

# CURRICULUM VITAE - Mary Alberg

## **Contact Information**

Department of Physics  
Seattle University  
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Seattle, WA 98122

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## **Research Interests**

hadron structure and interactions  
effective field theory  
exotic atoms

## **Education**

*University of Washington, Seattle, Washington*

Ph.D., Physics, 1974

Dissertation: "A K-Nucleus Optical Potential for Kaonic Atoms"

M.S., Physics, 1970

*Wellesley College, Wellesley, Massachusetts*

B.A., Physics, 1963

## **Professional Appointments**

*Seattle University*

Professor 1992 - present

Arline Bannan Chair of Mathematics and Natural Sciences 2000 - 2002

Chair, Department of Physics 1990 - 1995

Associate Professor 1983 - 1992

Assistant Professor 1979 - 1983

Lecturer 1978 - 1979

*University of Washington*

Affiliate Professor 1993 - present

Affiliate Associate Professor 1983 - 1993

Visiting Scholar 1977 - 1982

Research Associate 1974 - 1977

Lecturer 1974 - 1975

*Oxford University*

Visiting Fellow, Department of Nuclear Physics 1975

*U. S. Atomic Energy Commission*

Physicist, Health and Safety Laboratory 1963 - 1967

*Brookhaven National Laboratory*

Research Assistant, Cosmotron 1962

**Honors and Awards**

Sigma Alpha Epsilon Fellowship 1978 - 1979

Marie Curie Fellowship, American Association of University Women 1977 - 1978

National Science Foundation Traineeship 1971 - 1972

Danforth Foundation Fellowship 1968 - 1973

Phi Beta Kappa

Sigma Xi

**Grants**

*NSF Research in Undergraduate Institutions (RUI) Grants*

- "RUI: Hadron Structure and Interactions" 2006-2009 PHY-055570 (\$120,000)
- "RUI: Hadron Structure and Interactions" 2003-2006 PHY-0245101 (\$110,000)
- "Studies of Strangeness, Baryon Structure and Exotic Atoms" 2000-2003 PHY-0070942 (\$108,000)
- "RUI: Studies of Strangeness, Baryon Structure and Exotic Atoms" 1997-2000 PHY-9722023 (\$98,613)

*NSF Planning Grant*

- "Studies of Antiprotonic Atoms and the Strange Quark Content of the Nucleon" 1993-1994 PHY-9223618 (\$19,066)

**Professional Service**

- Presentations of a Public Lecture, "Einstein and Quantum Mechanics", in honor of the World Year of Physics 2005, at Seattle University (April, 2005) and at the Applied Physics Laboratory, University of Washington (June, 2005)
- Member of the Organizing Committee (1998-1999), Executive Committee (1999-2001), and Nominating Committee (2006-2008) of the Northwest Section of the American Physical Society (APS)
- Member of site visit team to Reed College (February 2002) for SPIN-UP (Strategic Programs for Innovations in Undergraduate Physics), a project of the National Task Force on Undergraduate Physics (NTFUP), jointly sponsored by AIP, APS, and AAPT
- APS Committee memberships: Education Committee, Division of Nuclear Physics (2000-2006);
- Committee on Membership, APS, 1996-1998 (Chair, 1998)

- Associate Editor, American Journal of Physics, 1995-1997
- Member of the International Advisory Committee for LEAP 2000 (Venice, Italy), LEAP 2003 (Yokohama, Japan) and LEAP 2005 (Bonn, Germany), the Conference on Low Energy Antiproton Physics
- Referee for journals of the APS and for *Physics Letters B*
- Reviewer of ILI and research proposals for NSF, including nuclear theory panel (2004)
- Member of the Committee of Visitors, Division of Physics, NSF (2003)

## **Publications**

- "Parton distributions in hadrons", *Prog. Particle Nucl. Phys.* **61**, (2008) 140.
- "Semiclassical description of protonium formation in antiproton collisions with molecular hydrogen" (with W. A. Beck and L. Wilets) *Phys. Rev. A* **74** (2006) 052706.
- "Parton Distributions in Hadrons" (with Ernest M. Henley), Proceedings of the Particles and Nuclei International Conference (PANIC 05), *AIP Conf. Proc.* **842** (2006) 522.
- "Renormalization of the singular attractive  $1/r^4$  potential" (with M. Bawin and F. Brau), *Phys. Rev. A* **71** (2005) 022108.
- "Semiclassical description of antiproton collisions with molecular Hydrogen" (with W. A. Beck and L. Wilets), *AIP Conf. Proc.* **796** (2005) 276.
- "Parton distributions in the proton and pion" (with E. M. Henley), *Phys. Lett. B* **611** (2005) 111.
- "Hyperon anti-hyperon production: A window on strangeness and baryon anti-baryon interactions," *Nucl. Phys. A* **692** (2001) 47.
- "Omega meson cloud and the proton's light anti-quark distributions" (with E. M. Henley and G. A. Miller), *Phys. Lett. B* **471** (2000) 396.
- "Light quark distributions in the proton sea" (with E. M. Henley), *Nucl. Phys. A* **663** (2000) 301.
- "What can we learn from antihyperon hyperon production?," *Nucl. Phys. A* **655** (1999) 179.
- "The quark distributions in the  $\Sigma^+$  hyperon" (with T. Falter and E. M. Henley), *Nucl. Phys. A* **644** (1998) 93.
- "Quark Substructure Approach to Helium Charge Distribution" (with L. Wilets, S. Pepin, Fl. Stancu, J. Carlson and W. Koepf), *Phys. Rev. C* **56** (1997) 486.
- "Antihyperon-Hyperon Production in a Quark Model" (with E.M. Henley, L.Wilets and P.D. Kunz), in Intersections between Particle and Nuclear Physics, *AIP Conf. Proc.* **412** (1997) 862.
- "Spin Observables in  $\Lambda$ -bar  $\Lambda$  Production" (with E.M. Henley, L. Wilets and P.D. Kunz), in PANIC'96, *Proc. 14th International Conference on Particles and Nuclei*, ed. C. Carlson and J. Domingo, p. 379, World Scientific, Singapore (1997).
- "Determination of Flavor Asymmetry for  $\Sigma^\pm$ ," (with E.M. Henley, X. Ji and A.W. Thomas), *Phys. Lett. B* **389** (1996) 367.
- "Strangeness in the Nucleon," in *Proceedings of the International School of Nuclear Physics, 17<sup>th</sup> Course, Quarks in Hadrons and Nuclei*, *Prog. Part. Nucl. Phys.* **36**, A. Faessler, ed., p. 217, Elsevier, Oxford (1996).
- "The Proton Spin Puzzle and Depolarization in  $p$ -bar  $p \rightarrow \Lambda$ -bar  $\Lambda$ ," (with J. Ellis and D. Kharzeev), *Phys. Lett. B* **356** (1995) 113.
- "Mesons and the Structure of Nucleons," (with W. Koepf and E.M. Henley), in *A Gift of Prophecy, Essays in Celebration of the Life of Robert Eugene Marshak*, ed. E.C.G. Sudershan, World Scientific, Singapore (1995), p. 288.

- “A Quark Model of  $\Lambda$ -bar  $\Lambda$  production in p-bar p interactions,” (with E.M. Henley, L. Wilets and P.D. Kunz), *Phys. At. Nuc.* **57** (1994) 1608.
- “A Quark Model of  $\Lambda$ -bar  $\Lambda$  production in p-bar p interactions,” (with E.M. Henley, L. Wilets and P.D. Kunz), *Il Nuovo Cimento* **107A** (1994) 2483.
- “Semiclassical Description of Antiproton Capture on Atomic Helium” (with W.A. Beck and L. Wilets), *Phys. Rev. A* **48** (1993) 2779.
- “A Quark Model of Antilambda-Lambda production in p-bar p interactions,” (with E.M. Henley, L. Wilets and P.D. Kunz), *Nuclear Physics A* **560** (1993) 365.
- “Scalar and Vector Contributions to p-bar p  $\rightarrow$   $\Lambda$ -bar  $\Lambda$  and p-bar p  $\rightarrow$   $\Lambda$ -bar  $\Sigma^0$  + c.c.” (with E.M. Henley, L. Wilets and P.D. Kunz), *AIP Conf. Proc.* **243** (1992) 345.
- “Scalar and Vector Contributions to p-bar p  $\rightarrow$   $\Lambda$ -bar  $\Lambda$ ” (with E.M. Henley, L. Wilets and P.D. Kunz), *Proceedings of the First Biennial Conference on Low Energy Antiproton Physics, LEAP 90*, p. 129.
- “Singlet Fraction in p-bar p  $\rightarrow$   $\Lambda$ -bar  $\Lambda$ ” (with E.M. Henley and W. Weise), *Phys. Lett. B* **255** (1990) 498.
- “Upper Limits to Fusion Rates of Isotopic Hydrogen Molecules in Pd” (with L. Wilets, J. Rehr and J. Mustre de Leon), *Phys. Rev. C* **41** (1990) 2544.
- “ $^3P_0$  and  $^3S_1$  Contributions to p-bar p  $\rightarrow$   $\Lambda$ -bar  $\Lambda$  at 1.5075 GeV/c” (with L. Wilets, E.M. Henley and P.D. Kunz), *Nucl. Phys. A* **508** (1990) 323c.
- “Comment on p-bar p  $\rightarrow$   $\Lambda$ -bar  $\Lambda$  Reaction in the One-gluon Exchange and the  $^3P_0$  Models” (with E.M. Henley and L. Wilets), *Phys. Rev. C* **38** (1988) 1506.
- “Quark Model Calculation of p p-bar  $\rightarrow$   $\Lambda$   $\Lambda$ -bar” (with K. Brauer, E.M. Henley and L. Wilets), *Proceedings of the IV LEAR Workshop, Villars-Sur-Ollon, Switzerland* (Harwood, London, 1988), p. 361.
- “A New Model for N N-bar Annihilation” (with E.M. Henley and L. Wilets), *Z. Phys. A* **331** (1988) 207.
- “Exclusion Effect of a Strong, Short-Range, Attractive Real Potential” (with L. Wilets), *Phys. Rev. C* **33** (1986) 736.
- “A Dynamical Model of Quark Rearrangement in Nucleon-Antinucleon Annihilation” (with G.A. Crawford, J-L. Dethier, and L. Wilets), in *Antinucleon and Nucleon-Nucleus Interactions*, ed. G.E. Walker, C.D. Goodman and C. Olnier (Plenum, N.Y., 1985), p. 197.
- “Bag-Model Analyses of Proton-Antiproton Scattering and Atomic Bound States” (with R. A. Freedman, E. M. Henley, W. Y. P. Hwang, D. Seckel and L. Wilets), *Phys. Rev. D* **27** (1983) 536.
- “The K-Nucleon Interaction and the K-Nucleus Optical Potential” (with E.M. Henley and L. Wilets), *Nukleonika* **25** (1980) 567.
- “Field-Theory Treatment of the pp  $\rightarrow$  d  $\pi^+$  Reaction” (with G.A. Miller, E.M. Henley and J.F. Walker), *Nucl. Phys. A* **306** (1978) 447.
- “The Nuclear and Particle Physics of Exotic Atoms,” *Proceedings of the Summer Study Meeting on Kaon Physics and Facilities*, Brookhaven National Laboratory, BNL 50579, p. 407 (1976).
- “The Off-Shell K-bar N T-matrix,” in *Meson-Nuclear Physics-1976, AIP Conf. Proc.* **33** (1976) 486.
- “Charge Asymmetry Of Nuclear Forces” (with E. M. Henley, G. A. Miller and J. F. Walker), in *Meson-Nuclear Physics-1976, AIP Conf. Proc.* **33** (1976) 668.
- “Theory of Kaonic Atoms” (with E.M. Henley and L. Wilets), *Ann. Phys.* **96** (1976) 43.
- “Galilean Invariance of the Pion-Nucleon Interaction” (with H.W. Ho and E.M. Henley), *Phys. Rev. C* **12** (1975) 217.
- “K- Nucleus Optical Potential for Kaonic Atoms,” Ph.D. Dissertation (March, 1974).
- “K- Nucleus Optical Potential” (with E.M. Henley and L. Wilets), *Phys. Rev. Lett.* **30** (1973) 255.

- “Kaonic Atoms and Nuclear Density Distributions” (with E.M. Henley and L. Wilets), *Comments Nucl. Part. Phys.* **5** (1972) 1.
- “An Investigation of Differential Energy and Angle Spectra for  $^{237}\text{Cs}$  Gamma Rays in Water and Air” (with H. Beck et al.), *Nucl. Sci. Eng.* **30** (1967) 65.
- “High Energy Accelerator Shield-Leakage Neutron Spectra” (with R. Sanna et al.), *Nucl. Sci. Eng.* **27** (1967) 338.
- “An Experimental Determination of the Energy Distribution of Gamma Rays Scattered in Sand” (with J.E. McLaughlin et al.), *Nucl. Sci. Eng.* **25** (1966) 303.
- “Nuclear-Track Emulsion Spectrometry at Low and Intermediate Neutron Energies” (with K. O’Brien et al.), *Supplemento al Nuovo Cimento* **111** (1965) 409.
- “Photoconductivity of Lead Sulfide Films” (with P.J. Fleming), *J. Appl. Phys.* **35** (1964) 3522.