

Curriculum Vitae

A. Biographical Information

1. Personal

Name: Prof. William Trischuk

Address: 23 Mayfield Ave. Department of Physics
Toronto, ON 60 St. George St.
M6S 1K2 Toronto, ON
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Canada
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(416) 978-8221 (fax)

Married with two daughters (ages 18 and 11)

2. Degrees

Doctor of Philosophy 1990 Harvard University.

"A Measurement of the W Boson Mass in 1.8 TeV Proton-Antiproton Collisions", supervisor Roy F. Schwitters.

Bachelor of Science 1986 McGill University.

3. Employment

University of Toronto

Department of Physics	Professor	2003 – present,
Department of Physics	Associate Professor	2000,
Department of Physics	Assistant Professor	1996.

CERN

ATLAS Experiment	Guest Professor	2013 - 2014.
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Institute of Particle Physics

Director	2004 – 2013.
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3. Employment (continued)

TRIUMF Physics Division	Visiting Scientist	2008 - 2009.
KEK, Japanese High Energy Physics Laboratory Physics Division	Mombusho Fellow	2002.
Princeton University Department of Physics	Visiting Research Scientist	2001 - 2002.
Princeton University Department of Physics	Visiting Research Scientist	2001 - 2002.
CERN Particle Physics Experiments	Staff Member	1992.
Particle Physics Experiments	Scientific Associate	1990.
Harvard University High Energy Physics group	Research Associate	1987.
Department of Physics	Teaching Assistant	1987.
McGill University Particle Physics group	Research Associate	1986.

4. Honours

Fellow of the American Physical Society	2010.
NSERC 1967 Graduate Scholarship	1986-1990.
McGill Newton Medal - Top student in Math/Sciences	1986.

5. Professional Affiliations and Activities

European Physical Society	1990 - 1996.
American Physical Society	1986 - 1992. 2010 - .
Canadian Association of Physicists	1984 - 1987. 1996 - .
Institute of Particle Physics	1996 - .

B. Academic History

6.A. Research Endeavours

In the fall of 2004 I accepted the position of Director of the Canadian Institute of Particle Physics (IPP). The IPP is a non-profit corporation, operated by fourteen institutional (mostly University) members across the country for the benefit of particle physics in Canada. The University of Toronto was a founding member 34 years ago. The main activity of the Institute is to manage NSERC funding that supports eight faculty-equivalent research scientists, who have appointments at member institutions across the country. These scientists lead the Canadian efforts in major particle physics experiments around the world. A secondary role of the Institute is to help in the long range planning of high energy physics activities in Canada. In this regard I have been in regular discussions with various individuals involved in the funding of such activities, including the NRC president, president of NSERC, the president of the CFI, the Prime Minister's Science advisor and science advisors in the ministry of Industry. During the fall of 2005 NSERC sponsored a decadal study of particle physics in Canada. The IPP, under my direction provided much of the input to this study. As a member of the decadal planning committee I led the preparation of the final report, and am currently in the process of using it to "sell" particle physics to the Canadian government. The IPP grant was renewed for, an unprecedented, five years in April 2008. We were awarded a 16% increase in funding as a result of a number of new initiatives I pursued during my term as Director. The increase is also a result of significant additional effort we put into re-structuring the IPP to fit into the context of NSERC's new MRS grant program that supports major research institutes in many disciplines in Canada. In 2008 we successfully launched the IPP postdoctoral theory fellowship program providing members with salary support to enable them to compete to bring the highest profile postdoctoral researchers to Canada. In 2009 we launched the IPP/CERN summer student program that supports five Canadian undergraduates to spend 2-4 months at CERN every summer. This program has been a huge success attracting thirty students (so far) all of whom have gone on to do graduate work, most in particle physics and about half in Canada. I stepped down as Director in the spring of 2013, after 9 years to concentrate on my ATLAS detector upgrade responsibilities.

In 2009-2010 I was the co-chair of the local organising committee for the Hadron Collider Physics conference. We hosted this meeting at the University of Toronto in late August 2010. The meeting attracted 145 participants from around the world and was the first, in this topical series, to include reports on physics results from the first data-taking at the LHC. Only one month after the very first results had presented at the ICHEP meeting in Paris this meeting provided a forum for a week-long discussion by experts of the results and included 25 posters from students and junior postdocs on the details of their work with the early LHC data. I am the editor of the proceedings that was e-published in early 2011.

6.A. Research Endeavours (continued)

My primary research interest is the study of high-energy hadron collisions. I am a founding member of the ATLAS experiment at CERN. After 15 years of design and construction we have now completed the first data-taking period at the LHC. During the past year the ATLAS collaboration has published over 130 physics publications including the discovery of the long sought Standard Model Higgs boson that was revealed in July 2012. I developed a system of beam collision monitors (BCM) that are our last line of defense against unstable LHC beams and determine the collision rates (luminosity) in ATLAS. These are now positioned within 5cm of the LHC beam and less than 2m from the ATLAS interaction point. At this location they must survive enormous radiation doses. They are working well and have ensured the safe operation of the ATLAS experiment for the last two years and in 2011 became the default luminosity monitors providing the basis for an unprecedented (at hadron colliders) 2% determination of the luminosity in ATLAS. With students I have also begun to look at ATLAS physics signals (searches for Standard Model single top production and possible members of a fourth generation of quarks, Higgs production in association with vector bosons and the polarisation of the top quark. Two of these studies have resulted in ATLAS publications so far.

For the past 20 years I have been developing Chemical Vapour Deposited (CVD) diamond particle sensor material that can survive the doses found near the interaction point at ATLAS. Diamond, with its tightly bound lattice and high band gap, offers two orders of magnitude greater radiation tolerance than silicon in these applications. Before coming to Toronto I was the spokesman of RD42, the diamond detector development project at CERN. This involved the coordination of a group of 50 physicists from 20 institutions in Europe and North America. I arranged the collaborative purchase of CVD diamond sensor material and its subsequent manufacture into strip and pixel tracker prototypes. After spending 10 years as a regular collaborator in RD42 I was asked to resume my duties as co-spokesperson in the fall of 2012. This generic R&D work has been instrumental in providing the sensors for the ATLAS BCM and we have recently provided another round of sensors for a more elaborate ATLAS diamond beam monitor (DBM) that I am in the process of installing at CERN, prior to the resumption of LHC data taking in 2015.

Between 1996 and 2007 I was a member of the Collider Detector at Fermilab (CDF) collaboration where I successfully installed and commissioned parts of the support and alignment mechanics for the silicon vertex detector. In 2001 we began collecting data with an upgraded detector in a run that has only recently ended. I used the data collected by CDF in this period to study properties of the W boson. Together with two of my students we are led the effort to measure the mass the W boson using the CDF data. This is one of the 18 fundamental parameters of the Standard Model of particle physics. In 2007 CDF published the most precise single experiment measurement of the W boson mass. This improved the world average by 20% placing intriguing constraints on the Standard Model prediction for the Higgs Boson mass – consistent with the recent observation of a Higgs boson in the

6.A. Research Endeavours (continued)

ATLAS experiment. This is an important cross-check for the self-consistency for the Standard Model.

In preparation for a sabbatical leave in the summer of 2008 I began the study of production and testing of superconducting RF cavities that will be used for future high energy accelerators. During my sabbatical stay at TRIUMF I developed a cryostat capable of testing single-cell prototype cavities and study the surface preparation and handling necessary for them to achieve peak performance. The next generation of electron-positron colliders will consist of a single-pass series of accelerating cavities. Depending on the quality and reliability of the industrial production of these cavities this linear collider will likely need to be 20-30km in length. Higher gradient cavities will allow the necessary energies to be reached in a shorter tunnel, resulting in significant cost savings. TRIUMF is developing is superconducting RF capabilities in an effort to build an electron linac to produce radioactive beams. To this end they have been working with Canadian industry to supply the cavities. If this work is successful Canadian suppliers could be in a unique position to bid on a significant fraction of the accelerating cavities that would be necessary for a linear collider towards the end of the next decade. Over the course of the 2008 academic year I developed proposals to the CFI to establish SRF cavity testing infrastructure in Toronto and to NSERC to develop a proof-of-principal application of an electron accelerator to flue-gas emission treatment.

During the 2001-2002 academic year I took a sabbatical leave from the University of Toronto. I spent the first part of the year at Princeton University and the four months at KEK - the Japanese high energy accelerator laboratory. During that year I worked on the Belle experiment. I studied the high statistics B meson samples collected by the Belle experiment, looking first for B decays containing a J/Ψ meson that had decayed hadronically and later studying B decays into a J/Ψ meson that decayed leptonically accompanied by a \bar{K}_L meson. Both of these channels lend themselves to the study of CP violation in B decay, and are channels that we will never be able to study with at CDF, because of excessive backgrounds. I also spent part of my time simulating and designing a trigger for the Belle experiment that will use information from a silicon detector that was installed in 2003. This trigger rejected interactions likely to have come from beam-gas interactions. In the course of this work I became familiar with the design of readout electronics using programmable logic chips.

Prior to coming to Toronto I was a senior member of the DELPHI experiment at CERN studying e^+e^- collisions at the highest energy available in the world. I led efforts to measure the lifetime of the tau lepton. I was responsible for the construction and operation of two silicon vertex detectors that were used in DELPHI and served as operations manager for the DELPHI experiment in 1993.

From 1986 to 1990 I did my thesis work on the CDF experiment where I was responsible for the operation of the calorimeters and measured the W boson mass with the highest precision in the world. Combined with precise top quark mass

measurements the W mass now provides the world's most precise indication of the Higgs boson mass. As an undergraduate research student I helped build a uranium liquid argon calorimeter, built a cosmic ray air-shower array, helped run a Fermilab fixed target and tested a novel set of drift chambers during the construction of the OPAL experiment.

6. B. Research Support

I currently hold the following research awards:

An NSERC project grant supporting the work of our group on the ATLAS experiment. This provides \$1,100,000 this year and is held jointly with Profs. P. Krieger, R.S. Orr, P., Savard, P.K. Sinervo and R. Teuscher. This supports our group of four postdocs and 12 graduate students. This award also supports my work on the ATLAS upgrades – including one postdoc and two graduate students who work on the DBM effort.

The IPP operating grant: This award provides support for eight research scientists based at universities across Canada as well as four theoretical postdoctoral fellows, five undergraduate summer students who we send to CERN each year and one high school teacher who participates in the CERN summer program. During my last year as Director the award was \$1,140,000 and has totaled almost \$10M during my tenure as IPP Director.

An NSERC equipment grant supporting diamond pixel detector R&D for the ATLAS upgrade that I lead in Canada. This provided me with \$180,000 to acquire diamond sensors that have been assembled into pixel modules for the ATLAS DBM between 2010 and 2013.

Professor R.S. Orr and I shared an NSERC discovery grant awarded in 2010 to develop the capability to test superconducting RF cavities in conjunction with TRIUMF. The \$40,000 awarded in each of three years was used to produce a second sound array that monitored SRF cavity tests and is being used to localize quenches allowing the study the properties of the cavity material (Niobium) where the quench. This could ultimately help refine fabrication and surface treatment procedures improving cavity manufacture reliability.

During my first ten years in Toronto I was involved in the CDF experiment. NSERC's support of this project dates back to my arrival in Canada in 1996. I received \$50,000 over two years. In the early 2000s the CDF project grant peaked at a level of \$600,000 per year that supported a group of four faculty, four research associates and twelve graduate students at Toronto. I was the PI for the CDF project from 1999 to 2004. I have also received a Connaught new faculty startup matching grant for \$29,000 that was devoted to prototyping the ATLAS pixel detector position monitoring hardware. Finally since coming to Toronto I have received an additional \$US 42,000 contract for the purchase of CVD diamond material from Fermilab and have been co-signatory on a \$65,000 NSERC grant for the purchase of a new computing server for the HEP group at Toronto.

6. B. Research Support (continued)

Before coming to Toronto I was spokesman of the RD42 project at CERN. There I received (with one colleague) CHF 175,000 of support over two years for the purchase of diamond material, testing equipment and to support two graduate students. I was also responsible for the upgrade of the DELPHI silicon vertex detector that received CHF 600,000 over three years between 1993 and 1995. This supported a group of 10 physicists, 3 postdoctoral fellows and 3 graduate students during the construction and installation of the detector.

C. Scholarly and Professional Work

7. Refereed Journal Publications

See attachment (727 publications over last 24 years)

8 Non-Refereed Publications

See attachment (14 conference proceedings and 8 reports)

9 Publications in Preparation

See attachment (22 manuscripts submitted for publication)

10. Papers Presented at Meetings

"Intermediate Vector Boson Production at 1.8 TeV", Canadian Association of Physicists Annual Congress, Montreal, June 1988.

"High Statistics Measurements of W and Z Bosons at Fermilab", American Physical Society, Baltimore, May 1989.

"Electroweak Physics Results from CDF", European Physical Society, Madrid, September 1989.

"Collider Measurements of the W Boson Mass", Italian Physical Society, Trento, October 1990.

"Status of the DELPHI Microvertex Detector", European B factory Workshop, Paris, December 1990.

"B and D lifetime Measurements at LEP", 4th International Symposium on Heavy Flavour Physics, Orsay, France, June 1991.

"10. Papers Presented at Meetings (continued)

- A Review of the Tau Lifetime", 2nd International Workshop on Tau Lepton Physics, Columbus, Ohio, September 1992.
- "Preliminary Results from a Diamond Strip Tracker", Workshop on Diamond Detectors, London, February 1994.
- "First Results from a Diamond Microstrip Detector", Conference on Advanced Technology and Particle Physics, Como, Italy, October 1994.
- "The Status of Diamond Detectors", European Physical Society, Brussels, July 1995.
- "The Tau Lepton Lifetime", 1996 Aspen Winter Conference on Particle Physics, January 1996
- "Diamond Detectors for Future Hadron Colliders", 4th International Conference on Gallium Arsenide and other Radiation Hard Detectors, Glasgow Scotland, June 1996.
- "Current Status of the CDF Experiment", Canadian Association of Physicists Annual General Meeting, Calgary, June 1997.
- "The Current Status of Semiconductor Trackers at the LHC", 8th International Wire Chamber Conference, Vienna, February 1998.
- "The First Bump Bonded Diamond Pixel Detector", Pixel 1998, Fermilab, May 1998.
- "Rare B Meson Decays with the CDF Experiment", 4th International Meeting on Charm, Beauty and Hyperons, Genoa, Italy, July 1998.
- "CP violation measurements with the CDF experiment", 3rd International Meeting on CP-Violation and B Physics, Taipei, Taiwan, December 1999.
- "CP violation measurements with the CDF experiment", American Division of Particles and Fields Meeting, Columbus, Ohio, August 2000.
- "A Measurement of the CP violating angle Φ_1 with Belle", Canadian Association of Physicists Congress, Quebec, June 2002.
- "Recent Results on CP Violation from the Belle Experiment", SLAC Summer Institute, Stanford, CA, August 2002.
- "Current Status of Diamond Particle Detectors", ICHEP04, Beijing, China, August 2004.
- "Recent Electroweak Physics Results from CDF", APS05, Tampa, FL, April 2005.

10. Papers Presented at Meetings (continued)

“The Subatomic Physics Long Range Plan”, National Science Facilities meeting, Canadian Light Source, Saskatoon, January 2007.

“The Status of the LHC Collider”, ATLAS-of-the-Americas workshop, Vancouver, June 2008.

“Recent Advances in Diamond Detectors”, ICHEP08, Philadelphia, USA, August 2008.

“Superconducting RF cavity development in Canada”, Canadian Association of Physicists Congress, Moncton, June 2009.

“Current State of the LHC and ATLAS”, 1st South Western Ontario LHC Phenomenology workshop, Perimeter Institute, Waterloo, Oct. 2009.

The Current State of the Art of Diamond Detectors. European Physical Society parallel session, Grenoble, July 2011.

Diamond Detectors for Future Particle Physics Experiments, Snowmass detector working group meeting, Boulder, Colorado, April 2013.

11. Invited Lectures

Recent Electroweak Physics Results from CDF, Cornell University, January 1990.

Measuring the W Mass with the CDF detector, SLAC,
Lawrence Berkeley Laboratory,
Argonne National Laboratory,
SSC Laboratory,
CERN,
LAL-Orsay,
Universitat Freiburg,
March - September 1999

DELPHI Microvertex Detector Physics, Brookhaven National Lab, May 1991.

The DELPHI Tau Lepton Lifetime, Lawrence Berkeley Laboratory, October 1994.

The Potential of CVD Diamond for Radiation Hard Trackers, DESY, Dec. 1994.

Developments in CVD Diamond Detector Technology, MPI-Heidelberg,
Cambridge University,
Sheffield University,
February - October 1995.

11. Invited Lectures (continued)

Diamond Detectors for Future Hadron Colliders, Colloquium at Toronto Oct 1996.
at Waterloo Feb 1997.

B Physics with the CDF Experiment at Carleton University, March 1998.

Progress with Diamond Particle Detectors, Colloquium at York U., Oct. 1998.

Recent *B* Physics Results from the CDF Experiment, Princeton University
Centre des Etudes Atomiques, Saclay
University of Alberta
February - March 2000.

Recent Developments in CVD Diamond Pixel Detectors, Invited talk Schweisel
Foundation Seminars, Bonn, Germany,
June 2000.

The CDF Silicon Detector Upgrade and *B* Physics Potential, KEK - Japanese
Particle Physics Lab, December 2000.

Recent Results on CP violation from the Belle Experiment, Toronto, Oct 02
Rutgers, Colloquium, Nov 02

Current Status of the CDF Experiment, Canadian Association of Physicists Annual
General Meeting, Charlottetown June 2003.

Flavour Physics and *B* mixing at Hadron Colliders,
two lectures at TRIUMF summer school, July 2003.

Recent Results from the CDFII experiment, Victoria seminar, June 2004.

The Future of Experimental Particle Physics in Canada, colloquium at
the Perimeter Institute, Waterloo, February 2005.

Canadian Particle Physics in the Coming Decade, IPP contribution to the NSERC
subatomic physics long range plan Town Hall meeting, McGill, December 2005.

Physics from the LHC to the ILC, Session summary at the North American Linear
Collider Physics Workshop, TRIUMF, July 2006.

The CDF Measurement of the *W* Boson Mass, Colliders 2 Cosmic Rays, Lake
Tahoe, CA, February 2007.

The CDF *W* Mass and Width Measurement, Hadron Collider Physics 2007, Elba,
Italy, May 2007.

Diamond Pixel Detectors for the ATLAS Upgrade, Vertex 2007, Lake Placid, NY,
September 2007.

11. Invited Lectures (continued)

- The Future of Particle Physics in Canada, Rutherford Lab, Didcot, England, February 2008.
- The Status of the ATLAS Beam Conditions Monitor, ATLAS-Canada workshop, Ottawa, December 2008.
- The State of the Art of Diamond Sensors, TRIUMF, Vancouver, April 2009.
- Perspectives on Future HEP Activities in North America, HCP2009, Evian, France, November 2009.
- Mega Accelerators for Micro-Science, McGill colloquium, November 2009.
York colloquium, January 2010.
- The Canadian Particle Physics Program, 13th ISTC Seminar, Novosibirsk, August 2010.
- Accelerator R&D in a University Setting, McGill HEP seminar, November 2010.
- The Canadian Particle Physics Program, 88th European Commission of Future Accelerators plenary meeting, CERN, November 2010.
- Commissioning and Using Silicon Trackers in HEP experiments, European Detector and Instrumentation School, CERN, February 2011.
- Diamond Detectors: Present and Future applications in ATLAS, MIT, November 2011.
- ATLAS Higgs Discovery, Queens University, Physics Department Colloquium, November 2012.
- Science Rendevous “Brave New Physics”, described Higgs discovery on a panel with Sean Carroll, Pierre Savard and Jay Ingram. Innaugural lecture in this UofT outreach series. December 2012.
- The LHC, ATLAS and the Higgs, Queens Engineering Space conference, January 2013.
- Diamond Detector Applications at the LHC and beyond, University of Texas, Austin, April 2013.

D. List of Courses

12. A. Undergraduate Courses

- PHY293, Oscillations and Waves for Engineering Science
3 lectures/wk, 180 students (two sections) (2009-10).
3 lectures/wk, 210 students (two sections) (2010-11).
3 lectures/wk, 190 students (two sections) (2011-12).
3 lectures/wk, 200 students (two sections) (2012-13).

12. A. Undergraduate Courses (continued)

- PHY189, Cutting Edge Physics
1 three-hour seminar/wk, 25 students (2009-10).
- PHY190, Special Relativity for Engineering Science Students
3 lectures/wk, 350 students (two sections) (2007-08),
3 lectures/wk, 330 students (two sections) (2006-07),
3 lectures/wk, 300 students (two sections) (2005-06).
Entirely new course/text.
- PHY138. Introductory Physics (Electricity and Magnetism)
2 lectures/wk, 1100 students in one class (2004-05),
2 lectures/wk, 1200 students in one class (2003-04),
10 lectures/wk, 1000 students in 5 sections (2002-03).
- PHY489. Introduction to High Energy Physics
2 lectures/wk, 15 undergrad students (2004-05),
2 lectures/wk, 9 undergrad students (2003-04),
2 lectures/wk, 8 undergrad students (2002-03).
- PHY325/425. Senior undergraduate laboratory.
Two 3hr labs/wk, 20 students, 210 TA hours (1998-99),
Two 3hr labs/wk, 25 students, 210 TA hours (1999-2000),
Course coordinator.
Two 3hr labs/wk, 30 students, 210 TA hours (2000-01).
Course coordinator.
- PHY281S. Physics IV, Intro to Quantum Mechanics.
3 lectures/wk, 100 students, 110 TA hours (1997),
3 lectures/wk, 140 students, 190 TA hours (1998),
3 lectures/wk, 130 students, 190 TA hours (1999),
3 lectures/wk, 150 students, 190 TA hours (2000) Coordinator,
3 lectures/wk, 140 students, 125 TA hours (2001) Co-taught.
- PHY357. Particle and Nuclear Physics
2 lectures/wk, 25 undergrad students (2012-13).
- ESC101/102, First Year Engineering Science Physics Lab.
One 3hr lab/wk, 45 students, 3 TAs (2007-08).
One 3hr lab/wk, 45 students, 3 TAs (2006-07).
- PHY299Y. Characterisation of Diamond Detectors,
Research experience, 2 students (1997-98),
Research experience, 1 students (1998-99).
- PHY487S, Development of Drift Chamber Senior Lab
Senior Thesis for Trevor Mills (1999).
- PHY487S, Single-top physics searches at CDF,
Senior Thesis for Brian Kirby (2005).

12. A. Undergraduate Courses (continued)

PHY487S, Simulations of the ATLAS Beam Conditions Monitor
Senior Thesis for Stefan Kissiov (2008).

PHY489. Introduction to High Energy Physics
2 lectures/wk, 15 undergrad students (2004-05),

12. B. Graduate Courses

PHY2405F. Experimental Methods in Particle Physics,
2 lectures/wk, 10 students (2006).
Course coordinator + one of six lecturers.

PHY1810F. Introduction to High Energy Physics,
2 lectures/wk, 8 students (2004-05),
2 lectures/wk, 4 students (2003-04),
2 lectures/wk, 6 students (2002-03).

PHY2405F. Experimental Methods in Particle Physics,
2 lectures/wk, 8 students (2005-06) --
coordinated lectures given by all six HEP faculty.
2 lectures/wk, 3 students (1997 and 1998).

13. A. Theses Supervised

Masters Students:

Dirk Meier, Diamond Detectors for Particle Physics,
(Secondary Advisor, January 1995 - May 1996).

Dan Humphrey, Rare top decays with the CDF experiment,
(Primary Advisor, September 1998-August 1999).

Chavv Chiv Chau, ATLAS beam monitoring
(Primary Advisor, June 2011 – August 2012).

Doctoral Students:

Miriam Diamond, ATLAS DBM and Higgs properties
(Primary Advisor, Sept 2013, -- _

Garrin McGoldrick, ATLAS DBM and top polarisation
(Primary Advisor, Sept. 2012 --).

Chavv Chiv Chau, ATLAS DBM and Associated Higgs Production
(Primary Advisor, Feb. 2013 --).

Dominique Tardif, Search for single top production at the LHC
(Primary Advisor, September 2006 - 2011).

Ian Vollrath, W Boson Production asymmetries with CDF-II
(Primary Advisor, September 2002 – November 2006).

Sven Vahsen, CP Asymmetries in J/Psi KL decay at Belle
(Secondary Advisory, June 2001 - July 2002).

Oliver Stelzer-Chilton, W mass studies the CDF-II experiment,
(Primary Advisor, June 2001 – October 2005).

13. A. Theses Supervised (continued)

Bernd Stelzer, Single top production with CDF-II,
(Primary Advisor, September 2001 – April 2005).
Bjoern Hinrichsen, Jet Studies with CDF,
(Primary Advisor, February 1996 - January 1999).
Robert Cropp, J/Psi meson polarisation with CDF,
(Primary Advisor, September 1996 - August 2000).
Attilio Andreazza, The Tau Lifetime at DELPHI,
(Secondary Advisor, Jan. 1994 - Dec. 1995).

13. B. Postdoc Supervision

Nicola Venturi, ATLAS beam conditions monitoring
(Primary Supervisor, October 2011 -).
Matt Rudolph, ATLAS top angular distributions and vertex
reconstruction (Primary supervisor, September 2011 -).
Justin Keung, ATLAS physics and SRF development
(Joint supervision, January 2010 – August 2012).
Ernest Jiankowski, ATLAS BCM post mortem analysis
(Primary advisor, June 2009-July 2010).
Rachid Mazini, CDF / ATLAS Calorimeter Simulation
(Joint supervision with R.S. Orr, May 2003 – July 2008).
Kostas Kordas, B physics with the CDF detector.
(Primary Advisor, January 2002 -- October 2004).
Michael Riveline, B physics with the CDF detector.
(Primary Advisor, February 1999 - July 2002).
John Mayer, Jet physics with the CDF detector.
(Primary Advisor, October 1998 - July 2000).
Pierre Savard, Top physics with the CDF detector.
(Secondary Advisor, September 1997 - June 2002).
Simon Gadomski, B physics with the CDF detector.
(Primary Advisor, October 1996 - July 1998).
Paula Collins, Upgrade of DELPHI vertex detector,
(Secondary Advisor, Sept. 1994 - March 1996).
Yves Dufour, Upgrade of the DELPHI vertex detector,
(Secondary Advisor, June 1991 - September 1994).

13. C. Other Training

PhD Committe Work

Cortney Sampson, PhD defense (April 1996).
George Sganos, PhD defense (April 1996).
Richard Teuscher, PhD defense (November 1996).
Christian Bauer, PhD defense (May 2000).
James de Graff, PhD defense (July 1997).
Andreas Warburton, PhD defense (December 1997).
Bjoern Hinrichsen, PhD defense (January 1999).
Christian Bauer, PhD defense (May 2000).

13. C. Other Training (continued)

Robert Cropp, PhD defense (August 2000).
Raphael Galea, PhD defense (November 2000).
Michael Trott, PhD qualifier (May 2004).
F. Kalen Martens, Dept. PhD defense (March 2007).
Gabe Rosenbaum, PhD defense (October 2010).
Sing Cheung, PhD defense (August 2011).
Bin Guo, PhD defense (August 2011).
Peter Thompson, PhD defense (April 2013).

PhD Committee Work outside University of Toronto:

Matthew Jones, PhD defense, Carleton University, (Apr. 1997).
Michael Riveline, PhD defense, McGill University, (Dec. 1998).
Isabel Trigger, PhD defense, Universite de Montreal, (Sep. 1999).
Andreas Ochs, PhD external referee, McGill University, (Aug. 2002).
David Waller, PhD defense, Carleton University, (Jan. 2003).
Yann Coadou, PhD defense, Universitat of Uppsala, (Oct. 2003).
Paul Jackson, PhD defense, University of Victoria, (June 2004).
Li Chen, PhD external referee, University of Alberta, (Aug. 2004).
Irena Dolenc, PhD defense, Josef Stefan Institute, Slovenia (Sep 2008).
Bostjan Macek, PhD defense, Josef Stefan Institute, Slovenia (Nov 2011).

Summer Student training:

Allen Atamer, Automation of diamond station (1997).
Angela Han, Diamond detector characterisation (1998).
Guy Weichenberg, CDF vertex detector positioning (1999).
Herve Choi, Electroweak Physics studies with CDF (2003).
Brian Kirby, CDF beam monitoring and feedback (2003).
Sahand Hormoz, CDF measurement of W mass (2004).
Josh Bendavid, ATLAS Beam Conditions monitor (2006).
Louis Tan, ATLAS Beam Conditions monitor (2007).
Karol Krizka, SRF cavity simulation (2010).
Aysha Abdel Aziz, Diamond testbeam studies (2011).
David DeMarco, Second sound studies for SRF cavity development (2011).
Jeong-Yeon Yook, ATLAS DBM installationa at CERN (2013).

Administrative Positions

14.A. University Committees

Physics Publicity and Communications, 1996-2000. Chair 1998-2000.
Physics Web Page Design (Chair), 1997-98.
Physics Undergraduate Curriculum, 1998-2001.
2006-2008.
Search for Theoretical Particle Physics Faculty position, 2001.

14.A. University Committees (continued)

Search for Experimental Particle Physics Faculty position,	2002.
Physics Department Planning,	2002 – 2006, 2012.
Physics High School Liaison,	2002 -2003.
Physics Department Promotions,	2003 - 2010.
Search for Experimental Particle Physics Faculty position,	2004.
Search for Experimental Condensed Matter Faculty position,	2005 & 2006.
Physics department salary reviews	2000, 2007,2008,2010,2011 & 2013
Graduate admissions,	2010. 2011 & 2013
Physics Standards and Evaluations	2011, 2012
Physics Department chair search	2013.

14.B. Outside the University

- Director of the Canadian Institute of Particle Physics (IPP) 2004 – 2013.
- Coordinate the activities of eight, faculty-level, research scientists based at institutions across the country.
 - Coordinate the planning of high energy particle physics in Canada
 - Sit ex-officio on NSERC experimental review committee's, NRC Committee on TRIUMF and represent Canada at Funding Agencies for the Linear Collider (FALC).
 - Member of the search committee for the new TRIUMF Director (2007).
 - Member of the TRIUMF Five-Year Planning Committee (2007-2008).
 - Chair of search committee for head of TRIUMF Science division (2009-10).
- Member of external review committee for SUNY-Buffalo physics department (April 2009).
- Member of KEK-B physics advisory panel (2009-2012).
- Member of the International Commission for Future Accelerators (ICFA) (2008-2013).
- Oversees the international coordination of High Energy Physics accelerators and experiments.
- Member of the US High Energy Physics Advisory Panel (HEPAP) (2007-2010).
- Three meetings a year to advise the US Department of Energy and the National Science Foundation on the physics program supported by their \$1B high energy physics budget. I am one of three foreign members of this committee.
 - Invited to sit on various DOE sponsored lab review committees (SLAC, Brookhaven, Fermilab).
 - Member of NSF Particle Physics grant adjudication panel (2013).
- Member of the North American Linear Collider Communications and Outreach committee (2004-2007).

14.B. Outside the University (continued)

Elected Member of the Fermilab Users Executive Committee for a two year term from September 2003,

- Secretary of this committee providing minutes of the monthly meetings to the 2000 Fermilab users worldwide.
- Chair of the committee for 2004-05. Arranged agendas for monthly meetings, met with lab Director regularly on users issues.

Member of an NSERC review committee for underground and astrophysics experiments, December 2003.

CDF International Finance Committee, representing NSERC team leader for subatomic Physics, 2003 - 2005.

Canadian Association of Physicists, Particle Physics Division (PPD) vice-chair (2002-03). Will be chair in (2003-04) and organize the PPD sessions at the June 2004 CAP meeting.

Member, NSERC Review committee for the BaBar-Canada project, January 2002.

Canadian Institute of Particle Physics (IPP) Council member. Elected to a 3 year term in June 2001.

International organising committee for 4th Conference on Pixel Detectors (Pixel 2000), in Genova, Italy, July 2000.

CDF Speakers selection committee, chair, 1999-2001.

LHC Machine Experiments Interface Committee, CERN, 1994-96.

DELPHI Publication Advisory Board, CERN, 1993-95.

DELPHI Co-ordination Panel, CERN, 1992-93.