

PUBLICATION LIST

1 Computation of Mathematical Functions

1. **Algorithms for the inversion of the noncentral beta distribution function.** V. Egorova, A. Gil, J. Segura, N.M. Temme. Accepted for publication in *Numerical Algorithms*.
2. **Fast and accurate computation of classical Gaussian quadratures.** A. Gil, J. Segura, N.M. Temme. *SIAM Journal on Scientific Computing* 48(3) (2026) B289-B316.
3. **Uniform Asymptotic approximation and numerical evaluation of the Reverse Generalized Bessel Polynomial zeros.** T.M. Dunster, A. Gil, D. Ruiz-Antolín, J. Segura. *Electronic Transactions on Numerical Analysis* 65 (2026) 140-155.
4. **A numerical algorithm for computing the zeros of parabolic cylinder functions in the complex plane .** T.M. Dunster, A. Gil, D. Ruiz-Antolín, J. Segura. *BIT Numerical Mathematics* 65, 20 (2025). <https://doi.org/10.1007/s10543-025-01065-w>.
5. **Evaluation of the generalized Fermi-Dirac integral and its derivatives for moderate/large values of the parameters. New version announcement.** A. Gil, A. Odrzywólek, J. Segura, N.M. Temme. *Computer Physics Communications* 312 (2025) 109605.
6. **Uniform asymptotic expansions for the zeros of parabolic cylinder functions.** T.M. Dunster, A. Gil, D. Ruiz-Antolín, J. Segura. *Studies in Applied Mathematics* 154 (2025) e70004 .
7. **A numerical algorithm for the computation of the noncentral beta distribution function.** V. Egorova, A. Gil, J. Segura, N.M. Temme. *Numerical Algorithms* 99, 17911804 (2025). <https://doi.org/10.1007/s11075-024-01931-8>

8. **McMahon-type asymptotic expansions of the zeros of the Coulomb wave functions.** A. Gil, J. Segura, N.M. Temme. *SIGMA* 20 (2024) , 075, 9 pages. Special Issue on *Asymptotics and Applications of Special Functions* in Memory of Richard Paris.
9. **Computation of the confluent hypergeometric function $M(a, b, x)$.** A. Gil, D. Ruiz-Antolín, J. Segura, N.M. Temme. *Lecture Notes in Computer Science* volume 14477, Springer (2024).
10. **Computation of parabolic cylinder functions having complex argument.** T.M. Dunster, A. Gil, J. Segura. *Applied Numerical Mathematics* 197 (2024) 230-242.
11. **New asymptotic representations of the noncentral t -distribution.** A. Gil, J. Segura, N.M. Temme. *Studies in Applied Mathematics* 151 (2023) 857-882 .
12. **Computation of the confluent hypergeometric function $U(a, b, x)$ and its derivative for positive arguments.** A. Gil, D. Ruiz-Antolín, J. Segura, N.M. Temme. *Numerical Algorithms* 94 (2023) 669-679.
13. **Computation of the regularized incomplete beta function.** V. Erogo, A. Gil, J. Segura, N.M. Temme. *Dolomites Research Notes on Approximation* 16(3) (2023) 10-16.
14. **Evaluation of the generalized Fermi-Dirac integral and its derivatives for moderate/large values of the parameters.** A. Gil, A. Odrzywolek, J. Segura, N.M. Temme. *Computer Physics Communications* 283 (2023) 108563.
15. **A new asymptotic representation and inversion method for the Student's t distribution.** A. Gil, J. Segura, N.M. Temme. *Integral Transforms and Special Functions* 33 (8) (2022) 597-608.
16. **Complete asymptotic expansions for the relativistic Fermi-Dirac integral.** A. Gil, J. Segura, N.M. Temme. *Applied Mathematics and Computation* 412 (2022) 126618.

17. **Computation of the reverse generalized Bessel polynomials and their zeros.** T.M. Dunster, A. Gil, D. Ruiz-Antolín, J. Segura. *Computational and Mathematical Methods* 3 (6) (2021) e1198.
18. **Sharp error bounds for turning point expansions.** T.M. Dunster, A. Gil, J. Segura. *Journal of Classical Analysis* 18 (1) (2021) 49-81.
19. **GammaCHI: a Fortran 90 package for the inversion and computation of gamma and chi-square cumulative distribution functions (central and noncentral). New version announcement .** A. Gil, J. Segura, N.M. Temme. *Computer Physics Communications* 267 (2021) 108083
20. **Fast and reliable high accuracy computation of Gauss-Jacobi quadrature.** A. Gil, J. Segura, N.M. Temme. *Numerical Algorithms* 87 (2021) 13911419.
21. **Simplified error bounds for turning point expansions.** T.M. Dunster, A. Gil, J. Segura. *Analysis and Applications* 19(4) (2021) 647678.
22. **Asymptotic expansions of Jacobi polynomials and of the nodes and weights of Gauss-Jacobi quadrature for large degree and parameters in terms of elementary functions.** A. Gil, J. Segura, N.M. Temme. *Journal of Mathematical Analysis and Applications* 494(2) (2021) 124642.
23. **Asymptotic computation of classical orthogonal polynomials.** A. Gil, J. Segura, N. M. Temme. In *Orthogonal Polynomials: Current Trends and Applications*, Eds. F. Marcellán, E.J. Huertas, v22 Springer SEMA/SEMAI. (2021). ISBN 978-3-030-56189-5
24. **Asymptotic inversion of the binomial and negative binomial cumulative distribution functions.** A. Gil, J. Segura, N.M. Temme. *Electronic Transactions on Numerical Analysis* 52 (2020) 270-280.
25. **Numerical evaluation of Airy-type integrals arising in uniform asymptotic analysis.** A. Gil, J. Segura, N.M. Temme. *Journal of Computational and Applied Mathematics* 371 (2020) 112717.

26. **Fast, reliable and unrestricted iterative computation of Gauss–Hermite and Gauss–Laguerre quadratures.** A. Gil, J. Segura, N.M. Temme. *Numerische Mathematik* 143 (2019) 649-682.
27. **On the computation and inversion of the cumulative noncentral beta distribution fction.** A. Gil, J. Segura, N.M. Temme. *Applied Mathematics and Computation* 361 (2019) 74-86.
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29. **Uniform asymptotic expansions for Laguerre polynomials and related confluent hypergeometric functions.** T.M. Dunster, A. Gil, J. Segura. *Advances in Computational Mathematics* 44(5) (2018) 1441-1474.
30. **Asymptotic expansions of Jacobi polynomials for large values of β and of their zeros.** A. Gil, J. Segura, N.M. Temme. *SIGMA* 14 (2018), 073, 9 pages.
31. **A new Fortran 90 program to compute regular and irregular associated Legendre functions (new version announcement).** B.I. Schneider, J. Segura, A. Gil, X. Guan, K. Bartschat. *Computer Physics Communications* 225 (2018) 192-193
32. **Asymptotic approximations to the nodes and weights of Gauss-Hermite and Gauss-Laguerre quadratures.** A. Gil, J. Segura, N.M. Temme. *Studies in Applied Mathematics* 140(3) (2018) 298-332.
33. **Conical: an extended module for computing a numerically satisfactory pair of solutions of the differential equation for conical functions.** T.M. Dunster, A. Gil, J. Segura, N.M. Temme. *Computer Physics Communications* 217 (2017) 193-197.
34. **Computation of asymptotic expansions of turning point problems via Cauchy’s integral formula: Bessel functions.** T.M. Dunster, A. Gil, J. Segura. *Constructive Approximation* 46(3) (2017) 645-675.

35. **Efficient algorithms for the inversion of the cumulative central beta distribution.** A. Gil, J. Segura, N.M. Temme. *Numerical Algorithms* 74 (1) (2017) 77-91.
36. **Efficient computation of Laguerre Polynomials.** A. Gil, J. Segura, N.M. Temme. *Computer Physics Communications* 210 (2017) 124-131.
37. **Computation of the incomplete gamma function for negative values of the argument.** A. Gil, D. Ruiz-Antolín, J. Segura, N.M. Temme. *ACM Transactions of Mathematical Software* 43 Issue 3 (2016) Article No. 26.
38. **Special functions: Computation.** Entry of the “*Encyclopedia of Applied and Computational Mathematics*”, edited by Björn Engquist. A. Gil, J. Segura, N.M. Temme. Springer. 2015.
39. **Computing the Kummer function $U(a, b, z)$ for small values of the arguments.** A. Gil, J. Segura, N.M. Temme. *Applied Mathematics and Computation* 271 (2015) 532-539.
40. **GammaCHI: a Fortran 90 package for the inversion and computation of gamma and chi-square cumulative distribution functions (central and noncentral).** A. Gil, J. Segura, N.M. Temme. *Computer Physics Communications* 191(2015)132-139.
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42. **The asymptotic and numerical inversion of the Marcum-Q function.** A. Gil, J. Segura, N.M. Temme. *Studies in Applied Mathematics* 133(2) (2014) 257-278.
43. **On the complex zeros of Airy and Bessel functions and those of their derivatives.** A. Gil, J. Segura. *Analysis and Applications* 12, 537 (2014) 537-561. Special Issue in honour of Frank Olver.

44. **Special volume on Numerical Software: Design, Analysis and Verification.** Eds. A. Gil, JM. Muller, J. Segura. *Science of Computer Programming* 90 (2014).
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47. **Funciones Especiales en la Era Digital.** A. Gil, J. Segura, N.M. Temme. *Gaceta de la Real Sociedad Matemática Española* 17(1) (2014).
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2 Modelling and Simulation of Biological Systems

88. **Unraveling the dynamics of oxytocin in hypothalamic neurons** B. Aznar-Escolano, V. Egorova, J. Villanueva, L.M. Gutiérrez, V. González-Vélez, A. Gil, S. Jurado. *Traffic* 27, no. 2 (2026): e70034. <https://doi.org/10.1111/tra.70034>.
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3 Theoretical Physics: PhD publications

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