

John Butcher
Curriculum Vitae

Born

31 March 1933
Auckland, New Zealand
New Zealand citizen

Present Position

Professor Emeritus
Department of Mathematics
The University of Auckland

Research Interests

Numerical methods for the solution of ordinary differential equations

Education

University of New Zealand (Auckland University College), 1952-1955;
B.Sc, 1955.
University of New Zealand (Auckland University College), 1955; M.Sc,
1956.
University of Sydney, 1956-1960; Ph.D, 1961.
University of Sydney, 1971, D.Sc, 1971

Positions Held

Lecturer, University of Sydney, 1959-1961.
Senior Lecturer, University of Canterbury, 1961-1964.
Computer Scientist, Stanford Linear Accelerator Center, 1965-1966.
Professor of Mathematics, University of Auckland, 1966-1979.
Head of Mathematics Department, University of Auckland, 1967-1973.
Founded Department of Computer Science, University of Auckland, 1980.
Professor of Computer Science, University of Auckland, 1980-1988.
Professor of Mathematics, University of Auckland, 1989-1998.
Professor Emeritus 1999- .

Memberships

Elected Fellow, Royal Society of New Zealand, 1980
Member and Past President New Zealand Mathematical Society
Society for Industrial and Applied Mathematics
Australia and New Zealand Industrial and Applied Mathematics

Awards

- Award for Mathematical Research, NZ Mathematical Society, 1991
For establishing new fundamental connections between analytic stability properties and algebraic properties of numerical methods for non-linear differential equations; for implementing new methods; and for an outstanding monograph on Runge-Kutta and general linear methods.
- Hector Memorial Medal, Royal Society Of NZ, 1996
For research in the Numerical Analysis of Differential Equations

Visiting Positions and Conferences

1997 August, September - Berlin, Germany; Alexisbad, Germany; Grado, Italy

1996

January, February, March - Troy, New York

April, May - Brisbane, Australia

May, June - Phoenix, Arizona; Toronto, Canada

1995 January - Phoenix, Arizona; Stockholm, Sweden; London, England

March - Stanford, California (Gear conference)

June - Geiranger, Norway; Dundee, Scotland

August, September - São Jose do Rio Preto and Curitiba, Brazil

Porto and Coimbra, Portugal; Valladolid and Zaragoza, Spain

September to December - Rennes, France; Amsterdam, Netherlands; Cambridge, England

1994 July - New Orleans; Atlanta, Georgia

August, September - Phoenix, Arizona; Miskolc, Hungary; Rennes, Marseilles, France

1993 August, September - Brazil (Rio de Janeiro; Uberlandia)

November, December - USA (Lafayette; Phoenix, Arizona; Raleigh, Nth Carolina)

1992 Co-organiser of: "International Conference on Scientific Computation and Differential Equations", Auckland 4-8 January 1993 (in honour of J. C. Butcher's 60th birthday)

University Of Durham - Workshop on numerical methods for evolutionary problems

1991 University of Manchester, England (3 months)

Universiteit te Leiden, Holland. Kloostermann Professor (2 months)

Arizona State University, Phoenix, Arizona (3 months)

1990 Novosibirsk, USSR (by invitation) (2 weeks)

Vienna, Scientific Computation Conference (in honour of H. J. Stetter)

Helsinki conference on Numerical Methods for Ordinary Differential Equations

1986 AT&T Bell Labs, New Jersey (2 months)

Imperial College, London (3 months)

Dortmund, Germany

1979 Linköping, Sweden, visiting Professor (several months)

Bonn, Germany (for a few months)

1972 Dundee, Scotland (8 months)

Vienna, Austria (4 months)

1970 Various British Universities (few days each)

Royal Institute of Technology, Stockholm, Sweden (one week)

Innsbruck, Austria Invited Speaker, 400th anniversary, Universität Innsbruck (one week)

Prof à l'école d'été, Bréau-sans-Nappe, France (3 weeks)

Publication

Publications

[154] The tree and forest spaces with applications to initial-value problem methods, Butcher, J. C. Chan, T.M.H., BIT Numerical Mathematics: Volume 50, Issue 4 (2010), Page 713-728.

[153] Polynomial Algebra for Birkhoff Interpolants, J. C. Butcher, R. M. Corless, L, Gonzalez-Vega and A. Shakoori Numer. Algorithms, 56 (2011), 319-347.

[152] B-series and B-series coefficients, J. C. Butcher, J. Numer. Anal. Indust. Appl. Math., t5 (2010), 39-48.

[151] Numerical Methods for Ordinary Differential Equations: Early Days in The Birth of Numerical Analysis (Adhemar Bultheel, Ronald Cools eds), World Scientific, 2009, ISBN: 978-981-283-625-0,35-44.

[150] Trees and numerical methods for ordinary differential equations, J. C. Butcher, Numerical Algorithms, 53 (2010), 153-170.

[149] Practical Runge--Kutta methods for scientific computation, J. C. Butcher, ANZIAM Journal, 50 (2009), 333-342.

[148] Trees, B-series and exponential integrators, J. C. Butcher, IMA J.Numer. Anal., 30 (2009), 131-140.

[147] General linear methods for ordinary differential equations, J. C. Butcher, Mathematics and Computers in Simulation, 79 (2009), 1834-1845.

[146] Order and stability of generalized Padé approximations, J. C. Butcher, Appl. Numer. Math. 59. (2009), 558-567.

[145] The existence of symplectic general linear methods, J. C. Butcher and L. L. Hewitt, Numer. Algorithms 51 (2009), (77-84).

[144] Butcher, J. C., Sanjay Garg, Dawoomi Kim and Puneet Sharma, 'A Modified Approach to Predict Dissolution and Absorption of Polydisperse Powders' Pharmaceutical Research, 25 (2008), 2309-2311.

[143] Butcher, J. C. 'Numerical Methods for Ordinary Differential Equations' Second Edition, J. Wiley, Chichester, (2008).

[142] Butcher, J. C. 'Numerical analysis' Journal of Quality Measurement and Analysis 4(1) (2008) , 1-9.

[141] Butcher, J. C. 'Forty-five years of A-stability' Numerical Analysis and Applied Mathematics: International Conference on Numerical Analysis and Applied Mathematics 2008. AIP Conference Proceedings, 1048 (2008).

- [140] Butcher, J. C. 'Runge-Kutta methods' Scholarpedia, 2(9) (2007), 3147.
- [139] Butcher, J. C., Jackiewicz, Z. and Wright, W. M., 'Error propagation of general linear methods for ordinary differential equations' J. Complexity, 23 (2007), 560-580.
- [138] Butcher, J. C. 'Thirty years of G-stability' BIT 46 (2006), 479-489.
- [137] Butcher, J. C. 'General linear methods' Acta Numerica 15 (2006), 157-256.
- [136] Butcher, J. C., Hill, A.T. 'Linear multistep methods as irreducible general linear methods' BIT 46 (2006), 5-19.
- [135] Butcher, J. C., Podhaisky, H. 'On error estimation in general linear methods for stiff ODEs' Appl. Numer. Math. 56 (2006), 345-357.
- [134] Butcher, J. C., Wright, W.M. 'Applications of doubly companion matrices' Appl. Numer. Math. 56 (2006), 358-373.
- [133] Butcher, J. C. 'High Order A-stable Numerical Methods for Stiff Problems' Journal of Scientific Computing 25 (2005), 51-66.
- [132] Butcher, J. C., Hojjati, G. 'Second derivative methods with RK stability' Numer. Algorithms 40 (2005), 415-429.
- [131] Butcher, J. C., Rattenbury, N. 'ARK Methods for Stiff Problems' Appl. Numer. Math. 53 (2005), 165-181.
- [130] Butcher, J. C., Jackiewicz, Z. 'Unconditionally Stable General Linear Methods for Ordinary Differential Equations' BIT 44 (2004), 557-570.
- [129] Butcher, J. C., Jackiewicz, Z. 'Construction of general linear methods with Runge-Kutta stability properties' Numer. Algorithms 36 (2004), 53-72.
- [128] Butcher, J. C., 'Some numerical methods for stiff problems', In International Conference on Computational Methods in Science and Engineering, Kastoria, Greece, 12-16 September (2003), 93-97.
- [127] Butcher, J. C., Wright, W.M. 'The construction of practical general linear methods' BIT 43 (2003), 695-721.
- [126] Butcher, J. C., 'Numerical Methods for Ordinary Differential Equations', J. Wiley, Chichester, (2003), 435pp.
- [125] Butcher, J. C., Moir 'Experiments with a new fifth method' Numer. Algorithms 33 (2003), 137-151.

- [124] Butcher, J. C., Jackiewicz, Z. 'A new approach to error estimation for general linear methods' Appl. Numer. Math. 95 (2003), 487–502.
- [123] Butcher, J. C., Wright, W.M. 'A transformation relating explicit and diagonally-implicit general linear methods' Appl. Numer. Math. 44 (2003), 313–327.
- [122] Butcher, J. C. 'Software issues for ordinary differential equations' Numer. Algorithms 31 (2002), 401–418.
- [121] Butcher, J. C., Chan, T.M.H. 'A new approach to the algebraic structures for integration methods' BIT 42 (2002), 477–489.
- [120] Butcher, J. C., O'Sullivan, A.E. 'Nordsieck methods with an off-step point ' Numer. Algorithms 31 (2002), 87–101.
- [119] Butcher, J. C., Jackiewicz, Z. 'Error estimation for Nordsieck methods' Numer. Algorithms 31 (2002), 75–85.
- [118] Butcher, J. C., Heard, A.D. 'Stability of numerical methods for ordinary differential equations' Numer. Algorithms 31 (2002), 59–73.
- [117] Butcher, J. C. 'The A-Stability of methods with Padé and generalized Padé stability functions' Numer. Algorithms 31 (2002), 47–58.
- [116] Butcher, J. C., Jackiewicz, Z. 'A reliable error estimation for diagonally implicit multistage integration methods' BIT 41 (2001), 656–665.
- [115] Butcher, J. C., Chen, D.J.L. 'On the implementation of ESIRK methods for stiff IVPs' Numer. Algorithms 26 (2001), 201–218.
- [114] Butcher, J. C., Chan, T.M.H. 'Variable stepsize schemes for effective order methods and enhanced order composition methods' Numer. Algorithms 26 (2001), 131–150.
- [113] Butcher, J. C. 'General linear methods for stiff differential equations' BIT 41 (2001), 240–264.
- [112] Butcher, J. C. 'Numerical methods for ordinary differential equations in the 20th century', In C. Brezinski and L. Wuytack (eds) Numerical Analysis: Historical Developments in the 20th Century North-Holland, Amsterdam, (2001), 449–478.
- [111] Butcher, J. C. 'Numerical methods for ordinary differential equations in the 20th century' J. Comput. Appl. Math. 125 (2000), 1–29.
- [110] Butcher, J. C., Chen, D.J.L. 'A new type of singly-implicit Runge-Kutta method' Appl. Numer. Math. 34 (2000), 179–188.

- [109] Butcher, J. C., Chan, T.M.H. 'Multi-step zero approximations for stepsize control' Appl. Numer. Math. 34 (2000), 167-177.
- [108] Butcher, J. C., SINGH, A.D. 'The choice of parameters in parallel general linear methods for stiff problems' Appl. Numer. Math. 34 (2000), 59-84.
- [107] Butcher, J. C., Chartier, P. , Jackiewicz, Z. 'Experiments with a variable-order type 1 DIMSIM code' Numerical Algorithms 22 (1999), 237-261.
- [106] Irwin, R.J. Hautus, M.J., Butcher, J. C. 'An area theorem for the same-different experiment' Perception & Psychophysics 61(4) (1999), 766-769.
- [105] Butcher, J. C., Chartier, P. 'The effective order of singly-implicit Runge-Kutta methods' Numer. Algorithms 20 (1999), 269-284.
- [104] Butcher, J. C., Chen, D.J.L. 'ESIRK methods and variable stepsize' Appl. Numer. Math. 28 (1998), 193-207.
- [103] Butcher, J. C. 'Order and effective order' Appl. Numer. Math. 28 (1998), 179-191.
- [102] Butcher, J. C. 'ARK methods up to order five' Numer. Algorithms 17 (1998), 193-221.
- [101] Butcher, J. C., Diamantakis, M.T. 'DESIRE: diagonally extended singly implicit Runge-Kutta effective order methods' Numer. Algorithms 17 (1998), 121-145.
- [100] Butcher, J. C., Chan, R.P,K. 'Efficient Runge-Kutta integrators for index-2 differential algebraic equations' Math. Comp. 67 (1998), 1001-1021.
- [99] Butcher, J. C., Jackiewicz, Z. 'Construction of high order diagonally implicit multistage integration methods for ordinary differential equations' Appl. Numer. Math. 27 (1998), 1-12.
- [98] Butcher, J. C. 'Numerical methods for differential equations and applications' The Arabian Journal for Science and Engineering 22 #2C (1997), 17-29.
- [97] Butcher, J. C., Chartier, P., Jackiewicz, Z. 'Nordsieck representation of DIMSIMs' Numerical Algorithms 16 (1997), 209-230.
- [96] Butcher, J. C., Jackiewicz, Z. 'Implementation of diagonally implicit multistage integration methods for ordinary differential equations' SIAM J. Numer. Anal. 34 (1997), 2119-2141.
- [95] Butcher, J. C., Jackiewicz, Z., Mittleman, H.D.. 'A nonlinear optimization approach to the construction of general linear methods of high order' J. Comput. Appl. Math 81 (1997), 181-196.

- [94] Butcher, J. C. 'An introduction to "Almost Runge-Kutta" methods' Applied Numerical Mathematics 24 (1997), 331-342.
- [93] Butcher, J. C., Tracogna, S.. 'Order conditions for two-step Runge-Kutta methods' Applied Numerical Mathematics 24 (1997), 351-364.
- [92] Butcher, J. C., Chartier, P. . 'A generalization of singly-implicit Runge-Kutta methods' Applied Numerical Mathematics 24 (1997), 343-350.
- [91] Butcher, J. C. 'Order and stability of parallel methods for stiff problems' Advances in Computational Mathematics 7 (1997), 79-96.
- [90] Butcher, J. C., Sanz-Serna, J.M.. 'The number of conditions for a Runge-Kutta method to have effective order p ' Applied Numerical Mathematics 22 (1996), 103-111.
- [89] Butcher, J. C., WANNER, G.. 'Runge-Kutta methods: some historical notes' Applied Numerical Mathematics 22 (1996), 113-151.
- [88] Butcher, J. C., Cash, J.R., Diamantakis, M.T.. 'DESI methods for stiff initial value problems' ACM Trans. Math. Software 22 (1996), 401-422.
- [87] Butcher, J. C., Jackiewicz, Z. 'Construction of diagonally implicit general linear methods of type 1 and 2 for ordinary differential equations' Applied Numerical Mathematics 21 (1996), 385-415.
- [86] Butcher, J. C., 'Runge-Kutta methods as mathematical objects', In D. F. Griffiths and G. A. Watson (eds), Numerical Analysis: A. R. Mitchell 75th Birthday Volume, World Scientific Publishing Company, Singapore, (1996), 39-56.
- [85] Butcher, J. C. 'A history of Runge-Kutta methods' Applied Numerical Mathematics 20 (1996), 247-260.
- [84] Butcher, J. C. 'General linear methods' Comput. Math. Appl. 31 (1996), 105-112.
- [83] Butcher, J. C., 'Orthogonal polynomials, Pade approximations and A-stability', Numerical Algorithms, 11 (1996), 71-78.
- [82] Butcher, J. C., Chartier, P.. 'Parallel general linear methods for stiff ordinary differential and differential algebraic equations' Applied Numerical Mathematics 17 (1995), 213-222.
- [81] Butcher, J. C. 'On fifth order Runge-Kutta methods' BIT 35 (1995), 202-209.
- [80] Butcher, J. C., Cash, J.R., Moore, G., Russell, R.D.. 'Defect correction for two-point boundary value problems on non equidistant meshes' Math Comp. 64 (1995), 629-648.
- [79] Butcher, J. C. 'An introduction to DIMSIMs' Comp. Appl. Math. 14 (1995), 59- 72.

[78] Butcher, J. C., 'Laguerre polynomials: applications in numerical ordinary differential equations', In D. Brown et al (eds), Proceedings of the Cornelius Lanczos International Centenary Conference Society of Industrial and Applied Mathematics, Philadelphia, PA, (1994). 371-373.

[77] Butcher, J. C. 'Runge-Kutta methods in modern computation Part II: Implicit Runge-Kutta methods and related applications' Computers in Physics 8 (1994), 512 - 517.

[76] Butcher, J. C. 'Runge-Kutta methods in modern computation Part I: Fundamental concepts' Computers in Physics 8 (1994), 411 - 415.

[75] Butcher, J. C. 'Initial value problems: numerical methods and mathematics' Computers and Mathematics with Applications 28 (1994), 1-16.

[74] Butcher, J. C. 'Some orbital test problems' Computing 53 (1994), 75 - 94.

[73] Butcher, J. C. 'A transformation for the analysis of DIMSIMs' BIT 34 (1994), 25 - 32.

[72] Butcher, J. C., 'The parallel solution of ordinary differential equations and some special functions', In R.V.M. Zahar, (ed), Approximation and Computation, ISNM, 119, Birkhaeuser Verlag, Basel-Boston-Berlin, (1994), 67-76.

[71] Butcher, J. C. 'General linear methods for the parallel solution of ordinary differential equations' World Sci. Ser. Appl. Anal. 2 (1993), 99-111.

[70] Butcher, J. C., Jackiewicz, Z. 'Diagonally implicit multistage integration methods for ordinary differential equations' BIT 33 (1993), 452-472.

[69] Butcher, J. C. 'Diagonally-implicit multi-stage integration methods' Appl. Numer. Math. 11 (1993), 347-363.

[68] Butcher, J. C., Johnston, B.P., 'Estimating local truncation errors for Runge-Kutta methods', J. Comput. and Applied Math., 45 (1993), special issue on Numerical Methods for Ordinary Differential Equations, Guest Editors: J. C. Butcher, J. R. Cash and P. J. van der Houwen, 203-212.

[67] Butcher, J. C. 'The role of orthogonal polynomials in numerical ordinary differential equations' Journal of Computational and Applied Mathematics 43 (1992), 231-242.

[66] Butcher, J. C., 'Some new hybrid methods for initial value problems', In J. R. Cash and I. Gladwell (eds), Computational Ordinary Differential Equations, Clarendon Press, Oxford, (1992), 29-46.

[65] Butcher, J. C., Chipman, F. H.. 'Generalized Padé approximations to the exponential function' BIT 32 (1992), 118-130.

- [64] Butcher, J. C. 'The adaptation of STRIDE to delay differential equations' Applied Numerical Mathematics 9 (1992), 415-425.
- [63] Butcher, J. C., Chan, R.P.K. 'On symmetrizers for Gauss methods' Numerische Mathematik 60 (1992), 465-476.
- [62] Butcher, J. C., 'The Fibonacci sequence, chromatic numbers and slam bidding', Bull. IMA, (1990).
- [61] Butcher, J. C., 'Order, stepsize and stiffness switching'. Computing, 44, (1990), 209-220.
- [60] Butcher, J. C., Cash, J.R.. 'Towards efficient Runge-Kutta methods for stiff systems' SIAM J. Numer. Anal. 27 (1990), 753-761.
- [59] Butcher, J. C., Cash, J.R.., 'Some recent developments on numerical initial value problems: a survey', Appl. Numer. Math., 5 (1989), special issue on Recent Theoretical Results in Numerical Ordinary Differential Equations, Guest Editor: J. C. Butcher, 3-18.
- [58] Butcher, J. C. 'Towards efficient implementation of singly-implicit methods' ACM Transactions Math. Software 14 (1988), 68-75.
- [57] Butcher, J. C. 'On a class of matrices with real eigenvalues' Linear Algebra Appl. 103 (1988), 1-12.
- [56] Butcher, J. C. 'The equivalence of algebraic stability and AN-stability' BIT 27 (1987), 510-533.
- [55] Butcher, J. C. 'Linear and non-linear stability for general linear methods' BIT 27 (1987), 182-189.
- [54] Butcher, J. C., 'The numerical analysis of ordinary differential equations: Runge-Kutta and general linear methods', J. Wiley, Chichester, (1987), 512pp.
- [53] RABINOWITZ, P.J.R., KAUTSKY, J.J.R., ELHAY, S.J.R., Butcher, J. C., 'On sequences of imbedded integration rules', In 'Numerical interpretation', NATO Adv. Sci. Inst. Ser. C. Math. Phys. Sci., 203 (1987), 113-139.
- [52] Butcher, J. C. 'Optimal order and stepsize sequences' IMA J. Numer. Anal. 6 (1986), 433-438.
- [51] Butcher, J. C. 'The non-existence of ten stage eighth order explicit Runge-Kutta methods' BIT 25 (1985), 521-540.
- [50] Butcher, J. C. 'General linear methods: a survey' Appl. Numer. Math. 1 (1985), 273-284.

- [49] Butcher, J. C. 'An application of the Runge-Kutta space' BIT 24 (1984), 425-440.
- [48] Butcher, J. C., Cooper, G.J. 'An iterative scheme for implicit Runge-Kutta methods' IMA J. Numer. Anal. 3 (1983), 127-140.
- [47] Butcher, J. C. 'A short proof concerning B-stability' BIT 22 (1982), 528-529.
- [46] Butcher, J. C. 'A generalization of singly-implicit methods' BIT 21 (1981), 175-189.
- [45] Butcher, J. C. 'Stability properties for a general class of methods for ordinary differential equation' SIAM J. Numer. Anal. 18 (1981), 37-44.
- [44] Butcher, J. C. 'Some implementation schemes for implicit Runge-Kutta methods' Lecture Notes in Mathematics 773 (1980), 12-24.
- [43] Burrage, K., Butcher, J. C., Chipman, F. 'Non-linear stability of a general class of differential equation methods' BIT 20 (1980), 185-203.
- [42] Burrage, K., Butcher, J. C., Chipman, F. 'An implementation of singly-implicit Runge-Kutta methods' BIT 20 (1980), 326-340.
- [41] Burrage, K., Butcher, J. C. 'Stability criteria for implicit Runge-Kutta methods' SIAM J. Numer. Anal. 16 (1979), 46-57.
- [40] Butcher, J. C. 'A transformed implicit Runge-Kutta method' J. Assoc. Comput. Mach. 26 (1979), 731-738.
- [39] Butcher, J. C. 'On a conjecture concerning a set of sequences satisfying the Fibonacci difference equation' Fibonacci Quarterly 16 (1976), 81- 83.
- [38] Butcher, J. C. 'On A-stable Runge-Kutta methods' BIT 17 (1977), 375-378.
- [37] 1976 Butcher, J. C. 'Runge-Kutta methods' (Chapter 5) and 'Implicit Runge-Kutta and related methods'(Chapter 10), in Modern numerical methods for ordinary differential equations (ed. G. Hall and J.M. Watt).
- [36] Butcher, J. C. 'A class of implicit methods for ordinary differential equations' Lecture notes in Mathematics 506 (1976), 28-37.
- [35] Butcher, J. C. 'On the implementation of implicit Runge-Kutta methods' BIT 16 (1976), 237-240.
- [34] Butcher, J. C. 'A stability property of implicit Runge-Kutta methods' BIT 15 (1975), 358-361.
- [33] Butcher, J. C. 'An order bound for Runge-Kutta methods' SIAM J. Numer. Anal. 12 (1975), 304-315.

- [32] Butcher, J. C. 'Computation and theory in ordinary differential equations' Math. Chronicle 3 (1974), 63-69.
- [31] Butcher, J. C. 'Order conditions for general linear methods for ordinary differential equations' ISNM 19 (1974), 77-81.
- [30] Butcher, J. C. 'The order of differential equation methods' Lecture Notes in Mathematics 362 (1974), 72-75.
- [29] Butcher, J. C., 'Order conditions for a general class of numerical methods for ordinary differential equations', in Topics in Numerical Analysis (ed. J.J.H. Miller), (1973), 35-40.
- [28] Butcher, J. C. 'The order of numerical methods for ordinary differential equations' Math. Comp. 27 (1973), 793-806.
- [27] Butcher, J. C. 'A convergence criterion for a class of integration methods' Math. Comp. 26 (1972), 107-117.
- [26] Butcher, J. C. 'An algebraic theory of integration methods' Math. Comp. 26 (1972), 79-106.
- [25] Butcher, J. C., 'An approximation theorem in numerical analysis', in A spectrum of Mathematics, (ed J. C. Butcher), Auckland and Oxford Univ. Presses, (1971), 121-125.
- [24] Butcher, J. C. 'The effective order of Runge-Kutta methods' Lecture Notes in Mathematics 109 (1969), 133-139.
- [23] Butcher, J. C. 'A multistep generalization of Runge-Kutta methods with four or five stages' J. Assoc. Comput. Mach. 14 (1967), 84-89.
- [22] Barker, J. S. F., Butcher, J. C. 'A simulation study of quasi-fixations of genes due to random fluctuation of selection intensities' Genetics 53 (1966), 261-268.
- [21] Butcher, J. C. 'On the convergence of numerical solutions of ordinary differential equations' Math. Comp. 20 (1966), 1-10.
- [20] Butcher, J. C. 'On the attainable order of Runge-Kutta methods' Math. Comp. 19 (1965), 408-417.
- [19] Butcher, J. C., 'Some recent developments in the theory of Runge-Kutta methods', Proceedings of I.F.I.P. Congress (New York) (1965), Vol.II.
- [18] Butcher, J. C. 'A modified multistep method for the numerical integration of ordinary differential equations' J. Assoc. Comput. Mach. 12 (1965), 124-135.
- [17] Butcher, J. C. 'On Runge-Kutta processes of high order' J. Austral. Math. Soc. 4 (1964), 179-194.

- [16] Butcher, J. C. 'Integration processes based on Radau quadrature formulas' *Math. Comp.* 18 (1964), 233-244.
- [15] Butcher, J. C. 'Implicit Runge-Kutta processes' *Math. Comp.* 18 (1964), 50-64.
- [14] Butcher, J. C. 'On the integration processes of A. Huta' *J. Austral. Math. Soc.* 3 (1963), 202-206.
- [13] Butcher, J. C. 'Coefficients for the study of Runge-Kutta integration processes' *J. Austral. Math. Soc.* 3 (1963), 185-201.
- [12] Butcher, J. C., Crawford, D.F., Messel, H., Smirnov, A.D., Varfolomeev, A.A. 'Results on the angular and radial distributions of particles in electron-photon showers' *J. Phys. Soc. Japan* 17 (1962), Suppl. A-III.
- [11] Butcher, J. C. 'Random sampling from the normal distribution' *Computer J.* 3 (1961), 251-253.
- [10] Butcher, J. C. 'A partition test for pseudo-random numbers' *Math. Comp.* 15 (1961), 198-199.
- [9] Butcher, J. C., Messel, H., 'Comparison of the electron number distribution in electron-photon showers in air and aluminium absorbers', *International Union of Pure and Applied Physics*, (1960), p.243.
- [8] Bolt, B. A., Butcher, J. C. 'Rayleigh wave dispersion for a single layer on an elastic half-space' *Australian J. of Physics* 13 (1960), 498-504.
- [7] Messel, H, Smirnov, A. D., Varfolomeev, A. A., Crawford, D. F., Butcher, J. C. 'Radial and angular distributions of electrons in electron-photon showers in lead and in emulsion absorbers' *Nuclear Physics* 39 (1962), 1-88.
- [6] Srinivasan, S. K., Butcher, J. C., Chartres, B. A., Messel, H 'Numerical calculations on the new approach to the cascade theory- III' *II Nuovo Cimento* 9 (1958), 77-84.
- [5] Butcher, J. C., Messel, H 'Electron number distribution in electron - photon Showers in Air and Aluminum Absorbers' *Nuclear Physics* 20 (1960), 15-128.
- [4] Butcher, J. C., Messel, H 'Electron number distribution in electron-photon Showers' *Physical Review* 112 (1958), 2096-2106.
- [3] Butcher, J. C., Chartres, B. A., Messel, H 'Tables of average numbers for electron - photon showers at small depths of absorber' *Nuclear Physics* 6 (1958), 271-281.
- [2] Butcher, J. C., 'On the numerical inversion of Laplace and Mellin transforms', *Proceedings of Computing Conference, Salisbury, S. Australia*, (1957).

[1] Butcher, J. C. 'Treatment variances for experimental designs with serially correlated observations' *Biometrika* 43 (1956), 208-212.