

# Dr. Todd K. Pedlar, Ph.D.

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## ***Professional Preparation***

*Whitman College, Walla Walla, WA.*

B.A. in Physics with Honors - *summa cum laude*. May 1991

*Northwestern University, Evanston, IL.*

Ph.D. in Physics (Concentration: Elementary Particle Physics), May 1999

*Advisor:* Professor Kamal K. Seth

Dissertation: "Study of Two Photon Decays of Charmonium Resonances Formed in Proton-Antiproton Annihilations."

*The Ohio State University* (positioned at Wilson Laboratory, Cornell University, Ithaca, NY)

Postdoctoral Research Associate, May 1999-April 2003

*Supervisor:* Klaus Honscheid

*Cornell University, Ithaca, NY*

Postdoctoral Research Associate, May 2003 - July 2003

*Supervisor:* Richard S. Galik

## ***Professional Appointments***

August 2010 – present: Associate Professor of Physics, Luther College, Decorah, IA

June 2012-May 2013 (*on sabbatical leave*): Visiting Research Fellow, Pacific Northwest National Laboratories, Richland, WA

August 2004 – present: Assistant Professor of Physics, Luther College, Decorah, IA

August 2003 - July 2004: Visiting Assistant Professor of Physics, Luther College, Decorah, IA

Teaching responsibilities include *General Physics I & II, Classical Physics I, Advanced Laboratory, Quantum Mechanics, Particle and Nuclear Physics, Thermal Physics, Physical Science, Energy and the Physical World, FY Seminar: Relativity, the Quantum and All That, Paideia I, Paideia II: Energy, Ethics and Climate Policy.*

May 2003 – July 2003: Postdoctoral Research Associate, Cornell University

May 1999 – April 2003: Postdoctoral Research Associate, The Ohio State University

Pursued research in elementary particle physics with the CLEO Collaboration while stationed at Wilson Laboratory, Cornell University. Held both collaboration-wide research and analysis team leadership positions. Particular area of expertise: production and decay of heavy quarkonium resonances, electronics and data acquisition systems.

## ***Honors and Awards***

- University Fellowship, Northwestern University (1991-1992)
- Pew Foundation Fellowship, Stanford University (1990)
- Phi Beta Kappa, Whitman College (1990)
- Northwest Conference Scholar-Athlete Award (1990,1991)
- National Merit Scholar (1987-1991)

### ***Research Grants Received***

*RUI: Studies of Heavy Quarkonium Spectroscopy with the Belle and Belle II Experiments*

National Science Foundation

Submitted September 2014; funding period: June 2015 - May 2018

\$150,561

*RUI: Studies of Heavy Quarkonium Spectroscopy with the Belle and Belle II Experiments*

National Science Foundation

Submitted September 2011; funding period: June 2012 - May 2015

\$134,592

*RUI: Studies of Heavy Quarkonium Spectroscopy with the CLEO and CLEO-c Experiments*

National Science Foundation

Submitted September 2008; funding period: June 2009 - May 2012

\$161,012 - Revised to \$135,000.

*RUI: Studies of Heavy Quarkonium Spectroscopy with the CLEO and CLEO-c Experiments*

National Science Foundation

Submitted October 2005; funding period: June 2006 - May 2009

\$138,242

*Studies of Heavy Quarkonium Spectroscopy with the CLEO and CLEO-c Experiments*

The Research Corporation

Submitted: November 2005; funding period: June 2006 - May 2008

\$36,076 (declined)

*Investigation of Hadronic Transitions Among States of Heavy Quarkonium with the CLEO Experiment*

Iowa College Foundation - R. J. McElroy Trust

Submitted: April 2006; funding period May 2006 - May 2007

\$2,000

*Investigation of Hadronic Transitions in the Bottomonium System*

Luther College (Summer Student Faculty/Collaborative Research Projects)

Submitted March 2005; funding period: June 2005 - August 2005

\$3,500

### ***Research Students entering Graduate Programs in Physics or Related Fields***

Zach Stottler, Virginia Polytechnic and State University, Ph.D. Program, Sept. 2015

Jon Zarling, Indiana University, Ph.D. Program, Sept. 2013

Christina Storlie, University of Minnesota, M.S. Program in Statistics, Sept. 2013 (MS obtained 2015)

Dallas Wulf, University of Wisconsin-Madison, Ph.D. Program, Sept. 2011

Kris Klein, University of Iowa, Ph. D. Program, September 2009 (Ph.D. obtained 2014)

Shovit Bhari, California State University – Fullerton, M.S. Program, Sept. 2006 (MS obtained 2008)

### ***Leadership activities within Experimental Collaborations***

CLEO Collaboration: co-convenor of Heavy Quarkonium Physics Analysis Group (2003-2009)

Belle II Collaboration: co-convenor of Heavy Quarkonium Physics Working Group (2014-present)

### ***Conference and Seminar Presentations (\* indicates a student presentation)***

#### *Invited Talks (all by T. Pedlar)*

13<sup>th</sup> Int'l. Conference on Heavy Quarks and Leptons, May, 2016, Blacksburg, VA.

Pacific Northwest National Laboratory, April 2013, Richland, WA.

Whitman College, March 2013, Walla Walla, WA.

American Physical Society National Meeting, April 2012, Atlanta, GA.

Minnesota State University-Mankato, April 2011, Mankato, MN

44<sup>th</sup> Rencontres de Moriond, March, 2009, La Thuile, Italy.

Rencontres du Physique de la Valee d' Aoste, February, 2008, La Thuile, Italy.

BaBAR Collaboration Symposium on Bottomonium Physics, February, 2008, Stanford, CA.

8<sup>th</sup> Int'l. Conference on Heavy Quarks and Leptons, October, 2006, Munich, Germany.

American Physical Society National Meeting, April, 2006, Dallas, TX.

Aspen Winter Conference on High Energy Physics, February, 2004, Aspen, CO.

#### *Contributed Talks*

\*Stottler, Z. and \*R. Stuart: Midstates Consortium for Math and Science Undergraduate Research Symposium, November, 2014, Washington University.

\*Wulf, D.: American Physical Society National Meeting, April 2012, Atlanta, GA.

Pedlar, T.: American Physical Society National Meeting, April, 2008, St. Louis, MO.

\*Klein, K. : American Physical Society National Meeting, April, 2008, St. Louis, MO. Midstates Consortium for Math and Science Undergraduate Research Symposium, November, 2007, University of Chicago.

\*Klein, K.: R. J. McElroy Trust Student/Faculty Research Symposium, April 2007, Waverly, IA.

\*Xavier, J.: American Physical Society National Meeting, April, 2007, Jacksonville, FL.

\*Xavier, J.: R. J. McElroy Trust Student/Faculty Research Symposium, April 2007, Waverly, IA.

\*Bhari, S.: American Physical Society National Meeting, April, 2006, Dallas, TX.

\*Bhari, S.: Midstates Consortium for Math and Science Undergraduate Research Symposium, November, 2005, University of Chicago.

## ***Papers Published in or Submitted to Refereed Journals***

The following articles are those papers which I have been one of the principal authors (marked with a \*), or to which I have made significant contributions in analysis and writing (no \*). I have indicated with a \*\* publications on which I was a principal author and for which Luther College students (with their names) are listed as co-authors, indicating their substantial contributions to the work. This list includes only papers published since my arrival at Luther. A full list of approximately 350 papers on which I am credited as an author is available on request, but these publications listed here accurately reflect my direct scholarly contributions.

1. “Energy scan of the  $e^+e^- \rightarrow h_b(nP)\pi^+\pi^-$  ( $n = 1, 2$ ) cross sections and evidence for  $Y(11020)$  decays into charged bottomonium-like states”, R. Mizuk, et al., (Belle Collaboration), in review with *Physical Review Letters*.
2. “First Observation of the Hadronic Transition  $Y(4S) \rightarrow \eta h_b(1P)$  and New Measurement of the  $h_b(1P)$  and  $\eta_b(1S)$  Parameters”, U. Tamponi, et al., (Belle Collaboration), *Phys. Rev. Lett.* **115**, 142001 (2015).
3. \*\*“The Physics of the B Factories”, A. Bevan, et al., *European Physical Journal C* **74**:3026 (2014). Also published in book form by Springer Verlag as “The Physics of the B Factories,” ISBN 978-3-662-44990-5.
4. \*\*“Results in  $B_s$  Physics and Bottomonium Spectroscopy using the Belle  $Y(5S)$  Data Sample”, C. Oswald and T. K. Pedlar, *Modern Physics Letters A* **28**, 1330036 (2013).
5. \*\*“Recent Results in Bottomonium Spectroscopy”, C. Patrignani, T. K. Pedlar and J. L. Rosner, *Annual Reviews of Nuclear and Particle Science*, **63**:21-70 (2013).
6. \*\*“Quarkonium at the Frontiers of High Energy Physics: A Snowmass White Paper”, G. T. Bodwin, E. Braaten, E. Eichten, S. L. Olsen, T. K. Pedlar and J. Russ, arXiv:1307.7425, submitted to the 2013 Snowmass Community Summer Study, August 2013.
7. “Study of the hadronic transitions  $Y(2S) \rightarrow (\eta, \pi^0) Y(1S)$  at Belle”, U. Tamponi, et al., (Belle Collaboration), *Phys. Rev. D* **87**, 011104(R) (2013).
8. \*\*“Evidence for  $\eta_b(2S)$  and observation of  $h_b(1P) \rightarrow \eta_b(1S)\gamma$  and  $h_b(2P) \rightarrow \eta_b(1S)\gamma$ ”, R. Mizuk, et al., (Belle Collaboration), *Phys. Rev. Lett.* **109**:232002 (2012).
9. \*\*“First observation of the P-wave singlet bottomonium states  $h_b(1P)$  and  $h_b(2P)$ ”, I. Adachi, et al., (Belle Collaboration), *Phys. Rev. Lett.* **108**, 032001 (2012)
10. \*\*“Branching fractions for  $Y(3S) \rightarrow \pi^0 h_b$  and  $\psi(2S) \rightarrow \pi^0 h_c$ ”, J. Y. Ge, et al., (CLEO Collaboration), *Phys. Rev. D* **84**, 032008 (2011).
11. \*\*“Measurements of branching fractions for electromagnetic transitions involving the  $\chi_{bJ}(1P)$  states,” M. Kornicer, et al. (CLEO Collaboration), *Phys. Rev. D* **83**, 054003 (2011).
12. \*\*“Measurement of the  $\eta_b(1S)$  mass and of the Branching Fraction for  $Y(3S) \rightarrow \gamma\eta_b(1S)$ ”, G. Bonvicini, et al. (CLEO Collaboration), *Phys. Rev. D* **81**, 031104(R) (2010).
13. \*\*“Improved Measurement of Branching Fractions for  $\pi\pi$  Transitions among  $Y(nS)$  states”, S.R. Bhari, et al. (CLEO Collaboration) *Phys. Rev. D* **79**, 011103(R) (2009).
14. “Inclusive  $\chi_{bJ}(nP)$  decays to  $D^0 X$ ”, R. A. Briere, et al. (CLEO Collaboration), *Phys. Rev. D* **78**, 092007 (2008).
15. \*\*“Observation of  $Y(2S) \rightarrow \eta Y(1S)$  and Search for Related Transitions”, Q. He, et al. (CLEO Collaboration) *Phys. Rev. Lett.* **101**, 192001 (2008).
16. “Study of Dipion Transitions among  $Y(3S)$ ,  $Y(2S)$  and  $Y(1S)$  States”, D. Cronin-Hennessy et al. (CLEO Collaboration), *Phys. Rev. D* **76**, 072001 (2007).
17. “Experimental Study of  $\chi_b(2P) \rightarrow \pi\pi\chi_b(1P)$ ”, C. Cawlfeld, et al. (CLEO Collaboration) *Phys. Rev. D* **73**, 012003 (2006)
18. “Observation of  $\psi(3770) \rightarrow \pi\pi J/\psi$  and Measurement of  $\Gamma_{ee}(\psi(2S))$ ”, N. E. Adam et al. (CLEO Collaboration), *Phys. Rev. Lett.* **96**, 082004 (2006).
19. \*\*“Observation of the Hadronic Transitions  $\chi_{b0,2} \rightarrow \omega Y(1S)$ ”, D. Cronin-Hennessy, et al. (CLEO Collaboration), *Phys. Rev. Lett.* **92**, 222002 (2004).
20. \*\*“Measurement of the Resonance Parameters of the Charmonium Ground State,  $\eta_c(1S)$ ”, M. Ambrogiani et al. (E835 Collaboration), *Phys. Lett.* **B566**, 45 (2003).

### ***Grant and Publication Reviews***

- Ad-hoc and Panel Grant Proposal Reviewer – National Science Foundation
- Ad-hoc Grant Proposal Reviewer – Department of Energy
- Manuscript Reviewer for *The Physics Teacher* (peer-reviewed journal published by the APS/AAPT) and *The Physical Review*, *Physics Education* (peer-reviewed journal published by the APS)

### ***Physics Textbook Reviewing and Authoring***

- *Textbook Reviewer* for W.H. Freeman and Company, Pearson/Addison Wesley, and McGraw-Hill
- *Textbook Problems Author* for W. H. Freeman & Company, 6<sup>th</sup> Edition, Tipler & Mosca, *Physics for Scientists and Engineers*
- *Textbook Problems and Testbank Problems Author* for McGraw-Hill, 1<sup>st</sup> Edition, Bauer & Westfall, *University Physics* and 4<sup>th</sup> Edition, Giambattista, Richardson and Richardson, *College Physics*

### ***Service and Outreach Activities***

#### ***Internal***

- Sept 2014-present: member, Academic Planning Committee, and Course Planning and Review subcommittee. CPR Chair, 2015-2016, Full APC Chair, Sept. 2016-present.
- Sept 2014-present: member of Organizing Committee for the 2017 Reformation Commemoration
- Faculty blogger at Ideas and Creations.
- Lutherlag teacher: 2004, 2010, 2011, 2013.
- Served 2011-2012 as Science Div. Faculty Rep. to the Board of Regents
- Served 2008-2010, as a member of the Honors Advisory Committee
- Member of Faculty/Executive/Staff search committees for
  - Vice President for Student Life (2011-12)
  - English (2011-12)
  - Art (2007-8)
  - Physics (2004-5, 2005-6, 2009-10)
  - SSS Director (2007-2008)
- Co-organizer and presenter, Faculty Workshop on First Year Seminars, (with Ruth Caldwell and Leah Pickard, Summer, 2008)
- Chapter President, Phi Beta Kappa, Eta of Iowa chapter (Fall, 2006 – Spring 2012)
- Served on the ad- hoc committee on First-Year Student Advising, 2005-6 that was tasked with development of the First-Year Advising program
- Co-organizer and presenter, Faculty Workshop on Modern Physics and Literature, “The Quantum Generation” (with Lise Kildegaard, funded by Jones Professorship, Summer, 2005)

#### ***External***

- Member of the Belle II Outreach Committee, June 2015-present, responsible for Twitter and Facebook outreach
- Representative to the Exec. Board of Midstates Consortium for Math and Science (2009 – present)
- Member, Iowa Section, American Association of Physics Teachers. Vice President for Four-Year Colleges, Iowa Section of the AAPT (2005-2011). Local Coordinator, American Association of Physics Teachers (AAPT) Tri-State (IA, WI, MN) Sectional meeting hosted at Luther College, October 21-22, 2005.
- Luther College PARTNERS project participant (PARTNERS pairs Luther College faculty with area high school teachers to bring physics instruction and enrichment to their classes)
  - January, 2009: w/Jim Fritz and Jeannette Spilde at Decorah High School: *The Physics of Music*
  - May, 2006: w/Caroline Scheidel, Turkey Valley: *Trebuchets and other Medieval Throwing Weapons*
  - January, 2005: (with Brad Chamberlain and our Physical Science students) with South Winneshiek - *Physics Competition instruction and preparation.*
  - December 2003: with Caroline Scheidel at Turkey Valley - *Nuclear Physics*

- Organizer and presenter: Luther College Physics outreach events and shows