

# Curriculum Vitae: Michael Faux

## *Departmental Address:*

Department of Physics  
SUNY College at Oneonta  
Oneonta, NY 13820  
USA

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## *Graduate Education*

University of Pennsylvania  
Ph.D. in Physics, August 1994

## *Graduate Thesis*

“Non-Perturbative Effects and Supersymmetry Breaking  
in Matrix Models and in String Theory”  
Thesis Advisor: Professor Burt Ovrut

## *Undergraduate Education:*

The Pennsylvania State University  
B.S. in Electrical Engineering, May 1985

## *Faculty Positions*

VIGRE Assistant Professor (non tenure-track), Columbia University,  
Department of Mathematics and Department of Physics, July 1999 - June 2002

Visiting Assistant Professor (non tenure-track), Hobart and William Smith Colleges,  
Department of Physics, July 2002 - June 2005

Assistant Professor, SUNY College at Oneonta,  
Department of Physics, September 2005 - August 2009

Associate Professor (tenured), SUNY College at Oneonta,  
Department of Physics, September 2009 - present

## *Administrative Positions*

Director, 3-2 Engineering Program, September 2009 - present

*Postdoctoral Research Fellowships*

Utrecht University, Utrecht, The Netherlands, September 1994 - December 1995

Institute for Theoretical Physics at K.U. Leuven, Leuven, Belgium, January 1996 - August 1997

Institut für Physik, Humboldt University, Berlin, Germany, September 1997 - June 1999

*Visiting Scientist Positions*

CERN Theory Division, Ph.D. student visitor, September 1992 - October 1993

*Corporate Positions:*

Associate Engineer, Advanced Transistor Development, IBM Corporation,  
East Fishkill, NY, June 1985 - January 1987

*Teaching Experience: Graduate Physics*

Anomalies in Quantum Field Theory (Columbia University)

Geometry and Topology in Physics (Columbia University)

String Theory I (Columbia University)

String Theory II (Columbia University)

*Teaching Experience: Undergraduate Physics*

Physics 100: General Physics<sup>†</sup>

Physics 103: Intro Physics I (non-calculus)<sup>†</sup>

Physics 104: Intro Physics II (non-calculus)<sup>†</sup>

Physics 150: Intro Physics I (calculus-based)<sup>†</sup> (Hobart and William Smith)

Physics 160: Intro Physics II (calculus-based)<sup>†</sup> (Hobart and William Smith)

Physics 205: Modern Physics

Physics 214: Vibrations and Waves

Physics 240: Electronics<sup>†</sup> (Hobart and William Smith)

Physics 313: Quantum Mechanics

Physics 333: Classical Electromagnetism

Physics 351: Classical Mechanics (Hobart and William Smith)

Physics 361: Electromagnetism (Hobart and William Smith)

Physics 399: General Relativity

<sup>†</sup>: with laboratory

*Teaching Experience: Undergraduate Astronomy*

Astronomy 108: Descriptive Astronomy

*Teaching Experience: Undergraduate Engineering*

Engineering 335: Electronics I<sup>†</sup>

Engineering 338: Electronics II<sup>†</sup>

Engineering 399: Vacuum Tube Amplifiers<sup>†</sup>

*Teaching Experience: Undergraduate Mathematics*

Math 131: Calculus II<sup>†</sup> (Hobart and William Smith)

Math 150: Calculus III (Columbia University)

*Teaching Experience: Undergraduate Special Topics*

FSEM 138: Reverberations of Scientific Revolutions (Hobart and William Smith)

Physics 294: Revolutions in Physics

Physics 299: Project Analemma<sup>†</sup>

Physics 299: General Relativity

Physics 299: Advanced Electronics<sup>†</sup>

Physics 299: Building a Theremin<sup>†</sup>

Physics 299: Supersymmetry I

Physics 399: Supersymmetry II

Physics 386: Capstone in Physics

Physics 399: Mathematical Physics

Physics 399: Adinkramatics

*Professional Associations, Academic Honors, and other distinctions:*

The Anacapa Society (member)

Oneonta Engineering Advisory Council (founding member)

Sigma Pi Sigma (faculty liason)

Society of Physics Students (faculty liason)

Tau Beta Pi National Honor Society (member)

Eta Kappa Nu National Honor Society (member)

Golden Key National Honor Society (member)

Who's Who in America (biography included 2010)

*Notable accomplishment*

Thru-Hiked the entire Appalachian Trail (March-August 1987)

*Community Service*

Curriculum Committee, member, SUNY College at Oneonta, 2005-2006

Library Committee, member, SUNY College at Oneonta, 2006 - present

Faculty advisor for the “Phriends of Physics” club, SUNY College at Oneonta 2005 - present

ΣΠΣ honor society, local chapter representative, 2006 - present

Society of Physics Students, local faculty liason, 2006 - present

Television interview, WSKG Oneonta, November 2007

Undergraduate Faculty Advising, SUNY College at Oneonta, 2004 - present

Supervision of undergraduate summer research projects and independent studies

Coach, Oneonta little league, 2006, 2007, 2008, and 2009 seasons

*Publication List*

starts on next page

## Refereed Published Papers

- [1] *Codes and Supersymmetry in One Dimension*,  
C. F. Doran, M. G. Faux, S. J. Gates, Jr., T. Hübsch,  
K. M. Iga, G. D. Landweber and R. L. Miller,  
Advances in Theoretical Mathematical Physics (2012) in press,
- [2] *Dimensional Enhancement via supersymmetry*,  
M. G. Faux, K. M. Iga, and G. D. Landweber,  
Advances in Mathematical Physics **2011** 259089 (2011),
- [3] *Spin holography via dimensional enhancement*,  
Michael G. Faux and Gregory D. Landweber,  
Physics Letters **B** 681 (2009) 161-165,
- [4] *A superfield for every dash chromotopology*,  
C. F. Doran, M. G. Faux, S. J. Gates, T. Hübsch, K. M. Iga and G. D. Landweber,  
International Journal of Modern Physics **A24** (2009) 5861
- [5] *Effective Symmetries of the Minimal Supermultiplet of  $N = 8$  Extended Worldline SUSY*,  
M. G. Faux, S. J. Gates, and T. Hübsch  
J. Phys. A: Math. Theor. 42 (2009) 415206
- [6] *Frames for Supersymmetry*,  
C. F. Doran, M. G. Faux, S. J. Gates, T. Hübsch, K. M. Iga and G. D. Landweber,  
International Journal of Modern Physics **A** Vol. 24 Issue No. 14 (2009) 2665-2676
- [7] *Super-Zeeman Embedding Models on  $N$ -Supersymmetric World-Lines*,  
C. Doran, M. Faux, S. J. Gates, T. Hübsch, K. Iga and G. Landweber,  
Journal of Physics **A42** (2009) 065402
- [8] *On the matter of  $N = 2$  matter*,  
C. Doran, M. Faux, S. J. Gates, Jr., T. Hübsch, K. Iga, G. Landweber  
Physics Letters **B** 659 (2008) 441-446
- [9] *Adinkras and the dynamics of superspace prepotentials*,  
C. Doran, M. Faux, S. J. Gates, Jr., T. Hübsch, K. Iga, G. Landweber  
Advanced Studies in Theoretical Physics, Vol. 2, no. 3 (2008) 113-164
- [10] *A counter example to a putative classification of one-dimensional  
 $N$ -extended supermultiplets*,  
C. Doran, M. Faux, S. J. Gates, Jr., T. Hübsch, K. Iga, G. Landweber  
Advanced Studies in Theoretical Physics, Vol. 2, no. 3 (2008) 99-111

- [11] *On graph theoretic identifications of Adinkras, supersymmetry representations and superfields*  
C. Doran, M. Faux, S. J. Gates, Jr., T. Hübsch, K. Iga, G. Landweber,  
International Journal of Modern Physics **A22** (2007) 869-930
- [12] *Adinkras: A graphical technology for supersymmetric representation theory*,  
M. Faux and S. J. Gates, Jr.  
Physical Review **D71** (2005) 065002
- [13] *A BPS interpretation of shape-invariance*,  
M. Faux and D. Spector  
Journal of Physics **A37** (2004) 10397-10407,
- [14] *Duality and central charges in supersymmetric quantum mechanics*,  
M. Faux and D. Spector,  
Physical Review **D70** (2004) 085014
- [15] *A periodic table for supersymmetric M-theory compactifications*,  
C. Doran and M. Faux,  
Journal of Mathematical Physics 44 (2003) 2853-2873
- [16] *Twisted sectors and Chern-Simons terms in M-theory orbifolds*,  
M. Faux, D. Lüst, and B. A. Ovrut,  
International Journal of Modern Physics **A18** (2003) 2995-3013
- [17] *An M-theoretic perspective on heterotic K3 orbifold compactification*,  
M. Faux, D. Lüst, and B. A. Ovrut,  
International Journal of Modern Physics **A18** (2003) 3273-3314
- [18] *Four-dimensional super Yang-Mills theory from an M-theory orbifold*,  
C. Doran, M. Faux, and B. A. Ovrut,  
Advances in Theoretical Mathematical Physics 6 (2002) 329-355
- [19] *Intersecting branes in M-theory and chiral matter in four dimensions*,  
C. Doran and M. Faux,  
Journal of High Energy Physics 0208:024 (2002)
- [20] *Local anomaly cancellation, M-theory orbifolds, and phase-transitions*,  
M. Faux, D. Lüst, and B. A. Ovrut,  
Nuclear Physics **B589** (2000) 269-291
- [21] *Intersecting orbifold planes and local anomaly cancellation in M-theory*,  
M. Faux, D. Lüst, and B. A. Ovrut,  
Nuclear Physics **B554** (1999) 437-483

- [22] *Vector-tensor multiplets*,  
P. Claus, B. de Wit, M. Faux, B. Kleijn, R. Siebelink and P. Termonia,  
Fortschritte der Physik 47 (1999) 125-132
- [23]  *$N = 2$  supergravity lagrangians with vector-tensor multiplets*,  
P. Claus, B. de Wit, M. Faux, B. Kleijn, R. Siebelink and P. Termonia,  
Nuclear Physics **B512** (1998) 148-178
- [24] *Chern-Simons couplings and inequivalent vector-tensor multiplets*,  
P. Claus, B. de Wit, M. Faux, and P. Termonia,  
Nuclear Physics **B491** (1997) 201-220
- [25] *The vector-tensor supermultiplet with gauged central charge*,  
P. Claus, B. de Wit, M. Faux, B. Kleijn, R. Siebelink, and P. Termonia,  
Physics Letters **B373** (1996) 81-88
- [26] *Instanton effects in matrix models and string effective lagrangians*,  
R. Brustein, M. Faux, and B. A. Ovrut,  
Nuclear Physics **B433** (1995) 67-98
- [27] *Effective  $d=2$  supersymmetric lagrangians from  $d=1$  supermatrix models*,  
R. Brustein, M. Faux, and B. A. Ovrut,  
Nuclear Physics **B421** (1994) 293-342

**arXiv papers**

- [28] *Topology types of Adinkras and the corresponding representations of  $N$ -extended supersymmetry*,  
C. F. Doran, M. G. Faux, S. J. Gates, T. Hübsch, K. M. Iga and G. D. Landweber,  
and R. L. Miller, arXiv:0806.0050
- [29] *Adinkras for Clifford algebras, and worldline supermultiplets*,  
C. F. Doran, M. G. Faux, S. J. Gates, T. Hübsch, K. M. Iga and G. D. Landweber,  
and R. L. Miller, arXiv:0811.3410
- [30] *Off-Shell supersymmetry and filtered Clifford supermodules*,  
C. Doran, M. Faux, S. J. Gates, Jr., T. Hübsch, K. Iga, G. Landweber  
arXiv:math-ph/0603012
- [31] *Central charges and extra dimensions in supersymmetric quantum mechanics*,  
M. Faux, D. Kagan, and D. Spector, arXiv:hep-th/0406152
- [32] *Confluences of anomaly freedom requirements in  $M$ -theory*,  
M. Faux, arXiv:hep-th/9803252

- [33] *New consistent limits to M-theory*,  
M. Faux, arXiv:hep-th/9801204
- [34] *Nonperturbative effects and supersymmetry breaking in matrix models and in string theory*,  
M. Faux, UMI-95-03756-mc (1994) Ph. D. Thesis

### Contributions to Books and Proceedings

- [35] *Relating doubly-even error-correcting codes, graphs, and irreducible representations of N-extended supersymmetry*,  
C. Doran, M. Faux, S. J. Gates, Jr., T. Hübsch, K. Iga, G. Landweber,  
New Advances in Applied and Computational Mathematics,  
editors F. Liu et al., Nova Science Pub., Inc., Hauppauge, 2007
- [36] *Phase-transitions and tensor dynamics in M-theory*,  
M. Faux, D. Lüst, and B. A. Ovrut,  
Mirror Symmetry IV: Advanced Studies in Mathematics 28 (2002) 231-254
- [37] *The vector-tensor multiplet and heterotic dilaton couplings*,  
P. Claus, B. de Wit, M. Faux, R. Kleijn, R. Siebelink, and P. Termonia,  
Gauge Theories, Quantum Gravity and Applied Supersymmetry II (1996) 231-238
- [38] *A systematic analysis of nonperturbative effects in matrix models and string effective lagrangians*,  
R. Brustein, M. Faux, and B. A. Ovrut,  
Physics from Plank Scale to Electroweak Scale (1994) 303-318
- [39] *Supersymmetric field theory from supermatrix models*,  
R. Brustein, M. Faux, and B. A. Ovrut,  
Proceedings of the 4th International Conference  
on Mathematical Physics, String Theory, and Quantum Gravity, Rakhov, Ukraine (1994)
- [40] *The strength of nonperturbative effects in matrix models and string effective lagrangians*,  
R. Brustein, M. Faux, and B. A. Ovrut,  
SUSY '94 (1994) 395-402, arXiv:hep-th/9407164
- [41] *Nonperturbative interactions in two-dimensional (super)string theory*,  
R. Brustein, M. Faux, and B. A. Ovrut,  
SUSY '93 (1993), arXiv:hep-th/9310143
- [42] *Nonperturbative effective lagrangians for super-matrix models*,  
R. Brustein, M. Faux, and B. A. Ovrut,  
Marseille EPS HEP (1993) 260-264

## Conferences and Workshops Attended:

Theoretical Advanced Study Institute (TASI '92): "From Superstrings and Black Holes to the Standard Model", University of Colorado, Boulder Colorado, 1-26 June 1992

Siberian Workshop on Quantum Field Theory and Strings,  
Tomsk State University, Tomsk, Siberia, Russia, August 1994 (speaker)

"Gauge Theories, Applied Supersymmetry, Quantum Gravity",  
Leuven University, Leuven, Belgium, 10-14 July 1995

Workshop on STU-Dualities and Non-Perturbative Phenomena in Superstrings  
and Supergravity, CERN, Geneva, Switzerland, 27 November - 1 December 1995

Rome Triangle Workshop on Gauge Theories, Applied Supersymmetry, and Quantum Gravity  
Rome, Italy, 18-22 March 1996 (speaker)

"Gauge Theories, Applied Supersymmetry, and Quantum Gravity II",  
Imperial College, London, England, 5-10 July, 1996 (speaker)

SUSY '97: "The Fifth International Conference on Supersymmetries in Physics",  
University of Pennsylvania, Philadelphia PA, 27-31 May 1997

"XXXIII Karpacz Winter School on Theoretical Physics, Duality, Strings, and Fields",  
Karpacz, Poland, 13-22 February 1997

"Physics from the Planck scale to the Electroweak scale",  
Warsaw, Poland, 2-5 April 1997 (speaker),

"Strings 1997", University of Amsterdam,  
Amsterdam, Netherlands, 16-21 June 1997

"Strings 1998", Institute for Theoretical Physics,  
University of California, Santa Barbara, California, 22-27 June 1998

"6th Hellenic School and Workshop on Elementary Particle Physics",  
Corfu, Greece, 20-26 September, 1998 (speaker)

"Conference on Strings, Dualities, and Geometry",  
University of Montreal, March 2000 (invited speaker)

"Strings 2001", Tata Institute of Fundamental Research  
Mumbai, India, 5-10 January, 2001

Second Northeast String Cosmology meeting,  
ISCAP, Columbia University, 19 December 2003

"AMS Special Session:  $K$ -Theory in  $M$ -Theory",  
University of Oregon, Eugene, Oregon 11-13 November 2005 (invited speaker)

“Workshop on Off-Shell Supersymmetry via Graph Theory and Superspace”,  
Banff International Research Station, Banff, Alberta, Canada,  
22-29 July 2006 (invited speaker)

Pacific Northwest Workshop on Off-Shell Supersymmetry and Graph Theory,  
University of Washington, Seattle Washington, 16-22 June 2007 (invited speaker)

Malibu Workshop on Off-Shell Supersymmetry and Graph Theory,  
Pepperdine University, Malibu, California, 12-16 September 2007 (invited speaker)

### **Seminars and Colloquia Given (2000 - present)**

Žilina University, Žilina, Slovakia, 14 June, 2001  
seminar: *Miracles and M-Theory*

University of New Hampshire, Durham, New Hampshire, 29 October 2003  
seminar: *Remnant World Lines and Shadows of Supersymmetry*,

University of Pennsylvania, Philadelphia, Pennsylvania, 16 December 2003  
seminar: *Remnant World Lines and Shadows of Supersymmetry*

Columbia University, New York, New York, 18 December, 2003  
ISCAP seminar: *Remnant World Lines and Shadows of Supersymmetry*,

Hobart and William Smith Colleges, Geneva, New York, 14 February 2004  
faculty lunch seminar: *Spaces Within: Hidden Spatial Dimensions  
and the Search for Fundamental Laws of Nature*

University of Maryland, College Park, Maryland, 20 September 2004  
seminar: *Envisaging Supergravity*

Columbia University, New York, 28 January 2005  
ISCAP seminar: *Envisaging Supergravity*

University of Washington, Seattle, Washington, 10 February 2005  
seminar: *The Veiled Architecture of Supersymmetric Gauge Theories*

SUNY Oneonta, Oneonta, New York, 19 April 2005  
seminar: *Reflections on Rigatoni and the Silent Shadows of Supersymmetry*

University of Oregon, Eugene, Oregon, 12 November 2005  
seminar: *The Adinkramatics of Gauge Transformations*

Banff International Research Station, Banff, Alberta, Canada, 23 July 2006  
seminar: *Open Puzzles in Extended Global Supersymmetry*

University of Washington, Seattle, Washington, 17 June 2007  
seminar: *The Quandary of Off-Shell Matter in Supersymmetry*

Pepperdine University, Malibu, California, 13 September 2007  
seminar: *The Matter of  $N = 2$  Matter*

Bard College, Annandale-on-Hudson, New York, 25 October 2007  
Colloquium: *What's so Super about Symmetry?*

Gettysburg College, Gettysburg, PA, 13 February 2008  
Colloquium: *Are all Particles Created Equal?*

Arnold Sommerfeld Institute, Munich, Germany, 17 July 2008  
seminar: *Supersymmetry: Old Dog, New Tricks*

SUNY Oneonta, Oneonta, New York, 15 October 2008  
Faculty Convivium: *Why Nature sings a symmetrical song*

SUNY Oneonta, Oneonta, New York, 18 October 2008  
“mini-class” public seminar: *Will the Large Hadron Collider destroy the earth?*

Shippensburg University, Shippensburg, PA, 24 February 2009  
seminar: *What Maxwell Wrought*

SUNY Oneonta, Oneonta, New York, 3 December, 2010  
seminar: *On Symmetries, Supersymmetries, and Akan Symbolism*

CBPF Theory Seminar, Rio de Janeiro, Brazil, 3 December, 2011  
seminar: *Avoiding Central Charges in Extended Supersymmetry*