JAMES A. MUSSER
Department of Physics
Indiana University
Bloomington, IN 47408

Birth:

January 11, 1957

Education:

1984	Ph.D., Physics, University of California, Berkeley
1979	B.S., Physics, University of Arizona

Positions:

2010-presen t	Professor, Physics Department, Indiana University
2007-2010	Interim Director, Indiana University Cyclotron Facility
2000-2007	Chair, Physics Department, Indiana University
1995-present	Professor, Physics Department, Indiana.University
1993-1995	Associate Professor, Physics Department, Indiana University
1990-1993	Assistant Professor, Physics Department, Indiana University
1986-1990	Assistant Research Scientist, Physics Department, University of Michigan
1984-1986	Research Fellow, Physics Department, University of Michigan
1980-1984	Research Assistant, Physics Department, University of California, Berkeley
1979-1980	Teaching Assistant, Physics Department, University of California, Berkeley
1976-1979	Undergraduate Research Assistant, Physics Department, University of Arizona

Societies:

Member, American Physical Society
Member, Phi Beta Kappa

Awards:

SSCL Fellowship, 1992

Service Committees:

DoE SAGENAP panel member
NASA SR&T Review Panel
NASA SMEX Review Panel
NSF PNA Panel

Research Activities:

MINOS is an experiment based at Fermilab which is designed to search for oscillations between neutrino species. Recent results from a number of recent experiments have suggested that muon neutrinos are mixing (oscillating) with a second neutrinos species, most probably with the tau neutrino. Mixing between neutrino species is possible only if neutrinos are massive, contrary to present assumptions. MINOS promises to provide an exceptionally important result in one of the most exciting and active areas of particle physics research at this time.

NOVA is a planned experiment at Fermilab that uses the same neutrino beam employed by MINOS, with a new far detector that is optimized to observe the sub-dominant oscillations that are the key to understanding CP violation in the lepton sector. A conceptual design report is currently being developed by the collaboration. Plans call for construction funds to be released to the collaboration in 2007.

CREST promises to provide the first measurements of the cosmic electron flux at energies greater then 10 TeV. I am the Spokesman for this multi-institutional project (which involves U. Michigan, U. Chicago, Penn State University, and U. Minn.)

Grants and Awards :

As Principal Investigator:

CREST	NASA	1/1/09 - 12/31/11	$ 622 K
Indiana High Energy Physics Task C	DoE	11/1/10 - 10/30/011	$ 600 K
Indiana High Energy Physics Task C Suppl	DoE	11/1/09 – 10/31/10	$ 35 K
Nova R&D / Construction	FNAL	10/30/09 – 9/1/10	$ 360 K

Publications:

2010

110: P. Adamson et.al. "Neutrino and antineutrino inclusive charged-current cross section measurements with the MINOS near detector" Phys Rev D **81**, 7 (2010).*

109: P. Adamson et.al. "Search for sterile neutrino mixing in the MINOS long-baseline experiment" Phys Rev D **81,**,5 (2010).*

108: P. Adamson et.al. "New constraints on muon-neutrino to electron-neutrino transitions in MINOS" Phys Rev D **82**, 5 (2010).*

107: P. Adamson et al. "Observation of muon intensity variations by season with the MINOS far detector," Phys.Rev.D **81,** 1 (2010). *

2009

106: Rengstorf, AW; Thompson, DL; Mufson, SL, et al. ApJ Supplement Volume: **181** Issue: **1**, **129-134 (2009)***

105: P. Adamson et al. "Search for muon-neutrino to electron-neutrino transitions in MINOS," Phys.Rev.Lett. 103, 261802 (2009)*.

104: S. Osprey et al. "Sudden stratospheric warmings seen in MINOS deep underground muon data" , Geophys. Res. Lett. 36, L05809 (2009)*.

2008

103: Study of muon neutrino disappearance using the Fermilab Main Injector neutrino beam MINOS Collaboration, Physical Review D **072002-1-34** (2008).*

102: Measurement of neutrino oscillations with the MINOS detectors in the NuMI beam MINOS Collaboration, Phys Rev Letters **101-13** 131802 (2008).*

101: Testing Lorentz Invariance and CPT Conservation with NuMI Neutrinos in the MINOS Near Detector MINOS Collaboration, Phys Rev Letters **101-15** 151601 (2008).*

100: Search for Active Neutrino Disappearance Using Neutral-Current Interactions in the MINOS Long-Baseline Experiment , MINOS Collaboration, Phys Rev Letters **101-22** 221804 (2008).*

99: Magnetized steel and scintillator calorimeters of the MINOS experiment MINOS Collaboration, Nuc Instr & Methods **A 596** 190-228 (2008).*

2007

98: Measurrement of neutrino velocity with the MINOS detectors and NuMI neutrino beam MINOS Collaboration, Phys Rev **D 76** 7 072005 (2007).*

97: The QUEST large area CCD camera
Baltay, C; Rabinowitz, D; Andrews, P; et al., Astronomical Soc Pacific **119 861** 1278-1294 (2007).*

96: The Measurement of the Atmospheric Muon Charge Ratio at Tev Energies with the MINOS detector (MINOS Collaboration*), Phys Rev D, **76**, 052003 (2007)*.

95: Charge-separated Atmospheric Neutrino-induced Muons in the MINOS far detector, (MINOS Collaboration*), Phys Rev D, **75**, 092003 (2007)*.

2006

94: Observation of muon neutrino disappearance with the MINOS detectors in the NuMI neutrino beam (MINOS Collaboration) *Phys. Rev. Lett.*, **97 (19)**, 191801 (2006)*

93: First observations of separated atmospheric nu(mu) and (nu)over-bar(mu) events in the MINOS detector
(MINOS Collaboration) *Phys. Rev. D*, **73 (7)**, 072002 (2006) *

2005

92: First Observation of Separated Atmospheric ν_μ and $\nu_{\bar{\mu}}$ Events in the MINOS Detector
(MINOS Collaboration) Submitted Phys. Rev. D

2004

91: The QUEST RR Lyrae survey. I. The first catalog
(QUEST Collaboration) ApJ **127**, 1158-1175 (2004)*

90: QUEST1 variability survey. II. Variability determination criteria and 200k light curve catalog
(QUEST Collaboration) ApJ **617**, 184-191 (2004)*

89: Search for stellar gravitational collapses with the MACRO Detector
(MACRO Collaboration) *European Phys. J.* **C 37, 265 (2004)***

88: Measurements of Atmospheric Muon Neutrino Oscillations, Global Analysis of the Data Collected with MACRO Detector
(MACRO Collaboration) *European Phys. J.* **C 36, 323 (2004)***

87: The Cosmic Ray Proton, Helium and CNO Fluxes in the 100 TeV Energy Region from TeV Muons and EAS Atmospheric Cherenkov Light Observations of MACRO and EAS-TOP
(MACRO Collaboration) *Astroparticle Phys.* **21, 223 (2004)***

86: New Quasars Detected via Variability in the QUEST1 Survey
(QUEST Collaboration) *ApJ* **606, 741 (2004)***

85: The Cosmic Ray Primary Composition Between 10(15) and 10(16) eV from Extensive Air Showers Electromagnetic and TeV Muon Data
(MACRO Collaboration) *Astroparticle Phys.* **20, 641 (2004)***

84: Weak Lensing from Space I: Instrumentation and Survey Strategy
(SNAP Collaboration) *Astroparticle Phys.* **20, 377 (2004)***

83: New Measurement of the Cosmic Ray Positron Fraction from 5 to 15 GeV
(HEAT Collaboration) *Phys. Rev. Lett.* **93, 241102 (2004)***

82: New Measurement of the Altitude Dependence of the Atmospheric Muon Intensity
(HEAT Collaboration) *Phys Rev* **D 70 , 092005 (2004)***

2003

81: Moon and Sun Shadowing Effect in the MACRO Detector
(The MACRO Collaboration) *Astroparticle Phy.*, **20, 145 (2003)***

80: Calibrations of CR39 and Makrofol Nuclear Track Detectors and Search For Exotic Particles
(The MACRO Collaboration) *Nuc. Phys. B – Proc. Supl.*, **125, 217 (2003)***

79: Atmospheric Neutrino Oscillations from Upward Throughgoing Muon Multiple Scattering in MACRO
(The MACRO Collaboration) *Phys. Lett. B*, **566, 35 (2003)***

78: Measurement of the Residual Energy of Muons in the Gran Sasso Underground Laboratory
(The MACRO Collaboration) *Astroparticle Physics*, **19, 313 (2003)***

77: Search for the Sidereal and Solar Diurnal Modulations in the Total MACRO Data Set
(The MACRO Collaboration) *Phys. Rev. D.*, **67, 042002 (2003)***

76: Search for Cosmic Ray Sources Using Muons Detected by the MACRO Experiment
(The MACRO Collaboration) *Astroparticle Physics*, **18, 615 (2003)***

75: Search for Nucleon Decays Induced by GUT Monopoles with the MACRO Experiment
(The MACRO Collaboration) *Eur. Phys. J. C*, **26, 117 (2003)***

74: Final Results of Magnetic Monopole Searches with the MACRO Experiment
(The MACRO Collaboration) *Eur. Phys. J. C* **25, 511 (2003)***

73: Muon Energy Estimate Using Multiple Scattering in the MACRO Detector
(The MACRO Collaboration) *NIM* **492, 376 (2003)***

2002

72: The MINOS Scintillator Calorimeter System (The MINOS Collaboration)
IEEE T Nucl Sci., **49, 861 (2002) ***

71: A Combined Analysis Technique for the Search for Magnetic Monopoles (MACRO Collaboration)
Astroparticle Phy, **18, 27 (2002)***

70: The MACRO Detector at Gran Sasso (MACRO Collaboration)
NIM, **486, 663 (2002)***

69: A large-area CCD Camera for the Schmidt Telescope at the Venezuelan National Astronomical Observatory (QUEST Collaboration)
Publ Astron Soc Pac, **797, 787 (2002)***

2001

68: Discovery of a bright Plutino (QUEST Collaboration)
Astrophysics J. **548, L243 (2001).***

67: The Low-Redshift Quasar-Quasar Correlation Function from an Extragalactic H Alpha Emission-Line Survey to z=0.4 (QUEST Collaboration) Astrophysical J. **548, 585 (2001).***

66: The QUEST RR Lyrae Survey: Confirmation of the Clump at 50 Kiloparsecs and other Overdensities in the Outer Halo (QUEST Collaboration) Astrophysics J. **554, L33 (2001).***

65: Matter Effects in Upward-Going Muons and Sterile Neutrino Oscillations, (MACRO Collaboration), Phys. Lett **B 517, 59 (2001).***

64: Cosmic Ray Electrons and Positrons from 1 to 100 GeV: Measurements with HEAT and their Interpretation, Astrophysical Journal **559, 296 (2001).***

63. Neutrino Astronomy with the MACRO Detector, (MACRO Collaboration), Astrophysical J **546 (2) 1038 (2001).***

62: Measurement of the cosmic-ray antiproton-to-proton abundance ratio between 4 and 50 GeV. (HEAT Collaboration) Phys. Rev. Lett. **87, 27: (2001).***

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61. Low Energy Atmospheric Muon Neutrinos in MACRO, (MACRO Collaboration), Phys Lett **B 478 (1-3): 5** (**2000).***

60. Search for Lightly Ionizing Particles with the MACRO Detector, (MACRO Collaboration), Phys Rev **D 62 (5): (2000).***

59. Nuclearite Search with the MACRO DETECTOR at Gran Sasso, (MACRO Collaboration), European Physics Journal C **13, 453 (2000)***

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(HEAT Collaboration) Astroparticle Phys. **11, 429 (1999)***

57. Discovery of the Optical Transient of GRB 990308B
(QUEST Collaboration) Ap.J. **524, L103 (1999)***

56. Observation of the Shadowing of Cosmic Rays by the Moon Using a Deep Underground Detector
(MACRO Collaboration) Phys. Rev. D **59, 012003 (1999)***

55. Measurement of the Energy Spectrum of Underground Muons at Gran Sasso with a Transition Radiation Detector
(MACRO Collaboration) Astroparticle Phys. **10, 11 (1999)** *

54. Limits on Dark Matter WIMPS Using Upward-going Muons in the MACRO Detector
(MACRO Collaboration) Phys. Rev. D **60, 082002 (1999)***

53. High Statistics Measurement of the Underground Muon Pair Separation at Gran Sasso

(MACRO Collaboration) Phys. Rev. D **60, 032001 (1999)***

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52. Cosmic Ray Reentrant Electron Albedo: High Energy Antimatter Telescope Measurements from Fort Sumner
(HEAT Collaboration) J. Geophys. Res.**103, 4817 (1998)***

51. The Energy Spectra and Relative Abundance of Electrons and Positrons in the Galactic Cosmic Radiation
(HEAT Collaboration) Ap. J. **498, 779 (1998)***

50. Real Time Supernova Neutrino Burst Detection with MACRO
(MACRO Collaboration) Astroparticle Physics **8, 123 (1998)***

48. The Observation of Upgoing Charged Particles Produced by High Energy Muons in Underground Detectors
(MACRO Collaboration) Astroparticle Physics **9, 105 (1998)***

47. Measurement of the Atmospheric Neutrino-Induced Upgoing Muon Flux Using MACRO
(MACRO Collaboration) Phys. Lett. B **434, 451 (1998)***

1997

46. Measurements of the Cosmic-Ray Positron Fraction from 1 to 50 GeV
(HEAT Collaboration) ApJ Letters **482, L191 (1997)***

45. High Energy Cosmic Ray Physics with the MACRO Detector at Gran Sasso: Part I. Analysis Methods and Experimental Results
(MACRO Collaboration) Phys Rev D **561, 407 (1997)***

44. High Energy Cosmic Ray Physics with the MACRO Detector at Gran Sasso: Part II. Primary Spectra and Composition
(MACRO Collaboration) Phys Rev D **561, 428 (1997)***

43. Seasonal Variations in the Underground Muon Intensity as seen by MACRO
(MACRO Collaboration) Astroparticle Phys **7, 109 (1997)***

42. Magnetic Monopole Search with the MACRO Detector at Gran Sasso
(MACRO Collaboration) Phys Lett B **486, 249 (1997)***

41. Performance of the High-Energy Antimatter Telescope (HEAT): A Magnet Spectrometer-Based Instrument for the Study of Cosmic-Ray Positrons
(Heat Collaboration) Nucl Inst. & Methods **(1997)**

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40. Performance of the MACRO Streamer Tube System in the Search for Magnetic Monopoles
(The MACRO Collaboration) *Astroparticle Physics* **4, 33 (1995).***

39. Atmospheric Neutrino Flux Measurement Using Upgoing Muons

(the MACRO Collaboration), *Physics Letters B* **357, 481 (1995). ***

38. Vertical Muon Intensity Measured with MACRO at the Gran Sasso Laboratory (The MACRO Collaboration) *Physical Review D* **52, 3793 (1995).***

37. Cosmic Ray Positrons at High Energies: a New Measurement (S.W. Barwick, J.J. Beatty, C. Chaput, S. Coutu, G. deNolfo, D. Ficenec, J. Knapp, D.M Lowder, S. Mckee, D. Muller, J.A. Musser, S.L. Nutter, E. Schneider, S.P. Swordy, K.K Tang, G. Tarle, A.D Tomasch, E. Torbet - the HEAT Collaboration), *Phys. Rev. Letters*, **75, 390 (1995).***

1994

36. Study of the Primary Cosmic Ray Composition Around the Knee of the Energy Spectrum (the MACRO Collaboration) *Physics Letters B* **337, 376 (1994).***

35. The Performance of a Position Sensitive Wire Chamber in the Presence of a Magnetic Field (C. Bower, M. Gebhard, R. Heinz, J. Musser, J. Pitts, L. Miller, and S. Mufson) *Nuclear Instruments and Methods* **A349, 37 (1994).**

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31. Study of the Cosmic Ray Primary Composition at $E_0 \sim$ 1000 TeV by EAS-TOP and MACRO at Gran Sasso (EAS-TOP and MACRO collaborations) *Nuclear Physics B* **35, 257 (1994).***

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30. First Supermodule of the MACRO Detector at Gran Sasso (The MACRO Collaboration) *Nuclear Instruments and Methods* **A324 ,337 (1993).**

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27. Balloon Observations of Galactic Cosmic Ray Helium Before and during a Forbush Decrease, (Clem, J., T.G. Guzik, M. Lijowski, J.P. Wefel, J.J. Beatty, D.J. Ficenec, S. Tobias, J.W. Mitchell, S. McKee, S. Nutter,A. Tomasch, G. Tarle, C.R. Bower, R.M. Heinz, S.L. Mufson, J. Musser, J. Pitts, G.M. Spiczak, S.P. Ahlen, B. Zhou) *Geophysical Research Letters* **20, 1743 (1993).***

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26. Study of the Ultrahigh-energy Primary Cosmic Ray Composition with the MACRO Experiment (The MACRO Collaboration) *Physical Review D* **46, 895 (1992). ***

25. Arrival Time Distributions of Very High Energy Cosmic Rays in MACRO (The MACRO Collaboration) *Nuclear Physics B* **370, 432 (1992). ***

24. Search for Nuclearites Using the MACRO Detector (The MACRO Collaboration) *Physical Review Letters* **69, 1860 (1992) . ***

23. GRACE: A Prototype for the Gran Sasso Air Cherenkov Experiment (D.S. Levin, B.C. Barish, E. Diehl, A. Habig, J. Handel, M. Kertzman, S. Mufson, J. Musser, S. Nutter, G. Sembroski, and G. Tarle) *Nuclear Instruments and Methods* **A322, 101 (1992).**

22. Search for Neutrino Bursts from Collapsing Stars with the MACRO Detector (The MACRO Collaboration) *Astroparticle Physics* **1, 11 (1992).***

21. Measurement of the Decoherence Function with the MACRO Detector at Gran Sasso (The MACRO Collaboration) *Physical Review D* **46, 4836 (1992).***

1991

20. The Search for Periodic Muon Signals from Cyg X-3 (The MACRO Collaboration), High Energy Gamma Ray Astronomy (New York: American Institute of Physics), p.194 (1991).

19. Cosmic Ray Search for Strange Quark Matter (The MACRO Collaboration) *Nuclear Physics B* **24, 191 (1991). ***

1990

18. Limits on the Antiproton/Proton Ratio in the Cosmic Radiation from 100 MeV to 1580 MeV (M.H. Salamon, S. McKee, J.A. Musser, G. Tarle, A. Tomasch, C.R. Bower, R.M. Heinz, J.L.Miller, S.L. Mufson, S.W. Barwick, G. Gerbier, D.M. Lowder, P.B. Price, B. Zhou, J.J. Beatty and S.P. Ahlen) *Astrophysical Journal* **349, 78 (1990).***

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16. Simultaneous Observation of Extensive Air Showers and Deep Underground Muons at the Gran Sasso Laboratory, (The MACRO Collaboration) *Physical Review D* **42 1396 (1990).***

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1988

12. A New Limit on the Low Energy Antiproton/Proton Ratio in the Galactic Cosmic Radiation (S.P. Ahlen, S. Barwick, J.J. Beatty, C.R. Bower, G. Gerbier, R.M. Heinz, D. Lowder, S. McKee, S. Mufson, J.A. Musser, P.B. Price, M.H. Salamon, G. Tarle, A. Tomasch, and B. Zhou) *Phyical. Review Letters* **61, 145 (1988).***

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1986

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1985

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1984

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4. First Observation of the Neutron-Rich Isotope ^{19}B (J.A. Musser and J.D. Stevenson) *Physical Review Letters* **53, 27, 2544 (1984).***

1983

3. A Threshold Cerenkov Counter for Isotopic Identification of High Energy Heavy Ions (J.D. Stevenson and J.A. Musser) *Nuclear Instruments and Methods* **213, 285 (1983).**

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1982

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