

# *Curriculum Vitae*

## David Toback

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(Updated June 14, 2008)

### 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>

- Thaman Professor for Undergraduate Teaching Excellence, Texas A&M University,  
January 2008 – Present
- Associate Professor, Texas A&M University (CDF & CMS), September 2005 – Present
- Assistant Professor, 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. Each are collaborations of over 800 scientists.

## Research Activities<sup>2</sup>

- *CMS Collaboration*<sup>3</sup>, *Texas A&M University, May 2005 – Present:*
  - TAMU group leader, Co-founder TAMU/CMS group
    - \* Faculty Development Leave (Fall 2005) to join collaboration and secure projects
  - Searches for Supersymmetry in the Co-annihilation Region using the  $\tau + \cancel{E}_T + \text{Jets}$  final state (in progress)
  - Physics Analysis Tool (PAT) Development for the Supersymmetry Group
  - HCal Software Project: Level 1 Trigger Electronics Simulation, data quality monitoring
  - HCal Hardware Project: High Level Trigger Commissioning and Validation
  - Grid computing
- *CDF Collaboration, Texas A&M University, September 2000 – Present:*
  - Co-Convener of the Supersymmetry Physics Analysis Group (Spring 2007 – Present)
  - Search for long-lived Supersymmetric particles that decay to photons (Run II, 570 pb<sup>-1</sup>, PRL & PRD)
    - This work was recognized by Fermilab as co-winner of the *University Research Association Thesis Award* for 2007
  - Leader of the *EMTiming* project to instrument the electromagnetic calorimeter with timing readout
  - Hardware description and performance of the *EMTiming* system (NIM)
  - Integrated search for Gauge Mediated Supersymmetry Breaking in the  $\gamma\gamma + \cancel{E}_T$  and  $\gamma + \cancel{E}_T + \text{track}$  channels (Run II, in progress)
  - Search for Supersymmetry at high  $\tan\beta$  (Run II, in progress)
  - Searches for Supersymmetry in the  $\gamma\gamma + \cancel{E}_T$  final state (Run II, 200 pb<sup>-1</sup>, PRD)
  - Search new particles that decay via  $X \rightarrow WZ$  (Run I, PRL)
  - Search for Supersymmetric top quarks that decay in  $R$ -Parity violating modes (Run I, PRL)
  - Co-developer of *ObjectMon*, a Run II online/offline object monitoring program
  - Co-developer of *ZooFinder*, a Run II automated “Unusual Event Finder” daemon
- *Phenomenology Activities, Texas A&M University, September 2000 – Present:*
  - Prospects for measuring heavy squark masses in the co-annihilation region at the LHC (In progress)
  - Prospects for measuring the Dark Matter Relic Density in the co-annihilation region at the LHC (PRL)
    - This work represents the first systematic method of determining the Dark Matter Relic Density at the LHC

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<sup>2</sup>I have broken my activities up into experimental projects (CDF, DØ and CMS) and phenomenology projects as this is fairly unusual for an experimentalist. I also separately list under each position any leadership position, experiment building projects I played a large role in, and one line about the physics results that resulted in a publication (and where it was published). Note that all leadership positions, for example the SUSY convener at CDF, are international roles and appointed by experimental leaders. Teaching projects and publications are listed separately.

<sup>3</sup>Note that the CMS experiment has over 2800 scientist-collaborators and has been in construction since the mid 1990's. It will not take data until Summer 2008 at the earliest.

- Prospects for measuring SParticle masses in the co-annihilation region at the LHC (PLB)
- Prospects of discovering Supersymmetry in the co-annihilation region at the LHC (PLB)
- Prospects of discovering long-lived Supersymmetric particles that decay to photons at the Tevatron (PRD)
- Prospects of discovering excited leptons at the Tevatron (PRD)
- *DØ Collaboration, University of Maryland, April 1998 – August 2000:*
  - Co-developer of *Sleuth*, a general signature-based search strategy (Run I, PRD)  
This work was recognized as the *American Physical Society Tanaka Prize* winner for 2002
  - Model-independent searches using *Sleuth* on  $\sim 50$  final states (Run I, PRL & PRD)
  - Deputy convener New Phenomena physics analysis working group
  - Leader of Run II Trigger Simulation project
  - Designed/simulated the functionality of Run II, Level 2 Tracking Trigger Preprocessor crate
  - Run II, Level 2 electronics *MBT* Interface Card debugging and testing
  - Level 2 electronics Test Stand and Installation Coordinator for Run II
  - Member of Run II Trigger and Dataset Board
- *CDF Collaboration, University of Chicago June 1991 – April 1998:*
  - Search for new physics in the  $\gamma\gamma + X$  final state (Run I, PRL & PRD)  
This work includes the famous  $ee\gamma\gamma\cancel{E}_T$  candidate event and was recognized by the University of Chicago with *The Nathan Sugerma Graduate Student Prize* for 1997
  - Search for new physics in the  $\ell\gamma$  final state (Run I, PRL & PRD)
  - Search for new physics in the  $W + 2$  jet final state (Run I, PRL)
  - Maintenance of the Run I, Level 1 calorimeter trigger
  - Design of *Crate Sum*, a Run II Level 1 calorimeter trigger upgrade board
  - Upgrade and maintenance of *SPY*, a Run I online monitoring package
  - Analysis of photomultiplier tube systems for the CDF Run II Plug Upgrade

## Funding<sup>4</sup>

The funding for Collider experiment can be separated into three categories: 1) University funding (salaries and travel), 2) Project funding (specific task for an experiment) and 3) Experiment funding (detector equipment, engineering and operating costs). Faculty for Collider experiments receive University funding through the U.S. Department of Energy (DOE) or the National Science Foundation (NSF), but not both. Some faculty procure Project Funding from the experiments. Equipment and experimental funding goes to the National labs (Fermilab, CERN etc.) and is not listed here.

While my University Funding is through a single “Block Grant,” this name is a misnomer as each P.I. is effectively funded independently. My funding is listed within the Collider Physics portion of Task A. Below I list the Task A, Collider portion, and my portion separately since in a each year there is some blurring between the boundaries. For all other funding I am the only P.I. unless noted.

- May 2009-April 2010: U.S. DOE, *High Energy Physics at Texas A&M University*, \$480K for Task A, \$328K for all of Collider Physics with \$192.6K being my portion
- June 2008 – September 2008: CDF Project Funds for *Supporting CDF Run II Operations by the Texas A&M Group*, \$25,000
- May 2008-April 2009: U.S. DOE, *High Energy Physics at Texas A&M University*, \$480K for Task A, \$328K for all of Collider Physics with \$192.6K being my portion
- May 2007-April 2008: U.S. DOE, *High Energy Physics at Texas A&M University*, \$492K for Task A, \$340K for all of Collider Physics with \$198.6K being my portion
- April 2007 – May 2007: CMS Project Funds for *HCal and L1 Commissioning for the CMS Detector at CERN*, ≈\$25K
- January 2007 – December 2008: CDF Project Funds to *Convene the CDF/Supersymmetry Physics Working Group*, \$20K
- January 2007 – August 2007: CDF Project Funds for *Supporting CDF Run II Operations by the Texas A&M Group*, \$24,891
- June 2006 – August 2006: Texas A&M Office of the Vice-President for Research Funds for *Win-Win PC-Based Grid Computing: Compute-Intensive Research, Student Computing, and a Grid-Capable Workstation*, \$20K
- May 2006-April 2007: U.S. DOE, *High Energy Physics at Texas A&M University*, \$477K for Task A, \$325K for all of Collider Physics with \$181.1K being my portion
- May 2006: Texas A&M College of Science Funds for *Matching for DOE High Energy Physics Research Computing Funds*, \$7K (with T. Kamon)
- May 2005-April 2006: U.S. DOE, *High Energy Physics at Texas A&M University*, \$413K for Task A, \$258.4K for all of Collider Physics with \$120K being my portion
- May 2004-April 2005: U.S. DOE, *High Energy Physics at Texas A&M University*, \$383K for Task A, \$220K for all of Collider Physics with \$73.5K being my portion
- May 2003-April 2004: U.S. DOE, *High Energy Physics at Texas A&M University*, \$375K for Task A, \$225K for all of Collider Physics with \$75K being my portion

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<sup>4</sup>These funds are for physics research only. Funding for teaching projects is listed separately

## Supervision of Students and Postdocs<sup>5</sup>

- *Postdoctoral Students:*
  - Dr. Michael Weinberger, January 2006 – Present
  - Dr. Maxim Goncharov, June 2001 – Present
  - Dr. Sungwon Lee, January 2001 – August 2005. Currently Assistant Professor, Texas Tech
- *Ph.D. Students (Dissertation chair):*
  - Jonathan Asaadi, Summer 2004 – Present (M.S. 2007)
    - 2nd Place, presentation competition, Texas A&M Student Research Week (2008)
  - Adam Aurisano, Summer 2004 – Present (M.S. 2007)
    - Winner, presentation competition, Texas Section of the APS (2004)
  - Eunsin Lee, Summer 2004 – Present (M.S. 2006)
    - 3rd Place, presentation competition, Texas A&M Student Research Week (2007)
    - Winner, presentation competition, Texas Section of the APS (2006)
  - Peter Wagner, August 2001 – August 2007 (Ph.D. 2007). Currently postdoc, Penn
    - Co-Winner, Thesis Award for 2007 from the *University Research Association*,
    - International award for the most outstanding thesis from a project on a Fermilab Experiment
- *Masters Students (Committee chair or co-chair):*
  - David Maffei, Summer 2003 – December 2006 (M.S. 2006)
  - Matthew Cervantes, Summer 2002 – August 2006 (M.S. 2006)
- *Graduate Students (Masters or Ph.D. committee member or co-chair):*
  - Nathaniel Pogue, Spring 2006 – Present
  - Masaki Watabe, Spring 2004 – Present
  - Vadim Khotilovich, Fall 2001 – Spring 2008 (Ph.D. 2008)
  - Slava Krutelyov, Fall 2000 – December 2005 (Ph.D. 2005, co-chair). Currently postdoc, UCSB
- *Undergraduates:*
  - David Rahmani, January 2008 – Present
  - Rishi Patel, New York University (REU student), Summer 2007
  - Paul Geffert (Honors Program Student), January 2006 – Present
  - Paul Simeon (Honors Program Student), January 2004 – Summer 2006
    - Winner, Goldwater Scholarship, (2007)
  - Russell Mammei, University of Texas at El Paso, Summer 2001
  - Christopher Battle, January 2001 – September 2002
  - Jeffrey Gaspard, April 2001 – June 2002
    - Winner, presentation competition, Texas Section of the APS (2001)
  - Julian Londoño, January 2001 – May 2001
  - Thomas Landers, University of Maryland, Summer 1999

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<sup>5</sup>Note: All students are from Texas A&M University unless otherwise noted. All awards are physics research awards from regional or national organizations, unless noted as an international award. Students I supervised (and their awards) on scholarly teaching activities, such as web-based materials, course and textbook development, are listed separately.

## PUBLICATIONS<sup>6</sup>

### A) Primary Author/Data Analyzer

1. SEARCH FOR HEAVY, LONG-LIVED NEUTRALINOS THAT DECAY TO PHOTONS AT CDF II USING PHOTON TIMING  
T. Aaltonen *et al.* (CDF Collaboration), Accepted for Publication in *Phys. Rev. D*, hep-ex/0804.1043
2. 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, Accepted for Publication in *Phys.Rev.Lett.*, hep-ph/0802.2968
3. 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)
4. 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)
5. THE TIMING SYSTEM FOR THE CDF ELECTROMAGNETIC CALORIMETERS  
M. Goncharov *et al.*, *Nucl. Instrum. Methods A* **565**, 543 (2006)
6. 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)
7. 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
8. 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)
9. 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)
10. 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)
11. 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)

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<sup>6</sup>These are physics publications only. Teaching related publications are listed separately.

12. 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)
13. 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)
14. SEARCH FOR NEW PHYSICS IN  $e\mu X$  DATA AT D0 USING SLEUTH: A QUASI MODEL INDEPENDENT SEARCH STRATEGY FOR NEW PHYSICS  
B. Abbott *et al.* (DØ Collaboration), *Phys. Rev. D* **62**, 092004 (2000)
15. 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)
16. 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, and all DØ publications from 1998-2000. This is typically between 20 and 40 peer reviewed publications per year. A complete list is available upon request.

## Colloquia, Seminars, and Conference Talks<sup>7</sup>

Note: High Energy Physics is a collaborative effort. New results are often presented in plenary talks by individuals who are summarizing the work of many scientists. It is preferred for junior scientists to give the talk. For this reason, my work is usually presented by others, in particular by my students and postdocs far more often than by me. I list here only formal talks I have given. A list of talks by my students, postdocs or colleagues for the last three years is presented in the next section.

- “Dark Matter in SUGRA models and the LHC,” The 15<sup>th</sup> International Conference on Supersymmetry and Unification of Fundamental Interactions (SUSY 2007)  
Karlsruhe Germany, July 2007
- “Particle Physics and Cosmology in the Co-Annihilation Region,” International Workshop on the Interface of Particle Physics and Cosmology (PPC 2007)  
Texas A&M University, May 2007
- “Searching for New Particles at Colliders,” High Energy Theory Seminar  
Texas A&M University, February 2006
- “Collider Physics at Texas A&M,” HEP Seminar  
Texas Tech University, August 2005
- “Searches for New Physics Using Photons at the Tevatron,” HEP Seminar  
University of Florida, May 2005  
University of Wisconsin, March 2005
- “Searching for New Physics at the Fermilab Tevatron,” Department Colloquium  
Texas A&M University, October 2004  
The State University of New York at Buffalo, November 2004
- “Run II Searches for Supersymmetry,” 15th International Topical Conference on Hadron Collider Physics  
Michigan State University, June 2004
- “Searching for New Physics with Photon and Missing Energy at CDF: Recent Results, Upgrades and Prospects,” HEP seminar  
Texas A&M University, May 2004  
University of Chicago June 2004
- “Searching for New Physics at the Fermilab Tevatron,” Department Colloquium  
Texas A&M University, September 2002
- “Model Independent Searches using Final State Photons at CDF and  $D\bar{O}$ ,” HEP seminar  
University of Maryland, April 2002  
Texas A&M University, May 2002
- “On Events with Leptons and Photons at CDF,” HEP seminar  
Texas A&M University, March 2002
- “Searching for New Physics at the Fermilab Tevatron,” HEP seminar  
University of Texas at Austin, May, 2001

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<sup>7</sup>These are physics talks only. Teaching related talks are listed separately.

- “Sleuth: A Quasi-Model-Independent New Physics Search Strategy,” HEP seminar  
University of Maryland, September 2000
- “Searching for New Physics at the Fermilab Tevatron,” Department Colloquium  
Texas A&M University, May, 2000
- “New Phenomena II: Recent Results from the Fermilab Tevatron,” 35th Rencontres de Moriond:  
Electroweak Interactions and Unified Theories  
Les Arcs, France, March 2000
- “CDF Searches for New Phenomena,” 12th Les Rencontres de Physique de la Vallée d’Aoste:  
Results and Perspectives in Particle Physics  
La Thuile, Italy, March 1998
- “Searches for New Physics in Diphoton + X events at CDF,” HEP seminar  
Argonne National Laboratory, January 1998  
University of Chicago, December 1997  
Duke University, November 1997  
University of Pennsylvania, October 1997  
The Johns Hopkins University, September 1997  
University of Maryland, August 1997  
Fermilab National Accelerator Laboratory, August 1997
- “Diphoton Missing  $E_T$  Distribution at CDF,” Annual Divisional Meeting of the Division of  
Particles and Fields of the American Physical Society  
University of Minnesota, August 1996
- “Search for Technicolor in the  $W$ +Jet-Jet Decay Channel,” TeV33 Conference  
Fermilab, May 1996
- “Search for  $W'$  in the  $W$  + Jet-Jet Decay Channel,” American Physical Society Meeting  
Indianapolis, May 1996
- “Search for  $W'$  in the  $W$  + Jet-Jet Decay Channel,” HEP seminar  
University of Chicago, May 1996
- “Search for  $W'$  in the  $W$  + Jet-Jet Decay Channel,” American Physical Society Meeting  
Washington D.C., May 1995

### Seminars, and Conference Talks on my work by others:

Note: Here I list the important talks given by my students, postdocs and colleagues presenting our collaborative work from 2005–Present

- “Search for Heavy, Neutral, Long-Lived Particles that Decay to Photons at CDF,” P. Wagner\*, Fermilab Users Meeting, Awards Ceremony Acceptance talk for the University Research Association (URA) Thesis Award  
Fermilab, Chicago, Illinois, June 2008, (\*) D. Toback is his thesis advisor
- “Determining  $\Omega h^2$  at the LHC - mSUGRA Co-annihilation Case”, T. Kamon\*, Nuclear, Particle, Astroparticle, and Cosmology Seminar (Nupac)  
University of New Mexico March 2008 (\*) Colleague who gave the talk
- “Measuring Dark Matter Relic Density at the LHC”, T. Kamon\*, 2nd International Workshop on the Interconnection between Particle Physics and Cosmology (PPC 2008)  
University of New Mexico, May 2008 (\*) Colleague who gave the talk
- “Cosmological Connection at the LHC: Stau Neutralino Co-Annihilation Case”, T. Kamon\*, Facing the LHC Data Workshop  
IPMU, Japan November 2007 (\*) Colleague who gave the talk
- “Searches for Heavy, Long-Lived Particles at CDF,” V. Krutelyov\* for the CDF Collaboration, The 15<sup>th</sup> International Conference on Supersymmetry and Unification of Fundamental Interactions (SUSY 2007)  
Karlsruhe Germany, July 2007, (\*) Colleague giving the talk, D. Toback is his former dissertation co-chair
- “Heavy Long-Lived Particles at the Tevatron,” M. Goncharov\* for the CDF Collaboration, The Europhysics Conference on High Energy Physics (EPS 2007)  
Manchester England, July 2007, (\*) D. Toback is his postdoctoral advisor
- “Across the Time Dimension in Search of Exotic Particles,” M. Goncharov\* for the CDF Collaboration, 2007 Phenomenology Symposium: Prelude to the LHC (PHENO 07)  
University of Wisconsin, May 2007, (\*) D. Toback is his postdoctoral advisor
- “Search for Heavy, Neutral, Long-Lived Particles that Decay to Photons at CDF,” P. Wagner\*, HEP Seminar  
University of Pennsylvania, April 2007  
Texas Tech University, April 2007  
University of California at Santa Cruz, April 2007  
University of California at San Diego, April 2007, (\*) D. Toback is his thesis advisor
- “Search for Heavy, Long-Lived Particles at CDF,” M. Goncharov\* for the CDF Collaboration, Fermilab Wine & Cheese  
Fermilab, March 2007, (\*) D. Toback is his postdoctoral advisor
- “Calorimeter Timing System at CDF,” M. Goncharov\*, Research Techniques Seminar  
Fermilab, March 2007, (\*) D. Toback is his postdoctoral advisor
- “Searches for New Physics at CDF,” P. Wagner\* for the CDF Collaboration, Lake Louise Winter Institute 2007  
Chateau Lake Louise Canada February 2007, (\*) D. Toback is his thesis advisor

- “Search for Heavy, Neutral, Long-Lived Particles that Decay to Photons at CDF,” M. Goncharov\*, HEP Seminar  
Kansas State University, May 2006, (\*) D. Toback is his postdoctoral advisor
- “Search for Delayed Photons,” M. Goncharov\* for the CDF Collaboration, Joint Meeting of Pacific Region Particle Physics Communities, (APS-DPF 2006 + JPS 2006)  
Honolulu Hawaii, October 2006, (\*) D. Toback is his postdoctoral advisor
- “Cosmology at the LHC” B. Dutta\*, Joint Meeting of Pacific Region Particle Physics Communities, (APS-DPF 2006 + JPS 2006)  
Honolulu Hawaii, October 2006, (\*) Colleague who gave the talk
- “Cosmology and Colliders,” B. Dutta\*, The 33<sup>rd</sup> International Conference on High Energy Physics (ICHEP 2006)  
Moscow State University, July 2006, (\*) Colleague who gave the talk
- “Search for Exotic New Phenomena at CDF,” M. Goncharov\* for the CDF Collaboration, The 14<sup>th</sup> International Conference on Supersymmetry and Unification of Fundamental Interactions (SUSY 2006)  
Irvine California, June 2006, (\*) D. Toback is his postdoctoral advisor
- “Detection of SUSY Signals in Stau-Neutralino Co-annihilation Region at the LHC,” T. Kamon\*, The 14<sup>th</sup> International Conference on Supersymmetry and Unification of Fundamental Interactions (SUSY 2006)  
Irvine California, June 2006, (\*) Colleague who gave the talk
- “Detection of SUSY Signals in Stau-Neutralino Co-annihilation at Colliders,” B. Dutta\*, Talk at Complementarity between Dark Matter Searches and Collider Experiments  
University of California at Berkeley, June 2006, (\*) Colleague who gave the talk
- “Calorimeter Timing System at CDF,” M. Goncharov\* for the CDF Collaboration, The 12<sup>th</sup> International Conference on Calorimetry in High Energy Physics (CALOR 2006)  
University of Illinois at Chicago, June 2006, (\*) D. Toback is his postdoctoral advisor
- “Signals in the Co-Annihilation Region of Supersymmetry at the LHC,” A. Aurisano\*, the April Meeting of the American Physical Society (APS 2006)  
Baltimore Maryland, March 2006, (\*) D. Toback is his thesis advisor
- “The Stau-Neutralino Co-annihilation Region and Colliders,” B. Dutta\*, The 13<sup>th</sup> International Conference on Supersymmetry and Unification of Fundamental Interactions (SUSY 2005)  
Durham University, UK, July 2005, (\*) Colleague who gave the talk
- “Searches for New Physics using Photons at the Energy Frontier”, S. W. Lee, HEP Seminar  
Texas Tech University, May 2005 (\*) D. Toback is his postdoctoral advisor

# *Teaching Curriculum Vitae*

## David Toback

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

- *Big Bang, Black Holes, No Math* (Cosmology for non-majors, Physics/Astronomy 289),  
New course created, textbook in preparation  
Texas A&M University, Spring 2007 - Fall 2007, Fall 2008
- *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, Fall 2007

### 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
- College of Science Nominee for the *Presidential Professor for Teaching Excellence Award*  
Texas A&M University, University-Wide Award for Accomplishment in Teaching, Spring 2008
- *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
- Department of Physics Co-Nominee for the *Presidential Professor for Teaching Excellence Award*  
Texas A&M University, University-Wide Award for Accomplishment in Teaching, Spring 2003
- *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

### Scholarly Teaching Activities

- *Big Bang, Black Holes, No Math*, Textbook for Physics/Astronomy 289, in progress
- *Integrating Web-Based Teaching Tools into Large University Physics Courses*, D. Toback, A. Mershin and I. Novikova, Published in *The Physics Teacher*, Vol 43, 595-598 (2005)
- Reviewer for *The Physics Teacher* Journal, 2007 – Present
- *Integrating Web-Based Teaching Tools into Large University Physics Courses*, Invited talk at *Teaching with Technology 2006*, Texas A&M University, February 2006
- 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 201, 202, 208 and 218 (Mechanics and Electromagnetism, Pre-Med and engineering tracks)
- 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 208, 218 and 289

### Supervision of Students on Teaching Projects

- *Physics Students (Graduate Students unless otherwise indicated):*  
Eunsin Lee, Summer 2007 – Present  
Jonathan Asaadi, Summer 2004 – Present  
    Recipient of a *American Association of Physics Teachers Outstanding Teaching Assistant Award*, 2008  
Matt Cervantes, Summer 2003 – Spring 2004  
Irina Novikova, Summer 2002 – Spring 2003  
    Named a Fellow by the Center for Teaching Excellence  
Andreas Mershin, Spring 2001 – Spring 2002  
Joel Walker: Spring 2001 – Summer 2003  
David Rahmani (undergraduate), Spring 2008 – Present
- *Journalism Majors:*  
Amelia Williamson, Spring 2008 – Present

# *Service Curriculum Vitae*

## David Toback

### Teaching, Research and Search Committees, and Service

Note: All activities are at Texas A&M University unless otherwise noted

- Physics Department Faculty Mentoring Program Development Committee, Summer 2008 – Present
- Faculty Talent (College of Science), “This is Aggieland,” Texas A&M University marketing video promoting undergraduate education and research opportunity, Division of Marketing & Communications, Spring 2008.
- Physics Department Advisory Committee, High Energy Representative, January 2008 – Present
- Chair for the Particle Physics Session, Meeting of the Texas Section of The APS, Fall 2007
- Panel Member for the Texas A&M Mentoring Faculty Workshop, Fall 2007
- High Energy Physics Experiment Faculty Search Committee Co-Chair, Fall 2007 – Present
- Joint Nuclear/High Energy Physics Summer Research Experience for Undergraduates (REU), Summer 2007
- Department of Physics Performance Evaluation Committee, Spring 2007
- Organizing committee for the *International Workshop on the Interface of Particle Physics and Cosmology (PPC 2007)*, Spring 2007
- High Energy Physics Experiment Faculty Search Committee, Fall 2006 – Fall 2007
- Chair of High Energy Physics Organizing Committee of the *Mitchell Symposium on Astronomy, Cosmology and Fundamental Physics*, Spring 2006
- Panel Member for the Texas A&M New Faculty Orientation, Fall 2005
- Texas A&M Faculty Focus Group for Student Life, Summer 2005
- Conceptual Design for Interdisciplinary Tenure Track Positions at Texas A&M University, January 2005 – September 2005
- Physics 218 Course Coordinator, Spring 2005
- Texas A&M University Association of Former Students College-Level Teaching Awards Committee, Spring 2005
- Editorial Board for WH Search, CDF, Fall 2004 – Present
- High Energy Physics Experiment Faculty Search Committee Co-Chair, Spring 2004 – October 2006
- Local Organizing Committee and Session Chair for the *Mitchell Symposium on Observational Cosmology*, Spring 2004

- First Year Physics Courses (PHYS 218/208) Textbook Selection Committee, Fall 2003 – Summer 2004
- MIT Undergraduate Admissions Educational Councilor, September 2003–Present
- College of Science Diversity Committee, Spring 2003
- Graduate Mentor for Irina Novikova, Texas A&M University Center for Teaching Excellence Fellows Program, Spring 2003
- Tevatron Electroweak Working Group, Fall 2002 – Spring 2004
- Mechanics Scholar Selection Committee Chair, Spring 2002 – Present
- Physics Graduate Admissions Committee and departmental recruiting WebSite, Spring 2002 – Fall 2005
- High Energy Physics Theory Faculty Search Committee, Spring 2002 – Spring 2004
- Chair for the Particle Physics Session, Meeting of the Texas Section of The APS, Fall 2001
- Editorial Board for 1st Generation Leptoquark Search, CDF, Summer 2001 – Spring 2002
- Trigger Menu Panel, DØ, Spring 1999- Fall 2000
- Organizing Committee, DØ Paris Trigger Workshop, Spring 1999
- Editorial Board for 2nd Generation Leptoquark Search, DØ, Fall 1998 – Spring 1999
- Undergraduate Thesis Committee for John Peterson, University of Chicago, May 1997
- Gregor Wentzel Teaching Prize Selection Committee, University of Chicago, May 1993

### **Reviewing Activities**<sup>8</sup>

- Proposal Reviewer for a joint proposal to the *Cooperative Grants Program for High Energy Physics*, U.S. Civilian Research and Development Foundation, Fall 2006
- Institutional Reviewer for *High Energy Physics Program Proposal*, National Science Foundation, Fall 2005
- Texas A&M Internal Engineering Sciences Proposal Selection Committee for the 2006 *Advanced Technology Program* (ATP), Fall 2005

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<sup>8</sup>These are physics review activities only. Teaching related reviewing is listed separately