CURRICULUM VITAE
Charles Ray Newsom

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Educational and Professional History

Education

B.S. 1974, University of Texas, with Honors and special Honors (Physics)
Ph.D. 1980, University of Texas (Physics)

Academic and Professional Positions

Associate Professor, Department of Physics and Astronomy, University of Iowa, August 1989 – Present

Assistant Professor, Department of Physics and Astronomy, University of Iowa, January 1985--August 1989

Research Associate, UCLA, October 1983--December 1984

Visiting Scientist, Laboratoire National Saturne, October 1980--September 1983

Postdoctoral appointment, Texas A and M University, August--October 1980

Graduate Research Assistant, University of Texas, 1975--1976

Teaching Assistant, University of Texas, 1976

Undergraduate Research Assistant, University of Texas, 1972--1974

Honors and Awards

Phi Eta Sigma, 1971
Sigma Pi Sigma, 1972
Special Honors Program, 1974
Associated Western University Fellowship at Los Alamos Laboratory, 1977-1980
Research Fellow, University of Texas, 2001

Memberships

American Physical Society

Teaching at The University of Iowa

29:282	Research in Astronomy		Summer	1985	1
29:281	Research in Physics		Summer	1995	1
29:281	Research in Physics		Summer	1996	1
29:281	Research in Physics		Summer	1997	2
29:130	Electricity and Magnetism	2nd	Semester	1984-85	15
29:132	Intermediate Laboratory	1st	Semester	1985-86	3
29:133	Advanced Laboratory	1st	Semester	1985-86	2
29:099	Honors Seminar	2nd	Semester	1985-86	1
29:132	Intermediate Laboratory	2nd	Semester	1985-86	4
29:133	Advanced Laboratory	2nd	Semester	1985-86	4
29:132	Intermediate Laboratory	1st	Semester	1986-87	2
29:133	Advanced Laboratory	1st	Semester	1986-87	2
29:132	Intermediate Laboratory	2nd	Semester	1986-87	6
29:133	Advanced Laboratory	2nd	Semester	1986-87	2
29:281	Research in Physics	2nd	Semester	1986-87	1
29:132	Intermediate Laboratory	1st	Semester	1987-88	2
29:133	Advanced Laboratory	1st	Semester	1987-88	2
29:132	Intermediate Laboratory	2nd	Semester	1987-88	8
29:133	Advanced Laboratory	2nd	Semester	1987-88	1
29:011	College Physics	1st	Semester	1988-89	146
29:011	College Physics	2nd	Semester	1988-89	109
29:011	College Physics	2nd	Semester	1989-90	109
29:012	College Physics	2nd	Semester	1989-90	140
29:018	Introductory Physics II	1st	Semester	1990-91	144
29:011	College Physics	2nd	Semester	1990-91	110
29:093	Reading in Physics	2nd	Semester	1990-91	1
29:011	College Physics	2nd	Semester	1992-93	146
29:132	Intermediate Laboratory	1st	Semester	1993-94	8
29:133	Advanced Laboratory	1st	Semester	1993-94	2
29:132	Intermediate Laboratory	2nd	Semester	1993-94	5
29:133	Advanced Laboratory	2nd	Semester	1993-94	1
29:132	Intermediate Laboratory	1st	Semester	1994-95	18
29:132	Intermediate Laboratory	2nd	Semester	1994-95	7
29:133	Advanced Laboratory	2nd	Semester	1994-95	2
29:099	Honors Seminar	1st	Semester	1995-96	1
29:132	Intermediate Laboratory	1st	Semester	1995-96	5
29:133	Advanced Laboratory	1st	Semester	1995-96	1
29:281	Research in Physics	1st	Semester	1995-96	1
29:011	College Physics	2nd	Semester	1995-96	109
29:281	Research in Physics	2nd	Semester	1995-96	1
29:281	Research in Physics	1st	Semester	1996-97	1
29:011	College Physics	2nd	Semester	1996-97	102
29:012	College Physics	2nd	Semester	1996-97	141
29:281	Research in Physics	2nd	Semester	1996-97	1
29:011	College Physics	1st	Semester	1997-98	168

29:132	Intermediate Laboratory	2nd	Semester	1997-98	12
29:132	Intermediate Laboratory	1st	Semester	1998-99	7
29:017	Introductory Physics I	2nd	Semester	1998-99	156
29:012	College Physics	1st	Semester	1999-00	65
29:011	College Physics	2nd	Semester	1999-00	88
29:011	College Physics	1st	Semester	2000-01	116
29:093	Reading in Physics	1st	Semester	2000-01	2
29:132	Intermediate Laboratory	2nd	Semester	2000-01	1
29:133	Advanced Laboratory	2nd	Semester	2000-01	3
29:012	College Physics	1st	Semester	2001-02	31
29:281	Research in Physics	1st	Semester	2001-02	1
29:011	College Physics	2nd	Semester	2001-02	55
29:093	Reading in Physics	2nd	Semester	2001-02	1
29:103	Reading in Physics		Summer	2002	1

Scholarship

Publications

1. M. KAYA … C. NEWSOM *et al*.
   "Production asymmetry of D_s from 600 GeV/*c* Σ^- and π^- beam,"
   Phys. Lett. *B* **558**, 34-40, 2003

2. M. I. ADAMOVICH … C. NEWSOM *et al*.
   "Spectra and correlations of λ and λ produced in 340 GeV/c σ- + C and 260 GeV/c N+C Interactions," *Phys. Rev. C* **65**, 042202, 2002

3. M. MATTSON … C. NEWSOM *et al*.
   "First Observation of the Doubly Charmed Baryon Ξ_{cc}^{+}"
   Phys. Rev. Lett. **89**, 112002, 2002

4. F. G. GARCIA … C. NEWSOM *et al*.
   "Hadronic production of Λ_c from 600 GeV/c π^-,$\Sigma^-$and p beams,"
   Phys. Lett. *B* 528, 49-57, 2002

5. A. OCHERASHVILI … C. NEWSOM *et al*.
   "First Measurement of $\pi^- e \rightarrow \pi^- e \gamma$ Pion Virtual Compton Scattering,"
   Phys. Rev. C **66**, 034613, 2002

6. N. MALCHUS, C. NEWSOM AND B. YURKE
   "Taxanomical notes on some gryphaeid oysters (Bivalvia) from the Middle Cretaceous of Texas, U.S.A." [draft]

7. R. MAHON … C. NEWSOM *et al*.
"The Branching Ratio of Anti $\Sigma^+ \to \bar{p}\gamma$, A Test of CP in Hyperon Decay," [to be submitted]

8. P. POGODIN … C. NEWSOM *et al*.
"Polarization of Inclusively Produced Σ^+ by 800 GeV/c Protons on Cu and Be," [under review by E781 committee prior to submission]

9. K. D. NELSON … C. NEWSOM *et al*.
"Polarization of $\wedge^0$ Inclusively Produced by a 610 GeV/c $\sum^-$ Beam," [to be submitted to PRD]

10. V. V. MOLCHANOV … C. NEWSOM *et al*.
"Radiative decay width of the $a_2(1320)^-$meson,"
Phys. Lett. B **521**, 171-180, 2001

11. I. ESCHRICH … C. NEWSOM *et al*.
"Measurement of the Σ^- charge radius by Σ^--electron elastic scattering,"
Phys. Lett. B **522**, 233-239 (2001)

12. M. IORI … C. NEWSOM *et al*. "Measurement of the $\Xi_c^\pm$ lifetime,"
Phys. Lett. B **523**, 22-28 [2001]

13. KUSHNIRENKO … C. NEWSOM *et al*.
"Precision Measurements of the $\lambda+_c$ and D0 Lifetimes,"
Phys. Rev. Lett. **86**, 5243-5246 (2001)

14. U. DERSCH … C. NEWSOM *et al*.
"Total Cross-Section Measurements with π–, Σ– and Protons on Nuclei and Nucleons Around 600-GeV/c.,"
Nucl. Phys. B **579**, 277-312, (2000)

15. M. I. ADAMOVICH … C. NEWSOM *et al*.
"Determination of the Total $c\bar{c}$ Production of Cross Section in 340 GeV/c Σ^- - Nucleus Interactions,"
Eur. Phys. J. **C13**, 247-254 (2000)

16. S. Y. JUN … C. NEWSOM *et al*.
"Observation of the Cabibbo-Suppressed Decay $\Xi_c^+ \to pK^-\pi^+$,"
Phys. Rev. Lett. **84**, 1857 (2000)

17. R. F. BARBAROSA … C. NEWSOM *et al*.
"Measurement of the Anti-Σ Lifetime and Direct Comparison with the Σ+ Lifetime,"
Phys. Rev. D **61**, 31101 (2000)

18. M. I. ADAMOVICH … C. NEWSOM *et al*.
"Production of Induced Ξ* Resonances in Σ^- Induced Reactions at 345 GeV/c
Eur. Phys. J. C **C11**, 271-278 (1999)

19. M. I. ADAMOVICH … C. NEWSOM *et al*.
"Charge Asymmetries for D, D_s and λ_c Production in Σ^--Nucleus Interactions at 340 GeV/*c*," *Eur. Phys. J*. **C8**, 593-601 (1999)

20. M. I. ADAMOVICH … C. NEWSOM *et al*.
"First Observation of $\Sigma^- - e^-$ Elastic Scattering in the Hyperon Beam Experiment WA89 at CERN," *Eur. Phys. J*. **C8**, 59-66 (1999)

21. F. ALBUQUERQUE … C. NEWSOM *et al*.
"A Search for Light Supersymmetric Baryons,"
Phys. Rev. Lett.**78**, 3252-3256 (1997)

22. M. I. ADAMOVICH … C. NEWSOM *et al*.
"Ξ^- Production by Σ^-, π^-, and Neutrons in the Hyperon Beam Experiment at CERN,"
Nucl. Phys. Proc. Suppl. **55A**, 14-18 (1997)

23. M. I. ADAMOVICH … C. NEWSOM *et al*.
"Measurement of the Polarization of $\lambda^0, \overline{\lambda}^0, \Sigma^+$ and Ξ^- Produced in a Σ^- Beam of 330 GeV}/*c*," *Z. Phys. A* **350** 379-386 (1995)

24. W. BRÜCKNER … C. NEWSOM *et al*.
"Silicon Microstrip Detectors with SVX Chip Readout,"
Nucl. Instrum. Methods **A357**, 274-282 (1995)

25. V. AGORITSAS … C. NEWSOM *et al*.
"Fast Readout of Scintillating Fiber Arrays Using Position-Sensitive Photomultipliers," *Nucl. Instrum. Methods* **A357**, 78-86 (1995)

26. S. TIMM … C. NEWSOM *et al*.
"Measurement of the Branching Ratio and Asymmetry for the $\Sigma^+ \to p\gamma$ Radiative Decay," *Phys. Rev. D* **51**, 4638-4660 (1995)

27. M. I. ADAMOVICH … C. NEWSOM *et al*.
"Measurement of the Ω_c^0 Lifetime," *Phys. Lett. B* **358**, 151--161 (1995)

28. A. MORELOS … C. NEWSOM *et al*.
"p_t and x_F Dependence of the Polarization of Σ^+ Hyperons Produced by 800 GeV/*c* Protons," *Phys. Rev. D* **52**, 3777--3780 (1995)

29. W. BRÜCKNER … C. NEWSOM *et al*.
"Silicon μ-strip Detectors with SVX Chip Readout,"
Nucl. Instrum. Methods **A348**, 444-448 (1994)

30. I. F. ALBUQUERQUE … C. NEWSOM *et al*.
"A New Upper Limit on the Branching Ratio of the $\Omega^- \to \Xi^- \gamma$ Radiative Decay,"
Phys. Rev. D **50**, 18-20 (1994)

31. T. DUBBS … C. NEWSOM *et al*.
"Measurement of the Branching Ratio for the $\Xi^- \to \Sigma^- \gamma$ Radiative Decay,"
Phys. Rev. Lett. **72**, 808-811 (1994)

32. A. MORELOS … C. NEWSOM *et al*.
"Measurement of the Magnetic Moments of the Σ^+ and $\overline{\Sigma}^-$ Hyperons,"
Phys. Rev. Lett. **71**, 3417-3420 (1993)

33. A. MORELOS … C. NEWSOM *et al*.
"Polarization of Σ^+ and $\overline{\Sigma}^-$ Hyperons Produced by 800-GeV/*c* Protons,"
Phys. Rev. Lett. **71**, 2172-2175 (1993)

34. D. D. KOETKE … C. NEWSOM *et al*.
"Muon-Neutrino Carbon Charged-Current Interaction Near the Muon Threshold,"
Phys. Rev. C **46**, 2554-2566 (1992)

35. D. CHEN … C. NEWSOM *et al*.
"First Observation of Magnetic Moment Precession of Channeled Particles in Bent Crystals, *Phys. Rev. Lett*. **69**, 3286-3289 (1992)

36. M. FOUCHER … C. NEWSOM *et al*.
"Measurement of the Asymmetry Parameter in the Hyperon Radiative Decay $\Sigma^+ \to p\gamma$," *Phys. Rev. Lett*. **68**, 3004-3007 (1992)

37. G. GLASS … C. NEWSOM *et al*.
"Analyzing Power Measurement for Forward Angle *n-p* Scattering at 790 MeV,"
Phys. Rev. C **41**, 2732-2736 (1990)

38. L. H. TROST … C. NEWSOM *et al*.
"New Measurement of the Production Polarization and Magnetic Moment of the Ξ^- Hyperon," *Phys. Rev. D* **40**, 1703-1707 (1989)

39. C. R. NEWSOM *et al*.
"Neutron-Proton Analyzing Power Measurements from 375 to 775 MeV,"
Phys. Rev. C **39**, 965-974 (1989)

40. S. Y. HSUEH … C. NEWSOM *et al*.
"High-Precision Measurement of Polarized-Σ^- Decay,"
Phys. Rev. D **38**, 2056-2076 (1988)

41. D. L. ADAMS … C. NEWSOM *et al*.
"Spin Observables in Small-Angle Elastic $\vec{p}\vec{d} \to \vec{p}d$ Scattering with an L-Type Deuteron Target at 800 MeV,"
Nucl. Phys. **A480** 530-546 (1988)

42. T. DOMBECK … C. NEWSOM *et al*.
"The Search for Neutrino Oscillations in the Appearance Mode $\nu_\mu \to \nu_e$ for Neutrino Energies Near the Muon Threshold,"
Phys. Lett. B **194**, 591-596 (1987)

43. G. ZAPALAC … C. NEWSOM *et al*.
"Measurement of the Σ^- Magnetic Moment Using the $\Sigma^- \to ne^-\vec{\nu}$ and $\Sigma^- \to n\pi^-$ Decay Modes," *Phys. Rev. Lett*. **57**, 1526-1529 (1986)

44. F. PERROT … C. NEWSOM *et al*.
"Measurement of the Total Cross Section Difference $\Delta\sigma_T$(pp) in the Energy Range Between 0.43 to 2.4 GeV,"
Nucl. Phys. **B278**, 881-904 (1986)

45. J. BYSTRICKY … C. NEWSOM *et al*.
"Measurement of n-p and p-p Asymmetry with Accelerated Polarized Deuteron Beam from 725 to 1000 MeVper Nucleon,"
Nucl. Phys. **A444** 597-610 (1985)

46. J. BYSTRICKY … C. NEWSOM *et al*.
"Measurement of the Spin Correlation Parameter A_{oonn} and of the Analyzing Power for p-p Elastic Scattering in the Energy Range from 0.5 to 0.8 GeV,:
Nucl. Phys. **B262**, 727-743 (1985)

47. J. BYSTRICKY … C. NEWSOM *et al*.
"A Proton and Neutron Beam Polarimeter at SATURNE~II,"
Nucl. Instrum. Methods **A239**, 131-138 (1985)

48. J. BYSTRICKY … C. NEWSOM *et al*.
"Measurement of the Spin Correlation Parameter A_{ookk} for pp Elastic Scattering in the Energy Range 0.72-1.1 GeV," *Nucl. Phys*. **B258**, 483-504 (1985)

49. J. BYSTRICKY … C. NEWSOM *et al*.
"Measurement of the Spin Correlation Parameter A_{ookk} (pp) in the Energy Range

0.84-1.1 GeV at SATURNE~II,"
Journal de Physique **46**, C2-479--C2-481 (1985)

50. S. Y. HSUEH… C. NEWSOM *et al*.
"Measurement of the Electron Asymmetry in the Beta Decay of Polarized Σ^- Hyperons," *Phys. Rev. Lett.* **54**, 2399-2402 (1985)

51. M. ARIGNON … C. NEWSOM *et al*.
"Novel Transmission Detector Used for Total Cross Section Measurements,"
Nucl. Instrum. Methods \bf **A235**}, 523-535 (1985)

52. J. BYSTRICKY … C. NEWSOM *et al*.
"N-N Experiments with Polarized Beam and Target at SATURNE~II,"
Few Body Problems in Physics, Vol. II, edited by B. Zeitnitz
[Elsevier Science Publishers, B.V., 1984]

53. J. BYSTRICKY … C. NEWSOM *et al*.
"Analyzing Power of Reaction $p \rightarrow C \rightarrow p'X$ from 0.52 to 2.8 GeV,"
Lett. Nuovo Cim. **41**, 285-288 (1984)

54. J. BYSTRICKY … C. NEWSOM *et al*.
"Structures in Proton-Proton Scattering at Intermediate Energies,"
Lett. Nuovo Cim. **82A**, 385-402 (1984)

55. J. BYSTRICKY … C. NEWSOM *et al*.
"Analyzing Power for Quasi-Elastic pp Scattering in Carbon and for Elastic pp Scattering on Free Protons," *Lett. Nuovo Cim*. **40**, 466-470 (1984)

56. J. BYSTRICKY … C. NEWSOM *et al*.
"Measurement of the Total Cross Section Difference $\Delta\sigma_L$(pp) in the Energy Range from 0.52 to 2.8 GeV,"
Phys. Lett. **142B**, 130-134 (1984)

57. G. GLASS … C. NEWSOM *et al*.
"The Measurement of K_{NN} and K_{LL} in $\vec{p}p \rightarrow \vec{n}X$ at 800 MeV,"
Phys. Lett. **129B**, 27-30 (1983)

58. G. GLASS … C. NEWSOM *et al*.
"The Inclusive Inelastic Reaction $np \rightarrow pX$ at 795 MeV,"
Phys. Rev. D **28**, 1045-1049 (1983)

59. B. E. BONNER … C. NEWSOM *et al*.
"Zero-Degree Measurements of the Inclusive Reaction $np \rightarrow pX$ in the Energy Range 400 to 800 MeV,"
Phys. Rev. D **27**, 497-501 (1983)

60. C. L. HOLLAS … C. NEWSOM *et al*.
"Deuteron Spectrum in np $\rightarrow$ d$(\pi\pi)^0$ at 1.46 GeV/c,"
Phys. Rev. C **25**, 2614-2618 (1982)

61. T. S. BHATIA … C. NEWSOM *et al*.
"Difference Between Polarization and Analyzing Power for 800-MeV n-p Elastic Scattering: Test of Time-Reversal Invariance,"
Phys. Rev. Lett. **48**, 227-230 (1982)

62. P. J. RILEY … C. NEWSOM *et al*.
"The Measurement of K_{NN} and K_{LL} in $\vec{p}d \rightarrow \vec{n}X$ and $\vec{p}^{9}Be \rightarrow \vec{n}X$ at 800 MeV,"
Phys. Lett. **103B**, 313-316 (1981)

63. C. L. HOLLAS … C. NEWSOM *et al*.
"Test of Charge Symmetry in the np $\rightarrow$ dπ^0 Reaction at 795 MeV,"
Phys. Rev. C **24**, 1561-1571 (1981)

64. T. S. BHATIA … C. NEWSOM *et al*.
"Zero-Crossing Angle in the np Analyzing Power at Medium Energies and Its Relation to Charge Symmetry," *Phys. Rev. C* **24**, 796-798 (1981)

65. B. E. BONNER … C. NEWSOM *et al*.
"Measurement of np Charge Exchange for Neutron Energies 150-800 MeV,"
Phys. Rev. Lett. **41**, 1200-1203 (1978)

66. B. E. BONNER … C. NEWSOM *et al*.
"Systematics of 0^o Neutron Production by 800 MeV Protons on Targets with $27 \leq A \leq 238$,"
Phys. Rev. C **18**, 1418-1425 (1978)

67. P. J. RILEY … C. NEWSOM *et al*.
"Neutron-Induced Deuteron Production from Light Nuclei at 800 MeV,"
Phys. Rev. C **17**, 1881-1884 (1978)

68. B. E. BONNER … C. NEWSOM *et al*.
"nd Scattering at 180° for Neutron Energies from 200 to 800 MeV,"
Phys. Rev. Lett. **39**, 1253-1256 (1977)

69. P. J. RILEY … C. NEWSOM *et al*.
"Measurement of (p,n) and (n,p) Reactions on ^{6}Li and ^{7}Li at 800 MeV,"
Phys. Lett.**68B**, 217-220 (1977)

70. J. CHAO … C. NEWSOM *et al*.
"^{78,80,82}Kr(d,p) ^{79,81,83}Kr Reactions," *Phys. Rev. C* **11**, 1237-1246 (1975)

Recent Invited Talks

International Workshop on Semiconductor Pixel Detectors for Particles and X-Rays – Pixel 2000, June 5-8, 2000, "Overview of the BTeV Pixel Detector"

8th International Conference on B-physics at Hadron Machines - Beauty2002, June 17-21, 2002, "The BTeV Vertex Trigger"

Grants

Title: High Energy Physics at The University of Iowa (Task B2)
Agency: DOE
Project period: 3/1/01-2/28/04
Amount: $300,000

(pending)

Title: Secure and Adaptive Middleware for the Grid
Agency: NSF (subcontract to University of Puerto Rico Mayaguez)
Project period: 9/1/03 - 8/31/07
Amount: $507,800
submitted 2/14/03

Title: Strange and charmed baryon and antibaryon production in pi-A reactions at E781 experiment as manifestation of baryon charge transfer by proton string junction
Agency: U.S. CRDF
Project period: 8/1/03 - 1/31/05
Amount: $12,000
submitted 1/31/03

Appendix

Research Experience

Fermi National Accelerator Laboratory (1984 - Present):

- BTeV pixel project - Deputy Project Director
  Fermilab/BTeV - Testbeam Liaison
  Pixel Testbeam Project - Physicist in Charge, January 2002 – present
- BTeV - A large collider experiment Iowa will construct a silicon pixel detector
- E781 - A high-precision study of charmed-strange baryon production and decay mechanisms
- Participating in the ongoing analysis of E781 (Vee and kink reconstruction package)
- Constructed an 8-plane, VLSI readout silicon beam spectrometer for E781
- E761 - Σ^+ and Ξ^- radiative decay branching ratios and asymmetries, charged hyperon polarizations and magnetic moments
- Designed and built the 5000 channel silicon vertex detector used in E761
- Participated heavily in the on-line (VAX) analysis of the E761 data, with emphasis on integrating the neutral track information (TRD and PbG) into the analysis
- E715 - Σ^- beta decay asymmetry, changed hyperon polarizations and magnetic moments
- Participated heavily in the off-line analysis of the magnetic moment of the of the Ξ^- (E715)

CERN Laboratory (1992--1993):

- WA89 - A charm strange baryon production study
- Collaborated on the beam silicon spectrometer system
- Collaborated (with E. Chudakov) on the design and fabrication of a thin diamond target array

Los Alamos Scientific Laboratory (1973--1984):

- Photomultiplier bleeder string design
- Neutron detector bar scintillator development
- Participated in polarized target assembly, and testing, synthesis of target material
- Fast electronics for scintillation and multi-wire proportional counters
- Advanced programming associated with PDP 11-60 on-line data acquisition programs
- Programming associated with PDP 11-70 off-line data analysis
- Analysis of neutron production experiments on CDC~7600 computer

Laboratoire National Saturne:

- Proton Beam Polarimeter Development and Study (original design and study by C. Whitton, UCLA)
- Proton Beam Polarization calibration measurement
- C_{NN} Measurement and Analysis—Spokesman
- $\Delta\sigma_t$ Measurement and Analysis
- $\Delta\sigma_L$ Measurement and Analysis
- C_{LL} Proposed Experiment—Spokesman
- On-Line data analysis using MITRA 115 computer
- Off-Line data analysis using CDC 7600 computer
- Familiar with Phase Shift Analysis Program used at CERN

University of Texas:

- Operation of Tandem Van de Graaff Accelerator
- Charged particle experiments in low energy nuclear physics
- DWBA analysis of (d,p) measurements on CDC 6400-6600 computer
- Sliding seal scattering chamber design
- Thin window gas/cell target design
- Knowledgeable in use of on-line PDP 7-PDP 15 programs

Thesis

Ph.D., Physics, University of Texas, September 1980
"Neutron Proton Analyzing Power at Medium Energies,"
[under direction of Peter J. Riley, Associate Professor]
Research done at LAMPF under J. E. Simmons, Los Alamos
Scientific Laboratory, Physics Division