Catherine Bénéteau

Education

1993-1999	University at Albany (SUNY)	Ph.D.	Mathematics
1991-1993	McGill University	M.Sc.	Mathematics
1987-1991	McGill University	B.Sc. (honors)	Mathematics

Employment History

- **Professor** at the University of South Florida, 2017 – present.
- **Associate Professor** at the University of South Florida, 2010 – 2017.
- **Assistant Professor** at the University of South Florida, 2006 – 2010.
- **Associate Professor** at Seton Hall University, 2005 – 2006.
- **Assistant Professor** at Seton Hall University, 1999-2005.
- **Instructor** at the Center for Talented Youth in Lancaster, PA (Summer 1999).
- **Instructor/Graduate Assistant** at the University at Albany (1993-1999).
- **Instructor/Graduate Assistant** at McGill University (1991-1993).

Publications

1. *A Natural Extension of a Nonsingular Endomorphism of a Measure Space*, C. Bénéteau, Rocky Mountain Journal of Mathematics, **26** (1996), 1261-1273.

2. *Jensen Type Inequalities and Radial Null Sets*, C. Bénéteau and B. Korenblum, Analysis, **21** (2001), 99-105.

3. *Some Coefficient Estimates for H^p Functions*, C. Bénéteau and B. Korenblum, Complex Analysis and Dynamical Systems, *Contemporary Mathematics*, **364** (2004), 5-14.

4. *Remarks on the Bohr phenomenon,* C. Bénéteau, A. Dahlner, and D. Khavinson, Computational Methods and Function Theory **4** (2004), No. 1, 1-19.

5. *Statistics, Technology, and the Social Sciences: a Successful Interdisciplinary Project,* with June Rohrbach, Focus Magazine, **24**, no.1 (2004), 9-10.

6. *Extremal problems for non-vanishing functions in Bergman spaces,* D. Aharonov, C. Bénéteau, D. Khavinson, and H. S. Shapiro, *Operator Theory: Advances and Applications,* **158** (2005), 59-86.

7. *The Isoperimetric Inequality via Approximation Theory and Free Boundary Problems,* C. Bénéteau and D. Khavinson, Computational Methods and Function Theory **6** (2006), No. 2, 253-274.

8. *A survey of certain extremal problems for non-vanishing analytic functions*, C. Bénéteau and D. Khavinson, Complex and Harmonic Analysis, DES Tech Publications (2007), 45-61.

9. *Extremal Problems in the Fock Space,* C. Bénéteau, B. Carswell, and S. Kouchekian, Computational Methods and Function Theory, *Comput. Methods Funct. Theory* **10** (2010), no. 1, 189-206.

10. *Discrete Wavelet Transformations and Undergraduate Education,* C. Bénéteau and P.J. Van Fleet, Notices of the American Mathematical Society, **58** (2011), no. 5, 656-666.

11. *Voices of Mathematicians and Mathematics Teacher Educators Collaborating on Courses for Prospective Secondary Teachers*, D. Thompson, C. Bénéteau, G. Kersaint, S. Bleiler, National Council of Teachers of Mathematics 2012 Yearbook, (2012), 229-241.

12. *A Survey of Linear Extremal Problems in Analytic Function Spaces,* C. Bénéteau and D. Khavinson, Complex Analysis and Potential Theory, CRM Proc. Lecture Notes **55** (2012), 33-46.

13. *Promoting Mathematical Reasoning through Critiquing Student Work,* C. Bénéteau, S. Bleiler, D. Thompson, Annual Perspectives in Mathematics Education (APME) 2014, Karen Karp editor.

14. *Selected Problems in Classical Function Theory,* C. Bénéteau and D. Khavinson, Centre de Recherches Mathematiques, CRM Proceedings and Lecture Notes, Contemp. Math. 638 (2015), 255-265.

15. *Cyclicity in Dirichlet-type Spaces and Extremal Polynomials,* C. Bénéteau, A. Condori, C. Liaw, D. Seco, and A. Sola, J. Anal. Math. 126 (2015), 259-286.

16. *Cyclicity in Dirichlet-type Spaces and Extremal Polynomials II: Functions on the Bidisk,* C. Bénéteau, A. Condori, C. Liaw, D. Seco, and A. Sola, *Pacific J. Math. 276 (2015), no.*

1, 35-58.

17. *Cyclic Polynomials in two variables,* C. Bénéteau, G. Knese, L. Kośinski, C. Liaw, D. Seco, and A. Sola, Trans. Amer. Math. Soc., 368 (2016), 8737-8754.

18. *Orthogonal Polynomials, Reproducing Kernels, and Zeros of Optimal Approximants,* C. Bénéteau, D. Khavinson, C. Liaw, D. Seco, A. Sola, J. London Math. Soc., 94 (2016), no. 3, 726-746.

19. *Peer Led Guided Inquiry in Calculus at the University of South Florida,* C. Bénéteau, G. Fox, J. Holcomb, X. Xu, J. Lewis, K. Ramachandran, S. Campbell, Journal of STEM Education, Vol. 17, No. 2, 2016.

20. *Navigating co-teaching: perspectives from mathematicians, mathematics educators, and students,* C. Bénéteau, S. Bleiler, G. Kersaint, M. Krajcevski, D. Thompson, 13th International Congress on Mathematical Education, July 2016.

21. *POGIL in the calculus classroom,* C. Bénéteau, Z. Guadarrama, J. Guerra, L. Lenz, J. Lewis, A, Straumanis, PRIMUS, published online January 2017.

22. *Multiple perspectives on collaborative teaching: mathematicians, mathematics teacher educators, and students,* C. Bénéteau, S. Bleiler, G. Kersaint, M. Krajcevski, D. Thompson, Annual Perspectives in Mathematics Education (APME) 2017: Reflective and Collaborative Processes to Improve Mathematics Teaching (Chapter 20), Lucy West editor, 2017.

23. *Implementing projects in calculus on a large scale at the University of South Florida,* G. Fox, S. Campbell, A. Grinshpan, X. Xu, J. Holcomb, C. Bénéteau, J. Lewis, K. Ramachandran, Journal of STEM Education, Volume 18, Number 3, 2017.

24. *Remarks on Inner Functions and Optimal Approximants,* C. Bénéteau, M. Fleeman, D. Khavinson, D. Seco, A. Sola, Canad. Math. Bull. 61 (2018), no. 4, 704-716.

25. *A survey on the maximal number of solutions of equations related to gravitational lensing*, C. Bénéteau and N. Hudson, *Complex analysis and dynamical systems,* 23–38, Trends Math., *Birkhäuser/Springer, Cham,* 2018.

26. *On the concept of inner function in Hardy and Bergman spaces in multiply connected domains,* C. Bénéteau, M. Fleeman, D. Khavinson, A. Sola, Analysis and

Mathematical Physics 9 (2019), 839-866.

27. *Zeros of optimal polynomial approximants: Jacobi matrices and Jentzsch-type theorems,* C. Bénéteau, D. Khavinson, C. Liaw, D. Seco, B. Simanek, Rev. Mat. Iberoam. 35 (2019), no. 2, 607-642.

28. *A free boundary problem associated with the isoperimetric inequality,* A. Abanov, C. Bénéteau, D. Khavinson, R. Teodorescu, J. Anal. Math. **139** (2019), 677-696.

29. *Simultaneous zero-free approximation and universal optimal polynomial approximants*, C. Bénéteau, O. Ivrii, M. Manolaki, D. Seco, J. Approx. Theory. **256** (2020).

30. *Boundary behavior of optimal polynomial approximants,* C. Bénéteau, M. Manolaki, D. Seco, Constr. Approx.**54** (2020), 157-183.

31. Potter, R.L., Meisels, G.G., Stiling, P., Yee, K., Sears, R., Beneteau, C.A., Schuler, K.G., Camacho, A.D. and Campbell, S.W., 2021, July. Systemic Transformation of Education Through Evidence-based Reform (STEER): Results and Lessons Learned. In *2021 ASEE Virtual Annual Conference Content Access*.

32. *A survey of optimal polynomial approximants, applications to digital filter design, and related open problems,* C. Bénéteau and R. Centner, Complex Analysis and its Synergies **7** (2021), 1-12.

33. *A counterexample to the weak Shanks Conjecture,* C. Bénéteau, D. Khavinson, and D. Seco, conditionally accepted (pending final review) in Constructive Approximation, **arXiv:2405.16943**.

34. **(Submitted)** *Surjective Isometries of C*-algebras: Complex Spectrum and Periodicity,* C. Bénéteau, F. Botelho, M. Cueto-Avellaneda, J. E. Guerra, D. Ilisevic, S. Kazemi, S. Oi, submitted to Complex Analysis and Operator Theory.

Technical Manuals

33. SPSS 13.0 Update, 2/E, supplement to Social Statistics, with R. Kendrick, Allyn&Bacon, 2006.

Books

34. Calculus I: A Guided Inquiry, A. Straumanis, C. Bénéteau, Z. Guadarrama, J. Guerra, L. Lenz, POGIL Press and Wiley, 2014.

35. Algebra for Calculus: A Guided Inquiry, C. Bénéteau, Z. Guadarrama, J. Guerra, L. Lenz, and A. Straumanis, Kendall Hunt, 2022.

36. (In progress, to be published by Taylor and Francis) Isoperimetric Sandwiches and Approximation, Dmitry Khavinson and Catherine Beneteau.

Books Edited

Recent progress on operator theory and approximation in spaces of analytic functions, Contemporary Mathematics Series, American Mathematical Society, edited by C. Bénéteau, A. Condori, C. Liaw, W. Ross, A. Sola, 2016.

Grants and Awards

Teaching Awards

University Outstanding Undergraduate Teaching Award, 2009-10, University of South Florida.

External Funding

1. **National Science Foundation (NSF) Conference Grant** DMS-2308417, $42, 500, Harmonic and Complex Analysis: Modern and Classical, An international conference in memory of Professor Lawrence Zalcman, March 1, 2023 – February 28, 2024.

2. **National Science Foundation (NSF) Grant** DMS-1603527, $24,767, Canada-US Summer School on Spectral Theory and Applications, June 1, 2016 – May 31, 2017.

3. **National Science Foundation (NSF) Grant** DMS-1464939, $30,000, Israel Conference on Complex Analysis and Dynamical Systems VII, March 1, 2015 – February 29, 2016, PI.

4. **National Science Foundation (NSF) IUSE Grant,** DUE 1525574, $ 2,975,896, Systemic Transformation of Evidence-Based Education Reform (STEER), September 2015 – August 2021, senior personnel.

5. **PREP Workshop** Mathematical Association of America, $23, 532, Advanced Techniques in the Writing and Implementing of Process Oriented Guided Inquiry (POGIL) Activities for Mathematics, July 2015, PI.

6. **PREP Workshop,** Mathematical Association of America, $23, 532, Implementing Process Oriented Guided Inquiry (POGIL) Activities for Calculus I, June 2014, coPI.

7. **National Science Foundation (NSF) WIDER Grant,** DUE 1347753, $249,491, Transforming STEM Teaching in a Large Urban-Serving Institution, September 2013 – August 2015, coPI.

8. **PREP Workshop,** Mathematical Association of America, $23, 102, Implementing Process Oriented Guided Inquiry (POGIL) Activities for Calculus I, June 2013, coPI.

9. **National Science Foundation (NSF) Grant** DMS 13501577, $20,000, "Israel-USA Conference on Complex Analysis and Dynamical Systems VI", March 2013 – February 2014, coPI.

10. **National Science Foundation (NSF) Grant** DUE 1122757, $ 54 051, "Collaborative Research: POGIL Math - Guided Inquiry Materials for Gatekeeper Courses in Mathematics", October 2011 – September 2016, PI.

11. **NSF Grant** DMS-0849032, $23,820, 25th Southeastern Analysis Meeting, March 2009 – April 2010, PI.

12. **Subcontract to a NSF Grant** "Untangling Mathematical KnoTSS (Knowledge for Teaching Secondary School): An Investigation of Collaborations Between Mathematicians and Mathematics Educators, Rebecca McGraw PI at the University of Arizona, Catherine Bénéteau senior personnel at the University of South Florida, $42,356, August 2008 – May 2010.

13. **NSF Grant** DUE-0756847, $1,999,163, August 2008 – July 2013, "A STEP to grow in Science-Engineering-Mathematics Degrees", co-PI.

14. **NSF Grant** DMS-0753705, $20,000, Joint Norway-USA Workshop in Complex Analysis and Mathematical Physics, May 2008 – May 2009, co-PI.

15. **NSF Grant** DUE-0717158, $90,860, September 2007 – August 2010, "Collaborative

Research: A Phase II Expansion of the Development of a Multidisciplinary Course on Wavelets and Applications," PI.

16. **Project A.C.E.** , $16,000, for work designing and delivering professional development modules to improve mathematics content knowledge of elementary, middle school, and high school teachers, August 2007 – August 2008, senior personnel. This grant was a partnership between the Hillsborough County School District, the Department of Mathematics and Statistics, and the College of Education.

17. **Association for Women in Mathematics and National Science Foundation Travel Grant**, $1200, for travel expenses to participate in the "Tag der Funktionentheorie 2003 – Journées d'analyse complexe" conference in Metz, France (June 2003) and the First Joint International Meeting of the American Mathematical Society and the Real Sociedád Espanola in Seville, Spain (June 2003).

18. Was part of a team that received a **NSF Grant** ($1,500) **from the MAA** as part of the New Jersey section to sponsor an undergraduate research conference on March 27, 2004 at Rutgers University.

19. **Association for Women in Mathematics Mentoring Travel Grant**, $2,910, for travel expenses related to research at the University of Arkansas for the month of April 2004, PI.

Internal Funding

1. College of Arts and Sciences Office of Research and Scholarship (CAS-ORS) Spring 2023 Conference Presenter Support award, $750 for travel to the 34th International Workshop on Operator Theory and Applications August 2023.

2. College of Arts and Sciences (CAS) Conference Coordination Award, $990, for the Southeastern Analysis Meeting, March 2009, PI.

3. New Researcher Grant (USF), $9,288, *Nonlinear extremal problems,* June 2007 – May 2008, PI.

4. CAS Travel Grant, $750, for travel to conference *Extremal problems in complex and real analysis,* Moscow, Russia, May 22-26, 2007, PI.

5. University Research Council Grant, $4,000, *Extremal Problems in Bergman Spaces,*

Seton Hall University, May-August 2004, PI.

6. Curriculum Development Grant, *Integrating Social Science in Introductory Statistics*, $55,000, Seton Hall University, co-PI. I was one of four investigators on a three year project to develop a statistics class for the social science departments in coordination with the political science department from September 2001 - August 2003.

7. University Research Council Grant, *Peaks and valleys: a mathematical study*, $4,000, Seton Hall University, May-August 2002, PI.

A Selection of Invited Talks

- *Surjective isometries of C*-algebras, JMM 2025, Special Session on Advances in Function Theoretic Operator Theory.*
- *A counterexample to the weak Shanks conjecture, JMM 2025, invited speaker, Special Session on Function spaces and their application.*
- *A counterexample to the weak Shanks conjecture, AMS Fall Eastern Section Meeting, October 2024, Special Session on multivariable operator theory.*
- *Surjective isometries of C*-algebras, AMS Fall Eastern Section Meeting, October 2024, Special Session on holomorphic function spaces and operators on them.*
- *Minimal zeros of optimal polynomial approximants revisited, and consequences for the Shanks conjecture, University at Albany colloquium, October 2024.*
- *Minimal Zeros of Optimal Polynomial Approximants Revisited, and Consequences for the Shanks Conjecture,* plenary speaker at Spaces of Analytic Functions and Their Operators, Germany, May 2024.
- *A survey of results on optimal polynomial approximants: Minimal zeros and Jacobi matrices revisited,* AMS Special Session on Complex Analysis, Operator Theory and Real algebraic geometry, JMM 2024, San Francisco, January 2024.
- *Minimal zeros, orthogonal polynomials, and Jacobi matrices revisited,* Workshop in Analysis, Georgia Tech University, December 2023.
- *Open problems related to optimal polynomial approximants of several variables,* International Workshop on Operator Theory and Applications, University of Helsinki, Finland, August 2023.
- *Distribution of Zeros of Optimal Polynomial Approximants,* International Workshop on Operator Theory and Applications, University of Helsinki, Finland, August 2023.
- *Process Oriented Guided Inquiry Learning in the Mathematics Classroom,* University College Dublin, May 2023.

- *Zeros and a Jentzsch-type theorem for optimal polynomial approximants,* University College Dublin, May 2023.
- Co-ran a mini workshop (1 hour and 15 minute) for 150 mathematics faculty on Implementing POGIL in the Mathematics Classroom, AMS Joint Meetings, Boston, January 2023.
- *A survey of optimal approximants and applications to digital filter theory*, AMS Section Meeting, University of Tennessee, Knoxville; also given online at the Complex Analysis Video Seminar, an international online seminar series run by a faculty member at University College London that started during COVID, both in October 2020.
- *Universality of optimal polynomial approximants,* Advanced Courses in Operator Theory and Complex Analysis, Paris, June 2019.
- *Optimal polynomial approximants: Zeros and Limit Points*, International Conference on Complex Analysis, Potential Theory and Applications, Dublin, June 2018.
- *Universality and boundary behavior of polynomial approximants,* New Developments in Complex Analysis and Function Theory, Crete, July 2018.
- *Zeros of optimal polynomial approximants in Dirichlet-type spaces,* Mathematical Congress of the Americas, July 2017.
- *Zeros of optimal polynomial approximants and spectral properties of related Jacobi matrices,* New Trends in Approximation Theory, a conference in the memory of André Boivin, Fields Institute, Toronto, July 2016.
- *Zeros of optimal polynomial approximants, norms of Jacobi matrices, and Jentzsch-type theorems,* Summer School on Spectral Theory and Applications, University of Laval, Quebec City, July 2016.
- *Discrete wavelets and image compression: Thoughts on an undergraduate course,* University of Bergen Colloquium, November 2015.
- *Polynomial solutions to an optimization problem in classical analytic function spaces,* 3 week mini-course given at the University of Bergen, October 2015.
- *Orthogonal polynomials, reproducing kernels, and zeros of optimal approximants,* Autonoma University, Barcelona, Spain, November 2015; McGill University, February 2016.
- *Optimal approximants in Dirichlet spaces,* Israel-US Conference on Complex Analysis and Dynamical Systems VII Conference, Nahariya, May 2015.
- *Cyclicity and Extremal Polynomials in Dirichlet-type Spaces of the Disk and the Bidisk,* Université Laval, May 2014.
- *Cyclicity and Extremal Polynomials in Dirichlet-type Spaces,* University of Trondheim, September 2013.
- *Cyclicity and Extremal Polynomials in Dirichlet-type Spaces,* University of Montreal, August 2013.
- *Cyclicity in the Dirichlet Space: a Constructive Approach,* Canadian Mathematical Society

Winter Meeting, Montreal, December 2012.

- *A Mathematician and Mathematics Educator Team Teaching Experience*, University of Michigan, October 2012.
- *POGIL: Not your every-day group work,* with Jill Guerra, Legacy of R.L. Moore Conference, August 2012.
- *The Isoperimetric Inequality and Free Boundary Problems,* University of York, October 2011.
- *Discrete Wavelets and Image Compression,* Plenary Lecture at the Florida Mathematical Association of America meeting, February 2011.
- *A minimal area problem for Bergman space: Recent Developments,* International Conference on Complex Analysis and Dynamical Systems, Israel, May 2011.
- *Zeros of certain kernel functions in the Fock space,* Complex Analysis and Dynamical Systems, Israel, May 2009; invited speaker, University of Cyprus, May 2009; American Mathematical Society Special Session on Function Theoretic Operator Theory, Joint Mathematics Meetings, Washington D.C., January 2009.
- *Lifting Algorithms for Discrete Wavelet Transformations,* Invited Speaker, Joint Annual Meeting of the Florida section of the Mathematical Association of America and the Florida Two-Year College Mathematics Association, Florida Gulf Coast University, February 2009.
- *A Student Project on Lifting Algorithms for Wavelet Transformations,* Mathematical Society of America Special Session on Wavelets for UnRadergraduates, Joint Mathematics Meetings, Washington D.C., January 2009.
- *The Isoperimetric Inequality and Free Boundary Problems,* International Conference on Complex Analysis and Mathematical Physics, Sophus Lie Conference Center, Norway, June 2008.
- *The Isoperimetric Inequality and Free Boundary Problems,* University of Cyprus, May 2008.
- *A Survey of extremal problems for non-vanishing functions,* University of Cyprus, May 2008.
- *A Schwarz-Pick type problem in H^p for $0 < p < 1$,* Classical Analysis Conference, University of North Carolina, Chapel Hill, NC, September 2007.
- *Extremal problems in H^p for $0 < p < 1$,* Conference on Extremal Problems in Complex and Real Analysis, Russia, May 2007.
- *Non linear extremal problems in Bergman spaces,* New Trends in Complex and Harmonic Analysis, an international conference on Analysis and Mathematical Physics, Norway, May 2007.
- *Extremal problems for non-vanishing functions in Bergman spaces,* Southeastern Analysis Meeting, Richmond, Virginia, March 2007.
- *Extremal problems and duality for non-vanishing functions,* Complex Analysis and

Dynamical Systems, Israel, January 2006.

- *The Isoperimetric Problem,* Invited addresses at the MAA section meeting of the Washington D.C., Virginia, Maryland section, November 5, 2005.
- *The Isoperimetric Inequality and Applications to Hydrodynamics*, Virginia Tech in Blacksburg, VA, October 2005.
- Served on a career advice panel for graduate students and postdocs at Washington University in St Louis, May 2005.
- *Extremal problems for non-vanishing functions in Bergman space,* Southeastern Analysis Meeting, April 2005.
- *Extremal problems in Hardy and Bergman spaces,* University of Arkansas, March 2005.
- *Anything still to be discovered about power series? The Bohr phenomenon!* Bucknell University, September 2004.
- *The Bohr Phenomenon and Extremal Problems in Hardy Spaces,* Complex Function Theory Days, Bar-Ilan University, Israel, June 2004.
- *Extremal Problems in Hardy and Bergman Spaces,* First Joint International Meeting of the AMS-RSME, Seville, Spain, June 2003.
- *A Bohr phenomenon in Hardy spaces*, Tag der Funktionentheorie, Metz, France, June 2003.
- *Coefficient estimates for Hardy and Bergman functions*, Spaces of Analytic Functions Conference, Marseille, France, October 2002.
- *Maximal Fourier Coefficients of H^p Functions*, Special Session on Harmonic Analysis, AMS Eastern Section Meeting, Williamstown, Massachusetts, November 2001.
- *A Jensen-type Theorem*, Special Session on Complex Variables, Joint Meetings of the AMS-MAA, January 2000.
- *Old Tricks for New Dogs: the Creation of a computer lab manual,* Joint Meetings of the AMS-MAA, January 1999.

Teaching

Graduate Students Directed

1. Clifton Garrison, started with me Fall 2023, currently studying Hardy spaces of analytic functions and preparing for third qualifying exam. Expected graduation Spring 2025.

2. *Advances and Applications of Optimal Polynomial Approximants,* Raymond Centner, Ph.D. thesis advisor, graduated May 2021. Currently working as a mathematics faculty member at the University of Southern Maine.

3. *Zeros of Harmonic Polynomials and Related Applications,* Azizah Alrajhi, Ph.D. thesis advisor, graduated December 2021. Currently working as a mathematics faculty member at King

Abdulaziz University.

4. *Linear Extremal Problems in the Hardy Space Hp for 0 < p < 1,* Robert Connelly, Master's thesis advisor, graduated Spring 2017.

5. *Analytic Functions in Smirnov Classes Ep with Real Boundary Values,* Lisa DeCastro, Ph.D. thesis, co-advisor, graduated Spring 2013.

6. *A Survey of the Development of Daubechies' Scaling Functions,* Amber Age, Master's thesis advisor, graduated Summer 2010.

7. *Statistical Idealities and Expected Realities in the Wavelet Techniques used for Denoising,* Eric DeNooyer, Master's thesis advisor, graduated Spring 2010.

8. *Orthogonal Filters and the Implications of Wrapping on Orthogonal Wavelet Transformations,* Sarah Bleiler, Master's Thesis advisor, graduated Fall 2008. Currently working as a faculty member in mathematics education at Middle Tennessee State University.

Additional Thesis/Dissertation Committees

1. *A Narrative Inquiry into the experience of a Novice Teacher's Mathematical Identity through Belonging to Mathematical Communities,* Kelly Navas, graduating Fall 2023 (already defended her thesis).

2. *Data-Driven Learning Algorithm Via Densely-Defined Multiplication Operators and Occupation Kernels*, John Kyei, graduated Spring 2023.

3. *Riemann Hilbert Problems for a non-local reverse-time non-linear second-order and fourth-order AKNS System of Multiple Components and Exact Soliton Solutions,* Alle Adjiri, graduated Summer 2021.

4. *Prevalence of typical images in high school geometry textbooks,* Megan Cannon, Master's thesis committee, graduated Summer 2017.

5. *Putnam's Inequality and Analytic Content in the Bergman Space,* Matthew Fleeman, Ph.D. dissertation committee, graduated Summer 2016.

6. *On Spectral Properties of Single Layer Potentials,* Seyed Zoalroshd, Ph.D. dissertation committee, graduated Summer 2016.

7. On Algorithmic Fractional Packings of Hypergraphs, Jill Dizona, Ph.D. dissertation committee, graduated Spring 2012.

8. *Problems in Classical Potential Theory with Applications to Mathematical Physics,* Erik Lundberg, Ph.D. dissertation committee, graduated Spring 2011.

9. *Geometric Transformations in Middle School Mathematics Textbooks,* Barbara Zorn, Ph.D. dissertation committee, graduated Fall 2010.

10. *Maxwell's Problem on Point Charges in the Plane,* Kenneth Killian, Master's thesis committee, graduated Summer 2008.

11. *Ferrite-Ferroelectric Thin Films with Tunable Electrical and Magnetic Properties,* Ranko Heindl, physics Ph.D. dissertation, committee chair, graduated Fall 2006.

Post-Doctoral Student Directed

- Co-mentored a graduate student from Sweden, Linus Bergqvist, who came for a research visit to USF in Spring 2022, and worked on inner functions and extremal problems in multiply-connected domains.
- Myrto Manolaki, 2016 – 18, Universality and extremal problems for analytic functions.

Undergraduate Research Students Directed

1. *Harmonic Polynomials and Gravitational Microlensing, Nicole Hudson, 2015 - 2017.*
2. *Harmonic Polynomials and their zeros, Hunter Jackson, 2014-15.*
3. *Zeros of Harmonic Polynomials*, Clifton Garrison, Spring 2014.
4. *Discrete Wavelet Transformations in Image Processing,* Karen Grant, Spring - Fall 2013.
5. *Math in Action: Making Math Fun in the High School Classroom,* Beth Liebspach, Summer 2011 – Summer 2012.
6. *Facial Recognition in Static Images using the Haar Wavelet Transform,* Joseph Gonzalez, Brian Holder-Chow Lin On, September 2011 – January 2012.
7. *Wavelets and Satellite Imaging,* Pedro Gomez, Fall 2009 – Summer 2011.
8. *Efficiently Programming RGB to HSI Conversion,* Joseph Gonzalez, Brian Holder-Chow Lin On, Michael Miller, Robert Le, September 2010 – August 2011.

9. *Wavelets and applications to image processing,* Tyson DiLorenzo, 2007-2008; *Lifting in discrete wavelet transformations,* 2008-2009, Tyson DiLorenzo.
10. *Linear optimization for polynomials,* Gabriel Zayas-Caban, 2007-2008.
11. *Coefficient Estimates in H^p spaces for $0 < p < 1$*, Karen Vaughan, Clare Boothe Luce summer scholar, summer 2001.
12. *The Isoperimetric Inequality*, Jim Jessup, senior project, spring 2003.
13. *Topics in Knot Theory,* Kerri Pisano, Clare Boothe Luce summer scholar, summer 2004.

Curriculum Development

- Developed flipped classroom materials for Calculus 1, including a complete set of course videos and class inquiry activities, Fall 2023.
- Developed a complete set of lecture videos for Real Analysis 1 (graduate class), first implemented in Fall 2020.
- Developed process oriented guided inquiry activities and training materials to be used in the pre-calculus and calculus classroom and implemented at the University of South Florida for groups of 3 – 4 students in a guided inquiry learning environment for all sections of Calculus 1.
- Created a "Discrete Wavelets" undergraduate course at the University of South Florida integrating the mathematics from linear algebra and harmonic analysis used in digital image processing applications. The course includes a significant use of scientific programming (via Mathematica) as a problem solving tool.
- Created, with a team of teachers from Hillsborough County and university faculty from the University of South Florida, a professional development course on "number sense" for elementary school teachers (through Project A.C.E.).
- At the University at Albany, designed course Maple laboratory manual to incorporate the use of Maple in the classroom.
- Created a statistics course at Seton Hall University for social science majors, integrating a daily use of SPSS software in the classroom. This course is now the primary statistics course taken by non science majors.
- Used Maple and Mathematica extensively in the teaching of intermediate algebra, calculus, differential equations, and discrete wavelets courses.
- Developed activities in elementary probability and used graphing calculators at the Center for Talented Youth in the teaching of statistics to gifted middle school students.

Courses taught

- University of South Florida: Engineering and "Regular" Calculus I, II, and III, Vector Calculus, Differential Equations, Discrete Wavelets, Continuous Wavelets (graduate), Geometry, Real Analysis 1 and 2 (graduate), Complex Analysis (graduate), Intermediate Analysis I and II, Capstone Course, High School Methods for Teachers, Geometry for Teachers, Number Concepts for Teachers, Algebra Concepts for Teachers.

- Seton Hall University: Mathematics courses for mathematics and computer science majors at Seton Hall University, including all courses in our calculus sequence, Foundations of Mathematics (where students learn how to construct and evaluate mathematical proofs), Real Analysis 1 and 2, Differential Equations, Complex Analysis, Junior seminar class (where students learn about how to conduct a research project in mathematics). Service courses for other departments, such as Intermediate Algebra, Elementary Statistics, Statistical Models for the Social Sciences, courses in the calculus sequence for science students.

- Center for Talented Youth: CTY is a program run by Johns Hopkins University for gifted children. I taught 2 courses for middle school and early high school students. One was a self-paced algebra class, and the other was a probability and statistics class. Duties included design and development of classroom materials, supervision of a teaching assistant, along with all usual lecture and grading activities.

- University at Albany: ran a problem session for a Mathematics for Education course.

Faculty and Graduate Student Consultant

I was a statistical software consultant (for the software SPSS) for statistics projects of faculty at Seton Hall University and graduate students in the College of Education for 2 years (2001-2003).

High School Outreach

- I was part of a team that ran the "Andrushkiw" competition at Seton Hall University since 1999. This is an annual mathematics competition for high school students in the New Jersey area. My duties included giving training courses for high school teachers while their students competed, welcoming students, and

helping to proctor and grade the exams.

- I was part of a team that organized a "Sonia Kovalevsky" high school day at the University at Albany. These days are funded through the Association for Women in Mathematics and are designed to encourage high school girls to study mathematics.

Course Coordination

I was the course coordinator for Calculus 1 at USF for several semesters and course coordinator for our lower level intermediate algebra class at Seton Hall University. Duties included training adjuncts and being a resource for them in case of problems, writing and coordination of laboratory materials, review and final exams.

Project NExT Fellowship

I was awarded a Project NExT (New Experiences in Teaching) fellowship in 1999. Project NExT is a group of young mathematics faculty members across the US who are involved in activities connected to innovative teaching and professional development.

Service

Conferences and workshops organized/co-organized

1. *Harmonic and Complex Analysis: Modern and Classical, An international conference in memory of Professor Lawrence Zalcman*, Bar Ilan University, Israel, June 2023.
2. *Association of Women in Mathematics Workshop,* AMS Joint Meetings, January 2023 and (planned) January 2024.
3. *Computational Methods and Function Theory International Conference,* hybrid online and in person, Federico Santa Maria University, Chile, January 2022.
4. Summer School on *Spectral Theory and Applications,* University of Laval, Québec City, Canada, July 2016.
5. *Completeness problems, Carleson measures, and spaces of analytic functions,* Mittag-Leffler Institute, July 2015.
6. *Implementing Process Oriented Guided Inquiry (POGIL) Activities for Calculus I*, Professional Enhancement Program (PREP) workshop for faculty June 2013 and June 2014. A more advanced PREP workshop on *Advanced Techniques in the Development and Implementation of POGIL Activities in Mathematics* in July 2015.
7. Mini course on *Implementing Process Oriented Guided Inquiry (POGIL) Activities for*

Calculus I, Joint Mathematics Meetings, 2015.

8. Israel-USA Conference on Complex Analysis and Dynamical Systems VII, May 2015.
9. Israel-USA Conference on Complex Analysis and Dynamical Systems VI, May 2013.
10. *Florida Analysis Seminar (FLOAS), April 28, 2012.*
11. *Florida Analysis Seminar (FLOAS),* May 14, 2011.
12. *Wavelets and Applications: Project Building,* workshop run for faculty at the Institute for Mathematics and Applications, Minnesota, July 2011.
13. *Wavelets and Applications: A Multidisciplinary Undergraduate Course with an emphasis on Scientific Computing,* Professional Enhancement Program (PREP) workshop for faculty, June 2-5, 2009, USF.
14. *25th Southeastern Analysis Meeting,* International Conference, March 20-22, 2009, USF.
15. *MAA Session on Wavelets for Undergraduates,* Joint Mathematics Meetings, Washington, D.C., January 6, 2009.
16. *Wavelets and Applications: A Multidisciplinary Undergraduate Course with an emphasis on Scientific Computing,* Professional Enhancement Program (PREP) workshop for faculty, June 4-7, 2008, University of St. Thomas, St. Paul, Minnesota.
17. *Joint Norway-USA Workshop in Complex Analysis and Mathematical Physics,* International Conference, June 9-13, 2008.
18. *Module Writing Workshop,* workshop for faculty, MathFest, August 6-7, 2008.
19. *Student Paper Session,* Undergraduate Research Conference, Rutgers University, March 27, 2004.

Referee/editor for the journals: *Analysis and Mathematical Physics (editor), Complex Analysis and Operator Theory, Complex Variables and Elliptic Equations, Computational Methods and Function Theory (editor), Journal d'Analyse, Journal of Mathematical Analysis and Applications, JSTEM, La Matematica, Kyoto Journal of Mathematics, Proceedings of the American Mathematical Society, Research in Collegiate Mathematics Education.*

University of South Florida Department, College, and University Service, and service to the community

- Developed and implemented several workshops and programs for faculty at USF with the TILT leadership team as part of the STEER grant, geared towards training faculty in evidence-based practices in the classroom. In particular, ran the peer observation program, from 2015-2021.
- Member and now current team leader for the GRE committee tasked with creating and evaluating GRE mathematics subject test exams, since 2018.
- Served as a reviewer for grants for NSF, Department of Undergraduate Education

Division (2018).
- Member of SNSM and CAS Tenure and Promotion Committees on several occasions, in particular Chair of SNSM T&P and member of CAS T&P in 2019.
- CAS Diversity Committee Member, 2021.
- Member of faculty search committees for research faculty as well as instructors on several occasions, in particular 2019, 2021, 2023.
- Member of the Calculus Task Force, Department of Mathematics, 2016 – 2018.
- Member of College of Arts and Sciences and School of Natural Sciences and Mathematics Undergraduate Committees, 2014-15.
- Undergraduate Committee Member and Chair, Mathematics, on and off, since 2007.
- Member of the Department Advisory Committee on several occasions (2018, 2023).
- Department assessment coordinator, 2013 – present.
- Member of the Quality Enhancement Plan (QEP) Planning Committee, 2013-14.
- Mathematics Advisory Committee, 2012-2014.
- College of Arts and Sciences Faculty Council Member, Fall 2010 – Spring 2013.
- Wrote qualifying exams for real analysis (Spring 2012, Fall 2013, Fall 2014, Spring 2015).
- Member of various hiring committees, 2008 - present (mathematics instructor search; mathematics chair search; chemistry education faculty search).
- Faculty Assessment Coordinator for the General Education Council, Fall 2010 – Spring 2011.
- Colloquium Committee, 2008-2009; 2012-2013.
- Faculty Development Committee, College of Arts and Science, 2007/08. Chair in 2008/09.
- Reviewer for the 21st Century Teaching and Learning Innovative Learning Centered Grant, Spring 2009.
- Member of the Conceptual Framework Committee for the College of Education, Spring 2009.
- Submitted calculus courses and capstone course for general education certification, 2007 – present.

Seton Hall University Department, College, and University Service

- Recruited mathematics majors by running “open house” days at Seton Hall.
- Assisted with placement testing of freshmen and transfer students.
- Organized the department colloquium and on several occasions invited speakers.

- Organized and invited speakers for “job fair” and graduate school activities for majors.
- Advised undecided Arts and Science students (about 50 students a semester).
- Search committee for a Mathematics and Computer Science position.
- Was on several Arts and Science College committees (by-laws, executive committee, Faculty secretary).
- Member of the University Senate.

Professional Memberships

I am a member of CITRUS (Center for the Improvement of Teaching & Research in Undergraduate STEM Education) at the University of South Florida, the American Mathematical Society, the Association for Women in Mathematics, the Mathematical Association of America, the National Council of Teachers of Mathematics, and PKAL (Project Kaleidoscope). I have been a Project NExT (New Experiences in Teaching) fellow since 1999.