

# ARAN GARCIA-BELLIDO

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## Research Positions and Experience

- 7/2008–present **Assistant professor at the University of Rochester. Member of the DØ and CMS collaborations.**
- Since March 2009. Representative of University of Rochester in the DØ Institutional Board.
- 11/2002–7/2008 **Resident at Fermi National Accelerator Laboratory, member of the DØ collaboration. Postdoctoral research associate with the University of Washington, Seattle.**
- December 2004-September 2007. Co-convenor of the Single Top Analysis Group.
  - August 2006-March 2007. Co-leader of the V+jets task-force.
  - August 2004-August 2005. Co-convenor of the Tracking and Vertexing Group.
  - August 2003-July 2008. Data Acquisition System on-call expert and on-site principal contact.
  - Since June 2003. Internal referee for the analyses on  $t\bar{t}$  production with  $b$ -tagging.
  - Since June 2008. Internal referee for  $b$ -tagging algorithms certification.
  - Since May 2007. Referee for IEEE Transactions on Nuclear Science.
- 4/2001–2/2002 **PhD student in ALEPH experiment at CERN, with support from CERN.**
- 3/2000–10/2000 **PhD student in ALEPH experiment at CERN, with support from PPARC.**
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## University Education

- 1999–2002 **Ph.D. Royal Holloway University of London, UK.**  
Thesis: “Searches for Gauge Mediated Supersymmetry Breaking at ALEPH with centre-of-mass energies up to 209 GeV”  
Supervisor: Prof. Grahame A. Blair
- 1994–1999 **Graduate in Physics at Universidad Complutense de Madrid, Spain.**
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## Refereed Publications

### As Main Editor:

1. *Evidence for production of single top quarks at DØ*. Phys. Rev. D78, 012005 (2008). Fermilab-PUB-E 08/056. <http://arxiv.org/pdf/0803.0739>
2. *Evidence for production of single top quarks and first direct measurement of  $|V(tb)|$* . Phys. Rev. Lett. 98, 181802 (2007). Fermilab-PUB-E 06/475. <http://arxiv.org/pdf/hep-ex/0612052>

3. *Multivariate searches for single top quark production with the DØ detector.* Phys. Rev. D75, 092007 (2007). Fermilab-PUB-E 06/069. <http://arxiv.org/pdf/hep-ex/0604020>
4. *Search for single top quark production in  $p\bar{p}$  collisions at  $\sqrt{s} = 1.96$  TeV.* Phys. Lett. B622 (2005) 265-276. Fermilab-PUB-E 05/207. <http://arxiv.org/pdf/hep-ex/0505063>
5. *Searches for gauge mediated SUSY breaking topologies in  $e^+e^-$  collisions at centre-of-mass energies up to 209 GeV.* Eur. Phys. J. C25 (2002) 339-351; CERN-EP/2002-021. <http://arxiv.org/pdf/hep-ex/0203024>

**As co-Author:**

1. *b-jet identification in the DØ experiment.* To be submitted to NIM A.

**Appear as author in 149 peer-reviewed publications from DØ and 39 peer-reviewed publications from ALEPH.**

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## Non Refereed Publications

**As Main Editor:**

1. *Evidence for single top quark production at DØ.* Proceedings of XLII Rencontres de Moriond, Electroweak Interactions and Unified Theories. Fermilab-CONF-E 07/144.
2. *The L3-DAQ system in DØ: operation and upgrades.* Proceedings of the Real Time 2007 Conference. Fermilab-CONF-E 07/114.
3. *Looking for single top quarks in DØ data.* Proceedings of the International Meeting on Fundamental Physics. El Escorial, Spain, April 2006. Fermilab-CONF-E 06/521.
4. *Top quark properties at the Tevatron.* 15<sup>th</sup> Topical Conference on Hadron Collider Physics, AIP Conference Proceedings vol. 753 (2005) 224-233.
5. *Searches for gauge mediated SUSY breaking at LEP.* 10<sup>th</sup> International Conference on Supersymmetry and Unification of Fundamental Interactions, Proceedings Hamburg vol. 2 (2002) 967-972.
6. *Search for GMSB and AMSB at LEP.* 7<sup>th</sup> Topical Seminar on The Legacy of LEP and SLC, Siena October 2001. Nucl. Phys. B (Proc. Suppl.) 109B (2002) 236-241.
7. *Searches for Gauge Mediated SUSY breaking topologies at  $\sqrt{s} = 189-208$  GeV.* ALEPH Contribution #239-240 to the International Europhysics Conference on High Energy Physics, Budapest July 2001. ALEPH 2001-053/CONF 2001-033.

**As co-Author:**

1. *Tevatron-for-LHC Report: Top and Electroweak Physics.* FERMILAB-CONF-07-052-E-T. hep-ph/0705.3251.
2. *Improved search for single top quark production at DØ in Run II.* Contributed paper to the 2005 Winter Conferences. DØ Note 4722.
3. *Search for single top quark production at DØ in Run II.* Contributed paper to the 2004 Summer Conferences. DØ Note 4510.
4. *Search for R-Parity violating decays of supersymmetric particles in  $e^+e^-$  collisions at centre-of-mass energies between 189-208 GeV.* ALEPH Contributed paper to the 2001 Winter Conferences. ALEPH 2001-012/CONF 2001-009.

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## Presentations at Conferences

- Jul. 2009 "Top quark production and properties".  
15<sup>th</sup> International Symposium on Particles, Strings and Cosmology. Hamburg, Germany.
- May. 2007 "The Level 3 DAQ system at DØ: operation and upgrades"  
15<sup>th</sup> IEEE NPSS Real Time Conference. Fermilab, Batavia, Illinois, USA.
- Mar. 2007 "Evidence for single top quark production at DØ"  
XLII Rencontres de Moriond. Electroweak Interactions and Unified Theories. La Thuile, Italy.
- Apr. 2006 "Search for single top quark production at DØ"  
International Meeting on Fundamental Physics. El Escorial, Madrid, Spain.
- Oct. 2005 "The lonesome top quark" (poster)  
Top Turns Ten Symposium. Fermilab, Batavia, Illinois, USA
- Apr. 2005 "Single top quark searches at the Tevatron"  
TeV4LHC Workshop. CERN, Geneva, Switzerland.
- Jun. 2004 "Top quark properties at the Tevatron"  
Hadron Collider Physics. East Lansing, Michigan, USA.
- May 2004 "Recent results from the high energy frontier"  
APS North West Meeting. Moscow, Idaho, USA.
- Apr. 2004 "Single top quark searches in muon+jets channel at DØ"  
Pheno 2004. Madison, Wisconsin, USA.
- Jun. 2002 "GMSB searches at LEP"  
SUSY02. DESY, Hamburg, Germany.
- Apr. 2002 "Gauge mediated SUSY breaking searches in ALEPH"  
Institute of Physics Congress 2002. High Energy Physics Conference. Brighton, UK.
- Oct. 2001 "Searches for GMSB and AMSB at LEP"  
Seventh topical Seminar on the Legacy of LEP and SLC. Siena, Italy.

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## Other Conferences and HEP Schools Attended

- May 2008 US CMS Run plan Workshop. Fermilab, Batavia, Illinois, USA.
- Jan. 2006 International Workshop on Top Quark Physics. Coimbra, Portugal.
- Oct. 2005 TeV4LHC Workshop. Fermilab, Batavia, Illinois, USA.
- Apr. 2005 Top Quark Symposium. Ann Arbor, Michigan, USA.
- Sep. 2004 TeV4LHC Workshop. Fermilab, Batavia, Illinois, USA.
- Aug. 2003 Lepton-Photon 2003. Fermilab, Batavia, Illinois, USA.
- Sep. 2001 2001 European School of High Energy Physics. Beatenberg, Switzerland.
- Sep. 2000 2000 Summer School for Young High Energy Physicists. Rutherford Appleton Laboratory, Abingdon, UK.
- Jul. 2000 Conference on Cosmology and Particle Physics CAPP2000. Verbier, Switzerland.

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## Internal Notes

1. "Search for neutral Higgs bosons  $\phi b \rightarrow \tau\tau b$  in  $3.6 \text{ fb}^{-1}$ ", DØ Note 5941.
2. "Improved search for single top quark production using the matrix element analysis technique in  $1 \text{ fb}^{-1}$  of data", DØ Note 5390.
3. "A second look at Bayesian Neural Networks in the search for single top quarks in  $1 \text{ fb}^{-1}$  of data", DØ Note 5361.
4. "Combining results from single top cross section measurements using the BLUE method", DØ Note 5342.
5. "Combining the matrix element and boosted decision tree analyses to search for single top quarks in  $1 \text{ fb}^{-1}$  of data", DØ Note 5293.
6. "A neural network search for single top quarks in  $1 \text{ fb}^{-1}$  of data", DØ Note 5289.
7. "Using Bayesian neural networks to search for single top quarks in  $1 \text{ fb}^{-1}$  of data", DØ Note 5288.
8. "Search for single top quark production using the matrix element analysis technique in  $1 \text{ fb}^{-1}$  of data", DØ Note 5287.
9. "Using boosted decision trees to search for single top quarks in  $1 \text{ fb}^{-1}$  of data", DØ Note 5286.
10. "Search for single top quark production in  $1 \text{ fb}^{-1}$  of data", DØ Note 5285.
11. "Improved search for single top quark production using secondary-vertex tagging", DØ Note 4670.
12. "Search for single top quark production at DØ in Run II", DØ Note 4398.
13. "DØ top analyses and data sample for the Winter Conferences 2004", DØ Note 4419.
14. "Primary vertex certification in p14", DØ Note 4320.

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## Invited Talks, Seminars & Colloquia

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|----------------|--|
| Dec. 2007      | "Top quarks can do it alone: decision trees in action"<br>Physics Colloquium, University of Rochester, New York, USA.  |
| Dec. 2007      | "The Matrix (Part IV): searching for lonely top quarks"<br>Physics Colloquium, Simon Fraser University, Vancouver, British Columbia, Canada.   |
| Mar. 2007      | "NLO for heavy flavor $W$ +jets"<br>Joint CDF-DØ Monte Carlo meeting, Fermilab, Batavia, Illinois, USA.  |
| Mar. 2007      | "Moriond conference summary"<br>All DØ Meeting, Fermilab, Batavia, Illinois, USA.  |
| Feb. 2007      | "Details of single top analysis at DØ"<br>Invited talk with discussion at CDF single top group meeting, Fermilab, Batavia, Illinois, USA.  |
| Jan.-Dec. 2007 | "Evidence for production of single top quarks and first direct measurement of $ V_{tb} $ "<br>Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, Madrid, Spain.<br>Instituto de Física Teórica. Universidad Autónoma de Madrid, Madrid, Spain.<br>IFAE Seminar, Instituto de Física de Altas Energías, Barcelona, Spain.<br>HEP seminar, Northeastern University, Boston, Massachusetts, USA.<br>Laboratory for Particle Physics and Cosmology, Harvard University, Massachusetts, USA.<br>Laboratory for High Energy Physics, Bern Universität, Switzerland.<br>Séminaire de physique corpusculaire, Université de Genève, Switzerland.<br>HEP seminar, TRIUMF, Vancouver, British Columbia, Canada.<br>HEP seminar, Stony Brook University, Stony Brook, New York, USA. |

Jan. 2006	“Search for single top at $D\bar{0}$ ” HEP Seminar, Argonne National Laboratory, Argonne, Illinois, USA.
Sep. 2005	“Are top quarks lonely?” Physics Colloquium, University of Illinois at Chicago, USA.
Jan. 2005	“Recent results from the Tevatron” IFIC Seminar, Instituto de Física Corpuscular, Valencia, Spain.
Jan. 2005	“Search for lonely top quarks at $D\bar{0}$ ” IFAE Seminar, Instituto de Física de Altas Energías, Barcelona, Spain.
May 2004	“Recent results from the Tevatron” EPE Seminar, University of Washington, Seattle, USA.
Feb. 2004	“Recent results from $D\bar{0}$ ” Instituto de Física Teórica. Universidad Autónoma de Madrid, Madrid, Spain.
Feb. 2001	“Searches for R-Parity violating decays of charginos at ALEPH” Royal Holloway University of London, London, UK.

## Teaching Experience

### Lecturer

2009	Mechanics. PHY123 at University of Rochester, Spring 2009.
2008	Nature of the physical world. PHY100 at University of Rochester, Fall 2008.

### Assisting in advising the following students on their dissertation research

2004–2007	Daekwang Kau, Florida State University. Graduated August 2007. “Evidence for single top quark production using Bayesian Neural Networks”
2004–2007	Jovan Mitrevski, Columbia University. Graduated July 2007. “Measurement of single top quark production at $D\bar{0}$ using a matrix element method”
2003–2007	Thomas Gadfort, University of Washington. Graduated April 2007. “Measuring single top production at $D\bar{0}$ ”
2004–2006	Philip Perea, University of California Riverside. Graduated June 2006. “Search for t-channel single top quark production in $p\bar{p}$ collisions at 1.96 TeV”
2004–2006	Shabnam Jabeen. University of Kansas. Graduated January 2006. “Search for single top quarks produced in the s-channel via electroweak interactions at $\sqrt{s} = 1.96$ TeV at the Tevatron”
2004–2006	Benoit Clément, IReS de Strasbourg. Graduated April 2006. “Production électrofaible du quark top au Run II de l'expérience $D\bar{0}$ ”

### Teaching Assistant

2002	2002 Particle Physics Masterclass at RHUL
2000–2002	First year undergraduate Physics Laboratory at RHUL

### PhD Graduation committee

Apr 09	Geumbong Yu, University of Rochester, "Search for charged higgs bosons in decays of top quarks in proton-antiproton collisions at $\sqrt{s} = 1.96$ TeV"
Nov 08	Jiyeon Han, University of Rochester, "The differential cross section distribution of Drell-Yan dielectron pairs in the Z boson mass region"

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## Skills Summary

<b>Language Knowledge</b>	Spanish (native) English (fluent) French (very good level, spoken and written)
<b>Computer Skills</b>	Linux cluster administrator, proficient in MacOS and Windows Experienced in C++, Fortran, Python, Java, Perl, HTML, Mathematica, Root and PAW
<b>Outreach</b>	Five one-hour talks at high-schools in Madrid and London devoted to public understanding of science
<b>UTeV dean</b>	In charge of organizing seminar talks for graduate students and post-docs at Fermilab during 2003. <a href="http://www.fnal.gov/orgs/utev">www.fnal.gov/orgs/utev</a>