

***Historical success
and
Education***

July 12, 2018

Historical Success

The compelling desire of my research group is to produce exciting physics results. Our primary motivation is physics discovery. Based upon this guiding principle, our main topics of research are those with great discovery potential. We would like to be granted the opportunity to continue this endeavor.

I feel very fortunate that I have been deeply involved with three major discoveries in my career, a special privilege above most people's dreams.

I. Discovery of the charm quark in 1974; as a post-doc at MIT, I was one of the very active participants of the experiment that led to the discovery of the J/ψ particles at Brookhaven, first evidence of the charmed quark. For this discovery, my supervisor, Professor Samuel Ting, shared the 1976 Nobel Prize with Professor Burton Richter.

Historical Success

2. Discovery of the Gluon Jet in 1979; I was the leading figure in the discovery of the three-jets events in the TASSO experiment at DESY which signifies the **first direct observation of the gluon.** This led to sharing, with three German physicists (Soding, Wolf, Wiik), the 1995 High Energy and Particle Physics Prize of the **European Physical Society.** I was elected Fellow of American Society of Arts and Sciences in 1996.

3. Discovery of the Higgs boson in 2012; together with my Wisconsin students and postdocs, we played a leading role in the discovery of the Higgs boson – in the Higgs to 2 photons, Higgs to 4 leptons and the Higgs combination effort; my group has been among the major contributors and was the first one to obtain the five sigma observation, which led to the CERN announcement of the discovery on July 4, 2012.

I am extremely pleased that my young graduate students and postdocs got this extraordinary chance to experience the Higgs discovery in their early career.

EDUCATION – OUR MISSION

EDUCATION – Our primary mission

Training of Graduate Students:

61 Grad. students have obtained Ph.D. degrees under my supervision: 10 in TASSO, 23 in ALEPH, 9 in Babar and 19 in ATLAS

Faculty Positions of Former Postdocs and Graduate Students

36 Former Postdocs and Grad Students are faculty members mainly in major universities (27 full professors, 5 associate professors with tenure and 4 assistant professors)

Another 13 are permanent staff members at major High Energy Physics laboratories, including Saul Gonzalez, now Program Director at NSF

Eighteen Ph.D. students have obtained their Ph.D. doing ATLAS research under my supervision.

EDUCATION *Training of graduate students*

61 Grad. students have obtained Ph.D. degrees under my supervision:

**10 TASSO
23 ALEPH
9 BaBar
19 ATLAS**

- | | | | |
|-----------------------------|---|---------------------------|--|
| 1) James Freeman | 1981 Fermilab | 11) Douglas Cowen | 1990 Caltech |
| 2) Timothy Barklow | 1983 Stanford | 12) John Hilgart | 1991 CERN Fellow |
| 3) Eric Wicklund | 1984 Caltech | 13) Joe Boudreau | 1991 CERN Fellow |
| 4) H. Venkataramania | 1985 Yale | 14) Jim Wear | 1991 U.C. Santa Cruz |
| 5) David Strom | 1986 McCormick Fellow U of Chicago | 15) Yibin Pan | 1991 Wisconsin |
| 6) Michael Cherney | 1987 Berkeley | 16) David Cinabro | 1991 Harvard |
| 7) Allen Caldwell | 1987 Columbia | 17) Jolean Pater | 1992 CERN Fellow |
| 8) Steven Ritz | 1988 Columbia | 18) Fred Weber | 1993 CERN Fellow |
| 9) David Muller | 1989 Stanford | 19) Michael Walsh | 1995 Rutgers |
| 10) M. Takashima | 1989 CERN Fellow | 20) Leo Bellantoni | 1995 Fermilab Lederman Fellow followed by Wilson Fellow |

EDUCATION Training of graduate students

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19 ATLAS

21) Zhong Feng	1995	Johns Hopkins	31) Doug Ferguson	2001	Wisconsin
22) Yongsheng Gao	1995	Harvard	32) Jason Nielsen	2001	Berkeley
23) Jane Nachtman	1997	Fermilab Wilson Fellow	33) Eric Charles	2002	Berkeley
24) Jim Grahl	1998	Iowa State	34) P. McNamara	2002	Rutgers
25) Peter Elmer	1998	Princeton	35) Steve Sekula	2004	MIT
26) Steve Armstrong	1998	CERN Fellow	36) Ran Liu	2004	Berkeley Business School
27) William Orejudos	1998	Berkeley	37) Jinwei Wu	2004	Harvard
28) Xidong Wu	1999	SBC Com.	38) Zhitang Yu	2005	Clearshape Tech.
29) Owen Hayes	1999	Booz Allen Hamilton Consult.	39) Mousumi Datta	2005	Fermi National Lab
30) Tom Greening	1999	CERN Fellow	40) Baosen Cheng	2005	Avestar-IP

EDUCATION Training of graduate students

10 TASSO
23 ALEPH
9 BaBar
19 ATLAS

61 Grad. students have obtained Ph.D. degrees under my supervision:

41) Attila Mihalyi	2005	Princeton Consulting	51) G. Carrillo Montoya	2012	CERN Fellow
42) Kyle Cranmer	2005	Godhaber Fellow at Brookhaven Nat.Lab	52) A. Castenada	2012	U of Texas – A&M
43) Karina Loureiro *	2006	Ohio State	53) Haichen Wang	2013	Chamberlain Fellow at Berkeley
44) Paul Kutter	2006	Citizen's Insurance	54) Haoshuang Ji	2014	CONVIVA (real-time big data processing platform).
45) Alden Stradling	2008	U of Texas-Arlington	55) Yao Ming	2016	Amazon
46) Yaquan Fang	2008	Wisconsin	56) Hongtao Yang	2016	Chamberlain Fellow at Berkeley
47) William Quayle	2008	US ATLAS Analysis Fellow	57) Andrew Hard	2016	Google
48) Xin Chen	2009	Wisconsin	58) Fangzhou Zhang	2017	Ernst & Young
49) Elizabeth Castaneda	2011	Foreign Academic Fellowship, Conacyt, Mexico	59) Fuquan Wang	2017	Yelp
50) Haifeng Li	2012	SUNY-Stony Brook	60) Laser Kaplan	2017	Accenture
			61) Xiangyang Ju	2018	Berkeley

* Presidential Early Career Award for Scientists and Engineers 2007

EDUCATION Faculty positions of former postdocs and grad students

36 Former Postdocs and Graduate Students are (or have been) faculty members mainly in major universities and 13 are permanent staff members at major High Energy laboratories.

(27 full professors, 5 associate professors with tenure and 4 assistant professors)

Full Professors

1. Allen Caldwell	Columbia University
2. Steven Ritz	UC Santa Cruz
3. David Strom	University of Oregon
4. Michael Cherney	Creighton Univ.
5. David Cinabro	Wayne State Univ.
6. Doug Cowen	Penn. State University
7. Robert Johnson	UC Santa Cruz
8. Vivek Sharma	UC San Diego
9. Joe Izen	Univ. of Texas, Dallas
10. John Harton	Colorado State Univ.
11. Yuanning Gao	Tsinghua Univ. in Beijing
12. Shan Jin	IHEP, Beijing
13. Hongbo Hu	IHEP, Beijing

14. John Conway	UC Davis
15. Haibo LI	IHEP, Beijing
16. Haiping Peng	USTC, China
17. Joe Boudreau	University of Pittsburgh
18. Michael Schmitt	Northwestern Univ.
19. Yaquan Fang	IHEP, Beijing
20. Stathes Paganis	National Taiwan Univ.
21. Bruce Mellado	U. of the Witwatersrand, Johannesburg
22. Jason Nielsen	University of California, Santa Cruz
23. Lianliang Ma	Shandong Univ. , China
24. Haifen Li	Shandong Univ. , China
25. Yongsheng Gao	California State Univ.-Fresno
26. Kyle Cranmer	New York University
27. Isabel Pedraza	Benemérita Universidad Autónoma de Puebla

EDUCATION Faculty positions of former postdocs and grad students

36 Former Postdocs and Graduate Students are (or have been) faculty members mainly in major universities and 13 are permanent staff members at major High Energy laboratories.

(27 full professors, 5 associate professors with tenure and 4 assistant professors)

Associate Professors with tenure

28. Yibin Pan	Univ. of Wisconsin
29. Trevor Vickey	Sheffield University, UK
30. Jane Nachtman	Univ. of Iowa
31. Gerald Rudolph	Universitat Innsbruck
32. Stephen Sekula	Southern Methodist University

Assistant Professors

33. Luis Flores Castillo	Chinese University of Hong Kong
34. Swagato Banerjee	University of Louisville
35. Xin Chen	Tsinghua University, Beijing
36. Haichen Wang	UC Berkeley

ATLAS: 20

CMS: 6

ALICE: 1

EDUCATION Permanent Staff at Major Research Laboratories

Former
Postdocs

Former
Grad. Students

1. Saul Gonzalez	<i>Program Director of Experimental Elementary Particle Physics at NSF ; Former Assistant Director for Physical Sciences at The White House Office of Science and Technology Policy; Former Program Manager for Proton Accelerator Physics, Physics Research Division of Office of High Energy Physics, DOE</i>
2. Pierre Lecomte	<i>Staff Physicist, ETHZ (Switzerland)</i>
3. Tom C.Meyer	<i>Staff Physicist at CERN</i>
4. John Walsh	<i>Researcher, INFN, Italy</i>
5. Mathew Graham	<i>Staff Physicist, SLAC</i>
6. James Freeman	<i>Scientist II, Fermilab</i>
7. Tim Barklow	<i>Staff Physicist at SLAC</i>
8. David Muller	<i>Staff Physicist at SLAC</i>
9. Eric Wicklund	<i>Staff Physicist at Fermilab</i>
10. Leo Bellantoni	<i>Scientist I, Fermilab (former Wilson and Lederman Fellows at Fermilab)</i>
11. Joleen Pater	<i>Staff Physicist at the University of Manchester</i>
12. Eric Charles	<i>Staff Physicist at SLAC</i>
13. Peter Elmer	<i>Research staff at Princeton University</i>

EDUCATION *Technology transfer*

An interesting development is that high energy physicists are entering the workforce of well-known industries. Having been well trained in the high technology environment of large international physics collaborations, members of our group are extremely well suited to provide the functionality of technology transfer, always on the leading edge. For example, former postdocs and former graduate students who have held positions in companies are: (The list is not fully up to date)

- 1. Ian Scott** – *Partner Chief Data Scientist Deloitte Canada. Former VP customer Solutions at Lattice Engines. Former Chief Technology Officer at Angoss Software; former Director of Client Services.*
- 2. John Yamartino** – *Director of Analytics at Lam Research. Former Senior Data Scientist at IBM (Greater New York City Area). Former Engineering Program Manager at Applied Materials, Inc., Silicon Valley.*
- 3. Makoto Takashima** – *Senior Managing Director, Co-Head of International Banking Unit of Europe, Middle East & Africa, Americas, Executive Officer and Director, Sumitomo Mitsui Banking Corporation. Former Executive Director in Equities Division at Morgan Stanley in London.*
- 4. Zhong Feng** – *Lead System Engineer at Raytheon for NASA/Goddard Space Flight Center*
- 5. John Hilgart** – *Senior Internet Infrastructure Architect at BASF ; former eCommerce Infrastructure Architect.*

- 6. Fred Weber** – *Senior Research Scientist, Columbia University Earth Institute (subject: Spoken Language Technology for Development: Communication as Empowerment) ; former Senior Research Scientist at ScanSoft, Inc. (Boston) for speech recognition.*
- 7. Jim Wear** – *Senior Scientist at GE Medical Systems*
- 8. Michael Walsh** – *Consultant at Superior Consulting Company Inc.*
- 9. Xidong Wu** – *Lead Member of Technical Staff in Telecommunications at AT&T (San Francisco Bay Area). Former Software Engineer at SBC Communications.*
- 10. Owen Hayes** – *Founder and Partner of Jorgeson Trading, former Director of Strategy & Technology at Thomson Reuters, Former Business Technology Director at Elsevier (Greater Philadelphia Area). Former Senior Associate at Booz Allen Hamilton Consulting Firm.*
- 11. Thomas Greening** – *Senior Scientist at Apple (San Francisco Bay Area) ; former Principal Scientist at Honeywell; recipient of Technical Achievement Award (2003) and Outstanding Engineer of the Year Award (2002).*
- 12. Stephen Armstrong** – *Senior Director – Corporate Capital and Financial Strategy at Lonza (Basel, Switzerland). Former Assistant Vice President, SGS Group management Ltd, Switzerland.*
- 13. Zhitang Yu** – *Senior Software Development Engineer at Mentor Graphics (San Francisco Bay Area) ; former Research and Development Engineer at ClearShape Technologies.*

- 14. Baosen Chen** – *Software Engineer at Plaxo (San Francisco Bay Area). Former Software Engineer at Avestar-IP.*
- 15. Attila Mihalyi** – *Director at Princeton Consultants, former Senior Engineering Specialist at Princeton Consultants (Greater New York City Area). Former Senior Associate/Consultant at Princeton Consultants.*
- 16. Jinwei Wu** – *Strategist at Goldman Sachs (Greater New York City Area).*
- 17. William Orejudos** – *Senior Member, Energy and Environmental Services, SRA International (Charlottesville, Virginia Area).*
- 18. Paul Kutter** – *Directors of Forecasting and Research at Citizens Property Insurance Corporation. Former Actuarial Analyst at Citizens Property Insurance (Tallahassee, Florida).*
- 19. Sanjay Padhi** – *Global Scientific Computing Principal at Amazon Web Services*
- 20. Lashkar Kashif** – *Business Associate – Data Science at Gartner Inc*

- 21. Haoshuang Ji** – *Senior Software engineer at Conviva*
- 22. Yao Ming** – *Software Development Engineer at Amazon corporate LLC.*
- 23. Andrew Hard** – *Software engineer at Google.*
- 24. Fuquan Wang** – *Software engineer at Yelp.*
- 25. Fangzhou Zhang** – *Senior Consultant at Ernst & Young.*
- 26. Laser Kaplan** – *Data Scientist for Accenture.*
- 27. Xiangyang Ju** - *High Performance Computing Postdoctoral Scholar at Berkeley*

- 1) **K. Cranmer** (*Goldhaber Fellow at BNL; Presidential Early Career Award for Scientists and Engineers 2007, now Assistant Professor at New York University*)
Searching for New Physics: Contributions to LEP and the LHC, 2005
- 2) **K. Loureiro** (*Postdoc at Ohio State University*)
Measuring the Photon Energy Scale Through Test Beam Data, 2006
- 3) **W. Quayle** (*US ATLAS Analysis Fellow at Lawrence Berkeley National Lab*)
Searches in the $H \rightarrow WW$ Decay Mode Using the ATLAS Detector, 2008
- 4) **Alden Stradling** (*Postdoc at the University of Texas at Arlington*) *An examination of backgrounds to early-run minimum-bias events in atlas at the LHC*, 2008
- 5) **Yaquan Fang**, (*Postdoc at University of Wisconsin*), *Search for SM Higgs decaying to two photons via ATLAS detector*, 2008.
- 6) **Xin Chen**, (*Postdoc at University of Wisconsin*), *Reconstruction of missing ET 2009 and search for a SM Higgs boson via VBF in the $H \rightarrow \tau^+ \tau^-$ decay in ATLAS*, 2008

- 7) **E. Castaneda Miranda** (*Foreign Academic Fellow, Mexico*)
Search for Dilepton Heavy Mass Resonances with the ATLAS at LHC, 2011 (Z')
- 8) **H. Li** (*Postdoc at Stony Brook*)
Search for Standard Model Higgs Boson in $H \rightarrow WW^ \rightarrow l\nu l\nu$ Decay Mode with ATLAS Detector at $\sqrt{s} = 7$ TeV, 2012*
- 9) **G. Carrillo Montoya** (*Postdoc at U of Witwatersrand and CERN fellow*)
Standard Model Higgs boson searches in the weak boson decay channels with the ATLAS detector, 2012
- 10) **A. Castaneda** (*Postdoc at U of Texas-A&M*)
Search for TeV-scale Gravity Signatures in Final States with Leptons and Jets with the ATLAS detector at $\sqrt{s}=7$ TeV, 2012
- 11) **Haichen Wang** (*Postdoc at Berkeley with Chamberlain Fellowship*),
Discovery of the Higgs boson in the $H \rightarrow \gamma\gamma$ channel with 7 and 8 TeV data - degree expected in August 2013 (Also selected as Enrico Fermi Fellow at U. of Chicago)
- 12) **Haoshuang Ji** (*software engineer at Conviva*) *Discovery and measurement of a Higgs Boson, 2014*

- 13) **Hongtao Yang** (Postdoc at Berkeley with Chamberlain Fellowship). *Discovery of the Higgs Boson, measurements of Higgs Boson properties, and search for high mass beyond the standard model scalar particle in the diphoton final state with the ATLAS detector at the large hadron collider, 2016)*
- 14) **Yao Ming** (Software Development Engineer at Amazon corporate LLC) .*Search for $b\bar{b}$ decay of the Standard Model Higgs boson produced in association with a vector boson (W/Z) with the ATLAS detector, 2016*
- 15) **Andrew Hard** (Software engineer at Google) *Search and discovery with the resonant $\gamma\gamma$ final state at ATLAS, 2016*
- 16) **Fuquan Wang** (Software engineer at Yelp) *Search for Dark Matter in events with a photon and missing transverse momentum in pp collisions at $\sqrt{s} = 8$ and 13 TeV with the ATLAS detector, 2016*
- 17) **Fangzhou Zhang** (Senior Consultant at Ernst & Young) *Measurements of the Higgs Boson Production and Decay Rates and Coupling Strengths using pp Collision Data at $\sqrt{s} = 7$ and 8 TeV in the ATLAS Experiment, 2017*
- 18) **Laser Kaplan** (Data Scientist for Accenture) *Search for low mass di-jet resonances produced in association with initial state radiation at ATLAS, 2017.*

19) Xiangyang Ju (High Performance Computing Postdoctoral Scholar at Berkeley). *Observation of a Standard Model Higgs boson and search for 1 additional scalars in the $t\bar{t} t\bar{t}$ final state with the ATLAS detector², 2018.*