

## HOWARD A. BAER

### VITA

<i>Address</i>	Department of Physics and Astronomy University of Oklahoma Norman, OK 73019 e-mail address: baerATnhn.ou.edu
<i>Phone</i>	405-325-7048
<i>Family</i>	Married to Adrienne Gautier Daughter: Madeleine Camille Baer Son: Jacob Francis Baer
<i>Citizenship</i>	United States
<i>Education</i>	1981-1984 Ph.D., University of Wisconsin, Physics 1980-1981 M.Sc., University of Wisconsin, Physics 1975-1979 B.Sc., University of Wisconsin, Physics, Mathematics (with honors)
<i>Research and Teaching Positions</i>	2008 - Present, Homer L. Dodge Professor of High Energy Physics University of Oklahoma, Norman 2003-2008, J. D. Kimel Professor, Florida State University, Tallahassee 1996-2003, Full Professor, Florida State University, Tallahassee 1998, Winter quarter, Visiting Professor, University of California-Davis 1993-1996, Associate Professor, Florida State University, Tallahassee 1990-1993, Assistant Professor, Florida State University, Tallahassee 1987-1990, Assistant Research Scientist in Particle Theory, Florida State University, Tallahassee 1985-1987, Postdoctoral Appointee in Particle Theory, Ar- gonne National Laboratory 1984-1985, Scientific Associate in Particle Theory, CERN, Geneva, Switzerland 1981-1984, Research Assistant in Particle Theory, Univer- sity of Wisconsin - Madison

1980-1981, Teaching Assistant in General Physics, University of Wisconsin-Madison  
1979-1980, Teaching Assistant in Physics, University of Maryland-College Park

*Awards*

1991 Summer Ass't Prof. Research Award  
1992 Summer COFRS Award  
1993 SSC Junior Faculty Fellowship  
1994 FSU Developing Scholar Award  
1996 Summer COFRS Award  
1998 Elected Fellow of American Physical Society  
2003 FSU Named Professor Award  
2005 FSU Physics Dep't PAI Award for Teaching and Research  
2008 OU H. L. Dodge endowed Chair of High Energy Physics  
2011 Top 20 Authors in Supersymmetry, ScienceWatch.com  
2012 Physics Letters B outstanding referee  
2012 Grad student Andre Lessa, APS Sakurai award for outstanding Ph.D. dissertation in theoretical particle physics  
2013-2016 Carl T. Bush Professorship in theoretical physics, OU  
2014 March theorist of the month, Helmholtz Alliance, DESY Lab, Hamburg  
2014 Appointed to Editorial Board, Physical Review D  
2014 George Lynn Cross Research Professor award, University of Oklahoma  
2016 UW-Madison Dep't of Physics Distinguished Alumnus award  
2021 European Physical Journal C: Distinguished referee award

*National service*

2006 Appointed to joint DOE/NSF HEPAP/AAAS Dark Matter Scientific Assessment Group: Chair of Theory sub-panel  
DOE review panel for UCLA, October, 2009  
DOE review panel for UW Madison, August, 2010  
NSF review board, February, 2011,

*Funding*

Funding history (1988-2017)  
From 2013-present, PI of University of Oklahoma HEP theory group, Task B  
From 2009-2013, co-PI of University of Oklahoma HEP theory group  
2023, \$50,000 (2 people)  
2022, \$50,000 (2 people)  
2021, \$40,000 (2 people)  
2020, \$84,000 (2 people)  
2019, \$84,000 (2 people)

2018, \$83,000 (2 people)  
 2017, \$45,000 (1 person)  
 2016, \$80,000 (2 people)  
 2015, \$196,000 (2 people)  
 2014, \$200,000 (2 people)  
 2013, \$290,000 (3 people)  
 2012, \$280,000 (3 people)  
 2011, \$280,000 (3 people)  
 2010, \$280,000 (3 people)  
 2009, \$130,000 (1 person)  
 From 1987 to 2008, a member and co-PI of FSU High Energy  
 Physics group (10 faculty) supported by U.S. Dep't of  
 Energy  
 2008, \$1,059,000 (10 people)  
 2007, \$1,129,000  
 2006, \$1,094,000  
 2005, \$1,049,000  
 2004, \$1,097,000  
 2003, \$1,102,000  
 2002, \$1,137,000  
 2001, \$1,125,000  
 2000, \$1,205,500  
 1999, \$965,000  
 1998, \$965,000  
 1997, \$985,000  
 1996, \$993,000  
 1995, \$1,038,000  
 1994, \$1,200,000  
 1993, \$1,080,000  
 1992, \$1,090,000  
 1991, \$1,099,000  
 1990, \$1,120,000  
 1989, \$983,000  
 1988, \$840,000

*Courses taught*

Fall 1990, PHY-2049C (General Physics)  
 Spring 1991, PHY-2049C (General Physics)  
 Fall 1991, PHZ-3113 (Mathematical Physics)  
 Spring 1992, PHZ-3113 (Mathematical Physics)  
 Fall 1992, AST-1002 (Planets, Stars, Galaxies)  
 Spring 1993, AST-1002 (Planets, Stars, galaxies)  
 Fall 1994, AST-1002 (Planets, Stars, Galaxies)  
 Spring 1995, AST-1002 (Planets, Stars, Galaxies)  
 Fall 1995, PHY-5645 (Quantum Mechanics A)  
 Spring 1996, PHY-5646 (Quantum Mechanics B)  
 Fall 1996, PHY-5645 (Quantum Mechanics A)  
 Spring 1997, PHY-5646 (Quantum Mechanics B)  
 Fall 1997, PHY-5667 (Quantum Mechanics C)

Spring 1998, Supersymmetry (at UC-Davis)  
 Spring 1998, PHY-6938 (Path Integrals and Renormalization)  
 Fall 1998, PHY-5667 (Quantum Mechanics C)  
 Spring 1999, PHY-5355 (Quantum Mechanics D)  
 Fall 1999, PHY-5667 (Quantum Mechanics C)  
 Spring 2000, PHZ-5354 (High Energy Physics 1)  
 Fall 2000, PHY-5667 (Quantum Mechanics C)  
 Spring 2001, PHZ-5354 (High Energy Physics 1)  
 Spring 2001, PHY-6938 (Quantum Field Theory B)  
 Fall 2001, PHY-5667 (Quantum Mechanics C)  
 Spring 2002, PHZ-5355 (High Energy Physics 2)  
 Spring 2002, PHY-6938 (Supersymmetry)  
 Fall 2002, PHZ-5606 (General Relativity)  
 Spring 2003, PHY-5354 (High Energy Physics 1)  
 Spring 2003, PHY-5355 (High Energy Physics 2)  
 Fall 2003, PHY-2049C (General Physics)  
 Spring 2004, PHY-5354 (High Energy Physics 1)  
 Fall 2004, PHZ-5606 (General Relativity)  
 Spring 2005, PHZ-5354 (High Energy Physics 1)  
 Spring 2005, PHY-5669 (Quantum Field Theory B)  
 Fall 2005, PHZ-5355 (Beyond the Standard Model)  
 Spring 2006, PHZ-5354 (High Energy Physics 1)  
 Spring 2006, PHY-5669 (Quantum Field Theory B)  
 Summer 2006, (Weak Scale Supersymmetry-26 lectures, University of Freiburg)  
 Spring 2007, PHZ-5354 (High Energy Physics 1)  
 Spring 2007, PHY-5669 (Quantum Field Theory B)  
 Fall 2007, PHZ-5355 (Beyond the Standard Model)  
 Spring 2008, PHY-5669 (Quantum Field Theory B)  
 Fall 2008, Phys-3053 (Physical Mechanics II)  
 Spring 2009, Phys-5970 (Beyond the Standard Model)  
 Spring 2010, Phys-6443 (Advanced Quantum Field Theory)  
 Fall 2010, Phys-3053 (Physical Mechanics II)  
 Fall 2010, Phys-5970 (Gauge theories)  
 Spring 2011, Phys-3043 (Physical Mechanics I)  
 Fall 2011, Phys-4213/5213 (Nuclear& Particle)  
 Spring 2012, Phys-3043 (Physical Mechanics I)  
 Fall 2012, Phys-3053 (Physical Mechanics II)  
 Spring 2013, Phys-5573 (Electrodynamics I)  
 Fall 2013, Phys-4213/5213 (Nuclear& Particle)  
 Spring 2014, Phys-6433 (Quantum Field Theory I)  
 Spring 2015, Phys-5573 (Electrodynamics I)  
 Fall 2015, Phys-1114 (General Physics, non-majors)  
 Spring 2016, Phys-6433 (Quantum Field Theory I)  
 Fall 2016, Phys-3053 (Physical Mechanics II)  
 Fall 2016, Phys-6443 (Advanced QFT)  
 Spring 2017, Phys-5573 (Electrodynamics I)

Fall 2017, Phys-5583 (Electrodynamics II)  
Spring 2018, Phys-6333 (General Relativity)  
Fall 2018, Phys-5583 (Electrodynamics II)  
Fall 2018, Phys-6443 (Advanced QFT)  
Spring 2019, Phys-5573 (Electrodynamics I)  
Fall 2019, Phys-5583 (Electrodynamics II)  
Spring 2020, Phys-5573 (Electrodynamics I)  
Spring 2020, Phys-6433 (Quantum Field Theory I)  
Fall 2020, Phys-5583 (Electrodynamics II)  
Fall 2020, Phys-6443 (Advanced QFT)  
Spring 2021, Phys-6333 (General Relativity)  
Fall 2022, Phys-6443 (Quantum Field Theory II)  
Spring 2023, Phys-6333 (General Relativity)  
Fall 2023, Phys-5583 (Electrodynamics II)  
Spring 2024, Phys-5573 (Electrodynamics I)  
Fall 2024, Phys-5583 (Electrodynamics II)

### **GRADUATE STUDENTS SUPERVISED**

Debra Karatas (Argonne, IIT) Ph.D. May 1989

Chih-Hao Chen (Florida State) Ph.D. July 1995

Ray Munroe (Florida State) Ph.D. July 1996

Mike Brhlik (Florida State) Ph.D. July 1997

Pamela Quintana (Florida State) Ph.D. July 2000

Tadas Krupovnickas (Florida State) Ph.D. July 2004

Jorge O' Farrill (Florida State) Ph. D. December 2004

Daniel Auto (Florida State) Ph. D. December 2004

Azar Mustafayev (Florida State) Ph. D. August 2006

Eun-Kyung Park (Florida State) Ph. D. August 2007

Heaya Summy (Florida State) Ph. D. September, 2008

Shibi Rajagopalan (Oklahoma) Ph. D., September, 2010

Andre Lessa (Oklahoma) Ph. D., August, 2011

Dan Mickelson (Oklahoma) Ph. D., August, 2014

Maren Padeffke-Kirkland (Oklahoma) Ph. D., August, 2015

Hasan Serce (Oklahoma) Ph. D., August, 2016

Mike Savoy (Oklahoma) Ph. D., August, 2017.

Yi Fan Zhang (Oklahoma) Ph. D., October, 2019.

Dibyashree Sengupta (Oklahoma) Ph. D., August 2020.

Shadman Salam (Oklahoma) Ph. D., December 2022.

Robert Wiley Deal (Oklahoma) Ph. D., May 2023.

Dakotah Martinez (Oklahoma) Ph. D., July 2024.

Jessica Bolich (Oklahoma) Ph. D., August 2026 expected.

## **BOOKS**

1. Proceedings of the Dirac Centennial Symposium (edited by H. Baer and A. Belyaev), World Scientific, 2004.
2. Weak Scale Supersymmetry: From Superfields to Scattering Events (H. Baer and X. Tata), Cambridge University Press, 537 pages (2006).

## PUBLICATIONS IN REFEREED JOURNALS

1. Decays of Weak Vector Bosons and t-Quarks into Doubly Charged Higgs Scalars (with V. Barger, W.Y. Keung and R.J.N. Phillips), Phys. Rev. **D26**, 218 (1982).
2. Possible Heavy Lepton Signals at  $\bar{p}p$  Colliders (with V. Barger, A.D. Martin, E.W.N. Glover and R.J.N. Phillips), Phys. Lett. **133B**, 449 (1983).
3. Systematic Procedures for Identifying t-Quarks in  $\bar{p}p$  Collider Events with a Muon and Jets (with V. Barger, A.D. Martin and R.J.N. Phillips), Phys. Rev. **D29**, 887 (1984).
4. Heavy Lepton from W-decay (with V. Barger, A.D. Martin, E.W.N. Glover and R.J.N. Phillips), Phys. Rev. **D29**, 2020 (1984).
5. The Background to t-Quarks Signals from Higher-Order QCD Contributions (with V. Barger, K. Hagiwara, A.D. Martin and R.J.N. Phillips), Phys. Rev. **D29**, 1923 (1984).
6. Fourth Generation Quarks and Leptons (with V. Barger, K. Hagiwara and R.J.N. Phillips), Phys. Rev. **D30**, 947 (1984).
7. Testing Models of Anomalous Radiative Decays of the Z Boson (with V. Barger and K. Hagiwara), Phys. Rev. **D30**, 1513 (1984).
8. Single Production of Very Heavy Particles at  $\bar{p}p$  Colliders (with V. Barger and K. Hagiwara), Phys. Lett. **146B**, 57 (1984).
9. Testing Spinless Boson Parent Models for Anomalous  $l^+l^-\gamma$  Events (with K. Hagiwara and J. Ohnemus), Phys. Rev. **D32**, 82 (1985).
10. Supersymmetry at Bay? (with J. Ellis, D.V. Nanopoulos and X. Tata), Phys. Lett. **153B**, 265 (1985).
11. Multilepton Signals From  $W^\pm$  and  $Z^0$  Decay to Gauginos at  $\bar{p}p$  Colliders (with X. Tata), Phys. Lett. **155B**, 278 (1985).
12. Consequences of Models for Monojet Events from  $Z^0$  Boson Decay (with K. Hagiwara and S. Komamiya), Phys. Lett. **156B**, 117 (1985).
13. Fourth Generation Charged Leptons and Neutrinos Via  $Z^0$  (with V. Barger and R.J.N. Phillips), Phys. Rev. **D32**, 688 (1985).
14. Implications of the t-Quark Signal for Stop Squarks and Charged Higgs Bosons (with X. Tata) Phys. Lett. **167B**, 241 (1986).
15. Component Formulae for Hadroproduction of Left and Right Handed Squarks (with X. Tata), Phys. Lett. **160B**, 159 (1985).
16. Squark Decays to Gauginos at the  $p\bar{p}$  Collider (with J. Ellis, G. Gelmini, D.V. Nanopoulos and X. Tata), Phys. Lett. **161B**, 175 (1985).
17. Can the CERN  $p\bar{p}$  Collider Data Limit Gaugino Masses? (with K. Hagiwara and X. Tata), Phys. Rev. Letter **57**, 294 (1986).
18. Prospects For Supersymmetry at the Fermilab Collider (with E.L. Berger), Phys. Rev. **D34**, 1361 (1986).
19. Gauginos as a Signal for Supersymmetry at  $p\bar{p}$  Colliders (with K. Hagiwara and X. Tata), Phys. Rev. **D35**, 1598 (1987).
20. On the Squark and Gluino Mass Limits from the CERN  $p\bar{p}$  Collider (with D. Karatas and X. Tata), Phys. Rev. **183B** 220 (1986).

21. Detecting Gluinos at Hadron Supercolliders (with V. Barger, D. Karatas and X. Tata), Phys. Rev. **D36**, 96 (1987).
22. Higgs Boson Signals in Superstring Inspired Models at Hadron Supercolliders (with D. Dicus, M. Drees and X. Tata), Phys. Rev. **D36**, 1363 (1987).
23. Multimueon Signals at the SSC From Heavy Quarks (with V. Barger and H. Goldberg) Phys. Rev. Lett. **59**, 860 (1987).
24. Top Quark Signatures at the Tevatron Collider (with V. Barger, H. Goldberg and R. Phillips), Phys. Rev. **D37**, 3152 (1988).
25. Two Photon Backgrounds for the Intermediate Mass Higgs Boson (with J. Owens). Phys. Lett. **205B**, 377 (1988).
26. On the Model Dependence of the Chargino Mass Bound from the CERN Collider Data (with K. Hagiwara and X. Tata). Phys. Rev. **D38**, 1485 (1988).
27. Searching for Supersymmetry at  $e^+e^-$  Supercolliders (with A. Bartl, D. Karatas, W. Majerotto and X. Tata) Int. Journal of Mod. Phys. **A4** 4111(1989).
28. Signals for 4th Generation Quarks and a Heavy t-Quark at the SSC (with V. Barger, H. Goldberg and J. Ohnemus), Phys. Rev. **D38**, 3467 (1988).
29. Expectations for Two and Three Jet Events at HERA (with J. Ohnemus and J.F. Owens) Z.Phys. **C42**, 657(1989).
30. WW Signatures From Top Quarks at the Tevatron (with V. Barger and R. Phillips), Phys. Rev. **D39**, 2809(1989).
31. Dileptons From Chargino and Stop Production at the Tevatron (with V. Barger, R. Phillips and X. Tata), Phys. Lett. **B220**, 303 (1989).
32. Top Quark Detection via W+n Jet Measurements (with V. Barger and R. Phillips), Phys. Lett. **B221**, 398 (1989).
33. Search for Top Quark Decays to Real W Bosons at the Tevatron Collider (with V. Barger and R. Phillips), Phys. Rev. **D39**, 3310(1989).
34. Hadronic W-Decays at HERA (with J. Ohnemus and D. Zeppenfeld), Z.Phys. **C43**, 675 (1989).
35. Effect of Cascade Decays on the Tevatron Gluino and Squark Mass Bounds (with X. Tata and J. Woodside), Phys. Rev. Letters **63**, 352 (1989).
36. A Next-to-Leading-Logarithm Calculation of Jet Photoproduction (with J. Ohnemus and J.F. Owens) Phys. Rev. **D40**, 2844 (1989).
37. Gluino Cascade Decay Signatures at the Tevatron Collider (with X. Tata and J. Woodside) Phys. Rev. **D41**, 906 (1990).
38. A Calculation of the Direct Photon Plus Jet Cross Section in the Next-to-Leading-Logarithm Approximation (with J. Ohnemus and J.F. Owens) Phys. Lett. **B234**, 127 (1990).
39. Constraints on Supersymmetric Particles from the LEP Data on  $Z^0$  Decay Properties (with M. Drees and X. Tata ) Phys. Rev. **D41**, 3414 (1990).
40. Detecting Very Massive Top Quarks at the Tevatron (with V. Barger, J. Ohnemus and R. Phillips) Phys. Rev. **D42**, 54 (1990).



41. A Next-to-Leading-Logarithm Calculation of Direct Photon Production (with J.Ohnemus and J.F.Owens) Phys. Rev. **D42**, 61 (1990).
42.  $Z^0$ +jets+Missing Transverse Momentum Events as a Signal for Supersymmetry at the Tevatron Collider (with X. Tata and J. Woodside), Phys. Rev. **D42**, 1450 (1990).
43. Gluino and Squark Production in Association with Gauginos at Hadron Supercolliders (with D. Dzialo Karatas and X. Tata), Phys. Rev. **D42**, 2259 (1990).
44. Phenomenology of Gluino Decays via Loops and Top Quark Yukawa Coupling (with X. Tata and J. Woodside), Phys. Rev. **D42**, 1568 (1990).
45.  $O(\alpha_s)$  Corrections to Observables from  $p\bar{p} \rightarrow W \rightarrow e\nu X$  (with M. H. Reno), Phys. Rev. **D43**, 2892 (1991).
46. Update of the Effects of Cascade Decays on the Tevatron Gluino and Squark Mass Bounds (with X. Tata and J. Woodside), Phys. Rev. **D44**, 207 (1991).
47. Phenomenology of Light Top Quark Superpartners (with M. Drees, R. Godbole, J. Gunion and X. Tata), Phys.Rev. **D44**,725 (1991).
48. A Complete  $O(\alpha_s)$  Event Generator for  $p\bar{p} \rightarrow W \rightarrow e\nu X$  with Parton Showering (with M. H. Reno), Phys. Rev. **D44**, R3375 (1991).
49. Multilepton Signals from Supersymmetry at Supercolliders (with X. Tata and J. Woodside), Phys. Rev. **D45**, 142 (1992).
50.  $W$  and  $Z$  Production at  $p\bar{p}$  Colliders: Parton Showers Merged with  $O(\alpha_s)$  Monte Carlo Approach (with M. H. Reno), Phys. Rev. **D45**, 1503 (1992).
51. Observability of  $\gamma\gamma$  Decays of Higgs Bosons from Supersymmetry at Hadron Supercolliders (with M. Bisset, C. Kao and X. Tata), Phys. Rev. **D46**, 1067 (1992).
52. Snagging the Top Quark with a Neural Net (with D. Dzialo-Karatas and G. Giudice), Phys. Rev. **D46**, 4901 (1992).
53. Supercollider Signals from Gluino and Squark Decays to Higgs Bosons (with M. Bisset, X. Tata and J. Woodside), Phys. Rev. **D46**, 303 (1992).
54. The Search for Higgs Bosons of Minimal Supersymmetry: Impact of Supersymmetric Decay Modes (with M. Bisset, D. Dicus, C. Kao and X. Tata), Phys. Rev. **D47**, 1062 (1993).
55. Search for the Pseudoscalar Higgs Boson of Minimal Supersymmetry via Its  $ZH_l$  Decay Mode at Hadron Supercolliders, (with C. Kao and X. Tata), Phys. Lett. **B303**, 284 (1993).
56. Probing Charginos and Neutralinos Beyond the Reach of LEP at the Tevatron Collider (with X. Tata), Phys. Rev. **D47**, 2739 (1993).
57.  $O(\alpha_s)$  Monte Carlo Approach to  $W$ +Higgs Associated Production at Hadron Supercolliders, (with B. Bailey and J. Owens), Phys. Rev. **D47**, 2730 (1993).
58. QCD Corrections to Leptonic and Hadronic Observables from  $p\bar{p} \rightarrow W^+ \rightarrow \bar{\tau}\nu_\tau X$ , (with M. H. Reno), Phys. Rev. **D47**, 3906 (1993).
59. New Signals from Gluinos and Squarks of Supergravity at the Fermilab Tevatron Collider (with C. Kao and X. Tata), Phys. Rev. **D48**, R2978 (1993).
60. An Estimate of Jet Activity in  $t\bar{t}$  Events, (with C. H. Chen and M. H. Reno), Phys. Rev. **D 48**, 5168 (1993).

61. Aspects of Chargino-Neutralino Production at the Fermilab Tevatron Collider (with C. Kao and X. Tata), Phys. Rev. **D48**, 5175 (1993).
62. Detecting Sleptons at Hadron Colliders and Supercolliders, (with C. H. Chen, F. Paige and X. Tata), Phys. Rev. **D49**, 3283 (1994).
63. Detecting Higgs Boson Decays to Neutralinos at Hadron Supercolliders, (with M. Bisset, C. Kao and X. Tata), Phys. Rev. **D50**, 316 (1994).
64. Supercollider Signatures of Supergravity Models with Yukawa Unification, (with M. Drees, C. Kao, M. Nojiri and X. Tata), Phys. Rev. **D50**, 2148 (1994).
65. Trileptons from Chargino-Neutralino Production at the CERN Large Hadron Collider, (with C.H. Chen, F. Paige and X. Tata), Phys. Rev. **D50**, 4508 (1994).
66. The Search for Top Squarks at the Fermilab Tevatron Collider, (with J. Sender and X. Tata), Phys. Rev. **D50**, 4517 (1994).
67. Tevatron and LEP-II Probes of Minimal and String-Motivated Supergravity Models, (with J. Gunion, C. Kao and H. Pois), Phys. Rev. **D51**, 2159 (1995).
68. Multi-channel Search for Minimal Supergravity at  $p\bar{p}$  and  $e^+e^-$  Colliders, (with C.H. Chen, R. Munroe, F. Paige and X. Tata), Phys. Rev. **D51**, 1046 (1995).
69. Impact of R-Parity Violation on Supersymmetry Searches at the Fermilab Tevatron Collider, (with C. Kao and X. Tata), Phys. Rev. **D51**, 2180 (1995).
70. Signals for Minimal Supergravity at the CERN Large Hadron Collider: Multijet plus Missing Energy Channel, (with C. H. Chen, F. Paige and X. Tata), Phys. Rev. **D52**, 2746 (1995).
71. Supersymmetry Reach of an Upgraded Tevatron Collider, (with C. H. Chen, C. Kao and X. Tata), Phys. Rev. **D52**, 1565 (1995).
72. Prospects for Supersymmetry at LEP2, (with M. Brhlik, R. Munroe and X. Tata), Phys. Rev. **D52**, 5031 (1995).
73. Cosmological Relic Density from Minimal Supergravity with Implications for Collider Physics, (with M. Brhlik), Phys. Rev. **D53**, 597 (1996).
74. Signals for Minimal Supergravity at the CERN Large Hadron Collider II: Multilepton Channels, (with C. H. Chen, F. Paige and X. Tata), Phys. Rev. **D53**, 6241 (1996).
75. Multiple Parton Emission Effects in Next-to-Leading-Order Direct Photon Production, (with M. H. Reno), Phys. Rev. **D54**, 2017 (1996).
76. Simultaneous Search for Two Higgs Bosons of Minimal Supersymmetry at the LHC, (with S. Abdullin, C. Kao, N. Stepanov and X. Tata), Phys. Rev. **D54**, 6728 (1996).
77. Supersymmetry Reach of Tevatron Upgrades: A Comparative Study, (with C. H. Chen, F. Paige and X. Tata), Phys. Rev. **D54**, 5866 (1996).
78. Supersymmetry Studies at Future Linear  $e^+e^-$  Colliders, (with R. Munroe and X. Tata), Phys. Rev. **D54**, 6735 (1996).
79. Constraints on the Minimal Supergravity Model from Non-Standard Vacua, (with M. Brhlik and D. Castano), Phys. Rev. **D54**, 6944 (1996).
80. Impact of Hadronic Decays of the Lightest Neutralino on the Reach of the CERN LHC, (with C. H. Chen and X. Tata), Phys. Rev. **D55**, 1466 (1997).
81. QCD Improved  $b \rightarrow s\gamma$  Constraints on the Minimal Supergravity Model, (with M. Brhlik), Phys. Rev. **D55**, 3201 (1997).

82. Signals from the Minimal Gauge-Mediated SUSY Breaking Model for the Fermilab Tevatron Collider, (with M. Brhlik, C. H. Chen and X. Tata), Phys. Rev. **D55**, 4463 (1997).
83. Collider Phenomenology for Supersymmetry with Large  $\tan\beta$  (with C. H. Chen, M. Drees, F. Paige and X. Tata), Phys. Rev. Letters **79**, 986 (1997).
84. Neutralino Dark Matter in Minimal Supergravity: Direct Detection vs. Collider Searches (with M. Brhlik), Phys. Rev. **D57**, 567 (1998).
85. Trilepton Higgs Signal at Hadron Colliders, (with J. Wells), Phys. Rev. **D57**, 4446 (1998).
86.  $b \rightarrow s\gamma$  Constraints on the Minimal Supergravity Model at Large  $\tan\beta$ , (with M. Brhlik, D. Castano and X. Tata), Phys. Rev. **D58**, 015007 (1998).
87. Next-to-Leading Order Slepton Pair Production at Hadron Colliders, (with B. Harris and M. H. Reno), Phys. Rev. **D57**, 5871 (1998).
88. Supersymmetry Reach of Tevatron Upgrades: The Large  $\tan\beta$  Case (with C. H. Chen, M. Drees, F. Paige and X. Tata), Phys. Rev. **D58**, 075008 (1998).
89. LHC Reach for Gauge Mediated Supersymmetry Breaking Models via Prompt Photon Channels, (with P. Mercadante, F. Paige, X. Tata and Y. Wang), Phys. Lett **B435**, 109 (1998).
90. A Heavy Gluino as the Lightest Supersymmetric Particle, (with K. Cheung and J. F. Gunion), Phys. Rev. **D59**, 075002 (1999).
91. The Reach of LEP2 and Fermilab Tevatron Upgrades for Higgs Bosons in Supersymmetric Models, (with B. Harris and X. Tata), Phys. Rev. **D59**, 015003 (1999).
92. Minimal Supergravity at the CERN LHC for Large  $\tan\beta$ , (with C. H. Chen, M. Drees, F. Paige and X. Tata), Phys. Rev. **D59**, 055014 (1999).
93. Searching for Bottom Squarks at Luminosity Upgrades of the Fermilab Tevatron Collider, (with P. Mercadante and X. Tata), Phys. Rev. **D59**, 015010 (1999).
94. The Reach of Fermilab Tevatron Upgrades for  $SU(5)$  Supergravity Grand Unified Models with Non-Universal Gaugino Masses, (with G. Anderson, C. H. Chen, and X. Tata), Phys. Rev. **D61**, 095005 (2000).
95. The Reach of Tevatron Upgrades for Gauge-Mediated Supersymmetry Breaking Models, (with P. Mercadante, X. Tata and Y. Wang), Phys. Rev. **D60**, 055001 (1999).
96. Trilepton Signal for Supersymmetry at the Fermilab Tevatron Revisited, (with M. Drees, F. Paige, P. Quintana and X. Tata), Phys. Rev. **D61**, 095007 (2000).
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## RECENT TALKS ON RESEARCH- Aug. 1990- present

### INVITED TALKS AT MEETINGS

1. Review of Supersymmetry, BSM Subgroup of Snowmass Workshop on the SSC, Snowmass, Colorado, July, 1990.
2. Review of Top Quark Physics, Workshop on High Energy Phenomenology, Calcutta, India, January 1991.
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5. Higgs Bosons from Supersymmetry, UC-Davis workshop on Higgs boson physics, Davis California, July 1991.
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10. Experimental Consequences of Supersymmetry, International Workshop on Supersymmetry and Unification of Fundamental Interactions, Northeastern University, Boston, March, 1993.
11. The Search for Supersymmetry:  $e^+e^-$  and  $pp$  Colliders Compared, Workshop on Physics and Experiments with Linear  $e^+e^-$  Colliders, Hawaii, April, 1993.
12. Simulating Supersymmetry: convenor's report, Workshop on Physics at Current and Future Accelerators, Argonne, IL June, 1993.
13. Expectations for Supersymmetry at the Tevatron Collider, Aspen Winter Conference on Particle Physics, Aspen, CO, January, 1994.
14. Revealing Minimal Supergravity with Collider Experiments, at Physics from Planck Scale to Electroweak Scale Conference, Warsaw, Poland, September, 1994.
15. The Search for Weak Scale Supersymmetry, plenary talk given at Beyond the Standard Model IV meeting, Lake Tahoe, CA, December, 1994.
16. Simulating Supersymmetry with ISAJET, at conference on the CMS detector at the CERN LHC, UCLA, February, 1995.
17. The Search for Supersymmetry at Collider Experiments, at SUSY '95 conference, Paris, France, May, 1995.
18. The Search for Supersymmetry:  $e^+e^-$  and  $pp$  Supercolliders Compared, at Workshop on Physics Potential of a High Energy  $e^+e^-$  Linear Collider, Estes Park, Colorado, June, 1995.
19. Supersymmetry with the CMS Detector, CMS Collaboration meeting, Lake Tahoe, CA, September, 1995.
20. Search for Higgs Bosons of the MSSM at LEP2 and NLC, Second Workshop on Physics Potential of a High Energy  $e^+e^-$  Linear Collider, Fermilab, November, 1995.

21. Neutralino Relic Density with Implications for Collider Physics, talk given at SUSY96, College Park, Md., May, 1996.
22. Event Generation for Supersymmetry, pedagogical lecture given at New Directions for High Energy Physics meeting, Snowmass, CO, July 1996.
23. Summary of Supersymmetry Theory Working Group, summary plenary talk given at New Directions for High Energy Physics meeting, Snowmass, CO, July 1996.
24. R-Violation at the LHC, invited talk at the CERN LHCC meeting on Supersymmetry at the LHC, October, 1996.
25. Prospects for Supersymmetry at Future Colliders, SUSY97 meeting, Philadelphia, May, 1997.
26. Prospects for Supersymmetry at Collider Experiments, Beyond the Desert meeting, Bavaria, Germany, June 1997.
27. Concluding Remarks, at Beyond the Desert meeting, Bavaria, Germany, June 1997.
28. Signals for gauge Mediated SUSY Breaking Models at the Tevatron, at Aspen Center for Physics, August, 1997.
29. Comparison of Lepton and HAdron Colliders for the Discovery of Supersymmetry, at Workshop on Physics Potential and Development of a  $\mu^+\mu^-$  Collider, San Francisco, December, 1997.
30. New Perspectives and Developments in the MSSM, CERN Physics at the LHC meeting, February, 1998.
31. Neutralino Dark Matter in Minimal Supergravity: Direct Detection vs. Collider Searches, Dark Matter 1998 meeting, Santa Monica, February, 1998.
32. Status of SUSY Event Generators, at UC-Davis D0 workshop on New Phenomena, March, 1998.
33. Status of ISAJET, at FNAL Run 2 workshop meeting, September, 1998.
34. New SUGRA Phenomenology, at FNAL Run 2 workshop meeting, September, 1998.
35. Consequences of SUSY Models for Linear  $e^+e^-$  Colliders, at Workshop on Physics and Detectors for Future  $e^+e^-$  Linear Colliders, Colorado, September, 1998.
36. Report of the Event Generator Subgroup, at Summary meeting for the FNAL SUSY Higgs workshop, November, 1998.
37. ISAJET including beamstrahlung, at American Linear Collider Detector Simulation Study 99 meeting, Fermi National Accelerator Lab, IL, February, 1999.
38. Supersymmetry: The Interface Between Theory and Experiment, for the Higgs and Supersymmetry: Search and Discovery meeting, University of Florida, March, 1999.
39. Consequences of SUSY SO(10) GUT Models, at Argonne SUSY Higgs meeting, May, 2000.
40. Precision measurement of third generation slepton masses at the NLC, Workshop of physics and detectors for future  $e^+e^-$  linear colliders, Johns-Hopkins University, March, 2001.
41. Supersymmetric Event Generation with ISAJET, Fermilab Workshop on Monte Carlo Event Generators for Run 2, Fermilab, April, 2001.
42. Impact of Muon Anomalous Magnetic Moment on Supersymmetric Theories, Pheno 2001 Symposium, Madison, WI, May, 2001.
43. Revealing SUSY at Colliders, SUSY 2001 meeting, Dubna, Russia, June, 2001.
44. Supersymmetric Matter Beyond 1 TeV, talk at Snowmass working group E4, July, 2001.

45. Supersymmetry at  $e^+e^-$  Linear Colliders, talk at Snowmass working group P4, July, 2001.
46. Dark Matter from Supersymmetric  $SO(10)$  Grand Unified Theories, talk at Snowmass P4 group, July, 2001.
47. Education through Videoteleconferencing at the National Underground Science Lab, Lead, South Dakota, October, 2001.
48. Neutralino Relic Density in Supergravity GUTs, talk given at International Meeting on Sources and Detection of Dark Matter, UCLA, February, 2002.
49. SUSY/Beyond the SM at a Linear Collider, talk at Loopfest meeting, Brookhaven Nat'l Lab, May, 2002.
50. Viable supersymmetric models with non-universal gaugino mediated SUSY breaking, talk at Frontiers Beyond the Standard Model meeting, U. of Minnesota, October, 2002.
51. Supersymmetry at the Large Hadron Collider, at LHC/ LC comparison meeting, Fermilab, Dec. 2002.
52. Phenomenology of Models from mSUGRA to Yukawa Unification, at SUGRA20 meeting, Northeastern University, Boston, March 2003.
53. Prospects for SUSY at the CERN LHC, at Pheno-03 meeting, UW-Madison, May 2003.
54. Constraints on mSUGRA Model and Prospects for Colliders, at SUSY03 meeting, Tucson, AZ, June, 2003.
55. Event Generation of SM and SUSY Processes at LCs using Isajet, at ALCPG meeting (SLAC/Stanford), January, 2004.
56. Linear Collider Capabilities for Supersymmetry in Dark Matter Allowed Regions of the mSUGRA Model, at ALCPG meeting (SLAC/Stanford), January, 2004.
57. SUSY Dark Matter with Implications for Collider Searches, at Dark Matter/Dark Energy 2004 meeting, UCLA, February, 2004.
58. Neutralino Dark Matter and the Linear Collider, at LCWS04 meeting, Paris, France, April, 2004.
59. Using Isajet to Simulate SUSY at  $e^+e^-$  Colliders, at LCWS04 meeting, Paris, France, April, 2004.
60. Review of Cosmological Implications for the Linear Collider at LCWS04 meeting, Paris, France, April, 2004.
61. Indirect, Direct and Collider Detection of Neutralino Dark Matter, at Argonne SUSY, Higgs, ED workshop, May, 2004.
62. Detecting Neutralino Dark Matter with the Linear Collider, at North American Linear Collider workshop, Victoria, BC, July, 2004.
63. SUSY Normal Mass Hierarchy and Prospects for the LC, at North American Linear Collider workshop, Victoria, BC, July, 2004.
64. Indirect, Direct and Collider Detection of SUSY Dark Matter, at Particles, Strings, Cosmology meeting, Northeastern University, Boston, August, 2004.
65. Supersymmetry, Dark Matter and Collider Physics, at TeV4LHC meeting, Fermilab, IL, September, 2004.
66. Indirect, Direct and Collider Detection of SUSY Dark Matter, at Dark Matter, 2004 meeting, Texas A&M University, College Station, TX, October, 2004.
67. SUSY Theory Overview, at XIII International Workshop on Deep Inelastic Scattering, April, 2005.

68. Constraints from present data on Supersymmetric Parameters, plenary talk at International Workshop on Linear Collider, Snowmass, CO, August, 2005.
69. Dark Matter: Theory Overview, plenary talk at Southeast Section of American Physical Society (SESAPS) meeting, Gainesville, FL, November, 2005.
70. Dark Energy: A Pedagogic Review, plenary talk at Southeast Section of American Physical Society (SESAPS) meeting, Gainesville, FL, November, 2005.
71. Collider perspective: theory, at Complementarity between Dark Matter Searches and Collider Experiments meeting, Los Angeles, CA, February, 2006.
72. Prospects for SUSY at the CERN LHC, panel member, presented at 14th International Conference on Supersymmetry and the Unification of Fundamental Interactions, Irvine, CA, June, 2006.
73. Isasugra, Isatools and isajet, presented at Tools for SUSY and the New Physics conference, LAPTH-LAPP, Annecy, France, June, 2006.
74. Four lectures at Chinese Summer school on elementary particle physics: 1. Supersymmetry: Introduction 2. Supersymmetric models, 3. Dark Matter, 4. SUSY at Colliders. Beijing, China, August, 2006
75. Event generators for supersymmetry, presented at Particles, Strings, Cosmology (PAS-COS) conference, Ohio State University, September, 2006.
76. The future of High Energy Physics: the LHC era and beyond, presented at Southeastern American Physical Society (SESAPS) meeting, Williamsburg, November, 2006.
77. Beyond the Standard Model: Resolving the mystery of dark matter, presented at New Mexico consortium's Institute for Advanced Study, April 21, 2007.
78. Particle Dark Matter, presented at Pheno '07, University of Wisconsin, May 8, 2007.
79. SUSY Dark Matter Models, presented at International symposium on particle Physics and Cosmology, Texas A&M University, May 15, 2007.
80. SUSY Dark Matter Models, presented at Brookhaven Forum: New Horizons at Colliders workshop, Brookhaven national Lab, May 30, 2007.
81. Dark Matter in Models with Mirage Unification, presented at Dark Side of the Universe meeting, University of Minnesota, June 5, 2007.
82. Three lectures on Supersymmetry at the Large Hadron Collider, at PreSUSY07 summer school, Karlsruhe, Germany, July 23-25, 2007: 1. Supersymmetric models, 2. Production cross sections and decay rates, 3. SUSY signatures and backgrounds at the LHC.
83. The US program on direct detection of dark matter, at Southeast APS meeting, Nashville, TN, November 8, 2007.
84. SUSY and cosmology, at Aspen winter conference on electroweak symmetry breaking, Jan. 16, 2008.
85. Models for dark matter and detection prospects, at Ohio State University CCAP meeting on DUSEL theory, April 5, 2008.
86. Supersymmetric Dark Matter at Particle Physics and Cosmology meeting, University of New Mexico, May 22, 2008.
87. Four lectures: Missing energy signals at the LHC, Theoretical Advanced Study Institute (TASI), Boulder, CO, June 23-27, 2008.
88. Theoretical perspective, talk at Atlas top and BSM jamboree, Sept. 9, 2008.
89. SUSY dark matter models, talk at Dark matter at the Cross roads meeting, DESY, Oct. 1, 2008.

90. The CERN LHC and the dark matter connection, at ENTApP 2009 meeting, CERN, February, 2009.
91. Why SUSY GUTs imply the bulk of dark matter is made of axions, Cook's Branch meeting, Houston, TX March, 25, 2009.
92. Supersymmetry and dark matter, at Shedding Light on Dark Matter meeting, University of Maryland, April 2, 2009.
93. Physics beyond the Standard Model, Tenth Conference on the intersection of Particle and Nuclear Physics, SanDiego, May 26, 2009.
94. Leptonic signatures for supersymmetry, at 17th International Conference on Supersymmetry and the Unification of Fundamental Interactions, Northeastern University, June 5, 2009.
95. Dark matter at the LHC, at 5th Patras workshop on axions, WIMPs and WISPs, Durham, UK, July 13, 2009.
96. Early SUSY search at LHC via multi-muon plus jets events, CERN BSM workshop, Geneva, Aug. 3, 2009.
97. Two lectures given at Karlsruhe/Freudenstadt meeting, Sept. 30-Oct. 1, 2009: 1. SUSY and Dark Matter, and 2. SUSY at the LHC.
98.  $SO(10)$  SUSY GUTs with mixed axion/axino cold dark matter, Axions 2010 meeting, University of Florida, Jan. 15, 2010.
99. Capability of LHC to discover supersymmetry with  $\sqrt{s} = 7$  TeV and  $1 \text{ fb}^{-1}$ , Cook's Branch meeting, Houston, TX April 14, 2010.
100. Beyond the Standard Model at LHC with  $\sqrt{s} = 7$  TeV and  $1 \text{ fb}^{-1}$ , Atlas jamboree, University of Texas-Arlington, May 17, 2010.
101. Mixed axion/axino cold dark matter and the LHC, talk at GGI mini-workshop on LHC and dark matter, Florence, Italy, June, 2010.
102. Theoretical expectations for detection of dark matter at the LHC, plenary talk at Identification of Dark Matter, 2010 meeting, Montpellier, France, July 30, 2010.
103. Neutralino dark matter, plenary talk at 2010 Workshop on Major DUSEL Physics Topics, SDSMT, Rapid City, South Dakota, October 1, 2010.
104. Difficult scenarios for SUSY at LHC, talk at UC Davis SUSY Recast meeting, April 8, 2011.
105. Mixed axion/LSP dark matter, talk at U. New Mexico mini-workshop on Dark Matter, May 27, 2011.
106. Supersymmetry at the LHC, plenary talk at Cosmo 2011 conference, Porto, Portugal, August, 2011.
107. Axions, saxions and axinos: a new dark matter paradigm, plenary talk given at Scalars 2011 conference, Warsaw, Poland, August, 2011.
108. From simplified models to cascade decays and back, talk at CERN WG2 meeting, CERN, October 31, 2011.
109. Mixed axion/LSP dark matter talk at Pitt-PACC dark matter meeting, University of Pittsburgh, November 15, 2011.
110. Neutralinos, axions, axinos and saxions, talk at U. Maryland JSI meeting, Annapolis, MD, November 30, 2011.
111.  $WZ + MET$ ,  $Wh + MET$  and natural SUSY, talk at CERN WG2 meeting, March 29, 2012.



112. Axions in SUSY, and what we will learn from accelerators (talk at Vistas in Axion Physics meeting, University of Washington, April, 2012.
113. Mixed axion higgsino dark matter from Natural SUSY, talk at Center for Theoretical Underground Physics, Lead South Dakota, July 12, 2012.
114. Summary of dark matter session, talk at Center for Theoretical Underground Physics, Lead South Dakota, July 20, 2012.
115. Radiative natural supersymmetry, University of Minnesota Frontiers Beyond the Standard Model meeting, October 11, 2012
116. Discovery of a Higgs-like resonance and implications for what's next, invited plenary talk at Fall APS Prairie Section meeting, Nov. 9, 2012, Lawrence, KS.
117. Axion, WIMP, LHC and ILC complementarity, at Closing in on Dark Matter meeting, Aspen, January, 2013.
118. Perspectives on SUSY in the post LHC8 era, at SLAC Cosmic Frontiers workshop, Stanford, March 7, 2013.
119. Post LHC8 SUSY benchmarks for ILC physics, at BNL Energy Frontier workshop, April 3, 2013.
120. Radiatively driven natural supersymmetry, UC-Davis workshop on The LHC Higgs signal: Fits, Models and BSM Implications, April 26, 2013.
121. Implications of LHC for dark matter: a higgsino/axion admixture, at Ohio state CCAP meeting, Dark Matter: from Space to Supercolliders, May 13, 2013.
122. Introduction to SUSY tools meets models (Bethe Center for Theoretical Physics, Bonn, SUSY Tools meeting, May 27, 2013.
123. Why the ILC must be built: Perspective from SUSY BSM European Linear Collider Workshop ECFA LC2013, May 29, 2013.
124. Supersymmetry and dark matter, Particle Physics and Cosmology meeting, Deadwood, SD, July 8, 2013.
125. Panel member, Particle Physics and Cosmology PPC meeting, Deadwood, SD, July 8, 2013.
126. Why is theory important: guidance from theory for future HEP facilities, theory panel, Snowmass/Minnesota, Aug. 2, 2013.
127. Mixed axion/higgsino dark matter from radiatively-driven natural supersymmetry, University of Minnesota Gamma Ray Sky meeting, Oct. 10, 2013.
128. How conventional measure over-estimate electroweak fine-tuning in SUSY theory, 3rd KIAS Workshop on Particle physics and Cosmology, Seoul, Korea, Nov. 11, 2013.
129. Radiatively-driven natural supersymmetry with implications for LHC, ILC axion and WIMP searches, DESY Helmholtz Alliance Theorist of the Month talk, March 19, 2014.
130. Testing SUSY naturalness: Physics at a Higgsino Factory, Americas workshop on Linear Colliders, Fermilab, May 12-16, 2014.
131. Mixed axion/higgsino dark matter in natural SUSY, Mitchell workshop on Collider and Dark Matter Physics, TAMU University, May 12-15, 2014.
132. Supersymmetric naturalness: the best reason to build ILC, Key Aspects Exploring the Road to Unification meeting, IPMU, Tokyo, March 25, 2015.
133. Beyond the Standard Model physics in the LHC13 era, XXIII International Workshop on Deep Inelastic Scattering (DIS2015), Southern Methodist University, Dallas, April 27, 2015.

134. Where is Supersymmetry? plenary talk at PittPACC Pheno meeting, May 6, 2015.
135. SUGRA gauge theories strike back, talk at TAMU collider & dark matter and Arnowitt fest meeting, May 18, 2015.
136. SUSY with radiatively-driven naturalness, talk at CETUP 2015, Lead, South Dakota, June 25, 2015.
137. Axion dark matter, invited review talk at PPC2015 meeting, Deadwood, South Dakota, June 29, 2015.
138. Discussion of non-thermal dark matter, CETUP meeting, lead South Dakota, June 23, 2015.
139. SUSY dark matter, axions, LHC and ILC, Dark Side of Universe meeting, Kyoto, Japan, Dec. 16, 2015.
140. Naturalness and mixed axion-higgsino dark matter, Sources and Detection of Dark matter and Dark Energy in the Universe meeting, UCLA, Feb. 17-19, 2016.
141. SUSY with radiatively-driven naturalness and implications for LHC, ILC, WIMP and axion searches, plenary talk at SUSY 2016 meeting, Melbourne, AU, July 5, 2016.
142. Multi methods for Multi-boson Production in unnatural and natural Supersymmetry, Multi-boson Interaction meeting, Aug. 26, 2016, Madison, WI.
143. SUSY naturalness, PQ symmetry and the landscape, SUSY alive and well meeting, IFT, Madrid, Spain, Sept. 28, 2016.
144. Beyond the Standard Model perspective: Why ILC is the right machine for SUSY discovery, Dec. 8, 2016 at LCWS2016 meeting, Morioka, Japan.
145. What does it take to discover or falsify weak scale SUSY? talk at Olivefest, May 17, 2017, University of Minnesota.
146. Why SUSY is still natural, talk at Bethe Forum on SUSY breakdown confronting LHC and other data, May 29, 2017, Bonn, Germany.
147. Signatures for SUSY with light higgsino: from here to HL- and HE-LHC , talk at (Re)interpreting LHC new physics search results: tools and methods, Fermilab LPC, Oct. 18, 2017.
148. How LHC tells us that there is excellent potential for ILC to discover new particles, remote talk at International Workshop on Future Linear Colliders, Strassburg, France, Oct. 23-27, 2017.
149. Supersymmetry at HL and HE LHC, talk given as HL/HE LHC meeting, Fermilab, IL, April 6, 2018.
150. Measures of EW naturalness in SUSY models, talk given at DESY Naturalness workshop, Hamburg, Germany, April 25, 2018.
151. Natural SUSY from the String Landscape, talk given at DESY Naturalness workshop, Hamburg, Germany, April 26, 2018.
152. SUSY particle production and cascade decays in Isajet, talk at A Celebration of the Life and Accomplishments of Frank Paige meeting, Brookhaven National Lab, May 2, 2018.
153. Expectations for SUSY from string theory, talk at Planck 2018 meeting, Bonn, Germany, May 21, 2018.
154. Update on reach of HL- and HE-LHC for natural SUSY, vidyo talk to CERN HL/HE-LHC meeting, May 21, 2018.
155. Status of Weak Scale Supersymmetry, talk at PaSCos 2018 meeting, Case Western Reserve University, June 7, 2018.

156. The ILC as a natural SUSY discovery machine and precision microscope: from light higgsinos to tests of unification, LCWS2018, Arlington TX, Oct. 23, 2018.
157. Dimitri and the advent of SUSY phenomenology (talk at Mitchell Institute meeting, May 15, 2019).
158. Naturalness vs. stringy naturalness (talk at Mitchell Institute meeting, May 16, 2019).
159. SUSY phenomenology, plenary talk at SUSY 2019 meeting, Corpus Christi, TX May 21, 2019.
160. Motivation for SUSY, invited parallel talk at SUSY 2019, Corpus Christi, TX May 21, 2019.
161. Natural SUSY at HL/HE-LHC, invited talk at Future Opportunities for High Energy accelerators, Madrid, Spain, June 27, 2019.
162. SUSY, naturalness, landscape, axions, invited talk at TomWeilerFest, Vanderbilt University, Aug. 14, 2019.
163. Compressed EWinos, Fermilab/Snowmass 2021 viz Zoom, August 31, 2020.
164. A primer on naturalness, Snowmass 2021 EF08 meeting via Zoom, Sept. 17, 2020.
165. Supersymmetry, naturalness and the landscape, invited talk via zoom at Energy Frontiers meeting, National Taiwan University, Taipei, Oct. 5, 2020.
166. Anomalous muon magnetic moment, supersymmetry, naturalness, LHC search limits and the landscape, EF08 meeting, May 14, 2021.
167. Anomalous muon magnetic moment, supersymmetry, naturalness, LHC search limits and the landscape,  $(g - 2)_\mu$  Days meeting, CERN, June 2, 2021.
168. SUSY predictions from the string landscape and naturalness, plenary talk at SUSY2021, Beijing, August 23, 2021.
169. Implications of naturalness and the string landscape for LHC SUSY searches, talk at New directions for SUSY searches with LHC Run 3 data, CERN, Nov. 16, 2021.
170. Supersymmetric models, two invited lectures at ICTS Hunting SUSY at HL-LHC meeting, Mumbai, India, Nov. 23, 2021.
171. Heavy Higgs decay to SUSY at FCC-hh (invited talk at FCC Physics Workshop), Liverpool UK, Feb. 7, 2022.
172. Supersymmetry from the string landscape (invited talk at PPC 2022 meeting), Washington University, St. Louis MO, June 6, 2022.
173. SUSY dark matter: waxing, not waning (invited talk at UCLA Dark matter 2003), March 30, 2023.
174. Higgs physics at future accelerators (invited talk at Corfu future accelerators meeting), April 25, 2023.
175. Introduction to Supersymmetry Phenomenology, invited lectures at preSUSY meeting, Southampton England, July 12, 2023.
176. Supersymmetry Phenomenology including dark matter (invited plenary talk at 30th International Workshop on Supersymmetry and Unification, Southampton, England, July 17, 2023).
177. Beyond the Standard Model Overview, Moriond QCD, April 3, 2024. La Thuile, Italy.
178. Weak scale SUSY emergent from the string landscape (at Supersymmetry 2024 meeting, Madrid, Spain, June 10, 2024).

179. Implications of the stringlandscapae for LHC SUSY searches (at Supersymmetry 2024 meeting, Madrid, Spain, June 10,2024).
180. Status of weak scale supersymmetry after LHC Run 2 and ton-scale noble liquid WIMP searches (invited plenary talk at Identification of Dark Matter meeting, L'Aquila, Italy, July 12, 2024).

### OTHER TALKS AT MEETINGS

1. Supersymmetry: Present Status and Future Prospects, Oklahoma meeting on Beyond the Standard Model, Norman, Oklahoma, October 1990.
2. W/Z Production: Showers Plus QCD, Workshop on Monte Carlo Methods, Amsterdam, April, 1991.
3. Multileptons from Supersymmetry, DPF91 meeting, Vancouver, Canada, August 1991.
4. W/Z Production: Showers Plus QCD, DPF91 meeting, Vancouver, Canada, August 1991.
5. ISASUSY, Symposium on the Supercollider, Madison, Wisconsin, April 1992
6. Supersymmetry, Beyond the Standard Model meeting, Ottawa, Canada, June 1992
7. Experimental Consequences of Supersymmetry, DPF meeting, Fermilab, Illinois, November, 1992.
8. Merging Parton Showers with Higher Order QCD Monte Carlos, Monte Carlo 1993 Conference, Florida State University, February, 1993.
9. Signatures of Supergravity Models with Yukawa Unification, Physics Doesn't Stop Conference, Madison, Wisconsin, April, 1994.
10. Progress in Supersymmetry, Johns-Hopkins DPF Workshop, Baltimore, May, 1994.
11. Supersymmetry at Tevatron and LHC, International Workshop on Supersymmetry and Unification of Fundamental Interactions, Ann Arbor, MI, May, 1994.
12. Constraints on the Minimal Supergravity Model, at International Symposium on Recent Developments in Phenomenology, Madison, WI, March, 1997.
13. Explaining the Direct Photon Anomaly, at International Symposium on Recent Developments in Phenomenology, Madison, WI, March, 1997.
14. Revealing SUSY at Colliders, at Thirty Years of Supersymmetry workshop, Minneapolis, MN, October, 2000.
15. Dark Matter from Supersymmetric  $SO(10)$  Grand Unified Theories, talk at National Underground Science Lab meeting, Lead, South Dakota, October, 2001.
16. Yukawa Coupling Unification in Supersymmetric Models, Pheno 2002 meeting, Madison, WI, April, 2002.
17. Neutralino Dark Matter and the ILC, talk at International Linear Collider Workshop, March, 2005, Stanford University.
18. Crazy SUSY Scenarios for the ILC That Just Might Be True, Linear Collider Workshop, March, 2005, Stanford University.
19. LHC/ILC Synergy for Supersymmetry, talk at the ILC/LHC Synergy meeting, Stanford Linear Accelerator Center, March, 2005.
20. Mixed Wino Dark Matter, talk at Pheno'05 conference, Madison, WI, May, 2005.
21. Direct, Indirect and Collider Detection of SUSY Dark Matter, at TeV Particle Astrophysics meeting, Fermilab, July, 2005.
22. Progress report on Isajet, talk at International Workshop on Linear Collider, Snowmass, CO, August, 2005.

23. SUSY with non-universal gaugino masses, talk at International Workshop on Linear Collider, Snowmass, CO, August, 2005.
24. Neutralino dark matter in SUSY models with and without universality, at Sources and Detection of Dark Matter and Dark Energy in the Universe meeting, Marina del Rey, February, 2006.
25. Supersymmetry at Colliders in Models with non-universal soft terms, presented at 14th International Conference on Supersymmetry and the Unification of Fundamental Interactions, Irvine, CA, June, 2006.
26. Prospects for models with mirage unification, presented at Particles, Strings, Cosmology (PASCOS) conference, Ohio State University, September, 2006.
27. Dark matter detection in models with a well-tempered neutralino, presented at SUSY07, Karlsruhe, August, 2007.
28. The magic of  $10^{-8}$  pb in SUSY dark matter searches, presented at DUSEL town meeting, Washington, DC, Nov. 3, 2007.
29. Dark matter in  $SO(10)$  SUSY GUTs, at 8th UCLA Symposium on Sources and Detection of Dark Matter and Dark Energy in the Universe, Feb. 22, 2008, Marina del Rey, CA.
30. What  $SO(10)$  SUSY GUTs look like at the LHC, seminar at UW-Madison Pheno meeting, April 28, 2008.
31. Mixed axion/axino dark matter in Yukawa-unified models, and prospects for LHC, at University of Michigan Workshop on Dark Matter and the LHC, January, 2009.
32. Why SUSY GUTs imply that the bulk of dark matter is made of axions, at UW-Madison Pheno 2009 meeting, May, 2009.
33. Mixed axion/axino dark matter in supersymmetric models, at 18th International Conference on Supersymmetry and the Unification of Fundamental Interactions, Bonn, Germany, August 24, 2010.
34. Mixed axion/axino cold dark matter, at UW-Madison Pheno 2011 meeting, May, 2011.
35. Radiative natural supersymmetry, International Conference on Linear  $e^+e^-$  Colliders, University of Texas Arlington, October 24, 2012
36. Radiative natural supersymmetry, UC-Irvine pre-snowmass meeting, January 15, 2013.
37. Progress in natural SUSY: radiatively-driven natural SUSY, University of Washington Energy Frontier workshop, June 30, 2013.
38. Mixed axion-neutralino cold dark matter, presentation in CF3 subgroup, Snowmass/Minnesota, July 31, 2013.
39. How conventional measure over-estimate electroweak fine-tuning in SUSY theory and why we must build ILC, International Workshop on Future Linear Colliders, Tokyo, Japan, Nov. 13, 2013.
40. Mainly axion cold dark matter from natural supersymmetry, at 11th Symposium on Sources and Detection of Dark Matter and Dark Energy in the Universe, Feb. 27, 2014.
41. SUSY naturalness and implications for LHC, ILC, axion and wimp detection, SUSY 2014 meeting, Manchester, UK, July 21, 2014.
42. Heavy Higgs bosons in natural SUSY, talk at PittPACC Pheno meeting, May 4, 2015.
43. Supersymmetry with radiatively driven naturalness: implications for LHC and ILC, talk at SUSY2015 meeting, Granlibakken, CA, August, 2015.
44. Relic density and baryogenesis from natural SUSY with mixed axion-higgsino dark matter, parallel session talk at SUSY 2016 meeting, Melbourne, AU, July 4, 2016.

45. Light higgsinos and naturalness: a powerful reason to build ILC (with J. List) at International Conference on high energy Physics ICHEP2016, Chicago, IL, Aug. 5, 2016.
46. SUSY, naturalness, simplicity, and falsifiability: why ILC must be built (talk at Americas Workshop on Linear Colliders 2017), SLAC, Stanford, June 26, 2017.
47. The potential for ILC to discover new particles (talk at DPF2017 meeting, Aug. 1, 2017).
48. Prospects for WIMP and axion detection in SUSY with radiatively-driven naturalness, UCLA Dark Matter 2018, Los Angeles, Feb. 22, 2018.
49. SUSY Phenomenology circa 2020, Pheno 2020 meeting, University of Pittsburgh (via zoom), May 4, 2020.
50. ILC as a natural SUSY discovery machine and precision microscope (Stanford Linear accelerator lab AWLC 2020 meeting via zoom), Oct. 20, 2020.
51. Higgs boson and Sparticle Masses from the Landscape: Dynamical vs. Spontaneous SUSY breaking, Pheno 2021 meeting, May 25, 2021.
52. Natural SUSY emergent from the string landscape; implications for collider and dark matter searches, SUSY 2021, Beijing, August 23, 2021.
53. Expectations for SUSY from the string landscape: SUSY flavor, CP and moduli problems, SUSY 2021, Beijing, August 24, 2021.
54. Statistical exploration of the landscape with consequences for SUSY at LHC, Strings, fields and Deep learning, Aspen, CO, January 18, 2024.

#### **SEMINARS, COLLOQUIA and PUBLIC TALKS**

1. Simulating Supersymmetry, CERN, Geneva, Switzerland, August, 1990.
2. Supersymmetry, University of Texas, Austin, February 1991.
3. Supersymmetry, Texas A& M, College Station, Texas, February 1991.
4. Supersymmetry, University of Wisconsin, Madison, WI, March 1991.
5. Jet Photoproduction at HERA, DESY Lab, Hamburg, Germany, April, 1991.
6. Higher Order Monte Carlos with Showering, University of Hawaii, May 1991.
7. W/Z Production at Hadron Colliders, FSU, October 1991.
8. W/Z Production at Hadron Colliders, Fermi National Laboratory, October 1991.
9. Supersymmetry at Hadron Colliders, Fermi National Laboratory, October 1991.
10. W/Z Production at Hadron Colliders, University of Texas, Austin, November 1991.
11. Supersymmetry, University of Alabama, December, 1991.
12. ISASUSY, FSU, March, 1992.
13. Experimental Consequences of Supersymmetry, CERN, Geneva September, 1992.
14. Colloquium on The Search for the Top Quark, Vanderbilt University, December, 1992.
15. Experimental Consequences of Supersymmetry, Brookhaven National Lab, December, 1992.
16. Experimental Consequences of Supersymmetry, University of California, Davis, January, 1993.
17. Colloquium on The Search for the Top Quark, University of California, Davis, January, 1993.
18. Experimental Consequences of Supersymmetry, Superconducting Supercollider Laboratory, June, 1993.

19. Experimental Consequences of Supersymmetry, University of Florida, September, 1993.
20. Status of Supersymmetry Phenomenology, University of Hawaii, October, 1993.
21. Simulating Supergravity Grand Unified Models, Superconducting Supercollider Lab, November, 1993.
22. Simulating Supergravity Grand Unified Models, CERN, Geneva, Switzerland, December, 1993.
23. Simulating Supergravity Grand Unified Models, University of Pisa, Italy, Dec., 1993.
24. Simulating Supergravity Grand Unified Models, University of Padua, Italy, Dec., 1993.
25. Simulating Supergravity Grand Unified Models, Austrian Institute for High Energy Physics, Vienna, Austria, Dec., 1993.
26. Simulating Supergravity Grand Unified Models, La Sapienza, University of Rome, Italy, Dec., 1993.
27. Expectations for Supersymmetry at Hadron Colliders, Duke University, February, 1994.
28. Simulating Supergravity Grand Unified Models, University of California, Davis, March, 1994.
29. Search for Minimal Supergravity, University of Colorado, Boulder, CO, July, 1994.
30. Minimal Supergravity at Colliders, Aspen Center for Physics, Aspen, CO, August, 1994.
31. Using ISAJET to Simulate Supersymmetry, Fermilab, November, 1994.
32. Topics in the Search for Minimal Supergravity at Tevatron Collider Experiments, Fermilab Wine and Cheese Seminar, November, 1994.
33. The Search for Supersymmetry, University of Florida, March, 1995.
34. The Search for Supersymmetry with the Atlas Detector, CERN, May, 1995.
35. The Search for Supersymmetry with the CMS Detector, CERN, May, 1995.
36. Neutralino Relic Density with Implications for Collider Physics, CMS group, CERN, Geneva, May, 1996.
37. Testing the Supersymmetry Hypothesis, Seminar at University of Oregon, Eugene, November, 1996.
38. The Supersymmetry Hypothesis, Colloquium at University of Oregon, Eugene, November, 1996.
39. Experimental Aspects of Supersymmetry, University of Florida, October, 1997.
40. Experimental Aspects of Supersymmetry, Colloquium at Lawrence Berkeley National Laboratory (LBL), Berkeley, CA, November, 1997.
41. Experimental Aspects of Supersymmetry, University of Wisconsin, Madison, December, 1997.
42. The Supersymmetry Hypothesis, Colloquium at University of California, Davis, February, 1998.
43. Experimental Consequences of Supersymmetry, Stanford Linear Accelerator Center (SLAC), March, 1998.
44. The Search for Higgs Bosons at CERN LEP2 and Tevatron Upgrades, University of Florida, September, 1998.
45. The Search for Higgs Bosons at CERN LEP2 and Tevatron Upgrades, Florida State University, October, 1998.

46. Particle Physics: The Standard Model and Beyond, Colloquium at University of Idaho, April, 1999.
47. Search for SUSY at the Tevatron Collider, Brookhaven National Lab, July, 1999.
48. Trileptons; Yukawa couplings;  $SO(10)$  Unification, Florida State University, August, 1999.
49. Testing Models of Supersymmetry at Colliders, Argonne National Lab, October, 1999.
50. Testing Models of Supersymmetry at Colliders, University of North Carolina, Chapel Hill, October, 1999.
51. The Hunt for Supersymmetric Matter, colloquium at University of Hawaii, March, 2000.
52. Consequences of SUSY  $SO(10)$  GUT Models, seminar at University of Hawaii, April, 2000.
53. Yukawa Unified SUSY  $SO(10)$  Model: Prospects for Run2 and Beyond, joint Experimental Theoretical Physics Seminar at Fermilab, June, 2000.
54. Consequences of SUSY  $SO(10)$  GUT Models, seminar at University of Wisconsin, July, 2000.
55. Supersymmetric Models with an Inverted Scalar Mass Hierarchy, seminar at Florida State University, September, 2000.
56. The Hunt for Supersymmetric Matter, colloquium at University of Wisconsin- Milwaukee, September, 2000.
57. The Hunt for Supersymmetric Matter, colloquium at Florida State University, December, 2000.
58. Supersymmetry with ISAJET, seminar at FSU, April, 2001.
59. Impact of Muon Anomalous Magnetic Moment on Supersymmetric Models, seminar at FSU, May, 2001.
60. Introduction to Gravity and Supergravity, 2 part seminar at FSU, September, 2001.
61. Aspects of SUSY  $SO(10)$  GUT models, seminar at University of Florida, Gainesville, October, 2001.
62. Prospects for Supersymmetry at Collider and non-Accelerator Experiments, Wisconsin-Madison, September, 2003.
63. Prospects for Supersymmetry at Collider and non-Accelerator Experiments, seminar at University of Oklahoma, March, 2004.
64. Supersymmetry, Dark Matter and Collider Physics, colloquium at University of Oklahoma, March, 2004.
65. Supersymmetry, Dark Matter and Collider Physics, colloquium at University of Wisconsin, April, 2004.
66. Direct, Indirect and Collider Searches for Neutralino Dark Matter in SUSY Models, Brookhaven National Lab, March, 2005.
67. Direct, Indirect and Collider Detection of Neutralino Dark Matter, University of Chicago, November, 2005.
68. Prospects for SUSY in Light of Dark Matter, LHC Physics Center, Fermilab, January, 2006.
69. Direct, indirect and collider detection of supersymmetric dark matter, Kellogg seminar at Caltech, February, 2006.
70. Supersymmetric Dark Matter: Direct, indirect and collider detection, colloquium at UW-Milwaukee, April, 2006.



71. Supersymmetry at the CERN LHC in light of Dark Matter, seminar at Bonn University, Germany, May, 2006.
72. Supersymmetry at the CERN LHC in light of Dark Matter, seminar at Wurzburg University, Germany, June, 2006.
73. Supersymmetry at the CERN LHC in light of Dark Matter, seminar at European Laboratory for Nuclear Physics (CERN), Geneva, Switzerland, June, 2006.
74. Supersymmetry at the CERN LHC in light of Dark Matter, seminar at University of Karlsruhe, Germany, July, 2006.
75. Direct, indirect and collider detection of supersymmetric dark matter, Columbia University, July 21, 2006.
76. Supersymmetry, dark matter and collider physics, colloquium at Kansas University, Lawrence, KS, September, 2006.
77. Outlook for supersymmetry in the LHC era, University of Wisconsin-Madison, October, 2006.
78. Supersymmetric dark matter: direct, indirect and collider detection, colloquium at University of Iowa, Iowa City, IA, October, 2006.
79. Journey to the Dark Side (of the Universe), seminar at University of Wisconsin-Milwaukee, December 1, 2006.
80. Direct, indirect and collider detection of supersymmetric dark matter, colloquium at Purdue University, March, 2007.
81. Direct, indirect and collider detection of supersymmetric dark matter, colloquium at University of New Mexico, April, 2007.
82. Dark matter as a guide to SUSY at the LHC, seminar at CERN, July 20, 2007.
83. The US program on direct detection of dark matter, seminar at UW-Madison, Oct. 12, 2007.
84. Direct, indirect and collider detection of supersymmetric dark matter, seminar at Vanderbilt University, November 7, 2007.
85. What  $SO(10)$  SUSY GUTs look like at the LHC, seminar at Bartol Research Institute (U. of Delaware), Jan. 30, 2008.
86. What  $SO(10)$  SUSY GUTs look like at the LHC, seminar at Kavli Institute of Theoretical Physics, UC-Santa Barbara, March 4, 2008.
87.  $SO(10)$  SUSY GUTs: Dark matter and collider searches, seminar at U. Minnesota ITP, April 3, 2008.
88. Supersymmetric dark matter at the LHC, colloquium at University of Oklahoma, April 21, 2008.
89.  $SO(10)$  SUSY GUTs: Dark matter and collider searches, seminar at Oklahoma State university, October 9, 2008.
90.  $SO(10)$  SUSY GUTs: Dark matter and collider searches, seminar at U Texas, Arlington, October 27, 2008.
91.  $SO(10)$  SUSY GUTs: Dark matter and collider searches, seminar at U Wisconsin, Madison, December 8, 2008.
92. Supersymmetric dark matter; Direct, Indirect and Collider Searches ,Colloquium at Oklahoma State University, April 16, 2009.
93. Prospects for supersymmetry during year 1 of LHC, seminar at UW-Madison, September 11, 2009.

94. Prospects for supersymmetry during year 1 of LHC, seminar at University of New Mexico, October 13, 2009.
95. Mixed axion axino cold dark matter from supersymmetric models with implications for LHC, seminar at CERN, March 5, 2010.
96. Prospects for anomaly-mediated SUSY breaking models at the LHC seminar at UW-Madison, April 22, 2010.
97. Prospects for supersymmetry during year 1 of LHC, seminar at University of Colorado, July 9, 2010.
98. Supersymmetric dark matter; Direct, Indirect and Collider Searches, Colloquium at University of Colorado, September 22, 2010.
99. OU and the CERN LHC: Unlocking the secrets of the Universe, talk to Shawnee Rotary Club, Oct. 12, 2010.
100. Mixed axion/LSP dark matter with implications for LHC, seminar at McGill University, Montreal, March 16, 2011.
101. Mixed axion/LSP dark matter with implications for LHC, seminar at University of Minnesota, April 21, 2011.
102. Expectations for supersymmetry and dark matter post LHC7, colloquium at University of New Mexico, April 27, 2012.
103. Supersymmetry, LHC and dark matter: an evolving picture colloquium at University of Minnesota, September 12, 2012.
104. Radiative natural supersymmetry, Texas A& M university, Dec. 10, 2012.
105. SUSY, alive and kickin', seminar at Stanford Linear Accelerator Center (SLAC), March 22, 2013.
106. Radiatively-driven natural supersymmetry, seminar at University of Wisconsin-Madison, April 12, 2013.
107. Why Science Matters, Perspective from Particle Physics & Cosmology talk at Cleveland County Democreatic party, Cornbreak& Beans, Aug. 16, 2013.
108. Supersymmetry and dark matter in the post Higgs discovery era, colloquium at University of Minnesota- Duluth, Jan. 31, 2014.
109. Supersymmetry and dark matter in the post Higgs discovery era, colloquium at Oklahoma State University, Feb. 13, 2014.
110. Supersymmetry and dark matter in the post Higgs discovery era, colloquium at Baylor University, April 9, 2014.
111. From Newton to Einstein and beyond, talk at Guthrie public library, June 3, 2014.
112. Smashing the atom: the CERN LHC and discovery of the Higgs boson, talk at Moore public library, July 8, 2014.
113. SUSY naturalness and implications for LHC, ILC, axion and wimp detection, University of Southampton, UK, July 29, 2014.
114. SUSY naturalness with implications for LHC, ILC, axion and wimp detection, University of Minnesota, Sept. 11, 2014.
115. A crisis for physics? talk at Science Cafe Norman, February 5, 2015.
116. Supersymmetry with radiatively driven naturalness, University of Wisconsin, Madison, March 9, 2015.
117. Natural SUSY with implications for LHC, ILC, WIMP and axion detection seminar at UC Santa Cruz, Oct. 13, 2015.

118. Status of supersymmetry in 2016: more bullish than ever, colloquium at UC Santa Cruz, Jan. 28, 2016.
119. Electroweak-inos, natural SUSY and high luminosity LHC, Topic of Week speaker, Fermilab LHC Physics Center, April 27, 2016.
120. Electroweak-inos, natural SUSY and high luminosity LHC, seminar, UW-Madison, May 5, 2016.
121. Naturalness and weak scale supersymmetry, colloquium at Oscar Klein Center, University of Stockholm, Sweden, May 9, 2017.
122. Supersymmetry and naturalness with implications for LHC, wimp and axion searches, BSM seminar at CERN, Geneva, Nov. 2, 2017.
123. Higgs and superparticle mass predictions from the string theory landscape, UW-Madison, Nov. 30, 2017.
124. Naturalness and supersymmetry with implications for LHC, ILC, WIMP and axion searches, colloquium at Texas A&M University, Nov. 8, 2018.
125. Worlds and superworlds: status of supersymmetry in the LHC era, colloquium at Wichita State University, Nov. 28, 2018.
126. Universe or multiverse?, talk at Morningstar community, Feb. 10, 2019.
127. Gravity-safe, electroweak natural axionic solution to strong CP and SUSY  $\mu$  problem, UW-Madison, Feb. 21, 2019.
128. SUSY, naturalness, the landscape, LHC and dark matter, University of Colorado, Boulder, November 21, 2019.
129. String theory: towards the ultimate laws of nature, public talk at Medicine Park winter chautauqua, Medicine Park, OK, Feb. 4, 2020.
130. Exploring the dark side of the universe: dark matter and dark energy, public talk for Science at the Cutting Edge series, Sam Noble museum, Norman, OK, Feb. 27, 2020.
131. Supersymmetry, naturalness, the landscape and LHC, seminar via Zoom at Canada Triumf National Lab, Vancouver BC, Sept. 15, 2020.
132. The naturalness issue and weak scale supersymmetry in the LHC era, colloquium at University of Southern California, September 22, 2021.
133. The naturalness issue and weak scale supersymmetry in the LHC era, colloquium at University of Wisconsin- Madison, November 12, 2021.
134. Status of Supersymmetry after LHC Run 2 and WIMP Detection Searches, colloquium at Northern Illinois University, Oct. 7, 2022.
135. The dark side of the multiverse: dark matter and dark energy, Okie-Tex star party, Sept. 15, 2023, Black Mesa, OK.
136. Natural SUSY, string landscape and implications for LHC, INFN Frascati, Italy, April 8, 2024.