Gerald Vincent DUNNE, Professor of Physics
University of Connecticut
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Education:

1984 B. Sc. (First Class Honours), Mathematical Physics, University of Adelaide
1985 M. Sc., Theoretical Physics, University of Adelaide
Thesis: *Deep Inelastic Scattering and the EMC Effect*; Advisor: A. W. Thomas
1988 Ph. D., Theoretical Physics, Imperial College, London
Thesis: *Methods of Quantization*; Advisor: I. G. Halliday

Experience:

1988-90 Postdoctoral Research Associate, Center for Theoretical Physics, MIT
1990-92 Instructor in Applied Mathematics, Department of Mathematics, MIT
1992-96 Assistant Professor, Department of Physics, University of Connecticut
1996-02 Associate Professor, Department of Physics, University of Connecticut
2002- Professor, Department of Physics, University of Connecticut

Professional Societies:

Life Member, American Physical Society
Fellow, Institute of Physics (U.K.)
Fellow, Connecticut Academy of Science and Engineering
2002-2009: Editorial Board, Journal of Physics A: Mathematical and Theoretical
2004-2009: Section Editor for Classical and Quantum Field Theory, Journal of Physics A
2019-2022: Editorial Board, Physical Review D

Honours or Distinctions:

1984 First Class Honours, Mathematical Physics, University of Adelaide
1985-88 Commonwealth Scholar (U.K. Award), Association of Commonwealth Universities and The British Council
1987 Full Athletics Colours (Squash), Imperial College, London
1998 Chancellor's Research Excellence Award, University of Connecticut
1999 Visiting Associate Professor, Technion, Israel
2000 PPARC Research Fellow, and Visiting Fellow, Balliol College, Oxford
2000 Visiting Professor, Universidad de Santiago de Chile,
2003 Rockefeller Foundation Award: Bellagio (Italy) Residency
2006 Visiting Professor, University of Adelaide Distinguished Visitors Programme
2007 German Research Foundation (DFG) Mercator Professor, Universität Heidelberg
2014 Visiting Professor, Technion, Israel
2014 Fulbright Senior Scholar, German Fulbright Commission
2014 German Research Foundation (DFG) Mercator Professor
2015-2024 Scientific Advisory Board, Max Planck Institute for Nuclear Physics, Heidelberg
2016 Visiting Professor, Gothenburg Centre for Advanced Studies, Chalmers University
2017 CLAS Faculty Research Excellence Award, University of Connecticut
2023- Advisory Board, Quantum Theory Centre, Danish Institute for Advanced Study

Gerald Vincent DUNNE – Publications

Books

- G. Dunne, *Self-Dual Chern-Simons Theories* (Springer-Verlag, Heidelberg, 1995); reprinted 2009.

Editorships

- P. Argyres, G. Dunne, G. Semenoff, L. C. R. Wijewardhana (Eds.), *A Life in Quantum Field Theory: Peter Suranyi Festschrift*, (World Scientific, Singapore, 2022).
- P. Dorey, G. Dunne and J. Feinberg, Editors, *Low Dimensional Quantum Field Theory*, Special Issue of JPhysA (IOP Publishing, Bristol, 2007).
- G. Dunne, L. Horwitz, M. Islam and P. Mannheim, Guest Editors for Festchrift in honor of Kurt Haller, *Foundations of Physics* Volume **30**, Issues 3,4 and 5 (2000).
- D. Cangemi and G. Dunne, Editors of the Proceedings of *Workshop on Low Dimensional Field Theory*, Telluride CO, August 1996 (World Scientific, Singapore, 1997).

Book Chapters

- G. V. Dunne, "Borel Summation and Analytic Continuation of the Heat Kernel on Hyperbolic Space," pp 167-189, Book Chapter in *A Life in Quantum Field Theory: Peter Suranyi Festschrift*, (World Scientific, Singapore, 2022), P. Argyres, G. Dunne, G. Semenoff, L. C. R. Wijewardhana (Eds.).
- G. V. Dunne, T. Sulejmanpasic and M. Ünsal, "Bions and Instantons in Triple-well and Multi-well Potentials," pp 119–148, Book chapter in Roman Jackiw 80th Festschrift, A. Niemi, T. Tomboulis, K. K. Phua (Eds), (World Scientific, Singapore, 2020).
- G. V. Dunne, "Extreme quantum field theory and particle physics with IZEST," in *Zeta-Exawatt Science and Technology*, G. Mourou and T. Tajima (Eds), Special Topics Issue of Eur. Phys. J. ST **223**, no. 6, 1055 (2014).
- E. Akkermans, G. V. Dunne and E. Levy, "Wave propagation in one-dimension: Methods and applications to complex and fractal structures", in *Optics of Aperiodic Structures - Fundamentals and Device Applications*, L. Dal Negro (Ed), Pan Stanford Press (2014).
- G. Basar and G. V. Dunne, "The Chiral Magnetic Effect and Axial Anomalies,", in *Strongly interacting matter in magnetic fields*, D. Kharzeev, K. Landsteiner, A. Schmitt, H.-U. Yee (Eds), (Springer, 2013).

- G. V. Dunne, "Heisenberg-Euler effective Lagrangians: Basics and extensions," in Ian Kogan Memorial Collection, *From Fields to Strings: Circumnavigating Theoretical Physics*, Vol I, M. Shifman et al (Eds), (World Scientific, Singapore, 2004), pp 445 - 522.

- G. Dunne, "Perturbative-Nonperturbative Connection in Quantum Mechanics and Field Theory", plenary talk at ArkadyFest Symposium, University of Minnesota, May 2002. Published in *Continuous Advances in QCD 2002: ArkadyFest*, K. Olive, M. Shifman and M. Voloshin (Eds.), (World Scientific, Singapore 2002), pages 478 - 505.

- G. Dunne, "Aspects of Chern-Simons Theories", Lectures at the 1998 Les Houches (France) NATO Advanced Studies Institute, *Topological Aspects of Low Dimensional Systems*, A.Comtet et al (Editors), (Springer-Verlag, 2000), pages 176 - 263.

- G. Dunne, "Self-Dual Chern-Simons Theories", Plenary Lectures at the 13^{th} *International Symposium on Field Theory and Mathematical Physics*, Mt. Sorak (Korea), June 27 - July 2, 1994. In the proceedings, *Field theory and Mathematical Physics*, J. E. Kim, editor (Mineumsa, Seoul, 1995), pages 1 - 42.

Book Reviews

- "Supersymmetry in Quantum Mechanics", by F. Cooper et al. Review by G. Dunne published in *Contemporary Physics* **44** (2003), 94.

Gerald Dunne: Google Scholar data: 10/2024

Publications: 224

Citations: 15,011

h-index: 70 (number of papers with at least h [*i.e.* 70] citations)

i10-index: 192 (number of papers with at least 10 citations)

Recent Invited Seminars and Colloquia

Seminars, colloquia and lectures courses in 28 countries: Australia, Austria, Brazil, Canada, Chile, Czech Republic, Denmark, France, Germany, India, Ireland, Israel, Italy, Japan, Korea, Mexico, Netherlands, Norway, New Zealand, Portugal, Russia, Spain, Sweden, Switzerland, Taiwan, Turkey, United Kingdom, United States.

272 presentations since I started counting in 2002: see list below

Lecture Courses at International Summer and Winter Schools

- Mt. Sorak (Korea) 1995 Summer School: lectures on Chern-Simons Vortices.
- Les Houches (France) 1998 Summer School: lectures on Chern-Simons Theory.
- Saalburg (Germany) 2008 Summer School: lectures,
  Functional Determinants in Quantum Field Theory.
- CERN (Geneva) 2014 Winter School: lectures,
  Resurgent Asymptotics in Quantum Field Theory.
- Schladming (Austria) 2015 Winter School: lectures,
  Resurgent Asymptotics in Quantum Field Theory.
- Parma (Italy) 2016 Summer School: lectures,
  Resurgent Asymptotics in Quantum Field Theory.
- Amherst (US) 2017 Summer School: lectures,
  Resurgent Asymptotics in Quantum Field Theory.
- Chalmers University, Gothenburg (Sweden) 2017: invited lecture course,
  Resurgence and Non-Perturbative Physics.
- Bangalore (India) 2018 Winter School: lectures,
  Resurgence and Non-Perturbative Physics.
- CP3 Origins Institute, (Denmark) 2018 Winter School: lectures,
  Resurgence and Non-Perturbative Physics.
- Kavli Pan-Asian Winter School (Seoul) 2019: lectures,
  Resurgence and Non-Perturbative Physics.
- Isaac Newton Institute Spring School on Asymptotic Methods and Applications, Cambridge (UK), March 2021: lectures,
  Resurgence in Differential Equations, and Effective Summation Methods.
- CERN Summer School "Continuum Foundations of Lattice Gauge Theory", CERN, Geneva, July 2024.
  Introductory Lectures on Resurgence.

Conference Organization

- 1996: *Low Dimensional Quantum Field Theory*: Telluride, Colorado.
- 2003: *Field Theory and Mathematical Physics*: Korea Institute for Advanced Study, Seoul
- 2008: *Low Dimensional Quantum Field Theory*: Asia Pacific Center for Theoretical Physics, Pohang (Korea).
- 2007: *Quantum Fields Under Extreme Conditions*: Leipzig (Germany)
- 2009: *Quantum Fields Under Extreme Conditions*: Univ. of Oklahoma
- 2010: *International Colloquium on Group Theoretical Methods in Physics*: Newcastle (UK)
- 2011: *Quantum Fields Under Extreme Conditions*: Benasque (Spain)
- 2011: *Waves and Quantum Fields on Fractals*: Technion, Haifa (Israel)
- 2015: *Resurgence and localization in string theory and quantum field theory*: Simons Center for Geometry and Physics, Stony Brook
- 2015: *Resurgence, Physics and Numbers*: Centro di Ricerca Matematica Ennio De Giorgi, Scuola Normale Superiore Pisa (Italy).
- 2016: *Recent Developments in Semiclassical Probes of Quantum Field Theories*: UMass Amherst Center for Fundamental Interactions
- 2016: *Resurgence in Gauge Theory and String Theory*: Instituto Superior Técnico, Lisbon (Portugal).
- 2016: *VIII Parma International School on Theoretical Physics*: Parma (Italy)
- 2016: *Resurgence at Kavli IPMU*: Institute for the Physics and Mathematics of the Universe, University of Tokyo
- 2017: *Resurgent Asymptotics in Physics and Mathematics*: Kavli Institute for Theoretical Physics, UC Santa Barbara. Lead co-ordinator of 10 week dedicated research program.
- 2019: *XI Bolyai-Gauss-Lobachevsky (BGL-2019) Conference: Non-Euclidean, Non-Commutative Geometry and Quantum Physics*, Kiev (Ukraine), May 2019.
- 2019: *Physics Opportunities at a Lepton Collider in the Fully Nonperturbative QED Regime*, SLAC, Stanford Linear Accelerator Center, August 2019.

- 2019: *EXHILP 2019, 3rd Conference on Extremely High Intensity Laser Physics*, Stanford University, September 2019.
- 2020: *Resurgence in String and Gauge Theory*, American Institute of Mathematics, May 2020.
- 2021: *Applicable Resurgent Asymptotics*, Isaac Newton Institute, University of Cambridge, March-June 2021 and September-December 2022.
- 2024: *Resurgence and Modularity in Gauge and String Theory*, Galileo Galilei Institute, Florence, April-May 2024.

Gerald V. Dunne: Publications. (* Denotes paper with a UConn student)

1. G. V. Dunne, "Resurgence of the Tilted Cusp Anomalous Dimension," [arXiv:2501.03105 [hep-th]], J. Phys A, Stanley Deser Special Issue.

2. M. Bevis, C. Ogle, O. Costin, C. Jekeli, R. D. Costin, J. Guo, J. Fowler, G. V. Dunne, C. K. Shum, and K. Snow, "Divergence beneath the Brillouin sphere and the phenomenology of prediction error in spherical harmonic series approximations of the gravitational field", Reports on Progress in Physics, Volume 87, Number 7, 078301 (2024).

3. M. Borinsky, G. V. Dunne and K. Yeats, "Tree-tubings and the combinatorics of resurgent Dyson-Schwinger equations," [arXiv:2408.15883 [math-ph]].

4. O. Costin, G. V. Dunne, A. Gruen and S. Gukov, "Going to the Other Side via the Resurgent Bridge," arXiv:2310.12317.

5. * G. V. Dunne and Z. Harris, "Resurgence of the effective action in inhomogeneous fields," Phys. Rev. D **107**, no.6, 065003 (2023), arXiv:2212.04599.

6. G. V. Dunne, A. Florio and D. E. Kharzeev, "Entropy suppression through quantum interference in electric pulses," Phys. Rev. D **108**, no.3, L031901 (2023), arXiv:2211.13347.

7. * O. Costin, G. V. Dunne and M. Meynig, "Noise effects on Padé approximants and conformal maps," J. Phys. A **55**, no.46, 464007 (2022) arXiv:2208.02410.

8. G. Basar, G. V. Dunne and Z. Yin, "Uniformizing Lee-Yang singularities," Phys. Rev. D **105**, no.10, 105002 (2022), arXiv:2112.14269.

9. * G. V. Dunne and M. Meynig, "Instantons or renormalons? Remarks on ϕ^4_{d-4} theory in the MS scheme," Phys. Rev. D **105**, no.2, 025019 (2022), arXiv:2111.15554.

10. G. V. Dunne, "Borel Summation and Analytic Continuation of the Heat Kernel on Hyperbolic Space," Book Chapter in *A Life in Quantum Field Theory: Peter Suranyi Festschrift*, (World Scientific, Singapore, 2022), P. Argyres, G. Dunne, G. Semenoff, L. C. R. Wijewardhana (Eds.). arXiv:2109.03897.

11. X. An, M. Bluhm, L. Du, G. V. Dunne, H. Elfner, C. Gale, J. Grefa, U. Heinz, A. Huang and J. M. Karthein, *et al.* "The BEST framework for the search for the QCD critical point and the chiral magnetic effect," Nucl. Phys. A **1017**, 122343 (2022), arXiv:2108.13867.

12. O. Costin and G. V. Dunne, "Conformal and Uniformizing Maps in Borel Analysis," Eur. Phys. J. Spec. Top. (2021), arXiv:2108.01145.

13. M. Beccaria, G. V. Dunne and A. A. Tseytlin, "Strong coupling expansion of free energy and BPS Wilson loop in $\mathcal{N} = 2$ superconformal models with fundamental hypermultiplets," JHEP **08**, 102 (2021), arXiv:2105.14729.

14. M. Beccaria, G. V. Dunne and A. A. Tseytlin, "BPS Wilson loop in $\mathcal{N} = 2$ superconformal SU(N) "orientifold" gauge theory and weak-strong coupling interpolation," JHEP **07**, 085 (2021), arXiv:2104.12625.

15. * M. Borinsky, G. V. Dunne and M. Meynig, "Semiclassical Trans-Series from the Perturbative Hopf-Algebraic Dyson-Schwinger Equations: ϕ^3 QFT in 6 Dimensions," SIGMA **17**, 087 (2021), arXiv:2104.00593.

16. * G. V. Dunne and Z. Harris, "Higher-loop Euler-Heisenberg transseries structure," Phys. Rev. D **103**, no.6, 065015 (2021), arXiv:2101.10409.

17. * Gamal Mograby, Maxim Derevyagin, Gerald V. Dunne, Alexander Teplyaev, "Spectra of Perfect State Transfer Hamiltonians on Fractal-Like Graphs", arXiv:2003.11190, J. Phys. A 54 (2021), no. 12, 125301.

18. G. V. Dunne, T. Sulejmanpasic and M. Ünsal, "Bions and Instantons in Triple-well and Multi-well Potentials," Book chapter in Roman Jackiw 80th Festschrift, A. Niemi, T. Tomboulis, K. K. Phua (Eds), (World Scientific, Singapore, 2020), arXiv:arXiv:2001.10128.

19. O. Costin and G. V. Dunne, "Uniformization and Constructive Analytic Continuation of Taylor Series," Commun. Math. Phys. **392**, 863-906 (2022), arXiv:2009.01962.

20. * G. Mograby, M. Derevyagin, G. V. Dunne and A. Teplyaev, "Hamiltonian systems, Toda lattices, Solitons, Lax Pairs on weighted Z-graded graphs," J. Math. Phys. **62**, no.4, 042204 (2021), arXiv:2008.04897.

21. M. Borinsky and G. V. Dunne, "Non-Perturbative Completion of Hopf-Algebraic Dyson-Schwinger Equations," Nucl. Phys. B **957**, 115096 (2020), arXiv:2005.04265

22. N. A. Dondi, G. V. Dunne, M. Reichert and F. Sannino, "Towards the QED beta function and renormalons at $1/N_f^2$ and $1/N_f^3$," Phys. Rev. D **102**, no.3, 035005 (2020), 2003.08397 [hep-th].

23. O. Costin and G. V. Dunne, "Physical Resurgent Extrapolation," Phys. Lett. B **808**, 135627 (2020), arXiv:2003.07451.

24. * N. J. Cleri and G. V. Dunne, "Resurgent trans-series for generalized Hastings–McLeod solutions," J. Phys. A **53**, no.35, 355203 (2020), arXiv:2002.06270.

25. * Maxim Derevyagin, Gerald V. Dunne, Gamal Mograby, Alexander Teplyaev, "Perfect quantum state transfer on diamond fractal graphs", arXiv:1909.08668, Quantum Information Processing, Springer 19:328 (2020).

26. O. Costin and G. V. Dunne, "Resurgent Extrapolation: Rebuilding a Function from Asymptotic Data. Painleve I", J. Phys. A **52**, no.44, 445205 (2019), arXiv:arXiv:1904.11593.

27. N. A. Dondi, G. V. Dunne, M. Reichert and F. Sannino, "Analytic Coupling Structure of Large N_f (Super) QED and QCD", Phys. Rev. D **100**, no.1, 015013 (2019), arXiv:1903.02568.

28. G. V. Dunne, "Resurgence, Painleve Equations and Conformal Blocks", J. Phys. A **52**, no.46, 463001 (2019), arXiv:1901.02076.

29. * A. Ahmed and G. V. Dunne, "Non-perturbative large N trans-series for the Gross-Witten-Wadia beta function", arXiv:1808.05236, Phys. Lett. B **785**, 342 (2018).

30. A. Behtash, G. V. Dunne, T. Schaefer, T. Sulejmanpasic and M. Ünsal, "Critical Points at Infinity, Non-Gaussian Saddles, and Bions"
arXiv:1803.11533 [hep-th], JHEP **1806**, 068 (2018).

31. G. V. Dunne, Y. Tanizaki and M. Ünsal, "Quantum Distillation of Hilbert Spaces, Semiclassics and Anomaly Matching"
arXiv:1803.02430 [hep-th], JHEP **1808**, 068 (2018)

32. * A. Ahmed and G. V. Dunne, "Transmutation of a Trans-series: The Gross-Witten-Wadia Phase Transition",
arXiv:1710.01812 [hep-th], JHEP **1711**, 054 (2017)

33. O. Costin and G. V. Dunne, "Convergence from Divergence",
arXiv:1705.09687 [hep-th], J. Phys. A **51**, no. 4, 04LT01 (2018)

34. G. Basar, G. V. Dunne and M. Ünsal, "Quantum Geometry of Resurgent Perturbative/Nonperturbative Relations," arXiv:1701.06572 [hep-th], JHEP **1705**, 087 (2017).

35. G. V. Dunne and M. Unsal, "Deconstructing zero: resurgence, supersymmetry and complex saddles," Journal of High Energy Physics 1612, 002 (2016), arXiv:1609.05770 [hep-th]

36. * R. Dabrowski and G. V. Dunne, "On the Time Dependence of Adiabatic Particle Number", Phys. Rev. D 94, 065005 (2016), arXiv:1606.00902 [hep-th]

37. G. V. Dunne and M. Unsal, "WKB and Resurgence in the Mathieu Equation"
arXiv:1603.04924 [math-ph], in "Resurgence, Physics and Numbers", F. Fauvet et al (Eds), Edizioni Della Normale (2017), Scuola Normale Superiore, Pisa.

38. G. V. Dunne and M. Unsal, "New Methods in QFT and QCD: From Large-N Orbifold Equivalence to Bions and Resurgence",
arXiv:1601.03414 [hep-th], Ann. Rev. Nucl. Part. Sci. **66**, 245 (2016).

39. P. V. Buividovich, G. V. Dunne and S. N. Valgushev, "Complex Path Integrals and Saddles in Two-Dimensional Gauge Theory"
arXiv:1512.09021 [hep-th], Phys. Rev. Lett. **116**, no. 13, 132001 (2016)

40. G. V. Dunne and M. Unsal, "What is QFT? Resurgent trans-series, Lefschetz thimbles, and new exact saddles", arXiv:1511.05977 [hep-lat]. Proceedings of Science, Lattice 2015. HEP entry.

41. A. Behtash, G. V. Dunne, T. Schaefer, T. Sulejmanpasic and M. Unsal, "Toward Picard-Lefschetz Theory of Path Integrals, Complex Saddles and Resurgence", arXiv:1510.03435 [hep-th]; invited review paper for *Advances in Theoretical and Mathematical Physics*, HEP entry.

42. A. Behtash, G. V. Dunne, T. Schäfer, T. Sulejmanpasic and M. Ünsal, "Complexified path integrals, exact saddles and supersymmetry", Phys. Rev. Lett. **116**, no. 1, 011601 (2016), arXiv:1510.00978 [hep-th]; HEP entry.

43. G. Basar and G. V. Dunne, "Hydrodynamics, resurgence, and transasymptotics", Phys. Rev. D **92**, no. 12, 125011 (2015), arXiv:1509.05046 [hep-th]; HEP entry

44. G. V. Dunne and M. Unsal, "Resurgence and Dynamics of O(N) and Grassmannian Sigma Models", JHEP **1509**, 199 (2015), arXiv:1505.07803 [hep-th]; HEP entry

45. G. V. Dunne, M. Shifman and M. Unsal, "Infrared Renormalons versus Operator Product Expansions in Supersymmetric and Related Gauge Theories", arXiv:1502.06680 [hep-th], Phys. Rev. Lett. **114**, no. 19, 191601 (2015) ; HEP entry

46. G. Başar and G. V. Dunne, "Resurgence and the Nekrasov-Shatashvili limit: connecting weak and strong coupling in the Mathieu and Lamé systems", arXiv:1501.05671 [hep-th] JHEP **1502**, 160 (2015) ; HEP entry

47. * R. Dabrowski and G. V. Dunne, "Superadiabatic particle number in Schwinger and de Sitter particle production," Phys. Rev. D **90**, 025021 (2014) [arXiv:1405.0302 [hep-th]].

48. G. V. Dunne and M. Unsal, "Uniform WKB, Multi-instantons, and Resurgent Trans-Series," Phys. Rev. D **89**, 105009 (2014), arXiv:1401.5202 [hep-th].

49. G. V. Dunne and M. Thies, "Full time-dependent Hartree-Fock solution of large N Gross-Neveu models," Phys. Rev. D **89**, 025008 (2014), [arXiv:1309.2443 [hep-th]].

50. G. V. Dunne and M. Thies, "Transparent Dirac potentials in one dimension: the time-dependent case," Phys. Rev. A **88**, 062115 (2013), [arXiv:1308.5801 [hep-th]].

51. A. Cherman, D. Dorigoni, G. V. Dunne and M. Unsal, "Resurgence in QFT: Unitons, Fractons and Renormalons in the Principal Chiral Model," Phys. Rev. Lett. **112**, 021601 (2014), [arXiv:1308.0127 [hep-th]].

52. G. V. Dunne and M. Unsal, "Generating Non-perturbative Physics from Perturbation Theory," Phys. Rev. D **89**, 041701 (2014) [arXiv:1306.4405 [hep-th]].

53. * G. Basar, G. V. Dunne and M. Unsal, "Resurgence theory, ghost-instantons, and analytic continuation of path integrals," JHEP **1310**, 041 (2013) [arXiv:1308.1108 [hep-th]].

54. G. V. Dunne and M. Thies, "Time-Dependent Hartree-Fock Solution of Gross-Neveu models: Twisted Kink Constituents of Baryons and Breathers," Phys. Rev. Lett. **111**, 121602 (2013) [arXiv:1306.4007 [hep-th]].

55. * R. Dabrowski and G. V. Dunne, "Fractionalized Non-Self-Dual Solutions in the CP(N-1) Model," Phys. Rev. D **88**, no. 2, 025020 (2013) [arXiv:1306.0921 [hep-th]].

56. * G. Basar, G. V. Dunne and D. E. Kharzeev, "Instantons and sphalerons in a magnetic field," Nucl. Phys. A **904-905**, 988c (2013).

57. G. V. Dunne and M. Unsal, "Continuity and Resurgence: towards a continuum definition of the CP(N-1) model," Phys. Rev. D **87**, 025015 (2013) [arXiv:1210.3646 [hep-th]].

58. G. V. Dunne and M. Unsal, "Resurgence and Trans-series in Quantum Field Theory: The CP(N-1) Model," JHEP **1211**, 170 (2012) [arXiv:1210.2423 [hep-th]].

59. G. V. Dunne, "Heat Kernels and Zeta Functions on Fractals," J. Phys. A **45**, 374016 (2012) [arXiv:1205.2723 [math-ph]].

60. E.Akkermans, O. Benichou, G.V. Dunne, A. Teplyaev, and R. Voituriez, "Spatial log-periodic oscillations of first-passage observables in fractals", Phys. Rev. E 86, 061125 (2012).

61. G. V. Dunne, "The Heisenberg-Euler Effective Action: 75 years on," Int. J. Mod. Phys. A **27**, 1260004 (2012), [arXiv:1202.1557 [hep-th]].

62. * G. Basar, G. V. Dunne and D. E. Kharzeev, "Electric dipole moment induced by a QCD instanton in an external magnetic field," Phys. Rev. D **85**, 045026 (2012) [arXiv:1112.0532 [hep-th]].

63. * C. K. Dumlu and G. V. Dunne, "Complex Worldline Instantons and Quantum Interference in Vacuum Pair Production," Phys. Rev. D **84**, 125023 (2011) [arXiv:1110.1657 [hep-th]].

64. E. Akkermans and G. V. Dunne, "Ramsey Fringes and Time-domain Multiple-Slit Interference from Vacuum," Phys. Rev. Lett. **108**, 030401 (2012) [arXiv:1109.3489 [hep-th]].

65. G. V. Dunne, C. Fitzner and M. Thies, "Baryon-baryon scattering in the Gross-Neveu model: the large N solution," Phys. Rev. D **84**, 105014 (2011) [arXiv:1108.5888 [hep-th]].

66. G. V. Dunne, "The search for the Schwinger effect: Nonperturbative vacuum pair production," Int. J. Mod. Phys. A **25**, 2373 (2010).

67. * G. V. Dunne, A. Huet, J. Hur and H. Min, "The Derivative Expansion at Small Mass for the Spinor Effective Action," Phys. Rev. D **83**, 105013 (2011) [arXiv:1103.3150 [hep-th]].

68. C. M. Bender, G. V. Dunne and P. N. Meisinger, "Complex periodic potentials with real band spectra," Phys. Lett. A **252**, 272 (1999) [cond-mat/9810369].

69. * C. K. Dumlu and G. V. Dunne, "Interference Effects in Schwinger Vacuum Pair Production for Time-Dependent Laser Pulses," Phys. Rev. D **83**, 065028 (2011) [arXiv:1102.2899 [hep-th]].

70. * G. Basar and G. V. Dunne, "Gross-Neveu Models, Nonlinear Dirac Equations, Surfaces and Strings," JHEP **1101**, 127 (2011) [arXiv:1011.3835 [hep-th]].

71. E. Akkermans, G. V. Dunne and A. Teplyaev, "Physical Consequences of Complex Dimensions of Fractals," Europhys. Lett. **88**, 40007 (2009) [arXiv:0903.3681 [cond-mat.mes-hall]].

72. E. Akkermans, G. V. Dunne and A. Teplyaev, "Thermodynamics of photons on fractals," Phys. Rev. Lett. **105**, 230407 (2010) [arXiv:1010.1148 [cond-mat.stat-mech]].

73. G. V. Dunne, "Crystalline condensates in the chiral symmetry breaking phase diagram," AIP Conf. Proc. **1261**, 37 (2010).

74. M. Beccaria, G. V. Dunne, G. Macorini, A. Tirziu and A. A. Tseytlin, "Exact computation of one-loop correction to energy of pulsating strings in $AdS_5 x S^5$," J. Phys. A **44**, 015404 (2011) [arXiv:1009.2318 [hep-th]].

75. * C. K. Dumlu and G. V. Dunne, "The Stokes Phenomenon and Schwinger Vacuum Pair Production in Time-Dependent Laser Pulses," Phys. Rev. Lett. **104**, 250402 (2010) [arXiv:1004.2509 [hep-th]].

76. G. V. Dunne and A. Kovner, "$U_A(1)$ Anomaly at high temperature: the scalar-pseudoscalar splitting in QCD," Phys. Rev. D **82**, 065014 (2010) [arXiv:1004.1075 [hep-ph]].

77. G. V. Dunne, "Symmetries in the Gross-Neveu phase diagram," Int. J. Mod. Phys. A **25**, 616 (2010).

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1. "From Rainbows to Field Theory: Decoding the Path Integral", Physics colloquium, University of New Hampshire, February 28, 2025.

2. "Resurgence and Non-Perturbative Physics", *High Energy Physics in the Quantum Era*, KEK Laboratory, Tsukuba, Japan, December 2024.

3. "Resurgence and Non-Perturbative Physics", King's College London, September 2024.

4. "Resurgent Method for High Intensity Physics", *PIF24 Physics in Intense Fields*, Edinburgh, Scotland, September 2024.

5. "Resurgence and Quantum Field Theory", Max Planck Institute for Mathematics, Bonn, Germany, August 2024.

6. Lecture Course (6 hours), "Resurgence and Non-Perturbative Physics", *Continuum Foundations of Lattice Gauge Theory'*, CERN, Geneva, July 2024.

7. "Resurgence and Quantum Field Theory", Dublin Theory Colloquium, Trinity College Dublin, Ireland, April 3, 2024.

8. "Schwinger Pair Production: Probing the Quantum Vacuum", Colloquium, University of Rwanda, Kigali, Rwanda, March 12, 2024.

9. "Resurgent Continuation in Chern-Simons Theory: Numerical Aspects", invited talk, Caltech, March 1, 2024.

10. "Resurgence and Quantum Field Theory", Theory Seminar, University of Washington, Seattle, February 13, 2024

11. "Resurgence and QFT: Mining Perturbation Theory for Non-perturbative Information", Quantum Theory Center Inauguration, Danish Institute for Advanced Study, Odense, November 21, 2023

12. "The Future is Quantum", Quantum Theory Center Inauguration, Danish Institute for Advanced Study, Odense, November 20, 2023

13. "Bridging the Gap: Mining Perturbation Theory for Non-perturbative Information", DimaFest, Brookhaven National Laboratory, September 1, 2023

14. "Resurgent Extrapolation and QFT", Plenary talk, EuroPlex Conference, Humboldt University Berlin, September 13, 2023

15. "The James Webb Space Telescope", public lecture, U3A Adelaide, Australia, July 6, 2023

16. "Mining Perturbation Theory: Resurgence Meets Amplitudes", Theoretical Physics Seminar, Northwestern University, May 19, 2023

17. "Decoding the Path Integral: Resurgence and Extreme Physics", Theory Seminar, University of Southampton, February 16, 2023

18. "Mining Perturbation Theory: Resurgence-Inspired Extrapolation and Analytic Continuation", Invited Talk, Workshop on Quantization and Resurgence, SwissMAP Research Station (Univ of Geneva and ETH Zurich), Les Diablerets, Switzerland, January 29-February 3, 2023

19. "Mining Perturbation Theory: Resurgence-Inspired Extrapolation and Analytic Continuation", Invited Theoretical Physics Seminar, University of Vienna, November 29, 2022

20. "Decoding the Path Integral: Resurgence and Extreme Physics", Invited Physic and Astronomy Colloquium, University of Rochester, October 12, 2022

21. "Mining Perturbation Theory: Resurgence-Inspired Extrapolation and Analytic Continuation", Invited Seminar, Isaac Newton Institute of Mathematical Sciences, Cambridge (UK), September 27, 2022

22. "Mining Perturbation Theory: Resurgence-Inspired Extrapolation and Analytic Continuation", Invited Seminar, Center for Quantum Mathematics, Odense, Denmark, September 6, 2022

23. "Resurgence of the Gradient Expansion for Intense Fields", Invited talk, Physics in Intense Fields (PIF22) Conference, London, August 30, 2022

24. "Decoding the Path Integral: Resurgence and Non-Perturbative Physics", Diamond Jubilee Distinguished Lecture, Institute of Mathematical Sciences, Chennai, India, June 15, 2022

25. "Resurgence in Physics and Mathematics", Invited Speaker, 3 hour plenary lecture at Idea Incubator, Caltech, May 21, 2022

26. "Decoding the Path Integral: Resurgence and Non-Perturbative Physics", Theory Seminar, University of Crete, May 10, 2022

27. "Decoding the Path Integral: Resurgence and Non-Perturbative Physics", Theory Seminar, King's College London, April 16, 2022.

28. "Decoding the Path Integral: Resurgence and Extreme Physics", Higgs Colloquium, University of Edinburgh, April 15, 2022.

29. "Decoding the Path Integral: Resurgence and Non-Perturbative Physics", Theory Seminar, SLAC, Stanford University, February 9, 2022.

30. "Decoding the Path Integral: Resurgence and Non-Perturbative Physics", GGI Colloquium, Galileo Galilei Institute, Florence, December 1, 2021

31. "Resurgent Trans-series in Hopf-Algebraic Dyson-Schwinger Equations", Erwin Schrödinger Institute, Vienna, November 15, 2021

32. "Resurgent Trans-series in Hopf-Algebraic Dyson-Schwinger Equations", Algebraic and Combinatorial Perspectives in the Mathematical Sciences seminar, Trondheim, Norway, October 29, 2021

33. "Resurgence and Non-Perturbative Physics", Physics Colloquium, University of Michoacan, Morelia, Mexico, October 22, 2021

34. "Resurgence, Resummation and Higher-Loop QED", Physics Seminar, University of Plymouth (UK), October 20, 2021

35. "Resurgence: connecting perturbative and non-perturbative physics: with applications to QCD", Quark Confinement and the Hadron Spectrum Conference, Stavanger, Norway (virtual), August 4, 2021

36. "Resurgence and Higher-Loop QED", Laser Physics Conference (LPHYS'21), Lyon, France (virtual), July 23, 2021

37. Introductory Lecture Course (3 lectures): "Resurgence in Differential Equations, and Effective Summation Methods", Isaac Newton Institute Spring School on Asymptotic Methods and Applications, Cambridge (UK), March 22-26, 2021

38. "Decoding the Path Integral: Resurgent Asymptotics and Extreme QFT", Fundamental Theory Seminar, Gravitational Physics Group, Penn State University, March 12, 2021

39. "Non-perturbative Physics from Perturbative Hopf Algebraic Renormalization", Physics Seminar, University of Liverpool, UK, February 24, 2021

40. "Resurgent Asymptotics and Non-Perturbative Physics", One World Seminar, International Association of Mathematical Physics , February 16, 2021

41. "Decoding the Path Integral: Resurgent Asymptotics and Extreme QFT", Hans Bethe Colloquium, University of Bonn, February 4, 2021

42. "Resurgent Asymptotics of Hopf Algebraic Renormalization", Math seminar, Humboldt University, Berlin (Germany), January 11, 2021

43. "Resurgence, Phase Transitions and Resurgent Extrapolation", Theory Seminar, Stony Brook University, December 10, 2020

44. "Resurgent Asymptotics of Hopf Algebraic Renormalization", invited lecture, Algebraic Structures in Perturbative Quantum Field Theory, Institut des Hautes Etudes Scientifiques, Bures-sur-Yvette (France), November 19, 2020

45. "Path Integrals: at the Intersection of Physics and Mathematics", Math-Physics Seminar, UConn Math Department, November 13, 2020

46. "Decoding the Path Integral: Resurgence and Extreme QFT", High Energy Physics seminar, University of Alabama, November 6, 2020

47. "Black Holes: the 2020 Nobel Prize in Physics", UConn Physics Colloquium, joint with Prof. Jon Trump, October 30, 2020

48. "Decoding the Path Integral: Resurgence and Extreme QFT", Theoretical Physics Colloquium, hosted by Arizona State University, October 28, 2020

49. "Resurgence and Phase Transitions", QFT Seminar, Perimeter Institute for Theoretical Physics, Waterloo (Canada), October 20, 2020

50. "The Future of Renormalization", Panel Discussion Panelist, Conference on Higher Structures Emerging from Renormalization, Schroedinger Institute, Vienna (Austria), October 14, 2020

51. "Resurgent Asymptotics of Hopf-Algebraic Dyson-Schwinger Equations.pdf", Invited Lecture, Conference on Higher Structures Emerging from Renormalization, Schroedinger Institute, Vienna (Austria), October 14, 2020

52. "Resurgence, Phase Transitions and Large N", Plenary Lecture and Discussion, Yukawa Institute (Kyoto, Japan), Conference on Nonperturbative Aspects of QFT, September 8, 2020

53. "Resurgence and Phase Transitions", Seminar, Centro de Estudios Cientificos, Valdivia (Chile), August 20, 2020

54. G. Dunne, "Resurgence, Phase Transitions and Extrapolation", invited seminar, Dublin Institute of Advanced Studies (Ireland), June 24, 2020

55. G. Dunne, "Introductory Lectures on Resurgence and Non-Perturbative Physics", lecture series of 4 lectures, School on Resurgence, Institute of Mathematical Sciences of the Americas, University of Miami, March 16-20, 2020

56. G. Dunne, "Scientific Communication: Preparing a Talk, a Proposal, or a Paper", UConn Graduate Student Seminar, February 14, 2020

57. G. Dunne, "Resurgence and Phase Transitions", KEK (Tsukuba, Japan) Theory Conference Plenary Talk, December 4, 2019

58. G. Dunne, "Decoding the Path Integral: Resurgence and Non-Perturbative Physics", KEK (Tsukuba, Japan) Laboratory Colloquium, December 3, 2019

59. G. Dunne, "Resurgence and Phase Transitions", UMass Amherst Physics Seminar, November 12, 2019

60. G. Dunne, "Resurgent Extrapolation: Painleve I", Rutgers Math Seminar, October 31, 2019.

61. G. Dunne, "Resurgence and Non-Perturbative Physics", Theory Seminar, Johns Hopkins University, October 29, 2019.

62. G. Dunne, "Resurgence and Non-Perturbative Physics", Theory Seminar, Brookhaven National Laboratory, October 4, 2019.

63. G. Dunne, "Decoding the Path Integral: Resurgent Asymptotics and Extreme Quantum Field Theory", Conference Quantum Systems in Extreme Conditions, Heidelberg, September 23, 2019.

64. G. Dunne, "Resurgence and Non-Perturbative Physics", Conference Non-Perturbative Methods in Quantum Field Theory, SISSA Trieste, September 5, 2019.

65. G. Dunne, "Non-perturbative methods for strong-field physics", Workshop Physics Opportunities at a Lepton Collider in the Fully Nonperturbative QED Regime, SLAC, August 7, 2019.

66. G. Dunne, Plenary Talk: "Resurgence and Phase Transitions", *Geometric Correspondences in gauge Theories*, SISSA (International School for Advanced Studies), Trieste (Italy), June 2019.

67. G. Dunne, Plenary Talk: "Resurgence and Phase Transitions", *Resurgence in Mathematics and Physics*, IHES (Institute des Hautes Études Scientifiques), France, June 2019.

68. G. Dunne, UConn Theory seminar, "Resurgence and Phase Transitions", April 29, 2019.

69. G. Dunne, *Introduction to Resurgence*, lecture at ICERM (Institute for Computational and Experimental Research in Mathematics, Brown University), March 9, 2019

70. G. Dunne, "The Physics of Divergence", Physics Colloquium, University of Seoul, January 17, 2019.

71. G. Dunne, "Introduction to Resurgence and Non-perturbative Physics", Lectures at Kavli Pan-Asian Winter School: Strings, Particles and Cosmology, Sogang University, Seoul, Jan 7-17, 2019. Lecture 1, Lecture 2, Lecture 3, Lecture 4

72. G. Dunne, "Resurgent Extrapolation and Summation: Painleve I", Ohio State Math, Analysis and Operator Theory Seminar, Dec 18, 2018.

73. G. Dunne, "Introduction to Resurgence and Non-perturbative Physics", Lectures at Winter School: Formal Developments in Quantum Field Theory, CP3-Origins, University of Southern Denmark, Odense, Nov 12-16, 2018.

74. G. Dunne, "The Physics of Divergence: Resurgence and Non-Perturbative Physics", Physics Colloquium, University of Wisconsin, Madison, October 19, 2018.

75. G. Dunne, "Resurgence and Non-Perturbative Physics", Mainz Institute for Theoretical Physics, Mainz, Germany, September 28, 2018.

76. G. Dunne, "Resurgence and Phase Transitions", PAN Seminar, University of Connecticut Physics, September 24, 2018.

77. G. Dunne, "Resurgence and Phase Transitions", CSSM Seminar, Adelaide University Physics, August 1, 2018.

78. G. Dunne, "Stephen Hawking: His Life and His Physics", Public Lecture, U3A Adelaide, July 30, 2018.

79. G. Dunne, "Cosmic Collisions: Gravity Waves and Colliding Neutron Stars", Public Lecture, U3A Adelaide, July 9, 2018.

80. G. Dunne, "Resurgence and Perturbative/Non-perturbative Relations", lecture at Les Houches Summer School: Structure of Local Quantum Fields, June 4-15, 2018.

81. G. Dunne, "Resurgence, Large N and Phase Transitions", Gauge Topology Workshop, ECT* Trento, May 29, 2018.

82. G. Dunne, "Quantum Geometry of Perturbative/Non-perturbative relations", Math Seminar, Ohio State University, May 10, 2018

83. G. Dunne, "Stephen Hawking: His Life and His Physics", UConn Sigma Pi Sigma Colloquium, April 27, 2018

84. G. Dunne, "Quantum Geometry of Perturbative/Non-perturbative relations", Math Seminar, Rutgers, April 12, 2018

85. G. Dunne, "Quantum Geometry of Perturbative/Non-perturbative relations", Simons Center for Geometry and Physics, Stony Brook, March 28, 2018

86. G. Dunne, "Introduction to Resurgence and Non-perturbative Physics", Lattice Field Theory Conference, ETH Zurich, March 8, 2018

87. G. Dunne, "Introduction to Resurgence and Non-perturbative Physics", 3 lectures at ICTS (Bangalore) Program: *Nonperturbative and Numerical Approaches to Quantum Gravity, String Theory and Holography*, January 27-February 5, 2018

88. G. Dunne, "Quantum Geometry of Resurgent Perturbative/Non-perturbative Relations", ICTS Bangalore, February 1, 2018

89. G. Dunne, "The Search for the Schwinger Effect: Non-perturbative Particle production from Vacuum", Schwinger Centennial Conference, Singapore, February 7, 2018

90. G. Dunne: 11/17/17, New Resummation Methods from Resurgence, KITP

91. G. Dunne: 10/27/17, Tutorial Introduction to Resurgence in All-orders WKB, KITP

92. G. Dunne: 10/16/17, Introductory Blackboard Talk for KITP Program: Resurgent Asymptotics in Physics and Mathematics, Universality of Resurgence in Physics and Mathematics

93. G. Dunne: 9/13/2017, Physics Colloquium: The Search for the Schwinger Effect: Non-perturbative Particle Production from Vacuum, Washington University in St Louis

94. G. Dunne: 9/6/17, plenary talk, "Quantum Geometry of Resurgent Perturbative/Non-perturbative Relations", RIMS-ITHEMs, Kobe (Japan)

95. G. Dunne: 6/28/17, plenary talk, "Quantum Geometry of Resurgent Perturbative/Non-perturbative Relations", CIRM Marseille (France)

96. G. Dunne, "Decoding the Path Integral: Resurgence and non-perturbative physics", Physics Seminar, North Carolina State University, May 11, 2017

97. G. Dunne: 5/10/17, theory seminar, "Quantum Geometry of Resurgent Perturbative/Non-perturbative Relations", NC State University

98. G. Dunne, "Decoding the path integral: Resurgence and Non-perturbative physics", High Energy Theory Seminar, Brown Univ. , April 19, 2017

99. G. Dunne, "Quantum Geometry of Resurgent Perturbative/Non-perturbative Relations", Kavli IPMU, Univ. of Tokyo, Dec. 14, 2016

100. G. Dunne, "Much Ado About Nothing: Creating Particles from Vacuum", Physics Colloquium, Emory Univ, November 15, 2016

101. G. Dunne, Lecture course: "Decoding the Path Integral", Parma International School of Theoretical Physics, University of Parma, Sept 5-10, 2016.

102. G. Dunne, "Decoding the path integral", CSSM Seminar, Univ. of Adelaide, June 22, 2016.

103. G. Dunne, "Resurgence and Large-N": Continuous Advances in QCD, University of Minnesota, May 14, 2016.

104. G. Dunne, "Much Ado About Nothing: Creating Particles from Vacuum", Sigma-Pi-Sigma colloquium, Bard College, April 29, 2016

105. G. Dunne, lecture course: "Decoding the Path Integral", Gothenburg Centre for Advanced Studies, Chalmers University, April 7-22, 2016

106. "Uniform Resurgence and the Path Integral", Ohio State (Math), March 23, 2016

107. "Resurgence and Non-perturbative physics: decoding the path integral", Ohio Univ, March 22, 2016

108. "Resurgence and Non-perturbative physics: decoding the path integral", Rutgers, March 1, 2016

109. "Resurgence and Non-perturbative physics: decoding the path integral", Brandeis, Jan 25, 2016