

## Curriculum Vitae

### Alec T. Habig

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### Education

Ph.D. in Astrophysics	September 1996	Indiana University
Thesis:	<u>Muon Astronomy and Cosmic Ray Physics with the MACRO Detector</u> with Prof. Stuart Mufson	
M.A. in Astronomy	February 1992	Indiana University
B.S. in Physics	May 1989	Wright State University
Thesis:	<u>N-Body Simulations of Interacting Galaxies</u> with Prof. David Wood	

### Research Experience

Current Position:	Professor (Full from June 2011, Assoc. from July 2005, Asst. from Sept. 2000), University of Minnesota Duluth Department of Physics. Associate Director of Soudan Mine Underground Lab (from June 2009) MINOS Experiment, slow controls, Operations Manager; convener of cosmic ray and neutrino time-of-flight analysis groups; Organization and implementation of the SNEWS ( <u>S</u> upernova <u>E</u> arly <u>W</u> arning <u>S</u> ystem) SN neutrino coincidence network. NOvA experiment: DAQ trigger and “Exotics” working group convener; SN $\nu$ simulations for HALO experiment. R&D for Long-Baseline Neutrino Experiment at DUSEL. Super-K Experiment, Analysis of atmospheric neutrinos (till April 2006);
Sabbaticals:	Visiting Research Fellow, University of Sussex
(August-October 2013)	NOVA and LBNE Experiments DAQ development
(August 2007-August 2008)	Visiting Scientist, Fermilab Neutrino Department MINOS Experiment Run Coordinator, NOVA Experiment DAQ development
September 1996 to August 2000	Postdoctoral Research Associate, Boston Univ. Particle Astrophysics Group Super-Kamiokande and MACRO Experiments Analysis of atmospheric neutrinos, and cosmic-ray muons. Organization and implementation of the SNEWS SN neutrino coincidence network.
January 1991 to August 1996	Graduate Research Assistant, Indiana Univ. High Energy Astrophysics Group MACRO and GRAČE Experiments Analysis of cosmic-ray muons and muon astronomy. Construction and operation of scintillator calibration system. Construction, operation, and analysis of air Cherenkov- underground muon coincidence experiment.
March 1989 to July 1989	Research Assistant, Wright State Univ. Physics Department Designed and built Al-Si plasma deposition system.

## Teaching Experience

- from September 2000      Assistant/Associate (from 2005) Professor  
Univ. of Minnesota Duluth Dept. of Physics  
Instrumentation, Experimental Methods, Intro Astronomy, General Physics,  
Electromagnetism and Optics, Relativity and Quantum Mechanics,  
Ideas in Physics, Current Topics in Physics, Electrodynamics,  
Data Analysis, Observational Astronomy, Astrophysics, and Seminar Classes
- August 1989 to Dec. 1990      Associate Instructor  
Indiana University Astronomy Department  
Introductory Astronomy Classes
- July 1988 to July 1989      Laboratory Technician  
Wright State University Physics Department  
Teaching lab and lecture demo equipment maintenance
- March 1987 to May 1989      Teaching Assistant  
Wright State University Physics Department  
Introductory Physics and Astronomy labs and tutoring

## University Service

- 2011–2014 & Sept. 2016–present      Member of the Subcommittee on Information Technology & Library  
Jan. 2011 to July 2014      Department Head, UMD Physics Department
- Sept. 2009 to June 2010      Member UMD Graduate Council Executive Committee
- June 2009 to present      Associate Director, Soudan Mine Underground Laboratory
- May 2009 to June 2011      Assistant Department Head, UMD Physics Department
- Sept. 2008 to June 2010      Member Swenson College of Science & Engineering Executive Committee
- July 2006 to June 2010      Director of Graduate Studies, Physics Department
- Jan. 2005 to Jan. 2008      Elected member of MINOS Executive Committee
- Sept. 2004 to May 2007      Member Curriculum Policies Committee, College of Science & Engineering
- January 2003 to Dec. 2003      Member Undergraduate Research Opportunities Program selection committee
- April 2002 to present      University Representative to the Minnesota Space Grant Consortium
- Oct. 2001 to May 2006      UMD Fencing Club faculty adviser
- July 2001 to present      Physics Department Library Representative
- June 1999 to August 2000      Departmental Computer Committee, Boston Univ. Physics Dept.
- Mar. 1997 to August 2000      IRIX, Linux, & Solaris System Manager  
Boston University High Energy Physics Group
- Jan. 1991 to August 1996      DUnix and HPUX System Manager  
Indiana University High Energy Astrophysics Group

## Honors, Awards and Affiliations

2016 Breakthrough Prize in Fundamental Physics, with members of the Super-Kamiokande Collaboration for Investigations of Neutrino Oscillations.

On the graduate faculty of the University of Minnesota Twin Cities (from 2004) and University of Washington (from 2008–2014) Physics Departments

University of Minnesota McKnight Land Grant Professor, 2004-2006.

Asahi prize, 1998, with members of the Super-Kamiokande Collaboration for the “Discovery of the Finite Mass of Neutrinos”, Asahi-Shinbun Cultural Foundation, Inc., Tokyo, Japan

INFN Graduate Research Fellowship, Laboratori Nazionale del Gran Sasso, June 1992 to July 1993

Sigma Pi Sigma, 1988

National Merit Scholar, 1985; Wright State University Full-tuition Merit Scholarship, 1985-1989

Member of the American Astronomical Society, High Energy Astrophysics Division

Member of the American Physical Society, Divisions of Particles and Fields; Astrophysics

## Grants

Received a Research at Undergraduate Institutions grant (w/ Rik Gran) for three years from June 2016 from the NSF, for “Neutrino Physics Research at the University of Minnesota Duluth”

Direct a grant from Fermilab (DoE funds, w/ Marvin Marshak) from October 2015 to September 2017 for “Fermilab Funded Activities and Basic Detector Operations at the NOvA Far Detector Laboratory and the the Soudan Underground Laboratory”

Received a Collaborative Research grant (w/ Kate Scholberg, Duke) for three years from August 2015 from the NSF, for “SNEWS, the SuperNova Early Warning System”

Received a grant (w/ Rik Gran) for two years from September 2015 from the NSF, for “Education and Public Outreach at the Soudan Mine Underground Lab”

Directed a grant from Fermilab (DoE funds, w/ Marvin Marshak) from October 2009 to September 2015 for “Fermilab Funded Activities Related to Facility Operations and Basic Detector Operations at the Soudan Underground Laboratory”

Received a Research at Undergraduate Institutions grant (w/ Rik Gran) for three years from June 2013 from the NSF, for “Experimental Neutrino Research with NOvA and MINERvA”

Received a grant (w/ Rik Gran) for three years from September 2012 from the NSF, for “Education and Public Outreach at the Soudan Mine Underground Lab”

Received a Collaborative Research grant (w/ Kate Scholberg, Duke) for three years from May 2012 from the NSF, for “HALO, the Helium and Lead Observatory”

Received a Research at Undergraduate Institutions grant (w/ Rik Gran) for three years from June 2010 from the NSF, for “Experimental Neutrino Research with MINOS, NOvA, and MINERvA”

Received a Collaborative Research grant (w/ Kate Scholberg, Duke) for three years from June 2010 from the NSF, for “SNEWS, the SuperNova Early Warning System”

Received a grant (w/ Rik Gran) for three years from May 2008 from the NSF, for “Education and Public Outreach at the Soudan Mine Underground Lab”

Received a grant (w/ Rik Gran, UMD) for four years from May 2008 from the NSF, for “Education and Public Outreach at the Soudan Mine Underground Lab”

Received a grant for one year from August 2007 from Fermilab, for “MINOS Run Coordination and NOVA DAQ Prototyping”

Received a Research at Undergraduate Institutions grant (w/ Rik Gran, UMD) for three years from June 2007 from the NSF, for “Neutrino Studies with Experiments in the NuMI Beam”

HST Proposals 8404, 8646, 9108, 9429, 9808 & 10264, Cycles 8–13, (PI J. Bahcall) “Observing the next nearby supernova”, a Target of Opportunity triggered by a SNEWS neutrino coincidence.

Received a Council on Public Engagement Seed Grant from the UofM, for “Soudan Underground Lab Traveling Outreach Project”, 2005

Received a Research at Undergraduate Institutions grant for three years from June 2004 from the NSF, for “Neutrino Oscillation Studies Using the MINOS and Super-Kamiokande Detectors”

Received a Grant-in-Aid of Research, Artistry, and Scholarship from the University of Minnesota, for “Neutrino Studies with the Super-K Experiment”, July 2003 through January, 2005

Received a Collaborative Research grant (w/ Kate Scholberg, MIT) for three years from July 2003 from the NSF, for “SNEWS, the SuperNova Early Warning System”

Received a Research at Undergraduate Institutions grant for three years from June 2001 from the NSF, for “Neutrino Oscillation Studies with MINOS and Super-K”

Received a Cottrell College Science Award from the Research Corporation, for two years from May 2001, to support Super-K research, for “Neutrino Oscillation Studies at the University of Minnesota Duluth”

Received a Grant-in-Aid of Research, Artistry, and Scholarship from the University of Minnesota, for “A Study of Neutrino Oscillations with the MINOS Experiment”, January 2001 through June, 2002

### **Public Presentations** (*while at UMD*)

“Experimental Overview of Supernova Neutrinos”

invited talk at the “Flavor Observations with Supernova Neutrinos” workshop (INT-16-61W), Univ. of Washington, August 15-19 2016.

“The HALO Experiment and Supernova Early Warning”

invited talk at the 20th Anniversary of Super-Kamiokande Symposium, Toyama, Japan, June 18, 2016;

also Fermilab Neutrino Seminar May 26, 2016;

also the Purdue University Physics Colloquium April 19, 2015;

also First Conference on Science at the Sanford Underground Research Facility South Dakota School of Mines, Rapid City, May 18-20 2015;

also Univ. of Sussex Experimental Particle Physics Colloquium September 26, 2014;

also Univ. of Virginia Physics Colloquium November 30, 2012;

also Univ. of Minnesota Elementary Physics Seminar, Minneapolis, MN, October 11, 2011.

“An Experimental Program in Neutrinos, Nucleon Decay and Astroparticle Physics Enabled by the Fermilab Long-Baseline Neutrino Facility” and “The NOvA Experiment”

two talks at the EPS-HEP conference in Vienna, Austria July 22-30 2015.

“Integration of the Super Nova Early Warning System with the NOvA Trigger” (poster: A. Habig & J. Zirnstern, *J. Phys.: Conf. Ser.* **664** 082015) and “Recent Evolution of the Offline Computing Model of the NOvA Experiment” (talk, A. Habig, C. Group, & A. Norman, *J. Phys.: Conf. Ser.* **664** 032011)

at the 21st International Conference on Computing in High Energy and Nuclear Physics April 13 -17, 2015, Okinawa, Japan.

“Neutrinos: from cosmic rays to accelerators, old iron mines to the fate of the cosmos”

Swenson College of Science and Engineering Faculty Colloquium, (UMD) April 21 2015;

also North Dakota State University’s Physics Colloquium, March 23 2015;

also UMD Philosophy Dept.’s Colloquium, November 2, 2012;

also Science Museum of Minnesota’s *Beaker and Brush* series, October 11, 2011;

also Physics Seminar, St. Olaf College, Oct. 12, 2005;

also Chemistry/Physics Colloquium, Concordia College, November 7, 2002;

also Geology Colloquium, Univ. of Minnesota Duluth, March 29, 2001.

Also presented to dozens of physics and science classes at Duluth East, Cloquet and Harbor City International High Schools from 2001 through 2015.

“Improved timekeeping for neutrino time of flight measurements in MINOS”

poster at Neutrino 2012, Kyoto, Japan, June 3-9 2012.

“Mass Hierarchy Study with MINOS Far Detector Atmospheric Neutrinos”

poster at Neutrino 2012, Kyoto, Japan, June 3-9 2012.

“Trying to Measure Faster than Light Neutrinos”

Carleton College Physics Colloquium, March 7 2012.

“Results from MINOS and progress on NoVA”, Experimental Particle Physics seminar at University of Birmingham, England, October 20, 2010.

“Current NuMI/MINOS Oscillation Results”, invited talk at the 11th International Workshop on Tau Lepton Physics, Manchester, UK, September 13-17, 2010 (proceedings in press);  
also invited talk at the International conference on Topics in Astroparticle and Underground Physics (“TAUP2009”), Rome, Italy, July 1-5 2009, proceedings are *J. Phys.: Conf. Ser.* 203 012102;  
also invited talk at Rencontres de Moriond ElectroWeak, La Thuile, Italy, March 5 2008, proceedings are arXiv:0805.2317 [hep-ex];  
and Experimental Seminar, Stanford Linear Accelerator Center, September 30 2008.  
“SNEWS, the Supernova Early Warning System”, Astrophysics and Space Research Seminar, University of Birmingham, England, November 17, 2010;  
also High Energy Physics Physics Seminar at Illinois Institute of Technology, March 18, 2010;  
also High Energy Physics seminar, Argonne National Lab, July 14 2009;  
invited talk at the International conference on Topics in Astroparticle and Underground Physics (“TAUP2009”), Rome, Italy, July 1-5 2009, proceedings are *J. Phys.: Conf. Ser.* **203** 012078;  
and invited talk at the “Twenty Years after SN1987A” conference, Waikoloa, HI, 24 February 2007.

“The NOvA Detectors”, contributed poster at the XXIV International Conference on Neutrino Physics and Astrophysics, Athens, Greece, June 14-19, 2010, proceedings are *Nucl. Phys. B Proc. Suppl.* **229-232**, 460. (2012)

“Neutrinos Change Flavor Under Wisconsin”, Seminar, University of Washington, July 11, 2008;  
also Astrophysics/High Energy Physics Seminar, Purdue University, January 30, 2007;  
and McKnight Professorship talk at UMD, May 3 2006.

“Cosmic Ray Studies with the MINOS Detectors”, Poster at Neutrino 08, Christchurch, New Zealand, May 25-31 2008, *Journal of Physics: Conference Series*, v136, p.042016

“MINOS Atmospheric Neutrino Contained Events”, Poster at the 30<sup>th</sup> International Cosmic Ray Conference (ICRC), Merida, Mexico, July 3-11 2007, proceedings are FERMILAB-CONF-07-177-E.

“First NuMI/MINOS  $\nu_\mu \leftrightarrow \nu_\tau$  Oscillation Results”, Seminar at the Kamioka Observatory, 16 May 2006.

“Status of Atmospheric Neutrino Experiments”, Invited talk at “Topical Workshop on Physics at Henderson DUSEL”, Colorado State University, November 18-19 2005. (Also organized the Astrophysics Working Group session at this conference.)

“Neutrino-induced muons observed with MINOS”, Talk at the 29<sup>th</sup> International Cosmic Ray Conference (ICRC), Pune, India, August 3-10 2005, proceedings are *hep-ex/0507010*

“High-Energy Neutrino Astronomy with the Super-Kamiokande Detector”, Poster at the 29<sup>th</sup> International Cosmic Ray Conference (ICRC), Pune, India, August 3-10 2005, proceedings are *astro-ph/0507051*

“The MINOS Detector”, Poster at the 29<sup>th</sup> International Cosmic Ray Conference (ICRC), Pune, India, August 3-10 2005, proceedings are *hep-ex/0507018*

“Upward Showering Muons in Super-K”, Talk at the 29<sup>th</sup> International Cosmic Ray Conference (ICRC), Pune, India, August 3-10 2005;  
also a talk at the High Energy Astrophysics Division meeting of the AAS, New Orleans, LA, Sept. 11 2004.

“Status of MINOS”, Invited talk at the Physics with Atmospheric Neutrinos and Neutrinos from Muon Storage Rings workshop, Mumbai, India August 1-2 2005

“SNEWS: The Supernova Early Warning System”, Poster at American Astronomical Society meeting, Minneapolis, MN, June 1 2005;  
also a Poster at Neutrino 2004, Paris, France, June 14-19 2004, *Nucl. Phys. B Proc. Suppl.* **143**, 543. (2005);  
and a Astronomy Colloquium, Indiana University, November 18, 2003.

“Super-Kamiokande: A Barrel of Neutrinos”  
Physics Colloquium, University of Minnesota (Twin Cities), September 29, 2004.

“Atmospheric Neutrino Oscillations in SK-I”  
Talk at the 28<sup>th</sup> International Cosmic Ray Conference (ICRC), Tsukuba, Japan, July 31–August 7, 2003.

“(Semi) UHE Neutrinos in Super-Kamiokande”  
Invited talk at the Ultra High Energy Neutrino Telescope Workshop, Chiba, Japan, July 29-30, 2003.

“The MINOS Far Detector”  
Poster at Neutrino 2002, Munich, Germany, May 25-30, 2002.  
*Nucl. Phys. B Proc. Suppl.* **118C**, 468. (2003)

“The Many Uses of Upward-going Muons in Super-K”  
Poster at Neutrino 2002, Munich, Germany, May 25-30, 2002.  
*Nucl. Phys. B Proc. Suppl.* **118C**, 463. (2003)

“High Energy Neutrino Oscillations seen with MACRO”  
Invited talk given at the Conference on Underground Science, Lead, SD, October 5, 2001. (Also organized the Atmospheric Neutrino and Proton Decay session at this conference.)

“An Indirect Search for WIMPs with Super-Kamiokande”  
Poster at the 27<sup>th</sup> International Cosmic Ray Conference (ICRC), Hamburg, Germany, 7-15 August 2001, proceedings are *hep-ex/0106024*.

## **Papers Published in Refereed Journals**

### **Primary Authorship**

“Precision measurement of the speed of propagation of neutrinos using the MINOS detectors”  
Adamson, P., *et al*, The MINOS Collaboration, USNO, and NIST, *Phys. Rev. D* **92**, 052005. (2015)

“Observation in the MINOS far detector of the shadowing of cosmic rays by the sun and moon”  
Adamson, P., *et al*, The MINOS Collaboration, *Astroparticle Physics* **34**, 457. (2010)

“A Brief Review of MINOS neutrino oscillation results”  
Habig, A., *Mod. Phys. Lett. A* **25**, 1219. (2010)

“Observation of muon intensity variations by season with the MINOS far detector”  
Adamson, P., *et al*, The MINOS Collaboration, *Phys. Rev. D* **81**, 012001. (2010)

“Sudden stratospheric warmings seen in MINOS deep underground muon data”  
Osprey, S. *et al*, The MINOS Collaboration, *Geophys. Res. Lett.* **36**, L05809. (2009)

- “The magnetized steel and scintillator calorimeters of the MINOS experiment”  
Michael, D.G. *et al*, The MINOS Collaboration, *Nucl. Instr. & Meth.* **A596**, 190-228. (2008)
- “High energy neutrino astronomy using upward-going muons in Super-Kamiokande-I”  
Abe, K. *et al*, The Super-Kamiokande Collaboration, *Astrophysical Journal*, **652**, 198. (2006)
- “A Measurement of Atmospheric Neutrino Oscillation Parameters by Super-Kamiokande I”  
Ashie, Y. *et al*, The Super-Kamiokande Collaboration, *Phys. Rev. D*, **71** 112005. (2005)
- “SNEWS: The SuperNova Early Warning System”  
Antonoli, P. *et al*, The SNEWS group, *New Journal of Physics*, **6** 114. (2004)
- “Search for Dark Matter WIMPs using Upward Through-going Muons in Super-Kamiokande”  
Desai, S., *et al*, The Super-Kamiokande Collaboration, *Phys. Rev. D* **70**, 083523. (2004)
- “Search for the sidereal and solar diurnal modulations in the total MACRO muon data set”  
Ambrosio, M., *et al*, The MACRO Collaboration, *Phys. Rev. D* **67**, 042002. (2003)
- “Search for cosmic ray sources using muons detected by the MACRO experiment”  
Ambrosio, M., *et al*, The MACRO Collaboration, *Astroparticle Physics* **18**, 615. (2003)
- “The MACRO detector at Gran Sasso”  
Ambrosio, M., *et al*, The MACRO Collaboration, *Nucl. Instr. & Meth.*, **A486**, 663. (2002)
- “Neutrino-induced upward-going stopping muons in Super-Kamiokande”  
Fukuda, Y., *et al*, The Super-Kamiokande Collaboration, *Phys. Lett.* **B467**, 185. (1999)
- “Measurement of the flux and zenith angle distribution of upward through-going muons by Super-Kamiokande”  
Fukuda, Y., *et al*, The Super-Kamiokande Collaboration, *Phys. Rev. Lett.* **82**, 2644. (1999)
- “Calibration of Super-Kamiokande using an electron LINAC”  
Nakahata, M., *et al*, The Super-Kamiokande Collab., *Nucl. Instr. & Meth.* **A421** 113. (1999)
- “Observation of the shadowing of cosmic rays by the Moon using a deep underground detector”  
Ambrosio, M., *et al*, The MACRO Collaboration, *Phys. Rev. D* **59** 012003. (1999)
- “Seasonal variations in the underground muon intensity as seen by MACRO”  
Ambrosio, M., *et al*, The MACRO Collaboration, *Astroparticle Physics*, **7**, 109. (1997)
- “Coincident observation of air cherenkov light by a surface array and muon bundles by a deep underground detector”, Levin, D.S., Barish, B.C., Diehl, E., Habig, A.T., Handel, J., Kertzman, M., Mufson, S., Musser, J., Nutter, S., Sembroski, G., Tarlé, G., and the MACRO Collab., *Phys. Rev. D*, **50**, 3046. (1994)
- “Muon astronomy with the MACRO detector”  
Ahlen, S., *et al*, The MACRO Collaboration, *Astrophysical Journal*, **412**, 301. (1993)
- “GRACE: A prototype for the Gran Sasso Air Cherenkov Experiment”  
Levin, D.S., Barish, B.C., Diehl, E., Habig, A.T., Handel, J., Kertzman, M., Mufson, S., Musser, J., Nutter, S., Sembroski, G., and Tarlé, G., *Nucl. Instr. & Meth.*, **A322**, 101. (1992)

## Contributed Authorship

“First measurement of muon-neutrino disappearance in NOvA”

P. Adamson *et al*, The NOvA Collaboration, *Phys. Rev. D* **93** 051104(R). (2016)

“First Measurement of Electron Neutrino Appearance in NOvA”

P. Adamson *et al*, The NOvA Collaboration, *Phys. Rev. Lett.* **116** 151806. (2016)

“Measurement of the Multiple-Muon Charge Ratio in the MINOS Far Detector”

Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. D* **93** 052017. (2016)

“Observation of Seasonal Variation of Atmospheric Multiple-Muon Events in the MINOS Near and Far Detectors”

Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. D* **91** 112006. (2015)

“The Search for  $n\bar{n}$  oscillation in Super-Kamiokande I”

Abe, K. *et al*, The Super-K Collaboration, *Phys. Rev. D*, **91**, 072006. (2015)

“Observation of muon intensity variations by season with the MINOS Near Detector”

Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. D* **90** 012010. (2014)

“Combined analysis of  $\nu_\mu$  disappearance and  $\nu_\mu \rightarrow \nu_e$  appearance in MINOS using accelerator and atmospheric neutrinos”

Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. Lett.*, **112** 191801. (2014)

“Measurement of Neutrino and Antineutrino Oscillations Using Beam and Atmospheric Data in MINOS ”

Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. Lett.*, **110** 251801. (2013)

“Comparisons of annual modulations in MINOS with the event rate modulation in CoGeNT”

Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. D* **87** 032005. (2013)

“Measurements of atmospheric neutrinos and antineutrinos in the MINOS Far Detector”

Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. D*, **86** 052007. (2012)

“Search for Lorentz invariance and CPT violation with muon antineutrinos in the MINOS Near Detector”

Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. D*, **85** 031101. (2012)

“First direct observation of muon antineutrino disappearance”

Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. Lett.*, **107** 021801. (2011)

“Measurement of the underground atmospheric muon charge ratio using the MINOS Near Detector”

Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. D*, **83** 032011. (2011)

“The atmospheric charged kaon/pion ratio using seasonal variation methods”

Grashorn, E.W., deJong, J.K, Goodman, M.C., Habig, A., Marshak, M.L., Mufson, S., Osprey, S., and Schreiner, P., *Astroparticle Physics* **33**, 131. (2010)

“Search for Astrophysical Neutrino Point Sources at Super-Kamiokande”

Thrane, E. *et al*, The Super-K Collaboration, *Astrophysical Journal* **704**, 503-512. (2009)



- “Search for Neutrinos from GRB 080319B at Super-Kamiokande”  
Thrane, E. *et al*, The Super-K Collaboration, *Astrophysical Journal* **697**, 730-734. (2009)
- “Testing Lorentz Invariance and CPT Conservation with NuMI Neutrinos in the MINOS Near Detector”  
Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. Lett.*, **101** 151601. (2008)
- “Measurement of Neutrino Oscillations with the MINOS Detectors in the NuMI Beam”  
Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. Lett.*, **101** 131802. (2008)
- “Study of muon neutrino disappearance using the Fermilab Main Injector neutrino beam”  
Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. D*, **77** 072002. (2008)
- “Study of TeV neutrinos with upward showering muons in Super-Kamiokande”  
Desai, S. *et al*, The Super-K Collaboration, *Astroparticle Physics* **29**, 42. (2008)
- “Measurement of the atmospheric muon charge ratio at TeV energies with MINOS”  
Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. D*, **76** 052003. (2007)
- “Charge-Separated Atmospheric Neutrino-Induced Muons in the MINOS Far Detector”  
Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. D*, **75**, 092003. (2007)
- “Search for Neutral Q-balls in Super-Kamiokande II”  
Takenaga, Y. *et al*, The Super-K Collaboration, *Phys. Lett.* **B647**, 18. (2007)
- “Observation of muon neutrino disappearance with the MINOS detectors in the NuMI neutrino beam”  
Michael, D.G. *et al*, The MINOS Collaboration, *Phys. Rev. Lett.*, **97**, 191801. (2006)
- “A Measurement of Atmospheric Neutrino Flux Consistent with Tau Neutrino Appearance”  
Abe, K. *et al*, The Super-Kamiokande Collaboration, *Phys. Rev. Lett.*, **97**, 171801. (2006)
- “Search for Diffuse Astrophysical Neutrino Flux Using Ultra-High Energy Upward-Going Muons in Super-Kamiokande I”  
Swanson, M.E.C. *et al*, The Super-Kamiokande Collaboration, *Astrophysical Journal*, **652**, 206. (2006)
- “Three Flavor Neutrino Oscillation Analysis of Atmospheric Neutrinos in Super-Kamiokande”  
Hosaka, J. *et al*, The Super-Kamiokande Collaboration, *Phys. Rev. D*, **74**, 032002. (2006)
- “First Observations of Separated Atmospheric Muon Neutrino and Muon Anti-Neutrino Events in the MINOS Detector”  
Adamson, P. *et al*, The MINOS Collaboration, *Phys. Rev. D*, **73**, 072002. (2006)
- “Observation of the Anisotropy of 10 TeV Primary Cosmic Ray Nuclei Flux with the Super-Kamiokande-I Detector”  
Guillian, G. *et al*, The Super-Kamiokande Collaboration, *Phys. Rev. D*, **75**, 062003. (2007).
- “Search for Nucleon Decay Via Modes Favored by Supersymmetric Grand Unification Models in Super-Kamiokande-I”  
Kobayashi, K. *et al*, The Super-Kamiokande Collaboration, *Phys. Rev. D*, **72**, 052007. (2005)

- “Evidence for an oscillatory signature in atmospheric neutrino oscillation”  
Ashie, Y., *et al*, The Super-Kamiokande Collaboration, *Phys. Rev. Lett.*, **93**, 101801. (2004)
- “Moon and Sun shadowing effect in the MACRO detector”  
Ambrosio, M., *et al*, The MACRO Collaboration, *Astroparticle Physics* **20** 145. (2003)
- “Search for neutrinos from gamma-ray bursts using Super-Kamiokande”  
Fukuda, S., *et al*, The Super-Kamiokande Collaboration, *Astrophysical Journal* **578**, 317. (2002)
- “Search for diffuse neutrino flux from astrophysical sources with MACRO”  
Ambrosio, M., *et al*, The MACRO Collaboration, *Astroparticle Physics*, **19** 1. (2003)
- “Matter effects in upward-going muons and sterile neutrino oscillations”  
Ambrosio, M., *et al*, The MACRO Collaboration, *Phys. Lett.* **B517**, 59. (2001)
- “Neutrino astronomy with the MACRO detector”  
Ambrosio, M., *et al*, The MACRO Collaboration, *Astrophysical Journal* **546**, 1038. (2001)
- “Tau neutrinos favored over sterile neutrinos in atmospheric muon neutrino oscillations”  
Fukuda, S., *et al*, The Super-Kamiokande Collaboration, *Phys. Rev. Lett.* **85**, 3999. (2000)
- “Low energy atmospheric muon neutrinos in MACRO”  
Ambrosio, M., *et al*, The MACRO Collaboration, *Phys. Lett.* **B478**, 5. (2000)
- “Search for proton decay through  $p \rightarrow \bar{\nu}K^+$  in a large water Cherenkov detector”  
Hayato, Y., *et al*, The Super-Kamiokande Collaboration, *Phys. Rev. Lett.* **83**, 1529. (1999)
- “Observation of the east-west anisotropy of the atmospheric neutrino flux”  
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