

HOWARD A. BAER

VITA

Address Department of Physics
University of Oklahoma
Norman, OK 73019
e-mail address:
baer@nhn.ou.edu

Phone 405-325-3961 ext. 36315

Citizenship United States

Education 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)

Research and Teaching Positions 2008 - Present, H. L. Dodge Chair 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, Argonne National Laboratory
1984-1985, Scientific Associate in Particle Theory, CERN, Geneva, Switzerland
1981-1984, Research Assistant in Particle Theory, University 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

<i>Awards</i>	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
<i>National service</i>	2006 Appointed to joint DOE/NSF HEPAP/AAAS Dark Matter Scientific Assessment Group: Chair of Theory sub-panel

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

Andre Lessa

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 (2007-2009)

140. Probing SUSY beyond the reach of LEP2 at the Fermilab Tevatron: low $|M_3|$ dark matter models (with A. Mustafayev, S. Profumo and X. Tata), Phys. Rev. **D75**, 035004 (2007).
141. Target dark matter detection rates in models with a well-tempered neutralino (with A. Mustafayev, E. Park and X. Tata), JCAP**0701**, 017 (2007). JCAP**0701**, 017 (2007).
142. Collider and dark matter phenomenology of models with mirage unification (with E. Park, X. Tata and T. Wang), JHEP**0706**, 033 (2007).
143. Precision gluino mass at the LHC in SUSY models with decoupled scalars (with V. Barger, G. Shaughnessy, H. Summy and L.-t. Wang), Phys. Rev. **D75**, 095010 (2007).
144. Implications of compressed supersymmetry for collider and dark matter searches (with A. Box, E. K. Park and X. Tata), JHEP**0708**, 060 (2007).
145. Mixed Higgsino Dark Matter from a Large $SU(2)$ Gaugino Mass (with A. Mustafayev, H. Summy and X. Tata), JHEP**0710**, 088 (2007).
146. Dark matter allowed scenarios for Yukawa-unified SUSY GUTs (with S. Kraml, S. Sekmen and H. Summy), JHEP**0803**, 056 (2008).
147. Early SUSY discovery at LHC without missing E_T : the role of multi-leptons (with H. Prosper and H. Summy), Phys. Rev. **D77**, 055017 (2008).
148. SUSY interpretation of the Egret GeV anomaly, Xenon-10 dark matter search limits and the LHC (with A. Belyaev and H. Summy), arXiv:0802.3127 (2008), Phys. Rev. **D77**, 095013 (2008).
149. Collider signals and neutralino dark matter detection in relic-density-consistent models without universality (with A. Mustafayev, E. K. Park and X. Tata), JHEP**0805**, 058 (2008).
150. $SO(10)$ SUSY GUTs, the gravitino problem, non-thermal leptogenesis and axino dark matter (with H. Summy), arXiv:0803.0510 (2008) Phys. Lett.**B666**, 5 (2008).
151. SUSY backgrounds to Standard Model calibration processes at the LHC (with V. Barger and G. Shaughnessy), Phys. Rev. **D78**, 095009 (2008).
152. Review of Particle Physics (with C. Amsler et al.), Phys. Lett. **B667**, 1 (2008).
153. Prospects for Yukawa Unified $SO(10)$ SUSY GUTs at the CERN LHC (with S. Kraml, S. Sekmen and H. Summy), JHEP**0810**, 079 (2008).
154. Early SUSY discovery at LHC via sparticle cascade decays to same-sign and multimuon states (with A. Lessa and H. Summy), Phys. Lett. **B674**, 49 (2009).
155. Cosmological consequences of Yukawa-unified SUSY models with mixed axion/axino cold and warm dark matter (with M. Haider, S. Kraml, S. Sekmen and H. Summy), JCAP**0902**, 002 (2009).
156. Collider, direct and indirect detection of supersymmetric dark matter, arXiv.0903.0555 (2009) (NJP- in press).
157. Mainly axion cold dark matter in the minimal supergravity model (with A. Box and H. Summy), JHEP**0908**, 080 (2009).
158. Supersymmetry discovery potential of the LHC at $\sqrt{s} = 10$ and 14 TeV without and with missing E_T (with V. Barger, A. Lessa and X. Tata), JHEP**0909**, 063 (2009).

159. Is “just-so” Higgs splitting needed for $t - b - \tau$ Yukawa unified SUSY GUTs? (with S. Kraml and S. Sekmen), *JHEP***0909**, 005 (2009).
160. Prospects for Hypercharged Anomaly Mediated SUSY Breaking at the LHC (with R. Dermisek, S. Rajagopalan and H. Summy), arXiv:0908.4259 (JHEP- in press).
161. Fine-tuning favors mixed axion/axino cold dark matter over neutralinos in the minimal supergravity model (with A. Box), arXiv:0910:0333 (2009).
162. Beyond the God-particle at the Tevatron: detecting gluinos from Yukawa-unified SUSY (with S. Kraml, S. Sekmen and H. Summy), arXiv:0910:2988 (2009).

OTHER REPORTS (2007-2009)

80. Report on the Direct Detection and Study of Dark Matter (Dark Matter Scientific Assessment Group (DMSAG) a joint subpanel of HEPAP and AAAC), July, 2007.
81. Dark matter and the LHC, book chapter contributed to Indian National Science Academy Platinum Jubilee volume on LHC physics, May, 2008.
82. DUSEL Theory White Paper, by K. S. Babu *et al.*, for National Science Foundation, September, 2008, arXiv:0810.4551 (2008).
83. Dark matter from SUGRA GUTs: mSUGRA, NUSUGRA and Yukawa-unified SUGRA, in *Proceedings of Dark Matter, 2008* meeting, ed. D. Cline, Santa Monica, February, 2008.
84. TASI 2008 lectures on Collider Signatures II: E_T^{miss} Signatures and Dark Matter Connection, in *Proceedings of TASI 2008* summer school, ed. T. Han, Boulder, CO, June, 2008, arXiv:0901.4732.
85. Physics Beyond the Standard Model, Proceedings of the Tenth Conference on the Intersection of Nuclear and Particle Physics (CIPANP 2009), San Diego, May 26-31, 2009, arXiv:0908.2785.
86. Leptonic Signatures for SUSY at the LHC, Proceedings of the 17th International Conference on Supersymmetry and the Unification of Fundamental Interactions (SUSY09) at Northeastern University, Boston, MA, 5-10 June, 2009

RECENT TALKS ON RESEARCH- 2007-2009

INVITED TALKS AT MEETINGS

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, San Diego, 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.

OTHER TALKS AT MEETINGS (2007-2009))

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.

SEMINARS and COLLOQUIA (2007-2009)

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, 2007.
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.