

## CURRICULUM VITAE OF HERMAN VERLINDE

NATIONALITY: Netherlands

### ACADEMIC HISTORY:

PhD at University of Utrecht (advisor Prof. G.'t Hooft) in September 1988.  
Thesis title: "The Path-Integral Formulation of Supersymmetric String Theory."  
BS in Theoretical Physics at University of Utrecht, May 1985.

### ACADEMIC APPOINTMENTS:

Professor of Physics at Princeton University, April 1998-present.  
Professor of Physics at University of Amsterdam, March 1995-March 1998  
Fellow of Dutch Royal Academy of Science, July 1994  
Assistant Professor at Princeton University, Sept 1990 - July 1996  
Research Associate at Princeton University, September 1988 until August 1990.

### FELLOWSHIPS, AWARDS, MEMBERSHIPS:

Faculty Fellow of Princeton Center of Theoretical Science, September 2012-2013  
Member at Institute of Advanced Study, September 2008- May 2009  
David and Lucille Packard Fellowship for Science and Engineering, 1993 - 1998.  
PIONIER-Fellowship of NWO, January 1995 - December 1999  
Fellowship of Dutch Academy of Science (KNAW), July 1994- June 1999.  
Alfred P. Sloan Fellowship, September 1994- July 1998.

### PROFESSIONAL ACTIVITIES:

Editorial board of Communications in Number Theory and Theoretical Physics  
Advisory Committee of the Center for Geometry and Physics, Postech, Korea  
Member of Organizing Committee, Strings 2014, Princeton, to be held in June 2014  
Chair of Organizing Committee, Strings' 97 Conference held in Amsterdam, July 1997.  
Editor of conference proceedings of Strings 1997, and 3 Trieste Spring Schools.  
Member of Review Committee of the German Excellence Initiative Grants, 2011  
Chair of Organizing Committee, "Physics at LHC," Princeton, March 2007.  
Organizer of programs, conferences, schools and workshops, including:

- PCTS Workshops on "Black Holes and Quantum Information," November 2013
- "Exact Methods in Gauge Theory," November 2011,
- "Big Bang and Beyond", August 2008-May 2009,
- KITP program on String Phenomenology and Cosmology, Spring 2009
- PI workshop on "Quantum Physics of Black Holes", January 2009
- CMI Workshop "Strings at LHC", Harvard, November 2008.
- CERN Theory Institute on String Phenomenology, August 2008
- Aspen Summer Workshops on String Theory, in 1998 and 2008.
- Prospects in Theoretical Physics summer schools at IAS in 2006 and 2008
- Amsterdam Summer Workshops on String Theory, from 1998 until 2002.
- Trieste Spring School on Strings and Quantum Gravity from 1990 until 1992.

Lecturer at numerous International Schools and Conferences

#### MEDIA ACTIVITIES:

- Appearance on “Through the Wormhole with Morgan Freeman”, Science Channel, 2014
- Appearance on Dutch national television: “The World Turns”, (De Wereld Draait Door), September 2011, <http://tvblik.nl/de-wereld-draait-door/8-september-2011>
- Panel discussion “A Thin Sheet of Reality: the Universe as a Hologram”, World Science Festival, New York, June 2011, <http://worldsciencefestival.com/videos/a-thin-sheet-of-reality-the-universe-as-a-hologram>
- Roundtable discussion ‘Theories of Everything’, at the Philoctetes Center, New York, March 2011, <http://philoctetes.org/past-programs/theories-of-everything>

#### INVITED LECTURES, COLLOQUIA AND SEMINARS SINCE 2006

1. UK Annual Theory Meeting, Durham, England, December 2013
2. UC Berkeley, Seminar, October 2013
3. Michigan, Workshop on Black Holes in String Theory, October 2013
4. Harvard University, Seminar, September 2013
5. KITP Black Holes vs Firewalls workshop, Santa Barbara, August 2013
6. Karl Schwarzschild Meeting on Gravitational Physics, Frankfurt, July 2013
7. Itzykson Conference, Frontiers of String Theory, Paris, July 2013
8. Great Lakes Strings Conference, Kentucky, May 2013
9. Simons Conference on ”Quantum Entanglement”, Virgin Islands, February 2013
10. Perimeter Institute, Waterloo, Seminar, January 2013
11. Black Holes and Firwalls Workshop, Stanford, November 2012
12. String and Particle Theory Meeting at University of Virginia, October 2012
13. Plenary talk at Ginzburg conference, Moscow, June 2012
14. Public Lecture at Ginzburg Conference, June 2012
15. String Summer Workshop, Amsterdam, June 2012
16. String Vacuum Project Workshop, Simons Center, Stony Brook, April 2012
17. KITP conference on Black Holes and Information, May 2012
18. Seminar at SITP Stanford, May 2012
19. New England String Meeting, November 2011
20. Seminar at MIT, October 2011
21. Symposium on Quantum Theory and Symmetries, Prague, August 2011
22. Aspen Summer Workshop, August, 2011
23. Holographic Cosmology Workshop, Perimeter Institute, June 2011
24. String Vacuum Project Workshop, Philadelphia, May 2011
25. Solvay Workshop, Brussels, May 2011
26. Three Generations Conference, IHES, May 2011
27. Seminar at Caltech, March 2011
28. Seminar at UC Santa Barbara, March 2011
29. Seminar at Stanford University, March 2011
30. Seminar at Brookhaven National Laboratory, January 2011
31. Physics of the Universe Symposium, Caltech/SpaceX, January 2011
32. Public Lecture ‘Black Holes’, Studium Generale, Utrecht, December 2010
33. String Pheno 2010, Paris, July 2010
34. Amsterdam Workshop on String Theory, June, 2010
35. CERN Theory Seminar, June 2010

36. Lorentz Center Highlight, Faculty Lecture, Leiden, May 2010
37. Workshop, Understanding Aims of Science, Leiden, May 2010
38. Plenary talk at Pheno 2010, Madison WI, 2010
39. Informal Seminar at KITP, Santa Barbara, April 2010
40. Lectures at 4th Asian Winter School, Mumbai, January 2010
41. Miami 2009 Conference, Miami, December 2009
42. New Horizons in Cosmology, UPenn, Philadelphia, December 2009
43. Seminar at UC Santa Barbara, November 2009
44. Seminar at UC Berkeley, November 2009
45. Simons Workshop, Stony Brook, August 2009
46. Symposium on Quantum Theory and Symmetries, Kentucky, July 2009
47. Workshop on Holographic Cosmology, Perimeter Institute, Waterloo, July 2009
48. PASCOS Conference, DESY, Hamburg, July 2009
49. BIRS Workshop on String Theory, Banff, February 2009
50. Seminar at University of Michigan, Ann Harbor, January 2009
51. Black Holes and Quantum Physics Workshop, Perimeter Institute, January 2009
52. String Landscape Discussion at PCTS, Princeton, November 2008
53. Clay Workshop "String Theory and the LHC," Harvard, November 2008
54. Seminar at New York University, November 2008
55. Strings 2008, CERN, August 2008
56. String Landscape Discussion at CERN TH Institute, August 2008
57. PITP Summer School, "String Theory and Phenomenology", IAS, July, 2008
58. Euro Strings Conference, Amsterdam, June 2008
59. Simons Workshop, Stony Brook, June 2008
60. String Pheno 2008, UPenn, May 2008
61. Seminar at Princeton, April 2008
62. Seminar at MIT, Cambridge, April 2008
63. Workshop on String Phenomenology, Liverpool, March 2008
64. Colloquium and Seminar at Ohio State University, March 2008
65. Workshop on String Theory at Mitchell Institute, Texas A & M, March 2008
66. Seminar at Amsterdam University, December 2007
67. Colloquium, University of Kentucky, October 2007
68. Simons Workshop, ITP Stony Brook, July 30 - August 31, 2007
69. Seminars at Ecole Polytechnique and Ecole Normale Supérieure, Paris, May 2007
70. FRIF Colloquium, Paris, April 2007
71. Seminar at Utrecht University, February 2007
72. North-East String Meeting, Brown University, November, 2006
73. Workshop on Cosmology and String Theory, Perimeter Institute, October 2006
74. Seminars at Caltech and KITP, October, 2006
75. String Phenomenology 2006 Conference, KITP Santa Barbara, August, 2006
76. Simons Workshop, ITP Stony Brook, July, 2006
77. Aspen Colloquium, "String Theory and the LHC", July 13, 2006
78. Amsterdam Summer Workshop on String Theory, July, 2006
79. PITP Summer School, "Applications of String Theory", IAS, July, 2006
80. Strings 2006, Beijing, June 19-24, 2006
81. Cargèse Summer School, "Strings and Branes", May 22 to June 3, 2006
82. IPM String School and Workshop, Tehran, April 10-19, 2006
83. Great Lakes Strings Conference, March 31-April 2, 2006
84. CIAR Cosmology and Gravity Annual Meeting, Banff, February 16-19, 2006
85. BIRS Workshop "Frontiers in String Theory", Banff, February 11-16, 2006

PUBLICATIONS OF HERMAN VERLINDE

- [1] L. McGough and H. Verlinde, “Bekenstein-Hawking Entropy as Topological Entanglement Entropy,” JHEP **1311**, 208 (2013)
- [2] E. Verlinde and H. Verlinde, “Black Hole Entanglement and Quantum Error Correction,” JHEP **1310**, 107 (2013)
- [3] J. J. Heckman and H. Verlinde, “Gravity Amplitudes from a Gaussian Matrix Model,” JHEP **1309**, 150 (2013)
- [4] J. J. Heckman and H. Verlinde, “Evidence for F(uzz) Theory,” JHEP **1101**, 044 (2011)
- [5] L. F. Alday, D. Gaiotto, S. Gukov, Y. Tachikawa and H. Verlinde, “Loop and surface operators in N=2 gauge theory and Liouville modular geometry,” JHEP **1001**, 113 (2010)
- [6] F. Benini, A. Dymarsky, S. Franco, S. Kachru, D. Simic and H. Verlinde, “Holographic Gauge Mediation,” JHEP **0912**, 031 (2009)
- [7] J. Gomis, D. Rodriguez-Gomez, M. Van Raamsdonk and H. Verlinde, “A Massive Study of M2-brane Proposals,” JHEP **0809**, 113 (2008)
- [8] J. Gomis, D. Rodriguez-Gomez, M. Van Raamsdonk and H. Verlinde, “Supersymmetric Yang-Mills Theory From Lorentzian Three-Algebras,” JHEP **0808**, 094 (2008)
- [9] S. Benvenuti, D. Rodriguez-Gomez, E. Tonni and H. Verlinde, JHEP **0901**, 078 (2009)
- [10] S. Franco, D. Rodriguez-Gomez and H. Verlinde, “N-ification of Forces: A Holographic Perspective on D-brane Model Building,” JHEP **0906**, 030 (2009)
- [11] H. Verlinde, L. T. Wang, M. Wijnholt and I. Yavin, “A Higher Form (of) Mediation,” JHEP **0802**, 082 (2008)
- [12] R. Dermisek, H. Verlinde and L. T. Wang, “Hypercharged Anomaly Mediation,” Phys. Rev. Lett. **100**, 131804 (2008) .
- [13] D. Malyshev and H. Verlinde, “D-branes at Singularities and String Phenomenology,” Nucl. Phys. Proc. Suppl. **171**, 139 (2007) .
- [14] J. J. Heckman, C. Vafa, H. Verlinde and M. Wijnholt, “Cascading to the MSSM,” JHEP **0806**, 016 (2008) .
- [15] M. Buican, D. Malyshev and H. Verlinde, “On the Geometry of Metastable Supersymmetry Breaking,” JHEP **0806**, 108 (2008) .

- [16] M. Buican, D. Malyshev, D. R. Morrison, H. Verlinde and M. Wijnholt, “D-branes at singularities, compactification, and hypercharge,” JHEP **0701**, 107 (2007) .
- [17] H. Verlinde and M. Wijnholt, “Building the Standard Model on a D3-brane,” JHEP **0701**, 106 (2007).
- [18] M. Buican, D. Malyshev, D. R. Morrison, H. Verlinde and M. Wijnholt, “D-branes at singularities, compactification, and hypercharge,” JHEP **0701**, 107 (2007)
- [19] H. Verlinde and M. Wijnholt, “Building the standard model on a D3-brane,” JHEP **0701**, 106 (2007)
- [20] O. DeWolfe, S. Kachru and H. L. Verlinde, “The giant inflaton,” JHEP **0405**, 017 (2004)
- [21] J. McGreevy, S. Murthy and H. L. Verlinde, “Two-dimensional superstrings and the supersymmetric matrix model,” JHEP **0404**, 015 (2004)
- [22] J. McGreevy, J. Teschner and H. L. Verlinde, “Classical and quantum D-branes in 2D string theory,” JHEP **0401**, 039 (2004)
- [23] J. McGreevy and H. L. Verlinde, “Strings from tachyons: The  $c = 1$  matrix reloaded,” JHEP **0312**, 054 (2003)
- [24] T. Friedmann and H. L. Verlinde, “Schwinger pair creation of Kaluza-Klein particles: Pair creation without tunneling,” Phys. Rev. D **71**, 064018 (2005)
- [25] J. Pearson, M. Spradlin, D. Vaman, H. L. Verlinde and A. Volovich, “Tracing the string: BMN correspondence at finite  $J^2/N$ ,” JHEP **0305**, 022 (2003)
- [26] D. Vaman and H. L. Verlinde, “Bit strings from  $N = 4$  gauge theory,” [arXiv:hep-th/0209215].
- [27] H. L. Verlinde, JHEP **0312**, 052 (2003) [arXiv:hep-th/0206059].
- [28] S. Kachru, J. Pearson and H. L. Verlinde, “Brane/flux annihilation and the string dual of a non-supersymmetric field theory,” JHEP **0206**, 021 (2002)
- [29] C. S. Chan, A. Hashimoto and H. L. Verlinde, “Duality cascade and oblique phases in non-commutative open string theory,” JHEP **0109**, 034 (2001)
- [30] C. S. Chan, P. L. Paul and H. L. Verlinde, “A note on warped string compactification,” Nucl. Phys. B **581**, 156 (2000)
- [31] J. Khoury and H. L. Verlinde, “On open/closed string duality,” Adv. Theor. Math. Phys. **3**, 1893 (1999)
- [32] E. P. Verlinde and H. L. Verlinde, JHEP **0005**, 034 (2000) [arXiv:hep-th/9912018].

- [33] J. de Boer, E. P. Verlinde and H. L. Verlinde, “On the holographic renormalization group,” JHEP **0008**, 003 (2000)
- [34] M. Berkooz and H. L. Verlinde, “Matrix theory, AdS/CFT and Higgs-Coulomb equivalence,” JHEP **9911**, 037 (1999)
- [35] H. L. Verlinde, “Holography and compactification,” Nucl. Phys. B **580**, 264 (2000)
- [36] S. B. Giddings, F. Hacquebord and H. L. Verlinde, “High energy scattering and D-pair creation in matrix string theory,” Nucl. Phys. B **537**, 260 (1999)
- [37] F. Hacquebord and H. L. Verlinde, “Duality symmetry of  $N = 4$  Yang-Mills theory on  $T^{**3}$ ,” Nucl. Phys. B **508**, 609 (1997)
- [38] R. Dijkgraaf, E. P. Verlinde and H. L. Verlinde, “5D black holes and matrix strings,” Nucl. Phys. B **506**, 121 (1997)
- [39] R. Dijkgraaf, E. P. Verlinde and H. L. Verlinde, “Matrix string theory,” Nucl. Phys. B **500**, 43 (1997)
- [40] R. Dijkgraaf, G. W. Moore, E. P. Verlinde and H. L. Verlinde, “Elliptic genera of symmetric products and second quantized strings,” Commun. Math. Phys. **185**, 197 (1997)
- [41] R. Dijkgraaf, E. P. Verlinde and H. L. Verlinde, “Counting dyons in  $N = 4$  string theory,” Nucl. Phys. B **484**, 543 (1997)
- [42] R. Dijkgraaf, E. P. Verlinde and H. L. Verlinde, “BPS quantization of the five-brane,” Nucl. Phys. B **486**, 89 (1997)
- [43] R. Dijkgraaf, E. P. Verlinde and H. L. Verlinde, “BPS spectrum of the five-brane and black hole entropy,” Nucl. Phys. B **486**, 77 (1997)
- [44] V. Balasubramanian and H. L. Verlinde, “Back-Reaction and Complementarity in 1+1 Dilaton Gravity,” Nucl. Phys. B **464**, 213 (1996)
- [45] Y. Kiem, H. L. Verlinde and E. P. Verlinde, “Black hole horizons and complementarity,” Phys. Rev. D **52**, 7053 (1995)
- [46] E. P. Verlinde and H. L. Verlinde, “High-energy scattering in quantum gravity,” Class. Quant. Grav. **10**, S175 (1993).
- [47] T. D. Chung and H. L. Verlinde, “Dynamical moving mirrors and black holes,” Nucl. Phys. B **418**, 305 (1994)
- [48] K. Schoutens, H. L. Verlinde and E. P. Verlinde, “Quantum black hole evaporation,” Phys. Rev. D **48**, 2670 (1993)

- [49] E. P. Verlinde and H. L. Verlinde, "A Quantum S matrix and 2-D black hole formation and evaporation," Nucl. Phys. B **406**, 43 (1993)
- [50] H. L. Verlinde and E. P. Verlinde, "Scattering at Planckian energies," Nucl. Phys. B **371**, 246 (1992)
- [51] R. Dijkgraaf, H. L. Verlinde and E. P. Verlinde, "String propagation in a black hole geometry," Nucl. Phys. B **371**, 269 (1992).
- [52] R. Dijkgraaf, H. L. Verlinde and E. P. Verlinde, "Topological Strings In  $D < 1$ ," Nucl. Phys. B **352**, 59 (1991).
- [53] R. Dijkgraaf, H. L. Verlinde and E. P. Verlinde, "Loop Equations And Virasoro Constraints In Nonperturbative 2-D Quantum Gravity," Nucl. Phys. B **348**, 435 (1991).
- [54] E. P. Verlinde and H. L. Verlinde, "A Solution of Two-Dimensional Topological Quantum Gravity" Nucl. Phys. B **348**, 457 (1991).
- [55] H. L. Verlinde, "Conformal Field Theory, 2-D Quantum Gravity And Quantization Of Teichmuller Space," Nucl. Phys. B **337**, 652 (1990).
- [56] R. Dijkgraaf, C. Vafa, E. P. Verlinde and H. L. Verlinde, "The Operator Algebra of Orbifold Models," Commun. Math. Phys. **123**, 485 (1989).
- [57] R. Dijkgraaf, E. P. Verlinde and H. L. Verlinde, "C = 1 Conformal Field Theories on Riemann Surfaces," Commun. Math. Phys. **115**, 649 (1988).
- [58] E. P. Verlinde and H. L. Verlinde, "Multiloop Calculations in Covariant Superstring Theory," Phys. Lett. B **192**, 95 (1987).
- [59] E. P. Verlinde and H. L. Verlinde, "Chiral bosonization, determinants and the string partition function," Nucl. Phys. B **288**, 357 (1987).