CURRICULUM VITAE

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Education:	Rutgers University Ph.D. (Mathematics), 1983 California Institute of Technology Undergraduate coursework; M.S. (Physics), 1980
Ph.D. Thesis:	"The Density of States of Random Matrices and Random Operators" (advisor Thomas Spencer, now at Institute for Advanced Study)
Employment:	University of Colorado Boulder • Adjoint Professor, Mathematics (2010–present); University of Arizona • Professor, Mathematics and Physics; also Affiliate, Statistics and Data Science Program (2007–present) • Professor, Mathematics and Physics (2001–2007) • Associate Professor, Mathematics and Physics (1997–2001) • Associate Professor, Mathematics (1994–1997) • Assistant Professor, Mathematics (1988–1994) • Visiting Assistant Professor, Mathematics (1986–1988) University of Texas at Austin • Instructor, Mathematics (1983–1986)
Memberships:	American Mathematical Society, Tau Beta Pi
Research Interests:	mathematical physics quantum information and computing enumerative combinatorics statistical inference, information theory (with applications in physics) applied probability and stochastic modelling special functions and orthogonal polynomials number theory and algebraic geometry

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Scopus:	www.scopus.com/authid/detail.uri?authorId=7201868021

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PUBLICATIONS: Journal Articles

"Sheffer polynomials and the s-ordering of exponential boson operators," (by R. S. Maier). *Journal of Mathematical Physics* **66**, article id. 122101, 20 pages (2025).
Available at arxiv.org/abs/2508.13094 [quant-ph].

"Boson operator ordering identities from generalized Stirling and Eulerian numbers," (by R. S. Maier). *Advances in Applied Mathematics* **156**, article id. 102678, 34 pages (2024).
Available at arxiv.org/abs/2308.10332 [math.CO].

"Triangular recurrences, generalized Eulerian numbers, and related number triangles" (by R. S. Maier). *Advances in Applied Mathematics* **146**, article id. 102485, 62 pages (2023).
Available at arxiv.org/abs/2207.10224 [math.CO].

"Extensions of the classical transformations of the hypergeometric function ${}_3F_2$" (by R. S. Maier). *Advances in Applied Mathematics* **105**, 25–47 (2019). Available at arxiv.org/abs/1808.03014 [math.CA].

"Cosmological tests with the Joint Light-curve Analysis [JLA]" (by F. Melia, Jun-Jie Wei, R. S. Maier, and Xuefeng Wu). *Europhysics Letters (EPL)* **123**, article id. 59002, 7 pages (2018). Available at arxiv.org/abs/1809.05094 [astro-ph.CO].

"Associated Legendre functions and spherical harmonics of fractional degree and order" (by R. S. Maier). *Constructive Approximation* **48**, 235–281 (2018). Available at arxiv.org/abs/1702.08555 [math.CA].

"EMP: An execution time measurement protocol for compute-bound programs" (by Y.-K. Suh, R. T. Snodgrass, J. D. Kececioglu, P. J. Downey, R. S. Maier & C. Yi). *Software: Practice and Experience* **47**, 559–597 (2017). Available at doi.org/10.1002/spe.2476.

"Legendre functions of fractional degree: Transformations and evaluations" (by R. S. Maier). *Proceedings of the Royal Society A* **472**, article 20160097, 29 pages (2016). Available at arxiv.org/abs/1602.03070 [math.CA].

"Integrals of Lipschitz–Hankel type, Legendre functions and table errata" (by R. S. Maier). *Integral Transforms and Special Functions* **27**, 385–391 (2016). arxiv.org/abs/1509.08963 [math.CA].

"A comparative analysis of the Supernova Legacy Survey Sample [SLSS] with ΛCDM and the $R_h = ct$ universe" (by J. J. Wei, X. F. Wu, F. Melia & R. S. Maier), *Astronomical Journal* **149**, article id. 102, 11 pages (2015). Available at arxiv.org/abs/1501.02838 [astro-ph.CO].

"The uniformization of certain algebraic hypergeometric functions" (by R. S. Maier). *Advances in Mathematics* **253**, 86–138 (2014). Available at arxiv.org/abs/0906.3485 [math.CA].

"The integration of three-dimensional Lotka–Volterra systems" (by R. S. Maier). *Proceedings of the Royal Society A* **469**, article id. 20693, 27 pages (2013). Available at arxiv.org/abs/1211.5813 [math.CO].

"Information criteria for deciding between normal regression models" (by R. S. Maier). Working paper, 27 pages (2013). Available at arxiv.org/abs/1305.5493 [stat.ME].

"Cosmic chronometers in the $R_h = ct$ universe" (by F. Melia and R. S. Maier). *Monthly Reviews of the Royal Astronomical Society* **432**, 2669–2675 (2013). arxiv.org/abs/1304.1802 [astro-ph.CO].

"Nonlinear differential equations satisfied by certain classical modular forms" (by R. S. Maier). *Manuscripta Mathematica* **134**, 1–42 (2011). Available at arxiv.org/abs/0807.1081 [math.NT].

"On rationally parametrized modular equations" (by R. S. Maier). *Journal of the Ramanujan Mathematical Society* **24**, 1–73 (2009). Available at arxiv.org/abs/math/0611041 [math.NT].

"Lamé polynomials, hyperelliptic reductions and Lamé band structure" (by R. S. Maier). *Philosophical Transactions of the Royal Society of London, Series A* **366**, 1115–1153 (2008). Published in the theme issue titled "Thirty Years of Finite-Gap Integration." Available at arxiv.org/abs/math-ph/0309005.

"Algebraic hypergeometric transformations of modular origin" (by R. S. Maier). *Transactions of the American Mathematical Society* **359**, 3859–3885 (2007). Available at arxiv.org/abs/math.NT/0501425.

"The 192 solutions of the Heun equation" (by R. S. Maier). *Mathematics of Computation* **76**, 811–843 (2007). Available at arxiv.org/abs/math.CA/0408317.

"A generalization of Euler's hypergeometric transformation" (by R. S. Maier). *Transactions of the American Mathematical Society* **358**, 39–57 (2006). Available at arxiv.org/abs/math/0302084.

"On reducing the Heun equation to the hypergeometric equation" (by R. S. Maier). *Journal of Differential Equations* **213**, 171–203 (2005). Available at arxiv.org/abs/math.CA/0203264.

"Algebraic solutions of the Lamé equation, revisited" (by R. S. Maier). *Journal of Differential Equations* **198**, 16–34 (2004). Available at arxiv.org/abs/math/0206285 [math.CA].

"On crossing event formulas in critical two-dimensional percolation" (by R. S. Maier). *Journal of Statistical Physics* **111**, 1027–1048 (2003). Available at arxiv.org/abs/math-ph/0210013.

"Droplet nucleation and domain wall motion in a bounded interval" (by R. S. Maier & D. L. Stein). *Physical Review Letters* **87** (2001), 270601. Available at arxiv.org/abs/cond-mat/0108217.

"Noise-activated escape from a sloshing potential well" (by R. S. Maier & D. L. Stein). *Physical Review Letters* **86** (2001), 3942–3945. Available at arxiv.org/abs/cond-mat/0006120.

"How an anomalous cusp bifurcates" (by R. S. Maier & D. L. Stein). *Physical Review Letters* **85** (2000), 1358–1361.

"Observation of saddle-point avoidance in noise-induced escape (by D. G. Luchinsky, R. S. Maier, R. Mannella, P. V. E. McClintock & D. L. Stein). *Physical Review Letters* **82** (1999), 1806–1809.

"Experiments on critical phenomena in a noisy exit problem" (by D. G. Luchinsky, R. S. Maier, R. Mannella, P. V. E. McClintock & D. L. Stein). *Physical Review Letters* **79** (1997), 3109–3112.

"Limiting exit location distributions in the stochastic exit problem" (by R. S. Maier & D. L. Stein). *SIAM Journal on Applied Mathematics* **57** (1997), 752–790.

"Topological features of fluctuations to the interior of a limit cycle" (by V. N. Smelyanskiy, M. I. Dykman, & R. S. Maier). *Physical Review E* **55** (1997), 2369–2391.

"Singular features of large fluctuations in oscillating chemical systems" (by V. N. Smelyanskiy, M. I. Dykman, R. S. Maier, & M. Silverstein), *Journal of Physical Chemistry* **100** (1996), 19197–19209.

"Oscillatory behavior of the rate of escape through an unstable limit cycle" (by R. S. Maier & D. L. Stein),

Physical Review Letters **77** (1996), 4860–4863.

"A scaling theory of bifurcations in the symmetric weak-noise escape problem" (by R. S. Maier & D. L. Stein). *Journal of Statistical Physics* **83** (1996), 291–357.

"The shape of stretched planar trees" (by R. S. Maier). *Random Structures and Algorithms* **6** (1995), 331–340.

"The effect of focusing and caustics on exit phenomena in systems lacking detailed balance" (by R. S. Maier & D. L. Stein). *Physical Review Letters* **71** (1993), 1783–1786.

"The escape problem for irreversible systems" (by R. S. Maier & D. L. Stein). *Physical Review E* **48** (1993), 931–938.

"Phase-type distributions and the structure of finite Markov chains" (by R. S. Maier). *Journal of Computational and Applied Mathematics* **46** (1993), 449–453.

"Transition-rate theory for non-gradient drift fields" (by R. S. Maier & D. L. Stein). *Physical Review Letters* **69** (1992), 3691–3695.

"A closure characterization of phase-type distributions" (by R. S. Maier & C. A. O'Cinneide). *Journal of Applied Probability* **29** (1992), 92–103.

"The algebraic construction of phase-type distributions" (by R. S. Maier). *Communications in Statistics: Stochastic Models* **7** (1991), 573–602.

"A path integral approach to data structure evolution" (by R. S. Maier). *Journal of Complexity* **7** (1991), 232–260.

"Colliding stacks: A large deviations analysis" (by R. S. Maier). *Random Structures and Algorithms* **2** (1991), 379–420.

"A probabilistic analysis of a learning matrix" (by W. G. Faris & R. S. Maier). *Advances in Applied Probability* **20** (1988), 695–705.

"The value of a random game: The advantage of rationality" (by W. G. Faris & R. S. Maier). *Complex Systems* **1** (1987), 235–244.

"Bounds on the density of states of random Schrödinger operators" (by R. S. Maier). *Journal of Statistical Physics* **48** (1987), 425–447.

"Transition probabilities in Nd(II) and the solar neodymium abundance" (by R. S. Maier & W. Whaling). *Journal of Quantitative Spectroscopy and Radiative Transfer* **18** (1977), 501–507.

PUBLICATIONS: Misc. Invited Talks and Preprints

"Hypergeometric transformations based on Hahn and Racah polynomials" (by R. S. Maier), invited talk at OPSFA 2019 [Orthogonal Polynomials, Special Functions and Applications 2019], RISC-Linz, Austria. Available at www3.risc.jku.at/conferences/opsfa2019/talk/maie.pdf.

"Information criteria for deciding between normal regression models" (by R. S. Maier), preprint. Available at arxiv.org/abs/1305.5493.

"Quadratic differential systems and Chazy equations" (by R. S. Maier), preprint. Available at arxiv.org/abs/1203.0283.

PAST NSF SUPPORT

"Noise-Induced Fluctuations in Nonequilibrium Systems," PHY-0099484 (2001–2005), awarded by the NSF Theoretical Physics Program. Lead PI, total amount $261K.

"Applications of Semiclassical Asymptotics in Stochastic Modelling," DMS-9500792 (1995–1998), awarded by the NSF Applied Mathematics Program. Sole PI, total amount $60K.

PUBLICATIONS: Conference Proceedings Articles

"Algebraic generating functions for Gegenbauer polynomials" (by R. S. Maier). In *Frontiers in Orthogonal Polynomials and q-Series*, ed. M. Z. Nashed and Xin Li, chapter 22. World Scientific, 2017. Available at arxiv.org/abs/1607.05215 [math.CA].

"P-symbols, Heun identities, and ${}_3F_2$ identities" (by R. S. Maier). In *Special Functions and Orthogonal Polynomials*, ed. D. Dominici & R. S. Maier, pp. 139–159. American Mathematical Society, 2008. Available at arxiv.org/abs/0712.4299 [math.CA].

"Parametrized stochastic grammars for RNA secondary structure prediction" (by R. S. Maier). In Proceedings of the 2007 Information Theory and Applications Workshop (ITA 2007). Available at arxiv.org/abs/q-bio/0701036 and at IEEE Xplore.

"A theory of magnetization reversal in nanowires" (by R. S. Maier),pp. 48–57 in Proceedings vol. 5471 of SPIE (The International Society for Optical Engineering), 2004; arxiv.org/abs/cond-mat/0407456.

"The effects of weak spatiotemporal noise on a bistable one-dimensional system" (by R. S. Maier & D. L. Stein), pp. 67–78 in Conference Proceedings vol. 5114 of SPIE (The International Society for Optical Engineering), 2003.

"The birth of a cusp: The unfolding of a boundary catastrophe" (by R. S. & D. L. Stein). In *Stochastic and Chaotic Dynamics in the Lakes*, ed. David S. Broomhead et al., pp. 26–33. American Institute of Physics Conference Proceedings vol. 502, 1999.

"The weak-noise characteristic boundary exit problem: Old and new results" (by R. S. Maier & D. L. Stein). In *Fluctuations and Order: The New Synthesis*, ed. Mark Millonas, pp. 109–119. Springer-Verlag, 1996.

"Effective bandwidth of Markov fluids with occupancy-based admission control" (by R. S. Maier). In proceedings of the Thirty-third Annual Allerton Conference on Communication, Control, and Computing (Monticello, Illinois, Oct. 1995), pp. 766–775. University of Illinois, 1995.

"Optimal paths, caustics, and boundary layer approximations" (by R. S. Maier & D. L. Stein). In proceedings of the 15th Biennial ASME Conference on Mechanical Vibration and Noise (Boston, Sept. 1995), Volume 3A, pp. 903–910.

"The exhaustion of shared memory: Stochastic results" (by R. S. Maier & R. Schott). In *Algorithms and Data Structures*, proceedings of WADS '93, the 1993 Workshop on Algorithms and Data Structures (Montréal, Canada, Aug. 1993), pp. 494–505. Lecture Notes in CS #709. Springer-Verlag, 1993.

"Large fluctuations in stochastically perturbed nonlinear systems: Applications in computing" (by R. S. Maier). In *1992 Lectures on Complex Systems*, proceedings of the 1992 Complex Systems Summer School (Santa Fé, June 1992), Addison-Wesley, 1993. arxiv.org/abs/chao-dyn/9305009.

"Communications networks as stochastically perturbed nonlinear systems: A cautionary note" (by R. S. Maier). In proceedings of the Thirtieth Annual Allerton Conference on Communication, Control, and Computing (Monticello, Illinois, Oct. 1992), pp. 674–681. University of Illinois, 1992.

"Orderings arising from expected extremes, with an application" (by P. J. Downey & R. S. Maier). In *Stochastic Inequalities*, proceedings of the AMS–IMS–SIAM Joint Summer Research Conference on Stochastic Inequalities (Seattle, July 1991), ed. M. Shaked and Y. L. Tong, pp. 66–75. Institute of Mathematical Statistics, 1992.

"Instability times of multiaccess broadcast channels" (by R. S. Maier). In proceedings of the Twenty-Eighth Annual Allerton Conference on Communication, Control, and Computing (Monticello, Illinois, Oct. 1990), pp. 139–148. University of Illinois, 1990.

"The asymptotic evolution of data structures" (by R. S. Maier). In *Advances in Computing and Information*, proceedings of ICCI '90, the Second Annual International Conference on Computing and Information (Niagara Falls, May 1990), pp. 14–23. Lecture Notes in Computer Science #468. Springer-Verlag, 1990.

"The density of states of random Schrödinger operators" (by R. S. Maier). In *Random Matrices and Their Applications*, proceedings of the AMS–IMS–SIAM Joint Summer Research Conference on Random Matrices (Bowdoin, Maine, June 1984), ed. J. E. Cohen, H. Kesten, & C. M. Newman, pp. 287–294. American Mathematical Society, 1986.

PUBLICATIONS: Refereed Proceedings Volumes Edited

"Applications and q-Extensions of Hypergeometric Functions" (ed. H. S. Cohl, R. Costas-Santos & R. S. Maier), no. 819 in the *Contemporary Mathematics* series, American Mathematical Society, 2025. This refereed proceedings volume resulted from several special sessions at sectional meetings of the AMS, which I co-organized. Available at ams.org/books/conm/819.

"Classical Hypergeometric Functions and Generalizations" (ed. H. S. Cohl, R. Costas-Santos & R. S. Maier), no. 818 in the *Contemporary Mathematics* series, American Mathematical Society, 2025. This refereed proceedings volume resulted from several special sessions at sectional meetings of the AMS, which I co-organized. Available at ams.org/books/conm/818.

"Algorithmic Probability and Combinatorics (ed. M. Lladser, R. S. Maier, M. Mishna & A. Rechnitzer), no. 520 in the *Contemporary Mathematics* series, American Mathematical Society, 2010. This refereed proceedings volume resulted from two special sessions at sectional meetings of the AMS, which I co-organized. Available at ams.org/books/conm/520.

"Special Functions and Orthogonal Polynomials" (ed. D. Dominici & R. S. Maier), no. 471 in the *Contemporary Mathematics* American Mathematical Society, 2008. This refereed proceedings volume resulted from a special session at a sectional meeting of the AMS, which I co-organized. Available at ams.org/books/conm/471.

Additional Conferences Co-Organized

"The 13th International Symposium on Orthogonal Polynomials, Special Functions, and Applications" (OPSFA13), a major conference held under SIAM auspices in June 2015 (at NIST, Gaithersburg, MD). I was one of the five co-organizers.

"Special Functions and Orthogonal Polynomials," a special session held at the Dec. 2012 meeting of the AMS Western Section (in Tucson, AZ). I was one of the three co-organizers.

PH.D. DISSERTATIONS

Supervised the dissertation of Michael Peralta, who was awarded the Ph.D. in Physics in 2001 at the University of Arizona. The dissertation title was "Statistical Simulation of Complex Correlated Semiconductor Devices." He developed new, mathematically based techniques for modeling analog IC's (integrated circuits), with the goal of improving the process by which they are manufactured. Dr. Peralta is now at Texas Instruments.

NOTABLE GRADUATE COURSES TAUGHT

Algorithmic & Computational Statistics (Math 577, Univ. of Arizona), with Givens & Hoeting, "Computational Statistics," as textbook. I taught this graduate Special Topics course in Fall 2013, Fall 2017, and Fall 2019.

Real Analysis (Math 523, Univ. of Arizona), with Royden as textbook. This is a Ph.D. core course.

Complex Analysis (Math 520, Univ. of Arizona), with Ahlfors and Jones & Singerman as textbooks. This is a Ph.D. core course.

Graph Theory (Math/CS 543, Univ. of Arizona), with Buckley & Harary, "Distance in Graphs," as textbook.

Theory of Computation (Math/CS 573, Univ. of Arizona), with Hopcroft & Ullman, "Introduction to Automata Theory, Languages, and Computation," as textbook.

Theory of Probability (Math/Stat 564, Univ. of Arizona), with Casella & Berger, "Statistical Inference," as textbook.

Statistical Computing (Stat 675, Univ. of Arizona), with Givens & Hoeting, "Computational Statistics," as textbook.

Mathematics of Computer Graphics (Math/CS 535, Univ. of Arizona), a course that I developed and arranged to have added to the catalog.

Software Tools for Bioinformatics (Math 577, Univ. of Arizona), a Special Topics course that I developed and have taught three times.

Software Tools for Computational Science and Engineering (APPM 7400, Univ. of Colorado), a Special Topics course that I developed and have taught twice.

RECENT (2025) REFEREEING

During the 2025 calendar year, refereed articles for 11 mathematics journals:
Advances in Applied Mathematics; *Advances in Mathematics*; *Aequationes Mathematicae*; *Annales Universitatis Mariae Curie-Skłodowska*; *Journal of Difference and Differential Equations*; *Journal of Difference Equations and Applications*; *Journal of Mathematical Physics*; *Journal of Physics A*; *Monatshefte für Mathematik*; *Nonlinear Dynamics*; *The Ramanujan Journal*.