

Curriculum Vita

William T. Ross

Roger Francis and Mary Saunders Richardson Chair in Mathematics

Contact

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Personal

- Born: 1964 in New York City
- Raised in Bronx, NY and Yonkers, NY
- Attended Yonkers public and parochial schools
- Attended Stepinac High School, White Plains, NY

Education

- Ph.D. (Mathematics) University of Virginia, 1991
- M.S. (Mathematics) University of Virginia, 1988
- B.S. (Mathematics) Fordham University, 1986

Professional Positions

- 2012 - present: Chair, Department of Mathematics and Computer Science, University of Richmond
- 2010 – present: Roger Francis and Mary Saunders Richardson Chair in Mathematics, University of Richmond
- 2005 – present: Professor of Mathematics, University of Richmond
- 1998 - 2005: Associate Professor of Mathematics, University of Richmond
- 1992 - 1998: Assistant Professor of Mathematics, University of Richmond
- 1991 - 1992: Visiting Assistant Professor of Mathematics, Lafayette College

Teaching Experience

Courses taught

- first year seminar, calculus (all levels), linear algebra, differential equations, real analysis, complex analysis, abstract algebra, statistics

Independent Study Courses

- senior thesis, harmonic analysis, advanced topics courses in complex analysis, real analysis, abstract algebra, linear algebra, operator theory

Special seminars and courses

- Calculus Conversations, Rethinking Undergraduate Mathematics, The Nature of Mathematics, Wavelet Seminar, Cool Math Seminar, Harmonic analysis seminar, Problems for the Millennium

Teaching awards

- 2005 – Nominated for SCHEV Teaching Award
- 2004 – Nominated for the Outstanding Mentor Award
- 2001 – Nominated for the SCHEV Teaching Award
- 1998 - Distinguished Educator Award
- 1993 – Nominated by the University of Richmond to Project Kaleidoscope
- 1991 - Award for excellence in teaching mathematics (University of Virginia)

Honor Thesis Students

- Jocelyn Xue (2014) - *Algebras of Toeplitz matrices*
- Jeff Zheng (2011) – *Rank-one perturbations of self-adjoint operators*
- Tim Ferguson (2006) – *Boundary values of Laplace transforms*
- Radek Stefanski (2004) – *Factorization of polynomials in several variables*
- Ron Walker (1998) - *Two problems in harmonic function theory*
- Andrew Pitts (1998) – *The Dirichlet problem and its physical applications*
- Michael Nimchek (1996) – *Banach spaces of analytic functions*
- Konstantin Kulev (1996) - *Ideals of the Lipschitz classes*

Publications

Books

1. (with S. R. Garcia and J. Mashreghi) *Finite Blaschke products and their connections*, under contract, Springer-Verlag.
2. (with S. R. Garcia and J. Mashreghi) *Introduction to model spaces and their operators*, Advanced Studies in Mathematics, Cambridge University Press, 2016.
3. (with A. Aleman and N. Feldman) *The Hardy space of a slit domain*, Frontiers in Mathematics, Birkhauser, 2009.
4. (with J. A. Cima and A. Matheson) *The Cauchy transform*, Surveys and Monographs, Vol. 125, American Mathematical Society, 2006.

5. (with H. S. Shapiro) *Generalized analytic continuation*, University Lecture Series, Vol. 25, American Mathematical Society, 2002.
6. (with J. A. Cima) *The backward shift on the Hardy space*, Surveys and Monographs, Vol. 79, American Mathematical Society, 2000.

Edited volumes

1. Bénéteau, Catherine; Condori, Alberto A.; Liaw, Constanze; Ross, William T.; Sola, Alan A. Some open problems in complex and harmonic analysis: report on problem session held during the conference Completeness Problems, Carleson Measures, and Spaces of Analytic Functions. *Recent progress on operator theory and approximation in spaces of analytic functions*, 207–217, Contemp. Math., 679, Amer. Math. Soc., Providence, RI, 2016.
2. (with E. Fricain and J. Mashreghi) *Invariant subspaces of the shift operator*. Proceedings of the CRM Workshop held at the Université de Montréal, Montréal, QC, August 26–30, 2013. Edited by Javad Mashreghi, Emmanuel Fricain and William Ross. Contemporary Mathematics, **638**. Centre de Recherches Mathématiques Proceedings. *American Mathematical Society, Providence, RI; Centre de Recherches Mathématiques, Montreal, QC*, 2015. viii+317

Research papers

1. (with I. Chalendar, P. Gorkin, J. Partington) ‘Clark measures and a theorem of Ritt’, to appear, *Mathematica Scandinavica*.
2. (with E. Fricain and A. Hartmann) ‘Multipliers between model spaces’, to appear, *Studia Mathematica*.
3. (with S. Garcia) ‘Approaching Cauchy’s theorem’, PRIMUS, [dx.doi.org/10.1080/10511970.2016.1234525](https://doi.org/10.1080/10511970.2016.1234525)
4. (with R. Cheng and J. Mashreghi) ‘Birkhoff-James orthogonality and the zeros of an analytic function’, *Computational Methods and Function Theory*, doi:10.1007/s40315-017-0191-5
5. (with S. Garcia and J. Mashreghi) Finite Blaschke products: A survey, Proceedings of the conference on Harmonic Analysis, Function Theory, Operator Theory and Applications, Bordeaux, June 1-6, 2015, Theta Foundation.
6. (with E. Fricain and A. Hartmann), ‘A survey on reverse Carleson measures’, Proceedings of the conference on Harmonic Analysis, Function Theory, Operator Theory and Applications, Bordeaux, June 1-6, 2015, Theta Foundation.
7. (with C. Beneteau, A. Condori, C. Liaw, A. Sola), ‘Some open problems in complex and harmonic analysis: report on the problem session held at the conference Completeness Problems, Carleson measures, and spaces of analytic functions’, *Contemporary Mathematics*, **679** (2016), 207 -- 217.
8. (with S. Garcia and J. Mashreghi), ‘Real complex functions’, *Contemporary Mathematics*, **679** (2016), 91 -- 128.

9. (with S. Garcia and R. T. W. Martin), 'Partial orders on partial isometries', *Journal of Operator Theory*, **75** (2016), 409 - 442.
10. (with E. Fricain and A. Hartmann), 'Concrete examples of $H(b)$ spaces', *Computational Methods and Function Theory*, **16** (2016), 287 - 306.
11. (with R. Cheng) An inner-outer factorization in L^p with applications to ARMA processes, to appear, *Journal of Mathematical Analysis and Applications*, **437** (2016), 396 - 418.
12. (with I. Chalendar, S. R. Garcia, and D. Timotin), 'An extremal problem for characteristic functions', *Transactions of the American Mathematical Society*, **368** (2016), 4115 - 4135.
13. (with A. Blandigneres, E. Fricain, F. Gaunard, and A. Hartmann), 'Direct and reverse Carleson embeddings for H_b spaces', *Indiana University Mathematics Journal*. **64** (2015), 1027 - 1057.
14. (with R. Cheng), 'Weak parallelogram laws in Banach spaces and applications to prediction theory', *Periodica Mathematica Hungaria*, **71** (2015), 45 - 58.
15. (with S. Garcia), 'Model spaces: a survey', *Contemporary Mathematics*, **638** (2015), 197 - 245..
16. (with A. Hartmann), 'Bad boundary behavior in star invariant subspaces I', *Arkiv for Matematik*, **52** (2014), 113 - 134.
17. (with S. Garcia and W. Wogen), 'C*-algebras generated by truncated Toeplitz operators', *Concrete operators, spectral theory, operators in harmonic analysis and approximation*, 181–192, *Oper. Theory Adv. Appl.*, **236**, Birkhäuser/Springer, Basel, 2014.
18. (with A. Blandigneres, E. Fricain, F. Gaunard, and A. Hartmann), 'Reverse Carleson embeddings for model spaces', *Journal of the London Mathematical Society*, **88** (2013), 437 - 464.
19. (with A. Aleman and R. T. W. Martin), 'On Livsic's theorem', *Journal of Functional Analysis*, **264** (2013), 999 - 1048.
20. (with A. Hartmann), 'Truncated Toeplitz operators and boundary values in nearly invariant subspaces', *Complex Analysis and Operator Theory*, **7** (2013), 261 - 273.
21. (with S. Garcia), 'Recent progress in truncated Toeplitz operators', *Blaschke products and their applications*, *Fields Institute Communications*, **65** (2013), 275 - 319.
22. (with A. Hartmann), 'Bad boundary behavior in star invariant subspaces II', *Annales Academiae Scientiarum Fennicae Mathematica*, **37** (2012), 467 - 478.
23. (with A. Hartmann), 'Boundary values in range spaces of co-analytic truncated Toeplitz operators', *Publicacions Matematiques*, **56** (2012), 191 - 223.
24. (with S. Garcia and D. Poore), 'Unitary equivalence to a truncated Toeplitz operator: analytic symbols', *Proceedings of the American Mathematical Society*, **140** (2012), 1281 - 1295.
25. (with F. Ross), 'The Jordan curve theorem is non-trivial', *Journal of Mathematics and the Arts*, **5** (4) (2011), 213 - 219.
26. (with S. Garcia and W. Wogen), 'Spatial isomorphisms of algebras of truncated Toeplitz operators', *Indiana University Mathematics Journal*, **59** (2010), 1971 - 2000.
27. (with J. Cima, S. Garcia, and W. Wogen), 'Truncated Toeplitz operators: spatial isomorphism, unitary equivalence, and similarity', *Indiana University Mathematics*

- Journal, **59**, 2010, 595 – 620.
28. (with S. Garcia), 'The norm of a truncated Toeplitz operator', CRM Proceedings and Monographs, **51**, 2010, 59 – 64.
 29. (with W. Wogen), 'Common cyclic vectors for unitary operators', Journal of Operator Theory, **62** (2009), 65 – 81.
 30. (with S. Garcia), 'A non-linear extremal problem on the Hardy space', Computational Methods and Function Theory, **9** (2009), 485 – 524.
 31. (with J. Cima and W. Wogen), 'Truncated Toeplitz operators on finite dimensional spaces', Operators and Matrices, **3** (2008), 357 – 369.
 32. 'Indestructible Blaschke products', Contemporary Mathematics, **454** (2008), 119-133.
 33. (with A. Matheson), 'An observation about Frostman shifts', Computational Methods and Function Theory, **7** (2007), 111 – 126.
 34. 'The classical Dirichlet space', Contemporary Mathematics, **393** (2006), 171 – 197.
 35. 'The backward shift on H_p ', Operator Theory, Advances and Applications, **158** (2005), 191 – 211.
 36. (with J. A. Cima and A. Matheson), 'The Cauchy transform', Operator Theory: Advances and Applications, **156** (2005), 79 – 111
 37. (with S. Richter and C. Sundberg) 'Zeros of functions with finite Dirichlet integral', Proceedings of the American Mathematical Society, **132** (2004), 2361 – 2365.
 38. (with W. R. Wogen), 'Common cyclic vectors for normal operators', Indiana University Mathematics Journal, **53** (2004), 1537 – 1550.
 39. (with J. A. Cima and A. Matheson) 'The backward shift on the space of Cauchy transforms', Proceedings of the American Mathematical Society, **132** (2004), 745 – 754.
 40. (with H. S. Shapiro) 'Prolongations and cyclic vectors', Computational Methods and Function Theory, **3** (2003), 453 – 483.
 41. (with A. Aleman and S. Richter) 'Pseudo-continuations and the backward shift', Indiana University Mathematics Journal, **47** (1998), 223 - 276.
 42. (with A. Aleman) 'The backward shift on weighted Bergman spaces', Michigan Mathematics Journal, **43** (1996), 291 - 319.
 43. (with A. Aleman and S. Richter) 'Bergman spaces on disconnected domains', Canadian Journal of Mathematics, **48** (1996), 225 - 243.
 44. 'Invariant subspaces of the harmonic Dirichlet space with large codimension', Proceedings of the American Mathematical Society, **124** (1996), 1841 - 1846.
 45. 'Invariant subspaces of Bergman spaces on slit domains', Bulletin of the London Mathematical Society, **26** (1994), 472 - 482.
 46. 'Analytic Besov spaces and invariant subspaces of Bergman spaces', Indiana University Mathematics Journal, **43** (1994), 1297 - 1319.
 47. 'An invariant subspace problem for $p = 1$ Bergman spaces on slit domains', Integral Equations and Operator Theory, **20** (1994), 243 - 248.
 48. (with S. Richter and C. Sundberg) 'Hyperinvariant subspaces of the harmonic Dirichlet space', Journal fur die reine und angewandte Mathematik, **448** (1994), 1 - 26.
 49. (with J. A. Ball) 'Weak-star limits of polynomials and their derivatives', Contributions to Operator Theory and its Applications, (I. Gohberg et al eds.), Operator Theory:

- Advances and Applications, **62**, Birkhauser-Verlag, Basel, 1993, 165 – 176.
50. 'The commutant of a certain compression', Proceedings of the American Mathematical Society, **118** (1993), 831 - 837.
51. 'Analytic continuation in Bergman spaces and the compression of certain Toeplitz operators', Indiana University Mathematics Journal, **40** (1991), 1363 - 1386.

Unpublished

- (with I. Chalendar) 'Compact operators on model spaces, arXiv:1603.01370.
- (with A. Aleman and S. Richter) 'Cyclic vectors for crescent domains', University of Richmond Technical Report #97-02.
- Advanced Topics in Calculus (Lecture Notes for a 4th semester Calculus course)

Sponsored Research

- National Science Foundation (Modern Analysis Program): *Virginia Operator Theory and Complex Analysis Meeting* (2004 – 2007)
- National Science Foundation (Modern Analysis Program): Research grants, 1993 – 1996, 1996 – 1998, 1998 - 2001, 2001 – 2003.

International Presentations

University of Lyon (France), University of Lille (France), University of Lens (France), University of Helsinki, Erwin Schrodinger Institute (Vienna), University of Bordeaux I (France), University of Toronto, Laval University (Quebec City), University of Montreal, Peoples Friendship University, (Moscow), Lund University (Sweden), Aristotle University (Thessaloniki), El Escorial, (Spain), Mathematisches Forschungsinstitut Oberwolfach (Germany), Trinity College (Dublin), Centre International de Rencontres Mathématiques (Marseille), Polish Academy of Sciences (Krakow), University of Southern Denmark (Odense), Norwegian University of Science and Technology, FernUniversität in Hagen (Germany)

US Presentations

Bucknell University; Christopher Newport University, Clemson University, College of William and Mary, East Carolina University, Fordham University, Furman University, George Mason University, Georgia Tech, Kansas State University, Memphis State University, Mount Holyoke College, Naval Academy, Pomona College, SUNY Albany, University of Alabama, UC-Santa Barbara, University of Florida, University of New Hampshire, University of North Carolina, University of South Alabama, University of South Florida, University of Tennessee, University of Virginia, Virginia Tech, Washington and Lee, Washington University, St. Louis

Conferences and Sessions Organized

- Special Session on *Operators, function spaces, and models (with A. Condori)*, at the American Mathematical Society meeting in Atlanta, January 2017.
- Special Session on *Operators, function spaces, and models (with A. Condori)*, at the American Mathematical Society meeting in Seattle, January 2016
- *Completeness problems, Carleson measures and spaces of analytic functions* (with C Beneteau, A. Condori, C. Liaw, A. Sola), Mittag-Leffler Institute, Stockholm, Sweden, June 2015.
- Special Session on *Invariant Subspaces of Function Spaces* (with C. Beneteau, A. Condori, and C. Liaw), University of Tennessee, Knoxville, TN, March 2014.
- CRM conference on Model Spaces (with E. Fricain and J. Mashreghi), Montreal, Canada, August 2013.
- Special Session (with S. Kouckekian) in *Complex Analysis and Operator Theory*, at the American Mathematical Society meeting at the University of South Florida, Fall 2011
- Special Session (with S. Richter) in *Operator Theory*, at the American Mathematical Society meeting in Richmond, Virginia, Fall 2010.
- Special session (with J. B. Conway and S. Kouckekian) in *Function theoretic operator theory*, at the American Mathematical Society meeting in Washington DC, Jan. 2009.
- *Southeastern Analysis Meeting*: University of Richmond, March 2007.
- Special session (with R. Mortini and E. Albrecht) in *Function spaces and their operators*, at a joint meeting of the American, German, and Austrian mathematical societies, Mainz, Germany, June 2005.
- Special Session (with Nathan Feldman) in *Linear operators on function spaces*, at an American Mathematical Society meeting at the University of North Carolina, Chapel Hill, October 2003.
- VOTCAM (Virginia Operator Theory and Complex Analysis Meeting): A regularly running (since 1992) conference held at various Virginia universities for mathematicians and graduate students interested in operator theory/complex analysis. Supported by NSF (2001 – 2007) .
- *Southeastern Analysis Meeting*: University of Richmond, March 1996.
- Special Session (with Paul Bourdon) in *Operators on Banach spaces of analytic functions*, at an American Mathematical Society meeting at the University of Richmond, November 1994.

Service

Professional Service

- Member of the American Mathematical Society
- Reviewer for Mathematical Reviews (over 120 reviews written)
- Referee for
 - Annales Academiae Scientiarum Fennicae Mathematica
 - Annals of Functional Analysis
 - Analysis Mathematica

- Arkiv der Mathematik
- Asian Journal of Mathematics
- Australian Journal of Mathematics
- Banach Journal of Mathematics
- Bulletin of the Korean Mathematical Society
- Bulletin of the London Mathematical Society
- Collectanea Mathematica
- Complex Analysis and Operator Theory
- Complex Analysis and its Synergies
- Computational Methods and Function Theory
- Concrete Operators, Contemporary Mathematics
- Czechoslovak Mathematics Journal
- Extracta Mathematica
- Houston Journal of Mathematics
- Integral Equations and Operator Theory
- Journal of Approximation Theory
- Journal of Contemporary Mathematical Analysis
- Journal of Functional Analysis
- Journal of the London Mathematical Society
- Journal of Mathematical Analysis and Applications
- Journal of Operator Theory
- Mathematische Annalen
- Mediterranean Journal of Mathematics
- Memoirs of the American Mathematical Society
- Operators and Matrices
- Proceedings of the American Mathematical Society
- Questiones Mathematicae
- Rocky Mountain Journal of Mathematics
- Taiwanese Journal of Mathematics
- Transactions of the American Mathematical Society
- Vietnam Journal of Mathematics
- Reviewer and panel member for the National Science Foundation
- Editorial advisory board: Concrete Operators

University Service

- Department Chair
- Mathematics Coordinator
- Hiring Committee Chair
- Nominating Committee
- Undergraduate Student Symposium Coordinator
- University Faculty Council
- Faculty Senate of Virginia

- University Scholars
- Colloquium Chair
- Calculus text review committee
- Goldwater Scholarship representative
- Phi-Beta-Kappa selection committee
- Distinguished Educator Award selection committee
- First-year and major advising
- Library Committee