

# Petar Maksimović

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## Professional History

- **The Johns Hopkins University: Professor (2011-present)** Convener of the CMS's "Leptonic SUSY" (2012-present) and "Top-Like BSM" (2011-2012) physics subgroups.
- **The Johns Hopkins University: Associate Professor (2007-2011)** Convener of the CMS's "Top Pair BSM" physics subgroup (2010-2011). Member of CMS Statistics Committee (2010-2011), CMS B PAG Editorial Board (2012), Level 2 manager of the "Physics Analysis Tools" group (2008-2009). Convener of the CDF's "B decays and CP violation" physics subgroup (2006-2008).
- **The Johns Hopkins University: Assistant Professor (2001-2007)** Co-ordinator of the CDF Database group (2003-2008). Co-leader of the Frontier Database Project (2003-2004) (CDF).
- **Harvard University: Post-doctoral fellow (1997-2001)**
- **Massachusetts Institute of Technology: Graduate student (1992-1997)**  
Ph. D. Thesis (on CDF): "*Observation of  $\pi - B$  meson charge-flavor correlations and measurement of time-dependent  $B^0\bar{B}^0$  mixing in  $p\bar{p}$  collisions.*", with Prof. P. Sphicas.
- **University of Belgrade (Yugoslavia): Undergraduate student (1988-1992)**  
Test-beam for the CHORUS experiment at CERN (scintillating capillary tracking devices) (1991).

## Awards

- JHU's 2012 Excellence in Teaching Award.
- Alfred P. Sloan Research Fellowship, 2004.
- Department of Energy Outstanding Junior Investigator award, 2004.
- "University Research Association thesis prize" in recognition of the outstanding Ph.D. thesis for research undertaken in association with Fermi National Accelerator Laboratory, 1999.

## Funding

- NSF grant since 2002 (as a co-PI, with Morris Swartz as PI), total \$4,390,000.
- DOE Outstanding Junior Investigator award (2004-2010), total \$437,000.
- Sloan Research Fellowship (2004-2006), total \$40,000.

## Departmental service at JHU

- Colloquium Committee (2012-present)
- Computer committee (2008-2011)
- Recruitment committee (2007-present)
- Adviser to the JHU chapter of the Society of Physics Students (2002-present)
- Admissions committee (2002-2004, chair in 2003, again 2012-present)
- Undergraduate program committee (2002-2007)

## Teaching at JHU

- "General Physics II", 171.102 (for science and engineering majors). Taught in fall 2011 and 2012.
- "Electricity and Magnetism I", 171.106 (the second physics course for the freshmen physics majors). Taught in spring 2011 and 2012.
- "Classical Mechanics I", 171.105 (general physics for freshmen physics majors). Taught in fall 2007, 2008, 2009, and 2010.

- “Classical Mechanics II” 171.204 (analytical mechanics for sophomore physics majors), spring 2007, 2008, 2009, and 2010.
- “Intermediate Laboratory” 173.308 and “Advanced Laboratory” 173.608 (experiments in modern physics which I helped set up; 173.608 is the graduate version). Spring 2002, 2003, 2004 and 2005; fall 2002, 2003, and 2005,
- “Electronics for Physicists” 173.307 (analog electronics following Horowitz and Hill). Fall 2002, 2003, and 2004.
- “Digital Electronics for Physicists” 173.309 (a course on writing firmware using FPGA technology, which I invented and developed). Spring 2003, fall 2003 and 2004.

## Student supervision

- I have supervised six Hopkins graduate students: J. Pursley (Ph.D. 2007, now at Harvard Medical School), R. Mumford (2008, now at Kelly Benefits), M. Mathis (2010, now at College of William and Mary). Two of my students are currently working on CMS experiment: D. Fehling and G. Hu.
- Before joining Hopkins, I informally supervised four graduate students on CDF: S. Bailey (Harvard), D. Vučinić (MIT), T. Shah (MIT) and H. Niu (Brandeis).
- At Hopkins, I have supervised 20 undergraduates in research (listed with their current affiliation): S. Jue (UC Berkeley), S. Tulin (Caltech), B. Schulyer (Wisconsin), B. Nord (NASA Goddard), E. Strauss (SLAC), M. Rudolph (MIT), M. Pagano (industry; in 2004, won PURA and Second Decade Society Fellowship), R. Bauer (Rutgers), M. Schmidt (U Chicago), R. Harlow (industry), J. Shaev (on leave; won PURA in 2007), M. Zakhary (Brandeis), B. Chiarito (U Chicago), D. Bjergaard (Duke; won PURA in 2010), A. Dichiara (industry), J. Mokris (JHU), J. Dandoy (U Chicago), P. Bajaj, K. McGee, and G. Obied. The last three are still at Hopkins. Of those who have gone to graduate school, six went to study particle physics. Three won the Provost Undergraduate Research Award: M. Pagano in 2004, J. Shaev in 2007, and D. Bjergaard in 2010. Pagano also won the Second Decade Society Fellowship (2004).
- I also supervised five post-doctoral fellows: Matthew Herndon (now faculty at U. Wisconsin), Matthew Martin, Satyajit Behari, Salvatore Rappoccio (now faculty at SUNY Buffalo), and Gavril Giurgiu.

## Media coverage

The discovery of the  $\Sigma_b$  (2006) spurred press releases from Fermilab and JHU, which were carried over a number of internet outlets and scientific blogs. They were followed by a segment on Voice of America TV, as well as several popular articles:

- *CERN Courier*, Dec. 2006 issue (Vol. 46, No. 10).  
<http://cerncourier.com/main/article/46/10/5>
- *Fermilab Today*, Nov. 23, 2006.  
[http://www.fnal.gov/pub/today/archive\\_2006/today06-10-23.html](http://www.fnal.gov/pub/today/archive_2006/today06-10-23.html)
- Interview with *Science* Digital Edition,  
<http://sciencenow.sciencemag.org/cgi/content/full/2006/1117/2>

## Summary of Scientific Accomplishments

- **Developed the Simultaneous Heavy Flavor and  $t\bar{t}$  cross section measurement (“SHYFT”) (2009-2011):**
  - developed SHYFT measurement at CDF: significantly reduced systematic errors on the  $t\bar{t}$  cross-section. The best single measurement of  $t\bar{t}$  cross-section for a given amount of data. Submitted to Phys. Rev. Lett..
  - applied the SHYFT technique to CMS data from 2010. The best single top cross-section measurement from LHC. Public since March 2011. To be submitted to Phys. Rev. D in June 2011.
- **Led CMS “Top Pair BSM” (Beyond Standard Model) group (2010-2011)**
  - coordinated the first search for  $Z' \rightarrow t\bar{t}$  at the LHC. Based on 2010 data. Technique similar to SHYFT. Public since March 2011. (Will publish with 2011 data.)
  - coordinated the first detailed study of “jet substructure”. Based on 2010 data. Public since January 2011. (Will publish with 2011 data.)
- **Discovered the  $\Sigma_b$  particle (2006-2007):**
  - reconstructed  $\Sigma_b^{(*)\pm} \rightarrow \Lambda_b^0 \pi^\pm$  using  $\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^-$  decays.
  - discovered four  $\Sigma_b^{(*)\pm}$  states with  $\sim 9\sigma$  significance. One of APS physics highlights for 2006. Published in Phys. Rev. Lett.
- **Performed the most precise measurement of the  $\Lambda_b$  lifetime (2006-2009):**

- developed a new technique to measure  $B$  hadron lifetimes in CDF data collected by a “displaced-track trigger” (which biases the proper time measurement). Applied to  $\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^-$  decays.
- performed the most precise  $\Lambda_b^0$  lifetime result at the time – comparable to all prior measurements combined. (Only recently surpassed, after a factor of five increase in integrated luminosity.) Published in Phys. Rev. Lett.
- **Searched for Charge-Parity (CP) violation in  $B_s \rightarrow J/\psi\phi$  decays (2007):**
  - studied the CP violating phase  $\beta_s$  in  $B_s \rightarrow J/\psi\phi$  decays. The result is a two-dimensional confidence contour in  $2\beta_s$  vs.  $\Delta\Gamma_s$ ; assuming the SM predictions, the  $p$ -value of combined CDF and DØ data 3.4%, or  $2.12\sigma$ . Published in Phys. Rev. Lett.
- **Measured properties of  $B^{**}$  and studied particles around  $B$  mesons for  $B_s$  mixing (2004-2007):**
  - measured the masses and widths of the orbitally excited ( $L = 1$ )  $B^{**0}$  mesons; the measurement of the masses is the best in the world and the measurement of the widths is the first of its kind. Published in Phys. Rev. Lett.
  - performed detailed studies of  $B$  hadronization in PYTHIA Monte Carlo, contributing to the measurement of Same Side *Kaon* Tagging based on PYTHIA, which in turn resulted in observation of  $B_s$  oscillations in 2006.
- **Pioneered measurements with fully reconstructed  $\Lambda_b$  decays (2003-2005):**
  - reconstructed a sample of  $\sim 3000$   $\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^-$  decays, including several very different types of backgrounds.
  - measured  $(f_{\Lambda_b}/f_d)(BR(\Lambda_b)/BR(B^0))$  using this sample. Published in Phys. Rev. Lett.
- **Observed gluonic penguin decays  $B^+ \rightarrow \phi K^+$  at CDF (2003-2004):**
  - published in Phys. Rev. Lett., together with another analysis.
- **Established Same Side Tagging and performed the first measurement of  $\sin 2\beta$  (1995-2000):**

- established Same Side Tagging in  $B^+$  and  $B^0$  data, following the idea of Gronau, Nippe and Rosner; the first observation of the correlation of  $B$  flavor and charge of leading hadronization particle.
- measured  $B^0$  mixing in lepton+charm samples using Same Side Tagging. Published in Phys. Rev. Lett. and Phys. Rev. D.
- tuned PYTHIA for the first time in hadronic environment
- used Same Side Tagging to search for CP violation in  $B^0$  decays by measuring  $\sin 2\beta$  in  $B^0 \rightarrow J/\psi K_s^0$ ; the first measurement which ruled out a part of the physically allowed parameter space. Two papers in Phys. Rev. Lett. and one in Phys. Rev. D.
- enhanced Same Side Tagging to work in inclusive lepton+vertex samples.
- observed  $B^{**}$  for the first time in hadronic environment. Published in Phys. Rev. Lett.
- observed  $B^0 \rightarrow J/\psi K^{(*)0} \pi^+ \pi^-$  which can also be used to measure  $\sin 2\beta$ . Published in Phys. Rev. Lett.

## Summary of Current Scientific Activities

- **Leading CMS “Top-Like BSM” (Beyond Standard Model) group (2011):**
  - overseeing all CMS searches for physics beyond SM that result in top quarks, or ‘top-like’ signatures
  - coordinating development and testing of algorithms for boosted object reconstruction at CMS (for energetic top quarks,  $W$  and  $Z$  bosons, Higgs, etc.)
- **Developed algorithms for reconstruction of highly energetic (“boosted”) top quarks (2008-present):**
  - implemented approach from Kaplan *et. al.* to identify boosted top quarks by declustering the merged “top-jet”; this is called “top tagging”. Reduces QCD background  $\sim 100$  times while keeping 30% of the signal. Approved by CMS in 2009.
  - developed a search for heavy resonances (Kaluza-Klein gluons or  $Z'$ ) which decay to two top quarks, which in turn decay hadronically; backgrounds are estimated from data. Approved by CMS in 2009. Performing this analysis with 2011 data.

- leading development of new tools for reconstruction of boosted “ $W$  jets” (“ $W$  tagging”), as well as of “moderately” boosted top quarks, where its decay products are only partially merged. This analysis is also being done with 2011 data.

## Summary of Technical Accomplishments

- **Improving pixel offline reconstruction (2005-present):**
  - co-developed code to reconstruct pixel hits, including the “pixel template reconstruction” which
    - \* will be correct after radiation damage
    - \* produces the probability of compatibility of the pixel hit and the track.
- **Improving CMS tracking through a better use of pixel information (2007-present):**
  - deployed pixel template probability in track seeding; observed improvements of a factor of two in the speed of pattern recognition, and about 30% in reduction in  $b$ -tagging mistag rate.
  - developed pixel quality cuts which can be deployed offline (after tracking)
  - working on using pixel template probability in the last phase of tracking, called “outlier rejection”.
- **Coordinating integration and deployment of statistical tools (2010):**
  - coordinating deployment and use of `Roofit`, and of `Roostats` built upon it. (`Roostats` is the new standard for both ATLAS and CMS.)
  - overseeing use of statistics tools within CMS Exotica group
- **Led CMS Physics Analysis Tools group (2008-2009):**
  - oversaw development of Physics Analysis Toolkit (PAT), a “common language” for analysis at CMS.
  - proposed and implemented simplification of PAT (“PAT v2.0”)
  - rewrote most of the analysis documentation
- **Pioneering Molecular Dynamics simulations on the Grid (2006-present).**

- connected NIH and OSG
- created the first prototype
- **Led the team which designed, built and programmed the Silicon Readout Controller for the CDF Silicon Vertex Detector DAQ system (1997-2000):**
  - completed the design of the board.
  - implemented the firmware in 9 FPGA chips.
  - integrated SRC into the Silicon DAQ; in particular, a lot of work was needed to keep the system operating in a deadtimeless mode.
  - commissioned the Silicon DAQ system in the Tevatron commissioning run in 2000.
- **Led the CDF Database group (2003-present) and Frontier Database project (2004-2005):**
  - led the CDF Database group since 2003.
  - co-led the team which built Frontier Database system for relaying and caching of calibration constants on the grid; it speeds up access to calibration by about 1000 times (at both CDF and CMS); Frontier is in production at CDF since 2005; it has also been integrated into POOL, and is the only mechanism for accessing calibrations at CMS.



## Selected Publications

I am an author of several hundred papers published by the CDF and CMS collaborations. However, I list below only those to which my contribution was substantial. Physics results that are approved by the collaboration for conferences but are in the non-refereed category (*e.g.*, references 2, 5, 6 and 11 below) are nevertheless required to pass a stringent internal review. (The last three entries in the ‘non-refereed’ list are in the process of being turned into publications.)

In this list, there are two gaps. A long gap from about 2000 until 2005, corresponds to the time between the end of Tevatron Run 1 and the point in Run 2 when there was enough data for an interesting physics measurement. In addition, since 2008 I have transitioned to CMS to ensure leadership in mining the early LHC data. As a result, I have only one recent CDF measurement for which the manuscript is in preparation, whereas there are several LHC publications in the pipeline.

### Refereed

1. F. Abe *et al.*, “Measurement of the  $B^0\bar{B}^0$  oscillation frequency using  $\pi B$  meson charge-flavor correlations in  $p\bar{p}$  collisions at  $\sqrt{s} = 1.8$  TeV,” Phys. Rev. Lett. **80**, 2057-2062 (1998).
2. F. Abe *et al.*, “Measurement of the CP-violation parameter  $\sin(2\beta)$  in  $B_d^0/\bar{B}_d^0 \rightarrow J/\psi K_S^0$  decays,” Phys. Rev. Lett. **81**, 5513-5518 (1998).
3. F. Abe *et al.*, “Measurement of  $B^0\bar{B}^0$  Flavor Oscillation Frequency and Study of Same Side Flavor Tagging of B mesons in  $p\bar{p}$  Collisions,” Phys. Rev. D **59**, 032001(1-41) (1999).
4. T. Affolder *et al.*, “A Measurement of  $\sin(2\beta)$  from  $B \rightarrow J/\psi K_S^0$  with the CDF Detector,” Phys. Rev. D **61**, 072005(1-16) (2000).
5. P. Maksimovic, “Recent B-Physics Results From CDF,” Nucl. Instrum. Meth. A **446**, 106-119 (2000).
6. T. Affolder *et al.*, “Observation of orbitally excited  $B$  mesons in  $p\bar{p}$  collisions at  $\sqrt{s} = 1.8$  TeV,” Phys. Rev. D **64**, 072002(1-16) (2001).
7. T. Affolder *et al.*, “A study of  $B^0 \rightarrow J/\psi K^{(*)0} \pi^+ \pi^-$  decays with the Collider Detector at Fermilab,” Phys. Rev. Lett. **88**, 071801(1-6) (2002).
8. M. Aoki *et al.*, “The CDF Run IIb silicon detector,” Nucl. Instrum. Meth. A **518**, 270-276 (2004).
9. D. Acosta *et al.*, “Evidence for  $B_s^0 \rightarrow \phi\phi$  Decays and Measurement of Branching Ratio and  $A_{CP}$  for  $B^+ \rightarrow \phi K^+$ ,” Phys. Rev. Lett. **95**, 031801(1-7) (2005).

10. A. Abulencia *et al.*, “Measurement of the  $B_s^0\bar{B}_s^0$  oscillation frequency,” Phys. Rev. Lett. **97**, 062003(1-7) (2006).
11. A. Abulencia *et al.*, “Measurement of  $\sigma(\Lambda_b^0)/\sigma(\bar{B}^0)\times BR(\Lambda_b^0 \rightarrow \Lambda_c^+\pi^-)/BR(\bar{B}^0 \rightarrow D^+\pi^-)$  in  $p\bar{p}$  collisions at  $\sqrt{s} = 1.96$  TeV.” Phys. Rev. Lett. **98**, 061802 (2007).
12. T. Aaltonen *et al.* “First observation of heavy baryons  $\Sigma_b$  and  $\Sigma_b^*$ ,” Phys. Rev. Lett. **99**, 202001 (2007).
13. M. Swartz, D. Fehling, G. Giurgiu, P. Maksimovic and V. Chiochia, “A new technique for the reconstruction, validation, and simulation of hits in the CMS pixel detector,” PoS **VERTEX2007**, 035 (2007). Also CMS Note-2007/033 (public).
14. T. Aaltonen *et al.* “First Flavor-Tagged Determination of Bounds on Mixing-Induced CP Violation in  $B_s \rightarrow J/\psi\phi$  Decays,” Phys. Rev. Lett. **100**, 161802 (2008)
15. A. Damjanovic, B. T. Miller, T. J. Wenaus, P. Maksimovic, B. Garcia-Moreno, B. R. Brooks, “Open Science Grid Study of the Coupling between Conformation and Water Content in the Interior of a Protein.” Journal of Chemical Information and Modeling, Vol. 48, No. 10. (27 October 2008), pp. 2021-2029.
16. T. Aaltonen *et al.*, “Measurement of Resonance Parameters of Orbitally Excited Narrow  $B^0$  Mesons,” Phys. Rev. Lett. **102**, 102003 (2009).
17. T. Aaltonen *et al.*, “Measurement of the  $\Lambda_b$  Lifetime in  $\Lambda_b \rightarrow \Lambda_c^+\pi^-$  Decays in  $p\bar{p}$  Collisions at  $\sqrt{s} = 1.96$  TeV,” Phys. Rev. Lett. **104**, 102002 (2010)
18. F. Azfar *et al.*, “Formulae for the Analysis of the Flavor-Tagged Decay,” JHEP 1011:158, 2010. 18pp.
19. W. Adam *et al.*, “PAT: The CMS physics analysis toolkit.” J. Phys. Conf. Ser. 219:032017, 2010. 6pp.
20. T. Aaltonen *et al.*, CDF Collaboration, “Measurement of the Top Pair Production Cross Section in the Lepton + Jets Channel Using a Jet flavor Discriminant.” Phys. Rev. D **84**, 0311101(R) (2011).
21. S. Chatrchyan *et al.*, CMS Collaboration, “Measurement of the t tbar Production Cross Section in pp Collisions at 7 TeV in Lepton + Jets Events Using b-quark Jet Identification.” Phys. Rev. D **84** (2011) 092004.
22. S. Chatrchyan *et al.*, CMS Collaboration, “Search for anomalous t t-bar production in the highly-boosted all-hadronic final state,” JHEP **1209**, 029 (2012).

## Non-refereed

1. “The CDFII Detector Technical Design Report,” with the CDFII Collaboration, FERMILAB-PUB-96/390-E, November 1996.
2. “Measurement of  $\Delta m_d$  Using a Probability Based Same-Side Tagger Applied to Lepton + Vertex Events.” FERMILAB-CONF-00-305-E. Published Proceedings of The Meeting of the Division of Particles and Fields (DPF 2000) of the American Physical Society, The Ohio State University, Columbus, OH, August 9-12 2000.
3. S. Behari for the CDF collaboration, “CDF Run IIb silicon vertex detector DAQ upgrade,” FERMILAB-CONF-03-406-E (2004).
4. S. Kosyakov *et al.*, “Frontier: High performance database access using standard Web components in a scalable multi-tier architecture,” FERMILAB-CONF-04-367-CD (2004).
5. The CMS Collaboration, “A Cambridge-Aachen (C-A) based Jet Algorithm for boosted top-jet tagging.” CMS PAS JME-09-001 (public).  
<http://cms-physics.web.cern.ch/cms-physics/public/JME-09-001-pas.pdf>
6. The CMS Collaboration, “Search for High-Mass Resonances Decaying into Top-Antitop Pairs in the All-Hadronic Mode.” CMS PAS EXO-09-002 (public).  
<http://cms-physics.web.cern.ch/cms-physics/public/EXO-09-002-pas.pdf>
7. A. Abdesselam *et al.*, “Boosted objects: A Probe of beyond the Standard Model physics.” Dec 2010. 18pp. arXiv:1012.5412 [hep-ph] (Submitted to Eur. Phys. J. C.)
8. The CMS Collaboration, “Study of Jet Substructure in pp Collisions at 7 TeV in CMS.” CMS PAS JME-10-013 (public),  
<http://cms-physics.web.cern.ch/cms-physics/public/JME-10-013-pas.pdf>
9. The CMS Collaboration, “Search for Resonances in Semi-leptonic Top-pair Decays Close to Production Threshold.” CMS PAS TOP-10-007 (public),  
<http://cms-physics.web.cern.ch/cms-physics/public/TOP-10-007-pas.pdf>
10. The CMS Collaboration, “Combination of top pair production cross sections in pp collisions at 7 TeV and comparisons with theory,” CMS PAS TOP-11-001 (public).  
<http://cms-physics.web.cern.ch/cms-physics/public/TOP-11-001-pas.pdf>
11. The CMS Collaboration, “Search for heavy resonances in the W/Z-tagged di-jet mass spectrum in pp collisions at 7 TeV”, CMS PAS EXO-11-095 (public).  
<http://cms-physics.web.cern.ch/cms-physics/public/EXO-11-095-pas.pdf>  
Submitted to Phys. Lett. B.

## Talks

All talks are invited unless explicitly denoted as contributed. (Since shifting to CMS in 2008, I focused on attending internal CMS meetings and workshops until I have results to report.)

1. Talk at the American Physical Society conference, Indianapolis, May 1996. “*Measurement of Time-Dependent  $B^0\bar{B}^0$  Mixing in Tagged Lepton plus Charm Events at CDF.*” (Contributed.)
2. Seminar at Harvard University, January 1998. “ *$B^0\bar{B}^0$  Mixing at CDF.*”
3. Seminar at Princeton University, December 1997. “ *$B^0\bar{B}^0$  Mixing at CDF.*”
4. Talk at Workshop on CP Violation, Adelaide, Australia, July 3-8, 1998. “*Future Prospects for Measurements of CP Violation at CDF and DO.*”
5. The 6th International Conference on B-Physics at Hadron Machines (“BEAUTY ’99”), Bled, Slovenia, June 21-25 1999. “*Recent B-physics results from CDF.*”
6. Colloquium at Duke University, February 2000. “*CP violation in  $B^0 \rightarrow J/\psi K_S^0$  – present and future.*”
7. Seminar at Harvard University, February 2000. “*CP violation in  $B^0 \rightarrow J/\psi K_S^0$  – present and future.*”
8. Seminar at The Johns Hopkins University, March 2000. “*CP violation in  $B^0 \rightarrow J/\psi K_S^0$  – present and future.*”
9. RPM talk at Lawrence Berkeley National Laboratory, March 2000. “*CP violation in  $B^0 \rightarrow J/\psi K_S^0$  – present and future.*”
10. SLAC seminar, April 2000. “*Recent B physics results from CDF.*”
11. Conference on Intersections of Particle and Nuclear Physics (CIPANP), Quebec City, Canada, May 22-28, 2000 “*Overview of  $B\bar{B}$  mixing.*”
12. Colloquium at The Johns Hopkins University, September 2001. “*CP violation at CDF.*”
13. Seminar at University of Maryland, College Park, October 2002. “*First Run 2 results from CDF.*”
14. The 9th International Conference on B-Physics at Hadron Machines (“BEAUTY 2003”), Carnegie Mellon University, Pittsburgh, Pennsylvania, October 14 - 18, 2003. “*CP Violation Prospects at the Tevatron.*”
15. Frontiers in Contemporary Physics III, Vanderbilt University, Nashville, Tennessee, May 23-28, 2005. “*Charmless B decays at CDF.*”

16. HEP2005 Europhysics Conference in Lisboa, Portugal July 21-27, 2005. “*Measurement of  $BR(\Lambda_b \rightarrow \Lambda_c \mu \nu)$* ” (Contributed.)
17. Rencontres de Moriond: Electroweak Interactions and Unified Theories, La Thuile, Val d’Aoste, Italy March 11-18, 2006. “*CDF results on B Physics.*”
18. The 14th International Conference on Supersymmetry and the Unification of Fundamental Interactions (SUSY’06), Irvine, California, June 12-17, 2006. “*New results in Flavor Physics from CDF.*”
19. Fermilab “Wine and Cheese” seminar, October 20, 2006. “*The Discovery of  $\Sigma_b.$* ”
20. Meeting of Division of Particles and Fields of American Physical Society (DPF 2006), Honolulu, Hawaii, October 30 – November 3, 2006. “*B spectroscopy at CDF.*” (Contributed.)
21. Colloquium at Towson University, November 7, 2006. “*The Discovery of  $\Sigma_b.$* ”
22. Colloquium at Loyola College, November 8, 2006. “*The Discovery of  $\Sigma_b.$* ”
23. SLAC seminar, November 28, 2006. “*The Discovery of  $\Sigma_b.$* ”
24. Colloquium at The Johns Hopkins University, November 30, 2006. “*The Discovery of  $\Sigma_b.$* ”
25. BNL seminar, December 7, 2006. “*The Discovery of  $\Sigma_b.$* ”
26. Seminar at the College of William and Mary, December 14, 2006. “*The Discovery of  $\Sigma_b.$* ”
27. Enrico Fermi Institute Colloquium, University of Chicago March 12, 2007. “*The Discovery of  $\Sigma_b.$* ”
28. Seminar at the University of Virginia, April 18, 2007. “*The Discovery of  $\Sigma_b.$* ”
29. RPM talk at Lawrence Berkeley National Laboratory, March 18, 2008. “*CP violation at CDF*” (with emphasis on  $\beta_s$  in  $B_s \rightarrow J/\psi\phi$ ).
30. Seminar at Princeton University, May 6, 2008. “*CP violation at CDF.*” (with emphasis on  $\beta_s$  in  $B_s \rightarrow J/\psi\phi$ ).
31. The 5<sup>th</sup> International Workshop on the CKM Unitarity Triangle (CKM 2008), Rome, September 9-13 “*Highlights since Nagoya.*” (An introductory plenary talk summarizing the recent progress in flavor physics.)

32. Pixel 2008 International Workshop, Fermilab, Batavia, Illinois, September 23-26, 2008. *“A New Technique for the Reconstruction, Validation, and Simulation of Hybrid Pixel Hits.”*
33. Fermilab “Wine and Cheese” seminar, December 19, 2008. *“B hadron lifetimes in displaced-trigger samples at CDF”* (with emphasis on  $\Lambda_b$  lifetime).
34. SEARCH 2012: Workshop on characterization of new physics, College Park, 17-19 March 2012. *“Searches for Heavy Resonances Decaying to Top Quarks.”*