

## References

- [Abd17] A. R. Abdulghany. “Generalization of parallel axis theorem for rotational inertia”. In: *American Journal of Physics* 85 (Oct. 2017), pp. 791–795.  
DOI: 10.1119/1.4994835.
- [AK15] Z. A. Anastassi and A. A. Kosti. “A 6(4) optimized embedded Runge–Kutta–Nyström pair for the numerical solution of periodic problems”. In: *Journal of Computational and Applied Mathematics* 275 (2015), pp. 311–320.  
DOI: 10.1016/j.cam.2014.07.016.
- [Arc+11] B. A. Archinal, M. F. A’Hearn, E. Bowell, A. Conrad, G. J. Consolmagno, R. Courtin, T. Fukushima, D. Hestroffer, J. L. Hilton, G. A. Krasinsky, G. Neumann, J. Oberst, P. K. Seidelmann, P. Stooke, D. J. Tholen, P. C. Thomas, and I. P. Williams. “Report of the IAU Working Group on Cartographic Coordinates and Rotational Elements: 2009”. In: *Celestial Mechanics and Dynamical Astronomy* 109.2 (2011), pp. 101–135.  
DOI: 10.1007/s10569-010-9320-4.  
eprint: <http://goo.gl/d6Wd1J>.
- [BCM07] S. Blanes, F. Casas, and A. Murua. “Splitting methods for non-autonomous linear systems”. In: *International Journal of Computer Mathematics* 84.6 (2007), pp. 713–727.  
DOI: 10.1080/00207160701458567.
- [BCR00] S. Blanes, F. Casas, and J. Ros. “Processing Symplectic Methods for Near-Integrable Hamiltonian Systems”. In: *Celestial Mechanics and Dynamical Astronomy* 77.1 (2000), pp. 17–36.  
DOI: 10.1023/A:1008311025472.
- [BCR01a] S. Blanes, F. Casas, and J. Ros. “High-order Runge–Kutta–Nyström geometric methods with processing”. In: *Applied Numerical Mathematics* 39.3–4 (2001). Themes in Geometric Integration, pp. 245–259.  
DOI: 10.1016/S0168-9274(00)00035-0.
- [BCR01b] S. Blanes, F. Casas, and J. Ros. “New Families of Symplectic Runge–Kutta–Nyström Integration Methods”. In: *Numerical Analysis and Its Applications*. Ed. by L. Vulkov, P. Yalamov, and J. Waśniewski. Vol. 1988. Lecture Notes in Computer Science. Springer Berlin Heidelberg, 2001, pp. 102–109.  
DOI: 10.1007/3-540-45262-1\_13.
- [BCR99] S. Blanes, F. Casas, and J. Ros. “Symplectic Integration with Processing: A General Study”. In: *SIAM Journal on Scientific Computing* 21.2 (1999), pp. 711–727.  
DOI: 10.1137/S1064827598332497.
- [Beu03] H. Beust. “Symplectic integration of hierarchical stellar systems”. In: *Astronomy & Astrophysics* 400 (Mar. 2003), pp. 1129–1144.  
DOI: 10.1051/0004-6361:20030065.
- [BF54] P. F. Byrd and M. D. Friedman. *Handbook of elliptic integrals for engineers and physicists*. Springer-Verlag, 1954.
- [Bla+13] S. Blanes, F. Casas, A. Farrés, J. Laskar, J. Makazaga, and A. Murua. “New families of symplectic splitting methods for numerical integration in dynamical astronomy”. In: *Applied Numerical Mathematics* 68 (2013), pp. 58–72.  
DOI: 10.1016/j.apnum.2013.01.003.
- [BM02] S. Blanes and P. C. Moan. “Practical Symplectic Partitioned Runge–Kutta and Runge–Kutta–Nyström Methods”. In: *Journal of Computational and Applied Mathematics* 142.2 (May 2002), pp. 313–330.  
DOI: 10.1016/S0377-0427(01)00492-7.
- [Bra+14] B. K. Bradley, B. A. Jones, G. Beylkin, K. Sandberg, and P. Axelrad. “Bandlimited implicit Runge–Kutta integration for Astrodynamics”. In: *Celestial Mechanics and Dynamical Astronomy* 119.2 (2014), pp. 143–168.  
DOI: 10.1007/s10569-014-9551-x.
- [Bre73] R. P. Brent. *Algorithms for minimization without derivatives*. Prentice-Hall, 1973.
- [Bul65] R. Bulirsch. “Numerical Calculation of Elliptic Integrals and Elliptic Functions”. In: *Numerische Mathematik* 7.1 (Feb. 1, 1965), pp. 78–90.  
DOI: 10.1007/BF01397975.

- [Bul69] R. Bulirsch. “Numerical Calculation of Elliptic Integrals and Elliptic Functions. III”. In: *Numerische Mathematik* 13.4 (Aug. 1969), pp. 305–315. DOI: 10.1007/BF02165405.
- [CFSZo7] E. Celledoni, F. Fassò, N. Säfström, and A. Zanna. “The exact computation of the free rigid body motion and its use in splitting methods”. Preprint. Oct. 2007.
- [CFSZo8] E. Celledoni, F. Fassò, N. Säfström, and A. Zanna. “The exact computation of the free rigid body motion and its use in splitting methods”. In: *SIAM J. Scientific Computing* 30 (May 2008), pp. 2084–2112.
- [CGMo8] M. P. Calvo, S. González-Pinto, and J. I. Montijano. “Global error estimation based on the tolerance proportionality for some adaptive Runge–Kutta codes”. In: *Journal of Computational and Applied Mathematics* 218.2 (2008). The Proceedings of the Twelfth International Congress on Computational and Applied Mathematics, pp. 329–341. DOI: 10.1016/j.cam.2007.02.034.
- [Cha73] J. F. Chandler. “Determination of the Dynamical Properties of the Jovian System by Numerical Analysis”. PhD thesis. Massachusetts Institute of Technology, 1973. eprint: <http://hdl.handle.net/1721.1/51410>.
- [Cha95] J. Chapront. “Representation of planetary ephemerides by frequency analysis. Applications to the five outer planets”. In: *Astronomy & Astrophysics – Supplement Series* 109 (Jan. 1995), pp. 181–192.
- [Chi97] S. A. Chin. “Symplectic integrators from composite operator factorizations”. In: *Physics Letters A* 226.6 (1997), pp. 344–348. DOI: 10.1016/S0375-9601(97)00003-0.
- [CHMR96] M. P. Calvo, D. J. Higham, J. I. Montijano, and L. Rández. “Global error estimation with adaptive explicit Runge–Kutta methods”. In: *IMA Journal of Numerical Analysis* 16.1 (1996), pp. 47–63. DOI: 10.1093/imanum/16.1.47.
- [CKoo] S. A. Chin and D. W. Kidwell. “Higher-order force gradient symplectic algorithms”. In: *Physical Review E* 62 (Dec. 2000), p. 8746. DOI: 10.1103/PhysRevE.62.8746. eprint: <http://arxiv.org/abs/physics/0006082>.
- [CS93a] M. P. Calvo and J. M. Sanz-Serna. “High-Order Symplectic Runge–Kutta–Nyström Methods”. In: *SIAM Journal on Scientific Computing* 14.5 (1993), pp. 1237–1252. DOI: 10.1137/0914073.
- [CS93b] M. P. Calvo and J. M. Sanz-Serna. “The Development of Variable-step Symplectic Integrators with Application to the Two-body Problem”. In: *SIAM Journal on Scientific Computing* 14.4 (July 1993), pp. 936–952. DOI: 10.1137/0914057.
- [CV84] J. Chapront and D. T. Vu. “A new compact representation of ephemerides: application to the motion of Pluto, the Sun and the Galilean satellites of Jupiter”. In: *Astronomy & Astrophysics* 141 (1984), pp. 131–143.
- [DEP87a] J. R. Dormand, M. E. A. El-Mikkawy, and P. J. Prince. “Families of Runge–Kutta–Nyström Formulae”. In: *IMA Journal of Numerical Analysis* 7.2 (1987), pp. 235–250. DOI: 10.1093/imanum/7.2.235.
- [DEP87b] J. R. Dormand, M. E. A. El-Mikkawy, and P. J. Prince. “High-Order Embedded Runge–Kutta–Nyström Formulae”. In: *IMA Journal of Numerical Analysis* 7.4 (1987), pp. 423–430. DOI: 10.1093/imanum/7.4.423.
- [DL42] G. C. Danielson and C. Lánzos. “Some improvements in practical Fourier analysis and their application to x-ray scattering from liquids”. In: *Journal of the Franklin Institute* 233.4 (1942), pp. 365–380. DOI: 10.1016/S0016-0032(42)90767-1.
- [DM11] F. Diele and C. Marangi. “Explicit symplectic partitioned Runge–Kutta–Nyström methods for non-autonomous dynamics”. In: *Applied Numerical Mathematics* 61.7 (2011), pp. 832–843. DOI: 10.1016/j.apnum.2011.02.003.

- [Eme07] V. V. Emel'yanenko. "A method of symplectic integrations with adaptive time-steps for individual Hamiltonians in the planetary  $N$ -body problem". In: *Celestial Mechanics and Dynamical Astronomy* 98.3 (2007), pp. 191–202.  
DOI: 10.1007/s10569-007-9077-6.
- [ERo3] M. El-Mikkawy and E. D. Rahmo. "A new optimized non-FSAL embedded Runge–Kutta–Nyström algorithm of orders 6 and 4 in six stages". In: *Applied Mathematics and Computation* 145.1 (2003), pp. 33–43.  
DOI: 10.1016/S0096-3003(02)00436-8.
- [Eve85] E. Everhart. "An Efficient Integrator that Uses Gauss-Radau Spacings". In: *Dynamics of Comets: Their Origin and Evolution*. Ed. by A. Carusi and G. B. Valsecchi. Vol. 115. Astrophysics and Space Science Library. Springer Netherlands, 1985, pp. 185–202.  
DOI: 10.1007/978-94-009-5400-7\_17.
- [Far+13] A. Farrés, J. Laskar, S. Blanes, F. Casas, J. Makazaga, and A. Murua. "High precision symplectic integrators for the Solar System". In: *Celestial Mechanics and Dynamical Astronomy* 116.2 (2013), pp. 141–174.  
DOI: 10.1007/s10569-013-9479-6.
- [Fin87] J. M. Fine. "Low order practical Runge–Kutta–Nyström methods". In: *Computing* 38.4 (1987), pp. 281–297.  
DOI: 10.1007/BF02278707.
- [FMLGo8] A. Fienga, H. Manche, J. Laskar, and M. Gastineau. "INPOP06: a new numerical planetary ephemeris". In: *Astronomy & Astrophysics* 477.1 (2008), pp. 315–327.  
DOI: 10.1051/0004-6361:20066607.
- [Fol+14] W. M. Folkner, J. G. Williams, D. H. Boggs, R. S. Park, and P. Kuchynka. "The Planetary and Lunar Ephemerides DE430 and DE431". In: *Interplanetary Network Progress Report* 42.196 (2014).  
eprint: <http://ilrs.gsfc.nasa.gov/docs/2014/196C.pdf>.
- [Fuk09] T. Fukushima. "Fast computation of complete elliptic integrals and Jacobian elliptic functions". In: *Celestial Mechanics and Dynamical Astronomy* 105.4 (Oct. 25, 2009), p. 305.  
DOI: 10.1007/s10569-009-9228-z.
- [Fuk11a] T. Fukushima. "Precise and fast computation of the general complete elliptic integral of the second kind". In: *Mathematics of Computation* 80 (Feb. 2011), pp. 1725–1743.  
DOI: 10.1090/S0025-5718-2011-02455-5.
- [Fuk11b] T. Fukushima. "Precise and fast computation of a general incomplete elliptic integral of second kind by half and double argument transformations". In: *Journal of Computational and Applied Mathematics* 235.14 (May 2011), pp. 4140–4148.  
DOI: 10.1016/j.cam.2011.03.004.
- [Fuk12] T. Fukushima. "Precise and fast computation of a general incomplete elliptic integral of third kind by half and double argument transformations". In: *Journal of Computational and Applied Mathematics* 236.7 (Jan. 2012), pp. 1961–1975.  
DOI: 10.1016/j.cam.2011.11.007.
- [Fuk18] T. Fukushima. *xelbdj.txt: Fortran test driver for "elbdj"/"relbdj", subroutines to compute the double/single precision general incomplete elliptic integrals of all three kinds*. Jan. 2018.  
DOI: 10.13140/RG.2.2.11113.80489.
- [Higo2] N. J. Higham. *Accuracy and Stability of Numerical Algorithms*. Society for Industrial and Applied Mathematics, 2002.
- [HMRo8] E. Hairer, R. I. McLachlan, and A. Razakarivony. "Achieving Brouwer's law with implicit Runge–Kutta methods". In: *BIT Numerical Mathematics* 48.2 (2008), pp. 231–243.  
DOI: 10.1007/s10543-008-0170-3.
- [HMSo9] E. Hairer, R. I. McLachlan, and R. D. Skeel. "On energy conservation of the simplified Takahashi–Imada method". In: *Mathematical Modelling and Numerical Analysis* 43.4 (2009). ID: unige:5211, pp. 631–644.
- [HS05] E. Hairer and G. Söderlind. "Explicit, Time Reversible, Adaptive Step Size Control". In: *SIAM Journal on Scientific Computing* 26.6 (2005), pp. 1838–1851.  
DOI: 10.1137/040606995.

- [JA12] B. A. Jones and R. L. Anderson. “A Survey of Symplectic and Collocation Integration Methods for Orbit Propagation”. In: *AAS/AIAA Spaceflight Mechanics Meeting*. Vol. 143. Advances in the Astronautical Sciences. 2012.
- [JE33] E. Jahnke and F. Emde. *Funktionentafeln mit Formeln und Kurven—Tables of functions with formulæ and curves*. Teubner, 1933.
- [JE38] E. Jahnke and F. Emde. *Funktionentafeln mit Formeln und Kurven—Tables of functions with formulæ and curves*. Teubner, 1938.
- [JEL60] E. Jahnke, F. Emde, and F. Lösch. *Tafeln Höherer Funktionen—Tables of higher functions*. Teubner, 1960.
- [Jon12] B. Jones. “Orbit Propagation Using Gauss-Legendre Collocation”. In: *AIAA/AAS Astrodynamics Specialist Conference*. Guidance, Navigation, and Control and Co-located Conferences. 2012.
- [Kudo07] S. Kudryavtsev. “Long-term harmonic development of lunar ephemeris”. In: *Astronomy & Astrophysics* 471 (2007), pp. 1069–1075.  
DOI: 10.1051/0004-6361:20077568.
- [LDVo4] V. Lainey, L. Duriez, and A. Vienne. “New accurate ephemerides for the Galilean satellites of Jupiter”. In: *Astronomy & Astrophysics* 420.3 (2004), pp. 1171–1183.  
DOI: 10.1051/0004-6361:20034565.
- [LJVF89] A. C. Long, J. J. O. Cappellari, C. E. Velez, and A. J. Fuchs. *Goddard Trajectory Determination System (GTDS) Mathematical Theory Revision 1*. Tech. rep. FDD/552-89/001 CSC/TR-89/6001. Computer Sciences Corporation, National Aeronautics, and Space Administration/Goddard Space Flight Center, July 1989.
- [MA92] R. I. McLachlan and P. Atela. “The Accuracy of Symplectic Integrators”. In: *Nonlinearity* 5 (1992), pp. 541–562.
- [McLo2] R. I. McLachlan. “Families of High-Order Composition Methods”. In: *Numerical Algorithms* 31.1-4 (2002), pp. 233–246.  
DOI: 10.1023/A:1021195019574.
- [McLo7] R. I. McLachlan. “A New Implementation of Symplectic Runge–Kutta Methods”. In: *SIAM Journal on Scientific Computing* 29.4 (2007), pp. 1637–1649.  
DOI: 10.1137/06065338X.
- [McL93] R. I. McLachlan. “Symplectic integration of Hamiltonian wave equations”. In: *Numerische Mathematik* 66.1 (1993), pp. 465–492.  
DOI: 10.1007/BF01385708.
- [McL95] R. I. McLachlan. “On the Numerical Integration of Ordinary Differential Equations by Symmetric Composition Methods”. In: *SIAM Journal on Scientific Computing* 16.1 (Jan. 1995), pp. 151–168.  
DOI: 10.1137/0916010.
- [Mon92] O. Montenbruck. “Numerical integration methods for orbital motion”. In: *Celestial Mechanics and Dynamical Astronomy* 53.1 (1992), pp. 59–69.  
DOI: 10.1007/BF00049361.
- [MQ02] R. I. McLachlan and G. R. W. Quispel. “Splitting methods”. In: *Acta Numerica* 11 (Jan. 2002), pp. 341–434.  
DOI: 10.1017/S0962492902000053.
- [MRQ06] R. I. McLachlan, G. Reinout, and W. Quispel. “Geometric Integrators for ODEs”. In: *J. Phys. A* 39 (2006), pp. 5251–5285.
- [Myro7] V. Myrnyy. “A Simple and Efficient FFT Implementation in C++”. In: *Dr. Dobbs’s* (2007). eprint: <https://www.drdobbs.com/cpp/a-simple-and-efficient-fft-implementation/199500857>.
- [New89] X. X. Newhall. “Numerical Representation of Planetary Ephemerides”. In: *Celestial Mechanics* 45 (1989), pp. 305–310.  
eprint: <http://adsabs.harvard.edu/full/1989CeMec...45..305N>.
- [OLBC10] F. Olver, D. Lozier, R. Boisvert, and C. Clark. *NIST Handbook of Mathematical Functions*. Cambridge University Press, 2010.

- [OS94] D. I. Okunbor and R. D. Skeel. “Canonical Runge–Kutta–Nyström methods of orders five and six”. In: *Journal of Computational and Applied Mathematics* 51.3 (1994), pp. 375–382.  
DOI: 10.1016/0377-0427(92)00119-T.
- [PL10] G. Petit and B. Luzum. *IERS Conventions (2010)*. IERS Technical Note 36. International Earth Rotation and Reference Systems Service Convention Centre, 2010.  
eprint: <http://www.iers.org/IERS/EN/Publications/TechnicalNotes/tn36.html>.
- [PR14] E. Pellegrini and R. P. Russell. “F and G Taylor Series Solutions to the Circular Restricted Three Body Problem”. In: *AAS/AIAA Spaceflight Mechanics Meeting*. Vol. 152. Advances in the Astronautical Sciences. 2014.
- [Rie+16] J. Ries, S. Bettadpur, R. Eanes, Z. Kang, U. Ko, C. McCullough, P. Nagel, N. Pie, S. Poole, H. Save, and B. Tapley. *The Combination Global Gravity Model GGM05C*. Technical Memorandum CSR-TM-16-01. Center for Space Research at the University of Texas at Austin, Jan. 2016.  
eprint: [ftp://ftp.csr.utexas.edu/pub/grace/GGM05/README\\_GGM05C.pdf](ftp://ftp.csr.utexas.edu/pub/grace/GGM05/README_GGM05C.pdf).
- [Sat69] Saturn V Flight Evaluation Working Group. *Saturn V Launch Vehicle, Flight Evaluation Report AS-503, Apollo 8 Mission*. Tech. rep. MPR-SAT-FE-69-1. George C. Marshall Space Flight Center, Feb. 1969.  
eprint: <http://hdl.handle.net/2060/19690015314>.
- [SM10] J. R. Scott and M. C. Martini. “High-Speed Solution of Spacecraft Trajectory Problems Using Taylor Series Integration”. In: *Journal of Spacecraft and Rockets* 47.1 (2010), pp. 199–202.
- [SN97] M. Sidlichovsky and D. Nesvorný. “Frequency modified Fourier transform and its application to asteroids”. In: *Celestial Mechanics and Dynamical Astronomy* 65 (1997), pp. 137–148.
- [Som93] B. P. Sommeijer. “Explicit, high-order Runge–Kutta–Nyström methods for parallel computers”. In: *Applied Numerical Mathematics* 13.1–3 (1993), pp. 221–240.  
DOI: 10.1016/0168-9274(93)90145-H.
- [SQG13] P. W. Sharp, M. A. Qureshi, and K. R. Grazier. “High order explicit Runge–Kutta Nyström pairs”. In: *Numerical Algorithms* 62.1 (2013), pp. 133–148.  
DOI: 10.1007/s11075-012-9571-0.
- [Sta98] E. M. Standish. *JPL Planetary and Lunar Ephemerides, DE405/LE405*. Interoffice Memorandum IOM 312.F-98-048. Jet Propulsion Laboratory, Aug. 1998.
- [Suz90] M. Suzuki. “Fractal decomposition of exponential operators with applications to many-body theories and Monte Carlo simulations”. In: *Physics Letters A* 146 (June 1990), pp. 319–323.  
DOI: 10.1016/0375-9601(90)90962-N.
- [TBS13] Y. Takahashi, M. W. Busch, and D. J. Scheeres. “Spin state and moment of inertia characterization of 4179 Toutatis”. In: *The Astronomical Journal* 146.4 (Sept. 2013), p. 95.  
DOI: 10.1088/0004-6256/146/4/95.
- [War03] H. S. Warren Jr. *Hacker’s Delight*. Addison-Wesley, 2003.
- [Wes17] D. B. Westra. *Identites and properties for associated Legendre functions*. Personal note. Universität Wien, Sept. 2017.  
eprint: <https://www.mat.univie.ac.at/~westra/associatedlegendrefunctions.pdf>.
- [WG13] G. Wilkins and M. Gu. “A modified Brent’s method for finding zeros of functions”. In: *Numerische Mathematik* 123 (2013), pp. 177–188.  
DOI: 10.1007/s00211-012-0480-x.
- [Yos90] H. Yoshida. “Construction of higher order symplectic integrators”. In: *Physics Letters A* 150.5–7 (1990), pp. 262–268.  
DOI: 10.1016/0375-9601(90)90092-3.
- [Zha+15] Y. Zhao, J. Ji, J. Huang, S. Hu, X. Hou, Y. Li, and W.-H. Ip. “Orientation and rotational parameters of asteroid 4179 Toutatis: new insights from Chang’e-2’s close flyby”. In: *Monthly Notices of the Royal Astronomical Society* 450.4 (May 2015), pp. 3620–3632.  
DOI: 10.1093/mnras/stv792.