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CURRICULUM VITAE

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Born: Dec. 18, 1961 in Hamilton, Ontario, Canada.

Citizenship: Canadian, U.S. Resident Alien

Education:

Postgraduate Ph.D. in Physics, Stanford University (1990)
Thesis Title: *Searching for New Particles from Z^0 Decays in e^+e^- Annihilations using the Mark II Detector at the SLAC Linear Collider (SLC).*
Thesis Advisor: Professor Jonathan Dorfan.

Undergraduate B.Ap.Sc. with honours in Engineering Science (Physics Option) (1984),
University of Toronto.

Professional Experience:

05/03 – Present *Professor* (Indiana University, Bloomington)
05/99 – Present *Associate Professor* (Indiana University, Bloomington)
07/93 – 05/99 *Assistant Professor* (Indiana University, Bloomington)
06/97 – 07/98 *OPAL Physics Coordinator* (On leave at European Laboratory of Particle Physics (CERN), Geneva, Switzerland. OPAL is an international collaboration of \simeq 340 physicists)
07/92 – 06/93 *DESY Research Scientist* (Inst. f. Experimentalphysik, Univ. Hamburg)
07/90 – 06/92 *CERN Scientific Associate* (CERN)
09/84 – 05/90 *Graduate Student Research Assistant* (Stanford University)
Summer 1983 *Undergraduate Student Research Assistant* (University of Toronto)

Awards and Honors:

Trustees' Teaching Award,
University-wide, Indiana University, Bloomington (2001).

Teaching Excellence Recognition Award,
Board of Trustees, Indiana University, Bloomington (1999,1998).

Joseph and Sophia Konopinski Prize,
awarded in recognition of excellence in the teaching of physics.
Indiana University, Bloomington (1997).

Cottrell Scholar Award,
grant to pursue excellence in research and teaching.
Research Foundation, U.S.A. (1996).

Joseph and Sophia Konopinski Prize,
awarded in recognition of excellence in the teaching of physics.
Indiana University, Bloomington (1994).

MacArthur Fellowship at the Enrico Fermi Institute,
University of Chicago, declined award (1989).

Natural Sciences and Engineering Council of Canada
(NSERC) 1967 Science and Engineering Scholarship
Four year award towards graduate studies, preferably abroad (1984–1988).

Grants Received or in Progress:

Title	Agency	Start/End Date	Total
High Energy Physics Task A (Fermilab and CERN) ^{††}	Department of Energy	1 Nov. 94 – 31 Oct. 95	\$860,000
High Energy Physics Task A (Fermilab and CERN) ^{††}	Department of Energy	1 Nov. 95 – 31 Oct. 96	\$815,000
Cottrell Scholar Program: Searches for Evidence of Supersymmetry in High Energy e^+e^- Annihilations	Research Foundation, U.S.A.	1 Sept. 96 – 31 Aug. 98	\$50,000
High Energy Physics Task A (Fermilab and CERN) ^{††}	Department of Energy	1 Nov. 96 – 31 Oct. 97	\$820,000
High Energy Physics Task A (Fermilab and CERN) ^{††}	Department of Energy	1 Nov. 97 – 31 Oct. 98	\$815,000
High Energy Physics Task A (Fermilab and CERN) ^{††}	Department of Energy	1 Nov. 98 – 31 Oct. 99	\$845,000
High Energy Physics Task A (Fermilab and CERN) ^{††}	Department of Energy	1 Nov. 99 – 31 Oct. 00	\$875,000
High Energy Physics Task A (Fermilab and CERN) ^{†§}	Department of Energy	1 Nov. 00 – 31 Oct. 01	\$645,000
High Energy Physics Task A (Fermilab and CERN) ^{†§}	Department of Energy	1 Nov. 01 – 31 Oct. 02	\$645,000
MoU with Fermilab: Fabrication of DØ Optical Waveguides	Fermilab and Department of Energy	3 March 99 – 1 March 01	\$65,000
MoU with Fermilab: Next Linear Collider Detector R& D	Fermilab and Department of Energy	1 Oct. 99 – 31 Sept. 00	\$35,000
MoU with Fermilab: Next Linear Collider Detector R& D	Fermilab and Department of Energy	1 Oct. 00 – 31 Sept. 01	\$37,500
QuarkNet: HEP Research Experiences for High School Teachers	National Science Found.	1 July 99 – 1 July 02	\$19,000
QuarkNet: Construction of Cosmic Ray Telescopes at 6 Area High Schools	National Science Found.	1 Feb. 01 – 1 Feb. 02	\$24,000
Cosmic Dance: Public Outreach, WonderLab Exhibit [‡]	NASA, IDEAS Grant Program	1 Apr. 02 – 1 Apr. 03	\$24,500

[†]with Profs. Dzierba, Ogren, Hanson, Zieminski.

^{††}with Profs. Ogren, Hanson, and Zieminski.

^{†§}with Profs. Gardner, Ogren, Zieminski.

[‡]with Prof. Olmer.

DoE Supplements or university cost-sharing not indicated.

Research Experience:

My primary research interests concentrate on searches for new particles not described by our current Standard Model and the study of particles containing b quarks. I have pursued these studies at the highest energy e^+e^- colliders in the world, and am now continuing these studies at the energy frontier of hadronic colliders. I am also participating in planning for experimentation at the next generation of e^+e^- colliders. In the following, I briefly summarize the topics on which I have worked in rough chronological order.

My Ph.D. thesis work used data from the Stanford Linear Collider (SLC) where the first clean sample of hadronic Z^0 decays ever were collected using the Mark II detector. Hardware projects included assisting in the testing and implementation of the flash-ADC system measuring energy loss in the Mark II drift chamber and the design, construction, and implementation of the read-out of a system of small lead-scintillator counters to make the Mark II detector more hermetic.

I joined the OPAL Collaboration as a CERN Scientific Associate, analyzing much larger samples of Z^0 decays at the LEP e^+e^- collider. I played a leading role in the development of algorithms to identify inclusive electrons in hadronic Z^0 decays and used these tools for the first OPAL measurement of the fraction of Z^0 decays into b quarks using electron tagging. I was the co-creator and coordinator of a standardized software package still in use today to identify charged particles in the OPAL detector, including leptons. I also made studies and major contributions to the correction for the OPAL jet chamber (CJ) systematics leading to an improved momentum resolution by a factor of two and improved impact parameter resolution. I was responsible for the CJ offline reconstruction software package and calibration database.

As a DESY Research Scientist, I worked for the Univ. Hamburg group and continued my responsibilities on the OPAL jet chamber and improving electron identification. I completed an analysis updating a measurement of the decay rate of the Z^0 using electron tagging, and with two other colleagues, combined the result with an analysis employing muon tagging. With colleagues, I worked on an analysis measuring the average lifetime of b baryons using the existing LEP1 data (see below). I began involvement in LEP-wide working groups studying techniques for searching for new quarks and leptons at the higher energies expected at LEP2.

Present Position: Indiana University

As an Assistant and Associate Professor at Indiana University, I continued until 1999 on the OPAL Collaboration with a research focus studying b hadrons, particularly b baryons, with the LEP1 data, and searching for evidence of Supersymmetry and supersymmetric particles in the LEP2 data. In Sept. 1998 I joined the DØ Collaboration and have been led a group working on the scintillating fiber tracker including fabricating the optical fiber waveguides carrying the scintillating light from the tracker and preshower detector to light-detection devices and co-leading the working group on b -jet identification in the Upgrade Detector. I have also been involved in future plans for a Next Linear Collider (NLC) that would collide electrons and positrons at unprecedented energies.

OPAL Collaboration

OPAL b Quark Physics

The ground state b baryon, Λ_b , consists of a heavy b quark with two lighter quarks that form a spin-0 system between them that tends to simplify theoretical predictions of properties. With the availability of a larger LEP1 data set, I completed an analysis with colleagues updating the measurement of the b -baryon lifetime that was the single most precise published value of the average b -baryon lifetime in the world for three years. These measurements clearly indicate that, as predicted, b baryons have the shortest lifetime of the heavy-light b hadrons produced at LEP but with values significantly shorter than predictions. In the same system, I then pursued a measurement of the average polarization of b baryons. The strong longitudinal polarization of the b quark from Z^0 is expected to be strongly retained in spin-1/2 Λ_b baryons. The OPAL published result is still the most precise in the world, is consistent with predictions, and is the first measurement to exclude zero polarization of b baryons at better than 95%, providing first direct evidence that the b quark is longitudinally polarized in Z^0 decays and that some degree of polarization is transferred to b baryons.

Other b quark physics include work with theorist V.A. Kostelecky of Indiana Univ. investigating techniques to experimentally test for CPT-violating effects in the B system. Simulations were made of various detectors at different accelerators, including OPAL at LEP. As a result, an OPAL colleague with an analysis of B^0 -meson mixing almost complete, incorporated these techniques resulting in the first measurement of the CPT-violating parameter δ_B in the B system, and also the best measurement in the world of the T-violating parameter ϵ_B for four years.

OPAL Supersymmetry Searches

Supersymmetry (SUSY) is one of the leading candidates for new physics beyond the Standard Model. I concentrated on searches for the SUSY particles charginos, neutralinos, and earlier for scalar leptons (sleptons). These searches were performed with OPAL colleagues as well as Indiana postdocs S. Braibant and H. Neal. I was involved in these search analyses up to center-of-mass energies of 192 GeV, but no significant evidence for SUSY particle production was observed. I also played a leadership role in the interpretation of these results at every step in center-of-mass energy to exclude as many different SUSY models as possible. One of the more important consequences of these studies is that working in the framework of the Minimal Supersymmetric Standard Model (MSSM) we were able to, for all parameters, give mass limits on the the lightest neutralino which is a leading candidate for cold dark matter. I was also active in the LEP SUSY Working Group in the combination of search results on charginos and neutralinos from all four LEP collaborations.

OPAL Physics Coordinator

I was selected by the OPAL Collaboration to serve as one of the two OPAL Physics Coordinators and I was on leave at CERN officially for July 1997 to August 1998. This position involved working closely with the spokesperson in overseeing physics analysis, technical coordination and analysis, internal reviews, communication, organization, publication policy, recommendation letters, monitoring working group progress, and conference preparation, participation, and presentations. Included in the above responsibilities was the detailed final internal review of 49 OPAL manuscripts for publication.

OPAL Silicon Microvertex Detector

To make the best use of the integrated luminosity at LEP2, the Indiana Univ. group contributed to the Phase III upgrade of the OPAL silicon microvertex detector to increase solid angle coverage to tag jets of particles containing b quarks to enhance the effectiveness of searches for the Higgs boson and other new particles. I was involved in the planning, coordination and funding of the project, and my graduate students S. Anderson and M. Starks gained valuable experience participating in this effort. Indiana Research Scientist S. de Jong was resident at CERN and led the day-to-day construction and operation of the detector.

DØ Collaboration

Along with Prof. Zieminski at Indiana University, I am a member of the DØ Collaboration at Fermilab for the next era of Tevatron Main Injector running recently starting in March 2001 as Run 2. The Tevatron is expected to run for at least a few years beyond the start of the Large Hadron Collider in 2006. As part of this run, a major upgrade has been made of the DØ detector, and using the data from hadronic collisions in the upgraded detector, I intend to continue my research program in b quark physics and new particle searches, including searching for Higgs bosons. Since installation of necessary tracking data acquisition components was only fully completed recently in Spring 2002, work with data is still dominated by commissioning the detector. Publication of first physics results is expected within about a year.

DØ Central Fiber Tracker

I am leading a group working on the DØ scintillating fiber tracker. The first component of this effort are contributions to the data acquisition, testing, alignment, and calibration of the fiber tracker. Indiana postdoc A. Mayorov, working under my supervision, led the calibration database effort with a particular focus on calibrating the fiber tracker and this is being continued by postdocs K. Stevenson. As a second component, I also led a group that fabricated at Indiana University clear fiber optic waveguide bundles that carry the light from the scintillating fibers and scintillators of the preshower detectors to light detection devices located remotely from the detector. A Memorandum of Understanding was established with Fermilab to provide funding for manpower and equipment to set up the factory necessary for production waveguide design,

assembly and testing. Numerous graduate and undergraduate students have all contributed to designing and prototyping waveguides, designing and setting up the data acquisition, and production assembly. We worked in close collaboration with colleagues from Notre Dame and Fermilab and fabricated all of the central and forward preshower waveguides, fabricated assemblies for all of the central tracker waveguides, and completed fabrication of one-third of the tracker waveguides. These waveguides were successfully installed, meet specifications, and used in data acquisition.

DØ b Physics and b Tagging

Since Feb. 2000, I have co-lead the Heavy Flavor Identification Working Group that is responsible for implementing algorithms to identify jets arising from b quarks. This task is particularly important due to the prominent role that b tagging plays in the high-priority physics of top quark studies, searching for Higgs bosons that are predicted to decay dominantly to $b\bar{b}$ for masses less than 140 GeV, and for physics of b hadrons. A b -tagging framework and algorithms for lepton tagging, impact parameter and secondary vertex tagging, and combinations in neural networks and likelihood methods have been successfully implemented in to the DØ reconstruction software suite. In the current data, b -jet tagging has been demonstrated using muons and impact parameters, and the latter is the first ever observation of lifetime information from b hadrons in the DØ detector. Results on b -jet cross sections using the muon tag will likely be among the first DØ Run 2 physics publications.

I have been involved in work for the Run 2 B Physics Workshop and co-convene and am the DØ contact for the working group on b production, fragmentation, and spectroscopy where I also worked on projections for B_c and double-heavy baryon observation and studies. In the DØ B Physics Group, students and I have started efforts on the analysis of B_s mixing.

DØ Other

Other activities in the DØ Collaboration include data-taking shifts on the fiber tracker, chairing and serving on Run 1 analysis editorial boards, and chairing and serving on DØ internal review committees such as reviews of the tracking reconstruction software and of the Level-2 trigger system, and acting as a “godparent” for Run 2 leptoquark searches.

Linear Collider Research

I have also been involved in studying the possibility of very high energy e^+e^- collisions at a linear collider (LC) that would be complementary to the physics observed at future hadron colliders such as the Large Hadron Collider (LHC). Since 1995, I have convened the NLC (Next Linear Collider, i.e., the North American proposal) Higgs Working Group in a series of workshops, both national and international, to investigate and present the strengths of the LC. It is clear that a LC would be essential to delineate and make precision measurements of important properties of a possible Higgs boson. Our goal is to increase the HEP community’s awareness of the benefits of a high energy e^+e^- collider to push the energy frontier so that international commitments can be made towards its possible construction in the future. Recent strong endorsement in Winter 2002 by the High-Energy Physics Advisory Panel (HEPAP) urges the US to take leadership in the building of a high-energy high-luminosity electron-positron linear collider and prepare a bid to host the machine taking advantage of existing resources and infrastructure. I serve on the North American Linear Collider Stewardship/Steering Committee as well as the Fermilab Steering Committee for Linear Colliders (“LC Octet”) reporting to Fermilab Director M. Witherell.

I am also involved in the research and development necessary for constructing a detector for the LC. I have received funding to investigate, using simulations, the effects of different intermediate trackers and the effect of overall detector performance on measuring the properties of a possible Higgs boson. We have also begun work on detector research and development for timing capabilities of an intermediate scintillating fiber tracker and detector to identify bunches in the beam structure of a NLC. I also serve on the organizing committee of the Midwest Consortium of Linear Collider Detector Research and Development.

Undergraduate Research, Outreach

I remain committed to the involvement of undergraduates, and high school teachers and students in research and have supervised a number of students in projects ranging from non-linear dynamics and sonoluminescence to substantial projects in our high energy particle physics program.

I have been the project director of the Indiana Univ. QuarkNet program since 1999 which involves Indiana high school teachers and students in HEP research projects and teaches the concepts of particle physics through a series of Summer Institutes. We were approved and funded as one of the centers in the first group of 12 institutes to participate. We have also received additional funding from NSF and are building and implementing cosmic ray telescopes at six Indiana high schools. In a related project, funding from NASA Space Science is being used to construct an cosmic ray exhibit at WonderLab, a local children's science museum.

Teaching Experience:

1993–Present *Assistant/Associate Professor* (Indiana University).

- Planned course syllabi, lecturing and organizing laboratory and discussion sections for General Physics for undergraduate life science majors (five semesters) and then for chemistry/physics majors (three semesters). Implemented the use of “Peer Instruction” and “Conceptests” as espoused by E. Mazur (Harvard).
- Two semesters honours section of Introductory Physics to physics and astrophysics majors. Held in specially equipped class with a computer workstation for every two students. Combined lectures, discussions, laboratories in a flexible format stressing collaborative learning and individualized research projects.
- Two semesters Basic Physics of Sound, mostly for Speech and Hearing, and Music majors; one semester associated laboratory
- One semester advanced undergraduate Mechanics and three semesters advanced undergraduate Electrodynamics. Implemented extensive use of Mathematica software to better visualize “real-life”, more complex applications.
- Three semesters graduate-level Particle Physics.
- Developed a graduate student course enhancing Associate Instructor training including the presentation of effective teaching techniques. Taught for one semester.
- **Mentoring:** supervision of foreign-exchange graduate student F. Fiedler (1.5 years), and four other graduate students: M. Starks (left program, now teaching college physics in Colorado), S. Anderson, D. Liu, W. Fan. Currently supervising three graduate students: A. Kryemadhi, J. Rieger, L. Welty.
- **Mentoring:** supervision of a number of undergraduate and high school students and high school teachers in small research projects during the academic year and summer sessions.

Fall 1987 *Teaching Assistant and Grader* (Stanford University) for graduate-level course on Particle Physics Phenomenology.

1984–1986 *Teaching Assistant and Laboratory Demonstrator* (Stanford University). Taught sectionals and ran laboratory sessions for lower division physics courses in Mechanics and Thermodynamics, Electromagnetism and Optics, and Modern Physics.

Invited Talks:

- *Global Detector Network, Summary of Higgs Working Group Sessions, and Scintillating Fibers for Intermediate Tracking and Bunch Identification.* North American Linear Collider Workshop, Univ. Texas, 9–11 Jan. 2003, Arlington, TX.
- *Higgs Physics at a Linear Collider.* LHC/LC Workshop 2002, Fermi National Laboratory, 10 Dec. 2002, Batavia, IL.
- *Physics and Detector Studies at the International Collider Workshop in Korea.* (With S. Tkaczyk, split into two talks), Joint Experimental-Theoretical Seminar (Fermilab Wine & Cheese Seminar), Fermi National Laboratory, 8 Nov. 2002, Batavia, IL.
- *Higgs Physics at a Linear Collider: Review of North American Activities.* International Linear Collider Workshop (LCWS2002), Jeju Island, 28 August 2002, South Korea.
- *The Next Mega Machine: The Linear Collider.* Outreach talk to 400 high school students, Santa Cruz Linear Collider Retreat, Univ. of California, Santa Cruz, 26 June 2002, Santa Cruz, CA.
- *Status of $D\bar{O}$ for B Physics.* Flavor Physics and CP Violation (FPCP), Univ. of Pennsylvania, 16 May 2002, Philadelphia, PA.
- *Measuring Higgs Properties at an e^+e^- Linear Collider.* HEP Seminar, Univ. Illinois, 29 Apr. 2002, Champaign, IL.
- *Response to HEPAP Subpanel Report.* Invited response, HEPAP Meeting, Latham Hotel, 28 Jan. 2002, Washington, D.C.
- *Overlap Studies of Higgs Events: Justification of Track Timing Capability.* Chicago Linear Collider Workshop, Tracking Parallel Session, Gleacher Center/University of Chicago, 8 Jan. 2002, Chicago, IL.
- *Measurement of an Invisible Branching Ratio of the Higgs at a Linear Collider.* Chicago Linear Collider Workshop, Higgs Physics Parallel Session, Gleacher Center/University of Chicago, 8 Jan. 2002, Chicago, IL.
- *Linear Colliders: Update from Snowmass.* HEP Seminar, Physics Dept. Indiana University, 22 Oct. 2001, Bloomington, IN.
- *Linear Collider Higgs Studies: Snowmass and Beyond.* Linear Collider Detector Meeting, Stanford Linear Accelerator Center, 16 Oct. 2001, Stanford, CA.
- *The Missing Key: The Higgs Boson and its Properties.* Departmental Colloquium, Univ. of Victoria, 11 Sept. 2001, Victoria, B.C., Canada.
- *Beauty in the $D0$ Run 2 Upgrade Detector.* HEP Seminar, Univ. of Victoria, 10 Sept. 2001, Victoria, B.C., Canada.
- *E3: Higgs Physics at a Linear Collider: Strengths, Open Issues, Ongoing Activity.* Plenary Session, Snowmass 2001, Future of Particle Physics, 10 July 2001, Snowmass, CO.
- *Higgs Boson Studies at an e^+e^- Linear Collider: Intermediate and Heavy.* Line Drive Fermilab Series and plenary talk at Workshop on the Future of Higgs Physics, 3 May 2001, Fermilab, Batavia, IL.
- *Detector Instrumentation in Particle Physics.* Distinguished Lecturer Series, 10 April 2001, Crane Naval Systems Base, Crane, IN.
- *Higgs Working Group.* Workshop on Experimentation at a e^+e^- Linear Collider, 21 March 2001, Johns Hopkins University, Baltimore, MA.
- *Physics and Prospects of an e^+e^- Linear Collider.* HEP Seminar, 2 March 2001, Notre Dame University, South Bend, IN.
- *Higgs Studies Organization.* Workshop on Higgs Physics at a Linear Collider, 27 Jan. 2001, Univ. California, Davis, Davis, CA.

- *New Particles and Physics at the Energy Frontier*. Physics Department Colloquium, 2 Nov. 2000, Indiana University / Purdue University, Indianapolis, IN.
- *Physics at a Linear Collider*. SLAC Users Meeting, HEPAP Session, 7 July 2000, SLAC, Stanford Univ., Stanford, CA.
- *Physics at a Linear Collider*. Fermilab Users Meeting, HEPAP Session, 27 June 2000, Fermilab, Batavia, IL.
- *Linear Collider Higgs Studies*. Plenary talk, Berkeley 2000: Workshop to Study physics and Detectors of Future e^+e^- Colliders, 30 March 2000, Univ. of California, Berkeley, CA.
- *New Particles and Physics at the Energy Frontier*. University of Victoria Colloquium, 18 March 2000, Victoria, British Columbia.
- *New Particles and Physics at the Energy Frontier*. TRIUMF Seminar, 17 March 2000, TRIUMF, Vancouver, British Columbia.
- *Double Heavy Baryons at Run II and the Tevatron, B_c at $D\bar{D}$: Triggering and Reconstruction, and Drag Effect with b 's*. Workshop on B Physics at the Tevatron Run II and Beyond, Production, Fragmentation, Spectroscopy Working Group, 25 Feb. 2000, Fermilab, Batavia, Illinois.
- *B Quark Spectroscopy at LEP*. Workshop on B Physics at the Tevatron Run II and Beyond, Production, Fragmentation, Spectroscopy Working Group, 25 Sept. 1999, Fermilab, Batavia, Illinois.
- *Experimental Particle Physics: A Primer*. Series of four lectures presented at 1999 Theoretical Advanced Study Institute (TASI99): Strings, Branes, and M-Theory, June 1–4, University of Colorado, Boulder.
- *b Quark Physics from OPAL*. Workshop on Physics with Electron Polarized Ion Collider, EPIC99, 9 April 1999, Indiana University Cyclotron Facility.
- *Searches for New Particles in e^+e^- and $p\bar{p}$ Collisions*. Plenary Session, APS Centennial Meeting, 25 March 1999, Atlanta, Georgia.
- *Measurement of the Average Polarization of b Baryons in Hadronic Z decays, and Measurement of Product Branching Ratio for b Baryons*. Parallel Session, B Quark Physics, APS Centennial Meeting, 24 March 1999, Atlanta, Georgia.
- *LEP at the Highest Energies*. 1999 Aspen Winter Conference on Particle Physics, Advances in Particle Physics, Recent Results and Open Questions, 19 Jan. 1999, Aspen, Colorado.
- *Measurement of b-baryon polarization in Z^0 decays*. XXIX International Conference on High Energy Physics (ICHEP 98), 23–29 July 1998, Vancouver, Canada.
- *CPT Violation Tests in the B System and b-tagging at LEP*. D0 b-Quark Workshop, 14–17 May 1997, Indiana University, Bloomington, Indiana.
- *SUSY Searches with the OPAL Detector*. Third Warsaw Workshop: Physics from the Planck to the Electroweak Scale, 2–5 April 1997, Warsaw University, Warsaw, Poland.
- *OPAL Searches for Charginos/Neutralinos and Interpretations*. SUSY Mini-Workshop, 14 March 1997, CERN, Geneva, Switzerland.
- *OPAL Confronts Supersymmetry (SUSY)*. Departmental Colloquium, 10 Feb. 1997, University of British Columbia, Vancouver, Canada.
- *B Quark Spectroscopy at LEP*. Presented at C0 Workshop, 4–6 December 1996, Fermilab, Batavia, Illinois.
- *First Start at Combining Chargino Results*. LEP-wide Supersymmetry Working Group Meeting, 27 Oct. 1997, CERN, Geneva, Switzerland.
- *Physics from High Energy e^+e^- Annihilations: Present and Future*. Indiana University Physics Dept. Colloquium, 25 Sept. 1996.

- *Higgs Physics at High-Energy Lepton Colliders: Summary Talk*. Workshop on Future Directions in High Energy Physics, (DPF), 26 June 1996, Snowmass, Colorado.
- *Measurement of the W Boson Mass at LEP*. Precision Electroweak Measurement Working Group Session, Workshop on Future Directions in High Energy Physics, (DPF), 15 June 1996, Snowmass, Colorado.
- *Search Results from LEP at 130-140 GeV (Plenary talk)*. Presented at 1996 Joint Meeting of the American Physical Society 1–5 May 1996, Indianapolis, IN, U.S.A.
- *Higgs Physics at e^+e^- Linear Colliders*. Presented at Workshop on Physics with High Energy e^+e^- Colliders, 6–8 May 1996, Brookhaven National Laboratory, New York.
- *Results from LEP1.5*. Plenary talk, D0 Collaboration Meeting, 12 April 1996, Fermilab, Batavia, Illinois.
- *Lifetimes and Mixing of Beauty Hadrons at LEP*. Fermilab Colloquium, 29 Nov. 1995, Fermilab, Batavia, Illinois.
- *A First Look at LEP1.5 Physics*. High Energy Physics Seminar, 12 Nov. 1995, Indiana University, Bloomington, Indiana.
- *Higgs Physics at e^+e^- Linear Colliders*. Presented at Workshop on Physics with High Energy Electron-Positron Colliders, 16–18 November 1995, Fermilab, Batavia, Illinois.
- *Higgs Physics at Linear Colliders: Experimental (Plenary talk)* Presented at Workshop on Physics and Experiments with Linear Colliders 8–12 September 1995, Morioka-Appi, Japan.
- *Elementary Particle Physics: What the Experimentalists are up to*. Presented at REU program, Indiana University Cyclotron Facility 19 July 1995, Bloomington, Indiana.
- *Lifetimes and Mixing of Beauty Hadrons*. Presented at the XV International Conference on Physics in Collision, 8–10 June 1995, Cracow, Poland.
- *b Quark Physics and Properties of b Baryons at LEP*. High Energy Physics Seminar, University of Michigan, 17 April 1995, Ann Arbor, Michigan.
- *b Quark Physics and Properties of b Baryons*. High Energy Physics Seminar, University of Toronto, 28 March 1995, Toronto, Canada.
- *Status of Monte Carlo Generators for LEP2 New Particle Searches at OPAL*. Presented at LEP2 Workshop, 18–19 Nov. 1994, CERN, Geneva.
- *Beauty at LEP*. Colloquium at Valporaiso University, 11 Nov 1994, Indiana.
- *More B Physics at LEP*. Presented at D0 B Physics Workshop, Indiana University 27 Oct. 1994, Indiana.
- *Review of Experimental Results from ICHEP in Glasgow*. High Energy Physics Seminar, 12 Sept. 1994, Indiana University, Bloomington, Indiana.
- *Z^0 Physics at LEP*. Presented at REU program, Indiana University Cyclotron Facility 10 June 1994, Indiana.
- *Lifetimes of Exclusive B States*. Seminar at Ohio State University, 6 April 1994, Ohio.
- *Lifetimes of Exclusive Beauty States at LEP*. Presented at Results and Perspectives in Particle Physics, 7–13 March 1993, La Thuile, Italy.
- *Supersymmetric Particle Searches at LEP*. Presented at the Workshop on Ten Years of SUSY Confronting Experiment, 7–9 September 1992, CERN, Geneva, Switzerland.
- *Performance of the OPAL Jet Chamber*. Presented at the 1992 Wirechamber Conference, 17–21 February 1991, Vienna, Austria.
- *The Third Family at LEP* (review of all B and τ physics at LEP). Presented at the XI International Conference on Physics in Collision, 20–22 June 1991, Colmar, France.
- *Searches for New Particles Produced in Z Decay*. Presented at the 1990 Meeting of Division of Particles and Fields of the American Physical Society, 3–6 January 1990, Houston, Texas.

- *Searches for New Heavy Neutral Leptons in Z^0 Decays Using the Mark II Detector at the SLC.* Presented at the LBL Physics Seminar, 7 December 1989, Berkeley, CA, U.S.A.
- *New Particle Searches in Z^0 Decays Using the Mark II Detector at the SLC.* Presented at the CERN Particle Physics Seminar, 27 November 1989, Geneva, Switzerland.
- *New Quarks and Leptons at a Future 1 TeV e^+e^- Collider (TLC).* Presented at the DPF Summer Study: Snowmass '88, High Energy Physics in the 1990's, 27 June – 15 July 1988, Snowmass, CO, U.S.A.
- *Physics at the Z^0 .* Presented at the SLAC Summer Science Program, 5–6 August 1987, Stanford, CA, U.S.A.

Other Professional Activities:

- Refereed manuscripts for Phys. Rev. Lett., Phys. Rev. D, Zeit. Phys., and Phys. Lett.
- Reviewed research proposals for U.S. Department of Energy, Natural Sciences and Engineering Research Council (NSERC - Canada), and Research Foundation, U.S.A. (Cottrell Scholar applicants).
- Subatomic Physics Grant Selection Committee, Natural Sciences and Research Council of Canada (NSERC).
- Member of North American Linear Collider Stewardship/Steering Committee, started Jan. 2002.
- Member of Fermilab Steering Committee for Linear Colliders (“LC Octet”), started Aug. 2002.
- Member of Organizing Committee, Midwest Consortium for Linear Collider Detector and Accelerator Research and Development, started Feb. 2002.
- Advisory Panel, Workshop on the CKM Unitarity Triangle, CERN, Geneva, 16-18 Feb. 2002.
- Physics Contact: E3 Working Group, Linear Collider Physics, Snowmass 2001 4-22 July 2001, Snowmass, CO.
- Organizing Committee, Chicago Workshop on Linear Colliders, Gleacher Center, Univ. of Chicago, 7-9 Jan. 2002.
- Organizing Committee, International Workshop on Linear Colliders (LCWS00), 24 – 28 Oct. 2000, Fermilab, Batavia, IL.
- Organizing Committee, US Meeting on NLC Detector Research and Development, 29–31 March 1999, Berkeley, University of California, California.
- International Organizing Committee, 7th International Symposium on Particles, Strings, and Cosmology, 10–16 Dec. 1999, Granlibakken, Lake Tahoe, California.
- International Organizing Committee, International Workshop on Linear Colliders (LCWS99), 28 April – 5 May 1999, Sitges, Barcelona, Spain.
- Participant in BaBar Software Review, SLAC, 12–13 April 1996.
- Member of the Organizing Committee for the *American Physical Society Meeting, Division of Particles and Fields*, held in Indianapolis, IN, 2–5 May 1996.
- Member of the Organizing Committee for *Physics with High Energy Electron-Positron Colliders Workshop*, Fermi National Laboratory, Batavia, IL, 16–18 Nov. 1995.
- Member of the Organizing Committee for *International Workshop on Linear Colliders 1995*, held in Morioka-Appi, Japan, 8–12 Sept. 1995.
- With Prof. Zieminski, co-chaired Local Organizing Committee for a bid and unsuccessful proposal to hold DPF 1996 Meeting at Indiana University, Bloomington.
- Member of Local Organizing Committee for *Third International Workshop on Vertex Detectors*, held at Fourwinds Resort, 8–13 May 1994, Lake Monroe, IN.
Editor of proceedings, IUHEE-95-1, May 1995.
- Member of the American Physical Society, American Association of Physics Teachers, Indiana Science Teacher Association, Union of Concerned Scientists, Sigma Xi Society (scholarship in Physics).