensional Molecular Data**

Kirk Gosik* and **Rongling Wu**, The Pennsylvania State University

4:30 **Statistical Inference for High Dimensional Linear Regression with Linear Constraints and Application to Microbiome Study**

Pixu Shi*, **Anru Zhang** and **Hongzhe Li**, University of Pennsylvania

4:45 **Taking into Account Overrepresented Patterns in Gene Expression Analysis**

Megan Orr* and **Ekua Bentil**, North Dakota State University

5:00 **Bayesian Screening for Group Differences in Methylation Array Data**

Eric F. Lock*, University of Minnesota

5:15 **Incorporating ENCODE Information into SNP-Based Phenotype Prediction**

Yue-Ming Chen* and **Peng Wei**, University of Texas School of Public Health, Houston

99. CONTRIBUTED PAPERS: Parameter Estimation in Hierarchical and Non-Linear Models

Gautier (3rd Floor)

Sponsor: ENAR

Chair: **Jingjing Yin**, Georgia Southern University

3:45 A Hierarchical Bayesian Method for Well-Mixed and Two-Zone Models in Industrial Hygiene

Xiaoyue Zhao*, Susan Arnold, Dipankar Bandyopadhyay
and Gurumurthy Ramachandran, University of Minnesota
Sudipto Banerjee, University of California, Los Angeles

4:00 Parameter Estimation: A Bayesian Inference Approach

Romarie Morales*, Arizona State University

4:15 Bias and Confidence Interval Correction in Four Parameter Logistic Models

Bronlyn Wassink* and **Tapabrata Maiti**, Michigan State University

4:30 Robust Mixed-Effects Model for Clustered Failure Time Data: Application to Huntington's Disease Event Measures

Tanya P. Garcia*, Texas A&M University
Yanyuan Ma, University of South Carolina
Yuanjia Wang and **Karen Marder**, Columbia University

4:45 Stacked Survival Models for Censored Quantile Regression

Kyle Rudser*, University of Minnesota
Andrew Wey, University of Hawaii
John Connett, University of Minnesota

5:00 The CoGaussian Distribution: A Model for Right Skewed Data

Govind S. Mudholkar and **Ziji Yu***, University of Rochester
Saria S. Awadalla, University of Chicago

5:15 Floor Discussion

8:30 – 10:15 am

100. New Statistical Methods in the Environmental Health Sciences

*Miami Lecture Hall
(3rd Floor)*

Sponsors: **ENAR, ASA Biometrics Section**

Organizers: **Brisa Sanchez** and **Peter X.K. Song**, University of Michigan

Chair: **Rong Xia**, University of Michigan

8:30 New Statistical Models to Detect Vulnerable Prenatal Window to Carcinogenic Polycyclic Aromatic Hydrocarbons on Fetal Growth

Lu Wang*, University of Michigan

8:55 Dimension Reduction for Spatially Misaligned Multivariate Air Pollution Data

Adam Szpiro*, University of Washington

9:20 Evaluating Alterations in Regression Coefficients Directed by Toxicant Mixtures

Peter X.K. Song*, University of Michigan

Shujie Ma, University of California, Riverside

9:45 Floor Discussion

101. Novel Phase II and III Clinical Trial Designs for Cancer Research that Incorporate Biomarkers and Nonstandard Endpoints

Pearson (3rd Floor)

Sponsor: **ENAR**

Organizer: **Sujata Patil**, Memorial Sloan Kettering Cancer Center

Chair: **Nichole Carlson**, University of Colorado, Denver

8:30 Novel Phase II and III Designs for Oncology Clinical Trials, with a Focus on Biomarker Validation

Daniel J. Sargent*, Mayo Clinic

8:55 Stratified Single Arm Phase 2 Design for Finding a Biomarker Group that Benefits from Treatment

Irina Ostrovnaya* and **Emily Zabor**, Memorial Sloan Kettering Cancer Center

9:20	Lung-MAP: A Phase II/III Biomarker-Driven Master Protocol for Second Line Therapy of Squamous Cell Lung Cancer Mary W. Redman* , Fred Hutchinson Cancer Research Center
9:45	Randomized Phase II Design to Study Therapies Designed to Control Growth of Brain Metastases in Cancer Patients Sujata M. Patil* , Memorial Sloan-Kettering Cancer Center

10:10	Floor Discussion
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102. Novel Statistical Methods to Decipher Gene Regulation using Sequence Data	<i>Jasmine (Terrace Level)</i>
Sponsor: ENAR	
Organizer: Hongyu Zhao , Yale University	
Chair: Hongyu Zhao , Yale University	

8:30	On the Detection of Nonlinear and Interactive Relationships in Genomic Data Bo Jiang and Jun Liu* , Harvard University
8:55	Statistical Analysis of Differential Alternative Splicing Using RNA-Seq Data Mingyao Li* , Yu Hu and Cheng Jia , University of Pennsylvania
9:20	A Case Study of RNA-Seq Data in Breast Cancer Patients Wei Sun* , University of North Carolina, Chapel Hill
9:45	Unit-Free and Robust Detection of Differential Expression from RNA-Seq Data Hui Jiang* , University of Michigan

10:10	Floor Discussion
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103. Flow Cytometry: Data Collection and Statistical Analysis

Foster (3rd Floor)

Sponsor: **ENAR**

Organizer: **Monnie McGee**, Southern Methodist University

Chair: **Monnie McGee**, Southern Methodist University

8:30 **Flow, Mass and Imaging Cytometry for Single Cell Analysis: A Fertile Field for Biostatistics Research**

Richard H. Scheuermann*, J. Craig Venter Institute
and University of California, San Diego

Yu Qian, J. Craig Venter Institute

Chiaowen Hsiao, University of Maryland, College Park

Monnie McGee, Southern Methodist University

8:55 **Computational Identification of Cell Populations from Cytometry Data: Methods, Applications, and Infrastructure**

Yu Qian* and **Hyunsoo Kim**, J. Craig Venter Institute

Shweta Purawat, University of California, San Diego

Rick Stanton, J. Craig Venter Institute

Ilkay Altintas, University of California, San Diego

Richard H. Scheuermann, J. Craig Venter Institute

9:20 **Mapping Cell Populations in Flow Cytometry Data for Cross-Sample Comparison Using the Friedman-Rafsky Test**

Chiaowen Joyce Hsiao*, University of Maryland, College Park

Mengya Liu, Southern Methodist University

Rick Stanton, J. Craig Venter Institute

Monnie McGee, Southern Methodist University

Yu Qian, J. Craig Venter Institute

Richard H. Scheuermann, J. Craig Venter Institute and University
of California, San Diego

9:45 **A Novel Approach to Modeling Immunology Data Derived from Flow Cytometry**

Jacob A. Turner*, Baylor Institute for Immunology Research

10:10 Discussant:

Monnie McGee, Southern Methodist University

104. Statistical Methods in Chronic Kidney Disease

Johnson (3rd Floor)

Sponsor: **ENAR**

Organizer: **Dawei Xie**, University of Pennsylvania

Chair: **Jesse Y. Hsu**, University of Pennsylvania

8:30 **Joint Modeling of Kidney Function Decline, End Stage Kidney Disease (ESRD), and Death with Special Consideration of Competing Risks**

Dawei Xie* and **Wensheng Guo**, University of Pennsylvania

Wei Yang, Merrill Lynch

Qiang Pan, University of Pennsylvania

9:00	Joint Multiple Imputation for Longitudinal Outcomes and Clinical Events which Truncate Longitudinal Follow-Up Bo Hu* , Cleveland Clinic Liang Li , University of Texas MD Anderson Cancer Center Tom Greene , University of Utah
9:30	Modeling the Effect of Blood Pressure on Disease Progression in Chronic Kidney Disease Using Multistate Marginal Structural Models Alisa J. Stephens* , Wei Peter Yang and Marshall M. Joffe , University of Pennsylvania Tom H. Greene , University of Utah
10:00	Dynamic Prediction of Clinical Events Using Longitudinal Biomarkers in a Cohort Study of Chronic Renal Disease Liang Li* , University of Texas MD Anderson Cancer Center

105. Challenging Statistical Issues in Imaging

Merrick I (3rd Floor)

Sponsors: **ENAR**, **ASA Section on Statistics in Imaging**,

ASA Statistical Learning and Data Mining Section

Organizer: **Haipeng Shen** and **Hongtu Zhu**, University of North Carolina, Chapel Hill

Chair: **Hongtu Zhu**, University of North Carolina, Chapel Hill

8:30	Relating Developmental Transcription Factors Based on Drosophila Embryonic Gene Expression Images Siqi Wu* , University of California, Berkeley
8:55	Analysis of Point Pattern Imaging Data using Log Gaussian Cox Processes with Spatially Varying Coefficients Timothy D. Johnson* , University of Michigan Thomas E. Nichols , University of Warwick
9:20	Fiber Direction Estimation in Diffusion MRI Raymond Wong* , Iowa State University Thomas C. M. Lee , Debashis Paul and Jie Peng , University of California, Davis
9:45	FVGWAS: Fast Voxelwise Genome Wide Association Analysis of Large-Scale Imaging Genetic Data Hongtu Zhu* and Meiyang Chen , University of North Carolina, Chapel Hill Thomas Nichols , University of Warwick Chao Huang , Yu Yang and Zhaohua Lu , University of North Carolina, Chapel Hill Qianjing Feng , Southern Medical University Rebecca C. Knickmeyer , University of North Carolina, Chapel Hill

10:10	Floor Discussion
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106. Statistical Methods for Predicting Subgroup Level Treatment Response

Ashe Auditorium
(3rd Floor)

Sponsor: IMS

Organizer: **Tianxi Cai**, Harvard University

Chair: **Jennifer Anne Sinnot**, Harvard School of Public Health

8:30 **A Regression Tree Approach to Identifying Subgroups with Differential Treatment Effects**

Wei-Yin Loh*, University of Wisconsin, Madison

8:55 **Feature Elimination for Reinforcement Learning Methods**

Sayan Dasgupta*, Fred Hutchinson Cancer Research Center

Michael R. Kosorok, University of North Carolina, Chapel Hill

9:20 **Increasing Efficiency for Estimating Treatment-Biomarker Interactions with Historical Data**

Jeremy MG Taylor*, **Philip S. Boonstra** and **Bhramar Mukherjee**,
University of Michigan

9:45 **Adaptive Designs for Developing and Validating Predictive Biomarkers**

Noah Simon, University of Washington

Richard M. Simon*, National Cancer Institute, National Institutes of Health

10:10 Floor Discussion

107. CONTRIBUTED PAPERS: ROC Curves

Ibis (3rd Floor)

Sponsor: ENAR

Chair: **Philip M Westgate**, University of Kentucky

8:30 **Improved Estimation of Diagnostic Cut-Off Point Associated with Youden Index Using Ranked Set Sampling**

Jingjing Yin*, **Hani Samawi**, **Chen Mo** and **Daniel Linder**,
Georgia Southern University

8:45 **A Better Confidence Interval for the Sensitivity at a Fixed Level of Specificity for Diagnostic Tests with Continuous Endpoints**

Guogen Shan*, University of Nevada Las Vegas

9:00 **Simpson's Paradox in the IDI**

Jonathan Chipman*, Vanderbilt University

Danielle Braun, Dana-Farber Cancer Institute

9:15 **A Nonparametric Test Based on t-Distribution for Comparing Two Correlated C Indices with Right-Censored Survival Outcome or AUCs with Dichotomous Outcome**

Le Kang* and **Shumei Sun**, Virginia Commonwealth University

9:30 Latent Mixture Models for Ordered ROC Curves Using the Scale Mixture of Normal Distributions

Zhen Chen* and **Sungduk Kim**, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health

9:45 Least Squares ROC Method for Tests with the Absence of the Gold Standard

Larry Tang*, George Mason University and National Institutes of Health Clinical Center

Minh Huynh, Department of Labor and National Institutes of Health Clinical Center

Xuan Che and **Elizabeth K. Rasch**, Epidemiology and Biostatistics, National Institutes of Health Clinical Center

Ao Yuan, Georgetown University

10:00 Floor Discussion

108. CONTRIBUTED PAPERS: Personalized Medicine and Biomarkers

Merrick II (3rd Floor)

Sponsor: **ENAR**

Chair: **Zhenzhen Zhang**, University of Michigan

8:30 Using Decision Lists to Construct Interpretable and Parsimonious Treatment Regimes

Yichi Zhang , **Eric Laber**, **Anastasios Tsiatis** and **Marie Davidian**, North Carolina State University

8:45 Synthesizing Genetic Markers for Incorporation into Clinical Risk Prediction Tools

Sonja Grill*, Technical University Munich, Germany

Donna P. Ankerst, Technical University Munich, Germany and University of Texas Health Science Center at San Antonio

9:00 A PRIM Approach to Predictive-Signature Development for Patient Stratification

Gong Chen*, Roche TCRC, Inc.

Hua Zhong, New York University School of Medicine

Anton Belousov, Roche Diagnostics GmbH

Viswanath Devanarayan, AbbVie, Inc.

9:15 On Estimation of Optimal Treatment Regimes for Maximizing t-Year Survival Probability

Runchao Jiang , **Wenbin Lu**, **Rui Song** and **Marie Davidian**, North Carolina State University

9:30 Evaluation of Novel Biomarkers when Limited by Small Sample Size

Bethany J. Wolf*, John Christian Spainhour and Jim C. Oates,
Medical University of South Carolina

9:45 Calibrate Variations in Biomarker Measures for Improving Prediction

Cheng Zheng*, University of Wisconsin, Milwaukee
Yingye Zheng, Fred Hutchinson Cancer Research Center

10:00 Building Small, Robust Gene Signatures to Predict Prognosis

Prasad Patil* and **Jeffrey T. Leek**, Johns Hopkins University

109. CONTRIBUTED PAPERS:
Time Series Analysis and Methods

Stanford (3rd Floor)

Sponsor: **ENAR**

Chair: **Haiwen Shi**, U.S. Food and Drug Administration

8:30 Robust Portfolio Optimization Under High Dimensional Heavy-Tailed Time Series

Huitong Qiu* and **Fang Han**, Johns Hopkins University
Han Liu, Princeton University
Brian Caffo, Johns Hopkins University

8:45 Change-Point Detection in EEG Spectra for Informed Frequency Band Selection

Anna Louise Schroeder*, London School of Economics
Hernando Ombao, University of California, Irvine

9:00 Time Series Analysis for Symbolic-Valued Data

S. Yaser Samadi*, Southern Illinois University
Lynne Billard, University of Georgia

9:15 High Dimensional State Space Model with L-1 and L-2 Penalties

Shaojie Chen* and **Joshua Vogelstein**, Johns Hopkins University
Seonjoo Lee, Columbia University
Martin Lindquist and **Brian Caffo**, Johns Hopkins University

9:30 Autoregressive Models for Spherical Data with Applications in Protein Structure Analysis

Daniel Hernandez-Stumpfhauser*, University of North Carolina, Chapel Hill
F. Jay Breidt and **Mark van der Woerd**, Colorado State University

9:45 Modeling Serial Covariance Structure in Semiparametric Linear Mixed-Effects Regression for Longitudinal Data

Changming Xia*, University of Rochester Medical Center
Hua Liang, The George Washington University
Sally W. Thurston, University of Rochester Medical Center

10:00 Floor Discussion



WEDNESDAY, MARCH 18

10:15 – 10:30 am — Refreshment Break with Our Exhibitors

*Lower Promenade
(Terrace Level)*

10:30 am – 12:15 pm

110. Incorporating Biological Information in Statistical Modeling of Genome-Scale Data with Complex Structures

Jasmine (Terrace Level)

Sponsor: **ENAR**

Organizer: **Mingyao Li**, University of Pennsylvania

Chair: **Mingyao Li**, University of Pennsylvania

10:30 Prioritizing GWAS Results by Integrating Pleiotropy and Annotation

Hongyu Zhao*, Yale School of Public Health

Dongjun Chung, Medical University of South Carolina

Can Yang, Hong Kong Baptist University

Cong Li and **Qian Wang**, Yale University

Joel Gelernter, Yale School of Medicine

10:55 Challenges and Solutions for Whole Exome Sequence Analysis for Pedigree and External Control Data

Daniel J. Schaid*, Mayo Clinic

11:20 Big Data Methods for Dissecting Variations in High-Throughput Genomic Data

Fang Du, **Bing He** and **Hongkai Ji***, Johns Hopkins Bloomberg School of Public Health

11:45 Model-Based Approach for Species Quantification and Differential Abundance Analysis Based on Shotgun Metagenomic Data

Hongzhe Li*, University of Pennsylvania

12:10 Floor Discussion

111. Emerging Issues in Clinical Trials and High Dimensional Data

Ashe Auditorium
(3rd Floor)

Sponsors: **ENAR**, **ASA Biopharmaceutical Section**

Organizer: **Qingxia (Cindy) Chen**, Vanderbilt University

Chair: **Qingxia (Cindy) Chen**, Vanderbilt University

10:30 **Assessing Covariate Effects with the Monotone Partial Likelihood Using Jeffreys' Prior in the Cox Model**

Ming-Hui Chen*, University of Connecticut

Mario de Castro, Universidade de Sao Paulo

Jing Wu and **Elizabeth D. Schifano**, University of Connecticut

10:55 **Assessing Temporal Agreement between Central and Local Progression-Free Survival Times**

Donglin Zeng* and **Emil Cornea**, University of North Carolina, Chapel Hill

Jun Dong and **Jean Pan**, Amgen Inc.

Joseph Ibrahim, University of North Carolina, Chapel Hill

11:20 **Statistical Design of Non-Inferiority Multiple Region Clinical Trials to Assess Global and Consistent Treatment Effects**

Guoqing Diao*, George Mason University

Donglin Zeng and **Joseph G. Ibrahim**, University of North Carolina, Chapel Hill

Alan Rong, **Oliver Lee** and **Kathy Zhang**, Amgen Inc.

Qingxia Chen, Vanderbilt University

11:45 **Bayesian Shrinkage Methods for High Dimensional Data**

Joseph G. Ibrahim* and **Hongtu Zhu**, University of North Carolina, Chapel Hill

Zakaria Khondker, Medivation, Inc.

Zhaohua Lu, University of North Carolina, Chapel Hill

12:10 **Floor Discussion**

112. Advances in Repeated Measures and Longitudinal Data Analysis

Pearson (3rd Floor)

Sponsor: **ENAR**

Organizer: **Sanjoy Sinha**, Carleton University

Chair: **Sanjoy Sinha**, Carleton University

10:30 **Joint Modelling of Different Types of Longitudinal Data with Outliers and Censoring**

Lang Wu*, University of British Columbia

10:55 A Hidden Markov Model for Non-Ignorable Non-Monotone Missing Longitudinal Data for Medical Studies of Quality of Life
Kaijun Liao, Hisun Pharmaceuticals USA
Qiang Zhang, Radiation Therapy Oncology Group
Andrea B. Troxel*, University of Pennsylvania Perelman School of Medicine

11:20 Inverse Weighted Estimating Equations for Repeated Measures in Tranfusion Medicine
Richard Cook*, University of Waterloo

11:45 Joint Modelling of Nonignorable Missing Longitudinal Outcomes and Time-to-Event Data
Sanjoy Sinha*, Carleton University

12:10 Floor Discussion

113. Advances in Modeling Zero-Inflated Data

Johnson (3rd Floor)

Sponsors: **ENAR, ASA Mental Health Statistics Section**
Organizer: **Brian Neelon**, Duke University
Chair: **James O'Malley**, Dartmouth University

10:30 Bayesian Two-Part Spatial Models for Semicontinuous Data
Brian Neelon*, Duke University
Li Zhu, University of Pittsburgh
Sara Benjamin, Duke University

10:55 Zero-Inflated Frailty Model for Recurrent Event Data
Lei Liu*, Northwestern University
Xuelin Huang, University of Texas MD Anderson Cancer Center
Alex Yaroshinsky, Vital Systems Inc.

11:20 Two-Part Models for Rolling Admission Group Therapy Data
Lane F. Burgette* and Susan M. Paddock, RAND Corporation

11:45 A Marginalized Two-Part Model for Semicontinuous Data
Valerie A. Smith*, Center for Health Services Research in Primary Care, Durham VAMC and University of North Carolina, Chapel Hill
John S. Preisser, University of North Carolina, Chapel Hill
Brian Neelon, Duke University
Matthew L. Maciejewski, Center for Health Services Research in Primary Care, Durham VAMC

12:10 Floor Discussion

114. New Developments in Missing Data Analysis: From Theory to Practice

Merrick II (3rd Floor)

Sponsors: **ENAR**, **ASA Survey Research and Methodology Section**

Organizer: **Lihong Qi**, University of California, Davis

Chair: **Yi Li**, University of Michigan

10:30 **Competing Risks Regression with Missing Data in the Prognostic Factors**

Federico Ambrogi*, University of Milan

Thomas H. Scheike, University of Copenhagen

10:55 **Comparison of Multiple Imputation via Chained Equations and General Location Model for Accelerated Failure Time Models with Missing Covariates**

Lihong Qi*, University of California, Davis

Yulei He, Centers for Disease Control and Prevention

Rongqi Chen, **Ying-Fang Wang** and **Xiaowei Yang**, University of California, Davis

11:20 **The Effect of Data Clustering on the Multiple Imputation Variance Estimator**

Yulei He*, **Iris Shimizu**, **Susan Schappert**, **Nathaniel Schenker**,

Vladislav Beresovsky, **Diba Khan** and **Roberto Valverde**, Centers for Disease Control and Prevention

11:45 **Fractional Hot Deck Imputation for Multivariate Missing Data in Survey Sampling**

Jae kwang Kim* and **Wayne A. Fuller**, Iowa State University

12:10 **Floor Discussion**

115. Environmental Methods with Deterministic and Stochastic Components

Foster (3rd Floor)

Sponsor: **ENAR**

Organizer: **Ed Boone**, Virginia Commonwealth University

Chair: **Edward L. Boone**, Virginia Commonwealth University

10:30 **High Resolution Nonstationary Random Field Simulation**

William Kleiber*, University of Colorado, Boulder

10:50 **Estimating Parameters in Delay Differential Equation Models**

Liangliang Wang* and **Jiguo Cao**, Simon Fraser University

11:10 **Zero-Inflated Spatial Temporal Models for Exploring Trend in Comandra Blister Rust Infection in Lodge Pole Pine Trees**

Cindy Feng*, University of Saskatchewan

11:30 A Spatio-Temporal Approach to Modeling Spatial Covariance

Ephraim M. Hanks*, The Pennsylvania State University

11:50 Incorporating Covariates in Deterministic Environmental Models

Edward L. Boone*, Virginia Commonwealth University

Ben Stewart-Koster, Australian Rivers Institute at Griffith University

12:10 Floor Discussion

116. Bayesian and Non-Parametric Bayesian Approaches to Causal Inference

*Miami Lecture Hall
(3rd Floor)*

Sponsor: **IMS**

Organizer: **Peter Mueller**, University of Texas, Austin

Chair: **Peter Mueller**, University of Texas, Austin

10:30 A Bayesian Nonparametric Causal Model for Regression Discontinuity Designs

George Karabatsos*, University of Illinois, Chicago

Stephen G. Walker, University of Texas, Austin

10:55 Evaluating the Effect of University Grants on Student Dropout: Evidence from a Regression Discontinuity Design Using Bayesian Principal Stratification Analysis

Fan Li*, Duke University

Alessandra Mattei and **Fabrizia Mealli**, University of Florence

11:20 Bayesian Nonparametric Estimation for Dynamic Treatment Regimes with Sequential Transition Times

Yanxun Xu* and **Peter Mueller**, University of Texas, Austin

Abdus S. Wahed, University of Pittsburgh

Peter F. Thall, University of Texas MD Anderson Cancer Center

11:45 A Framework for Bayesian Nonparametric Inference for Causal Effects of Mediation

Chanmin Kim, Harvard University

Michael J. Daniels*, University of Texas, Austin

Jason Roy, University of Pennsylvania

12:10 Floor Discussion

117. Design of Multiregional Clinical Trials: Theory and Practice

Merrick I (3rd Floor)

Sponsor: **ENAR**

Organizer: **Gordon Lan**, Janssen Research & Development

Chair: **Gordon Lan**, Janssen Research & Development

10:30 **Random Effects Models for Multiregional Clinical Trial Design and Analysis**

Gordon Lan*, Janssen Research & Development

11:15 **Consistency of Treatment Effect in Multiregional Clinical Trials**

Joshua Chen*, Sanofi Pasteur

11:50 Discussant:

Fei Chen, Janssen R&D, Johnson & Johnson

12:05 **Floor Discussion**

118. CONTRIBUTED PAPERS: Multivariate Survival Analysis

Ibis (3rd Floor)

Sponsor: **ENAR**

Chair: **Minsun Song**, National Cancer Institute, National Institutes of Health

10:30 **A Sieve Semiparametric Maximum Likelihood Approach for Regression Analysis of Bivariate Interval-Censored Failure Time Data**

Qingning Zhou*, University of Missouri

Tao Hu, Capital Normal University

Jianguo Sun, University of Missouri

10:45 **Methods for Contrasting Gap Time Hazard Functions**

Xu Shu* and **Douglas E. Schaubel**, University of Michigan

11:00 **Using Full Cohort Information to Improve the Efficiency of Multivariate Marginal Hazard Model for Case-Cohort Studies**

Hongtao Zhang*, **Jianwen Cai**, **Haibo Zhou** and **David Couper**,
University of North Carolina, Chapel Hill

11:15 **Marginal Models for Restricted Mean Survival with Clustered Time to Event Data Using Pseudo-Values**

Brent R. Logan* and **Kwang Woo Ahn**, Medical College of Wisconsin

11:30 **Semi-Parametric Modeling of Bivariate Recurrent Events**

Jing Yang* and **Limin Peng**, Emory University

11:45 Analysis of a Composite Endpoint Under Different Censoring Schemes for Component Events via Multiple Imputation

Yuqi Chen*, University of California, Santa Barbara
Chunlei Ke, Amgen Inc.
Jianming Wang, Celgene Corporation

12:00 Quantile Regression for Survival Data with Delayed Entry

Boqin Sun* and **Jing Qian**, University of Massachusetts, Amherst

**119. CONTRIBUTED PAPERS:
Constrained Inference**

Stanford (3rd Floor)

Sponsor: **ENAR**

Chair: **Emily Leary**, University of Missouri

10:30 Order Statistics from Lindley Distribution and their Applications

Khalaf S. Sultan* and **Wafaa S. AL-Thubyani**, College of Science
King Saud University, Saudi Arabia

**10:45 CLME: A Tool for Inference in Linear Mixed Effects Models
Under Inequality Constraints**

Casey M. Jelsema* and **Shyamal D. Peddada**, National Institute of
Environmental Health Sciences, National Institutes of Health

**11:00 Order-Constrained Bayesian Nonparametric Modeling of Correlated
Three-Way ROC Surfaces**

Beomseuk Hwang* and **Zhen Chen**, Eunice Kennedy Shriver
National Institute of Child Health and Human Development,
National Institutes of Health

**11:15 Partial Likelihood Estimation of Isotonic Proportional Hazards
Models**

Yunro Chung*, **Anastasia Ivanova**, **Michael Hudgens** and **Jason Fine**,
University of North Carolina, Chapel Hill

11:30 Nonparametric Tests of Uniform Stochastic Ordering

Chuan-Fa Tang*, **Joshua M. Tebbs** and **Dewei Wang**, University
of South Carolina

**11:45 Covariate Balanced Restricted Randomization: Optimal Designs,
Exact Tests, and Asymptotic Properties**

Jingjing Zou* and **Jose R. Zubizarreta**, Columbia University

12:00 Floor Discussion

120. CONTRIBUTED PAPERS: Nonparametric Methods

Gautier (3rd Floor)

Sponsor: ENAR

Chair: **Nabihah Tayob**, University of Texas MD Anderson Cancer Center

**10:30 Nonparametric and Semiparametric Estimation
in Multiple Covariates**

Richard Charnigo*, University of Kentucky
Limin Feng, Intel Corporation
Cidambi Srinivasan, University of Kentucky

**10:45 Nonparametric Empirical Bayes via Maximum Likelihood
for High-Dimensional Classification**

Lee H. Dicker, Rutgers University
Sihai D. Zhao, University of Illinois, Urbana-Champaign
Long Feng*, Rutgers University

**11:00 Nonparametric Inference for an Inverse-Probability-Weighted
Estimator with Doubly Truncated Data**

Xu Zhang*, University of Mississippi Medical Center

11:15 A Test For Directional Departure From Loewe Additivity

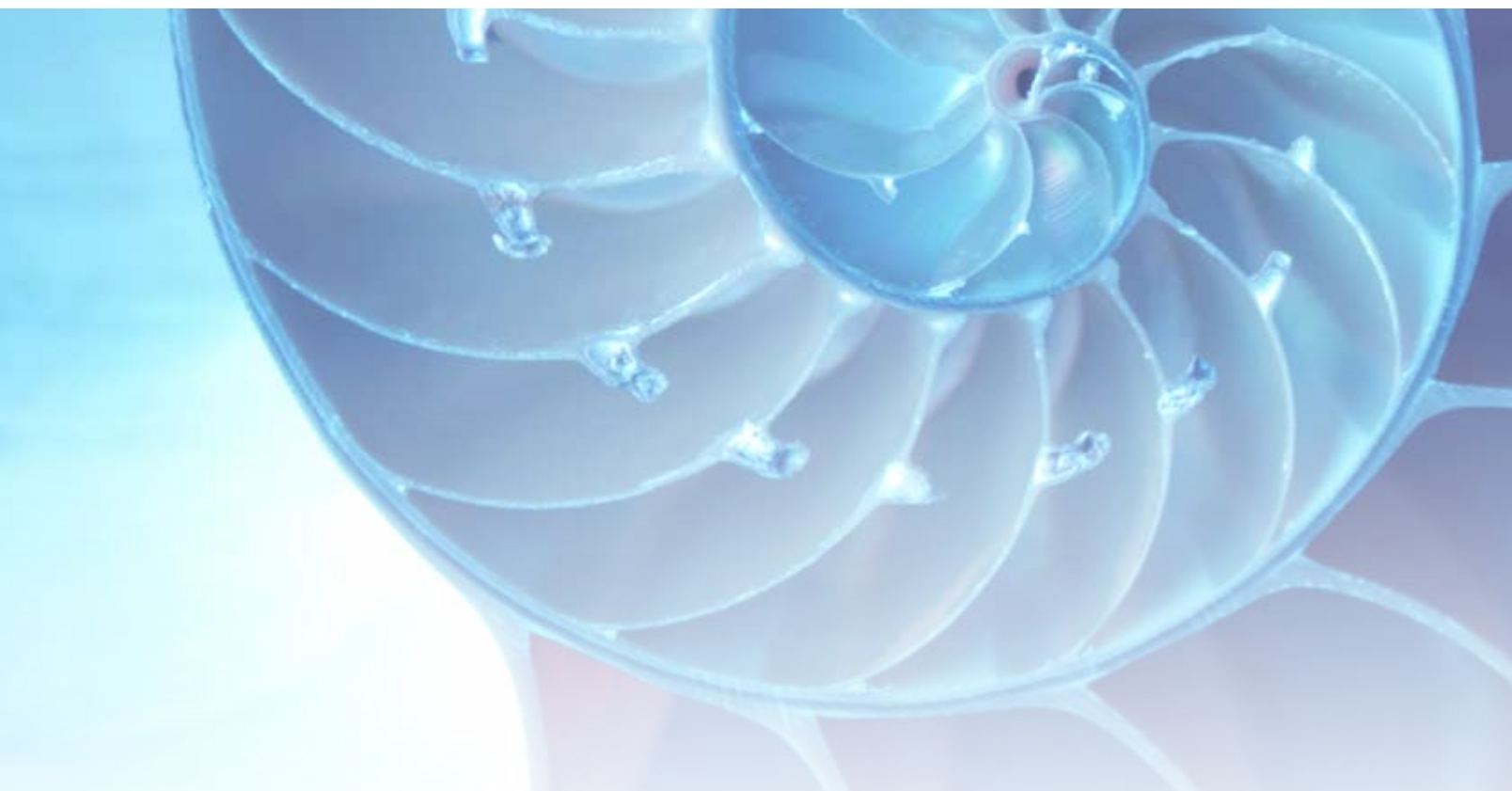
Mingyu Xi*, University of Maryland, Baltimore County

**11:30 Estimation and Confidence Bands for Nonparametric Regression
with Functional Responses and Multiple Scalar Covariates**

Andrada E. Ivanescu*, Montclair State University

**11:45 Nonparameteric Bayesian Analysis of The 2 Sample
Problem with Censoring**

Kan Shang* and **Cavan Sheerin Reilly**, University of Minnesota





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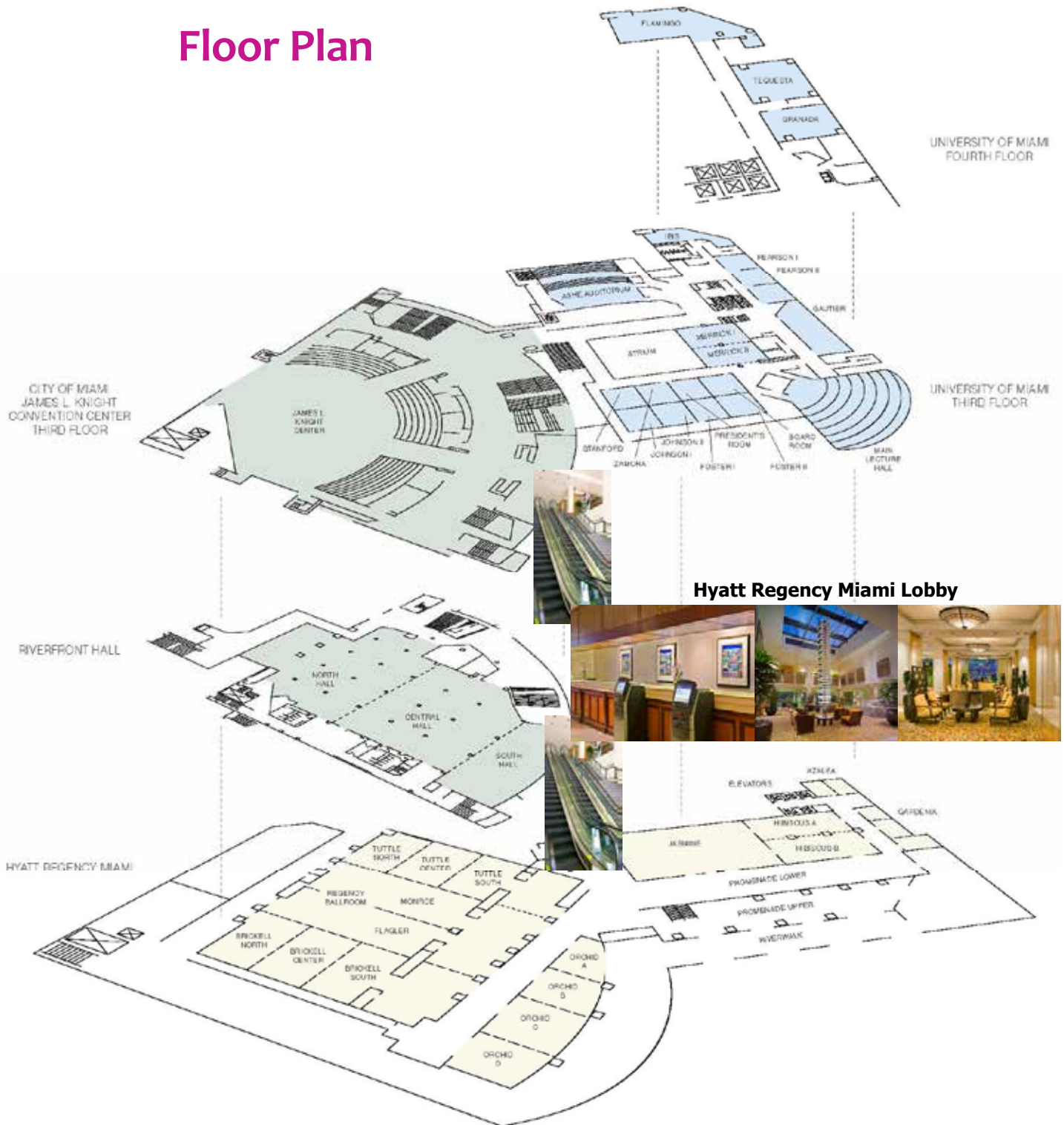
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