# BO YU-CHIEN NING

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## APPOINTMENTS

Visiting Assistant Professor, Department of Statistics, University of California, Davis *2021–Current*

The Foundation Sciences Mathématiques de Paris (FSMP) Postdoctoral Fellow,
Laboratoire de Probabilités, Statistique et Modélisation (LPSM),
Sorbonne Université (Paris 6), France *2020–2021*
*Advisor: Dr. Ismaël Castillo*

Postdoctoral Associate, Department of Statistics and Data Science, Yale University *2018–2020*
*Advisor: Dr. Jessi Cisewski-Kehe*

## OTHER APPOINTMENT

Scholarly visiting, LPSM, Sorbonne Université, France *September 19–October 18, 2022*
*(Courtesy Ismaël Castillo)*

## EDUCATION

Ph.D., Statistics, North Carolina State University *2014–2018*
*Advisors: Drs. Subhashis Ghoshal and Peter Bloomfield*

M.S., Economics, North Carolina State University *2011–2013*
*Advisor: Dr. Atsushi Inoue*

## RESEARCH INTERESTS

Frequentist analysis of Bayesian posteriors, Bayesian nonparametrics and high-dimensional models, astrostatistics, causal inference, censored and missing data, and time series analysis.

## RESEARCH

### Research papers

*Preprints*

- **Bo Y.-C. Ning** and Ismaël Castillo, 2022. Bayesian multiscale analysis of the Cox model. 82 pages, *arXiv:2205.12489 Major Revision from Bernoulli.* [Link]
- **Bo Y.-C. Ning**, 2021. Spike and slab Bayesian sparse principal component analysis. 40 pages, *arXiv:2102.00305 Under Review.* [Link] [R package]

*Publications*

- **Bo Ning**, Seonghyun Jeong, and Subhashis Ghosal, 2020. Bayesian linear regression for multivariate response under group sparsity. *Bernoulli*, 26(3):2353–2382. [Link]

- Ryan Martin and **Bo Ning**, 2020. Empirical priors and coverage of posterior credible sets for a sparse normal mean model. *Sankhya A (special issue dedicated to Jayanta K. Ghosh)*, 82:477–498. [Link]
- **Bo Ning**, Alexander Wise, Jessi Cisewski-Kehe, Sarah Dodson-Robinson, and Debra Fischer, 2019. Identifying activity-sensitive spectral lines: A Bayesian variable selection approach. *The Astronomical Journal*, 158(5):15 pages. [Link] [R code]
- Shubham Kanodia, Angie Wolfgang, Gudmundur K. Stefansson, **Bo Ning**, and Suvrath Mahadevan, 2019. Mass-Radius relationship for M dwarf exoplanets: Comparing nonparametric and parametric methods. *The Astrophysical Journal*, 882(1):14 pages. [Link] [Python package]
- **Bo Ning**, Subhashis Ghosal, and Jewell Thomas, 2019. Bayesian method for causal inference in spatially-correlated multivariate time series. *Bayesian Analysis*, 14(1):1–28. [Link] [R code]
- **Bo Ning**, Angie Wolfgang, and Sujit Ghosh, 2018. Predicting exoplanet masses and radii: A nonparametric approach. *The Astrophysical Journal*, 869(5):16 pages. [Link] [R code]

### Software packages

- Shuyu Guo and **Bo Y.-C. Ning**, 2023. MUSS: Spike and slab variable selector under matrix uncertainty. [Link]
- **Bo Y.-C. Ning**, 2021. VBsparsePCA: The variational Bayesian method for sparse PCA. *CRAN*. [Link]
- Shubham Kanodia, Angie Wolfgang, Gudmundur K. Stefansson, **Bo Ning**, Suvrath Mahadevan, 2019. MRExo: Non-parametric mass-radius relationship for exoplanets. *Astrophysics Source Code Library, record ascl:1912.020*. [Link]

### Papers in progress

- Bo Y.-C. Ning, 2023+. Multiple testing procedures for sparse binary sequences.

## PRESENTATIONS AND WORKSHOPS

### Presentations

*Invited talks*

- Institute of Statistical Science, Academia Sinica, Taipei, Taiwan, December 19, 2022. *Bayesian multiscale analysis of semiparametric models.*
- BASICS Workshop, LPSM Paris, September 29–30, 2022. *Bayesian multiscale analysis of the Cox model.*
- Department of Statistics, University of Nebraska-Lincoln, Lincoln, NE, March 11, 2022. *Uncertainty quantification of Bayesian methods for complex astronomical data.*
- Joint Statistical Meeting, Virtual Conference, August 01–06, 2020. *Disentangling stellar activity and planetary signals using Bayesian high-dimensional analysis.*
- Joint Statistical Meeting, Denver, CO, July 27–August 01, 2019, *Bayesian method for causal inference in spatially-correlated multivariate time series.*
- Jaguar Land Rover's global headquarters, Coventry, UK, July 01, 2019, *Bayesian method for causal inference in spatially-correlated multivariate time series.*
- Department Seminar, Department of Statistics, North Carolina State University, May 9, 2019, *Disentangling between stellar activity and planetary signals using a Bayesian approach for sparse PCA.*
- ASTRO Transition Workshop, SAMSI, NC, May 8–10, 2017, *Predicting exoplanet masses and radii: A nonparametric approach.*

· Maxpoint Research Day, Maxpoint Interactive Inc., Morrisville, NC, March, 2016, *Bayesian method for causal inference in spatially-correlated multivariate time series.*

*Contributed talks and poster presentations*

· (*Contributed talk*) 13th International Conference on Bayesian Nonparametrics, Puerto Varas, Chile, October 24–28, 2022. *Bayesian multiscale analysis of the Cox model.*

· (*Poster*) O'Bayes 2022 Meeting, Santa Cruz, CA, September 6–10, 2022. *Multiple testing boundary for sparse Bernoulli sequences.*

· (*Poster*) The 2022 ISBA World Meeting, Montréal, Canada, June 26–July 1, 2022. *Bayesian multiscale analysis of the Cox model.*

· (*Poster*) The Bayesian Young Statisticians 2022 Meeting, Montréal, Canada, June 22–23, 2022. *Bayesian multiscale analysis of the Cox model.*

· (*Seminar*) Department of Statistics Bayesian Reading Group, University of Oxford, UK, December 14, 2021. *Multiscale analysis of Bayesian Cox piecewise constant hazards model.*

· (*Seminar*) Department of Statistics, UC Davis, Davis, CA, December 2, 2021. *Multiscale analysis of Bayesian Cox piecewise constant hazards model.*

· (*Contributed talk*) Mirror workshop of ISBA 21, CIRM, Marseille, France, June 28–July 2, 2021. *On the joint Bernstein–von Mises phenomenon and sup-norm contraction rate of Bayesian Cox proportional hazard models.*

· (*Contributed talk*) JDS2021: 52nd Statistics Days of the French Statistical Society, Nice, France, June 7–11, 2021. *Disentangling stellar-activity and planetary signals using Bayesian high-dimensional analysis.*

· (*Contributed talk*) 235th Meeting of the American Astronomical Society, Honolulu, HI, January 04–08, 2020. *Identifying activity-sensitive spectral lines: A Bayesian variable selection approach.*

· (*Poster*) O'Bayes 2019 Meeting, University of Warwick, UK, June 28–July 02, 2019, *Disentangling stellar activity and planetary signals using Bayesian high-dimensional analyses.*

· (*Contributed talk*) 12th International Conference on Bayesian Nonparametrics, Oxford, UK, June 24–28, 2019, *Bayesian high-dimensional analyses for a multivariate linear regression model and a sparse spiked-covariance model.*

· (*Poster*) Statistics Conference, in honor of Aad van der Vaart's 60th Birthday, Leiden, the Netherlands, June 17–21, 2019, *Bayesian linear regression for multivariate response under group sparsity.*

· (*Contributed talk*) The Sixth Boston Area Exoplanet Science Meeting, Harvard/Center for Astrophysics, April 5, 2019, *Predicting exoplanet masses and radii: A nonparametric approach.*

· (*Poster*) NextGen: Data Science Day, New England Statistical Society, Yale University, October 27, 2018, *Bayesian methods for high-dimensional data analysis.*

· (*Seminar*) Exoplanet Seminar, Department of Astronomy, Yale University, October 2, 2018, *Predicting exoplanet masses and radii: A nonparametric approach.*

· (*Poster*) O'Bayes 2017 Meeting, Austin, TX, December 10–13, 2017, *Bayesian multivariate linear regression with unknown correlated errors under group sparsity.*

· (*Contributed talk*) 3rd Workshop on Extreme Precise Radius Velocities (EPRV), Penn State University, August 14–17, 2017, *Predicting exoplanet masses and radii: A nonparametric approach.*

· (*Poster*) Joint Statistical Meeting, Baltimore, August, 2017, *Predicting exoplanet masses and radii: A nonparametric approach.*

· (*Poster*) Joint Statistical Meeting, Chicago, August, 2016, *Bayesian method for causal inference in spatially-correlated multivariate time series.*

· (*Contributed talk*) ICSA Applied Statistics Symposium, Atlanta, June 12–15, 2016, *Bayesian method for causal inference in spatially-correlated multivariate time series.*

- (*Poster*) Graduate Student Research Symposium, the Graduate School of NC State University, March, 2016, *Bayesian method for causal inference in spatially-correlated multivariate time series.*
- (*Contributed talk*) International Conference on Advances in Interdisciplinary Statistics and Combinatorics, Greensboro, NC, September 30–October 2, 2016, *Bayesian inference for generalized extreme value distribution with Gaussian copula dependence.*

### Workshops

- Non-linear and High Dimensional Inference, Institut Henri Poincaré, Paris, France, October 3–7, 2022
- Foundations of Bayesian Inference for Complex Statistical Models, Oberwolfach Workshop, Germany, May 2–8, 2021
- ASTRO: Astrophysical Population Emulation and Uncertainty Quantification, SAMSI, NC, April 3–7, 2017
- ASTRO: Hierarchical Bayesian Modeling of Exoplanet Populations (by invitation only), SAMSI, NC, October 17–28, 2016
- Statistical, Mathematical and Computational Methods for Astronomy (ASTRO), SAMSI, NC, August 22–26, 2016

## TEACHING EXPERIENCE

### Instructor

*University of California, Davis*

- STA141B: Data & Web Technologies for Data Analysis *(Undergraduate level)*
  *Winter Quarter, 2022* [Syllabus] [Course materials]
- STA141C: Big Data & High Performance Statistical Computing *(Undergraduate level)*
  *Winter Quarter & Spring Quarter, 2022* [Syllabus] [Course materials]
- STA208: Statistical Machine Learning *(Master's level)*
  *Spring Quarter, 2022* [Syllabus] [Course materials]

### Guest instructor

- ExoStatistics: Exploring Extrasolar Planets with Data Science, Yale University *(Undergraduate level)*
  *April 23, 2019*

### Teaching assistant

- Experimental Statistics for Biological Sciences, NC State *(Ph.D. and Master's levels)*
  *Fall, 2015; Spring, 2016; Fall, 2016; and Fall, 2017*
- SAS Programming *(online course)*, NC State *(Master's level)*
  *Fall, 2014 and Spring, 2015*
- SAS Programming *(in-person course)*, NC State *(Master's level)*
  *Summer, 2014*
- Statistical Practice and Consulting, NC State *(Ph.D. and Master's levels)*
  *Spring, 2016; Spring, 2017; and Spring, 2018*

### Teacher training programs

- Certificate of Accomplishment in Teaching (CoAT) program, the Graduate School, NC State, 2016
- Graduate Student Summer Teaching Institute, the Graduate School, NC State, June 9–11, 2014

## AWARDS AND MEMBERSHIPS

### Awards

· ISBA Poster Award, International Society for Bayesian Analysis, 2022
· The Foundation Sciences Mathématiques de Paris Postdoctoral Fellowship, 2020
· IMS New Researcher Travel Award, 2019
· Yale University Postdoctoral Scholars Travel Fund Award, 2019
· Travel Support for O'Bayes Meeting, 2019
· ISBA Travel Award for Attending the 12th International Conference on Bayesian Nonparametrics, 2019
· Travel Grant for Attending Aad van der Vaart's 60th Birthday Conference, 2019
· MassMutual Poster Award, Honorable Mention (Professional Category), NESS NextGen: Data Science Day at Yale University, October 27, 2018
· O'Bayes Meeting Travel Award, 2017
· Outstanding Teaching Assistant Award, Department of Statistics, NC State, 2015
· Outstanding Teaching Assistant Award for Excellence in Mentorship, NC State Graduate School, 2015

### Memberships

· Member of ASA, ASA Astrostatistics Interest Group, Bernoulli Society, IMS, and ISBA
· Member of Mu Sigma Rho, National Statistical Honor Society, 2014

## STUDENT MENTORING

· Ms. Shuyu Guo (2022). Master's student in the Department of Statistics, UC Davis.
· Mr. Johnathan Dinh (2022). Master's student in the Department of Statistics, UC Davis

## SERVICE

· Panelist for reviewing NASA funding proposals
· Reviewer for *Journal of the Royal Statistical Society Series A, Journal of Multivariate Analysis, Astronomy and Computing, The Astronomical Journal, Journal of the Korean Statistical Society, Bayesian Analysis, Electronic Journal of Statistics, Monthly Notices of the Royal Astronomical Society, Yale Undergraduate Research Journal, Journal of the American Statistical Association, Statistics & Probability Letters*
· Secretary of the ASA Astrostatistics Interest Group, January 1, 2020–December 31, 2021
· Member of the Organizing Committee for the 3rd Annual Postdoctoral Symposium at Yale University, October, 2019–June, 2020
· Member of the Local Organizing Committee, NESS NextGen: Data Science Day at Yale University, October, 2018

## INTERNSHIPS

· Data Scientist Intern, MaxPoint Interactive Inc. Morrisville, NC, May 16–August 16, 2016
· Product Analytics Summer Intern, MaxPoint Interactive Inc. Morrisville, NC, May 12–August 12, 2015

## OBSERVING EXPERIENCE

· Two nights with Professor Debra Fischer using EXPRES Spectrometer on the Discovery Channel Telescope at Lowell Observatory located in Arizona, June 7–8, 2019

## LANGUAGES

· Fluent: Chinese (Cantonese, Gan, and Mandarin), English, Python, R, and LaTeX
· Intermediate: Japanese, SAS, and Taiwanese
· Beginner: French, Hakka, Julia, Matlab, Thai, and Spanish