

# *Curriculum Vitae*

## David Toback

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### Education

- *Ph.D., Physics*, December 1997: University of Chicago, Chicago, Illinois  
Thesis: *Searches for New Physics in Diphoton Events in  $p\bar{p}$  Collisions at  $\sqrt{s} = 1.8$  TeV*  
Thesis Advisor: Professor Henry J. Frisch  
*The Nathan Sugerman Graduate Student Prize* Award for Graduate Research
- *B.S., Physics*, June 1991: Massachusetts Institute of Technology  
Cambridge, Massachusetts  
Thesis: *Position Resolution of the Detection System of the Out-Of-Plane Spectrometer*  
Thesis Advisor: Professor William Bertozzi

### Positions Held<sup>1</sup>

- Professor of Physics and Astronomy, Texas A&M University (CDF & CMS), September 2010-Present
- Thaman Professor for Undergraduate Teaching Excellence, Texas A&M University, January 2008-Present
- Associate Professor of Physics, Texas A&M University (CDF & CMS), September 2005-August 2010
- Assistant Professor of Physics, Texas A&M University (CDF), September 2000-August 2005
- Research Associate, University of Maryland (DØ), April 1998-August 2000
- Research Associate, University of Chicago (CDF), January 1998-April 1998
- Graduate Student, University of Chicago (CDF), October 1991-December 1997

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<sup>1</sup>Note: CDF, DØ and CMS are the common acronym-style names of the experiments at Fermi National Accelerator Laboratory (Fermilab) and CERN respectively of which I am a member. CDF and DØ are collaborations of over 600 scientists while CMS has roughly 2,500.

## PUBLICATIONS<sup>5</sup>

### A) Primary Author/Data Analyzer

1. PROSPECTS FOR MEASURING THE NEUTRALINO MASS IN GAUGE MEDIATED SUSY DECAYS OF A HIGGS BOSON AT CDF  
Z. Hong and D. Toback, arXiv/1210.1884 (Submitted to Phys. Lett. B)
2. PROSPECTS OF SEARCHES FOR GAUGE MEDIATED SUPERSYMMETRY WITH  $h^0 \rightarrow \tilde{\chi}_1^0 \tilde{\chi}_1^0$  PRODUCTION IN THE TIME-DELAYED PHOTON+ $\cancel{E}_T$  FINAL STATE AT THE TEVATRON  
J. D. Mason and D. Toback, *Phys. Lett. B* **702**, 377 (2011)
3. THE LARGE HADRON COLLIDER ENTERS THE RACE FOR SUPERSYMMETRY  
D. Toback, Phys. Rev. Lett. Viewpoint, Physics **4**, 27 (2011)
4. SEARCH FOR SUPERSYMMETRY WITH GAUGE-MEDIATED BREAKING IN DIPHOTON EVENTS WITH MISSING TRANSVERSE ENERGY AT CDF II  
T. Aaltonen *et al.* (CDF Collaboration), *Phys. Rev. Lett.* **104**, 011801 (2010)
5. COSMO-PARTICLE SEARCHES FOR SUPERSYMMETRY AT THE COLLIDER DETECTOR AT FERMILAB  
D. Toback, *Modern Physics Letters A*, Vol 24, No. 38, 3063 (2009)
6. SEARCH FOR HEAVY, LONG-LIVED NEUTRALINOS THAT DECAY TO PHOTONS AT CDF II USING PHOTON TIMING  
T. Aaltonen *et al.* (CDF Collaboration), *Phys. Rev. D* **78**, 032015 (2008)
7. DETERMINING THE DARK MATTER RELIC DENSITY IN THE MSUGRA  $\tilde{\tau} - \tilde{\chi}_1^0$  CO-ANNIHILATION REGION WITH THE LHC  
R. Arnowitt, B. Dutta, A. Gurrola, T. Kamon, A. Krislock and D. Toback, *Phys. Rev. Lett.* **100**, 231802 (2008)
8. SEARCH FOR HEAVY, LONG-LIVED PARTICLES THAT DECAY TO PHOTONS AT CDF II  
A. Abulencia *et al.* (CDF Collaboration), *Phys. Rev. Lett.* **99**, 121801 (2007)
9. INDIRECT MEASUREMENTS OF THE  $\tilde{\tau} - \tilde{\chi}_1^0$  MASS DIFFERENCE AND  $M_{\tilde{g}}$  IN THE CO-ANNIHILATION REGION OF MSUGRA MODELS AT THE LHC  
R. Arnowitt, A. Aurisano, B. Dutta, T. Kamon, N. Kolev, D. Toback, P. Simeon and P. Wagner, *Phys. Lett. B* **649**, 73 (2007)
10. THE TIMING SYSTEM FOR THE CDF ELECTROMAGNETIC CALORIMETERS  
M. Goncharov *et al.*, *Nucl. Instrum. Methods A* **565**, 543 (2006)
11. DETECTION OF SUSY IN THE STAU-NEUTRALINO CO-ANNIHILATION REGION AT THE LHC  
R. Arnowitt, B. Dutta, T. Kamon, N. Kolev and D. Toback, *Phys. Lett. B* **639**, 172 (2006)

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<sup>5</sup>These are physics publications only. Teaching related publications are listed separately.

12. COMBINATION OF CDF AND DØ LIMITS ON A GAUGE MEDIATED SUSY MODEL USING DIPHOTON AND MISSING TRANSVERSE ENERGY CHANNEL  
V. Buescher *et al.* (CDF and DØ Collaborations), hep-ex/0504004
13. SEARCH FOR ANOMALOUS PRODUCTION OF DIPHOTON EVENTS WITH MISSING TRANSVERSE ENERGY AT CDF AND LIMITS ON GAUGE MEDIATED SUPERSYMMETRY BREAKING MODELS  
D. Acosta *et al.* (CDF Collaboration), *Phys. Rev. D* **71**, 031104 (2005)
14. PROSPECTS OF SEARCHES FOR NEUTRAL, LONG-LIVED PARTICLES THAT DECAY TO PHOTONS USING TIMING AT CDF  
D. Toback and P. Wagner, *Phys. Rev. D* **70**, 114032 (2004)
15. PROSPECTS OF SEARCHING FOR EXCITED LEPTONS DURING RUN II OF THE FERMILAB TEVATRON  
E. Boos, A. Vologdin, D. Toback and J. Gaspard, *Phys. Rev. D* **66**, 013011 (2002)
16. SEARCH FOR NEW HEAVY PARTICLES IN THE  $WZ^0$  FINAL STATE IN  $p\bar{p}$  COLLISIONS AT  $\sqrt{s} = 1.8$  TEV  
T. Affolder *et al.* (CDF Collaboration), *Phys. Rev. Lett.* **88**, 071806 (2002)
17. A QUASI-MODEL-INDEPENDENT SEARCH FOR NEW HIGH  $P_T$  PHYSICS AT DØ  
B. Abbott *et al.* (DØ Collaboration), *Phys. Rev. D* **64**, 012004 (2001)
18. A QUASI-MODEL-INDEPENDENT SEARCH FOR NEW HIGH  $P_T$  PHYSICS AT DØ  
B. Abbott *et al.* (DØ Collaboration), *Phys. Rev. Lett.* **86**, 3712 (2001)
19. SEARCH FOR NEW PHYSICS IN  $e\mu X$  DATA AT DØ USING SLEUTH: A QUASI MODEL INDEPENDENT SEARCH STRATEGY FOR NEW PHYSICS  
B. Abbott *et al.* (DØ Collaboration), *Phys. Rev. D* **62**, 092004 (2000)
20. SEARCHES FOR NEW PHYSICS IN DIPHOTON EVENTS IN  $p\bar{p}$  COLLISIONS AT  $\sqrt{s} = 1.8$  TEV  
F. Abe *et al.* (CDF Collaboration), *Phys. Rev. D* **59**, 092002 (1999)
21. SEARCHES FOR NEW PHYSICS IN DIPHOTON EVENTS IN  $p\bar{p}$  COLLISIONS AT  $\sqrt{s} = 1.8$  TEV  
F. Abe *et al.* (CDF Collaboration), *Phys. Rev. Lett.* **81**, 1791 (1998)

## **B) Major Author/Data Analyzer**

1. COMBINATION OF CDF AND DØ RESULTS ON W BOSON MASS AND WIDTH  
V.M. Abazov *et al.* (CDF and DØ Collaborations), *Phys. Rev. D* **70**, 092008 (2004)
2. SEARCH FOR PAIR PRODUCTION OF SCALAR TOP QUARKS IN R-PARITY VIOLATING DECAY MODES IN  $p\bar{p}$  COLLISIONS AT  $\sqrt{s} = 1.8$  TEV  
D. Acosta *et al.* (CDF Collaboration), *Phys. Rev. Lett.* **92**, 051803 (2004)
3. SEARCH FOR NEW PHYSICS IN PHOTON LEPTON EVENTS IN  $p\bar{p}$  COLLISIONS AT  $\sqrt{s} = 1.8$  TEV  
D. Acosta *et al.* (CDF Collaboration), *Phys. Rev. D* **66**, 012004 (2002)

4. SEARCH FOR NEW PHYSICS IN PHOTON LEPTON EVENTS IN  $p\bar{p}$  COLLISIONS AT  $\sqrt{s} = 1.8$  TEV  
D. Acosta *et al.* (CDF Collaboration), *Phys. Rev. Lett.* **89**, 041802 (2002)
5. SEARCHES FOR NEW PHYSICS IN EVENTS WITH A PHOTON AND B-QUARK JET AT CDF  
D. Acosta *et al.* (CDF Collaboration), *Phys. Rev. D* **65**, 052006 (2002)
6. SEARCH FOR GLUINOS AND SQUARKS USING LIKE-SIGN DILEPTONS IN  $p\bar{p}$  COLLISIONS AT  $\sqrt{s} = 1.8$  TEV  
T. Affolder *et al.* (CDF Collaboration), *Phys. Rev. Lett.* **87**, 251803 (2001)
7. SEARCH FOR SECOND GENERATION LEPTOQUARK PAIRS IN  $p\bar{p}$  COLLISIONS AT  $\sqrt{s} = 1.8$  TEV  
B. Abbott *et al.* (DØ Collaboration), *Phys. Rev. Lett.* **84**, 2088 (2000)
8. EXTRACTION OF THE WIDTH OF THE W BOSON FROM MEASUREMENTS OF  $\sigma(p\bar{p} \rightarrow W + X) \cdot B(W \rightarrow e\nu)$  AND  $\sigma(p\bar{p} \rightarrow Z + X) \cdot B(Z \rightarrow ee)$  AND THEIR RATIO  
B. Abbott *et al.* (DØ Collaboration), *Phys. Rev. D* **61**, 072001 (2000)
9. SEARCH FOR A TECHNICOLOR  $\omega_T$  PARTICLE IN EVENTS WITH A PHOTON AND A B QUARK JET AT CDF  
F. Abe *et al.* (CDF Collaboration), *Phys. Rev. Lett.* **83**, 3124 (1999)
10. SEARCH FOR SECOND GENERATION LEPTOQUARK PAIRS DECAYING TO MUON NEUTRINO + JETS IN  $p\bar{p}$  COLLISIONS AT  $\sqrt{s} = 1.8$  TEV  
B. Abbott *et al.* (DØ Collaboration), *Phys. Rev. Lett.* **83**, 2896 (1999)
11. SEARCH FOR LONGLIVED PARENTS OF  $Z^0$  BOSONS IN  $p\bar{p}$  COLLISIONS AT  $\sqrt{s} = 1.8$  TEV  
F. Abe *et al.* (CDF Collaboration), *Phys. Rev. D* **58**, 051102 (1998)

### **C) Other**

I am listed on all CDF publications from 1992-1998 and 2001 to the present, all DØ publications from 1998-2000, and all CMS publication from 2009-Present. This is typically between 20 and 40 peer reviewed publications per year. A complete list is available upon request.

# *Teaching Curriculum Vitae*<sup>7</sup>

## David Toback

### Courses Taught (Texas A&M University, 2001-Present)

- *Big Bang and Black Holes* (Cosmology for non-majors, ASTR/PHYS 289-109)  
Texas A&M University, Spring 2007 - Fall 2007, Fall 2008 - Fall 2010, Fall 2011-Present
  - New type of course, now in course catalogue
  - Approved as a Tier 2 Science Distribution course
  - Textbook in Press with Johns Hopkins University Press
  - Honors sections Spring 2010-Present
  - Laboratory methods component (ASTR/PHYS 289-119), Fall 2010-Present
    - \* Approved as a Tier 2 Science Distribution, in Spring 2011
- *Introduction to Classical Mechanics* (Engineering track, Physics 218)  
Texas A&M University, Spring 2001-Spring 2005, Spring 2006 - Fall 2006, Spring 2008
  - Course coordinator, Spring 2005
  - Participant in the *Visual Physics* interactive engagement learning program, Fall 2003-Fall 2006 (except Fall 2005)
  - Participant in the *STEPS* Math, Physics & Engineering Cohort program, Spring 2008

### Awards

- *University Professor for Undergraduate Teaching Excellence*  
Named the Arthur J. and Wilhelmina Doré Thaman Professor, 2008-Present  
Texas A&M University, University-Level Award, Spring 2008  
Reappointed, Spring 2012
- Outstanding Science Communicator Award  
Texas A&M University Chapter of Sigma Xi, Spring 2012
- *Teacher-Scholar Award*  
Texas A&M University, Honors and Undergraduate Research Program Award, Spring 2011
- *Student Led Award for Teaching Excellence*  
Texas A&M University, System-Wide Award for Accomplishment in Teaching, Spring 2010
- *Student Led Award for Teaching Excellence*  
Texas A&M University, System-Wide Award for Accomplishment in Teaching, Fall 2008
- Nominee for the *Presidential Professor for Teaching Excellence Award*  
Texas A&M University, University-Wide Award for Accomplishment in Teaching
  - Department of Physics nominee, Spring 2012
  - Department of Physics nominee, Spring 2009
  - College of Science nominee, Spring 2008
  - Department of Physics co-nominee, Spring 2003

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<sup>7</sup>Note that this includes my research students. This is duplicate information from my normal CV

- *Distinguished Achievement in Teaching Award*  
Association for Former Students, Texas A&M University, University-Level Award, Spring 2007
- *Distinguished Achievement in Teaching Award*  
Association for Former Students, Texas A&M University, College-Level Award, Summer 2004
- *Montague Scholar Award*  
Texas A&M University, Center for Teaching Excellence, Fall 2002
- Award from the Corps of Cadets  
Texas A&M University, Spring 2002
- *The Wayne C. Booth Graduate Student Prize*  
University of Chicago Award for Graduate Student Teaching, Spring 1992
- *The Gregor Wentzel Prize*  
University of Chicago Department of Physics Award for Graduate Student Teaching, Spring 1992

### **Teaching Publications and Presentations**

- *Big Bang, Black Holes, No Math*, Textbook for Physics/Astronomy 109  
In press with Johns Hopkins University Press
- *Integrating Web-Based Teaching Tools into Large University Physics Courses*,  
D. Toback, A. Mershin and I. Novikova, *The Physics Teacher*, Vol 43, 595-598 (2005)
- *Integrating Web-Based Teaching Tools into Large University Physics Courses*,  
Invited talk at *Teaching with Technology 2006*, Texas A&M University, February 2006

### **Teaching Funding**

- Development Award as a *University Professor for Undergraduate Teaching Excellence* at Texas A&M University, \$15,000 prize, 2012-2015
- Development Award as a *University Professor for Undergraduate Teaching Excellence* at Texas A&M University, \$15,000 prize, 2008-2011
- Development Award by the *Center for Teaching Excellence* at Texas A&M University for *Web-based Teaching for Physics Courses*, \$5,000 prize, Fall 2002

### **Teaching Tools and Programs Developed**

- Creator/administrator of the *Physics 218 Challenge Exam* and *Mechanics Scholars* Program  
Texas A&M University, Spring 2002-Present  
Program to select the Texas A&M University, Department of Physics *Mechanics Scholars*, and winners of the *Award for Exceptional Performance in Physics 218*
- Creator/maintainer of the *Automated Mathematics Evaluation System (AMES)*  
Texas A&M University, Fall 2001-Present  
A web-based math quiz system for Physics 101 (Physics Majors Seminar), 201, 202, 208 and 218 (Mechanics and Electromagnetism, Pre-Med and engineering tracks) and Astronomy 314 (Introduction to Astronomy)

- Creator/maintainer of the *Computerized Homework Assignment Grading System (CHAGS)*  
Texas A&M University, Spring 2002-Present  
A web-based homework collection system for Physics 201, 202, 208 and 218
- Creator/maintainer of the *QUizzes Intended to Consolidate Knowledge (QUICK)*  
Texas A&M University, Spring 2002-Present  
A web-based homework quiz and mini-practice exam system for Physics 109, 208, 218, 289 and Astronomy 314