# Theodore J. Allen


Hobart & William Smith Colleges | 315/781-3623 [office] | 315/719-0359 [home]
Geneva, NY 14456 | 315/781-3860 [FAX] | tjallen@hws.edu


**Education**

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| Ph.D. | California Institute of Technology<br>*Theoretical Physics* | 1988 |
| M.S. | California Institute of Technology<br>*Physics* | 1984 |
| B.S. | University of Wisconsin-Madison<br>*Applied Mathematics, Engineering and Physics* | 1982 |

**Positions**

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|---|---|---|
| Professor | Hobart & William Smith Colleges | 2023-Present |
| Associate Professor | Hobart & William Smith Colleges | 2005-2023 |
| Assistant Professor | Hobart & William Smith Colleges | 2000-2005 |
| Assistant Professor | SUNY Institute of Technology | 1999-2000 |
| Assistant Professor | Hobart & William Smith Colleges | 1998-1999 |
| Lecturer in Physics | University of Wisconsin-Madison | 1997 |
| Faculty Assistant | University of Wisconsin-Madison | 1994-1998 |
| Assistant Scientist | University of Wisconsin-Madison | 1993-1995 |
| Lecturer in Physics | University of Wisconsin-Madison | 1992-1993 |
| Research Associate | University of Wisconsin-Madison | 1991-1993 |
| Research Associate | Syracuse University | 1988-1991 |
| Research Associate | California Institute of Technology | 1988 |

**Ph.D. Student** Dennis B. Crossley, Ph.D. UW-Madison 1994
Thesis: *BRST Quantization and Self-dual Gravity*

**Service**

Referee: *Physical Review Letters & Physical Review, Journal of Physics, Modern Physics Letters & International Journal of Modern Physics*

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|---|---|---|
| Faculty Parliamentarian | HWS | 2002-2019 |
| Department Chair | HWS | 2013 S-2019 S |
| Department Chair | HWS | 2008 F-2009 S |
| Department Chair | HWS | 2004 F-2006 S |
| Committee on the Library | HWS | 2010-2013 |
| Health Professions Advisory Committee | HWS | 2001-2019 |
| APS Career & Professional Development Liaison | HWS | 2001-Present |
| Grievance Committee | HWS | 2004 & 2015 |
| Faculty Representative to Investment Board | HWS | 2000-01 |
| Academic Computing Systems Committee | SUNY-IT | 1999-2000 |
| Assessment Committee | SUNY-IT | 1999-2000 |
| Laser Safety Committee | SUNY-IT | 1999-2000 |
| Elementary Laboratories Committee | UW-Madison | 1996-97 |
| Physics Mentor | UW-Madison | 1996-98 |
| Junior Year Physics Majors Advisor | UW-Madison | 1995-96 |
| University Physical Society Advisor | UW-Madison | 1994-97 |
| Graduate Theoretical Physics Advisor | UW-Madison | 1994-96 |
| Awards Committee | UW-Madison | 1994-95 |

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| **Honors** | National Science Foundation Graduate Fellow | Caltech | 1982-85 |
| | University Academic Excellence Award | UW-Madison | 1982 |
| | Elected Phi Beta Kappa | | 1981 |
| | Elected Phi Kappa Phi | | 1981 |
| | Elected Tau Beta Pi, National Engineering Honor Society | | 1981 |
| | University Academic Excellence Award | UW-Madison | 1981 |
| | Radtke Prize Scholarship in Physics | UW-Madison | 1981 |
| | Frank D. Cady Scholarship in Mathematics | UW-Madison | 1979 & 1980 |
| | National Merit Scholar | | 1978-1982 |

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| **Seminars Courses & Talks** | Hamilton College *Colloquium* | September 2006 |
| | Syracuse University | October 2003 |
| | University of Wisconsin-Madison | September 2003 |
| | Montreal-Rochester-Syracuse-Toronto Meeting | May 2001 |
| | Syracuse University | December 1998 |
| | Duke University | August 1995 |
| | Illinois State University | March 1995 |
| | Amherst College | February 1995 |
| | Division of Particles and Fields, UNM-Albuquerque | August 1994 |
| | Division of Particles and Fields, Fermilab | November 1992 |
| | University of Wisconsin-Milwaukee *Colloquium* | March 1992 |
| | University of Rochester | February 1991 |
| | University of New Hampshire | |
| | *Minicourse on Symplectic Geometry* | November 1990 |
| | Montreal-Rochester-Syracuse-Toronto Meeting | May 1989 |
| | University of Rochester | September 1988 |
| | University of California-Davis | January 1988 |

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| **Conferences Attended** | *Pheno 2007*, Madison | May 2007 |
| | *Montreal-Rochester-Syracuse-Toronto Meeting*, Montreal | May 2004 |
| | *Montreal-Rochester-Syracuse-Toronto Meeting*, Syracuse | May 2003 |
| | *Montreal-Rochester-Syracuse-Toronto Meeting*, Perimeter Institute | May 2002 |
| | *Montreal-Rochester-Syracuse-Toronto Meeting*, U. Western Ontario | May 2001 |
| | *Confinement III*, Jefferson Labs | June 1998 |
| | *S-Duality and Mirror Symmetry*, ICTP Trieste | June 1995 |
| | *DPF Meeting*, UNM-Albuquerque | August 1994 |
| | *Physics Doesn't Stop*, Madison | April 1994 |
| | *SSC Symposium*, Madison | April 1993 |
| | *DPF Meeting*, Fermilab | November 1992 |
| | *SSC Symposium*, Madison | April 1992 |
| | *Symposium on Blackholes, Membranes and Strings*, Houston | January 1992 |
| | *Montreal-Rochester-Syracuse-Toronto Meeting*, Rochester | May 1991 |
| | *Montreal-Rochester-Syracuse-Toronto Meeting*, Montreal | May 1990 |
| | *Montreal-Rochester-Syracuse-Toronto Meeting*, Syracuse | May 1989 |
| | *Mathematical Aspects of String Theory*, San Diego | August 1986 |
| | String Workshop, Santa Barbara | August 1985 |
| | *Geometry, Anomalies and Topology*, Argonne | March 1985 |
| | *Second Jerusalem Winter School*, Hebrew University | December 1984 |

### Publications in Refereed Journals

1. "Inequivalence of the Brink-Schwarz and Siegel superparticles," *Mod. Phys. Lett.* **A2**, 209 (1987).

2. "Non-Gaussian density perturbations in inflationary cosmologies," with B. Grinstein and M.B. Wise, *Phys. Lett.* **B197**, 66 (1987).

3. "The Dirac propagator from pseudoclassical mechanics," *Phys. Lett.* **B214**, 87 (1988).

4. "The canonical structure of the manifestly supersymmetric string," *Int. J. Mod. Phys.* **A4**, 2811 (1989).

5. "Axionic black holes from massive axions," with M.J. Bowick and A. Lahiri†, *Phys. Lett.* **B237**, 47 (1990).

6. "BRST quantization and coadjoint orbit theories," *Phys. Rev. D* **43**, 3442 (1991).

7. "Topological mass generation in 3+1 dimensions," with M.J. Bowick and A. Lahiri†, *Mod. Phys. Lett.* **A6**, 559 (1991).

8. "Particle statistics in topologically nontrivial two dimensional magnetic systems," *Nucl. Phys.* **B360**, 409 (1991).

9. "Simpson's neutrino and the singular see-saw," with R. Johnson, S. Ranfone†, J. Schechter and J.W.F. Valle, *Mod. Phys. Lett.* **A6**, 1967 (1991).

10. "Duality and the vacuum," *Nucl. Phys.* **B395**, 185 (1993).

11. "Collective coordinate action for charged sigma-model vortices in finite geometries," *Mod. Phys. Lett.* **A8**, 1815 (1993).

12. "Harmonic BRST quantization of systems with irreducible holomorphic Boson and Fermion constraints," with D.B. Crossley†, *Phys. Rev. D* **47**, 5494 (1993).

13. "Phase space reduction and vortex statistics: An anyon quantization ambiguity," with A.J. Bordner† and D.B. Crossley†, *Phys. Rev. D* **49**, 6907 (1994).

14. "Charged vortex dynamics in Ginzburg-Landau theory of the fractional quantum Hall effect," with A.J. Bordner†, *Int. J. Mod. Phys.* **A10**, 645 (1995).

15. "Reality conditions, reducibility and ghosts," with D.B. Crossley†, *Phys. Rev. D* **52**, 1102 (1995).

16. "Quark confinement dynamics," with M.G. Olsson, S. Veseli†, and K. Williams†, *Phys. Rev. D* **55**, 5408 (1997).

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† Student

17. "Excited glue and the vibrating flux tube," with M.G. Olsson and S. Veseli, *Phys. Lett.* **B434**, 110 (1998).

18. "Vibrational modes of a rotating string," with J.R. Schmidt, *Can. J. Phys.* **76**, 965 (1998).

19. "Flux tube vibrations and the excited glue spectroscopy," with M.G. Olsson and S. Veseli, *Nucl. Phys. Proc. Suppl.* **B75** , 299 (1999).

20. "Adiabatic string shape for non-uniform rotation," with M.G. Olsson and S. Veseli, *Phys. Rev. D* **59**, 094011 (1999).

21. "Curved QCD string dynamics," with M.G. Olsson and S. Veseli, *Phys. Rev. D* **60**, 074026 (1999).

22. "A note on the computation of mode sums," with M.G. Olsson and J.R. Schmidt, *Phys. Rev. D* **62**, 066006 (2000).

23. "From scalar to string confinement," with M.G. Olsson and S. Veseli, *Phys. Rev. D* **62**, 094021 (2000).

24. "Analytic quantization of the QCD string," with C. Goebel, M.G. Olsson and S. Veseli, *Phys. Rev. D* **64**, 094011 (2001).

25. "QCD string structure in vector confinement," with T. Coleman†, M.G. Olsson and S. Veseli, *Phys. Rev. D* **67**, 054016 (2003).

26. "Reduction of the QCD string to a time component vector potential," with M.G. Olsson, *Phys. Rev. D* **68**, 054022 (2003).

27. "QCD strings with spinning quarks," with M.G. Olsson and J. R. Schmidt, *Phys. Rev. D* **69**, 054013 (2004).

28. "Universal light quark mass dependence and heavy light meson spectroscopy," with T. Coleman, M.G. Olsson, and S. Veseli, *Phys. Rev. D* **69**, 074010 (2004).

29. "Direct experimental test of scalar confinement," with M. G. Olsson, Yu Yuan†, J. R. Schmidt, and S. Veseli, *Phys. Rev. D* **70**, 054012 (2004).

30. "Quantization of Pseudoclassical Systems in the Schrödinger Realization," with D. A. Spector and C. W. Wilson†, *J. Math. Phys.* **61**, 052106 (2020).

31. "Spin in Schrödinger-quantized Pseudoclassical Systems," *J. Math. Phys.* **62**, 102101 (2021); quant-ph/2105.12187.

† Student

### Unpublished Articles

32. "BRST quantization and gravity in self-dual variables,"
with D.B. Crossley†, UW-Madison Preprint MAD/TH-94-11.

33. "A mechanism for charge quantization," with C. J. Efthimiou, and D. A. Spector,
hep-th/0209204.

### Contributed Articles

34. "Lectures on superstring theory," given by J. H. Schwarz,
at the Second Jerusalem Winter School, notes by T. J. Allen,
in *Physics in Higher Dimensions*, Eds., T. Piran and S. Weinberg,
(World Scientific Publishers, Singapore, 1986).

35. "Axionic black holes," with A. Lahiri† and M.J. Bowick, in *Proceedings of the Eleventh Annual MRST Meeting,* Eds. C. Rosenzweig and K.C. Wali, 1989.

36. "Mass generation without symmetry breaking," with M.J. Bowick and A. Lahiri†,
in *Proceedings of Twelfth Annual MRST meeting,* Eds. B. Margolis and P. Valin, 1990.

37. "Charged vortex dynamics in a Ginzburg-Landau theory
of a 2+1 Dimensional Charged Scalar Field," with A.J. Bordner†,
in *The Fermilab Meeting DPF92*, C.H. Albright, P.H. Kasper,
R. Raja and J. Yoh, eds., (World Scientific, Singapore, 1993) p. 1537.

38. "Vortex statistics: an anyon quantization ambiguity,"
with A.J. Bordner† and D.B. Crossley†, *The Albuquerque Meeting,*
*Proceedings of the 8th Meeting of the Division of Particles and Fields*,
Sally Seidel, Ed. (World Scientific, Singapore, 1995) p. 1430.

39. "Relativistic strings and hybrid mesons," with M.G. Olsson and S. Veseli,
*Proceedings of the Third International Conference on Quark Confinement,*
(World Scientific, Singapore, 2000) p. 149.

40. "Scalar and QCD string confinement," with M.G. Olsson and S. Veseli,
*Proceedings of the 7th Conference on Intersections Between Particle*
*and Nuclear Physics (CIPANP 2000)*, 22-28 May 2000, Quebec City, Quebec, Canada.
AIP Conf. Proc. **549**, 283 (2002).

41. "Analytic semi-classical quantization of a QCD string with light quarks,"
with C. Goebel, M.G. Olsson and S. Veseli,
*Theoretical High Energy Physics, MRST 2001: A Tribute to Roger Migneron*.
Eds. V. Elias, D.G.C. McKeon, and V.A. Miransky.
(American Institute of Physics, Melville, New York, 2001) p. 277.

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† Student

42. "Confinement Dynamics," with M.G. Olsson,
*Proceedings of the 8th Conference on Intersections Between Particle and Nuclear Physics (CIPANP 2003)*, 19-24 May 2003, New York, NY (USA).
AIP Conf. Proc. **698** 562-565, (2004).