

Gabriella Sciolla

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Education

- 1996 Ph.D., Torino University
- 1992 Laurea, Torino University, 110/110 cum laude and honorable mention

Professional Positions

- 2011–present Associate Professor, Brandeis University
- 2007–2011 Associate Professor, MIT
- 2003–2007 Assistant Professor, MIT
- 2002–2003 Pappalardo Fellow, MIT
- 2000–2002 Research Scientist, Laboratory for Nuclear Science, MIT
- 1996–2000 Research Associate, Stanford Linear Accelerator Center

Awards and Honors

- 2010 Buechner Undergraduate Advising Award, MIT
- 2007 Cecil and Ida Green Career Development Professorship, MIT
- 2006 Outstanding Faculty Mentor Award for Undergraduate Research, MIT
- 2005 Charles E. Reed Faculty Initiatives Fund, MIT
- 1992 Angelo Della Riccia Fellowship

Selected Professional Activities

- 2010–present Fermilab Physics Advisory Committee (PAC), member
- 2003–2005 Executive Committee of the SLAC Users Organization (Chair 2003–04)
- 2003–2005 BABAR Speakers Bureau (Chair 2005–06)

Selected Publications

The complete list of publications is provided as a separate file. The list below contains only selected papers that best represent my own work.

- [1] *Directional detection of Dark Matter*, G. Sciolla, Mod. Phys. Lett. A, Vol. 24, No. 23, 1793-1809 (2009), e-Print: arXiv:0811.2764 [astro-ph].
- [2] *Gaseous Dark Matter Detectors*, G. Sciolla and C. J. Martoff, New J. Phys. 11 105018 (2009), e-Print: arXiv:0905.3675 [astro-ph.IM].
- [3] *The case for a directional dark matter detector and the status of current experimental efforts*, S. Ahlen *et al.*, Int. J. Mod. Phys. A25:1-51, 2010, e-Print: arXiv:0911.0323 [astro-ph.CO].
- [4] *First Dark Matter search results from a surface run of the 10-L DMTPC directional Dark Matter detector*, S. Ahlen *et al.* [DMTPC Collaboration], accepted for publication by Phys. Lett. B, e-Print: arXiv:1006.2928 [hep-ex].
- [5] *The DMTPC project*, G. Sciolla *et al.* [DMTPC Collaboration], J. Phys. Conf. Ser. 179, 012009 (2009), e-Print arXiv:0903.3895 [astro-ph].
- [6] *The DMTPC detector*, G. Sciolla *et al.* [DMTPC Collaboration], PoS(IDM2008)002, e-Print arXiv:0811.2922 [astro-ph].
- [7] *Observation of the 'head-tail' effect in nuclear recoils of low-energy neutrons*, D. Dujmic *et al.* [DMTPC Collaboration], Nucl. Instrum. Meth. A **584**, 327 (2008).
- [8] *A Measurement of photon production in electron avalanches in CF₄*. A. Kaboth *et al.* [DMTPC Collaboration], Nucl. Instrum. Meth. A **592**, 63 (2008).
- [9] *Charge amplification concepts for direction-sensitive dark matter detectors*, D. Dujmic *et al.* [DMTPC Collaboration], Astroparticle Physics **30**, 58 (2008).
- [10] *DMTPC: a new apparatus for directional detection of Dark Matter*, G. Sciolla *et al.* [DMTPC Collaboration], in: Proceedings of the 34th International Conference on High Energy Physics (ICHEP 2008), July 25–August 5, 2008, Philadelphia, USA, e-Print: arXiv:0810.0291 [astro-ph].
- [11] *Toward directional detection of Dark Matter with the DM-TPC detector*, G. Sciolla *et al.* [DMTPC Collaboration], in: Proceedings of the XXth Rencontres de Blois, May 18–23, 2008, Chateau de Blois, France, e-Print: arXiv:0806.2673 [astro-ph].
- [12] *DMTPC: a new approach to directional detection of Dark Matter*, G. Sciolla *et al.* [DMTPC Collaboration], in: Proceedings of the 43rd Rencontres de Moriond, March 15–22, 2008, La Thuile, Val d'Aosta, Italy, e-Print: arXiv:0805.2431 [astro-ph].
- [13] *Recent measurements of CP violation at the B factories*, G. Sciolla, Mod. Phys. Lett. A, Vol. 18, No. 30, 2083–2098 (2003), e-Print: hep-ex/0307045.

- [14] *A measurement of CP asymmetry in $b \rightarrow s\gamma$ using a sum of exclusive final states*, B. Aubert *et al.* [BABAR Collaboration], Phys. Rev. Lett. **101**, 171804 (2008), e-Print: arXiv:0805.4796 [hep-ex].
- [15] *Branching fraction measurements of $B^+ \rightarrow \rho^+\gamma$, $B^0 \rightarrow \rho^0\gamma$, and $B^0 \rightarrow \omega\gamma$* , B. Aubert *et al.* [BABAR Collaboration], Phys. Rev. Lett. **98**, 151802 (2007), e-Print: hep-ex/0612017.
- [16] *Observation of CP violation in the B^0 meson system*, B. Aubert *et al.* [BABAR Collaboration], Phys. Rev. Lett. **87**, 091801 (2001), e-Print: hep-ex/0107013.
- [17] *Measurement of the CP-violating amplitude $\sin 2\beta$* , B. Aubert *et al.* [BABAR Collaboration], Phys. Rev. Lett. **89**, 201802 (2002), e-Print: hep-ex/0207042.
- [18] *Improved Measurement of Time-Dependent CP Violation in $B^0 \rightarrow \bar{c}\bar{c}K^{0(*)}$ Decays*, B. Aubert *et al.* [BABAR Collaboration], Phys. Rev. Lett. **94**, 161803 (2005), e-Print: hep-ex/0408127.
- [19] *How well do we know the Unitarity Triangle? An experimental review*, G. Sciolla, PoS KAON:005 (2008), e-Print: arXiv:0708.3238 [hep-ex].
- [20] *Beauty in the Standard Model and Beyond*, G. Sciolla, AIP Conf. Proc. **870**, 10 (2006), e-Print: arXiv:0708.3189v1 [hep-ex].
- [21] *Recent measurements of $\sin 2\beta$ at BABAR*, G. Sciolla for the BABAR Collaboration, Nucl. Phys. B (Proc. Suppl.) **156**, 16–20 (2006), e-Print: hep-ex/0509022.
- [22] *Beyond CP violation: Hadronic physics at BABAR*, G. Sciolla for the BABAR Collaboration, J. Phys. Conf. Ser. **9**, 11 (2005), e-Print: hep-ex/0503012.
- [23] *Branching fraction measurements of $B \rightarrow \eta_c K$ decays*, B. Aubert *et al.* [BABAR Collaboration], Phys. Rev. D **70**, 011101 (2004), e-Print: hep-ex/0403007.
- [24] *Measurements of the mass and width of the η_c meson and of an $\eta_c(2S)$ candidate*, B. Aubert *et al.* [BABAR Collaboration], Phys. Rev. Lett. **92**, 142002 (2004), e-Print: hep-ex/0311038.
- [25] *The BABAR drift chamber*, G. Sciolla *et al.*, Nucl. Instr. and Meth. A419 (1998) 310.
- [26] *Electronics for the BABAR central drift chamber*, J. Albert *et al.*, IEEE Trans. Nucl. Sci. **46**, 2027–2032 (1999).
- [27] *The BABAR drift chamber project*, A. Boucham *et al.*, Nucl. Instr. and Meth. A409 (1998) 46–52.
- [28] *Measurement of Λ_b production and lifetime in Z^0 hadronic decays*, DELPHI Collaboration, Phys. Lett. B311 (1993) 379–390.
- [29] *Lifetime and production rate of beauty baryons from Z decays*, DELPHI Collaboration, Zeit. Phys. C68 (1995) 375.

- [30] *Production of strange B-baryons decaying into Ξ^\mp - ℓ^\mp pairs at LEP*, DELPHI Collaboration, Zeit. Phys. C68 (1995) 541.
- [31] *Determination of the average lifetime of b-baryons*, DELPHI Collaboration, Zeit. Phys. C71 (1996) 199.
- [32] *Production of strange particles in the hadronic decay of the Z^0* , DELPHI Collaboration, Phys. Lett. B275 (1992) 231.

In the news

Newspaper and magazine articles or interviews featuring my research and teaching activity.

- *At M.I.T., Large Lectures Are Going the Way of the Blackboard*, by Sara Rimer, New York Times, Jan. 12, 2009,
<http://www.nytimes.com/2009/01/13/us/13physics.html?pagewanted=all>
- *Hunt for Dark Matter* , interview with Katherine Bourzac, Technology Review, May/June 2009,
<http://www.technologyreview.com/video/?vid=306>
- *What We Don't Know in Physics* , by Katherine Bourzac, Technology Review, Jan/Feb 2009,
<http://www.technologyreview.com/article/21854/>

Invited Talks and Seminars

Conferences and Workshops

- *Review of experimental techniques for WIMP direct detection*, SLAC Summer Institute, Aug. 11, 2009.
- *Review of Particle and Nuclear Astrophysics*, plenary talk, CIPANP 2009, San Diego, May 31, 2009.
- *Determination of angles and sides of CKM triangle at the B factories*, plenary talk, Les Rencontres de Physique de la Vallée d'Aoste, La Thuile, Mar. 1-7, 2009.
- *Directional detection of Dark Matter*,
Detecting Dark Matter in the Milky Way workshop, Case Western, Mar. 12-14, 2009;
Searching for Dark Matter: a unified approach workshop, Radcliffe, Feb. 26-29, 2009.
- *DMTPC: a new approach to directional Dark Matter detection*,
2009 Aspen winter conference on Dark Matter and Dark Energy, Aspen, Jan. 25-30, 2009 (plenary);
COSMO 08, Madison WI, Aug. 25-29, 2008;
IDM2008: Identification of Dark Matter, Stockholm, Aug. 18-22, 2008;
XXXIVth International Conference On High Energy Physics (ICHEP 2008), Philadelphia Jul. 30-Aug. 5, 2008 (poster);
XXth Rencontres de Blois: Challenges In Particle Astrophysics, Blois, France, May 18-23, 2008;
Moriond Cosmology, La Thuile, Italy, Mar. 15-21, 2008 (plenary);
UCLA symposium on Dark Matter and Dark Energy (DM08), Feb. 20-22, 2008 (plenary).
- *DMTPC: a TPC with optical readout for directional Dark Matter detection*,
IEEE 2009, Orlando, Oct. 25-31, 2009;
The Fourth International Symposium on Large TPCs for Low Energy Rare Event Detection, Paris, Dec. 18-19, 2008 (plenary).
- *Directional Dark Matter detection with a low pressure TPC*, CYGNUS 2007, First Workshop on Directional Detection of Dark Matter, Boulby Underground Laboratory, UK, Jul 22-24, 2007.
- *How well do we know the CKM parameters? An experimental overview*, plenary talk, Kaon 2007 (Kaon International Conference), Frascati, Italy, May 21-25, 2007.
- *Constraints on the Unitarity Triangle from $B \rightarrow \rho/\omega\gamma$ decays*, CKM 2006, Nagoya, Japan, Dec. 12-16, 2006.
- *New Physics potential in radiative penguin decays*, Workshop on Physics at the B Factories with 1 ab^{-1} , SLAC, Dec. 7, 2006.
- *Beauty in the Standard Model and beyond*, plenary talk, CIPANP 2006, Puerto Rico, May 30-Jun. 3, 2006.

- *Searching for New Physics at the B factories: Measurements of $\sin(2\beta)$ at BABAR*, plenary talk, Beauty 2005, Assisi, Italy, Jun. 20–24, 2005.
- *Beyond CP violation: hadronic physics at BABAR*, plenary talk, First Meeting of the APS Topical Group on Hadronic Physics, Fermilab, Oct 24–26, 2004.
- *Cracking the Unitarity Triangle: B physics at BABAR*, invited talk, APS/DPF Annual Meeting, Philadelphia, PA, Apr. 5–9, 2003.
- *Probing New Physics with CP violation: $\sin(2\beta)$ at BABAR*, PHENO 2003, Madison, WI, May 5–8, 2003.
- *The first physics results from BABAR*, plenary talk, International Conference on CP Violation Physics, Ferrara, Italy, Sep. 18–22, 2000.
- *The measurement of $\sin(2\beta)$ at BABAR: a feasibility study*, PHENO 99 Symposium: Phenomenology for the Third Millennium, Madison, WI, Apr. 12–14, 1999.
- *The BABAR Drift Chamber*, 8th Vienna Wirechamber Conference, Vienna, Feb. 23–27, 1998.
- *B Hadron exclusive lifetimes*, III German-Russian Workshop on Theoretical Progress in Heavy Quark Physics, Dubna, May 20–22, 1996.
- *Beauty baryons lifetime measurements in DELPHI*, LXXXI National Congress of S.I.F. (Italian Physical Society), Perugia, Oct. 2–7, 1995.
- *Observation of excited b hadrons in DELPHI*, 6th International Conference on Hadron Spectroscopy (Hadron 95), Manchester, Jul. 10–14, 1995.
- *Λ_b lifetime measurements in DELPHI*, FILEP 93 - Congresso Italiano sulla Fisica di LEP, Florence, Apr. 1–3, 1993.

Colloquia and Seminars

- *Dark Matter is from Cygnus: in search of a wind of Dark Matter in the Milky Way*, Physics Colloquium, Harvard, Mar. 16, 2009;
Physics Colloquium, MIT, Sep. 17, 2009;
Physics Colloquium, Northeastern University, Apr. 15, 2010;
Physics Colloquium, Wellesley University, Apr. 22, 2010;
Physics Colloquium, Brandeis University, May 11, 2010;
Physics Colloquium, Rutgers University, Sep. 16, 2010;
Physics Colloquium, Brown University, Sep. 20, 2010.
- *DMTPC: a new approach to directional Dark Matter detection*, Nuclear Physics Seminar, Brookhaven National Laboratory, Jan. 22, 2008;
Particle Physics Seminar, Princeton University, Jan. 23, 2008;
Particle Physics Seminar, University of Oregon, Feb. 4, 2008;
Particle Physics Seminar, TRIUMF, U. British Columbia, Feb. 5, 2008;

- SLAC experimental seminar, SLAC, Feb. 19, 2008;
 Particle Physics Seminar, University of Torino (Italy), Mar. 12, 2008;
 Particle Physics Seminar, University of Grenoble (France), Mar. 13, 2008;
 Particle Physics Seminar, University of Florida, Apr. 1, 2008;
 Particle Physics Seminar, University of Arizona, May 2, 2008;
 Particle Astrophysics Seminar, Fermilab, May 19, 2008;
 High Energy Physics Seminar, University of Chicago, Jun. 2 2008;
 Astroparticle Physics Seminar, U.Mass Amherst, Oct. 10 2008;
 Particle Physics Seminar, University of Paris VI/VII, Dec. 15, 2008;
 Particle Physics Seminar, Orsay Laboratory, Dec. 16, 2008;
 Particle Physics Seminar, Saclay Laboratory, Dec. 17, 2008;
 Particle Physics Seminar, Ohio State University, Feb. 6, 2009;
 Particle Physics Seminar, U.C. San Diego, Feb. 10, 2009;
 RPM seminar, LBL, Feb. 12, 2009;
 Particle Physics Seminar, Caltech, Feb. 17, 2009;
 Particle Physics Seminar, U.C. Irvine, Feb. 18, 2009;
 Particle Physics Seminar, U.C.L.A., Feb. 19, 2009;
 Particle Physics Seminar, U. Penn, Mar. 24, 2009;
 Particle Physics Seminar, University of Pisa, Apr. 28, 2009;
 Particle Physics Seminar, University of Rome La Sapienza, Apr. 30, 2009;
 Particle Physics Seminar, Yale University, Nov. 5, 2009;
 Particle Physics Seminar, University of Tokyo, Dec. 21, 2009;
 Particle Physics Seminar, Rutgers University, Jul. 6, 2010.
- *Beauty in the mirror: Looking for New Physics in CP violation*,
 Physics Department Colloquium, Columbia University, Feb. 12, 2007;
 Physics Department Colloquium, University of Arizona, Mar. 30, 2007;
 Physics Department Colloquium, University of Chicago, Apr. 5, 2007.
 - *Searching for New Physics in Rare B decays*,
 LNS Colloquium, MIT, Sep. 18, 2006;
 High Energy Physics Seminar (RPM), Lawrence Berkeley Laboratory, Oct. 5, 2006;
 High Energy Physics Seminar, Harvard University, Oct. 26, 2006;
 Experimental Particle Physics Seminar, University of Pennsylvania, Nov. 21, 2006;
 KEK Seminar, Tsukuba, Japan, Dec. 18, 2006;
 High Energy Physics Seminar, Tokyo University, Dec. 19, 2006;
 Experimental Particle Physics Seminar, Duke University, Jan. 29, 2007;
 High Energy Physics Seminar, Boston University, Feb. 5, 2007;
 High Energy Physics Seminar, University of Massachusetts at Amherst, Feb. 16, 2007;
 High Energy Physics Seminar, Carnegie Mellon University, Feb. 21, 2007;
 High Energy Physics Seminar, U.C. Davis, Mar. 6, 2007;
 High Energy Physics Seminar, U.C. Santa Barbara, Mar. 8, 2007;
 High Energy Physics Seminar, University of Lausanne (Switzerland), Mar. 23, 2007;
 High Energy Physics Seminar, Laboratoire d'Annecy-le-Vieux de Physique des Particules (France), Mar. 26, 2007;
 High Energy Physics Seminar, University of Torino (Italy), Mar. 27, 2007.

- *CP violation at the B factories*, High Energy Physics Seminar, Yale, Mar. 21, 2006.
- *Beauty at the mirror: CP violation at the B factories*, Physics Department Colloquium, Florida State University, Sep. 2, 2004; Physics Department Colloquium, Northeastern University, Nov. 13, 2003.
- *Cracking the Unitarity Triangle: B physics at BABAR*, Center for Theoretical Physics Seminar, MIT, Mar. 9, 2004.
- *CP violation at the B factories*, Journal Club Seminar, Cornell, Mar. 5, 2003.
- *Beauty at the mirror: what can we learn from CP violation at the B factories?* Special LNS Seminar, MIT, Dec. 18, 2002.
- *CP violation at the B factories*, Physics Department Colloquium, Tufts University, Apr. 12, 2002; Physics Department Colloquium, Brandeis University, Mar. 19, 2002.
- *Recent CP violation results from BABAR*, High Energy Physics Seminar, Boston University, Mar. 27, 2002; High Energy Physics Seminar, Harvard University, Oct. 22, 2001.
- *Observation of CP violation in the B system at BABAR*, LNS Colloquium, MIT, Oct. 15, 2001.
- *CP violation in B decays*, Particle Physics Seminar, Torino University, Sep. 20, 2000.
- *The BABAR Drift Chamber: from construction to the first physics results*, Particle Physics Seminar, Torino University, Sep. 16, 1999.
- *Lifetime measurement of the beauty baryons in DELPHI*, SLAC Particle Physics Seminar, Mar. 12, 1996.
- *Beauty lifetime measurements at LEP*, Seminar at the Technische Universitat of Dresden, Apr. 20, 1995.

Presentations for the General Public, Lectures at Summer Schools, Miscellanea

- *Searching for New Physics in Rare B Decays*, Strangeness, Charm and Beauty in Particle Physics, Vera Luth Retirement Symposium, SLAC, Sep. 24, 2010.
- *The future of SLAC: why DUSEL*, talk given at Redefining the role of SLAC as a User Facility, SLAC, Feb. 7, 2008.
- *Shedding Light on the Dark Universe*, MIT Alumni Breakfast, May 6, 2008; Lunch for Junior Faculty in the School of Science at MIT, Nov. 14, 2008; AIP Public Lecture for the General MIT Community, MIT, Jan. 5, 2009.
- *TEAL: a new approach to undergraduate physics education*, Berkeley, Feb. 13, 2009.

- *DMTPC: a new approach to directional Dark Matter detection*, DUSEL Town Meeting, Washington DC, Nov. 3, 2007.
- *Challenges and Opportunities of the University Program*, HEPAP Subpanel on the University Grants Program, Feb. 8, 2007.
- *The Role of Time Reversal in the Search for New Physics*, MIT Physics Department visiting committee, Oct. 16–Nov 1, 2006.
- *The other window on New Physics: CP violation at the B factories*, Lecture given at the New England Particle Physics Students Retreat, Cape Cod, Aug. 14–18, 2006.
- *What's the matter with anti-matter? A short history of CP violation*, AIP Public Lecture for the General MIT Community, MIT, Jan 24, 2005.
- *CP violation at the B factories: experimental aspects*, Lecture given at the New England Particle Physics Students Retreat, North Woodstock, NH, Aug. 18–22, 2003.
- *Bees, Elephants, Penguins, and the Symmetries of Nature* Second Pappalardo Symposium, MIT, May 2, 2003.