Dr. Ronald A. Walker

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Education

University of Michigan, Ann Arbor, MI
Ph.D. in Mathematics, August 2003
Dissertation: "Concerning the Characterization of Boundaries of Holomorphic 1-Chains within Complex Surfaces"
Advisor: Dr. David Barrett

University of Richmond, Richmond, VA
Bachelor of Science in Mathematics, with Honors, and Computer Science, May 1998
Summa Cum Laude

Positions

Associate Professor, Penn State Harrisburg, Middletown, PA, 2013-present
Honors Director, Penn State Harrisburg, Middletown, PA, 2013-present
Assistant Honors Director, Penn State Harrisburg, Middletown, PA, 2012-2013
Assistant Professor, Penn State Harrisburg, Middletown, PA, 2007-2013
Visiting Assistant Professor, Juniata College, Huntingdon, PA, 2006-2007
Ross Assistant Professor, The Ohio State University, Columbus, OH, 2003-2006

Honors and Fellowships

National Science Foundation Graduate Research Fellowship, 1998-2000, 2002-2003
Regent's Fellowship, University of Michigan, 2000-2002
Summer Instructorship, University of Michigan, May-June 2001
Phi Beta Kappa, University of Richmond, 1997
Pi Mu Epsilon, University of Richmond, 1997
Outstanding Mathematics Student, University of Richmond, 1996,1997, 1998

Research Experience

Present Research, 2003 - present
Specializing in the area of several complex variables with particular interests connected to boundaries of analytic varieties and holomorphic chains, in particular exploring how the ambient complex space affect such question. Also researching some connected algebraic topics such as linear dependence, multisymmetric function theory, and rationality criteria and the symbolical computational theory related to such.

Graduate Research, University of Michigan, January 2001 - May 2003
Advisor: Dr. David Barrett
Topic: Characterization of boundaries of holomorphic 1-chains within some complex surfaces

Undergraduate Honors Research, University of Richmond, summer 1996, 1997 - 1998
Advisor: Dr. William T. Ross
Topic: Solutions to the Dirichlet problem with rational boundary data and characterization of zero sets of harmonic functions

REU in Matrix Analysis, College of William and Mary, summer 1997
Advisor: Dr. Ilya Spitkovsky
Topic: Almost periodic factorization of block triangular matrices

Teaching Experience

Associate Professor, Penn State Harrisburg, Middletown, PA
- 6 semesters of teaching experience encompassing 12 different class sections
- Taught 3 sections of introductory courses in first year calculus (3 sections) with class sizes approximately ranging from 5 to 40.
- Taught 6 sections of advanced courses in formal proof writing and discrete mathematics (4 sections), operations research (1 section) and mathematical finance (1 section) with class sizes roughly ranging from 5 to 30.
- Taught 3 sections of junior honors courses including an interdisciplinary seminar (2 sections) and honors thesis preparation (1 section) with class sizes roughly ranging from 5 to 20.

Assistant Professor, Penn State Harrisburg, Middletown, PA
- 12 semesters of teaching experience encompassing 32 different class sections
- Taught 19 sections of introductory courses in trigonometry (1 section), algebra (1 section), business calculus (1 section), first year calculus (7 sections), honors first year calculus (3 sections), linear algebra (3 sections), and first year seminar (3 sections) with class sizes approximately ranging from 5 to 40.
- Taught 13 sections of advanced courses in linear algebra (3 sections), operations research (5 sections), abstract algebra (3 sections), complex analysis (1 section), and coding theory (1 section) with class sizes roughly ranging from 5 to 25.
- Supervised one honors thesis in operations research.

Visiting Assistant Professor, Juniata College, Huntingdon, PA
- 2 semesters of a general education quantative methods course with 20-30 students. Involved in-class computers (Minitab and Maple) and team-based work.
- 2 semesters of introductory calculus with 20-30 students. Courses involved substantial use of Maple lab assignments. (Texts by Hughes-Hallet, Gleason, McCallum, et al.)
- 1 semester of introductory linear algebra with 20 students
- 1 semester of junior/senior level abstract algebra

Ross Assistant Professor, The Ohio State University, Columbus, OH
- 4 quarters (5 sections total) of first year calculus. Each lecture section included 60-180 students and involved direction of 1-3 TA's who conducted recitation.
- 1 quarter of a sophomore-level multivariable calculus geared for engineering honors students. Class consisted of 40 students while directing one TA. (Text: Hughes-Hallet, Gleason, McCallum, et al.)
- 1 quarter of introductory linear algebra with two sections containing 20 and 30 students, respectively.
- 1 quarter of a first-year graduate course in real analysis.

Graduate Student Instructor, University of Michigan, Ann Arbor, MI
- 3 semesters of introductory calculus with sections consisting of 30 students. (2 semesters under a coordinated instructor system and 1 summer semester taught independently.) Group-based learning techniques used as part of in-class instruction and homework. (Text: Hughes-Hallett, Gleason, et al.)

Publications

Walker R., Regarding an adaptive algorithm for testing multivariate linear dependence, Linear Algebra and its Applications 434 (2011) 605-613

Walker R., Boundaries of holomorphic 1-chains within holomorphic line bundles over $\mathbb{CP}^1$, J. Geom. Anal. 20 (2010) 226-241

Walker R., Extended shockwave decomposability related to boundaries of holomorphic 1-chains within $\mathbb{CP}^2$, Indiana Univ. Math. J. 57 (2008) 1133-1172

Walker R., Characterizations of boundaries of holomorphic 1-chains within $\hat{\mathbb{C}} \times \hat{\mathbb{C}}$ and $\mathbb{C} \times \hat{\mathbb{C}}$, J. Geom. Anal. 18 (2008) 1159-1170

Walker R., Linear dependence of quotients of analytic functions of several variables with the least subcollection of generalized Wronskians, Linear Algebra and its Applications 408 (2005) 151-160

Karlovich Y., Spitkovsky I., Walker R., Almost periodic factorization of block triangular matrix functions revisited, Linear Algebra and its Applications 293 (1999) 199-232

Presentations

"Boundaries of Holomorphic Chains in Holomorphic Vector Bundles", Invited Conference Talk, Sectional Meeting of the AMS, March 2012

"The Dirichlet Problem for Various Types of Boundaries and Boundary Data", School Seminar Talk, Penn State Harrisburg, November 2011

"Boundaries of Holomorphic Chains in Vector Bundles over Complex Projective Space", Conference Talk, Southeastern Analysis Meeting, March 2011

"Multisymmetric Functions: Some General Issues and Connections to Complex Analytic Geometry", College Seminar Talk, Penn State Harrisburg, February 2011

"Rationality Criteria for Meromorphic Functions in Several Variables", Conference Talk, Southeastern Analysis Meeting, March 2010

"Boundaries of Holomorphic 1-Chains within Holomorphic Line Bundles Over the Riemann Sphere", Conference Talk, Southeastern Analysis Meeting, March 2009

"Line Bundles over the Riemann Sphere and Boundaries of Holomorphic 1-Chains", Department Seminar Talk, Penn State Harrisburg, February 2009

"Marginal Sets of Young-like Sets, Binomial Coefficient Expansions, and an Application to Algorithmic Complexity", Department Seminar Talk, Penn State Harrisburg, October 2008

"Trimming the Infinite to the Finite: An Application in Differential Algebra of Transfinite Induction and an Adaptive Algorithm", Department Seminar Talk, Penn State Harrisburg, February 2008

"Some Results in Partial Differential Linear Algebra and their Computational Complexity", Department Seminar Talk, Penn State Harrisburg, January 2008

"Blow-ups and Resolutions of Singularities", Math Club Talk, Penn State Harrisburg, November 2007

"Blow-ups and Resolutions of Singularities", Colloquium Talk, Juniata College, April 2007

"Meromorphic Whitney multifunction solutions to the sign-flipped Burgers equation with application to boundaries of analytic varieties", Conference Talk, AMS Sectional Meeting, March 2007

"Linear Dependence, Generalized Wronskians, and Young Diagrams too", Colloquium, Penn State Altoona, February 2007

"Boundaries of holomorphic 1-chains within line bundles over $\mathbb{CP}^1$", Seminar Talk, The Ohio State University, June 2006

"Boundaries of holomorphic 1-chains within holomorphic line bundles over $\mathbb{CP}^1$", Seminar Talk, Purdue University, April 2006

"Sums of Shockwave Solutions", Seminar Talk, The Ohio State University, April 2005

"Related Characterizations of Boundaries of Holomorphic 1-Chains within $\hat{\mathbb{C}} \times \hat{\mathbb{C}}$, $\mathbb{C} \times \hat{\mathbb{C}}$, and $\mathbb{C}^2$", Seminar Talk, The Ohio State University, February 2004

"Characterizations of Boundaries of Holomorphic 1-Chains within $\hat{\mathbb{C}} \times \hat{\mathbb{C}}$, $\mathbb{C} \times \hat{\mathbb{C}}$, and $\mathbb{C}^2$", Conference Talk, Midwest Several Complex Variables Conference, October 2003

"Several Complex Variables: You Can't Have Just One", Joint VIGRE Seminar Talk with Dan Jupiter, University of Michigan, March 2003

"Boundaries of Complex Analytic Varieties in $\mathbb{CP}^2$", Seminar Talk, University of Michigan, February 2002
"AP factorization of matrices", Conference Talk, Southeastern Analysis Meeting, February 1998
"AP factorization of matrices", Colloquium, University of Richmond, February 1998
"Solving the Dirichlet problem with rational functions", Conference Talk, Joint Meetings of AMS and MAA, January 1997
"Hot! Hot! Hot!: Two Problems in Harmonic Function Theory", Colloquium, University of Richmond, September 1996