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CURRICULUM VITAE

Pekka K. Sinervo, FRSC

A. Biographical Information

1. Personal

Personal Data:
Pekka K. Sinervo, FRSC
Born: May 24, 1958
Canadian citizen

Work Address:
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2. Degrees

Degree : Ph.D. Elementary Particle Physics
Institution : Stanford University
Date : May 1986
Advisor : D. W. G. S. Leith
Thesis : Study of Strange Meson Spectrum as Observed in the Reaction $K^- p \to K^\circ \pi^+ \pi^- n$ at 11 GeV/c

Degree : B.Sc. (4 year) Mathematics and Physics
Institution : University of Toronto
Date : May 1980

3. Employment

- Professor of Physics, University of Toronto (Nov 2016 - present)
- Senior Vice-President, Research, Canadian Institute for Advanced Research (May 2009 - Oct 2016)
- Rosi and Max Varon Visiting Professor, Weizmann Institute of Science, Rehovot, Israel (Sep 2008 - Apr 2009)
- Vice-Provost, First-Entry Programs, University of Toronto (Nov 2006 - Feb 2008)
- Dean, Faculty of Arts and Science, University of Toronto (Jan 2004 - Feb 2008)
- Interim Dean, Faculty of Arts and Science, University of Toronto (May 2003 - Dec 2003)
- Vice-Dean, Academic, Faculty of Arts and Science, University of Toronto (Jan 2003 - Apr 2003)
- Vice-Dean, Graduate Education and Research, Faculty of Arts and Science, University of Toronto (Sep 2000 - Dec 2002)

- Chair, Department of Physics, University of Toronto (Jul 1997 - Aug 2000)
- Visiting Scientist, Lawrence Berkeley National Laboratory, Berkeley, CA (Jan 1997 - Jun 1997)
- Professor of Physics, University of Toronto (Jul 1995 - Apr 2009)
- Associate Professor of Physics, Department of Physics, University of Toronto (Jul 1990 - Jun 1995)–tenure awarded May 1993
- Visiting Scientist, Fermi National Accelerator Laboratory, Batavia, IL, (Feb 1994 - Jul 1994)
- Assistant Professor, Department of Physics, University of Pennsylvania (Jul 1988 - Jun 1990)
- Postdoctoral Researcher, Department of Physics, University of Pennsylvania (Jun 1986 - Jun 1988)

4. Honours

Feb 2012	Fellow, American Association for the Advancement of Science
Jan 2008	Acenberg Award, Rotman Research Institute
Jun 2007	Patron of the Society, Canadian Astronomical Society
Jul 2004	Senior Fellow, Massey College, University of Toronto
May 2004	Fellow, American Physical Society
Nov 1999	Fellow, Royal Society of Canada
Nov 1995	Rutherford Memorial Medal in Physics, Royal Society of Canada
Feb 1995	Outstanding Teaching Award, Faculty of Arts and Science, University of Toronto
Jun 1980	Reuben Wells Leonard Scholarship for the Physical Sciences University College, University of Toronto
Mar 1980	NSERC Postgraduate Scholarship (renewed 1982) Natural Sciences and Engineering Research Council
Mar 1980	NSERC 1967 Science Scholarship (declined) Natural Sciences and Engineering Research Council
Mar 1979	Harry M. Boxen Memorial Scholarship, University College, University of Toronto
Apr 1976	C.L. Burton Scholarship, University College, University of Toronto

5. Professional Affiliations

- Member, Canadian Association of Physicists
- Member, Institute of Particle Physics
- Member and Fellow, American Association for the Advancement of Science
- Member and Fellow, American Physical Society
- Fellow, Royal Society of Canada

B. Academic History

6. a. Research Activities

My research tries to understand the basic building blocks of our world and the forces that hold them together. I am a member of the ATLAS collaboration at the CERN Large Hadron Collider (LHC) in Geneva, Switzerland, where we are studying 13 TeV proton-proton collisions. I am particularly interested in the top quark, the most massive of the fundamental building blocks predicted by the "Standard Model" of high energy physics and the last quark to be discovered.

Having published conclusive evidence of its existence in 1995, I am now studying the top quark with data collected by the ATLAS experiment. My students and I have developed techniques for making innovative measurements of top quark properties. A secondary research interest is the Higgs boson, given its strong interactions with the top quark, and the search for dark matter.

I am also involved in the development of advanced statistical techniques applied to the analysis of particle physics data.

I was a member of the CDF collaboration from 1986 to 2012, which studied high-energy proton-antiproton collisions produced at the Fermilab Tevatron Collider. I had a lead role in the 1995 discovery to the top quark and in subsequent measurements of its properties.

My research interests prior to 1986 focused on the study of strange mesons, which formed the topic of my Ph.D. dissertation. I studied the orbitally and radially excited states of the K^* meson, as this system provided us with the cleanest experimental view of the spectroscopy of a light quark-antiquark state.

During the period 1978 through 1980, I participated in the first measurements of the lifetimes of charmed hadrons as a member of a University of Toronto research group.

My secondary research activity is the development of advanced detectors and computational systems for the particle physics experiments. My group designed parts of the data collection systems for the SDC detector, a device that was intended to search for the Higgs boson at the Superconducting Super Collider (SSC). I have collaborated on the development of a Grid computing model for the ATLAS experiment, and have developed high-speed electronics and data acquisition systems.

I have held various leadership and administrative roles in my field, serving most recently as chair of the Board of Directors of SNOLab, an underground laboratory located in Sudbury, Ontario dedicated to the search for dark matter.

C. Scholarly and Professional Work

7. Refereed Publications (total of 1354)

The following publications are my most relevant publications, following the guidelines developed by the Commission of Particles and Fields (C11) of the International Union of Pure and Applied

Physics, September 2008. I have either been a primary author of the publication, or made significant specific contributions to the work therein, either as one of the working co-authors or through specific intellectual contributions to the study.

1. M. Aaboud *et al.* [ATLAS Collaboration] (primary author), *"Measurements of $t\bar{t}$ differential cross-sections of highly boosted top quarks decaying to all-hadronic final states in pp collisions at $\sqrt{s} = 13$ TeV using the ATLAS detector"*, submitted to Phys. Rev. D. arXiv:1801.02052 [hep-ex], CERN-EP-2017-226.
2. G. Aad *et al.*[ATLAS Collaboration] (primary author), *"Measurements of $t\bar{t}$ differential cross-sections in the all-hadronic channel with the ATLAS detector using highly boosted top quarks in pp collisions at $\sqrt{s} = 13$ TeV,"* ATLAS-CONF-2016-100, August 2016.
3. G. Aad *et al.* [ATLAS Collaboration] (secondary author), *"Differential top-antitop cross-section measurements as a function of observables constructed from final-state particles using pp collisions at $\sqrt{s} = 7$ TeV in the ATLAS detector"*, JHEP **1506**, 100 (2015). arXiv:1502.05923 [hep-ex], DOI: 10.1007/JHEP06(2015)100. HEP entry
4. T. A. Aaltonen *et al.* [CDF Collaboration] (primary author), *"Studies of high-transverse momentum jet substructure and top quarks produced in 1.96 TeV proton-antiproton collisions"*, Phys. Rev. D **91**, no. 3, 032006 (2015). arXiv:1407.3484 [hep-ex], 10.1103/PhysRevD.91.032006.
5. G. Aad *et al.* [ATLAS Collaboration] (secondary author), *"Performance of jet substructure techniques for large-R jets in proton-proton collisions at $\sqrt{s} = 7$ TeV using the ATLAS detector"*, JHEP **1309**, 076 (2013). arXiv:1306.4945 [hep-ex], 10.1007/JHEP09(2013)076.
6. G. Aad *et al.* [ATLAS Collaboration] (primary author), *"Search for resonances decaying into top-quark pairs using fully hadronic decays in pp collisions with ATLAS at $\sqrt{s} = 7$ TeV"*, JHEP **1301**, 116 (2013). arXiv:1211.2202 [hep-ex], 10.1007/JHEP01(2013)116.
7. G. Aad *et al.* [ATLAS Collaboration] (primary author), *"ATLAS measurements of the properties of jets for boosted particle searches"*, Phys. Rev. D **86**, 072006 (2012). arXiv:1206.5369 [hep-ex], 10.1103/PhysRevD.86.072006.
8. G. Aad *et al.* [ATLAS Collaboration] (secondary author), *"Jet mass and substructure of inclusive jets in $\sqrt{s} = 7$ TeV pp collisions with the ATLAS experiment"*, JHEP **1205**, 128 (2012). arXiv:1203.4606 [hep-ex], 10.1007/JHEP05(2012)128.
9. A. Altheimer, S. Arora, L. Asquith, G. Brooijmans, J. Butterworth, M. Campanelli, B. Chapleau and A. E. Cholakian *et al.*. (secondary author), *"Jet Substructure at the Tevatron and LHC: New results, new tools, new benchmarks"*, J. Phys. G **39**, 063001 (2012). arXiv:1201.0008 [hep-ph], 10.1088/0954-3899/39/6/063001.
10. T. Aaltonen *et al.* [CDF Collaboration] (primary author), *"Study of Substructure of High Transverse Momentum Jets Produced in Proton-Antiproton Collisions at $\sqrt{s} = 1.96$ TeV"*, Phys. Rev. D **85**, 091101 (2012). arXiv:1106.5952 [hep-ex], 10.1103/PhysRevD.85.091101.
11. G. Aad *et al.* [ATLAS Collaboration] (primary author), *"Measurement of the top quark pair*

production cross section in pp collisions at $\sqrt{s} = 7$ TeV in dilepton final states with ATLAS", Phys. Lett. B **707**, 459 (2012)
arXiv:1108.3699 [hep-ex].

12. G. Aad *et al.* [ATLAS Collaboration] (primary author), *"Search for New Physics in Dijet Mass and Angular Distributions in pp Collisions at $\sqrt{s} = 7$ TeV Measured with the ATLAS Detector,"* New J. Phys. **13**, 053044 (2011).
arXiv:1008.2461 [hep-ex].
13. R. Alon, E. Duchovni, G. Perez, A. P. Pranko, P. K. Sinervo (primary author), *"A Data-Driven Method of Pile-Up Correction for the Substructure of Massive Jets,"* Phys. Rev. D **84**, 114025 (2011).
arXiv:1101.3002 [hep-ph].
14. A. Abdesselam, E. B. Kuutmann, U. Bitenc, G. Brooijmans, J. Butterworth, P. Bruckman de Renstrom, D. Buarque Franzosi, R. Buckingham *et al.* (secondary author), *"Boosted Objects: A Probe of Beyond the Standard Model Physics,"* Eur. Phys. J. C **71**, 1661 (2011).
arXiv:1012.5412 [hep-ph].
15. T. Aaltonen *et al.* [CDF Collaboration] (secondary author), *"Measurement of $t\bar{t}$ Spin Correlation in $p\bar{p}$ Collisions Using the CDF II Detector at the Tevatron,"* Phys. Rev. **D83**, 031104 (2011).
arXiv:1012.3093 [hep-ex].
16. G. Aad *et al.* [ATLAS Collaboration] (primary author), *"Search for New Particles in Two-Jet Final States in 7 TeV Proton-Proton Collisions with the ATLAS Detector at the LHC,"* Phys. Rev. Lett. **105**, 161801 (2010).
arXiv:1008.2461 [hep-ex].
17. T. Aaltonen *et al.* (secondary author), *"Measurement of the Fraction of $t\bar{t}$ Production via Gluon-Gluon Fusion in $p\bar{p}$ Collisions at $\sqrt{s} = 1.96$ TeV,"* Phys. Rev. D **79**, 031101 (2009).
arXiv:0807.4262 [hep-ex].
18. T. Aaltonen *et al.* (primary author), *"First Measurement of the Fraction of Top Quark Pair Production Through Gluon-Gluon Fusion,"* Phys. Rev. D **78**, 111101 (2008).
arXiv:0712.3273 [hep-ex].
19. A. Abulencia *et al.* (primary author), *"Precise Measurement of the Top Quark Mass in the Lepton + Jets Topology at CDF II,"* Phys. Rev. Lett. **99**, 182002 (2007).
20. A. Abulencia *et al.* (primary author), *"Top Quark Mass Measurement Using the Template Method in the Lepton + Jets Channel at CDF II,"* Phys. Rev. D **73**, 032003 (2006).
21. A. Abulencia *et al.* (primary author), *"Precision Top Quark Mass Measurement in the Lepton + Jets Topology in $\bar{p}p$ Collisions at $\sqrt{s} = 1.96$ TeV,"* Phys. Rev. Lett. **96**, 022004 (2006).
22. *Search for a W′ Boson Decaying to a Top and Bottom Quark Pair in 1.8 TeV $p\bar{p}$ Collisions,* D. Acosta *et al.* (primary author), Phys. Rev. Lett. **90**, 081802 (2003).
23. *Signal Significance in Particle Physics,*
P. K. Sinervo, hep-ex/0208005 (August 2002). Published in the Proceedings of the Conference on Advanced Statistical Technques in Particle Physics, Durham England, Mar 16-22 (2002).
24. *Search for Single Top Quark Production in $p\bar{p}$ Collisions at $\sqrt{s} = 1.8$ TeV,*
D. Acosta *et al.* (secondary author), Phys. Rev. D **65**, 091102 (2002).

25. *Measurement of the Top Quark P_T Distribution in $p\bar{p}$ Collisions at $\sqrt{s} = 1.8$ TeV*, T. Affolder *et al.* (primary author), Phys. Rev. Lett. **87**, 102001 (2001).
26. *Search for a W' Boson via the Decay Mode $W' \to \mu\nu_\mu$ in 1.8-TeV $p\bar{p}$ Collisions*, F. Abe *et al.* (primary author), Phys. Rev. Lett. **84**, 5716-5721 (2000).
27. *Measurement of b Quark Fragmentation Fractions in $\bar{p}p$ Collisions at $\sqrt{s} = 1.8$ TeV*, T. Affolder *et al.* (primary author), Phys. Rev. Lett. **84**, 1663-1668 (2000).
28. *Measurement of b Quark Fragmentation Fractions in the Production of Strange and Light B Mesons in Proton Anti-Proton Collisions at $\sqrt{s} = 1.8$ TeV*, F. Abe *et al.* (primary author), Phys. Rev. D. **60**, 092005 (1999).
29. *CVD Diamond Pixel Detectors for LHC Experiments*, R. Wedenig *et al.* (secondary author), Nucl. Phys. Proc. Suppl. **78**, 497-504 (1999).
30. *The First Bump Bonded Pixel Detectors on CVD Diamond*, W. Adam *et al.* (secondary author), Nucl. Instrum. Methods **A43**, 326-335 (1999).
31. *Observation of $B^+ \to \psi(2S)K^+$ and $B^0 \to \psi(2S)K^{*0}(892)$ Decays and Measurements of B Meson Branching Fractions into J/ψ and $\psi(2S)$ Final States,* F. Abe *et al.* (primary author), Phys. Rev. D **58**, 072001 (1998).
32. *Ratios of Bottom Meson Branching Fractions Involving J/ψ Mesons and Determination of b Quark Fragmentation Fractions* , F. Abe *et al.* (primary author), Phys. Rev. D **54**, 6596-6609 (1996).
33. *Observation of Top Quark Production in $p\bar{p}$ Collisions with the Collider Detector at Fermilab*, F. Abe *et al.* (primary author), Phys. Rev. Lett. **74**, 2626-2631 (1995).
34. *Evidence for top quark production in $p\bar{p}$ collisions at $\sqrt{s} = 1.8$ TeV*, F. Abe *et al.* (primary author), Phys. Rev. **D50**, 2966-3026 (1994).
35. *Evidence for Top Quark Production in $p\bar{p}$ Collisions at $\sqrt{s} = 1.8$ TeV*, F. Abe *et al.* (primary author), Phys. Rev. Lett. **73**, 225-231 (1994).
36. *Limit on the Top Quark Mass from $p\bar{p}$ Collisions at $\sqrt{s} = 1.8$ TeV*, F. Abe *et al.* (primary author), Phys. Rev. **D45**, 3921-3948 (1992).
37. *Performance and System Flexibility of the CDF Hardware Event Builder*, T. M. Shaw, K. Schurecht and P. K. Sinervo, FERMILAB-CONF-91-314 (Nov 1991). To be published in the proceedings of the IEEE Nuclear Science Symposium, Sante Fe, NM (Nov 1991).
38. *Top Quark Search in the Electron + Jets Channel in Proton-Antiproton Collisions at $\sqrt{s} = 1.8$ TeV*, F. Abe *et al.* (primary author), Phys. Rev. **D43**, 664-686 (1991).
39. *A Search for the Top Quark in the Reaction $\bar{p}p \to$ Electron + Jets at $\sqrt{s} = 1.8$ TeV*, F. Abe *et al.* (primary author), Phys. Rev. Lett. **64**, 192-196 (1990).
40. *Fast Data Acquisition with the CDF Event Builder,* P. K. Sinervo *et al.* (primary author), IEEE Trans. Nucl. Sci. **36**, 440-445 (1989).
41. *Evidence for a $J^{PC} = 4^{++}$ State at ~ 2.2 GeV c^2 From K^-p Interactions at 11* GeV c*,* D. Aston *et al.* (joint author), Phys. Lett. **215B**, 199-204 (1988).
42. *The CDF Event Builder,* A.W.Booth *et al.* (primary author), IEEE Trans. Nucl. Sci. **NS-34**, 790-795 (1987).
43. *The Organization and Maintenance of the CDF Offline Code on IBM VM and DEC VAX/VMS*

Operating Systems,
K. Chadwick, R. Hollebeek and P.K. Sinervo (primary author), Comput. Phys. Commun. **45**, 409-415 (1987).

44. *The Strange Meson Resonances Observed in the Reaction $K^-p \to \bar{K}^0\pi + \pi^-n$ at 11* GeV c*,*
D. Aston *et al.* (primary author), Nucl. Phys. **B292**, 693-713 (1987).
45. *Observation of the Leading K^* L-Excitation Series from $J^P = 1^-$ Through 5^- in the Reaction $K^-p \to K^-\pi pn$ at 11* GeV c*,*
D. Aston *et al.* (joint author), Phys. Lett. **180B**, 308-312 (1986).
46. *A Study of the Strange Meson Spectrum as Observed in the Reaction $K^-p \to \bar{K}^0\pi + \pi^-n$ at 11* GeV c*,* P.K. Sinervo, SLAC report 299, 1-233 (May 1986). Ph.D. Thesis.
47. *The SLAC Three-Body Partial Wave Analysis System,*
D. Aston, T. Lasinski and P.K. Sinervo (primary author), SLAC report 222, 1-66 (Oct 1985).
48. *The 3081/E Emulator: A Processor for use in On-line and Off-line Arrays,*
P.M. Ferran *et al.* (secondary author), SLAC preprint 3753, contributed to Conf. on Computing in High Energy Physics, Amsterdam, Netherlands, Jun 25-28, 1985.
49. *Partial Wave Analysis of the $\bar{K}^0\pi + \pi^-$ System Produced in K^-p Interactions at 11* GeV c*,*
D. Aston *et al.* (primary author), Nucl. Phys. **B247**, 261-292 (1984).
50. *Observation of Two Non-leading Strangeness-one Vector Mesons,*
D. Aston *et al.* (primary author), Phys. Lett. **149B**, 258-262 (1984).
51. *Measurement of the D^+, F^+ and Λ_c^+ Charmed Particle Lifetimes,*
N. Ushida *et al.* (joint author), Phys. Rev. Lett. **45**, 1053-1056 (1980).
52. *Measurement of the D° Lifetime,*
N. Ushida *et al.* (joint author), Phys. Rev. Lett. **45**, 1049-1052 (1980).

N.B. A complete list of refereed publications is available upon request.