

# Ryan Tully-Doyle

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Research areas: functional analysis, several complex variables, free noncommutative analysis, operator analysis

## EDUCATION

- 2015 PhD in Mathematics, University of California, San Diego  
Dissertation: “On the representation and behavior of certain classes of holomorphic functions in several variables”  
Advisor: Jim Agler
- 2001 BS in Mathematics, *magna cum laude*, California Polytechnic State University, San Luis Obispo

## PROFESSIONAL APPOINTMENTS

- 2017- University of New Haven, Assistant Professor  
2015-2017 Hampton University, Assistant Professor

## PUBLICATIONS

### REFEREED JOURNAL ARTICLES

- 2018 1. Representation of free Herglotz functions (with J. E. Pascoe and B. Passer), to appear, *Ind. Univ. J. Math*, [arXiv:1607.00407](https://arxiv.org/abs/1607.00407)
- 2017 2. Free functions with symmetry (with J. E. Pascoe, D. Cushing), *Math. Z.* 2017,

## DOI.

- 2017 3. Free Pick functions: representations, asymptotic behavior and matrix monotonicity in several noncommuting variables (with J. E. Pascoe), *J. Func. Anal.*, 2017 **273**(1) 283 - 328, [arXiv:1309.1791](#)
- 2016 4. Analytic functions on the bidisk at boundary singularities via Hilbert space methods, *Oper. Matrices*, 2017 **11**(1) 55-70 [arXiv:1607.01413](#)
- 2016 5. Convex entire noncommutative functions are polynomials of degree two or less (with J.W. Helton, J. E. Pascoe, and V. Vinnikov), *Integral Equations Operator Theory*, 2016 **86**(2) 151-163 [arXiv:1501.06000](#)
- 2016 6. Nevanlinna Representations in Several Variables (with J. Agler, N.J. Young), *J. Func. Anal.* 2016 **270**, [arXiv:1203.2261](#)
- 2012 7. Boundary Behavior of Analytic Functions of Two Variables via Generalized Models (with J. Agler, N.J. Young), *Indag. Math.* 2012 **23** 995-1027, [arXiv:1203.6589](#).

## PAPERS IN SUBMISSION

- 2016 1. Cauchy transforms arising from homomorphic conditional expectations parametrize free Pick functions but those arising from conditional expectations do not (with J. E. Pascoe), in revision, [arXiv:1607.06737](#)

## PAPERS IN PREPARATION

- 2018 1. Escaping non-tangentiality: towards a higher order Julia-Carathéodory theory based on amortized tangential approach. (with J. E. Pascoe and M. Sargent).

## GRANTS AND AWARDS

### GRANTS

- 2018 University of New Haven Summer Research Grant. Amount: \$3250.

### AWARDS

- 2015 “Super Teacher”, Hampton University. Best teacher in Mathematics Department as chosen by Hampton University mathematics majors.
- 2012 Research Assistantship, University of California, San Diego.
- 2001 Charles J. Hanks Award, California Polytechnic University, San Luis Obispo. Awarded annually to the most outstanding undergraduate mathematics student.
- 1999 Ralph E. Weston Memorial Award, California Polytechnic University, San Luis Obispo. Awarded annually to the best Putnam Exam result at the university.

1997-2001 Meritorious, Mathematical Competition in Modeling, California Polytechnic University, San Luis Obispo

## CONFERENCES AND PRESENTATIONS

### RESEARCH TALKS

- 2018 AMS Eastern Sectional Meeting, invited, University of Delaware, September 2018
- 2018 "Escaping non-tangential approach", invited seminar talk, University of Florida, August 2018
- 2018 "Escaping non-tangential approach", International Workshop on Operator Theory and Applications, invited, China Eastern Normal University, Shanghai, July 2018
- 2017 "Rational inner functions on the bidisk and the structure of boundary derivatives of Schur functions" AMS Sectional Meeting, Indiana University, April 2017
- 2017 "Derivatives of holomorphic functions and operator theory", invited talk, University of New Haven, Mar. 2017
- 2017 Joint Mathematical Meetings, Atlanta, contributed, Jan. 2017
- 2016 "Representations of Pick functions", International Workshop on Operator Theory and Applications, Washington University, invited, July 2016
- 2016 Joint Mathematical Meetings, Seattle WA, Jan 2016, AMS Session in Noncommutative Analysis, invited, Jan. 2016
- 2015 "Representations of functions in the Pick class", Joint Mathematical Meeting, San Antonio, contributed, Jan. 2015
- 2014 "Boundary behavior of holomorphic functions and Hilbert space geometry", Differential Geometry Seminar, Arizona State University, invited, Sept. 2014
- 2014 "Boundary behavior of Schur functions on the bidisk and generalized models", Function Theory in Several Complex Variables in Relation to Modeling Uncertainty, ICMS, Edinburgh, Scotland, invited, July 2014
- 2014 "Representations of functions in the Pick class", Great Plains Operator Theory Symposium, Kansas State University, contributed, May 2014
- 2014 "Boundary behavior of Schur functions on the bidisk and generalized models", contributed talk, Southeastern Analysis Meeting, Clemson University, contributed, March 2014

### CONFERENCES AND EXPOSITORY TALKS

- 2018 "Is  $1 + 2 + 3 + \dots = -1/12$ ?", NES/MAA Sectional, University of New Haven, June 2018
- 2017 Hilbert Function Spaces, Palazzo Feltrinelli, Gargnano, Italy, May 2017
- 2016 Virginia Operator Theory and Complex Analysis Meeting, University of Rich-

- mond, Oct. 2016
- 2015 Southeastern Analysis Meeting, Athens GA, March 2015
- 2014 Joint Math Meetings, Baltimore MD, January 2014
- 2013 Hilbert Function Spaces, Palazzo Feltrinelli, Gargnano, Italy, May 2013

#### DEPARTMENT AND SEMINAR TALKS

- 2018 “Is  $1 + 2 + 3 + \dots = -1/12$ ?”, Department Seminar, September 2018
- 2016 “The structure of derivatives of Schur functions and related operators”, Real Analysis Seminar, Hampton University, September 2016
- 2016 “Free analysis, matrix convexity, and free power series”. Research Seminar, Hampton University, October 2015
- 2013 “Nevanlinna representations of Pick functions in noncommuting variables”, Free Analysis Seminar, UC San Diego, La Jolla CA, August 2013
- 2012 Free Analysis Seminar, UC San Diego, La Jolla CA, September 2012

#### UNDERGRADUATE RESEARCH ADVISING

- 2018 Tyler Balon. Developing an updated curriculum for Mathematical Cryptography course in CS.
- 2018 Tyler Balon. Randomness in website URLs.
- 2018 Robert Schmicker. A pursuit simulation incorporating randomness with applications in biology.
- 2018 Angela Maestropietro. On the numerical range of small matrices.

#### TEACHING EXPERIENCE

##### AS INSTRUCTOR

- Mathematics for the Liberal Arts (Fall 2015)
- Modern Geometry (Fall 2015, Fall 2018)
- Precalculus (Fall 2016)
- Calculus (Spring 2016)
- Calculus II (Fall 2016)
- Vector Calculus (Spring 2016, Spring 2018)
- Discrete Mathematics and Combinatorics (Spring 2016, Fall 2016)
- Linear Algebra (Spring 2016, Spring 2018)
- Probability and Statistics for Engineers (Fall 2016)
- Abstract Algebra (Spring 2017)
- Graduate Real Analysis (Spring 2017)
- Probability and Statistics I (Fall 2017)

Advanced Calculus (Fall 2017)  
Math Modeling (Fall 2017)  
Advanced Mathematical Modeling (Spring 2018)  
Real Analysis (Spring 2018)  
Probability and Statistics II (Spring 2018)  
Elementary Statistics (Spring 2018)  
Advanced Linear Algebra (Summer 2018)  
Mathematical Cryptography (Summer 2018)

#### AS TEACHING ASSISTANT

Introductory Calculus  
Linear Algebra  
Vector Calculus  
Differential Equations  
Complex Analysis  
Real Analysis  
Introduction to Analysis

#### SERVICE TO THE PROFESSION

2018- Referee for *J. Math. Anal. Appl.*, *New York J. Math.*  
2018 Local organizer for NES/MAA Sectional, Spring 2018  
2016- AMS Math Reviews

#### DEPARTMENTAL SERVICE

Mathematics department computer systems administrator, Summer 2018-present  
Math and Physics Club Faculty Advisor, University of New Haven, Fall 2017  
Selection Committee, University of New Haven, Fall 2017  
Outreach Committee, University of New Haven, Fall 2017  
Search Committee, Hampton University, Spring 2017  
Mathematics Department Graduate Committee, Hampton University, Spring 2016-  
Spring 2017  
Data and assessment administrator, Trackdat software, Hampton University Math-  
ematics Department, Spring 2015-present  
Mathematics advisor to undergraduate majors, Hampton University, Fall 2015-  
present  
Course coordinator, Calculus, Hampton University, Spring 2016  
Hampton University Honors Day, Spring 2016, Spring 2017

Department Research Seminar Organizer, Hampton University, Fall 2015-present  
Quality Enhancement Program Committee, Hampton University, 2015  
Undergraduate Curriculum Committee, Hampton University, 2015  
Mathematics Club Mentor, Hampton University, 2015

## OUTREACH

University of New Haven Accepted Student Day, Spring 2018  
University of New Haven Open House activities, Fall 2017  
Hampton University Conference on the Black Family, Spring 2016  
Hampton University High School Day, Fall 2015, Fall 2016

## LANGUAGES

English - native  
Spanish - can read with dictionary  
French - can read with dictionary

## PROFESSIONAL MEMBERSHIPS

American Mathematical Society  
Mathematical Association of America