# PUBLICATION LIST

# 1 Computation of Mathematical Functions

1. **Fast and accurate computation of classical Gaussian quadratures** . A. Gil, J. Segura, N.M. Temme. *Submitted.*

2. **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.

3. **Evaluation of the generalized Fermi-Dirac integral and its derivatives for moderate/large values of the parameters. New version announcement**. A. Gil, A. Odrzywołek, J. Segura, N.M. Temme. *Computer Physics Communications* 312 (2025) 109605.

4. **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 .

5. **A numerical algorithm for the computation of the noncentral beta distribution function**. V. Egorova, A. Gil, J. Segura, N.M. Temme. *Numerical Algorithms* (2024). https://doi.org/10.1007/s11075-024-01931-8

6. **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.

7. **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).

8. **Computation of parabolic cylinder functions having complex argument**. T.M. Dunster, A. Gil, J. Segura. *Applied Numerical Mathematics* 197 (2024) 230-242.

9. **New asymptotic representations of the noncentral $t$-distribution**. A. Gil, J. Segura, N.M. Temme. *Studies in Applied Mathematics* 151 (2023) 857-882 .

10. **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.

11. **Computation of the regularized incomplete beta function**. V. Erogova, A. Gil, J. Segura, N.M. Temme. *Dolomites Research Notes on Approximation* 16(3) (2023) 10-16.

12. **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.

13. **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.

14. **Complete asymptotic expansions for the relativistic Fermi-Dirac integral**. A. Gil, J. Segura, N.M. Temme. *Applied Mathematics and Computation* 412 (2022) 126618.

15. **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.

16. **Sharp error bounds for turning point expansions**. T.M. Dunster, A. Gil, J. Segura. *Journal of Classical Analysis* 18 (1) (2021) 49-81.

17. **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

18. **Fast and reliable high accuracy computation of Gauss-Jacobi quadrature**. A. Gil, J. Segura, N.M. Temme. *Numerical Algorithms* 87 (2021) 13911419.

19. **Simplified error bounds for turning point expansions**. T.M. Dunster, A. Gil, J. Segura. *Analysis and Applications* 19(4) (2021) 647678.

20. **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.

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22. **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.

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25. **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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27. **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.

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29. **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

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31. **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.

32. **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.

33. **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.

34. **Efficient computation of Laguerre Polynomials**. A. Gil, J. Segura, N.M. Temme. *Computer Physics Communications* 210 (2017) 124-131.

35. **Computation of the incomplete gamma function for negative values of the argument**. A. Gil, D. Ruiz-Antolín, J. Segura, N.M.

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36. **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.

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38. **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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45. **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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53. **Basic Methods for Computing Special Functions**. A. Gil, J. Segura, N.M. Temme. *Recent Advances in Computational and Applied Mathematics* (2010) Ed. T.E. Simos. Springer. ISBN: 978-90-481-9980-8

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# 2 Modelling and Simulation of Biological Systems

86. **The Role of Nicotinic Receptors on Ca$^{2+}$ Signaling in Bovine Chromaffin Cells** A. Gil, V. González-Vélez, L.M. Gutiérrez, J. Villanueva. Accepted for publication in *Current Issues in Molecular Biology* (2024).

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97. **Modelling F-actin cortex influence on the secretory properties of neuroendocrine cells**. L.M. Gutiérrez, A. Gil. *Communicative & Integrative Biology* 4(4) (2011) 1-3.

98. **The F-actin cortical network is a major factor influencing the organization of the secretory machinery in chromaffin cells**. C.J. Torregrosa-Hetland, D. Giner, I. Lopez-Font, J. Villanueva, A. Nadal, I. Quesada, S. Viniegra, A. Gil, V. Gonzalez-Velez, J. Segura and L.M. Gutierrez. *Journal of Cell Science* 124(5) (2011) 727-734.

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# 3 Theoretical Physics: PhD publications

110. **Many Body approach to electron nucleus scattering at intermediate energies.** A. Gil, J. Nieves, E. Oset. Chapter 3 of the book (pags. 119-160), "Electromagnetic Response Functions of Nuclei", R. Cenni Editor, Nova Science Publishers (N.Y) 2001. Authors: J. Jourdan, J.E. Amaro, G.P. Co, A. Lallena, A. Gil, J. Nieves, E. Oset, M.B. Barbaro, A. de Pace, T.W Donnelly, A. Molinari, R. Cenni and P. Saraco.

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