

## CURRICULUM VITAE

### **Yongsheng Gao, Ph.D**

Team Leader of CSU ATLAS program and CSU Fresno ATLAS program

Professor

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### **Education and Training:**

1996 – 2000 Postdoc, Harvard University, Dept. of Physics

Advisor: Prof. George Brandenburg

1995 Ph.D. in Physics, University of Wisconsin-Madison

Thesis Advisor: Prof. Sau Lan Wu

Thesis Title: Precise Measurement of  $b$  Baryon Lifetime

1988 M.S. in Physics, Shandong University, P.R. China

1985 B.S. in Physics, Shandong University, P.R. China

### **Citizenship:** USA

### **Research and Professional Experience:**

2017 – present	Professor (tenured)	Physics Dept	California State University, Fresno
2012 – 2017	Associate Professor (tenured)	Physics Dept	California State University, Fresno
2007 – 2012	Assistant Professor	Physics Dept	California State University, Fresno
2000 – 2007	Assistant Professor	Physics Dept	Southern Methodist U., Dallas, TX
1996 – 2000	Postdoc	Physics Dept	Harvard University
1989 – 1995	Graduate Research Assistant	Physics Dept	University of Wisconsin-Madison
1988 – 1989	Teaching Assistant	Physics Dept	University of Wisconsin-Madison

### **Award & Honors:**

- 2014 CSU Fresno Provost's Award for "Distinguished Achievement in Research, Scholarship or Creative Accomplishment"
- 2010 CSU Fresno Provost's Award for "Promising New Faculty"

### **Other Scientific Positions:**

1. Proposal reviewer for National Science Foundation (NSF) Elementary Particle Physics program (2012, 2013, 2014, 2015, and 2016)
2. Proposal reviewer for Department of Energy (DOE) High Energy Physics program (2004, 2006, and 2007)

3. Representative of CSU Fresno at US ATLAS Institutional Board, US LHC Users Organization, and CERN Users' Office (2007 – 2015)
4. Representative of CSU at US ATLAS Institutional Board, US LHC Users Organization, and CERN Users' Office (2015 – present)
5. Chair of the Scientific Review Committee of CLEO Collaboration for the manuscript "First observation and Dalitz analysis of  $D^0 \rightarrow K^0_s \eta \pi^0$ " by Mikhail Dubrovin and David Cinabro. The paper was published in Phys. Rev. Lett. 93, 111801 (2004)
6. Member of the Scientific Review Committee of CLEO Collaboration for the manuscript "Observation of  $B \rightarrow K^0_s \pi^+ \pi^-$  and Evidence for  $B \rightarrow K^{*+} \pi^-$ " by W. Sun. The paper was published in Phys. Rev. Lett. 89, 251801 (2002)
7. Member of the Scientific Review Committee of CLEO Collaboration for the manuscript "Search for decays of  $B^0 \rightarrow \pi^0 \pi^0$ " by F. Blanc and J.P. Alexander. The paper was published in Phys. Rev. D65, 031103 (2002)
8. Chair of the Scientific Review Committee of CLEO Collaboration for the manuscript "Search for decays of  $B^0$  mesons into pairs of leptons:  $B^0 \rightarrow e^+ e^-, \mu^+ \mu^-, e^+ \mu^-$ " by T. Wlodek. The paper was published in Phys. Rev. D62, 091102 (2000)
9. Member of the Scientific Review Committee of CLEO Collaboration for the manuscript "Search for decay  $B^0 \rightarrow D^{*0} \gamma$ " by V. Savinov. The paper was published in Phys. Rev. Lett. 84, 4292 (2000)
10. Member of the Scientific Review Committee of CLEO Collaboration for the manuscript "Observation of high momentum  $\eta'$  production in B decay" by Y. Li and T. Browder. The paper was published in Phys. Rev. Lett. 81, 1785 (1998)

**Professional Memberships:**

American Physical Society (1989 – present)

**Major Research Interests:**

Experimental High Energy Physics: Test the Standard Model of particle physics and search for new physics beyond the Standard Model on the ATLAS experiment of the Large Hadron Collider (LHC) at the European Organization for Nuclear Research (CERN).

**Research Support:**

*External Grants*

Grants received from NSF Elementary Particle Physics (EPP), NSF Major Research Instrumentation (MRI), NSF International Research Experience for Students (IRES), and DOE High Energy Physics (HEP) programs:

Year	Proposal Title, lead/subcontractor institutions	Amount Awarded (Role)/Agency
8/1/2015 to 7/31/2018	Searching and Discovering New Physics with Run-2 on ATLAS Experiment of LHC	\$509,994 (Single Principal Investigator) NSF EPP
8/1/2015 to 7/31/2018	A New US-CERN Summer Program on ATLAS Experiment of LHC at CERN for California State University System	\$249,863 (Single Principal Investigator) NSF IRES

6/1/2012 to 5/31/2015	Searching and Discovering New Physics at the ATLAS Experiment of LHC	\$510,999 (Single Principal Investigator) NSF EPP
3/1/2010 to 2/29/2012	Development of the US ATLAS Physics Analysis Instrument (APAI) for the Analysis of Data from the ATLAS Experiment at the LHC; Lead: CSU Fresno; Subcontractors: U. of Chicago, Columbia, Hampton, Michigan State, Northern Illinois, New York, Stony Brook, U. of Washington	\$620,000 (Single Principal Investigator) NSF MRI
8/15/2009 to 7/31/2012	Search for New Physics at ATLAS with Leptons and Photons	\$460,000 (Single Principal Investigator) NSF EPP
2007 to present	Annual ATLAS membership fee to CERN for CSU Fresno ATLAS program, CSU ATLAS program	~\$400,000 (Single Principal Investigator) NSF EPP
FY2007	Operation of the SMU HEP group	\$512,000 (Co-Investigator) DOE HEP
FY2006	Operation of the SMU HEP group	\$480,000 (Co-Investigator) DOE HEP
FY2005	Operation of the SMU HEP group	\$480,000 (Co-Investigator) DOE HEP
FY2004	Operation of the SMU HEP group	\$390,000 (Co-Investigator) DOE HEP
FY2003	Travel Supplemental	\$15,000 (Single Principal Investigator) DOE HEP
FY2003	Operation of the SMU HEP group	\$420,000 (Co-Investigator) DOE HEP
FY2002	Computing Supplemental Request	\$20,000 (Single Principle Investigator) DOE HEP
FY2002	Operation of the SMU HEP group	\$415,000 (Co-Investigator) DOE HEP
FY2001	Operation of the SMU HEP group	\$400,000 (Co-Investigator) DOE HEP

*Internal Grants*

<b>Date</b>	<b>Source and Title</b>	<b>Amount</b>
2017/4	CSM Faculty Professional Development Award	\$1,200
2017/1	Fund from CSM for the ATLAS program	\$15,000
2016/9	Instructionally-Related Activities Award	\$6,000
2016/4	CSM Faculty Scholarly and Creative Activity Award	\$5,000
2015/4	CSM Faculty Scholarly and Creative Activity Award	\$2,500
2016/1	Fund from CSM for the ATLAS program	\$15,000
2015/11	CSM Faculty Professional Development Award	\$1,200
2015/9	Instructionally-Related Activities Award	\$3,875
2015/4	CSM Faculty Scholarly and Creative Activity Award	\$2,500
2015/1	Fund from CSM for the ATLAS program	\$15,000

2015/1	Instructionally-Related Activities Award	\$4,800
2014/5	CSM Faculty Professional Development Award	\$1,200
2014/1	Fund from CSM for the ATLAS program	\$15,000
2014/1	Instructionally-Related Activities Award	\$6,000
2013/11	CSM Faculty Professional Development Award	\$1,000
2013/1	Fund from CSM for the ATLAS program	\$15,000
2013/1	Instructionally-Related Activities Award	\$9,000
2012/6	Fund from ORSP for the ATLAS program	\$50,000
2012/4	CSM Faculty Performance Award	\$1,000
2012/1	Fund from CSM for the ATLAS program	\$15,000
2012/1	Instructionally-Related Activities Award	\$9,000
2011/10	Fund from the Provost for the ATLAS program	\$100,000
2011/4	CSM Faculty Performance Award	\$1,000
2011/1	Fund from CSM for the ATLAS program	\$15,000
2010/12	Instructionally-Related Activities Award	\$7,500
2010/4	CSM Faculty Performance Award	\$1,000
2010/3	Fund from CSM for the ATLAS program	\$15,000
2009/12	Instructionally-Related Activities Award	\$7,500
2009/11	Fund from ORSP for the ATLAS program	\$50,000
2009/9	Fund from the Provost for the ATLAS program	\$150,000
2009/5	Provost's Research, Scholarship and Creative Activities	\$5,000
2009/4	CSM Faculty Performance Award	\$1,000
2009/3	Fund from CSM for the ATLAS program	\$15,000
2009/1	Instructionally-Related Activities Award	\$15,000
2008/12	College Scholarly & Creative Activity Release time	\$5,000
2008/5	Provost's Graduate Faculty/Program Enhancement Award	\$4,000 (with Prof. Singleton)
2008/5	Provost's Research, Scholarship and Creative Activities	\$5,000
2008/2	College Scholarly & Creative Activity Release Time	\$5,000
2008/1	Fund from CSM to build up the ATLAS program	\$145,000

**Invited Talks:**

- “The CSU ATLAS Program at LHC of CERN”, talk at CSU STEM Conference in Los Angeles, CA from 8/10/2017 to 8/11/2017 organized by CSU Chancellor's Office
- “A New US-CERN Summer Program on ATLAS Experiment of LHC at CERN for California State University System”, talk at 38<sup>th</sup> International Conference on High Energy Physics from 8/3/2016 to 8/10/2016 in Chicago, IL
- “The California State University (CSU) ATLAS Program at the LHC of CERN”, physics seminar at Shanghai Jiao Tong University in Shanghai, China on 6/24/2016
- “Hunting/Discovering Higgs Boson (“God” particle) and New Physics at Large Hadron Collider (LHC) of CERN”, physics colloquium at CSU San Diego on 10/9/2015
- “Hunting/Discovering Higgs Boson (“God” particle) and New Physics at Large Hadron Collider (LHC) of CERN”, physics colloquium at CSU Fullerton on 9/4/2015
- “Fresno State ATLAS Program at LHC of CERN”, invited talk at Central California STEM Collaborative Symposium on 3/5/2015
- “Hunting and Discovering Higgs Boson (“God” particle) at Large Hadron Collider (LHC) of

- CERN”, Provost’s Award Lecture on 2/4/2015
- “Hunting and Discovering Higgs Boson (“God” particle) at Large Hadron Collider (LHC) of CERN”, physics colloquium at CSU San Bernardino on 1/30/2015
- “Hunting and Discovering Higgs Boson (“God” particle) at Large Hadron Collider (LHC) of CERN”, physics colloquium at CSU Los Angeles on 1/29/2015
- “Hunting and Discovering Higgs Boson (“God” particle) at Large Hadron Collider (LHC) of CERN”, physics colloquium at CSU Northridge on 1/28/2015
- “ATLAS Experiment at Large Hadron Collider of CERN”, colloquium at Shandong University in Jinan, China on 5/14/2014
- “High Energy Physics Detectors and HEP Experiments”, seminar at Shandong University in Jinan, China on 5/13/2014
- “Discovery of Higgs Boson at ATLAS Experiment of LHC at CERN”, physics colloquium at Gonzaga University on 10/18/2013
- “Discovery of Higgs Boson at ATLAS Experiment of LHC at CERN”, physics colloquium at Eastern Washington University on 5/24/2013
- “New Particle Discovery at ATLAS Experiment of LHC at CERN”, physics colloquium at CSU Dominguez Hills on 5/10/2013
- “New Particle Discovery at ATLAS Experiment of LHC at CERN”, physics colloquium at University of Nevada at Reno on 9/28/2012
- “New Particle Discovery at ATLAS Experiment of LHC at CERN”, colloquium at CSU Channel Islands on 9/5/2012
- “Fresno State and CSU’s ATLAS Program at the Large Hadron Collider of CERN”, colloquium at CSU San Marcos on 2/23/2012
- “Fresno State and CSU’s ATLAS Program at the Large Hadron Collider of CERN”, colloquium at CSU Chico on 2/10/2012
- “Fresno State and CSU’s ATLAS Program at the Large Hadron Collider of CERN”, colloquium at CSU Humboldt on 4/11/2011
- “Fresno State and CSU’s ATLAS Program at the Large Hadron Collider of CERN”, talk at Fresno State showcasing untenured faculty research and creative activities on 3/22/2011
- “ATLAS/LHC Program at Fresno State and CSU”, public lecture at Monday Study Club on 2/7/2011
- “CERN, Large Hadron Collider and Fresno State”, public lecture at Osher Institute at California State University on 10/4/2010
- “CERN, Large Hadron Collider and Fresno State”, public lecture at Osher Institute at California State University on 9/30/2010
- “ATLAS/LHC Program at Fresno State”, seminar at SPS meeting at California State University, Sacramento on 3/17/2010
- “Road to Discovery of ATLAS/LHC”, physics colloquium at California State University, Pomona on 10/29/2009
- “Road to Discovery of ATLAS/LHC”, physics colloquium at California State University, Long Beach on 3/23/2009
- “Road to Discovery of ATLAS/LHC”, physics colloquium at California State University, Stanislaus on 3/20/2009
- “Road to Discovery of ATLAS/LHC”, physics colloquium at California State University, San

Bernardino on 11/20/2008

- “Road to Discovery of ATLAS/LHC”, physics colloquium at University of Nevada on 11/14/2008
- “Road to Discovery of ATLAS/LHC”, physics colloquium at CSU Sacramento on 11/6/2008
- “Large Hadron Collider and Fresno State at LHC”, colloquium at the Greater Fresno Optimist Club on 9/18/2008
- “ATLAS Research Program at California State University, Fresno”, High Energy Physics Seminar at Shandong University on 7/13/2008
- “ATLAS Experiment and Physics Program”, invited talk at Summer Forum on Frontier of High Energy Physics: LHC Physics, July 8 – 12, 2008 in Weihai, China
- “Road to Discovery of ATLAS/LHC”, physics colloquium at California State University, Dominguez Hills on 3/5/2008
- “Road to Discovery of ATLAS/LHC”, physics colloquium at California State University, Fresno on 2/8/2008
- “New Semileptonic Results from CLEO”, invited talk at 33<sup>rd</sup> International Conference on High Energy Physics (ICHEP2006), July 26 – August 2, 2006 in Moscow, Russia
- “Significance Calculation and a New Method to Search for New Physics and  $H \rightarrow \gamma\gamma$ ”, invited talk at North American ATLAS Standard Model and Higgs Workshop, April 26 – 28, 2006 at Argonne National Lab
- “ $D^+ \rightarrow \mu^+ \nu$  and  $f_{D^+}$  from 281  $\text{pb}^{-1}$  at  $\Psi(3770)$  with CLEO-c”, invited talk at International Europhysics Conference on High Energy Physics (HEP2005), July 21 – 27, 2005 in Lisboa, Portugal
- “Hadronic Decays and Cross-sections at  $\Psi(3770)$  with CLEO-c”, invited talk at International Europhysics Conference on High Energy Physics (HEP2005), July 21 – 27, 2005 in Lisboa, Portugal
- “Semileptonic D Decays from CLEO and BELLE”, invited talk at 32<sup>nd</sup> International Conference on High Energy Physics (ICHEP2004), July 21 – 27, 2004, August 16 – 23, 2004 in Beijing, China
- “LHC and ATLAS Physics”, invited lecture series at International Workshop on Frontiers in High Energy Physics, July 2 – 10, 2004 in Beijing, China
- “Recent Charm Results from CLEO”, invited talk at International Europhysics Conference on High Energy Physics (EPS2003), July 17 – 23, 2003 in Aachen, Germany
- “B Physics and Recent Results from CLEO”, High Energy Physics Seminar at Michigan State University on 10/16/2001
- “Recent Results from CLEO Collaboration”, invited talk at International Conference on Flavor Physics (ICFP2001), May 31 – June 6, 2001 in Zhang-Jia-Jie, Hunan, China
- “Study of B Meson Decays to Charmonia Final States at CLEO”, invited talk at American Physical Society, Division of Particle and Fields Conference (DPF2000), August 9 – 12, 2000 in Columbus, Ohio
- “On the Road to Measure CP Violation in B Decays”, physics colloquium at University of Virginia on 3/24/2000
- “On the Road to Measure CKM Angles  $\alpha$  and  $\gamma$ : Observation of  $B \rightarrow \pi\rho$  Decays”, High Energy Physics Seminar at Johns Hopkins University on 3/15/2000
- “On the Road to Measure CKM Angles  $\alpha$  and  $\gamma$ : Observation of  $B \rightarrow \pi\rho$  Decays”, High Energy Physics Seminar at University of Massachusetts, Amherst on 3/2/2000
- “CP Violation in B Decays”, physics colloquium at University of Oklahoma on 2/24/2000
- “On the Road to Measure CKM Angles  $\alpha$  and  $\gamma$ : Observation of  $B \rightarrow \pi\rho$  Decays”, High Energy

Physics Seminar at Harvard University High Energy Physics Lab on 1/26/2000

- “On the Road to Measure CKM Angles  $\alpha$  and  $\gamma$ : Observation of  $B \rightarrow \pi\rho$  Decays”, High Energy Physics Seminar at Stanford Linear Accelerator Center (SLAC) on 11/18/1999
- “First Observation of  $B \rightarrow \pi\rho$  Decays at CLEO”, High Energy Physics Seminar at University of Pennsylvania on 10/19/1999
- “First Observation of  $B \rightarrow \pi\rho$  Decays”, invited talk at American Physical Society (APS99) meeting, March 1999 in Atlanta, Georgia
- “Recent Results on Rare B Decays from CLEO”, invited talk at American Physical Society, Division of Particle and Fields Conference (DPF99), Jan., 1999 in Los Angeles, California
- “Recent Studies of Hadronic B Decays at CLEO”, invited talk at the Fifth Conference on Physics Beyond the Standard Model, May, 1997 in Balholm, Norway
- “Measurement of  $\Lambda_b$  Mass in ALEPH”, invited talk at the Third German-Russian Workshop on Heavy Quark Physics, May, 1996 in Dubna, Russia
- “Precise Measurement of b Baryon Lifetime and Exclusive Reconstruction of  $\Lambda_b$  in ALEPH”, High Energy Physics Seminar at Lawrence Berkeley Laboratory on 11/28/1995
- “Precise Measurement of b Baryon Lifetime and Exclusive Reconstruction of  $\Lambda_b$  in ALEPH”, High Energy Physics Seminar at Stanford Linear Accelerator Center (SLAC) on 11/21/1995
- “Precise Measurement of b Baryon Lifetime and Exclusive Reconstruction of  $\Lambda_b$  in ALEPH”, High Energy Physics Seminar in the Department of Physics, Yale University on 11/16/1995
- “Precise Measurement of b Baryon Lifetime and Exclusive Reconstruction of  $\Lambda_b$  in ALEPH”, High Energy Physics Seminar at High Energy Physics Laboratory, Harvard University on 11/10/1995
- “Measurements of b Baryon Lifetime”, invited talk at American Physical Society, Division of Particle and Fields Conference (DPF94), Aug., 1994 in Albuquerque, New Mexico
- “Evidence for  $\Lambda_b$  Baryon in Z Decays”, invited talk at American Physical Society (APS93), Apr., 1993 in Washington D.C.
- “Evidence for  $\Lambda_b$  Baryon in Z Decays”, invited talk at American Physical Society, Division of Particle and Fields Conference (DPF92), Nov., 1992 in Batavia, Illinois

**Selected Publications:** (Full list of publication includes **over 1000 papers** published mainly in Physical Review, Physical Review Letters, Physics Letters, etc.)

1. M. Aaboud, et al. (ATLAS collaboration), “Search for New Phenomena in Dijet Events using 37 fb<sup>-1</sup> of PP Collision Data Collected at  $\sqrt{s}=13$  TeV with the ATLAS Detector” Submitted to PRD in 3/2017
2. G. Aad, et al. (ATLAS collaboration), “Search for New Phenomena in Dijet Mass and Angular Distributions from PP Collision at  $\sqrt{s}=13$  TeV with the ATLAS Detector” Phys. Lett. B754, 302 (2016)
3. G. Aad, et al. (ATLAS collaboration), “Search for New Phenomena in Dijet Angular Distributions in Proton-Proton Collision at  $\sqrt{s}=8$  TeV Measured with the ATLAS Detector” Phys. Rev. Lett. 114, 221802 (2015)
4. G. Aad, et al. (ATLAS collaboration), “Search for New Phenomena in Dijet Mass Distributions Using PP Collision at  $\sqrt{s}\sim 8$  TeV” PRD 91, 052007 (2015)
5. G. Aad, et al. (ATLAS collaboration), “ATLAS Search for New Phenomena in Dijet Mass and Angular Distributions Using PP Collision at 7 TeV” Journal of High Energy Physics 01, 029 (2013)

6. G. Aad, et al. (ATLAS collaboration), “Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC” Phys. Lett. B716, 1 (2012)
7. G. Aad, et al. (ATLAS collaboration), “Search for New Physics in the Dijet Mass Distribution Using 1 fb<sup>-1</sup> of PP Collisions Data at sqrt(s) = 7 GeV Collected by the ATLAS Detector” Phys. Lett. B708, 37 (2012)
8. G. Aad, et al. (ATLAS collaboration), “Search for New Physics in the Dijet Mass and Angular Distributions in PP Collisions Data at sqrt(s) = 7 GeV Measured with the ATLAS Detector” New Journal of Physics 13, 053044 (2011)
9. G. Aad, et al. (ATLAS collaboration), “Measurement of the  $W \rightarrow l\nu$  and  $Z/\gamma^* \rightarrow ll$  Production Cross Section in PP Collisions at sqrt(s) = 7 TeV with the ATLAS Detector” Journal of High Energy Physics 12, 060 (2010)
10. J.Y. Ge et al. (CLEO collaboration), “Study of  $D^0 \rightarrow \pi^- e^+ \nu$ ,  $D^+ \rightarrow \pi^0 e^+ \nu$ ,  $D^0 \rightarrow K^- e^+ \nu$ , and  $D^+ \rightarrow K^0 e^+ \nu$  in Tagged Decays of the Psi(3770)” Phys. Rev. D79, 052010 (2009)
11. S. Dobbs et al. (CLEO collaboration), “Study of the Semileptonic Charm Decays  $D^0 \rightarrow \pi^- e^+ \nu$ ,  $D^+ \rightarrow \pi^0 e^+ \nu$ ,  $D^0 \rightarrow K^- e^+ \nu$ ,  $D^+ \rightarrow K^0 e^+ \nu$ ” Phys. Rev. D77, 112005 (2008)
12. D. Cronin-Hennessy et al. (CLEO collaboration), “Study of the Decays  $D^0 \rightarrow \pi^- e^+ \nu$ ,  $D^+ \rightarrow \pi^0 e^+ \nu$ ,  $D^0 \rightarrow K^- e^+ \nu$ ,  $D^+ \rightarrow K^0 e^+ \nu$ ” Phys. Rev. Lett. 100, 251802 (2008)
13. Y. Gao, L. Lu and X. Wang, “Significance Calculation and a New Analysis Method in Searching for New Physics at the LHC” Eur. Phys. J. C45, 659 (2006)
14. J. Colas et al. “Position Resolution and Particle Identification with the ATLAS EM Calorimeter” Nucl. Instrum. Meth. A550, 96 (2005)
15. T.E. Coan et al. (CLEO collaboration), “Absolute Branching Fraction Measurements of Exclusive  $D^0$  Semileptonic Decays” Phys. Rev. Lett. 95, 181802 (2005)
16. G.S. Huang et al. (CLEO collaboration), “Absolute Branching Fraction Measurements of Exclusive  $D^+$  Semileptonic Decays” Phys. Rev. Lett. 95, 181801 (2005)
17. T.E. Coan et al. (CLEO collaboration), “Wess-Zumino Current and the Structure of the Decay  $\tau \rightarrow K^- K^+ \pi^+ \nu$ ” Phys. Rev. Lett. 92, 232001 (2004)
18. R.A. Roy et al. (CLEO collaboration), “Branching Fractions of  $\tau$  Leptons to Three Charged Hadrons” Phys. Rev. Lett. 90, 181802 (2003)
19. T.E. Coan et al. (CLEO collaboration), “First Search for the Flavor Changing Neutral Current Decay  $D^0 \rightarrow \gamma\gamma$ ” Phys. Rev. Lett. 90, 101801 (2003)
20. R. Mahapatra et al. (CLEO collaboration), “Observation of Exclusive  $B \rightarrow D^{(*)} K^{*-}$  Decays” Phys. Rev. Lett. 88, 101803 (2002)
21. S. Anderson et al. (CLEO collaboration), “Improved Upper Limits on the FCNC Decays  $B \rightarrow K l^+ l^-$  and  $B \rightarrow K^*(892) l^+ l^-$ ” Phys. Rev. Lett. 87, 181803 (2001)
22. C.P. Jessop et al. (CLEO collaboration), “Study of Charmless Hadronic B Meson Decays to Pseudoscalar-Vector Final States” Phys. Rev. Lett. 85, 2881 (2000)
23. B. Nemati et al. (CLEO collaboration), “Search for Color Suppressed B Hadronic Decay Processes with CLEO”, Phys. Rev. D57, 5363 (1998)
24. R. Barate et al. (ALEPH collaboration), “Measurement of the b Baryon Lifetime and Branching Fractions in Z Decays” Eur. Phys. J. C2, 197 (1998)
25. H.F. Sadronzinski et al. “Monitoring the Performance of Silicon Detectors with Binary Readout in the ATLAS Beam Test” Nucl. Instrum. Meth. A383, 245 (1996)
26. D. Buskulic et al. (ALEPH collaboration), “Measurement of the Mass of the  $\Lambda_b$  Baryon” Phys. Lett. B380, 442 (1996)
27. Buskulic et al. (ALEPH collaboration), “Measurements of the b Baryon Lifetime” Phys. Lett.

B357, 685 (1995)

28. Decamp et al. (ALEPH collaboration), “Charged Particle Pair Production Associated with a Lepton Pair in Z Decays: Indication of an excess in the  $\tau$  Channel” Phys. Lett. B263, 112 (1991)
29. Decamp et al. (ALEPH collaboration), “A Search for Pair Produced Charged Higgs Bosons in Z Decays” Phys. Lett. B241, 623 (1990)

### **Synergistic Activities in Experimental High Energy Physics:**

1. ATLAS experiment at the Large Hadron Collider of CERN (2002 – present):
  - Enrolled CSU Fresno as a collaboration institute of ATLAS and CERN (2007)
  - Serving as team leader of the CSU Fresno ATLAS program (2007 – present) and team leader of the CSU ATLAS program (2015 – present); Among all the 23 CSU campuses, CSU Fresno is the only one on ATLAS or CMS, the two LHC experiments which discovered the Higgs boson (so-called “God” particle) in 2012
  - Building up the CSU Nuclear and Particle Physics Consortium (NUPAC) which consists of 17 CSU campuses (Bakersfield, Channel Islands, Chico, Dominguez Hills, East Bay, Fresno, Humboldt, Long Beach, Los Angeles, Northridge, Pomona, Sacramento, San Bernardino, San Francisco, San Luis Obispo, Sonoma, and Stanislaus) (2008 – present). The CSU Fresno ATLAS program has been the center of CSU NUPAC
  - Developing new color-connection jet substructure and superstructure variables for new physics searches and trigger (2010 – 2012)
  - New physics searches with jets in final state using ATLAS data (2009 – present)
  - Upgrade of ATLAS detector (2010 – present)
  - ATLAS CONNECT project to connect US ATLAS Tier 3 clusters to Tier 2 centers for ATLAS collaboration (2013 – present)
  - Building up the first US ATLAS Tier 3 OpenStack and CloudStack clusters at CSU Fresno in collaboration with computer science faculty and students from CSU Fresno and Chinese research universities (2011 – 2012)
  - Built up ATLAS Grid Computing Tier 3 clusters at CSU Fresno and other 8 US ATLAS institutions for ATLAS physics analyses with NSF MRI award (2009 – 2013)
  - Initiated ATLAS performance and particle identification studies using reflections of Z decays (2006 – 2008)
  - Significance calculation and a new analysis method to search for new physics at LHC (EPJC2006)
  - Electron identification and  $e$ - $\pi$  separation with Liquid Argon test beam data (NIM2005)
  - Supervise CSU Fresno postdocs, graduate and undergraduate students on ATLAS (2008 – present)
  - Supervise graduate and undergraduate students from other CSU NUPAC campuses on ATLAS (2009 – present)
  - Supervise SMU postdoc and graduate students on ATLAS (2002 – 2007)
2. CLEO experiment at the Cornell Electron-positron Storage Ring (CESR) of Cornell University (1996 – 2006):
  - Team leader of the SMU CLEO group (2001 – 2006)
  - Coordinator of CLEO III silicon vertex detector assembly and testing at Cornell University (1996 – 1999)

- Study of B, charm and tau physics using CLEO data
  - Responsible for 11 Physical Review Letters (PRL) and Physical Review D (PRD) papers
  - Tracking systematic studies with CLEO III
  - Supervise SMU postdoc on CLEO (2000 – 2005)
3. ALEPH experiment at the Large Electron-Positron (LEP) Collider of CERN (1989 – 1995):
- Precision measurement of b-baryon lifetime, rare B decays, searches for Higgs & new physics, etc.
  - Responsible for 4 Physics Letters (PL) papers

**Research Activities on the ATLAS Experiment of LHC at CERN (2002 – present, and 1995):**

- New color-connection jet substructure and superstructure variables for new physics searches, and new physics searches with jets in final state:
  - Talks at the ATLAS Higgs, Standard Model, and Exotics Working Groups from 2009 to 2012.
- ATLAS CONNECT to connect US ATLAS Tier 3 clusters to Tier 2 centers for ATLAS collaboration. CSU Fresno Tier 3 was the first Tier 3 cluster on ATLAS CONNECT and has been the testbed for ATLAS CONNECT (2013 – present)
- Build up the first US ATLAS Tier 3 OpenStack and CloudStack clusters at CSU Fresno. This work is in collaboration with computer science faculty and students from CSU Fresno and Chinese research universities (2011 – 2012)
- Build up ATLAS Grid Computing Tier 3 cluster at CSU Fresno for ATLAS physics analyses with NSF MRI award (2009 – 2013)
- Upgrade of ATLAS detector:
  - Talks by CSU students at ATLAS Inner Detector, Muon Detector, Trigger upgrade R&D working groups from 2010 to present
- Initiated ATLAS performance studies, particle identification efficiencies and fake rates using reflections of Z decays from incoming ATLAS data and their impacts on ATLAS physics program:
  - Talks at the ATLAS Higgs, Standard Model, Exotics, Electron/Photon, Jet/EtMiss, and Tau Working Groups from 2006 to 2008. Method and work adopted by ATLAS for performance studies, electron/photon identification efficiencies and fake rate studies, and new physics searches with ATLAS data
- Significance calculation and a new method to search for new physics at the LHC:
  - Talks at the ATLAS Higgs Working Group from 2005 to 2007
  - Published in European Physical Journal C45, 659 (2006). Method adopted by ATLAS for Higgs and new physics searches
- Electron identification and e- $\pi$  separation with 2002 ATLAS liquid argon testbeam data:
  - ATLAS Note: ATL-LARG-2003-013 by L. Lu, Y. Gao and R. Stroynowski
  - Published in Nucl. Instrum. Meth. A550, 96 (2005)
- Set up ATLAS grid computing cluster at SMU in 2002 with DOE grant and SMU fund
- Participate ATLAS data challenges with the SMU computing cluster as US ATLAS Grid Testbed site
- ATLAS silicon microstrip detector R&D:
  - Test FELIX front-end readout chips
  - Beam test and signal/noise measurements

- Published in Nucl. Instrum. Meth. A383, 245 (1996)

**Research Activities on CLEO Experiment of CESR (1996 – 2006):**

- Precise measurements of  $D^0$  and  $D^+$  form factors and CKM matrix elements  $V_{cs}$  and  $V_{cd}$  using exclusive  $D^0 \rightarrow K^- e^+ \nu_e$ ,  $\pi^- e^+ \nu_e$ ,  $D^+ \rightarrow K^0_s e^+ \nu_e$ ,  $\pi^0 e^+ \nu_e$  decays:
  - CLEO Note: CBX 05-35 by F. Liu and Y. Gao
  - Published in Phys. Rev. Lett. 100, 251802 (2008), Phys. Rev. D77, 112005 (2008), and Phys. Rev. D79, 052010 (2009)
- Absolute branching fraction measurements of exclusive  $D^0/D^+$  semileptonic decays:
  - CLEO Note: CBX 05-35 by F. Liu and Y. Gao
  - First observation of  $D^0 \rightarrow \rho^- e^+ \nu_e$  and improved measurements of  $D^0 \rightarrow K^- e^+ \nu_e$ ,  $\pi^- e^+ \nu_e$ , and  $K^{*-} e^+ \nu_e$  with first CLEO-c data
  - Published in Phys. Rev. Lett. 95, 181801 (2005) and Phys. Rev. Lett. 95, 181802 (2005)
- Wess-Zumino current and the structure in the decay  $\tau^- \rightarrow K^- K^+ \pi^- \nu$ :
  - CLEO Note: CBX 03-27 by F. Liu, R. Stroynowski and Y. Gao
  - Published in Phys. Rev. Lett. 92, 232001 (2004)
- First search for Flavor-Changing-Neutral-Current (FCNC) process of  $D^0 \rightarrow \gamma\gamma$ :
  - CLEO Note: CBX 02-30 by Y. Gao
  - Published in Phys. Rev. Lett. 90, 101801 (2003)
- Study of  $\tau$  to three charged hadron decays at CLEO III:
  - CLEO Notes: CBX 02-29, 03-2 by F. Liu, R. Stroynowski and Y. Gao
  - Published in Phys. Rev. Lett. 90, 181802 (2003)
- Tracking systematic study with CLEO III:
  - CLEO Note: CBX 02-13 by F. Liu and Y. Gao
- First observation of  $B \rightarrow D^0 K^{*-}$ ,  $D^+ K^{*-}$ ,  $D^{*0} K^{*-}$ , and  $D^{*-} K^{*-}$ 
  - Can be used to measure the angle  $\gamma$  of the “Unitarity Triangle”
  - CLEO Notes: CBX 01-43, 01-43b by F. Liu, Y. Gao and R. Stroynowski
  - Published in Phys. Rev. Lett. 88, 101803 (2002)
- Search for Flavor-Changing-Neutral-Current (FCNC) decay  $B \rightarrow l^+ l^- K^{(*)}$ :
  - CLEO Note: CBX 01-20 by Y. Gao
  - Published in Phys. Rev. Lett. 87, 181803 (2001)
- New physics opportunities at the Upsilon(5S) for CLEO:
  - CLEO Note: CBX 00-41 by Y. Gao
- First observation of  $B \rightarrow \pi^\pm \rho^0$ ,  $B \rightarrow \pi^+ \rho^-$  and  $\pi^- \rho^+$ :
  - First observation of hadronic  $b \rightarrow u$  transitions
  - Can be used to measure the angle  $\alpha$  and  $\gamma$  of the “Unitarity Triangle”
  - CLEO Notes: CBX 99-71, 99-12, 98-77, 98-47 and 97-96 by Y. Gao and G. Brandenburg
  - Published in Phys. Rev. Lett. 85, 2881 (2000)
- Search for  $B^0 \rightarrow \pi^0 \rho^0$ ,  $\pi^0 K^{*0}$ ,  $K^+ \rho^-$ , and  $B \rightarrow \pi^0 \rho^\pm$ ,  $\pi^0 K^{*\pm}$ ,  $K^\pm \rho^0$ ,  $\pi^\pm K^{*0}$ :
  - CLEO Notes: CBX 99-70, 99-30 by Y. Gao and G. Brandenburg
  - Published in Phys. Rev. Lett. 85, 2881 (2000)

- Search for color-suppressed B hadronic decays  $B^0 \rightarrow D^0(D^{*0})\pi^0(\rho^0,\eta,\eta',\omega)$ :
  - CLEO Notes: CBX 97-30, 97-58 by Y. Gao
  - Published in Phys. Rev. D57, 5363 (1998)
- Coordinator of CLEO III silicon vertex detector assembly and testing project at Cornell University (1996 – 1999):
  - Design all the assembly and testing procedures
  - Train and supervise technicians and graduate students in prototyping and production

### **Research Activities on ALEPH Experiment of LEP at CERN (1989 – 1995):**

- Exclusive reconstruction of  $\Lambda_b$  baryon:
  - Published in Phys. Lett. B380, 442 (1996)
- Precise measurements of b baryon lifetime:
  - First precise b baryon lifetime measurement using silicon vertex detector. It showed for the first time that b baryon lifetime is significantly shorter than that of b mesons
  - Ph. D. Thesis at University of Wisconsin-Madison
  - Published in Phys. Lett. B357, 685 (1995)
- Charged particle pair production associated with a lepton pair in Z decays: Indication of an excess in the Tau channel:
  - Published in Phys. Lett. B263, 112 (1991)
- A search for pair produced charged Higgs boson in Z decays:
  - Published in Phys. Lett. B241, 623 (1990)

### **Mentoring Activities:**

- **Postdoctoral Researchers Supervised:**
  - Harinder Bawa (2008 – present)
  - Andrew Lowe (2010 – 2012, current position: scientific fellow at Wigner Research Centre for Physics)
  - David Joffe (2004 – 2007, current position: assistant professor at Kennesaw State University)
  - Feng Liu (2000 – 2006, current position: project physicist at University of California, Riverside)
- **Graduate Students Supervised:**
  - Ph.D thesis advisor of Liang Lu (2002 – 2005). Current position: Operation President of Bokee Information Technology Co., Beijing, China;
  - Arya Afshari (2010 – 2013).
  - Emmanuel Angulo (2010 – 2014).
  - Brandon Ausmus (2013 – 2014).
  - Michael Blackston (2007 – 2011)
  - Marijus Brazickas (2014 – 2016).
  - Michael Duncan (2009 – 2010).
  - Jimmy Gonzalez (2015 – present).

- James Macdougall (2010 – 2013).
- Jeraldo Martinez (2009 – 2010).
- Roger Newcomb (2009 – 2010).
- Navid Rad (2010 – 2013).
- Victor Ruelas (2013 – 2015).
- John Scott (2014).
- Larry Scott (2012 – 2014).
- Jaryd Ulbricht (2013 – 2015).
- Varun Varahamurthy (2013 – 2014).
- Brent Wilson (2009 – 2011).
- Dengfeng Zhang (Ph.D student from Shandong University) (2015 – present).

- **Undergraduate Students Supervised:**

Adrien Atallah (2010), Brandon Ausmus (2013), Aaron Bassill (2015 – 2016), Lawrence Carlson (2008 – 2011), Andrew Castro (2011), Taylor Dinkins (2015 – 2016), Joseph Dipirro (2008), Michael Dobbs (2015 – 2016), Alaric Doria (2013), Cameron Embree (2013 – 2015), Gradon Faulkner (2013 – 2015), Jimmy Gonzalez (2013 – 2015), Simon Gonzales (2011 – 2013), Ian Guerrero (2015 – 2016), Brandon Gunn (2016 – 2017), Michael Hatfield (2011), Joseph Hunter (2011), Sarah Kroecker (2015 – 2016), Olivia Krohn (2013 – 2017), Zachary Kurland (2016 – 2017), Valentina Lee (2016 – present), Eric Licciardello (2013 – 2014), Annette Lopez (2015 – present), James MacDougall (2009 – 2010), Jeraldo Martinez (2008 – 2009), Sarah McGovern (2010), Tanaz Angelina Mohayai (2009), Sasha Moskaleva (2010), Jon Van Noort (2015), Fiona Pons (2015 – 2016), Jeremy Rentch (2013), Jeffrey Rowland (2014 – 2015), Gerald Rude (2008), Stephan Squire (2015 – present), Daniel Turner (2015 – 2015), Varun Varahamurthy (2012 – 2013), Ethan Villarama (2015 – 2016), Geordan Waldman (2015), Steve Wilburn (2008), and Ben Zastovnik (2008 – 2009).

- **Students from CSU Nuclear and Particle Physics Consortium (NUPAC) Campuses Supervised to Work at CERN on ATLAS Research during Summer:**

Year	CSU NUPAC students worked at CERN on ATLAS research projects
2017	12 (Fresno: 4; Channel Islands: 1; Humboldt: 1; Northridge: 1; San Francisco: 1; Sacramento: 3; Sonoma: 1)
2016	12 (Fresno: 6; Channel Islands: 1; Humboldt: 1; Los Angeles: 1; Sacramento: 2; Sonoma: 1)
2015	7 (Fresno: 5; Channel Islands: 2)
2014	7 (Fresno: 5; Channel Islands: 2)
2013	6 (Fresno: 3; Channel Islands: 3)
2012	5 (Fresno)
2011	6 (Fresno: 4; Pomona: 2)
2010	5 (Fresno: 2; Long Beach: 2; Sacramento: 1)
2009	5 (Fresno: 4; Sacramento: 1)
2008	5 (Fresno)

## **Teaching Experience:**

### **Undergraduate Courses:**

#### **“General Physics: Mechanics”:**

Credit hours: 3                      Enrollment: ~100                      (2007, 2008, 2009, 2010)

#### **“General Physics Lab: Mechanics”**

Credit hours: 3                      Enrollment: ~25                      (2007, 2008, 2010, 2011, 2012)

#### **“Introductory Mechanics”**

Credit hours: 3                      Enrollment: ~120                      (2001)

#### **“Introductory Electricity and Magnetism”**

Credit hours: 3                      Enrollment: ~120                      (2001, 2002, 2003, 2004)

#### **“Modern Physics”**

Credit hours: 3                      Enrollment: ~20                      (2005, 2006, 2007, 2009)

#### **“Introduction to High Energy Physics, Part I”**

Credit hours: 3                      Enrollment: ~15                      (2008)

#### **“Introduction to High Energy Physics, Part II”**

Credit hours: 3                      Enrollment: ~15                      (2008)

**“Introduction to Particle Physics and ATLAS Experiment of LHC at CERN” (Online course to CSU NUPAC campuses)**

Credit hours: 3                      Enrollment: ~40                      (2012, 2014, 2015, 2016, 2017)

**“Tools/Skills for Working at CERN on ATLAS Research” (Online course to CSU NUPAC campuses)**

Credit hours: 3                      Enrollment: ~12                      (2017)

### **Graduate Courses:**

#### **“Classical Mechanics”**

Credit hours: 3                      Enrollment: ~10                      (2000 and 2002)

#### **“Particle Physics”**

Credit hours: 3                      Enrollment: ~10                      (2001 and 2008)

### **New Course Development:**

I have designed and developed 6 new courses: the undergraduate courses “High Energy Physics I”, “High Energy Physics II”, “High Energy Physics Lab/Project”, graduate course “Particle Physics”, and online undergraduate courses “Introduction to Particle Physics and ATLAS Experiment of LHC at CERN” and “Tools/Skills for Working at CERN on ATLAS Research” (see below).

### **Online Course Development:**

To prepare students from CSU NUPAC campuses to work at CERN on ATLAS research, I developed the online courses “Introduction to Particle Physics and ATLAS Experiment of LHC at CERN” in 2013 and “Tools/Skills for Working at CERN on ATLAS Research” in 2017. These online courses are offered every fall and spring semester to prepare new CSU students to work at CERN every summer.

## **Departmental and University Service**

- Representative of CSU for US LHC Users Organization (5/2015 to present)
- Representative of CSU Fresno for US LHC Users Organization (10/2007 to 5/2015)
- Representative of CSU for CERN’s Users’ Office (5/2015 to present)

- Representative of CSU Fresno for CERN's Users' Office (10/2007 to 5/2015)
- Representative of CSU for US ATLAS Institutional Board (5/2015 to present)
- Representative of CSU Fresno for US ATLAS Institutional Board (10/2007 to 5/2015)
- Retention, Tenure and Promotion (RTP) committee member for Prof. Pei-Chun Ho at CSU Fresno (2012 – 2013)
- Member of the Research Committee of College of Science and Mathematics at CSU Fresno (2008 – 2013, and 2015 – present)
- Member of the New ATLAS Faculty Search Committee of the physics department of CSU Sacramento (2013 – 2014)
- Chair of Arya Afshari's Master Thesis committee at CSU Fresno (2012 – 2013)
- Chair of Emmanuel Angulo's Master Thesis committee at CSU Fresno (2013 – 2014)
- Chair of Navid Rad's Master Thesis committee at CSU Fresno (2012 – 2013)
- Chair of Victor Ruelas Rivera's Master Thesis committee at CSU Fresno (2015 – present)
- Chair of Brent Wilson's Master Thesis committee at CSU Fresno (2010 – 2011)
- Chair of Jaryd Ulbricht's Master Thesis committee at CSU Fresno (2014 – 2015)
- Member of the University Assessment Committee at CSU Fresno, serving as assessment coordinator for physics department (2008 – 2012)
- Computing supervisor of SMU physics department (2001 – 2007). Supervise computer system managers; responsible for maintaining and upgrading of the physics computing system for productive teaching and research.
- Radiation Safety Officer of SMU physics department (2000 – 2007).
- Member of the SMU Information Technology Committee (2005 – 2007). The charter of this committee is to review and recommend to the University Senate policies concerning information technology, including issues regarding systems and networks
- Member of the SMU Computing Standards Committee (2002 – 2007). The charter of this committee is to make recommendations on computer hardware, software, network and server technology to University Committee on Information Technology (UCIT)
- Chair of Liang Lu's Ph.D Thesis committee at SMU in 2005
- Member of Matthew R. Knee's Master Thesis committee at SMU in 2004