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## Daniel Patrick Cronin-Hennessy

**Work**

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**Education**

1997      Ph.D. Physics, Duke University (Advisor: Dr. Thomas J. Phillips)  
 1993      M.A. Physics, Duke University  
 1990      B.S. Physics, Boston College

**Ph.D. Thesis Topic**

Tests of Perturbative QCD in  $W + n$  jets events Produced in 1.8 TeV  $\bar{p}p$  Collisions  
 This analysis measured the production rates and kinematic properties of jets produced in association with the  $W$  boson.

**Professional Experience**

99-Present      **Research:** Post-Doc/Research Associate for University of Rochester from March 1999 to present. Professor Ed Thorndike Principal Investigator.    ◦ Most recent published work is a search for baryons in the decay  $B \rightarrow X_s \gamma$     ◦ Measured mass distribution moments of  $X_c$  in  $B \rightarrow X_c l \nu$  for purpose of extracting HQET parameters.    ◦ Measured photon energy spectrum moments in  $B \rightarrow X_s \gamma$ . A marriage of these analyses produced the world's most precise value of  $|V_{cb}|$ . Measured photon energy shape function used by end-point analysis group to reduce model dependence of  $|V_{ub}|$  extraction.  
**Administrative:** *CLEO Analysis Coordinator (current)*. Oversight of all CLEO analyses. My principal focus this year is planning and prioritizing CLEO analysis projects that will facilitate publications from the first phase of the charm factory.  
*B Meson Physics Technical Advisory Committee Chair (July 02- July 03)*. Responsible for oversight of about 20 ongoing CLEO  $B$ -physics analyses. Responsibility includes moving analyses to a high quality and timely publication.  
 ◦ *Operations Manager (July 01- July 02)*. Manager of approximately 40 detector experts and technicians. Coordinated run schedule, downtimes and detector upgrades. Accumulated data at over 90 beam energy points between 1.8 GeV and 5.6 GeV. Initiated use of remote shifting technology (demonstrated at Global Accelerator Network Workshop).    ◦ Served on CLEO Physics Run Plan Committee where I was active in the design and implementation of  $\Upsilon$  resonance physics program.    ◦ Chair of CLEO Shift Committee which created new and efficient model of HEP control-room operations (show-cased at Cornell NSF site review for outreach potential).

Chair of  $\Lambda_c$  Lifetime Paper Committee and  $\Xi_c$  Lifetime Paper Committee.

**Service:** Detector expert for Rochester's Cathode Strip Detector that provides precision  $Z$  measurements for charged particles at outer radius of CLEOIII drift chamber. Solely responsible for installation, commissioning and maintenance. Wrote online code, reconstruction code, Monte Carlo simulation and calibration code. ◦ Electron ID efficiency studies for use in multiple analyses. ◦ Produced Time-of-Flight Detector resolution calibration for generic CLEO Monte Carlo.

**Education:** Oversee junior post-doc and graduate student work at Rochester. ◦ Directed undergraduate research for summer REU students (Tiana Fluker- 1999 and Brian Winey- 2000). This program engages undergraduate students in serious physics research.

1997-99 **Research:** Post-Doc from September 1997 to February 1999 at Duke University. Continued  $W + \text{jets}$  research. Measured rate of inelastic  $\bar{p}p$  collisions at CDF. ◦ Measured prescaled luminosity for over 200 CDF selection triggers.

**Administrative:** Served on CDF review committee for proposed low-angle Cherenkov detector. ◦ Served as literary and technical reviewer for CDF exotics publication (*Search for the  $W' \rightarrow \mu\nu$* ).

**Education:** Physics Lecturer for Introductory Mechanics. Used innovative approaches in large lecture course (Peer Review techniques, Concept Tests, and Force Concept Inventory Test). ◦ Assisted supervision of two graduate students (Marina Brozovic and Justin Lancaster) in Monte Carlo studies of Higgs and supersymmetry signals and in calibration techniques for the hadronic calorimeter at CDF.

1993-97 **Research:** Research Assistant for Duke University High Energy Physics. ◦ Studied wire aging for drift chambers under irradiation. ◦ As member of electroweak physics group I developed code that calculated a physics-specific missing transverse energy correction for identifying neutrinos in our detector. ◦ Joined QCD physics group and tested QCD predictions by selecting events tagged with electroweak decays ( $W \rightarrow e\nu$ ). ◦ Active in development of new technique for measuring the jet contamination from additional  $\bar{p}p$  interactions. ◦ Produced and defended doctoral thesis on  $W$  plus jets physics at CDF. Dr. Tom Phillips was my advisor

**Service:** Self-appointed Data Quality Manager. I compiled data on the status of seven critical subsystems during data collection for two years. Run1B CDF publications are derived from the dataset that I determined was publication-quality. ◦ During data acquisition served as ACE whose job is to keep data acquisition continuing at all costs.

**Education:** I helped develop and execute the Lederman Center's outreach immersion program which was designed to aid schools in science education.

- 1991-93     **Education:** Lab instructor for advanced electronics and introductory physics. ◦ Teaching assistant for graduate level quantum mechanics and undergraduate electromagnetism
- 1990-91     **Research:** Served in electronics support group for Triangle Universities Nuclear Laboratory (TUNL). ◦ Worked on refurbishing Enge split-pole spectrograph.
- 1989-90     **Research:** Senior thesis research in development of thin semiconductor-metal films for use as thermometers at low temperature. Modeled conductive paths across 2-D surfaces. Gained technical knowledge of polarimeter, sputtering chamber, precision voltage measurements, vacuum pumps and cryostats. Prof. Michael Graf of Boston College was my advisor.

### Conferences and Presentations

- “Lectures: Experimental Aspects of CP Violation,”  
Theoretical Advanced Study Institute in Elementary Particle Physics (TASI),  
Boulder Co, June 1-27, 2003.
- “Hadronic B Decays from BaBar, Belle, and CLEO,”  
Invited session of April DPF Meeting, Philadelphia Pa, April 5-8, 2003.
- “Summary of Neutrino Oscillation Results,”  
Cornell Particle Physics Journal Club Seminar, Oct. 18, 2002.
- “Inclusive  $B$  Physics: Spectra, Moments and CKM Matrix Elements,”  
ICHEP, Netherlands, Jul. 24-31, 2002. (*invited*)
- “Extraction of  $|V_{cb}|$  from Inclusive  $B \rightarrow X_c l \nu$  and  $b \rightarrow s \gamma$ ,”  
Rencontres de Moriond (QCD), France, Mar. 23-30, 2001. (*invited*)
- “High Redshift Supernova Data,”  
Cornell Particle Physics Journal Club Seminar, Oct. 12, 2000.
- “Determination of  $|V_{cb}|$  from the Exclusive Decay  $B \rightarrow D^* l \nu$ ,”  
Division of Particles and Fields, Columbus OH., Aug. 9-12, 2000.
- “ $W$  Physics at CDF and D0,”  
Pheno-CTEQ Meeting, Madison WI., Mar. 23-28, 1998.
- “Tests of LO QCD Predictions for  $W^\pm \rightarrow e^\pm \nu$  with  $n$  Associated Jets,”  
APS Meeting, D.C., Apr. 18-21, 1997.
- “Jets in  $W$  events from 1.8 TeV  $\bar{p}p$  Collisions,”  
Division of Particles and Fields, Minneapolis, MN, Aug. 10-15, 1996.
- “Tests of LO QCD Predictions for  $W^\pm \rightarrow e^\pm \nu$  and  $Z \rightarrow e^+ e^-$  with  $n$  Jets,”  
QCD96 Workshop, Montpellier, France, Jul. 4-12, 1996.
- “Properties of Jets in  $W$  Boson Events Produced in 1.8 TeV  $\bar{p}p$  Collisions,”  
APS Meeting, D.C., Apr., 1996.

## Selected Publications

- 2003 “Search for Baryons in the Radiative Penguin Decay  $b \rightarrow s\gamma$ ,”  
(K. W. Edwards *et al.*) Physical Review **D68:011102**, 2003.
- 2002 “The CLEOIII Drift Chamber,”  
(D. Peterson *et al.*) Nucl. Instrum. Meth. **A478:142-146**, 2002
- 2002 “Measurement of the  $\Xi_c^+$  Lifetime,”  
(A. H. Mahmood *et al.*) Physical Review **D65:031102**, 2002.
- 2001 “Hadronic Mass Moments in Inclusive Semileptonic  $B$  Meson Decays,”  
(D. Cronin-Hennessy *et al.*) Physical Review Letters **87:251808**, 2001.
- 2001 “Branching Fraction and Photon Energy Spectrum for  $b \rightarrow s\gamma$ ,”  
(S. Chen *et al.*) Physical Review Letters **87:251807**, 2001.
- 2001 “Improved Upper Limits on the FCNC  $B \rightarrow Kl^+l^-$  and  $B \rightarrow K^*(892)l^+l^-$ ,”  
(S. Chen *et al.*) Physical Review Letters **87:181803**, 2001.
- 2001 “Measurement of the  $\Lambda_c^+$  Lifetime,”  
(A. H. Mahmood *et al.*) Physical Review Letters **86:2232-2236**, 2001.

## Internal CLEO Publications

- 2003 “Search for Baryons in the Radiative Penguin Decay  $b \rightarrow s\gamma$ ,”  
D. Cronin-Hennessy, J. Thayer, E. Thorndike  
CBX 03-9
- 2001 “Improving the Determination of  $|V_{ub}|$  Using the  $b \rightarrow s\gamma$  Photon Energy Spectrum,”  
D. Cronin-Hennessy, J. Ernst, A. Lyon, J. Thayer, E. Thorndike  
CBX 01-59
- 2001 “Resonance Running Program,”  
D. Cronin-Hennessy, R. Galik, D. Rubin, T. Skwarnicki, V. Savinov, H. Vogel  
CBX 01-33
- 2001 “Description of the  $b \rightarrow s\gamma$  Analysis,”  
D. Cronin-Hennessy, J. Ernst, A. Lyon, J. Thayer, E. Thorndike  
CBX 01-02
- 2001 “A Review of the Hadronic Moments Analysis,”  
D. Cronin-Hennessy, E. Thorndike, and S. Roberts  
CBX 01-01
- 1999 “Recompress and CLEO II.V Full Roar Lepton Skims,”  
D. Cronin-Hennessy, M. Palmer  
CBX 99-47

**Internal CDF Publications**

- 1998 Note 4721: "Luminosity at CDF," (D. Cronin-Hennessey, A. Beretvas)
- 1997 Note 4343: "Measurement of the  $W + \geq 1 \text{ Jet} / W + \geq 0 \text{ Jet}$  Cross Section Ratio in  $W \rightarrow e\nu$  Events," (D. Cronin-Hennessey, Jay Dittmann)
- 1997 Note 4317: "Getting Your Luminosity," (D. Cronin-Hennessey *et al.*)
- 1997 Note 4093: "Measurement of the  $W \rightarrow e\nu + n \text{ Jet}$  Cross Sections," (D. Cronin-Hennessey *et al.*)
- 1996 Note 4088: "The Top Contribution and Non-QCD Background Calculation for  $W + \text{ Jets}$ ," (D. Cronin-Hennessey *et al.*)
- 1996 Note 4087: "The QCD Background Calculation for  $W + \text{ Jets}$ ," (D. Cronin-Hennessey *et al.*)
- 1996 Note 4086: "The Acceptance Calculation for  $W + \text{ Jets}$ ," (D. Cronin-Hennessey *et al.*)
- 1996 Note 4085: "The Missing Transverse Energy Correction," (D. Cronin-Hennessey *et al.*)
- 1996 Note 3599: "Multiple Vertices as a Function of Luminosity," (A. Beretvas *et al.*)
- 1996 Note 3570: "A Study of Two  $\chi^2$  Methods for Comparing Distributions," (D. Cronin-Hennessey *et al.*)
- 1996 Note 3418: "Beam Beam Counter Cross Section Accidentals Correction," (D. Cronin-Hennessey *et al.*)
- 1996 Note 3361: "QCD Background to  $W + n \text{ Jets}$ ," (D. Cronin-Hennessey *et al.*)
- 1995 Note 3360: "Measurement of  $Z \rightarrow e^+e^- + N \text{ Jet}$  Cross Sections in 1.8 TeV  $\bar{p}p$  Collisions," (D. Cronin-Hennessey *et al.*)
- 1995 Note 3096: "Properties of Jets in  $Z$  Boson Events from 1.8 TeV  $\bar{p}p$  Collisions," (D. Cronin-Hennessey *et al.*)
- 1995 Note 3095: "Properties of Jets in  $W$  Boson Events from 1.8 TeV  $\bar{p}p$  Collisions," (D. Cronin-Hennessey *et al.*)
- 1995 Note 3077: "Measurement of  $W \rightarrow e\nu + N \text{ Jet}$  Cross Sections in 1.8 TeV  $\bar{p}p$  Collisions," (D. Cronin-Hennessey *et al.*)
- 1995 Note 3050: "Measurement of  $Z \rightarrow e^+e^- + N \text{ Jet}$  Cross Sections in 1.8 TeV  $\bar{p}p$  Collisions," (D. Cronin-Hennessey *et al.*)
- 1995 Note 3021: "Luminosity for the Top PRL," (D. Cronin-Hennessey *et al.*)
- 1994 Note 2857: "Preliminary Comparison of Run 1A and Run 1B  $Z + \text{ Jets}$  Data," (D. Cronin-Hennessey *et al.*)