

# Ryan T. Botts, Ph.D.

## Associate Professor of Mathematics

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<https://github.com/rbotts>

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### **Education**

Ph.D. Mathematics: Ohio University, Athens, OH. 2003- 2010

Advisor: Martin J. Mohlenkamp

Title: The Learning and Analysis of Regulatory Networks Using Sums of Separable Functions

M.S. Mathematics: Cal Poly State University, San Luis Obispo, CA. 2003.

B.S. Mathematics: Cal Poly State University, San Luis Obispo, CA. 2001.

### **Employment and Teaching Experience**

2015-Current	Associate Professor of Mathematics, Point Loma Nazarene University
2010-2015	Assistant Professor of Mathematics: Point Loma Nazarene University
2007-2010	Teaching Assistant: Ohio University-Athens
2007-2010	Research Assistant: Ohio University-Athens Adv. Dr. Martin J. Mohlenkamp. <i>Toward a Direct Numerical Solution of the Multiparticle Schrodinger Equation</i>
2009-2010	Part-Time Instructor: Ohio University- Lancaster
2006-2007	Secondary School Teacher: Templeton High School
2003-2006	Teaching Assistant: Ohio University-Athens
2001-2003	Teaching Assistant: Cal Poly State University-SLO

### **Research Interests**

Statistical learning, bioinformatics, data and applications are all areas I am interested in. Some days I am working as a bioinformatician interested in using the genomic sequences of antibiotic resistant bacteria to better understand the sources, acquisition and distribution of clinically relevant samples found in contaminated urban wetlands. Other days I am an applied mathematician working in numerical analysis, more specifically in machine learning in high-dimensions with tensor products, trying to build learning algorithms for novel applications. Working on a wide variety of interdisciplinary problems has led me into research on how to train the next generation of interdisciplinary scientists.

## **Publications**

Botts, R., Z. Lindsey, M. Lensink, K. Peterson, L. Ustick, E. Top, C. Brown and D. Cummings. (2018). *BackGAT: A tool for analyzing and curating plasmid backbone gene names*. Plasmid (In preparation).

Botts, R., J. Bravo, M. Brown, C.. Castilleja, V. Guzman, S. Hall, J. Henderson, S. Kenney, M. Lensink, M. Paternoster, S. Pyle, L. Ustick, C. J. Walters, C. Brown, E. Top, and D. Cummings. (2018). *Complete nucleotide sequences of four environmental multidrug-resistance plasmids encoding CTX-M-type extended-spectrum  $\beta$ -lactamases*. Frontiers in Microbiology. (In preparation).

Botts, R., T. Wiegman, A. Rodriguez, A. Eppert, W. Garley, S. Blankenship, and M. Mooring. (2018). *Temporal niche partitioning of Neotropical predators and prey: Effect of circadian rhythm on activity*. Biotropica (In preparation).

Botts, R., T. Wiegman, A. Rodriguez, A. Eppert, W. Garley, S. Blankenship, and M. Mooring. (2018). *Temporal niche partitioning of Neotropical predators and prey: Effect lunar phase on activity*. Journal of Mammology (In preparation).

Dorrell, M., H. Woelbern, R. Botts, S. Bravo, J. Tremblay, T. Kurz, D. Goral, J. Rusing, Z. Sedillo, P. Thompson, A. Barnett, G. Villegas, D. Elson, M. Alexander, J. Wada, E. Garcia, S. Victor, J. Silva, C. Coopwood, A. Rausch, B. Fortin, C. Lowey, and A. Hale. (2019). *Bevacizumab and temsirolimus combine to provide synergistic angiostatic properties in a novel modified, quantifiable CAM Model*. (In preparation).

Sagawa, J., R. Botts and R. Oakes-Mueller. (2018). *Developing the good physician: the influence of role models in the development of virtues and wellbeing in medical students*. (In preparation).

Botts, R., B. Apffel, C. J. Walters, K. Davidson, R. Echols, M. Geiger, V. Guzman, V. Haase, M. Montana, C. La Chat, J. Mielke, K. Mullen, C. Virtue, C. Brown, E. Top, and D. Cummings. (2017). *The genomic and functional analysis of four multidrug resistance plasmids captured from the sediment of an urban wetland*. Frontiers in Microbiology; 8(1922) doi:10.3389/fmicb.2017.01922.

Botts, R., L. Carter and C. Crockett. (2017). *Hybrid courses across the curriculum: what works and what doesn't*. ACMS 21<sup>st</sup> Biennial Conference Proceedings.

Botts, R., L. Carter and C. Crockett. (2017). *Blended Learning in a Quantitative Literacy Course*. Primus. Online. doi: [10.1080/10511970.2017.1371264](https://doi.org/10.1080/10511970.2017.1371264).

Borgogna, T., J.-L. Borgogna, J. A. Mielke, C. J. Brown, E. M. Top, R. T. Botts, D. E. Cummings. (2015). *High Diversity of CTX-M Extended-Spectrum  $\beta$ -Lactamases in*

*Municipal Wastewater and Urban Wetlands. Microbial Drug Resistance*; 22(4): 312-320. doi:10.1089/mdr.2015.0197.

Carter, L., R. Botts and C. Crockett. (2013). *Computational Science Programs: the Background Research*. Proceedings of FIE 2013. Frontiers in Education.

Botts, R. A. J. Homburg, and T. R. Young. (2012). *The Hopf Bifurcation with Bounded Noise*. Discrete Cont. Dynam. Systems - A. 32: 2997-3007.

d’Avezac, M., R. Botts, M. J. Mohlenkamp, and A. Zunger. (2011). *Learning to Predict Physical Properties using Sums of Separable Functions*. SIAM Journal on Scientific Computing; 33(6): 3381-3401.

Botts, R. and L. Carter. (2011) *Lessons Learned: A Journey in Computational Science*. ACMS 18<sup>th</sup> Biennial Conference Proceedings.

Botts, R. (2010). *The Learning and Analysis of Regulatory Networks Using Sums of Separable Functions*. Ohio University Libraries.

### **Presentations:**

J. Canner\*, A. Unfried\*, and R. Botts\*. (2019). Workshop on R Programming. ACMS 21<sup>th</sup> Biennial Conference, Marion, IN.

R. Botts\*, and G. Crow\*. (2019). *Adventures in Introductory Statistics: Hybrid, Traditional and Then Hybrid Again*. ACMS 21<sup>th</sup> Biennial Conference, Marion, IN.

L. Carter\*, M. Leigh, C. Crockett and R. Botts\*. (2019). Panel: *Mentoring Students with Extra Challenges*. ACMS 21<sup>th</sup> Biennial Conference, Marion, IN.

R. Botts\*, L. Carter\*, C. Crockett\*, G. Crow\*, J. Jimenez\*, and M. Zack\*. (2015). Panel: *Hybrid Classes in Mathematics and Computer Science*. ACMS 19<sup>th</sup> Biennial Conference, Ancaster, ON, Canada.

R. Botts. (2018). *MinION workshop*. College of Earth, Oceanic, and Atmospheric Sciences at Oregon State University. Corvallis, OR.

R. Botts\*, and C. Crockett\*. (2018). *Blended courses across the curriculum: what works and what doesn’t*. First Fridays Point Loma Nazarene University, San Diego, CA.

R. Botts. (2017). *A quantitative perspective on antibiotic resistant bacteria in urban wetlands*. Faculty Scholarship Day Point Loma Nazarene University, San Diego, CA.

R. Botts\*, C. Crockett\*, G. Crow, J. Jimenez\* and M. Zack\*. (2017). Zeroing in on Algebra II/Integrated III A Problem Solving Symposium co-presenter. *The Next Class: What Skills are Universities Hoping College Students will Learn*. San Diego Math Network Workshop, San Diego, CA.

- L. Ustick\*, R. Botts\*, Z. Lindsey, K. Petersen, E. Top, C. Brown, D. Cummings. (2017). *Characterizing the need for standardized nomenclature of plasmid backbone genes*. ASM Microbe Conference, New Orleans, LA.
- R. Botts\*, L. Ustick\*, C. Catilleja, V. Guzman, S. Hall, J. Henderson, Z. Lindsey, C. Walters, R. Platz, S. Pyle, C. Brown, E. Top, D. Cummings. (2017). *Four new CTX-M plasmids captured from urban wetlands along the US-Mexico border*. ASM Microbe Conference, New Orleans, LA.
- R. Botts\*, L. Carter\*, C. Crockett\*, G. Crow\*, J. Jimenez\*, and M. Zack\*. (2015). Panel: *Hybrid Classes in Mathematics and Computer Science*. ACMS 19<sup>th</sup> Biennial Conference, Ancaster, ON, Canada.
- R. Botts. (2014). *Adventures in Machine Learning with Sums of Separable Functions*. Machine Learning Seminar Series. SPAWAR, San Diego, CA.
- R. Botts. (2014). *Antibiotic Resistance in Urban Wetlands and the Bioinformatics Challenges it Presents*. IBEST Seminar Series. Moscow, ID.
- R. Botts\* and D. Cummings\*. (2013). *Antibiotic Resistance in Urban Wetlands*. Faculty Scholarship Day Point Loma Nazarene University, San Diego, CA.
- R. Botts\*, D. Cummings\*, J. Fregoso\*, and T. Borgogna\*. (2013). *Antibiotic Resistance in Urban Wetlands*. University of Idaho, Moscow, ID.
- R. Botts\* and L. Carter\*. (2011). *Lessons learned: A Journey in Computational Science*. ACMS Eighteenth Biennial Conference, Santa Barbara, CA.
- R. Botts. (2010). *Regulatory Network Analysis and Approximation Using Tensor Products*. SIAM Regional Conference Pittsburgh, PA.

## **Funding**

- PLNU Alumni Association Grant. *Sequencing and Genomic Analysis of Novel Colistin Resistance Plasmids Found in Urban Wetlands*. \$2000. R. Botts. Spring 2017.
- PLNU RASP Grant. Sequencing of Multi-Drug Resistance Plasmids. \$2000. R. Botts. Fall 2016.
- PLNU Sabbatical Award. The Analysis and Characterization of Plasmids Carrying Antibiotic Resistance Genes Captured in Urban Wetlands. R. Botts. Fall 2016.
- National Institutes of Health (NIH) Grant. *Capture and Characterization of Self-Transmissible Plasmids from Urban Wetlands Encoding Clinically Relevant Antibiotic*

*Resistance Genes*. \$237,790. D. E. Cummings, R. T. Botts, and E. M. Top. May 2013 – April 2016.

PLNU Wesleyan Center for 21<sup>st</sup> Century Studies Grant. *Training Undergraduates to Perform Sequence Analysis on Self-Transmissible Plasmids Captured in Urban Wetlands*. \$2000. R. Botts. May 2013.

PLNU Alumni Association Grant. *The Analysis and Characterization of CTX-M Antibiotic Resistance Genes in Urban Wetlands*. \$2000. R. Botts and D. Cummings. May 2013

### **Academic Awards**

2009: Ohio University Graduate Assistant Outstanding Teaching Award. (Ohio University).

2005-2006: Ohio University Foundation Doctoral Fellowship for a graduate student with an outstanding undergraduate record and other characteristics of distinction. (Ohio University).

2005: College of Arts and Sciences Outstanding Teaching Assistant. (Ohio University).

2004: Charles A. Denbow Memorial Scholarship for an outstanding first year graduate student. (Ohio University).

2003: Charles J. Hanks Award for excellence in mathematics for a Master's student. (Cal Poly-SLO).

### **Other Activities**

September 2018-May 2019: Co-leader of Faculty Learning Community on Inclusive Teaching Practices in STEM at PLNU.

July 2019: Co-leader of 8 hour R programming workshop at the Association of Christians in the Mathematical Sciences Biannual Conference. Marion, IN.

January 2017: Led two day MinION workshop for the College of Earth, Oceanic, and Atmospheric Sciences at Oregon State University. Corvallis, OR.

August 2017: Zeroing in on Algebra II/Integrated III A Problem Solving Symposium co-presenter. “The Next Class: What Skills are Universities Hoping College Students will Learn.” San Diego Math Network Workshop, San Diego, CA.

August 2013: Faculty Scholarship Day Presentation “Antibiotic Resistance in Urban Wetlands.” PLNU, San Diego, CA.

September 2011: The National Academies Pacific Northwest Regional Summer Institute on Undergraduate Education in Biology, Olympia, WA.

July 2011: Technology Integrated Learning Environments Workshop: Fiveweek workshop offered at PLNU, San Diego, CA.

June 2011: Lessons Learned: A Journey in Computational Science. Session talk at ACMS meeting, Santa Barbara, CA.

July 2010: Mini-symposium on Multilinear Computation and Application at SIAM regional conference, Pittsburgh, PA.

April 2008: Research presentation for the Ohio University Board of Trustees followed by Q and A session regarding obstacles in research with the OU Board of Trustees.

April 2008: Member of graduate student panel discussion for undergraduate students considering graduate work at an MAA regional conference in Marietta, OH.

April 2007: Cal State Early Assessment Project: Promote student success on college math entrance exams and effectively place them in courses.

2006-2007: Participant in California Beginning Teacher Support and Assessment Program (BTSA)

2004-2006: Graduate Student Senate Grant Committee Chair: Oversaw the distribution of \$24,000 of grant money annually.

2003-2006: Graduate Student Senate department representative.

### **PLNU Student Presentations**

Eppert\*, A., A. Rodrigues, T. Wiegman, S. Blankenship, R. Botts and M. Mooring. (2019). *Predator-prey relationships in high elevation Costa Rican ecosystems*. West Coast Biological Sciences Undergraduate Research Conference, University of San Diego, San Diego, CA.

Bravo\*, J., T. Kucey, G. Yap, R. Botts, D. Cummings, and D. Page. (2019). *Plasmid genomes from vancomycin-resistant Enterococci isolated from a wastewater treatment plant in San Diego County*. West Coast Biological Sciences Undergraduate Research Conference, University of San Diego, San Diego, CA.

Kenney\*, S., M. Brown, T. Kucey, R. Botts, D. Cummings, and D. Page. (2019). *Mating frequencies of conjugative resistance plasmids in liquid and biofilm cultures*. West Coast Biological Sciences Undergraduate Research Conference, University of San Diego, San Diego, CA.

Lensink\*, M., Z. Lindsey, T., D. Cummings, D. Page and R. Botts. (2019). *Computational analysis of the relationships between mobile genetic elements*,

*accessory genes and plasmid backbone genes*. West Coast Biological Sciences Undergraduate Research Conference, University of San Diego, San Diego, CA.

Guridi\*, W., V. Chavez\*, C. Rundio, A. Earle, T. Steele, R. Botts and M. McConnell. (2019). *Characterization of a bacteriophage that infect four of the five major disease-causing Salmonella serogroups*. West Coast Biological Sciences Undergraduate Research Conference, University of San Diego, San Diego, CA.

Rodriguez\*, A., T. Wiegman, W. Garley, R. Botts and M. Mooring. (2018). *The relationship between lunar cycle and activity patterns of neotropical predator and prey species*. West Coast Biological Sciences Undergraduate Research Conference, St. Mary's College, Moraga, CA. (oral presentation, 2<sup>nd</sup> place)

Wiegman\*, T., A. Rodriguez, W. Garley, R. Botts and M. Mooring. (2018). *Computational analysis of population activity patterns based on camera trap data*. West Coast Biological Sciences Undergraduate Research Conference, St. Mary's College, Moraga, CA. (oral presentation)

Lensink\*, M., J. Bravo\*, C. Castilleja, V. Guzman, S. Hall, J. Henderson, Z. Lindsey, S. Kenney, T. Kucey, R. Platz, S. Pyle, B. Menke, L. Ustick, C. J. Walters, C. Brown, E. Top, R. Botts and D. Cummings. (2018). *Characterization of four novel plasmids from an urban coastal wetland*. West Coast Biological Sciences Undergraduate Research Conference, St. Mary's College, Moraga, CA. (poster presentation)

Hall, S., V. Guzman\*, J. Henderson, L. Ustick, S. Pyle, and C. Castilleja, C. Brown, E. Top, R. Botts, and D. Cummings. (2017). *Genomic and phenotypic analysis of four novel plasmids encoding CTX-M type extended spectrum Beta-lactamases*. West Coast Biological Sciences Undergraduate Research Conference, Point Loma Nazarene University, San Diego, CA. (poster presentation)

Ustick\*, L., R. Botts\*, Z. Lindsey, K. Petersen, E. Top, C. Brown, D. Cummings. (2017). *Characterizing the need for standardized nomenclature of plasmid backbone genes*. American Society for Microbiology Microbe Conference, New Orleans, LA. (poster presentation)

Conrad\*, J., J. Paul\*, and A. Thwing\*. (2016). *Assessing methods for analyzing MacTel*. Mathematical Association of America Sectional Meeting, Loyola Marymount University, Los Angeles, CA. (poster presentation)

Hall\*, S., V. Guzman, L. Ustick, C. Virtue, K. Davidson, C. La Chat, C. Brown, E. Top, R. Botts and D. Cummings. (2016). *Novel antibiotic resistance plasmids from the coastal environment*. West Coast Biological Sciences Undergraduate Research Conference, Point Loma Nazarene University, San Diego, CA. (poster presentation)

La Chat\*, C., C. Virtue, J. Walters, K. Davidson, R. Echols, M. Hoenecke, V. Haas, J. Mielke, M. Geiger, E. Top, C. Brown, R. Botts, and D. Cummings. (2015). *Genotypes and conferred phenotypes of four multi-drug resistant plasmids isolated from the natural environment*. West Coast Biological Sciences Undergraduate Research

Conference, Point Loma Nazarene University, San Diego, CA. (poster presentation)

Borgogna\*, T. R. J.-L Borgogna\*, J. A. Mielke, C. J. Brown, E. M. Top, R. T. Botts, D. E. Cummings. (2014). *Abundance and Diversity of CTX-M extended-spectrum – lactamases in urban wetlands associated with wastewater treatment plants*. General Meeting of the American Society for Microbiology, Boston, MA. (poster presentation)

Petersen\*, K., L. Carter, D. Cummings, and R. Botts. (2014). *Plasmid Identification Using Gene Clusters*. Mathematical Association of America Sectional Meeting, Concordia University, Irvine, CA. (poster presentation, won outstanding undergraduate poster)

Borgogna\*, J.-L., T. Borgogna, L. Carter, R. Botts, and D. Cummings. (2014). *Diversity, abundance, and persistence of antibiotic resistance genes in urban wetlands in San Diego County*. West Coast Biological Sciences Undergraduate Research Conference, Azusa Pacific University, Azusa, CA. (poster presentation)

Collins\*, B., L. Carter, R. Botts, and D. Cummings. (2014). *The identification and annotation of novel plasmids carrying drug resistance from urban wetlands*. Point Loma Nazarene University Honors Conference, San Diego, CA. (poster presentation)

Frye\*, W., R. Botts, and D. Cummings. (2014). *Aminoglycoside resistance plasmids in Pseudomonas species isolated from the Tijuana River Estuary*. West Coast Biological Sciences Undergraduate Research Conference, Azusa Pacific University, Azusa, CA. (oral presentation)

Borgogna,\* T., J.-L. Borgogna, M. Rouffet, R. Botts, and D. Cummings. (2014). *Detection and Quantification of CTX-M Extended-Spectrum  $\beta$ -lactamases in Urban Wetlands and Associated Waste Water Treatment Plants*. West Coast Biological Sciences Undergraduate Research Conference, Azusa Pacific University, Azusa, CA. (oral presentation, won outstanding undergraduate presentation)

Booth\*, C., L. Carter, M. Dorrell, and R. Botts. (2013). *Applications of Image Processing to Automate Tumor Image Quantification*. Mathematical Association of America Sectional Meeting, University of San Diego, San Diego, CA. (poster presentation)

Levasseur\*, T., J. Jimenez, R. Botts. (2012). *The Calculus of Variations*. Point Loma Nazarene University Honors Conference, San Diego, CA. (poster)

McClatchey\*, N., J. Jimenez, R. Botts. (2012). *Image Compression Using Tensor Decomposition*. Point Loma Nazarene University Honors Conference, San Diego, CA. (poster)

### **Research Students**

Smith, Leslie, Yabut, Jasmine and Hovis, Gabrielle. *Genomic analysis of plasmid accessories and backbone genes*. 2019. Summer researcher.



Allen, Gabrielle and Wagner, Abigail. *Occupancy analysis of large mammals in Costa Rica*. 2019. Summer researcher.

Eppert, Amy. *Temporal niche partitioning and the role of prey abundance in large mammals in Costa Rica*. 2018-2019. Summer researcher.

Lensink, Mariele. *Developing a plasmid annotation workflow for third generation sequence data*. 2018. Summer researcher.

Weigman, TJ. *Developing RShiny tools for lunar and occupancy analysis of large mammal behavior in Costa Rica from camera trap data*. 2017-2018. Summer researcher, poster presented at WBSURC. App: <https://tjwieg.shinyapps.io/Starshiny/>

Lindsey, Zac. An Interactive Tool for the Study of Plasmid Backbone Gene Labels. 2016-2018. Summer researcher, PLNU honor's conference. App: <https://zaclindsey.shinyapps.io/plasmidbackbone2/>

Steele, Taylor. *The development of a third generation sequencing workflow with applications to novel ciprofloxacin resistance plasmids from coastal urban wetlands*. 2017. PLNU honor's conference.

Platz, Rachel. *How frequently are ISCR elements recombining to produce novel antibiotic resistant bacteria?* 2015-2017. Summer researcher, poster presented at PLNU honor's conference.

Ustick, Lucas. *Plasmid annotation and visualization pipeline*. 2015-2017. Summer researcher, oral presentation at PLNU honor's conference.

Conrad, J, J. Paul, and A. Thwing. *Assessing methods for analyzing MacTel*. 2016. Honor's project, poster presented at MAA regional meeting.

Collins, Brooke. Undergraduate research project. *The identification and annotation of novel plasmids carrying drug resistance genes from urban wetlands*. 2012-2014. Summer researcher, poster presented at PLNU honor's conference.

Borgogna, Joanna. *Diversity, abundance and persistence of antibiotic resistance genes within urban wetlands in San Diego County*. 2013-2014. Poster presented at WCBSURC 2014.

Peterson, Kristen. *Analysis of plasmid survival strategies using machine learning*. 2013-2014. Summer researcher, poster presented at MAA regional meeting.

Booth, Caylor. Undergraduate research project: *Automated image quantification software to assess tumor vascularization*. Interdisciplinary project with Mike Dorrell (Biology), 2011-2013. Summer researcher, poster presented at MAA regional meeting.

McClatchey, Nate. Undergraduate research project: *Image Compression Using Tensor Decomposition*. Co-advised with Jesus Jimenez. 2011-2012. Poster presented at MAA regional meeting.

Levasseur, Tyler. Undergraduate research project: *The Calculus of Variations*. Co-advised with Jesus Jimenez. 2011-2012. Poster presented at MAA regional meeting.

### **Research Student Mentoring (Summer and School Year):**

2019: Leslie Smith, Gabrielle Hovis, Jasmine Yabut, Amy Eppert, Gabby Allen, Abigail Wagner  
2018: Mariele Lensink, TJ Wiegman, Amy Eppert, Leslie Smith  
2017: Zac Lindsey, Mariele Lensink, TJ Wiegman  
2016: Zac Lindsey, Rachel Platz, Lucas Ustick  
2015: Carly Boyd, Rachel Platz, Katie Kittridge, Katelyn Ortiz  
2014: J. J. Paul, Carly Boyd  
2013: Brooke Appfel, Kristen Petersen  
2012: Caylor Booth  
2011: Caylor Booth

### **Honors Scholars:**

2018-2019: Mariele Lensink, Amy Eppert (Co-advisor)  
2017-2018: Zac Lindsey, Taylor Steele  
2016-2017: Rachel Platz, Lucas Ustick  
2015-2016: Joey Conrad (Co-advisor), JJ Paul (Co-advisor), Annie Thwing (Co-advisor)  
2013-2014: Brooke Appfel, Joanna Fregoso, Kristen Petersen  
2012-2013: Caylor Booth  
2011-2012: Tyler Levasseur (Co-advisor), Nate McClatchey (Co-advisor)

### **Teaching Development**

- Participation in the Higher Education Reading Group at PLNU, led by Maria Zack and Greg Crow.
- SoCAL PKAL regional network meeting participation “Broadening Participation and Persistence in College STEM: Equity, Diversity and Inclusion” UCSD, San Diego, CA March 2017.
- *Rohr Science Faculty Learning Community*. PLNU, San Diego, CA 2011-Current.
- *Peer evaluator training*. PLNU, San Diego, CA. Oct. 2015.
- *Wesleyan Practices in Teaching* reading group. PLNU, San Diego, CA Summer 2015.
- *Raise Your Students’ Grades Luncheon: Sandra McGuire*. PLNU, San Diego, CA Oct. 2014.

- *Sloan-C Student Satisfaction: Flipped Learning Online*. Online. Oct. 4-11, 2013.
- *Sloan-C New to Online: The Quality Matters Rubric*. Online. June 21-28, 2013.
- *Sloan-C Blended Learning Mastery Series*. Online. Aug. 16- Oct 25, 2013.
- *The Art of Changing the Brain*. CTL PLNU, San Diego, CA Aug. 2013.
- *Team Based Learning*. PLNU, San Diego, CA Aug. 2012.
- *I Want to Be Just Whelmed*. CTL PLNU, San Diego, CA Aug 2011
- *The National Academies Summer Institute on Undergraduate Education in Biology in Olympia, WA* Sep. 7-11, 2011.
- *Technology Integrated Learning Environment (TILE)*. PLNU, San Diego, CA Aug. 2011.
- *Student Engagement Techniques*. CTL PLNU, San Diego, CA Aug. 2011.
- *New Faculty Seminar on Student Engagement*. CTL PLNU San Diego, CA Nov. 2010.
- *Classroom Assesment Techniques*. CTL PLNU, San Diego, CA Oct. 2010.
- *Creating a Community in Your Classroom*. CTL PLNU San Diego, CA Aug. 2010.

### **Courses Taught**

MTH123	Pre-Calculus Mathematics
MTH133	Pre-Calculus for the Sciences
MTH164/121	Calculus I/Modeling Lab
MTH203	Introduction to Statistics
MTH213	Fundamentals of Elementary Mathematics I
MTH223	Fundamentals of Elementary Mathematics II
MTH233	Linear Algebra
MTH242	Number Theory
MTH303	Problem Solving
MTH333	Differential Equations
MTH362	Calculus Based Statistics
MTH363	Calculus Based Statistics with R
MTH373	Mathematical Modeling
MTH424	Real Analysis
MTH491	Independent Study in Mathematics/Statistics
MTH492	Special Topics in Mathematics
CSC311	MATLAB
CSC311	R
CSC/ISS/MTH496	Service Learning I
CSC/ISS/MTH497	Service Learning II
GNSG701	Applied Statistics and Data Analysis

### **Service to the University and Department**

AY2018-2019:

- Honor's project advisor: Mariele Lensink, Amy Eppert (Co-advisor)

- Honor's committee member: Shelby Kenney, Joseph Bravo, Jacob Barragan, Sebastian Elsenbroek
- Faculty Resource Committee. Chair.
- Faculty Council. Member.
- Faculty honor guard

AY2017-2018:

- Honor's project advisor: Taylor Steele, Zac Lindsey
- Honor's committee member: Sydney Davis
- Master's project mentor: Tricia Tran
- Master's committee member: Caylor Booth
- New faculty mentor
- Analysis of GE survey data (faculty, student and alumni) for Dean
- Faculty Resource Committee. Member
- Mobile Task Force. Member
- GE Task Force. Member
- Faculty honor guard

AY2016-2017:

- Honor's project advisor: Rachel Platz, Lucas Ustick
- Honor's committee member: Ellen Asselin
- New faculty mentor
- Spoke with leaders from student ministries about my vocational journey.
- Intercollegiate Athletics committee. Member
- Faculty honor guard

AY2015-2016:

- Honor's project advisor: Carly Boyd, Joey Conrad, JJ Paul, Annie Thwing
- Honor's committee member: Kathryn Carlton
- Men's club volleyball advisor
- Department Preview Days representative
- Department website coordinator
- Intercollegiate Athletics committee. Member
- MAT Thesis Panel member: Lauren Brashears 1/21/2016
- Faculty honor guard

AY2014-2015:

- Honor's committee member: Nicholas McMahon, Hannah Quinn, Dylan Poorboy, Melody Axtell
- Men's club volleyball advisor
- Student Mentor through spiritual development
- Department Preview Days representative
- Department website coordinator
- Pre-health interviews
- Faculty honor guard

- Science Honor's Weekend planning and implementation
- Campus Air Conditioning working group
- Intercollegiate Athletics committee. Member

AY2013-2014:

- Honor's project advisor: Brooke Appfel, Joanna Fregoso, Kristen Petersen
- Honor's committee member: Eduardo Alvarez, Will Frye, Taylor Davis, Timothy Borgogna
- Men's club volleyball advisor
- Northrop Grumman 2 day Excel course for PLNU, with Carl Hammond.
- Faculty to Faculty Canvas Training workshop volunteer for faculty at PLNU
- FYE Small group facilitator
- Department Preview Days representative
- Department website coordinator
- Pre-health interviews
- Faculty honor guard
- Science Honor's Weekend planning and implementation

AY2012-2013:

- Honor's project advisor: Caylor Booth
- Honor's committee member: Doug Zuill
- Master's thesis committee member PLNU, statistics consulting: Patricia Evans
- Faculty Development Committee Member
- Learning Management System Working Group, member
- Men's club volleyball advisor
- Department Preview Days representative
- Department website coordinator
- Volunteer Lecturer for College Bound at PLNU
- Pre-health interviews
- Faculty honor guard
- Science Honor's Weekend planning and implementation

AY 2011-2012:

- Department Preview Days representative
- Department website coordinator
- Enrollment Management Committee member
- Dorm Discussion Group Leader on "The Immortal Life of Henrietta Lacks."
- Faculty honor guard
- Science Honor's Weekend planning and implementation
- Participation in Facelift, a one day community service project, PLNU involvement coordinated by Kevin Modesto.

AY 2010-2011:

- Honor's project advisor: Tyler Levasseur, Nate McClatchey

- Master's thesis committee member PLNU, statistics consulting: Danielle Dwyer
- Planning and leadership of PLNU/SPAWAR joint program "Girls Day Out" in October 2010
- Faculty honor guard
- Science Honor's Weekend planning and implementation
- Participation in Facelift, a one day community service project, PLNU involvement coordinated by Kevin Modesto

### **Service To Community**

- Reviewer for Marine Pollution, Processes,
- Reviewer for International Journal of Environmental Research and Public Health. 2018.
- Reviewer for Environmental Chemical Engineering. 2018.
- Led two day MinION workshop for the College of Earth, Oceanic, and Atmospheric Sciences at Oregon State University. Corvallis, OR January 2017.
- Mathematical Association of America Joint Mathematics Meeting poster presentation judge. San Diego, CA January 2018.
- Reviewer for Environmental Monitoring and Assessment. 2017, 2018
- Reviewer for Primus. 2017, 2018
- Reviewer for Microbial Drug Resistance. 2017.
- West Coast Biological Sciences Undergraduate Research Conference oral presentation co-chair and poster session judging coordinator. San Diego, CA April 2016.
- Mathematical Association of America Sectional Meeting poster presentation judge. Los Angeles, CA April 2016.
- Mathematical Association of America Sectional Meeting poster presentation judge. San Diego, CA April 2015.
- Mathematical Association of America Sectional Meeting poster presentation judge. Irvine, CA January 2014.
- California Basic Educational Skills Test Reading and Mathematics Item Review Conference. Development and analysis of CBEST test items. Evaluations Systems (Pearson) Sacramento, CA September 2013.
- Project Kaleidoscope (PKAL) conference planning committee for "Transforming STEM Education: Inquiry, Innovation, Inclusion, and Evidence" San Diego, CA 2012.
- Mathematical Association of America Sectional Meeting poster presentation judge. San Diego, CA January 2013.
- Textbook review of *The Basic Practice of Statistics*, D. Moore. Fall 2013.
- Textbook review of *Precalculus: A Prelude to Calculus*, S. Axler. Fall 2012.

### **Conferences**

- Second Annual SSC Pacific Workshop on Naval Applications of Machine Learning 2018

- SIAM/AMS/MAA Joint Mathematics Meeting in San Diego, CA January 2018
- ASM Microbe meeting New Orleans, LA 2017
- PKAL conference on Diversity in STEM La Jolla, CA 2017
- First Annual SSC Pacific Workshop on Naval Applications of Machine Learning 2017
- West Coast Biological Sciences Undergraduate Research Conference. San Diego, CA April 2016.
- Mathematical Association of America Sectional Meeting. Los Angeles, CA April 2016.
- SIAM/AMS/MAA Joint Mathematics Meeting in Seattle, WA January 2016.
- ACMS (Association of Christians in the Mathematical Sciences) meeting Ancaster, ON Canada June 2015.
- Mathematical Association of America Sectional Meeting. San Diego, CA April 2016.
- Mathematical Association of America Sectional Meeting. San Diego, CA April 2015.
- SIAM/AMS/MAA Joint Mathematics Meeting in Houston, TX January 2015.
- Mathematical Association of America Sectional Meeting. Irvine, CA April 2014.
- SIAM/AMS/MAA Joint Mathematics Meeting in Baltimore, MD January 2014.
- ACMS (Association of Christians in the Mathematical Sciences) meeting Santa Barbara, CA June 2011.
- GLBIO (Great Lakes Bioinformatics Conference) with sessions on bioinformatics education at Athens, OH May 2-4, 2011.
- OCCBIO (Ohio Collaborative Conference on Bioinformatics), with sessions on bioinformatics curriculum and education at Cleveland, OH, July 2009.
- SIAM/AMS/MAA Joint Mathematics Meeting in San Francisco, CA January 2010.
- SIAM (Society for Industrial and Applied Mathematics) Annual Conference in Pittsburgh, PA, July 2010.

### **Professional Memberships**

Society for Industrial and Applied Mathematics (SIAM) since 2009.

Association of Christians in the Mathematical Sciences (ACMS) since 2010.