

## Curriculum Vita

23 September 2019

Daniel B. Szyld

### EDUCATION:

Undergraduate studies at the School of Exact Sciences (Mathematics), Universidad Nacional de Buenos Aires, Argentina, 1973–1977 (no degree).

Courant Institute of Mathematical Sciences, New York University, 1977–1983. M.S. in Mathematics, 1979. Ph.D. in Mathematics (Numerical Analysis), 1983.

**DOCTORAL DISSERTATION:** A Two-level Iterative Method for Large Sparse Generalized Eigenvalue Calculations, October 1983. Olof B. Widlund, advisor.

### POSITIONS HELD:

Department of Mathematics, School of Exact Sciences, University of Buenos Aires, Teaching Assistant (April 1975–July 1977).

Agricultural Division, National Committee of Atomic Energy, Argentina, Research Assistant (June 1975 –July 1977).

Institute for Economic Analysis, New York University, Research Assistant (1978), Assistant Research Scientist (1978–1980), Associate Research Scientist (1980–1985).

Department of Computer Science, Courant Institute of Mathematical Sciences, New York University, Adjunct Professor (Spring 1984, Spring 1985).

Department of Computer Science, Duke University, Visiting Assistant Professor (1985–1986), Assistant Professor (1986–1990).

Department of Mathematics, Temple University, Associate Professor (1990–1995), Professor (since 1995).

**SHORT AND LONG TERMS SCIENTIFIC VISITS:** Pontificia Universidade Católica do Rio de Janeiro, Brazil; Kent State University, Kent, Ohio; IMPA, Instituto de Matematica Pura e Aplicada, Rio de Janeiro, Brazil; Charles University, Prague, Czechoslovakia (before 1993), Czech Republic (after 1993); University of Bologna, Italy; Universidad de Buenos Aires, Argentina; University of Wuppertal, Germany; University of Bielefeld, Germany; Technische Universität Berlin, Germany; Université du Littoral Côte d’Opale, Calais, France; University of Alicante, Spain; Polytechnic University of Valencia, Spain; Sandia National Laboratories, Albuquerque, New Mexico; École Centrale de Paris, France.

### AWARDS AND HONORS:

Featured interview, *IMAGE*, The Bulletin of the International Linear Algebra Society, Issue 61, Fall 2018, pp. 6–8, conducted by Froilán Dopico.

Achievement in Mathematics Award, College of Science of Technology 20th Anniversary Special Recognition, Temple University, November 2018.

Fellow of the Society of Industrial and Applied Mathematics, Class of 2017.

Fellow of the American Mathematical Society, Class of 2017.

Dean's Distinguished Award for Excellence in Research, College of Science of Technology, Temple University, October 2011.

Featured in the book *Hall of Fame* containing linocuts portraits of scientists in the field of scientific computing made by Henk van der Vorst. Published by SARA, the High Performance Computing Agency of the Netherlands, December 2010.

Distinguished Scholar, Department of Mathematics, Temple University, academic year 2008–2009.

Commemorative Medal of the School of Physics and Mathematics, Charles University in Prague, June 1997, for “outstanding work in Numerical Linear Algebra.”

**LANGUAGES SPOKEN:** English (fluent), Spanish (native), French (advanced), Italian (intermediate), Portuguese (intermediate), German (basic).

### PUBLICATIONS:

#### RESEARCH ARTICLES IN REFEREED JOURNALS:

1. Faye Duchin and Daniel B. Szyld, Application of Sparse Matrix Techniques to Inter-Regional Input-Output Analysis, *Economics of Planning*, **15** (1979) 142–167. *Zbl. Math.* **467**:90016.
2. Daniel B. Szyld, G. Sánchez Sarmiento and S. Tsujui de Santos, Análisis de Diversos Métodos Iterativos Para la Resolución del Problema  $Ax = \lambda Bx$  (Analysis of Several Iterative Methods for the Solution of the Problem  $Ax = \lambda Bx$ ), *SIGMA, Revista de Matemáticas Aplicadas*, **6** (1980) 1–16.
3. Daniel B. Szyld, Un Algoritmo Para Obtener una Submatriz y/o Permutaciones de una Matriz Esparcida (An Algorithm to Obtain a Submatrix and/or Permutations of a Sparse Matrix), *SIGMA, Revista de Matemáticas Aplicadas*, **8** (1982) 133–144.
4. Daniel B. Szyld, Bilateral Representation of Trade for Inter-Regional Models, *Applied Mathematical Modelling*, **8** (1984) 50–52.
5. Wassily Leontief, Faye Duchin and Daniel B. Szyld, New Approaches in Economic Analysis, *Science*, **228** (1985) 419–422.

6. Daniel B. Szyld, Conditions for the Existence of a Balanced Growth Solution for the Leontief Dynamic Input-Output Model, *Econometrica*, **53** (1985) 1411–1419. *Zbl. Math.* **585**:90018.
7. Faye Duchin and Daniel B. Szyld, A Dynamic Input-Output Model with Assured Positive Output, *Metroeconomica*, **37** (1985) 269–282.
8. Daniel B. Szyld, Criteria for Combining Inverse and Rayleigh Quotient Iteration, *SIAM Journal on Numerical Analysis*, **25** (1988) 1369–1375. *MR 90a*:65089. *Zbl. Math.* **665**:65031.
9. James O’Neil and Daniel B. Szyld, A Block Ordering Method for Sparse Matrices, *SIAM Journal on Scientific and Statistical Computing*, **11** (1990) 811–823. *MR 91f*:65087. *Zbl. Math.* **706**:65021.
10. Ivo Marek and Daniel B. Szyld, Comparison Theorems for Weak Splittings of Bounded Operators, *Numerische Mathematik*, **58** (1990) 387–397. *MR 92f*:65070. *Zbl. Math.* **694**:65023 (also **706**:65048).
11. Ivo Marek and Daniel B. Szyld, Splittings of  $M$ -Operators: Irreducibility and the Index of the Iteration Operator, *Numerical Functional Analysis and Optimization*, **11** (1990) 529–553. *MR 92f*:65069. *Zbl. Math.* **714**:65059.
12. Paul J. Lanzkron, Donald J. Rose and Daniel B. Szyld, Convergence of Nested Classical Iterative Methods for Linear Systems, *Numerische Mathematik*, **58** (1991) 685–702. *MR 92e*:65045. *Zbl. Math.* **718**:65022.
13. Ivo Marek and Daniel B. Szyld, Pseudoirreducible and Pseudoprimitive Bounded Operators, *Linear Algebra and its Applications*, **154–156** (1991) 779–791. *MR 92g*:47047. *Zbl. Math.* **731**:65042.
14. Daniel B. Szyld and Mark T. Jones, Two-stage and Multisplitting Methods for the Parallel Solution of Linear Systems, *SIAM Journal on Matrix Analysis and Applications*, **13** (1992) 671–679. *MR 92k*:65069. *Zbl. Math.* **754**:65037.
15. Daniel B. Szyld, A Sequence of Lower Bounds for the Spectral Radius of Nonnegative Matrices, *Linear Algebra and its Applications* **174** (1992) 239–242. *MR 93i*:15027. *Zbl. Math.* **758**:15013.
16. Andreas Frommer and Daniel B. Szyld,  $H$ -splittings and Two-stage Iterative Methods, *Numerische Mathematik* **63** (1992) 345–356. *MR 93j*:65048. *Zbl. Math.* **764**:65018.
17. Daniel B. Szyld and Olof B. Widlund, Variational Analysis of Some Conjugate Gradient Methods, *East-West Journal of Numerical Mathematics*, **1** (1993) 51–74. *MR 94m*:65059. *Zbl. Math.* **835**:65055.

18. Ivo Marek and Daniel B. Szyld, Iterative and Semi-iterative Methods for Computing Stationary Probability Vectors of Markov Operators, *Mathematics of Computation*, **61** (1993) 719–731. *MR 94a*:65030. *Zbl. Math.* **788**:65142.
19. Daniel B. Szyld, Equivalence of Convergence Conditions for Iterative Methods for Singular Equations, *Numerical Linear Algebra with Applications*, **1** (1994) 151–154. *MR 95a*:65099. *Zbl. Math.* **837**:65057.
20. Ivo Marek and Daniel B. Szyld, Local Convergence of the (Exact and Inexact) Iterative Aggregation Method for Linear Systems and Markov Operators, *Numerische Mathematik*, **69** (1994) 61–82. *MR 96c*:65051. *Zbl. Math.* **822**:65019.
21. Andreas Frommer and Daniel B. Szyld, Asynchronous Two-stage Methods, *Numerische Mathematik*, **69** (1994) 141–153. *MR 95m*:65048. *Zbl. Math.* **821**:65010.
22. Rafael Bru, Violeta Migallón, José Penadés and Daniel B. Szyld, Parallel, Synchronous and Asynchronous Two-stage Multisplitting Methods, *Electronic Transactions on Numerical Analysis*, **3** (1995) 24–38. *MR 95m*:65049. *Zbl. Math.* **856**:65024.
23. Ricardo D. Pantazis and Daniel B. Szyld, Regions of Convergence of the Rayleigh Quotient Iteration Method, *Numerical Linear Algebra with Applications*, **2** (1995) 251–269. *MR 96a*:65055. *Zbl. Math.* **831**:65041.
24. Mordukh E. Primak and Daniel B. Szyld, A Projection Cutting Plane Algorithm for Convex Programming Problems, *Applied Mathematics and Computation*, **74** (1996) 261–271. *MR 97d*:90068. *Zbl. Math.* **846**:65025.
25. Mark T. Jones and Daniel B. Szyld, Two-stage Multisplitting Methods with Overlapping Blocks, *Numerical Linear Algebra with Applications*, **3** (1996) 113–124. *MR 96k*:65022. *Zbl. Math.* **856**:65023.
26. José Mas, Violeta Migallón, José Penadés and Daniel B. Szyld, Nonstationary Parallel Relaxed Multisplitting Methods, *Linear Algebra and its Applications*, **241–243** (1996) 733–747. *MR 97g*:65070. *Zbl. Math.* **857**:65035.
27. Violeta Migallón, José Penadés, and Daniel B. Szyld, Block Two-stage Methods for Singular Systems and Markov Chains, *Numerical Linear Algebra with Applications* **3**(1996) 413–426. *MR 97j*:65059. *Zbl. Math.* **906**:65037.
28. Michele Benzi and Daniel B. Szyld, Existence and Uniqueness of Splittings for Stationary Iterative Methods with Applications to Alternating Methods, *Numerische Mathematik*, **76** (1997) 309–321. *MR 98c*:65041. *Zbl. Math.* **905**:65048.
29. Andreas Frommer, Hartmut Schwandt and Daniel B. Szyld, Asynchronous Weighted Additive Schwarz Methods, *Electronic Transactions on Numerical Analysis*, **5** (1997) 48–61. *MR 98c*:65046. *Zbl. Math.* **890**:65027.

30. Daniel B. Szyld, Different Models of Parallel Asynchronous Iterations with Overlapping Blocks, *Computational and Applied Mathematics*, **17** (1998) 101–115. *MR 2000a:65044. Zbl. Math. 963:65035.*
31. Andreas Frommer and Daniel B. Szyld, Asynchronous Iterations with Flexible Communication for Linear Systems, *Calculateurs Parallèles Réseaux et Systèmes Répartis*, **10** (1998) 421–429.
32. Zhong-Zhi Bai, Violeta Migallón, José Penadés, and Daniel B. Szyld, Block and Asynchronous Two-stage Methods for Mildly Nonlinear Systems, *Numerische Mathematik*, **82** (1999) 1–20. *MR 2000a:65062. Zbl. Math. 941:65047.*
33. Michele Benzi, Daniel B. Szyld, and Arno van Duin, Orderings for Incomplete Factorization Preconditionings of Nonsymmetric Problems, *SIAM Journal on Scientific Computing*, **20** (1999) 1652–1670. *MR 2000b:65082. Zbl. Math. 940:65033.*
34. Andreas Frommer and Daniel B. Szyld, Weighted Max Norms, Splittings, and Overlapping Additive Schwarz Iterations, *Numerische Mathematik*, **83** (1999) 259–278. *MR 2000g:65023. Zbl. Math. 934:65035.*
35. Kostas Blathras, Daniel B. Szyld, and Yuan Shi, Timing Models and Local Stopping Criteria for Asynchronous Iterative Algorithms, *Journal of Parallel and Distributed Computing*, **58** (1999) 446–465.
36. Andreas Frommer and Daniel B. Szyld, On Asynchronous Iterations, *Journal of Computational and Applied Mathematics* **123** (2000) 201–216. *MR 2001j:65052. Zbl. Math. 967:65066.*
37. Ivo Marek and Daniel B. Szyld, Comparison Theorems for the Convergence Factor of Iterative Methods for Singular Matrices, *Linear Algebra and its Applications* **316** (2000) 67–87. *MR 2001h:65040. Zbl. Math. 963:65036.*
38. Daniel B. Szyld and Jian-Jun Xu, Convergence of Some Asynchronous Nonlinear Multisplitting Methods, *Numerical Algorithms*, **25** (2000) 347–361. *MR 2002a:65087. Zbl. Math. 974:65050.*
39. Violeta Migallón, José Penadés and Daniel B. Szyld, Nonstationary Multisplittings with General Weighting Matrices, *SIAM Journal on Matrix Analysis and Applications*, **22** (2001) 1089–1094. *MR 2001m:65046. Zbl. Math. 982:65032.*
40. Michele Benzi, Andreas Frommer, Reinhard Nabben, and Daniel B. Szyld, Algebraic Theory of Multiplicative Schwarz Methods, *Numerische Mathematik*, **89** (2001) 605–639. *MR 2002h:65038. Zbl. Math. 991:65037.*
41. Andreas Frommer and Daniel B. Szyld, An Algebraic Convergence Theory for Restricted Additive Schwarz Methods Using Weighted Max Norms, *SIAM Journal on Numerical Analysis*, **39** (2001) 463–479. *MR 2002g:65031. Zbl. Math. 1006:65031.*

42. Daniel B. Szyld and Judith A. Vogel, A Flexible Quasi-Minimal Residual Method with Inexact Preconditioning, *SIAM Journal on Scientific Computing*, **23** (2001) 363–381. *MR 2002h*:65053. *Zbl. Math.* **997**:65062.
43. Ludwig Elsner, Andreas Frommer, Reinhard Nabben, Hans Schneider, and Daniel B. Szyld, Conditions for strict inequality in comparisons of spectral radii of splittings of different matrices, *Linear Algebra and its Applications*, **363** (2003) 65–80. *MR 2004b*:65038. *Zbl. Math.* **1018**:65049.
44. Ivo Marek and Daniel B. Szyld, Comparison of Convergence of General Stationary Iterative Methods for Singular Matrices, *SIAM Journal on Matrix Analysis and Applications*, **24** (2002) 68–77. *MR 2003k*:65031. *Zbl. Math.* **1018**:65041.
45. Valeria Simoncini and Daniel B. Szyld, Flexible Inner-Outer Krylov Subspace Methods, *SIAM Journal on Numerical Analysis*, **40** (2003) 2219–2239. *MR 2004f*:65040. *Zbl. Math.* **1047**:65021.
46. Reinhard Nabben and Daniel B. Szyld, Convergence theory of restricted multiplicative Schwarz methods, *SIAM Journal on Numerical Analysis*, **40** (2003) 2318–2336. *MR 2004a*:65041. *Zbl. Math.* **1040**:65031.
47. Valeria Simoncini and Daniel B. Szyld, Theory of Inexact Krylov Subspace Methods and Applications to Scientific Computing. *SIAM Journal on Scientific Computing*, **25** (2003) 454–477. *MR 2005g*:65065. *Zbl. Math.* **1048**:65032.
48. Ivo Marek and Daniel B. Szyld, Algebraic Schwarz Methods for the Numerical Solution of Markov Chains. *Linear Algebra and its Applications*, **386** (2004) 67–81. *MR 2005i*:65002. *Zbl. Math.* **1050**:65030.
49. Rafael Bru, Francisco Pedroche, and Daniel B. Szyld, Overlapping Additive and Multiplicative Schwarz Iterations for  $H$ -matrices, *Linear Algebra and its Applications*, **393** (2004) 91–105. *MR 2005i*:65042. *Zbl. Math.* **1066**:65036.
50. Valeria Simoncini and Daniel B. Szyld, On the Occurrence of Superlinear convergence of exact and inexact Krylov subspace methods, *SIAM Review*, **47** (2005) 247–272. *MR 2006h*:65050. *Zbl. Math.* **1079**:65034.
51. Valeria Simoncini and Daniel B. Szyld, The effect of non-optimal bases on the convergence of Krylov Subspace Methods, *Numerische Mathematik*, **100** (2005) 711–733. *MR 2006j*:65098. *Zbl. Math.* **1118**:65022.
52. Rafael Bru, Francisco Pedroche, and Daniel B. Szyld, Subdirect sums of nonsingular  $M$ -matrices and of their inverses, *Electronic Journal on Linear Algebra*, **13** (2005) 162–174. *MR 2006i*:15044. *Zbl. Math.* **1094**:15008.
53. Rafael Bru, Francisco Pedroche, and Daniel B. Szyld, Additive Schwarz Iterations for Markov Chains, *SIAM Journal on Matrix Analysis and Applications*, **27** (2005) 445–458. *MR 2006h*:65043. *Zbl. Math.* **1097**:65047.

54. Rafael Bru, Francisco Pedroche, and Daniel B. Szyld, Subdirect sums of  $S$ -Strictly diagonally dominant matrices, *Electronic Journal on Linear Algebra*, **15** (2006) 201–209. *MR 2008c:15036. Zbl. Math. 1142:15307.*
55. Daniel B. Szyld, The many proofs of an identity on the norm of oblique projections, *Numerical Algorithms*, **42** (2006) 309–323. *MR 2007k:46040. Zbl. Math. 1102:47002.*
56. Reinhard Nabben and Daniel B. Szyld, Schwarz iterations for symmetric positive semidefinite problems, *SIAM Journal on Matrix Analysis and Applications*, **29** (2006) 98–116. *MR 2008k:65066. Zbl. Math. 1140:65027.*
57. Valeria Simoncini and Daniel B. Szyld, Recent computational developments in Krylov Subspace Methods for linear systems, *Numerical Linear Algebra with Applications*, **14** (2007) 1–59. *MR 2008c:65095. Zbl. Math. 1199:65112.*
58. Marcus Sarkis and Daniel B. Szyld, Optimal left and right additive Schwarz preconditioning for minimal residual methods with Euclidean and energy norms, *Computer Methods in Applied Mechanics and Engineering*, **196** (2007) 1612–1621. *MR 2007j:65114. Zbl. Math. 1173:65366.*
59. David Fritzsche, Andreas Frommer, and Daniel B. Szyld, Extensions of Certain Graph-based Algorithms for Preconditioning, *SIAM Journal on Scientific Computing*, **29** (2007) 2144–2161. *MR 2008m:65129. Zbl. Math. 1149:65033.*
60. Josep Arnal, Violeta Migallón, José Penadés, and Daniel B. Szyld, Newton Additive and Multiplicative Schwarz Iterative Methods, *IMA Journal of Numerical Analysis*, **29** (2008) 143–161. *MR 2009a:65123. Zbl. Math. 1137:65033.*
61. David Fritzsche, Volker Mehrmann, Daniel B. Szyld, and Elena Virnik, An SVD approach to identifying meta-stable states of Markov chains, *Electronic Transactions on Numerical Analysis*, **29** (2008) 46–69. *MR 2010c:60206. Zbl. Math. 1171:15008.*
62. Valeria Simoncini and Daniel B. Szyld, New conditions for non-stagnation of minimal residual methods, *Numerische Mathematik*, **109** (2008) 477–487. *MR 2009a:65079. Zbl. Math. 1151:65026.*
63. Xiuhong Du and Daniel B. Szyld, A note on the mesh independence of convergence bounds for additive Schwarz Preconditioned GMRES, *Numerical Linear Algebra with Applications*, **15** (2008) 547–557. *MR 2009e:65055. Zbl. Math. 1212:65417.*
64. Abed Elhashash and Daniel B. Szyld, On general matrices having the Perron-Frobenius property, *Electronic Journal on Linear Algebra*, **17** (2008) 389–413. *MR 2009f:15042. Zbl. Math. 1156:15009.*
65. Sébastien Loisel, Reinhard Nabben, and Daniel B. Szyld, On hybrid multigrid-Schwarz algorithms, *Journal of Scientific Computing*, **36** (2008) 165–175. *MR 2009k:65062. Zbl. Math. 1203:65072.*

66. Abed Elhashash and Daniel B. Szyld, Generalizations of  $M$ -Matrices which may not have a nonnegative inverse, *Linear Algebra and its Applications*, **429** (2008) 2435–2450. *MR 2010a*:15067. *Zbl. Math.* **1153**:15025.
67. Andreas Frommer, Reinhard Nabben, and Daniel B. Szyld, Convergence of Stationary Iterative Methods for Hermitian Semidefinite Linear Systems and Applications to Schwarz Methods, *SIAM Journal on Matrix Analysis and Applications*, **30** (2008) 925–938. *MR 2009m*:65055. *Zbl. Math.* **1165**:65012.
68. Xiuhong Du and Daniel B. Szyld, Inexact GMRES for singular linear systems, *BIT Numerical Mathematics*, **48** (2008) 511–531. *MR 2009i*:65051. *Zbl. Math.* **1161**:65024.
69. Abed Elhashash and Daniel B. Szyld, Two characterizations of matrices with the Perron-Frobenius property, *Numerical Linear Algebra with Applications*, **16** (2009) 863–869. *MR 2011b*:15082. *Zbl. Math.* **1224**:15064.
70. Abed Elhashash, Uriel G. Rothblum, and Daniel B. Szyld, Paths of matrices with the strong Perron-Frobenius property converging to a given matrix with the Perron-Frobenius property, *Electronic Journal on Linear Algebra*, **19** (2009) 90–97. *MR 2011b*:15081. *Zbl. Math.* **1190**:15035.
71. Sébastien Loisel and Daniel B. Szyld, On the geometric convergence of Algebraic Optimizable Schwarz Methods with applications to elliptic problems, *Numerische Mathematik*, **114** (2010) 697–728. *MR 2011g*:65284. *Zbl. Math.* **1189**:65275.
72. Valeria Simoncini and Daniel B. Szyld, On the field of values of oblique projections, *Linear Algebra and its Applications*, **433** (2010) 810–818. *MR 2011k*:47004. *Zbl. Math.* **1195**:47003.
73. Valeria Simoncini and Daniel B. Szyld, Interpreting IDR as a Petrov-Galerkin method, *SIAM Journal on Scientific Computing*, **32** (2010) 1898–1912. *MR 2011g*:65053. *Zbl. Math.* **1219**:65039.
74. Abed Elhashash and Daniel B. Szyld, Matrix functions preserving sets of generalized nonnegative matrices, *Electronic Journal on Linear Algebra*, **20** (2010) 673–690. *MR 2012a*:15045. *Zbl. Math.* **1207**:15030.
75. Daniel B. Szyld and Fei Xue, Efficient preconditioned inner solves for inexact Rayleigh quotient iteration and their connections to the single-vector Jacobi-Davidson method. *SIAM Journal on Matrix Analysis and Applications*, **32** (2011) 993–1018. *MR 2012i*:65068. *Zbl. Math.* **1238**:65028.
76. Xingwei Yang, Daniel B. Szyld, and Longin Jan Latecki, Diffusion on a Tensor Product Graph for Semi-Supervised Learning, *Advances in Imaging and Electron Physics*, **169** (2011) 147–172.



77. Olivier Dubois, Martin J. Gander, Sébastien Loisel, Amik St-Cyr, and Daniel B. Szyld, The Optimized Schwarz Method with a Coarse Grid Correction, *SIAM Journal on Scientific Computing*, **34** (2012) A421–A458. *MR* 2890272. *Zbl. Math.* **1248**:65127.
78. Mark Embree, Josef A. Sifuentes, Kirk M. Soodhalter, Daniel B. Szyld, and Fei Xue, Short-Term Recurrence Krylov Subspace Methods for Nearly-Hermitian Matrices, *SIAM Journal on Matrix Analysis and Applications*, **33** (2012) 480–500. *MR* 2970216. *Zbl. Math.* **1253**:65042.
79. Hassane Sadok and Daniel B. Szyld, A new look at CMRH and its relation to GMRES, *BIT Numerical Mathematics*, **52** (2012) 485–501. *MR* 2931360. *Zbl. Math.* **1247**:65045.
80. Martin J. Gander, Sébastien Loisel, and Daniel B. Szyld, An optimal block iterative method and preconditioner for banded matrices with applications to PDEs on irregular domains, *SIAM Journal on Matrix Analysis and Applications*, **33** (2012) 653–680. *MR* 2970224. *Zbl. Math.* **1252**:65068.
81. Daniel B. Szyld and Fei Xue, Local convergence analysis of several inexact Newton-type algorithms for general nonlinear eigenvalue problems. *Numerische Mathematik*, **123** (2013) 333–362. *MR* 3010183. *Zbl. Math.* **1259**:65077.
82. David Fritzsche, Andreas Frommer, Stephen Shank, and Daniel B. Szyld, Overlapping blocks by growing a partition with applications to preconditioning. *SIAM Journal on Scientific Computing*, **35** (2013) A453–A473. *MR* 3033056. *Zbl. Math.* **1268**:65044.
83. Xiuhong Du, Marcus Sarkis, Christian E. Schaerer, and Daniel B. Szyld, Inexact and truncated Parareal-in-time Krylov subspace methods for parabolic optimal control problems. *Electronic Transactions on Numerical Analysis*, **40** (2013) 36–57. *MR* 3034309. *Zbl. Math.* **1288**:65093.
84. Bryan Shader, Naomi Shaked-Monderer and Daniel B. Szyld, Nearly positive matrices, *Linear Algebra and its Applications*, **449** (2014) 520–544. *MR* 3191882 *Zbl. Math.* **1302**:15044.
85. Kirk M. Soodhalter, Daniel B. Szyld, and Fei Xue, Krylov Subspace Recycling for Sequences of Shifted Linear Systems, *Applied Numerical Mathematics*, **81** (2014) 105–118. *MR* 3212178. *Zbl. Math.* **1291**:65108.
86. Andreas Frommer and Daniel B. Szyld, On Necessary Conditions for Convergence of Stationary Iterative Methods for Hermitian Semidefinite Linear Systems, *Linear Algebra and its Applications*, **453** (2014) 192–201. *MR* 3201693.
87. Valeria Simoncini, Daniel B. Szyld, and Marlliny Monsalve, On two numerical methods for the solution of large-scale algebraic Riccati equations. *IMA Journal of Numerical Analysis*, **34** (2014) 904–920. *MR* 3232439. *Zbl. Math.* **1298**:65083.

88. Daniel B. Szyld and Fei Xue, Several properties of invariant pairs of nonlinear algebraic eigenvalue problems. *IMA Journal of Numerical Analysis*, **34** (2014) 921–954. *MR* 3232440. *Zbl. Math.***1297**:65057.
89. Lahcen Laayouni and Daniel B. Szyld, On the performance of the Algebraic Optimized Schwarz Methods with applications, *Numerical Algorithms*, **67** (2014) 889–916. *MR* 3277789. *Zbl. Math.***1304**:65121.
90. Daniel B. Szyld and Fei Xue, Local convergence of Newton-like methods for degenerate eigenvalues of nonlinear eigenproblems. I. Classical algorithms. *Numerische Mathematik*, **129** (2015) 353–381. *MR* 3300423. *Zbl. Math.***1309**:65059.
91. Daniel B. Szyld and Fei Xue, Local convergence of Newton-like methods for degenerate eigenvalues of nonlinear eigenproblems. II. Accelerated algorithms. *Numerische Mathematik*, **129** (2015) 382–403. *MR* 3300424. *Zbl. Math.***1309**:65060.
92. Sébastien Duminil, Hassane Sadok, and Daniel B. Szyld, Nonlinear Schwarz iterations with Reduced Rank Extrapolation, *Applied Numerical Mathematics*, **94** (2015) 209–221. *MR* 3342592. *Zbl. Math.***1325**:65170.
93. Daniel B. Szyld and Fei Xue, Preconditioned eigensolvers for large-scale nonlinear Hermitian eigenproblems with variational characterizations. I. Extreme Eigenvalues. *Mathematics of Computations*, **85** (2016) 2887–2918. *Zbl. Math.***1344**:65045.
94. Daniel B. Szyld, Eugene Vecharynski, and Fei Xue, Preconditioned eigensolvers for large-scale nonlinear Hermitian eigenproblems with variational characterizations. II. Interior eigenvalues. *SIAM Journal on Scientific Computing*, **37** (2015) A2969–A2997. *MR* 3435092. *Zbl. Math.***1329**:65108.
95. Prince Chidyagwai, Scott Ladenheim, and Daniel B. Szyld, Constraint Preconditioning for the Coupled Stokes–Darcy System. *SIAM Journal on Scientific Computing*, **38** (2016) A668–A690. *MR* 3465426.
96. Stephen D. Shank, Valeria Simoncini, and Daniel B. Szyld, Efficient low-rank solutions of Generalized Lyapunov equations, *Numerische Mathematik*, **134** (2016) 327–342. *MR* 3537953. *Zbl. Math.***1348**:65078.
97. Chen Greif, Tyrone Rees, and Daniel B. Szyld, GMRES with multiple preconditioners, *SeMA Journal*, **74** (2017), 213–231. *MR* 3656592. *Zbl. Math.***1383**:65026.
98. Mian Ilyas Ahmad, Daniel B. Szyld, and Martin B. van Gijzen, Preconditioned multishift BiCG for  $\mathcal{H}_2$ -optimal model reduction, *SIAM Journal on Matrix Analysis and Applications*, **38** (2017) 401–424. *MR* 3654882. *Zbl. Math.***1365**:65080.
99. Frédéric Magoulès, Daniel B. Szyld, and Cédric Venet, Asynchronous Optimized Schwarz Methods with and without Overlap. *Numerische Mathematik*, **137** (2017) 199–227. *MR* 3679933. *Zbl. Math.***1382**:65449.

100. Andreas Frommer, Kathryn Lund, Marcel Schweitzer, and Daniel B. Szyld, The Radau–Lanczos method for matrix functions. *SIAM Journal on Matrix Analysis and Applications*, **38** (2017) 710–732. MR 3681369. Zbl. Math.**1371**:65042.
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47. Models of Asynchronous Iterations with Overlap, The Tenth Haifa Matrix Conference, Technion, Haifa, Israel, January 5-9, 1998. Invited Speaker.
48. Orderings for Incomplete Factorization Preconditioning of Nonsymmetric Linear Systems, Copper Mountain Conference on Iterative Methods, Copper Mountain, Colorado, March 30 – April 3, 1998.
49. Orderings for Incomplete Factorization Preconditioning of Sparse Nonsymmetric Linear Systems, AMS Sectional meeting 933, Special Session on Sparse Matrix Computations, Philadelphia, April 5, 1998.
50. The mystery of asynchronous iterations convergence when the spectral radius is one, Seventh ILAS Conference, Madison, Wisconsin, June 3–6, 1998.
51. A Study of Different Orderings for Incomplete Factorization Preconditioning of Nonsymmetric Linear Systems, Fourth World Congress on Computational Mechanics, Buenos Aires, Argentina, June 29 – July 2, 1998.
52. Weighted Max Norms, Splittings, and Overlapping Additive Schwarz Iterations, Fourth IMACS International Symposium on Iterative Methods in Scientific Computation, University of Texas at Austin, October 18–20, 1998.

53. Comparison Theorems for the Convergence Factor of Iterative Methods for Singular Matrices, Linear Algebra: Theory, Applications, and Computations, a Conference in honor of Robert J. Plemmons on the occasion of his 60th birthday, Wake Forest University, Winston-Salem, North Carolina, January 8–9, 1999. Invited speaker.
54. Comparison Theorems for the Convergence Factor of Iterative Methods for Singular Matrices, Mathematical Journey through Analysis, Matrix Theory and Scientific Computation: A Conference on the Occasion of Richard S. Varga's 70th Birthday, Kent State University, Kent, Ohio, March 24–26, 1999.
55. Comparison Theorems for the Convergence Factor of Iterative Methods for Singular Matrices, SIAM Annual Meeting, Atlanta, Georgia, May 12–15, 1999.
56. Comparison Theorems for the Convergence Factor of Iterative Methods for Singular Matrices, Eighth ILAS Conference, Barcelona, Spain, July 19–22, 1999.
57. Experimental Study of Parallel Iterative Solutions of Markov Chains with Block Partitions, Third International Meeting on the Numerical Solution of Markov Chains, Zaragoza, Spain, September 6–10, 1999.
58. Algebraic Theory of Additive and Multiplicative Schwarz, Sixth Copper Mountain Conference on Iterative Methods, Copper Mountain, Colorado, April 2–7, 2000.
59. An Algebraic Convergence Theory for Restricted Additive Schwarz Methods Using Weighted Max Norms, Thirteenth Conference on Domain Decomposition Methods, Lyon, France, October 9–12, 2000.
60. An Algebraic Convergence Theory for Restricted Additive Schwarz Methods Using Weighted Max Norms, Seventh SIAM Conference on Applied Linear Algebra, Raleigh, North Carolina, October 23–25, 2000.
61. Comparison Theorems for the Convergence Factor of Singular Matrix, Oberwolfach Meeting on Nonnegative Matrices, M-matrices and Applications, Oberwolfach, Germany, November 26–December 2, 2000. Attendance by invitation only.
62. Algebraic Theory of Schwarz Methods for Domain Decomposition, AMS Sectional meeting 964, Special Session on Numerical Linear Algebra, Lawrence, Kansas, March 30–31, 2001. Invited talk in special session.
63. Overview of Parallel Asynchronous Methods for Linear and Nonlinear Problems, First International Seminar “Mathematics of Computers and Decision Making”, Patras, Greece, May 25–26, 2001. Invited speaker.
64. Algebraic Theory of Schwarz Methods for Domain Decomposition, Fifth IMACS International Symposium on Iterative Methods in Scientific Computation, Heraklyon, Greece, May 28–31, 2001.
65. Perspectives on Asynchronous Computations for Fluid Flow Problems, First MIT Conference on Computational Fluid and Solid Mechanics, Cambridge, Mass., June 12–14, 2001. Invited talk in special session.

66. Some Experiments with Flexible QMR for Nonsymmetric Linear Systems, International Linear Algebra Conference, Haifa, Israel, June 25–29, 2001.
67. Algebraic Theory of Additive and Multiplicative Schwarz Methods, SIAM Annual Meeting, San Diego, July 9–13, 2001.
68. Theory and Experiments with FQMR, a Flexible Quasi-Minimal Residual Method with Inexact Preconditioning, GAMM Workshop on Numerical Linear Algebra, Berlin, September 7–8, 2001.
69. Theory and Experiments with FQMR, a Flexible Quasi-Minimal Residual Method with Inexact Preconditioning, International Conference on Numerical Algorithms, Marrakesh, Morocco, October 1–15, 2001.
70. Flexible Inner-Outer Krylov Methods (and Inexact Krylov Methods), Latsis symposium on iterative solvers for large linear systems, ETH, Zurich, 18–21 February 2002.
71. Flexible and Inexact Krylov Subspace Methods, Ninth ILAS Conference, Auburn, Alabama, 10–13 June 2002.
72. Flexible and Inexact Krylov Subspace Methods, Householder Symposium XV on Numerical Linear Algebra, Peebles, Scotland, UK, 17–21 June 2002. Attendance by invitation only.
73. Flexible and Inexact Krylov Subspace Methods, SIAM Annual meeting, Philadelphia, 8–12 July 2002.
74. Theory of Inexact Krylov Subspace Methods and Applications to Scientific Computing, Conference on Computational Linear Algebra with Applications, Milovy, Czech Republic, August 4–10, 2002.
75. Inexact Krylov Subspace Methods, SIAM Conference on Computational Science and Engineering, San Diego, 10–13 February 2003.
76. Inexact Krylov Subspace Methods, Sixth IMACS International Symposium on Iterative Methods in Scientific Computing, Denver, 27–30 March 2003.
77. Inexact Krylov Subspace Methods, ETNA: Following the Flows of Numerical Analysis, Conference celebrating ten years of *ETNA (Electronic Transactions on Numerical Analysis)*, Kent State University, Kent, Ohio, 29–31 May 2003.
78. Algebraic Analysis of Schwarz Methods for Domain Decomposition, SIAM Annual Meeting, Montreal, 16–20 June 2003.
79. Inexact Krylov Subspace Methods, SIAM Annual Meeting, Montreal, 16–20 June 2003.
80. Superlinear Convergence of Krylov Subspace Methods, Eighth SIAM Conference on Applied Linear Algebra, Williamsburg, Va., 15–19 July 2003.



81. Algebraic Analysis of Schwarz Methods for Singular Systems, Fifteenth Conference on Domain Decomposition Methods, Berlin, 21–25 July 2003.
82. Algebraic Schwarz Methods for the Numerical Solution of Markov Chains, Fourth International Conference on the Numerical Solution of Markov Chains, University of Illinois, Urbana-Champaign, 3–5 September 2003.
83. Superlinear Convergence of Krylov Subspace Methods, Theoretical and Computational Aspects of Matrix Algorithms, 12–17 October 2003, Schloss Dagstuhl, International Conference and Research Center for Computer Science, Wadern, Germany.
84. Computable Stopping Criteria for Inexact Preconditioning, 2003 International Conference on Preconditioning Techniques for Large Sparse Matrix Problems in Scientific and Industrial Applications, Napa, California, 27–29 October 2003.
85. The effect of non-optimal bases on the convergence of Krylov subspace methods, Eight Copper Mountain Conference on Iterative Methods, Copper Mountain, Colorado, 28 March – 2 April 2004.
86. Inexact Krylov Subspace Methods and Applications to Scientific Computing, International Conference on Modern Computational Methods in Applied Mathematics, 14–19 June 2004, Stefan Banach International Mathematical Center, Bedlewo/Poznan, Poland. Invited semi-plenary talk.
87. Two current approaches for the Numerical Solution of Markov Chains: Schwarz (overlap) and Asynchronous Parallelism, Eleventh ILAS Conference, Coimbra, Portugal, 19–22 July 2004.
88. Dynamically Adapted Inexact Additive Schwarz Preconditioner, Sixteenth International Conference on Domain Decomposition Methods, New York, 12–15 January 2005.
89. Non-optimal Bases and the Convergence of Krylov Subspace Methods, SIAM Conference on Computational Science and Engineering, Orlando, Florida, 12–15 February 2005.
90. Asynchronous Parallel Solution of Markov Chains: Application to PageRank, SIAM Conference on Computational Science and Engineering, Orlando, Florida, 12–15 February 2005.
91. Reducing the Cost of Krylov Subspace Methods: Inexact and Truncated Versions. Algorithm 2005, Conference on Scientific Computing, Podbanske, Slovakia, 13–18 March 2005. Invited plenary speaker.
92. Dynamically Adapted Inexact Additive Schwarz Preconditioner, Seventh IMACS Conference on Iterative Methods, Toronto, Canada, 5–7 May 2005.
93. Convergence of Krylov Subspace Methods when using Non-optimal Bases, Seventh IMACS Conference on Iterative Methods, Toronto, Canada, 5–7 May 2005.

94. The effect of non-optimal bases on the convergence of Krylov subspace methods, Householder Symposium XVI on Numerical Linear Algebra, 23–27 May 2005, Seven Springs Mountain Resort, Champion, Pa. Attendance by invitation only.
95. Dynamically Adapted Inexact Additive Schwarz Preconditioner and Energy Norm Minimizing Residual Methods, SIAM Annual Meeting, New Orleans, 11–15 July 2005.
96. Dynamically Adapted Inexact Additive Schwarz Preconditioner and Energy Norm Minimizing Residual Methods, Conference on Applied Linear Algebra, in honor of Richard Varga. Palić, Serbia and Montenegro, 12–15 October 2005. Invited Plenary Speaker.
97. Practical use of Krylov Subspace Methods: Inexact and Truncated Versions, International Congress on the Applications of Mathematics, Santiago, Chile, 13–17 March 2006. Invited Speaker in the Thematic Session: Matrix Analysis and Applications.
98. Optimal Left and Right Additive Schwarz Preconditioning for Minimal Residual Methods with Euclidean and Energy Norms, Ninth Copper Mountain Conference on Iterative Methods, Copper Mountain, Colorado, 2–7 April 2006.
99. Asynchronous Parallel Solution of Markov Chains: Application to PageRank, A. A. Markov Anniversary Meeting, Charleston, South Carolina, 12–14 June 2006.
100. Optimal Left and Right Additive Schwarz Preconditioning for Minimal Residual Methods with Euclidean and Energy Norms, Seventeenth International Conference on Domain Decomposition Methods, Strobl/ St. Wolfgang, Austria, 3–7 July 2006.
101. On an Identity on Norms of Oblique Projections, Thirteenth ILAS Conference, Amsterdam, The Netherlands, 18–21 July 2006.
102. Optimal Left and Right Additive Schwarz Preconditioning for Minimal Residual Methods with Euclidean and Energy Norms, Thirteenth ILAS Conference, Amsterdam, The Netherlands, 18–21 July 2006.
103. Optimal Left and Right Additive Schwarz Preconditioning for Minimal Residual Methods with Euclidean and Energy Norms, Numerical Analysis Day on Innovative Numerical Methods in Engineering Applications, Bologna, Italy, 18 September 2006. Invited speaker.
104. Inexact Krylov Subspace Methods for PDEs and Control Problems, DOE ASCR Annual Applied Mathematics Research Program PI meeting, 22–24 May 2007, Lawrence Livermore National Laboratory, Livermore, California.
105. Perron-Frobenius Properties of General Matrices, Fourteenth ILAS Conference, Shanghai, People’s Republic of China, 16–20 July 2007.

106. New conditions for non-stagnation of GMRES, and corresponding convergence bounds, “Harrachov 2007,” Computational Methods with Applications, Harrachov, Czech Republic. 19–25 August 2007,
107. New conditions for non-stagnation of minimal residual methods, Matrix Analysis and Applications, CIRM Luminy, France, 15–19 October 2007. Attendance by invitation only.
108. Perron-Frobenius properties and a generalization of  $M$ -matrices, Hans Schneider’s 80th Birthday Celebration at UConn, 1–2 November 2007, University of Connecticut, Storrs. Invited speaker.
109. New conditions for non-stagnation of GMRES, and corresponding convergence bounds, Eighteenth International Conference on Domain Decomposition Methods, The Hebrew University of Jerusalem, Israel, 12–17 January 2008.
110. Inexact Krylov Subspace Methods for PDEs and Control Problems, Gene Golub Memorial Conference, Dartmouth, Massachusetts, 29 February 2008.
111. Inexact Krylov Subspace Methods for PDEs and Control Problems, Ninth IMACS International Symposium on Iterative Methods in Scientific Computing, Lille, France, 17–20 March 2008, Invited Speaker.
112. On the geometric convergence of Algebraic Optimizable Schwarz Methods with applications to elliptic problems, Ninth IMACS International Symposium on Iterative Methods in Scientific Computing, Lille, France, 17–20 March 2008, Invited Speaker for the minisymposium on Domain Decomposition methods.
113. Perron-Frobenius Properties and a Generalization of  $M$ -matrices, Conference on Applied Linear Algebra in Honor of Ivo Marek, 28–30 April 2008, Novi Sad, Serbia. Invited plenary speaker.
114. Inexact Krylov Subspace Methods for Parabolic Control Problems, Memorial Workshop for Ralph Byers, 31 May – 1 June, 2008, Institute for Mathematics, Technical University, Berlin, Germany.
115. On General Matrices Having the Perron-Frobenius Property, Fifteenth Conference of the International Linear Algebra Society (ILAS), 16–20 June 2008, Cancun, Mexico.
116. Convergence of Stationary Iterative Methods for Hermitian Semidefinite Linear Systems, Fifteenth Conference of the International Linear Algebra Society (ILAS), 16–20 June 2008, Cancun, Mexico.
117. Inexact Krylov Subspace Methods for PDEs and Control Problems, SIAM Annual meeting, 7–11 July 2008, San Diego, California.

118. Modern Krylov Subspace Methods for Parabolic Control Problems, Conference in Numerical Analysis (NumAn2008), Recent Approaches to Numerical Analysis: Theory, Methods, and Applications (honoring Richard S. Varga on his 80th birthday), 1–5 September 2008, Kalamata, Greece.
119. An Optimal Block Iterative Method and Preconditioner for Banded Matrices, INdAM Workshop on Structured Linear Algebra Problems: Analysis, Algorithms, and Applications, 15–19 September 2008, Cortona, Italy. Attendance by invitation only.
120. Very fast convergence of Algebraic Optimizable Schwarz methods and preconditioners, Fast Algorithms for Scientific Computing, A Symposium in Honor of Olof B. Widlund on the Occasion of His 70th Birthday, 19–20 September 2008, Courant Institute, New York University, New York.
121. Very fast convergence of Algebraic Optimizable Schwarz methods and preconditioners, DOE ASCR Annual Applied Mathematics Research Program PI meeting, Argonne National Laboratory, Argonne, Illinois, 15–17 October 2008.
122. An Optimal Block Iterative Method and Preconditioner for Banded Matrices, Conference on the Occasion of Richard Varga's 80th Birthday, Kent State University, Kent, Ohio, 17–18 October 2008.
123. Eventually Nonnegative and other Matrices with Perron-Frobenius Properties, Workshop on Nonnegative Matrix Theory: Generalizations and Applications, American Institute of Mathematics, Palo Alto, California, 1–5 December 2008. Attendance by invitation only.
124. Application of inexact and truncated Krylov Subspace Methods to the solution of parabolic control problems, AMS Special Session on Mathematics of Computation, Joint Mathematics Meetings, Washington, DC, 5–8 January 2009.
125. An optimal block iterative method and preconditioner for banded matrices, Numerical Analysis and Scientific Computation with Applications (NASCA), 18–22 May 2009, Agadir, Morocco. Invited plenary speaker.
126. Modern Krylov Subspace Methods for Parabolic Control Problems, Twentyfourth IFIP TC7 Conference on System Modelling and Optimization, Buenos Aires, Argentina, 27–31 July 2009. Invited plenary speaker.
127. Very fast methods and preconditioners for banded matrices and PDEs on irregular domains, Third Conference of Latinamerican Mathematicians (III CLAM), Santiago, Chile, 31 August – 4 September, 2009. Invited Speaker in the Thematic Session: Numerical Analysis.
128. Generalized  $M$ -Matrices, SIAM Conference on Applied Linear Algebra, Monterey, California, 25–29 October 2009.

129. Optimal Block Method and Preconditioner for Banded Matrices SIAM Conference on Applied Linear Algebra, Monterey, California, 25–29 October 2009.
130. Very fast methods and preconditioners for banded matrices and PDEs on irregular domains, AMS Special Session on Mathematics of Computation, Joint Mathematics Meetings, San Francisco, 13–16 January 2010.
131. Inexact Newton with Krylov projection and recycling for Riccati equations, DOE Applied Mathematics Program Meeting, Berkeley, California, 3–5 May 2010 (poster).
132. The field of values of oblique projections, Conference on Applied Linear Algebra 2010, in honor of Hans Schneider, and GAMM Workshop on Applied and Numerical Linear Algebra, Novi Sad, Serbia, 24–28 May 2010. Invited plenary speaker.
133. Modifications to Block Jacobi with overlap to accelerate convergence of iterative methods for banded matrices, Sixteenth Conference of the International Linear Algebra Society (ILAS), Pisa, Italy, 21–25 June 2010. Invited plenary speaker.
134. Matrix functions preserving sets of generalized nonnegative matrices, Minisymposium on Nonnegative Matrices, Sixteenth Conference of the International Linear Algebra Society (ILAS), Pisa, Italy, 21–25 June 2010.
135. Interpreting IDR as a Petrov-Galerkin method, SIAM Annual Meeting, Pittsburgh, PA, 12–16 July 2010.
136. Algebraic Optimizable Schwarz Methods for the Solution of Banded Linear Systems and PDEs on Irregular Domains, Third International Conference on Numerical Algebra and Scientific Computing (NASC 2010) Beijing, People’s Republic of China, 23-27 October 2010. Invited plenary speaker.
137. Algebraic Optimizable Schwarz Methods and Preconditioner for the Solution of Banded Linear Systems and PDEs on Irregular Domains, Minisymposia on Numerical Analysis and Linear Algebra, NAMIAM 2010: First North American Meeting on Industrial and Applied Mathematics, 7–10 December 2010, Universidad del Mar, Huatulco, Oaxaca, Mexico.
138. Superlinear Convergence of MINRES, AMS Special Session on Mathematics of Computation: Differential Equations, Linear Algebra, and Applications, Joint Mathematics Meetings, New Orleans, 6–9 January 2011.
139. Practical use of Krylov Subspace Methods: Inexact and Truncated Versions, SCALA 2011: Scientific Computing Around Louisiana, Tulane University, New Orleans, 28–29 January 2011. Invited plenary speaker.
140. Petrov-Galerkin view of IDR (and BiCGStab), Householder Symposium XVIII on Numerical Linear Algebra, Tahoe City, California, 12–17 June 2011. Plenary speaker. Attendance by invitation only.

141. Efficient Preconditioned Inner Solves for Inexact Rayleigh Quotient Iteration and Their Connections to the Simplified Jacobi-Davidson Method, ICIAM 2011 – 7th International Congress on Industrial and Applied Mathematics, Vancouver, BC, Canada, 17–22 July 2011.
142. Algebraic Optimized Schwarz Preconditioners and Applications, Minisymposium on New Developments in Iterative Solvers for Large Sparse Problems, ICIAM 2011 – 7th International Congress on Industrial and Applied Mathematics, Vancouver, BC, Canada, 17–22 July 2011.
143. Matrices with Perron-Frobenius Properties, Dagstuhl Seminar – Data Mining, Networks and Dynamics, 7–11 November 2011, Schloss Dagstuhl, Leibniz International Conference and Research Center for Computer Science, Wadern, Germany.
144. Inexact and truncated Parareal-in-time Krylov subspace methods for parabolic optimal control problems, DelMar Numerics Day 2012, Annual Workshop on Computational Mathematics, 28 April 2012, University of Delaware, Newark, Delaware.
145. Truncated and inexact Krylov subspace methods for parabolic control problems, SIAM Conference on Applied Linear Algebra, 18–22 June 2012, Valencia, Spain.
146. Additive Schwarz with variable weights is better, 21th International Conference on Domain Decomposition Methods, 25-29 June 2012, INRIA Rennes-Bretagne-Atlantique, Rennes, France.
147. Matrices with Perron-Frobenius Properties. Workshop on Theoretical and Applied Aspects of Nonnegative Matrices, 27–29 July 2012, Banff International Research Station for Mathematical Innovation and Discovery, Banff, Alberta, Canada. This talk was filmed, and is available at the BIRS website.
148. Multi-preconditioning GMRES. Invited talk at the thematic session on Numerical Analysis, Fourth Congreso Latinoamericano de Matemáticos (IV CLAM), 6-10 August 2012, Cordoba, Argentina.
149. On the numerical solution of Riccati equations. XII GAMM Workshop on Applied and Numerical Linear Algebra, 2-5 September 2012, Château Liblice, Czech Republic.
150. On Matrices with the Perron-Frobenius Properties, LAA editors meeting, 11-13 October 2012, Madison, Wisconsin.
151. Block GMRES with Subspace Recycling and applications to fluid density functional theory, First Annual Computational Research on Owsnet Symposium, 29 October 2012, Temple University, Philadelphia (poster).
152. MPMGMRES: a generalized minimum residual method with multiple preconditioners, AMS Special Session on Mathematics of Computation: Differential Equations, Linear Algebra, and Applications, Joint Mathematics Meetings, San Diego, 9–12 January 2013.

153. MPGMRES: a generalized minimum residual method with multiple preconditioners, SIAM Conference on Computational Science and Engineering, Boston, 25 February–1 March 2013.
154. On two practical methods for the numerical solution of Riccati equations, New Frontiers in Numerical Analysis and Scientific Computing, 19–20 April 2013, Kent State University. Plenary speaker.
155. MPGMRES: a generalized minimum residual method with multiple preconditioners, Eighteenth Conference of the International Linear Algebra Society (ILAS), 3–7 June 2013, Providence, RI.
156. Constraint preconditioner for the coupled Stokes-Darcy flow, International Conference on Preconditioning Techniques for Scientific and Industrial Applications, 19–21 June 2013, St. Anne’s College, Oxford, UK.
157. Preconditioned solution of the coupled Stokes-Darcy flow problem, Preconditioning of Iterative Methods, Theory and Applications, A conference in honor of Ivo Marek, 1–5 July 2013, Prague, Czech Republic. Invited speaker.
158. Inexact and truncated Parareal-in-time Krylov subspace methods for parabolic optimal control problems, Workshop on Numerical Linear Algebra and Optimization, 8–10 August 2013, Pacific Institute for the Mathematical Sciences, Vancouver, Canada.
159. Inexact and truncated Parareal-in-time Krylov subspace methods for parabolic optimal control problems, Modeling and Optimization: Theory and Applications (MOPTA 2013), 14-16 August 2013, Lehigh University, Bethlehem, PA. Invited talk for the special session on PDE-Constrained Optimization.
160. How to use more than one preconditioner at the same time? XIII GAMM Workshop on Applied and Numerical Linear Algebra, 9–10 September 2013, Wuppertal, Germany.
161. Classical iterative methods for the solution of Generalized Lyapunov Equations, Thirteenth Copper Mountain Conference on Iterative Methods, Copper Mountain, Colorado, 6–11 April 2014.
162. Old and new iterative methods for the solution of Generalized Lyapunov Equations, Modelling 2014, Roznov pod Radhostem, Czech Republic, 2–6 June 2014. Invited speaker.
163. Classical iterative methods for the solution of Generalized Lyapunov Equations, Householder Symposium XIX on Numerical Linear Algebra, Spa, Belgium, 8–13 June 2014. Attendance by invitation only.
164. Multiple Preconditioners for GMRES, Minisymposium on Advances in Krylov and Extended Krylov Subspace Methods, SIAM annual meeting, Chicago, 6–12 June 2014.

165. Nearly Positive Matrices, Minisymposium on Nonnegative Matrices and Generalizations, The Nineteenth Conference of the International Linear Algebra Society (ILAS), Seoul, South Korea, 6–9 August 2014.
166. Efficient Low-Rank Solutions of Generalized Lyapunov Equations, SIAM Conference on Computational Science and Engineering, Salt Lake City, Utah, 13–18 March 2015.
167. Asynchronous Optimized Schwarz Methods, Conference on Numerical Algebra, Matrix Theory, Differential-Algebraic Equations, and Control Theory, 6–9 May 2015, Technical University, Berlin, Germany. Invited Speaker.
168. Constraint Preconditioning for coupled Stokes-Darcy Flow, Conference on Computational Biofluids in Physiology, University of Utah, Salt Lake City, 14–15 May 2015. Invited Speaker.
169. Constraint Preconditioning for coupled Stokes-Darcy Flow, International Conference on Preconditioning Techniques for Scientific and Industrial Applications, Eindhoven, The Netherlands, 17–19 June 2015.
170. Asynchronous Optimized Schwarz Methods, Minisymposium on Recent advances in matrix computations for extreme-scale computers, the Eighth International Congress on Industrial and Applied Mathematics (ICIAM), Beijing, China, 10–14 August 2015.
171. Iterative methods for the solution of Generalized Lyapunov Equations, Minisymposium on Iterative Methods and Preconditioning, the Eighth International Congress on Industrial and Applied Mathematics (ICIAM), Beijing, China, 10–14 August 2015.
172. Asynchronous Optimized Schwarz Methods, Minisymposium on Advances in Fast Iterative Solvers for Sparse Linear Systems, SIAM Conference on Applied Linear Algebra, Atlanta, 25–30 October 2015. This talk was filmed, and it is available at the SIAM website.
173. Asynchronous Optimized Schwarz Methods for the Solution of PDEs, Fourteenth Copper Mountain Conference on Iterative Methods, Copper Mountain, Colorado, 20–25 March 2016.
174. Constraint Preconditioning for coupled Stokes-Darcy Flow, Workshop on Recent Development of Matrix Computations, National Center for Theoretical Sciences, National Taiwan University, Taipei, 13 May 2016.
175. Asynchronous Optimized Schwarz Methods for the Solution of PDEs, SIAM Annual Meeting, Boston, 10–15 July 2016.
176. Classical iterative methods for the solution of Generalized Lyapunov Equations, Special Session on Graphs, Matrices and Applications, Conferencia Matemática Capricornio, Antofagasta, Chile, 2–5 August 2016. Invited talk.



177. Asynchronous Optimized Schwarz Methods for the Solution of PDEs, Conferencia Matemática Capricornio, Antofagasta, Chile, 2–5 August 2016. Invited plenary lecture.
178. Block Krylov subspace methods for matrix functions, Numerical Linear Algebra and Applications, CIRM Luminy, France, 24–28 October 2016. Attendance by invitation only.
179. Classical iterative methods for the solution of Generalized Lyapunov Equations, SIAM Special Session on Linear Algebra, Joint Mathematics Meetings, Atlanta, 4–7 January 2017.
180. Asynchronous Optimized Schwarz Methods, Theory and Experiments, Twenty-fourth International Conference on Domain Decomposition Methods, Lognyear-byen, Svalbard, Norway, 6–10 February 2017.
181. Asynchronous Optimized Schwarz Methods, Theory and Experiments, Workshop on Domain Decomposition, Past, Present, and Future, Courant Institute, New York University, 24–25 February 2017.
182. Asynchronous Optimized Schwarz Methods for the Solution of PDEs, SIAM Conference on Computational Science and Engineering, Atlanta, 27 February – 3 March 2017.
183. Asynchronous Optimized Schwarz Methods, Theory and Experiments, Householder Symposium XX on Numerical Linear Algebra, Blacksburg, Virginia, 18–23 June 2017. Attendance by invitation only.
184. Asynchronous Optimized Schwarz Methods, Theory and Experiments, Special Session on Applied Mathematics and Computational Science across the Americas, Mathematics Conference of the Americas, Montreal, July 24–28, 2017.
185. Multipreconditioned GMRES for Shifted Systems, The International Conference on Preconditioning Techniques for Scientific and Industrial Applications (Preconditioning 2017) University of British Columbia, Vancouver, Canada, 31 July – 2 August 2017.
186. Singular values of certain almost block Toeplitz matrices, INdAM Meeting on Structured Matrices in Numerical Linear Algebra: Analysis, Algorithms and Applications, Cortona, Italy, 4–8 September 2017. Attendance by invitation only.
187. Asynchronous Optimized Schwarz Methods for the Solution of PDEs, SIAM Special Session on Linear Algebra, Joint Mathematics Meetings, San Diego, 10–13 January 2018.
188. An overview of the theory of convergence of asynchronous iterations, Fifteenth Copper Mountain Conference On Iterative Methods, Copper Mountain, Colorado, 25–30 March 2018.

189. Modified Block Full Orthogonalization Methods, Minisymposium on Advances in Preconditioned Iterative Methods for Linear Systems, SIAM Annual Meeting, Portland, Oregon, 8–13 July 2018
190. Multiple preconditioned GMRES for shifted systems, with applications to hydrology and matrix functions, Minisymposium on Matrices, Moments and Quadrature with Applications, SIAM Annual Meeting, Portland, Oregon, 8–13 July 2018
191. Algebraic View of Schwarz Methods, Minisymposium on Fifty years of Domain Decomposition theory and algorithms: celebrating Olof B. Widlund’s 80th birthday, 25th International Domain Decomposition Conference, DD XXV, 23–27 July, 2018, St. John’s, Newfoundland, Canada.
192. Convergence Results for Asynchronous Optimized Schwarz Methods for the solution of PDEs, AMS Fall Eastern Sectional Meeting 1141, Special Session on Advances in Numerical Approximation of Partial Differential Equations, University of Delaware, Newark, Delaware, 29–30 September 2018.
193. Asynchronous Iterative Solvers for Extreme Scale, 2019 ASCR Applied Mathematics Principal Investigators Meeting, Rockville, Maryland, 29–30 January 2019 (poster).
194. Asynchronous Optimized Schwarz Methods for the Solution of PDEs on bounded domains, Mini-symposium on Asynchronous Iterative Methods, SIAM Conference on Computational Science and Engineering, Spokane, Washington, 25 February – 1st March 2019.
195. Asynchronous Optimized Schwarz Methods for the Solution of PDEs on bounded domains, Conference on Recent Advances in Scientific Computation (ETNA25), Santa Margherita di Pula, Italy, 27–29 May 2019. Invited plenary lecture.
196. On the Spectrum of a Class of Bipartite Matrices, Minisymposium on  $M$ -matrices and Inverse  $M$ -matrices: Applications and Generalizations. 23rd Conference of the International Linear Algebra Society (ILAS 2019), Rio de Janeiro, Brazil, 8–12 July 2019.
197. Asynchronous optimized Schwarz methods for the solution of PDEs on bounded domains, Minisymposium on Numerical approaches for solving large-scale sparse systems, 23rd Conference of the International Linear Algebra Society (ILAS 2019), Rio de Janeiro, Brazil, 8–12 July 2019.
198. Asynchronous Iterative Methods, Minisymposium on Computational Linear Algebra in Massively Parallel contexts: Precision and Performance, Ninth International Congress on Industrial and Applied Mathematics (ICIAM 2019), Valencia, Spain, 15–19 July 2019.
199. Algebraic View of Asynchronous Optimized Schwarz Methods, Minisymposium on Asynchronous Iterative Methods, Ninth International Congress on Industrial and Applied Mathematics (ICIAM 2019), Valencia, Spain, 15–19 July 2019.

**INVITED SEMINARS AND COLLOQUIA:**

1. Some Methods for Eigenvalue Problems, IIMAS (Institute for Research in Mathematical Analysis and Systems), UNAM (National Autonomous University of Mexico), Mexico City, August 7, 1979.
2. Sparse Matrix Techniques, Computer Center, CONEA (National Committee of Atomic Energy), Buenos Aires, Argentina, January, 1981.
3. Dynamic Input-Output Model of the U.S. Economy, Department of Economics, University of Bremen, Bremen, Fed. Republic of Germany, May 25, 1986.
4. Aggregation Methods for Input-Output Matrices, Central Bureau of Statistics, Oslo, Norway, May 29 and 30, 1986.
5. Convergence of block and nested iterative methods for linear systems, Department of Mathematics and Computer Science, University of Tulsa, Tulsa, Oklahoma, October 18, 1988.
6. Convergence of block and nested iterative methods for linear systems, Department of Mathematics, University of Utah, Salt Lake City, Utah, October 31, 1988.
7. Convergence of block and nested iterative methods for linear systems, IIMAS (Institute for Research in Mathematical Analysis and Systems), UNAM (National Autonomous University of Mexico), Mexico City, March 16, 1989.
8. Convergence of block and nested iterative methods for linear systems, Department of Numerical Mathematics, Charles University, Prague, Czechoslovakia, April 26, 1989.
9. Parallel Solution of Generalized Eigenvalue Problems, Department of Numerical Mathematics, Charles University, Prague, Czechoslovakia, March 21, 1990.
10. Regions of Convergence of Rayleigh Quotient Iteration, IIMAS (Institute for Research in Mathematical Analysis and Systems), UNAM (National Autonomous University of Mexico), Mexico City, March 15, 1991.
11. Regions of Convergence of Rayleigh Quotient Iteration, Department of Numerical Mathematics, Charles University, Prague, Czechoslovakia, April 17, 1991.
12. Regions of Convergence of the Rayleigh Quotient Iteration Method, Numerical Analysis Seminar, Courant Institute, New York University, January 22, 1993.
13.  $H$ -Splittings, Multisplittings, and Two-Stage Iterative Methods, Department of Numerical Mathematics, Charles University, Prague, Czech Republic, 19 May 1993.
14. Regiones de Convergencia del Método de Iteración del Cociente de Raleigh para Autovalores, Applied Mathematics Seminar, Universidad Politécnica de Valencia, Valencia, Spain, 1 June 1995.

15. Threshold Partitioning of Sparse Matrices and Applications to Markov Chains, Numerical Analysis Seminar, Courant Institute, New York University, 19 April 1996.
16. Splittings of Singular Matrices, State Key Laboratory of Scientific Computing, Academia Sinica, Beijing, 18 March 1997.
17. Parallel Asynchronous Methods for Linear Systems, Department of Computer Science and Engineering, Pennsylvania State University, 4 April 1997.
18. Asynchronous Weighted Additive Schwarz Methods, Department of Information Technology and Computer Science, University of Alicante, Spain, 23 May 1997.
19. Parallel Asynchronous Additive Schwarz Methods, CERFACS, Toulouse, France, 27 May 1997.
20. The Effects of Reorderings on the Convergence of Krylov Subspace Methods for Nonsymmetric Linear Systems, Department of Applied Mathematics, University of Freiberg, Germany, 23 June 1997.
21. The Effects of Reorderings on the Convergence of Krylov Subspace Methods for Nonsymmetric Linear Systems, Department of Applied Computer Science, University of Wuppertal, Germany, 27 June 1997.
22. Parallel Asynchronous Additive Schwarz Methods, Colloquium at the Department of Mathematics, Georgetown University, Washington, D.C., 14 November 1997.
23. Asynchronous Additive Schwarz Methods, Analysis Seminar, Department of Mathematics, University of Pennsylvania, Philadelphia, 25 November 1997.
24. Parallel Asynchronous Methods for the Solution of Linear Systems, School of Exact Sciences, University of Buenos Aires, Buenos Aires, Argentina, 14 December 1998.
25. Asynchronous Parallel Iterative Methods for Linear and Nonlinear Problems, Numerical Analysis Seminar, Los Alamos National Laboratory, Los Alamos, New Mexico, 27 October 1999.
26. Asynchronous Parallel Iterative Methods for Linear and Nonlinear Problems, Colloquium, Department of Mathematics, University of Bielefeld, Germany, 22 February 2000.
27. Comparison Theorems for the Convergence Factor of Iterative Methods for Singular Matrices, Colloquium, Department of Mathematics, University of Düsseldorf, Germany, 24 February 2000.
28. On the Theory of Additive and Multiplicative Schwarz Methods, Colloquium, Department of Mathematics, University of Wuppertal, Germany, 29 February 2000.

29. Asynchronous Parallel Iterative Methods for Linear and Nonlinear Problems, Scientific Computing and Computational Mathematics program, Stanford University, 17 April 2000.
30. Asynchronous Parallel Iterative Methods, Numerical Analysis Seminar, Department for Applied Mathematics and Mechanics, University of Warsaw, Poland, 27 April 2000.
31. Asynchronous Parallel Iterative Methods for Linear and Nonlinear Problems, Applied Linear Algebra Seminar, Institute of Computer Science, Academy of Science of the Czech Republic, Prague, 2 May 2000.
32. On the Computational Schwarz Method, Department of Computer Science and Artificial Intelligence, University of Alicante, Spain, 18 July 2000.
33. Algebraic Theory of Additive and Multiplicative Schwarz, CERFACS, Toulouse, France, 19 July 2000.
34. Asynchronous Parallel Iterative Methods for Linear and Nonlinear Problems, Applied Mathematics Seminar, University of Michigan, Ann Arbor, 10 November 2000.
35. Asynchronous Parallel Iterative Methods for Linear and Nonlinear Problems, Seminar, Mathematical Sciences Department, Worcester Polytechnic Institute, Worcester, Massachusetts, 16 February 2001.
36. Algebraic Theory of Schwarz Methods for Domain Decomposition, Colloquium in Applied Mathematics, New Jersey Institute of Technology, Newark, New Jersey, 6 April 2001.
37. Asynchronous Parallel Iterative Methods for Linear and Nonlinear Problems, Seminar, Department of Mathematics and Computer Science, Drexel University, Philadelphia, 27 February 2002.
38. Theory of Inexact Krylov Subspace Methods and Applications to Scientific Computing, Lecture for the High Performance Computing Group, Electrical Engineering Department, COPPE, Federal University of Rio de Janeiro, Brazil, 18 July 2002.
39. Theory of Inexact Krylov Subspace Methods and Applications to Scientific Computing, Computational Mathematics Seminar, Institute of Pure and Applied Mathematics, Rio de Janeiro, Brazil, 19 July 2002.
40. Inexact Krylov Subspace Methods and Applications to Scientific Computing, Numerical Analysis Seminar, Courant Institute, New York University, 4 October 2002.
41. Convergence of Inexact Krylov Subspace Methods, Mathematics Department Colloquium, Distinguished Lectureship Series, University of Wyoming, Laramie, 27 March 2003.

42. Superlinear Convergence of Exact and Inexact Krylov Subspace Methods, Scientific Computing Seminar, Department of Mathematical Sciences, Emory University, Atlanta, 11 April 2003.
43. Convergence of Inexact Krylov Subspace Methods, Numerical Analysis Seminar, Departments of Computer Science and Mathematics, University of Maryland, College Park, 6 May 2003.
44. Convergence of Inexact Krylov Subspace Methods, Numerical Mathematics Seminar, Department of Mathematics, University of Bielefeld, Germany, 28 July 2003.
45. Convergence of Inexact Krylov Subspace Methods, Computer Science Department Colloquium, University of Illinois, Urbana-Champaign, 3 September 2003.
46. Convergence of Inexact Krylov Subspace Methods, Applied Mathematics Seminar, University of Utah, Salt Lake City, 26 March 2004.
47. Convergence of Inexact Krylov Subspace Methods, Scientific Computing Seminar, Lawrence Berkeley National Laboratory, Berkeley, California, 16 April 2004.
48. Convergence of Inexact Krylov Subspace Methods, Colloquium, Department of Mathematical Sciences, Kent State University, Kent, Ohio, 29 April 2004.
49. The effect of non-optimal bases on the convergence of Krylov Subspace Methods, Research Numerical Seminar, Institute for Mathematics, Technical University, Berlin, Germany, 22 June 2004.
50. Asynchronous Parallel Solution of Markov Chains: Application to PageRank, Research Numerical Seminar, Institute for Mathematics, Technical University, Berlin, Germany, 9 March 2005.
51. Reducing the Cost of Krylov Subspace Methods: Inexact and Truncated Versions. Colloquium, Department of Mathematics, University of Science and Technology, Cracow, Poland, 11 March 2005.
52. Reducing the Cost of Krylov Subspace Methods: Inexact and Truncated Versions. Computational and Applied Mathematics Seminar, Department of Mathematics, Pennsylvania State University, State College, Pennsylvania, 8 April 2005.
53. Reducing the Cost of Krylov Subspace Methods: Inexact and Truncated Versions. Computational Mathematics Seminar, Institute of Pure and Applied Mathematics, Rio de Janeiro, Brazil, 4 August 2005.
54. Convergence of Inexact Krylov Subspace Methods, Colloquium, Department of Mathematics, Universidad Nacional de Buenos Aires, Argentina, 22 August 2005.
55. How are the Ranking of the Web Pages Computed in Search Engines?, Special Seminar, Department of Computer Science, Universidad Nacional de Buenos Aires, Argentina, 23 August 2005.

56. Superlinear Convergence of Krylov Subspace Methods, Colloquium, Instituto Argentino de Matemática, Buenos Aires, Argentina, 10 March 2006.
57. Practical use of Krylov Subspace Methods: Inexact and Truncated Versions, Applied Mathematics Seminar, Centre for Research in Mathematics, Université de Montréal and McGill University, Montreal, Canada, 24 April 2006.
58. Practical use of Krylov Subspace Methods: Inexact and Truncated Versions, Mathematics Department Colloquium, Drexel University, Philadelphia, 8 May 2006.
59. Optimal Left and Right Additive Schwarz Preconditioning for Minimal Residual Methods with Euclidean and Energy Norms, Research Numerical Seminar, Institute for Mathematics, Technical University, Berlin, Germany, 23 May 2006.
60. Optimal Left and Right Additive Schwarz Preconditioning for Minimal Residual Methods with Euclidean and Energy Norms, Colloquium, Department of Mathematics, Università di Roma I "La Sapienza", Roma, Italy. 19 September 2006.
61. Optimal Left and Right Additive Schwarz Preconditioning for Minimal Residual Methods with Euclidean and Energy Norms, Advance Computational Modelling Centre Seminar, University of Queensland, Brisbane, Australia, 1 December 2006.
62. Practical use of Inexact Krylov Subspace Methods, Partial Differential Equations and Applied Analysis Seminar, Mathematical Sciences Department, Worcester Polytechnic Institute, Worcester, Massachusetts, 30 January 2007.
63. Optimal Left and Right Additive Schwarz Preconditioning for Minimal Residual Methods with Euclidean and Energy Norms, Numerical Mathematics and Optimization Seminar, Department of Mathematics and Computer Science, University of Freiberg, Germany, 19 February 2007.
64. Perron-Frobenius Properties of General Matrices, Colloquium of the Working Group on Modelling and Numerical Differential Equations, Institute for Mathematics, Technical University, Berlin, Germany, 23 February 2007
65. Perron-Frobenius Properties of General Matrices, Colloquium, Department of Mathematics, Universidad Carlos III, Madrid, Spain, 26 February 2007.
66. An Overview of Krylov Subspace Methods and their Application to Scientific Computing, Colloquium, Department of Mathematics, Tulane University, New Orleans, Louisiana, 12 April 2007.
67. Inexact Krylov Subspace Methods for PDEs and Control Problems Scientific Computing and Applied and Industrial Mathematics Seminar, University of British Columbia, Vancouver, Canada, 25 May 2007.
68. An Overview of Krylov Subspace Methods and their Application to Scientific Computing, Institute of Mathematics, Fudan University, Shanghai, People's Republic of China, 12 July 2007.

69. Optimal Left and Right Additive Schwarz Preconditioning for Minimal Residual Methods with Euclidean and Energy Norms, Mathematics Colloquium, Université du Littoral, Côte d'Opal, Calais, France, 10 March 2008.
70. Modern Krylov Subspace Methods for Parabolic Control Problems, Numerical Analysis Seminar, Department of Mathematics, University of Geneva, Switzerland, 7 May 2008.
71. Overlapping Partitioning of Graphs and Applications to Preconditioning, Joint Colloquium, Departments of Mathematics and Computer Science, Universidad Nacional de Buenos Aires, Argentina, 22 July 2008.
72. Matrices with Perron-Frobenius Properties, Colloquium, Instituto Argentino de Matemática, Buenos Aires, Argentina, 23 July 2008.
73. An Optimal Block Iterative Method and Preconditioner for Banded Matrices, Drexel Mathematics Colloquium, Department of Mathematics, Drexel University, Philadelphia, 6 November 2008.
74. Matrices with Perron-Frobenius Properties, Mathematics Seminar, Technion, Israel Institute of Technology, Haifa, Israel, 18 December 2008.
75. A new iterative method and preconditioner for banded matrices and PDEs on irregular domains, Numerical Analysis Seminar, Dipartimento di Matematica, Università di Bologna, Italy, 26 May 2009.
76. An optimal iterative method and preconditioner for banded matrices and PDEs on irregular domains, Mathematics Colloquium, Université du Littoral, Côte d'Opal, Calais, France, 23 June 2009.
77. An optimal iterative method and preconditioner, Seminar on Numerical Analysis and Differential Equations, Université de Lille I, Lille, France, 25 June 2009.
78. On an identity on oblique projections, Undergraduate Seminar, University of Alabama at Tuscaloosa, 13 November 2009.
79. Very fast methods and preconditioners for banded matrices and PDEs on irregular domains, Research Seminar, University of Alabama at Tuscaloosa, 13 November 2009.
80. Very fast convergence of Algebraic Optimizable Schwarz methods and preconditioners for banded matrices and PDEs on irregular domains. Seminar, Department of Applied Mathematical Analysis, Delft University of Technology, Delft, The Netherlands, 10 June 2010.
81. Fast convergence of Algebraic Optimizable Schwarz methods and preconditioners for banded matrices and PDEs on irregular domains. Scientific Computing special colloquium, Research and Postgraduate Directorate, Universidad Nacional de Asunción, Paraguay, 9 August 2010.



82. Interpreting IDR as a Petrov-Galerkin method. Numerical Linear Algebra Seminar, Research and Postgraduate Directorate, Universidad Nacional de Asunción, Paraguay, 10 August 2010.
83. The field of values of oblique projections. Colloquium, Instituto Argentino de Matemática, Buenos Aires, Argentina, 13 August 2010.
84. Fast convergence of Algebraic Optimizable Schwarz methods and preconditioners for banded matrices and PDEs on irregular domains. Computational and Numerical Analysis Seminar, Universidad Nacional de Córdoba, Argentina, 18 August 2010.
85. Modifications to Block Jacobi with overlap to accelerate convergence of iterative methods and preconditioners for banded matrices. Joint Colloquium, Departments of Mathematics and Computer Science, Universidad Nacional de Buenos Aires, Argentina, 24 August 2010.
86. Algebraic Optimizable Schwarz Methods for the Solution of Banded Linear Systems and PDEs on Irregular Domains, Seminar, Computer Science Research Institute, Sandia National Laboratory, Albuquerque, 8 November 2010.
87. Additive Schwarz Preconditioning for Minimal Residual Methods with Euclidean and Energy Norms, Seminar, Department of Applied Mathematical Analysis, Delft University of Technology, Delft, The Netherlands, 31 March 2011.
88. Algebraic Optimizable Schwarz methods for the solution of banded linear systems and PDEs on irregular domains, Numerical Analysis and Scientific Computing Seminar, Courant Institute, New York University, 15 April 2011.
89. Modern Krylov Subspace Methods for Parabolic Control Problems, Computational and Applied Mathematics Seminar, Department of Mathematics, Purdue University, 22 April 2011.
90. Algebraic Optimizable Schwarz methods for the solution of banded linear systems and PDEs on irregular domains, Computer Science Colloquium, Purdue University, 22 September 2011.
91. Inexact and truncated Parareal-in-time Krylov subspace methods for parabolic optimal control problems, Colloquium, Department of Mathematics, Case Western Research University, 3 February 2012.
92. Multi-preconditioned GMRES, Seminar, Center for Scientific Computation and Mathematical Modeling, University of Maryland, College Park, 7 March 2012.
93. Modern Krylov Subspace Methods (and applications to Parabolic Control Problems), Visitor Programme of the Centre for Numerical Analysis and Intelligent Software, International Centre for Mathematical Sciences, Edinburgh, Scotland, UK, 16 May 2012.

94. Multi-preconditioning GMRES. Colloquium of the Johann Radon Institute for Computational and Applied Mathematics of the Austrian Academy of Sciences, Linz, Austria, 6 September 2012.
95. Modern Krylov Subspace Methods (and applications to Parabolic Control Problems), Scientific and Statistical Computing Seminar, University of Chicago, 25 October 2012.
96. Modern Krylov Subspace Methods (and applications to Parabolic Control Problems), Numerical Analysis and Scientific Computing Seminar, Emory University, 8 November 2012.
97. An optimal block iterative method and preconditioner for banded matrices with applications to PDEs on irregular domains, Applied Mathematics Colloquium, University of Maryland, Baltimore County, 5 April 2013.
98. Preconditioned solution of the coupled Stokes-Darcy flow problem, Colloquium, Department of Mathematics, Universidad Nacional de Buenos Aires, Argentina, 26 August 2013.
99. How to use more than one preconditioner at the same time? Numerical Mathematics and Optimization Seminar, Department of Mathematics and Computer Science, University of Freiberg, Germany, 13 September 2013.
100. Modern Krylov Subspace Methods (and applications to Parabolic Control Problems), Colloquium of the Working Group on Modelling and Numerical Differential Equations, Institute for Mathematics, Technical University, Berlin, Germany, 17 September 2013.
101. Preconditioned solution of the coupled Stokes-Darcy flow problem, Colloquium, Department of Mathematics, Vietnam National University, Hanoi, 23 October 2013.
102. GMRES with multiple preconditioners, Numerical Analysis Seminar, Department of Mathematics, University of Bologna, Italy, 18 February 2014.
103. Efficient iterative methods for the solution of Generalized Lyapunov Equations, Colloquium, Department of Mathematics, Universidad de Buenos Aires, Argentina, 26 June 2014.
104. Asynchronous optimized Scharz methods for the parallel solution of PDEs, Colloquium, Department of Mathematics, Universidad de Buenos Aires, Argentina, 24 August 2015.
105. Nearly positive matrices, Colloquium, Instituto Argentino de Matemática, Buenos Aires, Argentina, 26 August 2015.
106. Nearly positive matrices, Colloquium, Department of Mathematics, Universidad Católica del Norte, Antofagasta, Chile, 1 September 2015.

107. Asynchronous Optimized Schwarz Methods for the Solution of PDEs, Colloquium, Center for Applied Mathematics, Cornell University, 6 November 2015.
108. Asynchronous Optimized Schwarz Methods for the Solution of PDEs, Colloquium, Department of Mathematics, Virginia Tech, 1 March 2016.
109. Classical iterative methods for the solution of Generalized Lyapunov Equations, National Center for Theoretical Sciences, Seminar on Applied Mathematics, National Taiwan University, Taipei, 16 May 2016.
110. Asynchronous Optimized Schwarz Methods for the Solution of PDEs, Seminar, Department of Applied Mathematics, National Chiao Tung University, Hsienchu, Taiwan, 17 May 2016.
111. Asynchronous optimized Schwarz methods for the parallel solution of PDEs, Colloquium, Department of Mathematics, University of Pittsburgh, 16 September 2016.
112. Asynchronous Optimized Schwarz Methods for the solution of PDEs, Scientific Computing Seminar, Department of Computer Science and Engineering, University of Minnesota, 15 December 2016.
113. Multiple preconditioned GMRES for shifted systems, with applications to hydrology and matrix functions, Colloquium of the Working Group on Modelling and Numerical Differential Equations, Institute for Mathematics, Technical University, Berlin, Germany, 6 October 2017.
114. Multiple preconditioned GMRES for shifted systems, with applications to hydrology and matrix functions, Applied Mathematics Colloquium, New Jersey Institute of Technology, Newark, 20 October 2017.
115. Asynchronous Optimized Schwarz Methods for the solution of PDEs, Numerical Analysis seminar, North Carolina State University, Raleigh, 17 April 2018.
116. Classical iterative methods for the solution of Generalized Lyapunov Equations, Smith Colloquium, Department of Mathematics, University of Kansas, Lawrence, Kansas, 13 September 2018.
117. Classical iterative methods for the solution of Generalized Lyapunov Equations, Mathematics Colloquium, Morgan State University, Baltimore, 15 November 2018.
118. Multiple preconditioned GMRES for shifted systems, with applications to hydrology and matrix functions, Seminar, Center for Computing Research, Sandia National Laboratories, Albuquerque, 29 November 2018.
119. Classical iterative methods for the solution of Generalized Lyapunov Equations, Computational and Applied Mathematics Seminar, Department of Mathematics, Pennsylvania State University, State College, Pennsylvania, 25 March 2019.
120. Asynchronous Optimized Schwarz Methods for the solution of PDEs, Numerical Analysis seminar, University of Maryland, College Park, 14 May 2019.

121. Classical iterative methods for the solution of Generalized Lyapunov Equations, Applied Mathematics Seminar, Universidad Politécnica de Valencia, Valencia, Spain, 22 July 2019.

**INVITED LECTURES FOR SHORT COURSES OR WORKSHOPS:**

1. Numerical Linear Algebra, APAC Summer Workshop on Computational Science, Queensland University of Technology, Brisbane, Australia, 4–8 December 2006. Six-hour course.
2. Modern Krylov Subspace Iterative Methods, Department of Mathematics, School of Exact Sciences, Universidad de Buenos Aires, Argentina, 9–11 March 2011. Six-hour course.
3. Efficient methods for solving large linear systems of equations, CIMPA-UNESCO-MICINN Research School on Mathematical modeling and numerical simulation for Waves propagation and Imaging, 16–27 April 2012, Universidad Simón Bolívar, Caracas, Venezuela, Eight-hour course.
4. Modern iterative Krylov subspace methods for the solution of linear systems, Master's course on Numerical Linear Algebra, 21–25 May 2012, Universidad Carlos III de Madrid, Spain. Ten-hour course.
5. Numerical Linear Algebra, 14-28 October 2013, Vietnam National University Hanoi. Twenty-hour course.

**GRANTS AND CONTRACTS, EXTERNALLY FUNDED:**

National Science Foundation Travel Grant, Cooperative Science Programs with Latin America and the Caribbean, A Scientific Visit to Plan Cooperative Research in Argentina in Mathematical Economics, April 1986, \$2,396.

National Science Foundation Travel Grant, U.S.-Eastern Europe Cooperative Science Program, A Scientific Visit to Plan Cooperative Research in Czechoslovakia in Computational Mathematics, April 1989, \$900.

Daniel B. Szyld, P.I., National Science Foundation Research Grant, Division of Mathematical Sciences, Program in Applied Mathematics, Mathematical Sciences: Block, Parallel and Nested Iterative Methods, July 1, 1988 – December 31, 1990, \$60,390.

Daniel B. Szyld, P.I., National Science Foundation International Cooperative Research Grant, U.S.-Eastern Europe Cooperative Science Program, U.S.-Czechoslovakia Research on Analysis of Iterative Methods for Linear Operators (Mathematics), May 1, 1990 – October 31, 1993, \$16,310.

Daniel B. Szyld, P.I., National Science Foundation Research Grant, Division of Mathematical Sciences, Program in Applied Mathematics, Mathematical Sciences: Parallel, Block and Two-stage Iterative Methods for Linear Systems, September 1992 – February 1996, \$135,000.

- Daniel B. Szyld, P.I., National Science Foundation International Cooperative Research Grant, U.S.-Western Europe Cooperative Science Program, U.S.-Germany Cooperative Research in Applied and Computational Mathematics: Analysis of Block and Two-stage Iterative Methods, September 1992 – February 1996, \$10,750.
- Daniel B. Szyld, P.I., National Science Foundation International Cooperative Research Grant, U.S.-Western Europe Cooperative Science Program, U.S.-Spain Cooperative Research in Applied and Computational Mathematics: Parallel Solutions of Linear Systems, March 1996 – February 1999, \$11,000.
- Daniel B. Szyld, P.I., National Science Foundation Research Grant, Division of Mathematical Sciences, Program in Computational Mathematics, Mathematical Sciences: Blocks, Partitions, Asynchronous Parallel Methods, and Applications to Markov Chains and other problems, August 1996 – July 1999, \$75,000.
- Daniel B. Szyld, P.I., Anne Greenbaum, co-P.I., National Science Foundation International Workshop Grant, U.S.-Eastern Europe Cooperative Science Program, U.S.-Czech Mathematics Workshop on Iterative Methods and Parallel Computations, September 1996 – August 1997, \$13,760.
- Daniel B. Szyld, P.I., National Science Foundation Research Grant, Division of Mathematical Sciences, Program in Computational Mathematics, Computational and Applied Linear Algebra: Asynchronous Parallel Methods, Multiplicative Schwarz and other Problems, July 1999 – July 2001, \$58,000.
- Daniel B. Szyld, P.I., National Science Foundation Conference Grant, Division of Mathematical Sciences, Program in Computational Mathematics, Conference on Computational Linear Algebra with Applications, July 2002 – July 2003, \$14,000.
- Daniel B. Szyld, P.I., National Science Foundation Research Grant, Division of Mathematical Sciences, Program in Computational Mathematics, Flexible Krylov Methods and Schwarz Preconditioners, September 2002 – August 2005, \$225,000.
- Jesse Barlow, P.I., Charles Van Loan, Daniel B. Szyld, Hongyuan Zha, and Michael L. Overton, co-P.I.s, National Science Foundation Conference Grant, Division of Mathematical Sciences, Program in Computational Mathematics, XVI Householder Symposium on Numerical Linear Algebra; Champion, PA; May 23–27, 2005, September 2004 – August 2005, \$20,000.
- Daniel B. Szyld, P.I., Department of Energy Research Grant, Office of Science, Program of Advanced Scientific Computing Research, Division of Applied Mathematics, Schwarz Preconditioners for Krylov Methods: Theory and Practice, May 2005 – April 2008, \$569,000.
- Daniel B. Szyld, P.I., National Science Foundation Research Grant, Directorate for Computer and Information Science and Engineering, Division of Computer and Communication Foundations, Program of Theoretical Foundations, Asynchronous

Parallel Methods with Overlap for Google Matrices, Dynamics of Biomolecules, and Other Markov Chains Problems, July 2005 – July 2008, \$30,000.

Daniel B. Szyld, P.I., Ilse Ipsen, Co-P.I., National Science Foundation Conference and Travel Grant, Division of Mathematical Sciences, Program in Computational Mathematics, Student and early career support for ISSNLA, May 2008 – April 2009, \$13,000.

Michael Overton, P.I., Xiao-Chuan Cai, Daniel Szyld, and David Keyes, co-P.I.s, Conference on a Conference on Scalable Parallel Algorithms for Partial Differential Equations, Department of Energy Research Grant, Office of Science, Program of Advanced Scientific Computing Research, Division of Applied Mathematics, July 2008 - June 2009, \$10,000.

Michael Overton, P.I., Xiao-Chuan Cai, Daniel Szyld, and David Keyes, co-P.I.s, Scalable Parallel Algorithms for Partial Differential Equations, National Science Foundation Conference and Travel Grant, Directorate for Computer and Information Science and Engineering, Division of Computer and Communication Foundations, Program of Theoretical Foundations, August 2008 - July 2009, \$25,000.

Daniel B. Szyld, P.I., Department of Energy Research Grant, Office of Science, Program of Advanced Scientific Computing Research, Division of Applied Mathematics, Krylov Subspace and Schwarz Methods for PDEs and Control Problems, August 2008 – December 2011, \$540,000.

Daniel B. Szyld, P.I., Ilse Ipsen, Co-P.I., National Science Foundation Conference and Travel Grant, Division of Mathematical Sciences, Program in Computational Mathematics, Graduate Student Support for the 2010 Gene Golub Summer School in Italy, March 2010 – February 2011, \$20,000.

Daniel B. Szyld, P.I., Fei Xue, Co-P.I., National Science Foundation Research Grant, Division of Mathematical Sciences, Program in Computational Mathematics, Eigenvalues problems, Krylov subspace methods, and subspace recycling, August 2011 – July 2014, \$280,000.

Daniel B. Szyld, P.I., National Science Foundation Research Grant, Division of Mathematical Sciences, Program in Computational Mathematics, Multiple Preconditioning for Saddle-Point and other Problems, September 2014 – August 2017, \$150,000.

Isaac Klapper, P.I., Daniel B. Szyld, Co-P.I., National Science Foundation Research Grant, Division of Mathematical Sciences, Program in Mathematical Biology, Collaborative Research: Connecting Omics to Physical and Chemical Environment in Community Microbial Ecology, September 2015 – August 2018, \$200,000.

Daniel B. Szyld, P.I., Department of Energy Research Grant, Office of Science, Program of Advanced Scientific Computing Research, Division of Applied Mathematics, Asynchronous Iterative Solvers For Extreme-Scale Computing, September 2016 – August 2019, \$450,000.

**GRANTS, INTERNALLY FUNDED:**

Tonia Hsieh, P.I., Daniel B. Szyld, Co-P.I., Temple University, Office of Vice-Provost for Research, Targeted Research Grant, Understanding Deformation Patterns of Suspension and Granular Material. Academic years 2015–16 and 2016–17. \$100,000.

**TEACHING:**

**LIST COURSES TAUGHT IN THE LAST FIVE YEARS:**

Linear Algebra (undergraduate course)

Theoretical Linear Algebra (undergraduate course)

Introduction to Numerical Analysis (graduate course)

Numerical Linear Algebra (two-semester graduate course)

Workshop on Mathematical Modelling (graduate course)

**MASTER'S THESES DIRECTED**

1. Christian J. Corley, Threshold Incomplete Factorization as a Preconditioner of an Iterative Solution for Nonsymmetric Systems of Linear Equations, M.S. Thesis, Duke University, June 1988.
2. Ricardo D. Pantazis, Processor and Memory Management for Parallel Generalized Eigenvalue Computations, M.S. Thesis, Duke University, June 1989.
3. Myra Wise Bologna, An Algorithm for the Classification and Comparison of Splittings for Singular Matrices, M.A. Thesis, Temple University, August 1999.
4. Nancy D. Wong, Computing Solid Angles by Barycentric Subdivision, M.A. Thesis, Temple University, May 2006.

**DISSERTATIONS DIRECTED**

1. Ricardo D. Pantazis, Parallel Solution of Generalized Symmetric Eigenvalue Problems, Department of Computer Science, Duke University, July 1991.
2. Judith Vogel, A Flexible Quasi-Minimal Residual Method with Inexact Preconditioning, Department of Mathematics, Temple University, August 2000. First prize, student paper competition, Copper Mountain Conference on Iterative Methods, April 2000. First job: Assistant Professor, the Virginia Commonwealth University.
3. Abed Elhashash, Characterizations of matrices enjoying the Perron-Frobenius property and generalizations of  $M$ -matrices which may not have nonnegative inverses, Department of Mathematics, Temple University, September 2007. First job: Instructor, Drexel University.

4. Xiuhong Du, Additive Schwarz preconditioned GMRES, inexact Krylov subspace methods, and applications of inexact CG, Department of Mathematics, Temple University, June 2008. First job: Assistant Professor, Alfred University.
5. David Fritzsche, Overlapping and nonoverlapping orderings for preconditioning, Department of Mathematics, Temple University, March 2010. (Joint Ph.D. program with the University of Wuppertal, Germany. Co-advisor: Andreas Frommer) First job: WestLB, an insurance company in Germany.
6. Kirk Soodhalter, Krylov Subspace Methods With Fixed Memory Requirements: Nearly Hermitian Linear Systems and Subspace Recycling, Department of Mathematics, Temple University, March 2012. First job: Postdoctoral Fellow (short term Assistant Prof.) Johannes Kepler Universität, Linz, Austria.
7. Stephen D. Shank, Low-rank Solution Methods for Large-scale Linear Matrix Equations, Department of Mathematics, Temple University, April 2014. (Co-advisor: Valeria Simoncini, Università di Bologna, Italy) First job: Postdoctoral Fellow, Massachusetts Institute of Technology.
8. Scott A. Ladenheim. Constraint Preconditioning of Saddle Point Problems, Department of Mathematics, Temple University, April 2015. First job: Postdoctoral Fellow, University of Manchester, England, UK.
9. Kathryn D. Lund. A new block Krylov subspace framework with applications to functions of matrices acting on multiple vectors, Department of Mathematics, Temple University, March 2018. (Joint Ph.D. program with the University of Wuppertal, Germany. Co-advisor: Andreas Frommer). First job: Postdoctoral Fellow, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland.
10. José C. Garay. Asynchronous Optimized Schwarz Methods for Partial Differential Equations in Rectangular Domains, Temple University, June 2018. First job: Postdoctoral Fellow, Louisiana State University.

**POSTDOCTORAL SUPERVISION:**

Sébastien Loisel, Ph.D. McGill University (2005), 2006–2009.

Marlliny Monsalve, Ph.D. Universidad Central de Venezuela (2009), 2009–2010.

Fei Xue, Ph.D. University of Maryland (2009), 2009–2012.

Mireille El-Haddad, Ph.D. University of Paris, VI (2017), 2017–2018.

Fayçal Chaouqui, Ph.D. University of Geneva (2018), 2018–2020 (expected).

**THESES COMMITTEE SERVICE IN ADDITION TO STUDENTS SUPERVISED:**

James O’Neil, Department of Computer Science, Duke University, M.S., 1987.



- Phil Cimento, Department of Computer Science, Duke University, Ph.D., 1988.
- Shing Ma, Department of Computer Science, Duke University, M.S., 1988.
- Herve Tardif, Department of Computer Science, Duke University, M.S., 1988.
- Paul J. Lanzkron, Department of Computer Science, Duke University, Ph.D., 1988.
- Several others committees in the Departments of Mathematics and Mechanical Engineering, Duke University, 1986-1989.
- Cristina Corral O., Departamento de Matemática Aplicada, Universidad Politécnica de Valencia, Valencia, Spain, Ph.D., May 1995.
- Kostas Blathras, Department of Computer and Information Sciences, Temple University, Ph.D., August 1996.
- Hwajeong Choi, Department of Mathematics, Temple University, Ph.D., July 1997.
- M. Carmen Perea M., Departamento de Estadística e Investigación Operativa, Universidad de Alicante, Alicante, Spain, Ph.D., February 1998.
- Hans E. Johnston, Department of Mathematics, Temple University, Ph.D., August 1999.
- M. Jesús Castel, Departamento de Ciencia de la Computación e Inteligencia Artificial, Universidad de Alicante, Alicante, Spain, Ph.D., July 2000.
- Josep Arnal, Departamento de Ciencia de la Computación e Inteligencia Artificial, Universidad de Alicante, Alicante, Spain, Ph.D., July 2000.
- Jian-Jun Xu, Department of Mathematics, Temple University, Ph.D., April 2001.
- Christian E. Schaerer Serra, Electrical Engineering Department, COPPE, Federal University of Rio de Janeiro, Brazil, Ph.D., July 2002.
- David Fritzsche, Department of Mathematics, University of Wuppertal, Germany, Diploma Thesis, June 2004.
- Duilio Tadeus da Conceição Junior, Instituto Nacional de Matemática Pura e Aplicada (IMPA), Rio de Janeiro, Brazil, Ph.D., March 2006.
- Stefan Borovac, Department of Mathematics, University of Wuppertal, Germany, Ph.D., July 2006.
- Worku Bitew, Department of Mathematics, Temple University, Ph.D., April 2008.
- Elena Virnik, Institute for Mathematics, Technical University, Berlin, Germany, Ph.D., May 2008.
- Bediha Beser, Department of Physics, Temple University, Ph.D., April 2010.

Kumar Dookhitram, Department of Mathematics, Univeristy of Mauritius, Ph.D., October 2010.

Tijmen P. Collignon, Department of Applied Mathematical Analysis, Faculty of Electrical Engineering, Mathematics and Computer Science, Delft University of Technology, Delft, The Netherlands, Ph.D., April 2011.

Michael Dobbins, Department of Mathematics, Temple University, Ph.D., April 2011.

Selcuk Koyuncu, Department of Mathematics, Drexel University, Ph.D., May 2012.

Verena Kuhlemann, Department of Mathematical Science, Emory University, Ph.D., November 2012.

Shimao Fan, Department of Mathematics, Temple University, Ph.D., July 2013.

Dong Zhou, Department of Mathematics, Temple University, Ph.D., June 2014.

Shih-Ting Huang, Department of Mathematics, Temple University, M.S., March 2015.

Matthew Lagro, Department of Mathematics, Temple University, Ph.D., April 2015.

Ana Julio Torres, Department of Mathematics, Universidad Católica del Norte, Antofagasta, Chile, August 2015.

Roberto Díaz Martínez, Department of Mathematics, Universidad Católica del Norte, Antofagasta, Chile, August 2015.

Louis Graup, Department of Mathematics, Temple University, B.S., April 2016.

Reibnaldo A. Astudillo Rengifo, Faculty of Electrical Engineering, Mathematics and Computer Science, Delft University of Technology, Delft, The Netherlands, Ph.D., March 2018.

Kai Zhao, Department of Mathematics, Temple University, Ph.D., March 2018.

Olivier Tissot, Univeristé Pierre et Marie Curie, Paris, France. Ph.D., January 2019.

**SERVICE:**

**SERVICE TO THE PROFESSION:**

**Editorial Work:**

*Boletín SEMA* (Bulletin of the Spanish Society of Applied Mathematics), member of the Scientific Committee, 2010–2013.

*SeMA Journal*, (Bulletin of the Spanish Society of Applied Mathematics), Associate Editor, 2016–present.

*Electronic Journal of Linear Algebra*, Associate Editor, 1995–2001. Associate Managing Editor, 1995–2003. Advisory Editor, 2001–present.

*Electronic Transactions on Numerical Analysis*, Editor, 1998–2004, 2014–present. Editor in Chief, 2005–2013.

*Linear Algebra and its Applications*, Associate Editor, 2011–2015, Senior Editor 2016–2019.

*Mathematics of Computation*, Associate Editor, 2007–2016. Editor, 2017–2021.

*Numerical Linear Algebra with Applications*, member of the editorial board, 2008–present.

*Journal of Numerical Analysis and Approximation Theory* (formerly *Revue d'Analyse Numérique et de Théorie de l'Approximation*). Member of the Editorial Board, 2012–present.

*SIAM Journal on Matrix Analysis and Applications*, Member of the Editorial Board, 2003–2014. Editor-in-Chief 2015–2020.

*BIT -Numerical Mathematics*, Volume **34 (5)**, 2003. Editor, special issue of papers presented at the Conference on Computational Linear Algebra with Applications, Milovy, Czech Republic, August 4–10, 2002.

*Electronic Transactions on Numerical Analysis*, 2018. Editor, special volume dedicated to Olof B. Widlund on the occasion of his 80th birthday.

*Linear Algebra and its Applications*, Volume **302/303**, 1999. Editor, special issue of papers presented at the 7th Conference of the International Linear Algebra Society, Madison, Wisconsin, June 3–6, 1998. *MR 2000g:00091*.

Volume **386**, 2004. Editor, special issue of papers presented at the Fourth International Conference on the Numerical Solution of Markov Chains, September 3–5, 2003, University of Illinois at Urbana-Champaign.

Volume **429**, issue 20, 2008. Editor, special issue dedicated to Richard S. Varga's 80th birthday.

Reviewer for *Mathematical Reviews*, 2007–2013.

Member of the Editorial Board of the book series “Advances in Computation, Theory and Practice,” published by NOVA Science Publishers, 1998–1999.

### Conference Work:

Gatlinburg X Conference, Fairfield Glade, Tennessee, October 19–23, 1987, organized session on eigenvalue problems.

Householder Symposium XI, Tylösand, Sweden, June 18–22, 1990, organized session on eigenvalue problems.

Special Session on ‘Numerical Linear Algebra’ for the American Mathematical Society Eastern Sectional Conference, Philadelphia, October 12–13, 1991. Session Organizer.

- Member of the Organizing Committee, International Workshop on Iterative Methods and Parallel Computation, Milovy, Czech Republic, June 16–21, 1997.
- Member of the Organizing Committee, Conference on Numerical Analysis in honor of Olof B. Widlund on the occasion of his 60th birthday, Courant Institute, New York, January 23–24, 1998.
- Special Session on ‘Sparse Matrix Computations’ for the American Mathematical Society Eastern Sectional Conference, Philadelphia, April 4–6, 1998. Session Co-organizer.
- Member of the Organizing Committee, ILAS98: The 7th Conference of the International Linear Algebra Society, Madison, Wisconsin, June 3–6, 1998.
- Co-Organizer, Minisymposium on Parallel Asynchronous Methods, ILAS99: The 8th Conference of the International Linear Algebra Society, Barcelona, Spain, July 19–22, 1999.
- Member of the Program Committee, Third International Conference on the Numerical Solution of Markov Chains, Zaragoza, Spain, September 6–10, 1999.
- Member of the Program Committee, Conference on Computational Linear Algebra with Applications, Milovy, Czech Republic, August 4–10, 2002.
- Member of the Program Committee, Fourth International Conference on the Numerical Solution of Markov Chains, September 3–5, 2003, University of Illinois at Urbana-Champaign.
- Co-organizer, Seminar on Theoretical and Computational Aspects of Matrix Algorithms, October 12–17, 2003, Schloss Dagstuhl, International Conference and Research Center for Computer Science, Wadern, Germany.
- Co-organizer, Minisymposium on Schwarz Preconditioners and Accelerators, Sixteenth International Conference on Domain Decomposition Methods, New York, 12–15 January 2005.
- Organizer. Minisymposium on Large Scale Computations for Markov Chains and PageRank (Google), Third SIAM Conference on Computational Science and Engineering, February 12–15, 2005, Orlando.
- Member of the Scientific Program Committee. Algoritmy 2005, Conference on Scientific Computing, March 13–18, 2005, High Tatra Mountains, Podbanske, Slovakia.
- Member of the Local Organizing Committee. XVI Householder XVI Symposium on Numerical Linear Algebra, May 23–27, 2005, Seven Springs Mountain Resort, Champion, Pa.
- Member of the Scientific Committee. Conference on Applied Linear Algebra in Honor of Richard S. Varga, 12–15 October 2005, Palić, Serbia and Montenegro.

- Member of the Program Committee. A. A. Markov Anniversary Meeting, Charleston, South Carolina, 12–14 June 2006.
- Organizer. Invited Minisymposium on Markov Chains, GAMM-SIAM Conference on Applied Linear Algebra, Düsseldorf, Germany, 24–27 July 2006.
- Co-organizer (with Andreas Frommer and Michael Mahoney). Seminar on Web Information Retrieval and Linear Algebra Algorithms, 11–15 February 2007, Schloss Dagstuhl, International Conference and Research Center for Computer Science, Wadern, Germany.
- Co-organizer, Workshop on Structured Perturbations, and Distance Problems in Matrix Computations, 26–30 March 2007, Stefan Banach International Mathematical Center, Bedlewo/Poznan, Poland.
- Co-organizer (with Michael Neumann). Minisymposium on Generalizations of the Perron-Frobenius Theorem and of M-matrices, Fourteenth Conference of the International Linear Algebra Society (ILAS), 16–20 July 2007, Shanghai, China.
- Member of the Scientific Program Committee, “Harrachov 2007,” Computational Methods with Applications, 19–25 August 2007, Harrachov, Czech Republic.
- Member of the Scientific Committee, Ninth IMACS International Symposium on Iterative Methods in Scientific Computing, 17–20 March, 2008, Lille, France.
- Member of the Scientific Committee, Conference on Applied Linear Algebra in Honor of Ivo Marek, 28–30 April 2008, Novi Sad, Serbia.
- Member of the Organizing Committee, Fifteenth Conference of the International Linear Algebra Society (ILAS), 16–20 June 2008, Cancun, Mexico.
- Member of the International Program Committee, Fifth International workshop on Parallel Matrix Algorithms and Applications, 20–22 June 2008, Neuchâtel, Switzerland.
- Member of the Steering Committee, SIAG/LA-SIMUMAT International Summer School on Numerical Linear Algebra, 21–25 July 2008, Castro Urdiales, Spain.
- Member of the Organizing Committee, Fast Algorithms for Scientific Computing: a symposium in honor of Olof B Widlund on the occasion of his seventeenth birthday, 19–20 September 2008, Courant Institute, New York University, New York.
- Member of the Scientific Committee, Conference on Numerical Analysis and Scientific Computing with Applications, 18–22 May 2009, Agadir, Morocco.
- Member of the Program Committee, SIAM Conference on Applied Linear Algebra, 26–29 October 2009, Monterey, California.

- Member of the International Program Committee, Sixth International workshop on Parallel Matrix Algorithms and Applications, 30 June–2 July 2010, Basel, Switzerland.
- Member of the Program Committee, Sixth International Conference on the Numerical Solution of Markov Chains, 16–18 September 2010, College of William and Mary, Williamsburg, Virginia.
- Member of the Program Committee, Computer Aspects of Numerical Algorithms (CANA'10), 18–20 October 2010, Wista, Poland.
- Coordinator for Minisymposium on Numerical Analysis and Linear Algebra, NAMIAM 2010: First North American Meeting on Industrial and Applied Mathematics, 7–10 December 2010, Universidad del Mar, Huatulco, Oaxaca, Mexico.
- Member of the Editorial Board, The Second International Conference on Parallel, Distributed, Grid and Cloud Computing for Engineering, 12–15 April 2011, Ajaccio, Corsica, France.
- Chair, Best Poster Prize Committee, Householder Symposium XVIII on Numerical Linear Algebra, Tahoe City, California, 12–17 June 2011.
- Member of the Program Committee, Computer Aspects of Numerical Algorithms (CANA'11), 19–21 September 2011, Szczecin, Poland.
- Co-organizer (with Benjamin Seibold). Mid-Atlantic Numerical Analysis Day, 4 November 2011, Temple University, Philadelphia.
- Co-organizer (with Valeria Simoncini), Minisymposium on Recent Advances in the Numerical Solution of Large Scale Matrix Equations, SIAM Conference on Applied Linear Algebra, 18–22 June 2012, Valencia, Spain.
- Co-organizer (with Eric de Sturler), Minisymposium on Challenges for the Solution and Preconditioning of Multiple Linear Systems, SIAM Conference on Applied Linear Algebra, 18–22 June 2012, Valencia, Spain.
- Member of the Scientific Program Committee, Seventh International workshop on Parallel Matrix Algorithms and Applications, 28–30 June 2012, Birkbeck University of London, UK.
- Co-organizer (with Shaun Fallat, Michael Tsatsomeros, and Pauline Van den Driessche). Workshop on Theoretical and Applied Aspects of Nonnegative Matrices, 27–29 July 2012, Banff International Research Station for Mathematical Innovation and Discovery, Banff, Alberta, Canada.
- Member of the Program Committee. Computer Aspects of Numerical Algorithms (CANA'12), 9–12 September 2012, Wroclaw, Poland.
- Co-organizer (with Benjamin Seibold). Mid-Atlantic Numerical Analysis Day, 2 November 2012, Temple University, Philadelphia.

Member of the Program Committee. New Frontiers in Numerical Analysis and Scientific Computing - A conference on the occasion of Lothar Reichel's 60th birthday and on the 20th anniversary of ETNA, 19-20 April 2013, Kent State University, Kent, Ohio.

Member of the Program Committee. Computer Aspects of Numerical Algorithms (CANA'13), Krakow, Poland, 8–11 September 2013.

Co-organizer (with Benjamin Seibold). Mid-Atlantic Numerical Analysis Day, 22 November 2013, Temple University, Philadelphia.

Member of the Program Committee. 8th International Conference on Matrix Analytic Methods in Stochastic Models, National Institute of Technology Calicut, Kerala, India, 6–10 January 2014.

Member of the Scientific Program Committee. Eighth International workshop on Parallel Matrix Algorithms and Applications (PMAA'14), University of Lugano, Switzerland, 2–4 July 2014.

Co-organizer (with Benjamin Seibold). Mid-Atlantic Numerical Analysis Day, 7 November 2014, Temple University, Philadelphia.

Co-organizer (with Jennifer Pestana). Minisymposium on Iterative Methods and Preconditioning, Eighth International Congress on Industrial and Applied Mathematics (ICIAM), 10–14 August 2015, Beijing, China.

Co-organizer (with Sunny Joshi). Mid-Atlantic Numerical Analysis Day, 13 November 2015, Temple University, Philadelphia.

Member of the Scientific Program Committee. Tenth International workshop on Parallel Matrix Algorithms and Applications (PMAA'16), 6–8 July 2016, Bordeaux, France.

Member of the Scientific Committee. Congreso de Matemáticas Capricornio (Capricorn Congress of Mathematics), 2–5 August 2016, Antofagasta, Chile.

Co-organizer (with Benjamin Seibold). Mid-Atlantic Numerical Analysis Day, 11 November 2016, Temple University, Philadelphia.

Co-organizer (with Michael Overton). Workshop on Domain Decomposition, Past, Present, and Future, 24–25 February 2017, Courant Institute, New York University.

Co-organizer (with Nicole Spillane). Minisymposium on Efficient Iterative Solvers with Enlarged Minimization Spaces, SIAM Conference on Computational Science and Engineering, 27 February – 3 March 2017, Atlanta.

Member, Special Sessions Subcommittee, Mathematical Congress of the Americas, 24–28 July 2017, Montreal, Canada.

Member, Program Committee, The International Conference on Preconditioning Techniques for Scientific and Industrial Applications (Precon-17) 31 July 31 – 2 August 2017, University of British Columbia, Vancouver, Canada.

Co-organizer (with Benjamin Seibold). Mid-Atlantic Numerical Analysis Day, 3 November 2017, Temple University, Philadelphia.

Co-organizer (with Eugene Vecharynski), SIAM Special Session on Numerical Linear Algebra, Joint Mathematics Meeting, 10–13 January 2018, San Diego.

Co-organizer (with Hartwig Anzt and Edmond Chow), Minisymposium on Asynchronous Iterative Methods, SIAM Conference on Applied Linear Algebra, 4–8 May 2018, Hong Kong.

Co-organizer (with Erik Boman), Minisymposium on Asynchronous Domain Decomposition Methods, 25th International Domain Decomposition Conference, DD XXV, 23–27 July, 2018, St. John's, Newfoundland, Canada.

Co-organizer (with Xiao-Chuan Xai and Luca Pavarino), Minisymposium on Fifty years of Domain Decomposition theory and algorithms: celebrating Olof B. Widlund's 80th birthday, 25th International Domain Decomposition Conference, DD XXV, 23–27 July, 2018, St. John's, Newfoundland, Canada.

Co-organizer (with Susanne Brenner, Igor Shparlinski, and Chi-Wang Shu), Celebrating 75 Years of Mathematics of Computation, 1–3 November 2018, Workshop held at the Institute for Computational and Experimental Reserach in Mathematics (ICERM), Providence, RI.

Co-organizer (with Benjamin Seibold). Mid-Atlantic Numerical Analysis Day, 9 November 2018, Temple University, Philadelphia.

Co-organizer (with Christian Glusa). Mini-symposium on Asynchronous Iterative Methods, SIAM Conference on Computational Science and Engineering, Spokane, Washington, 25 February – 1st March 2019.

Member, Program Committee, The International Conference on Preconditioning Techniques for Scientific and Industrial Applications (Precon-19) 1-3 July 2019, University of Minnesota, Twin cities, Minneapolis, Minnesota.

Co-organizer (with Xiao-Chuan Cai and Marcus Sarkis). Mini-symposium on Numerical Approaches for Solving Large-Scale Sparse Systems, Twentysecond Conference of the International Linear Algebra Society (ILAS), 8–12 July 2019, Rio de Janeiro, Brazil.

Co-organizer (with Christian Glusa), Minisimposium on Asynchronous Iterative Methods, Ninth International Congress on Industrial and Applied Mathematics (ICIAM 2019), Valencia, Spain, 15–19 July 2019.



Co-organizer (with Victorita Dolean and Nicole Spillane), Workshop on Parallel Solution Methods for Systems Arising from PDEs, 16–20 September 2019, Centre International de Rencontres Mathématiques, Luminy, France.

Member of the Scientific Committee, International conference on Mathematical modelling and computational methods in applied sciences and engineering, Modelling 2019, 16–20 September 2019, Olomouc, Czech Republic.

Co-organizer (with Christian Glusa), Minisymposium on Asynchronous Iterative Methods, 26th International Conference on Domain Decomposition Methods, Hong Kong, 2–6 December 2019.

Member, Special Sessions Subcommittee, Mathematical Congress of the Americas, 19–24 July 2021, Buenos Aires, Argentina.

**Other Professional Service:**

Reviewer for numerous proposals for the National Science Foundation, and for the Department of Energy.

Reviewer for a number of major journals in Linear Algebra, Numerical Analysis and Scientific Computing.

National Research Council, panel member for the evaluation of the National Science Foundation Minority Graduate Fellowships, 1991.

International Linear Algebra Society, appointed to the Committee on Electronic Publishing, 1993.

International Linear Algebra Society, appointed to the Committee on the Future of the Internet, 1993. Authored report on the Future of the Internet, 29 November 1993.

Oak Ridge Associated Universities, panel member for the evaluation of the National Science Foundation Minority Graduate Fellowships, 1995.

International Linear Algebra Society, appointed to the Nominating Committee, 1996.

External review panel for the Department of Mathematics, Baruch College, City University of New York, May 2000.

Member of the Board of Directors, International Linear Algebra Society (ILAS), 2001–2004.

Member of the selection committee for the 2006 award of the Richard C. DiPrima Prize. SIAM, Society of Industrial and Applied Mathematics.

Chair, SIAM Activity Group on Linear Algebra, 2007–2009.

Member of the Joint Policy Board of Mathematics Committee for the Mathematics Awareness Month 2008.

Member of the Journals Committee, International Linear Algebra Society (ILAS), 2008–2011.

Member of the President’s Advisory Board, International Linear Algebra Society (ILAS), 2008–2011.

Chair, Gene Golub SIAM Summer School Committee, 2010–2013.

Member of the Board of Advisors of Accelogic (a software company for High Performance Computing), since 2012.

Vice President at Large, SIAM, Society of Industrial and Applied Mathematics, 2014–2015.

Mathematical Council of the Americas, member (representing SIAM), 2015–2022.

Chair, SIAM Committee on Section Activities, 2019–2021.

**SERVICE TO THE UNIVERSITY:**

Elected to the University Tenure and Promotion Advisory Committee, 2011–2013.

TAUP-Temple University Negotiating Committee, 2004–2005, 2008–2009.

Appointed to the Senate Committee on the Status of Women Faculty, 2002–2005.

Elected representative to the Faculty Senate, 1999–2001.

Appointed to the Latino Initiative Committee, 1997–1998, 1998–1999.

Affiliated Faculty of Latin American Studies, 1997–2006.

**SERVICE TO THE COLLEGE:**

College of Arts and Sciences Scientific Research Advisory Committee, Spring 1993.

College of Arts and Sciences Committee on the Sciences, 1993–1994.

Promotions Committee of the College of Arts and Sciences, 1996–1998.

Tenure and Promotions Committee of the College of Science and Technology, Chair, 1998–1999. Member 2009–2010. Chair, 2010–2011.

Undergraduate Committee of the College of Science and Technology, 2000–2001.

Dean Advisory Committee of the College of Science and Technology, 2007–2012.

Bylaws Committee, College of Science and Technology, 2007–2010.

Merit Committee, College of Science and Technology, 2008–2011.

**SERVICE TO THE DEPARTMENT:**

Director of Graduate Studies, Department of Computer Science, Duke University, 1986–1988.

Director of Undergraduate Studies, Department of Mathematics, Temple University, 1997–1999.

Executive Committee, Department of Mathematics, Temple University, 1997–1999, 2003–2006 (Chair, 2003–2004), 2008–2011 (Chair, 2010–2011), 2012–2015 (Chair, 2014–2015), 2016–2019.

Computer Committee, Department of Mathematics, Temple University, 1990–1997 (Chair, 1992–1994).

Library Committee, Department of Mathematics, Temple University, 1991–1992, 2000–2004, 2005–2006 (Chair, 2003–2004, 2005–2006).

Undergraduate Committee, Department of Mathematics, Temple University, 2000–2001.

Core Committee, Department of Mathematics, Temple University, 2001–2003.

In charge of the Research Reports, Department of Mathematics, Temple University, 1991–present.

Personnel Committee, Department of Mathematics, Temple University, 1991–1994, 1998–2001 (Chair, 2000–2001), 2004–2010, 2011–2015. Chair of Search Committee, 1992–1993, 2008–2009, 2014–2016. Member of the Search Committee, 1997–1998, 2003–2005, 2007–2008, 2010–2013, 2014–2015, 2015–2018..

Spanish Exam Coordinator, Department of Mathematics, Temple University, 1991–1993, 1995.

French Exam Coordinator, Department of Mathematics, Temple University, 2011–2013, 2014–2016.

Graduate Committee, Department of Mathematics, Temple University, 1992–1993, 2003–2006, 2008–2010, 2011–2015, 2017–2019.

Volunteer adviser to several undergraduate and graduate students, 1992–present.

Informal adviser-mentor to junior faculty members, 1992–1997, 2010–2015.

Mentoring Committee, 2010–2015.

Department Seminar on Applied Mathematics and Numerical Analysis, co-organizer, 1993–2000.

Gave several lectures each semester in the Department Seminar on Applied Mathematics and Numerical Analysis, 1993–2000.

Editor of the Temple University Mathematics Monthly (TUMM), New Series, 1997–2000.

Mathematical Models in Biology Seminar, Departments of Mathematics and Biology, co-organizer, 2000–2001.

Merit Committee, Department of Mathematics, Temple University, 2004–2007, 2009–2012. (Chair, 2006–2007, 2010–2012.)

Applied Mathematics and Scientific Computing Seminar, co-organizer, 2004–2006, 2007–present.

Chair Advisory Committee, 2007–2013.

Department Colloquium coordinator, 2007–2008.

Department Technology Committee 2011–2012.

Faculty Advisor (one of several) for the Temple Mathematical Contest in Modeling 2011–2017.

Faculty Advisor for the Temple University SIAM student chapter, 2015–present.

#### **OUTREACH AND SERVICE TO THE COMMUNITY:**

Invited Lecture for the course “Discrete Mathematics” at Friends Select School, Center City Philadelphia, January 1994.

“What is it to be a Mathematician?” Keynote address at the Sixth Annual Mathematics and Science Symposium, Friends Select School, Center City Philadelphia, 25 April 1995.

Lecture to eighth grade about being a mathematician at the Gillespie Middle School Career Day, North Philadelphia, 2 May 1996.

Interviewed in Buenos Aires, Argentina, for popular science TV program on the topic of search engines. Aired on national TV in Argentina on 18 September 2005.

#### **CONSULTANCIES:**

Inter-American Development Bank, Washington, D.C. International technical cooperation to assist the Argentine Planning Department on an Input-Output planning model, 1985–1987.

Nazarbayev University, Astana, Kazakhstan. Hiring Committee. Interview applicants in short list for faculty position, 2013–2015.

#### **PROFESSIONAL MEMBERSHIPS:**

American Mathematical Society (AMS), 1979–2003, 2008–present. Fellow, class of 2017.

Association for Women in Mathematics (AWM) 1987–present.

International Linear Algebra Society (ILAS), 1988–present. Member of the Board, 2001–2004, Member of the President Advisory Board, 2008–2011.

Society for Industrial and Applied Mathematics (SIAM), 1980–present. Vice-President at Large, 2014–2015. Fellow, class of 2017.

SIAM Activity Group on Linear Algebra, 1987–present. Chair, 2007–2009.

GAMM Activity Group on Applied and Numerical Linear Algebra, 2007–present. Member of the International Advisory Board, 2013–present.