

Curriculum Vitae

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Academic Qualifications:

- 1990 – 1993 The University of Hong Kong, B.Sc. (Math)
- 1993 – 1995 The Hong Kong University of Science and Technology, M.Phil. (Math)
- 1995 – 1998 The Hong Kong University of Science and Technology, Ph.D. (Math)

Present Academic Position:

- 2015 – The University of Hong Kong, Professor
- 2020 – The University of Hong Kong, Co-director of BASc Applied AI program

Previous Academic Positions Held:

- 1998 – 2000 University of Cambridge, Croucher Foundation Research Fellow
- 2000 – 2002 The University of Hong Kong, Postdoctoral Fellow
- 2002 – 2008 The University of Hong Kong, Assistant Professor
- 2003 – 04 (summer) Tsinghua University, Senior Visiting Scholar
- 2007 (spring) Purdue University, Visiting Assistant Professor
- 2008 – 2015 The University of Hong Kong, Associate Professor
- 2009 – 2011 The University of Hong Kong, Deputy Head
- 2017 – 2020 The University of Hong Kong, Head of Department

Research Interest:

Complex analysis and its applications, voting theory and epidemic modelling. Current research topics are geometric function theory and invariant metrics, complex differential and functional equations, geometry of polynomials.

Current Research Students:

- Jiaqi Wang (Ph.D.)
- Aneesh Jatar (Ph.D.)
- Kin Ming Tsang (MPhil.)

Students Supervised/Co-supervised:

Chiu Chak Tang (Ph.D., 2020)
Kwok Chung Tam (M.Phil., 2020)
Jiaying Huang (Ph.D., 2019)
Chung Tak Chiu, Kenneth (M.Phil., 2017)
Pan Shun Lau (Ph.D., 2016 [co-supervise with Dr. N.K. Tsing])
Chengfa Wu (Ph.D., 2014)
Pak Leong Cheung (M.Phil., 2011, Ph.D., 2014)
Chiu Yin Tsang (M.Phil., 2008, Ph.D., 2012)
Kwok Kin Wong (M.Phil., 2012)
Liang Xu (M.Phil., 2010)
Yiu Fai Lee (M.Phil., 2006, Ph.D., 2010 [co-supervise with Prof. Pak Shum])
Mingxi Wang (M.Phil., 2007)
Tsz Lung Chan (M.Phil., 2007)
Ching Wan Tai (M.Phil., 2007 [co-supervise with Dr. N.K. Tsing])
Yan Yu Choi (M.Phil., 2006)

Awards

1. Croucher Foundation Research Fellowship (1998)
2. Outstanding Services Award from Department of Mathematics, The Hong Kong University of Science and Technology (1998)
3. Outstanding Young Researcher Award, The University of Hong Kong (2006)
4. Award for Service Contribution 2010-11, Faculty of Science, The University of Hong Kong (2011)
5. Faculty Knowledge Exchange Award, The University of Hong Kong (2012)

Editorship

1. Guest editor of *Complex Variables and Elliptic Equations* for the Special Issue Dedicated to Professor Chung-Chun Yang (Issue 1-4, pages 1-398, 2011).
2. Associate editor of *The Bulletin of the Australian Mathematical Society* (2013-).
3. Associate editor of *Computational Methods and Function Theory* (2021-).

Research Grants

1. Factorization and complex dynamics of meromorphic functions and related topics (2003) [HK\$ 411000, Competitive Earmarked Research Grants (CERG)].
2. D-Companion Matrices and Geometry of Polynomials (2005)[HK\$ 231000, Competitive Earmarked Research Grants (CERG)].
3. A double epidemic model for SARS propagation (2003) [HK\$43500, Small Project Funding from HKU].

4. Exact solutions of algebraic differential equations (2005) [HK\$ 28400, France/Hong Kong Joint Research Scheme - Travel Grants].
5. Meromorphic solutions of algebraic differential equations (2007) [HK\$ 445000, Competitive Earmarked Research Grants (CERG)].
6. Factorizations and iterations of meromorphic functions and related topics (2009) [HK\$ 312,000, Competitive Earmarked Research Grants (CERG)].
7. Smale's inequalities for polynomials and related problems (2011) [HK\$ 650,000, Competitive Earmarked Research Grants (CERG)].
8. Vector valued Nevanlinna theory and systems of algebraic differential equations (2011) [HK\$ 43,200, France/Hong Kong Joint Research Scheme - Travel Grants].
9. Meromorphic mappings and their applications to related problems in number theory and differential equations (2013) [as a co-investigator, RMB\$ 500,000, NSFC grant 11271227].
10. Zero distributions of derivatives of polynomials: deterministic and random (2013) [HK\$ 592,987, Competitive Earmarked Research Grants (CERG)].
11. Fermat-type functional equations and the method of jet differentials (2015) [HK\$ 451,255, Competitive Earmarked Research Grants (CERG)].
12. The squeezing functions, Fridman functions and Loewner differential equations for multi-connected domain (2019) [HK\$ 606,445, Competitive Earmarked Research Grants (CERG)].
13. Functional transcendence via Nevanlinna theory (2020) [HK\$ 606,445, Competitive Earmarked Research Grants (CERG)].

Publications

1. T.W. Ng and C.C. Yang, Certain criteria on the existence of a transcendental entire common right factor. *Analysis* **17** (1997), no. 4, 387-393.
2. T.W. Ng and C.C. Yang, On the zeros of $\sum a_i \exp g_i$. *Proc. Japan Acad. Ser. A Math. Sci.* **73** (1997), no. 7, 137-139.
3. T.W. Ng and C.C. Yang, On the common right factors of meromorphic functions. *Bull. Austral. Math. Soc.* **55** (1997), no. 3, 395-403.
4. T.W. Ng and C.C. Yang, On the composition of a prime transcendental entire function and a prime polynomial, *Pacific Journal of Mathematics* **193** (2000), no. 1, 131-141.
5. A.F. Beardon and T.W. Ng, On Ritt's factorization of polynomials, *Journal of London Mathematical Society*, **62** (2000), no. 1, 127-138.
6. T.W. Ng, An example concerning infinite factorizations of transcendental entire functions, *Expositiones Mathematicae* **18** (2000), no. 2, 127-130.
7. T.W. Ng, Recent progress on the unique factorizations of entire functions, Proceedings of the Second International ISAAC Congress, Vol.2, 1187-1199, Kluwer Academic Publishers, 2000.

8. T.W. Ng, Permutable entire functions and their Julia sets, *Mathematical Proceeding of Cambridge Philosophical Society* **131** (2001), no.1, 129-138.
9. T.W. Ng, Imprimitve parametrization of analytic curves and factorizations of entire functions, *Journal of London Mathematical Society*, **64** (2001), no.2, 1-10.
10. A.F. Beardon, D. Minda and T.W. Ng, Smale's mean value conjecture and the hyperbolic metric, *Mathematische Annalen* **322** (2002), 623-632.
11. A.F. Beardon, T.K. Carne and T.W. Ng, The critical values of a polynomial, *Constructive Approximations*, **18** (2002), 343-354.
12. W.K. Ching, S.K. Chung, Y.K. Lau, T.W. Ng and S.P. Yung, A Vector-host Epidemic Model, *International Mathematical Journal*, pp. 751-755, Vol.2, 2002.
13. T.W. Ng, Smale's mean value conjecture for odd polynomials, *Journal of Australia Mathematical Society*, **75** (2003), no. 3, 409-411.
14. T.W. Ng, Gabriel Turinici and Antoine Danchin, A Double Epidemic Model for the SARS Propagation, *BMC Infectious Diseases* **3** (2003).
15. W.K. Ching, T.W. Ng and S.K. Chung, On Modeling SARS in Hong Kong, *International Journal of Applied Mathematics*, **13** (2003), no. 1, 1-7.
16. W.K. Ching, E. Fung, M. Ng and T.W. Ng, Multivariate Markov Models for the Correlation of Multiple Biological Sequences, International Workshop on Bioinformatics, PAKDD Seoul, Korea (2003), pp.23-34.
17. G. Hui, J.H. Zheng and T.W. Ng, On a new singular direction of meromorphic functions, *Bull. Austral. Math. Soc.* **69** (2004), no. 2, 277-287.
18. A.F. Beardon, D. Minda, T.K. Carne and T.W. Ng, Random iteration of analytic maps, *Ergodic Theory and Dynamical Systems*, **24** (2004), no. 3, 659-675.
19. W.S. Cheung and T.W. Ng, A companion matrix approach to the study of zeros and critical points of a polynomial, *Journal of Mathematical Analysis and Its Application*, **319** (2006), no. 2, 690-707.
20. T.W. Ng, J.H. Zheng and Y.Y. Choi, Residual Julia Sets of Meromorphic Functions, *Mathematical Proceeding of Cambridge Philosophical Society*, **141** (2006), no.1, 113-126.
21. A.F. Beardon and T.W. Ng, Parametrizations of algebraic curves, *Ann. Acad. Sci. Fenn.*, **31** (2006), 541-554.
22. Chung-Chau Hon, Tsan-Yuk Lam, Alexei Drummond, Andrew Rambaut, Yiu-Fai Lee, Chi-Wai Yip, Fanya Zeng, Pui-Yi Lam, Patrick T.W. Ng and Frederick C. C. Leung, Phylogenetic Analysis Reveals a Correlation between the Expansion of Very Virulent Infectious Bursal Disease Virus and Reassortment of Its Genome Segment B, *Journal of Virology*, **80** (2006), no.17, 8503-8509.
23. T.W. Ng, G. Turinici, W.K. Ching, S.K. Chung and A. Danchin, A parasite vector-host epidemic model for TSE propagation, *Medical Science Monitor* **13** (2007), no.3, 59-66.
24. Lydia W.T. Cheung, Y.F. Lee, T.W. Ng, W.K. Ching, U.S. Khoo, Michael K.P. Ng and Alice S.T. Wong, CpG/CpNpG motifs in the coding region are preferred sites for mutagenesis in the breast cancer susceptibility genes, *FEBS Letters*, **581** (2007), Issue 24, 4668-4674.

25. W.K. Ching, Y. Cong, T.W. Ng, Allen H. Tai, A fast algorithm for the spread of HIV in a system of prisons. *Math. Comput. Modelling* **46** (2007), no. 9-10, 1247–1255.
27. W.K. Ching, Y. Cong, T.W. Ng, Zheng-Jian Bai, Some Infection Models for the Development of AIDS, *Lecture Notes in Operations Research* **9**, *Optimization and Systems Biology*, (2008), 21-28
28. A. Eremenko, L.W. Laio and T.W. Ng, Meromorphic solutions of higher order Briot-Bouquet differential equations, *Mathematical Proceeding of Cambridge Philosophical Society*, **146** (2009), no. 1, 197–206.
29. T.L. Chan, W.S. Cheung and T.W. Ng, Graceful Tree Conjecture for Infinite Trees, *The Electronic Journal of Combinatorics*, **16** (2009), Research Paper 65, 15 pp.
30. W.S. Cheung and T.W. Ng, Relationship between the zeros of two polynomials, *Linear Algebra and Its Applications*, **432** (2010), no.1, 107–115.
31. R. Conte and T.W. Ng, Meromorphic solutions of a third order nonlinear differential equation, *Journal of Mathematical Physics*, **51** (2010), no.3, 0335181-03351819.
32. W.K. Ching, L.M. Li, N.K. Tsing, C.T. Tai, T.W. Ng, A.S. Wong and K.W. Cheng, A weighted Local Least Squares Imputation method for missing value estimation in microarray gene expression data, *Int. J. Data Mining and Bioinformatics*, **4**, (2010), no. 3, 331–347.
33. K.W. Chow and T.W. Ng, Periodic solutions of a derivative nonlinear Schrodinger equation: Elliptic integrals of the third kind, *Journal of Computational and Applied Mathematics*, **235**, no. 13, (2011), 3825-3830.
34. R.Conte, T.W. Ng and K.K. Wong, Exact meromorphic solutions of the real cubic Swift-Hohenberg equation, *Studies in Applied Mathematics*, **129**, (2012), no. 1, 117–131.
35. R. Conte and T.W. Ng, Meromorphic Traveling Wave Solutions of the Complex Cubic-Quintic Ginzburg-Landau Equation, *Acta Applicandae Mathematicae* **122**, (2012), 153-166.
36. T.W. Ng and M. Wang, Ritt’s theory on the unit disk, *Forum Mathematicum*, **25**, (2013), Issue 4, 821–851.
37. T.W. Ng and C.Y. Tsang Polynomials versus finite Blaschke products, *Blaschke products and their applications*, Fields institute communications, **65**, Editors: Javad Mashreghi and Emmanuel Fricain, (2013) 249–274.
38. W.S. Cheung, T.W. Ng and C.Y. Tsang, Density estimates on composite polynomials, *Journal of Australia Mathematical Society*, **95**, (2013). 329-342 .
39. W.S. Cheung, T.W. Ng, A Three-Dimensional Voting System in Hong Kong, *European Journal of Operational Research*, **236**, (2014) Issue 1, 1 July, 292–297.
40. P.L. Cheung, T.W. Ng and S.C.P. Yam, Critical points of random finite Blaschke products with independent and identically distributed zeros, *Complex Analysis and Potential Theory, 9th International Society for Analysis, its Applications and Computation (ISAAC) Congress, Krakow, Poland, in August 2013*, Eds.: T. Aliev Azeroglu, A.Golberg, S.Rogosin. Cambridge Scientific Publishers, Cambridge, UK,(2014), 23–30.

41. T.L. Chan, W.S. Cheung, T.W. Ng, Graceful labeling for mushroom trees, *Aequationes mathematicae*, **89**, (2015) Issue 3, June, 719–724.
42. P.L. Cheung, T.W. Ng, J. Tsai and S.C.P. Yam, Higher order, polar and Sz.-Nagy’s generalized derivatives of random polynomials with independent and identically distributed zeros on the unit circle, *Computational Methods and Function Theory*, **15**, (2015) Issue 1, March, 159–186.
43. P.L. Cheung and T.W. Ng, Finiteness of fixed equilibrium configurations of point vortices in the plane with background flow, *Nonlinearity*, **27**, (2014), 2445–2463.
44. T.W. Ng and C.Y. Tsang, Chebyshev-Blaschke products, *Journal of Computational and Applied Mathematics*, **277**, (2015), 106–114.
45. R. Conte, T.W. Ng and C.F. Wu, Hayman’s classical conjecture on some nonlinear second-order algebraic ODEs, *Complex Variables and Elliptic Equations*, **60**, (2015), 1539–1552.
46. P.S. Lau, T.W. Ng and N.K. Tsing, The star-shapedness of a generalized numerical range, *Linear Algebra and its Applications*, **506**, (2016), 308–315.
47. P.S. Lau, T.W. Ng and N.K. Tsing, Convexity and star-shapedness of real linear images of special orthogonal orbits, *Linear Algebra and its Applications*, **507**, (2016), 51–67.
48. R. Conte, T.W. Ng and C.F. Wu, Singularity methods for meromorphic solutions of differential equations. In Euler, N (Eds.), *Nonlinear Systems and Their Remarkable Mathematical Structures*, Volume I, p. 159–186. Boca Raton, FL: CRC Press, 2018.
49. T.W. Ng and C.F. Wu, Nonlinear Loewy Factorizable algebraic ODEs and Haymans conjecture, *Israel Journal of Mathematics*, **229** (2019), Issue 1, 1–38.
50. J.J. Zhang, C.C. Yang and T.W. Ng, On admissible entire solutions of Pell type functional equation $f^2 + ag^2 = 1$. *Journal of Mathematical Analysis and Applications*, **480** (2019), Issue 1, 123240.
51. J. Huang and T.W. Ng, Hypertranscendence of perturbations of hypertranscendental functions. *Journal of Mathematical Analysis and Applications*, **491** (2020), Issue 1, 124390.
52. T.W. Ng, C.C. Tang and J. Tsai, The squeezing function on doubly-connected domains via the Loewner differential equation, *Mathematische Annalen*, **380** (2021), 1741–1766.
53. A. Danchin, T.W. Ng and G. Turinici, A new transmission route for the propagation of the SARS-CoV-2 coronavirus. *Biology*, **10** (2021), Issue (1), 10.
54. S.V. Danielyan, A.E. Guterman, and T.W. Ng. Integrability of diagonalizable matrices and a dual Schoenberg type inequality. *Journal of Mathematical Analysis and Applications* **498** (2021), Issue 2, 24909.
55. T.W. Ng, C.C. Tang and J. Tsai, Fridman function, injectivity radius function and squeezing function. *The Journal of Geometric Analysis*, **32**, 21 (2022). <https://doi.org/10.1007/s12220-021-00818-7>.
56. J. Huang and T.W. Ng, Ax-Schanuel type theorems on functional transcendence via Nevanlinna theory. *Mathematische Zeitschrift*, (2021). <https://doi.org/10.1007/s00209-021-02848-x>

57. G.G. Gundersen, W.R. Lu, T.W. Ng, C.C. Yang, Entire solutions of differential equations that are related to trigonometric identities. *Journal of Mathematical Analysis and Applications*, **507** (2022), Issue 1, 125788.
58. R. Conte, T.W. Ng and C.F. Wu, Closed-form meromorphic solutions of some third order boundary layer ordinary differential equations, *Bulletin des Sciences Mathématiques*, (2022). <https://doi.org/10.1016/j.bulsci.2021.103096>.
59. T.W. Ng, C.C. Tang and J. Tsai, Carathéodory balls and proper holomorphic maps on multiply-connected planar domains, arXiv:2105.03156 (2021).

Public & Community Service

1. Panel member of CDC-HKEAA Committee on Mathematics Education(Senior Secondary) Working Group on New Senior Secondary Mathematics Curriculum (compulsory Part), 2005-2007.
2. Chairperson of Test Development Committee (Secondary Mathematics) of HKEAA, 2008-2009.
3. External examiner for the Certificate in Professional Development Programmes under the discipline of "Mathematics" offered by the Hong Kong Institute of Education for the academic years 2014-2019.
4. Independent Manager of Po Leung Kuk No.1 W.H. Cheung College, 2015-.
5. Council Member of Hong Kong Institution of Science, 2018-2022.
6. Vice-President of The Hong Kong Mathematical Society, 2020-.
7. Chairperson of the Departmental Advisory Committee of the Department of Mathematics and Information Technology of The Education University of Hong Kong, 2021-2023.