

# CURRICULUM VITAE

## Francis Halzen

### Personal Information

Citizenship: United States

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### Education

1972 Agrégé de l'Enseignement Supérieur, University of Louvain, Belgium

1969 Ph.D., University of Louvain, Belgium

1966 Master's degree, University of Louvain, Belgium

### University of Wisconsin–Madison Positions

2001–present Principal Investigator and co-Spokesperson for the IceCube project

2013–2014 Acting Director of the Wisconsin IceCube Particle Astrophysics Center

1991 Hilldale Professor

1987 Gregory Breit Distinguished Professor

1984–present Director of the Institute for Elementary Particle Physics Research

1977 Romnes Faculty Fellow

1977 Professor

1974 Associate Professor

1972 Assistant Professor

1971 Research Associate

## Education, Experience, and Awards

### Experience

- 1996 Science Associate at CERN, Geneva, Switzerland
- 1987 NSF – Japan U.S. exchange, Univ. Tokyo, Japan
- 1985 Scientific Associate at CERN, Geneva, Switzerland
- 1983 Fellow of the Japan Society for the Promotion of Science, U of Tokyo
- 1982 Visiting Professor at the University of Durham, UK
- 1982 Nordita Professor at the University of Helsinki
- 1977–1983 Lector at the University of Louvain, Belgium
- 1980 Visiting Professor at the University of Hawaii-Honolulu
- 1977 Consultant at the Rutherford High Energy Laboratory, Oxford, UK
- 1977 Visiting Scientist at CERN, Geneva, Switzerland
- 1971–1983 Chercheur Agrégé of the National Science Foundation, Belgium
- 1969–1971 Scientific Associate at CERN, Geneva, Switzerland
- 1968–1969 Research Associate of the National Science Foundation, Belgium

### Summer and Short-Term Positions

- 2012–13 Aspen Institute for Physics
- 2007 Summer program, CERN, Geneva, Switzerland
- 2007 Scientific Associate at CERN, Geneva, Switzerland
- 1988 Visiting Professor at the University of Durham, UK
- 1987 Visiting Professor at the University of Durham, UK  
Visitor in Joint Particle Physics & Astrophysics Program at Johns Hopkins University, Baltimore, MD  
NSF Japan – US Exchange, University of Tokyo, Japan
- 1984 Visiting Professor at the University of Durham, UK
- 1981 Visiting Senior Scientist of the Science Research Council at the University of Durham, UK
- 1980 Visiting Scientist at LRL, University of California-Berkeley
- 1975 Associate Scientist at the Brookhaven National Laboratory, Upton, NY
- 1974–1975 Consultant at the Argonne National Laboratory, Chicago, IL

## Education, Experience, and Awards

- 1974 Consultant at Fermilab, Batavia, IL  
1971 Consultant at the Rutherford High Energy Laboratory, Oxford, UK

### Awards

- 2021 Bruno Rossi Prize, American Astronomical Society  
2019 Yodh Prize, IUPAP  
Niels Bohr Lecture, NBI, Copenhagen  
George and Maureen Ewan Lecture, Queens University, Canada  
2018 Bruno Pontecorvo Prize, Joint Institute for Nuclear Research Scientific Council  
Member Academia Europeae  
Gleb Wataghin Colloquium, Instituto de Fisica, Sao Paulo, Brazil  
22<sup>nd</sup> Kaczmarczik Lecture, Drexel University, Philadelphia  
Victor Hess Lecture, Innsbruck Physics Lecture, Universität Innsbruck, Austria.  
2017 Doctor Honoris Causa, Southern Methodist University  
Julius Wess Award, Karlsruhe Institute of Technology  
2016 Foreign member of the Belgian Royal National Academy of Science KVAB  
Bethe lectures, Cornell  
Brinson lectures, University of Chicago  
2015 European Physical Society Cocconi Prize for Particle Astrophysics and  
Cosmology  
Balzan Prize for Astroparticle Physics, Switzerland  
2014 Doctor Honoris Causa, Ghent University, Belgium  
Int'l Franqui Professor, VUB-ULB-UGent-UMons-UA-ULg-KULeuven, Belgium  
Smithsonian American Ingenuity Award  
2013 *Physics World* Breakthrough of the Year Award, for making the first observation  
of cosmic neutrinos  
APS Highlights of the Year  
Franqui Int'l Chair, VUB – ULB – UGent – UMons – UA – ULg (Belgium)  
Hilldale Award, University of Wisconsin  
2012 Affiliated Distinguished Professor, Technische Universität München, Germany  
2010 Lecture for the Celebration of the 100<sup>th</sup> Anniversary of the Birth of Gunnar Kallen  
2008 Watkins Professor at Wichita State University, Kansas

## Education, Experience, and Awards

- 2006            Helmholtz-Humboldt Research Award, Germany  
First John Bahcall Memorial Lecture, Weizman Institute, Israel  
Spitzer Lectures at Princeton University
- 2005            Doctor of Philosophy Honoris Causa, Uppsala University, Sweden  
Halzen Mesa, Antarctica, named (lat. -77.39, long. 161.44)
- 2000            “Best American Science Writing 2000” for the essay *Antarctic Dreams*, published  
                  in *The Sciences*, New York Academy of Sciences (1999)  
Cherwell-Symon Memorial Lecture 2000, Oxford University, UK
- 1999            University of Wisconsin Sesquicentennial Award: four faculty positions awarded  
                  for the AMANDA/IceCube projects
- 1998            Korean Research Foundation: Collaborative Research with Foreign  
                  Distinguished Scholars
- 1997            “The Science Coalition” award, *Great Advances of 1996* for the AMANDA  
                  experiment, Washington, DC
- 1995            Fellow of the American Physical Society

## Refereed Publications & arXiv Papers

Multimessenger Gamma-Ray and Neutrino Coincidence Alerts Using HAWC and IceCube Subthreshold Data (IceCube Collaboration, Solares et al.), *Astrophys. J.* **906** 1 63 (2021); astro-ph.HE/2008.10616.

Lepton Injector and Lepton Weighter: A neutrino event generator and weighter for neutrino observatories (IceCube Collaboration, Abbasi et al.), submitted to *Computer Physics Communications*; arXiv:2012.10449.

Follow-up of astrophysical transients in real time with the IceCube Neutrino Observatory (IceCube Collaboration, Abbasi et al.), submitted to *The Astrophysical Journal*; arXiv:2012.04577.

A search for time-dependent astrophysical neutrino emission with IceCube data from 2012 to 2017 (IceCube Collaboration, Abbasi et al.), submitted to *The Astrophysical Journal*; arXiv:2012.01079.

Search for sub-TeV neutrino emission from transient sources with three years of IceCube data (IceCube Collaboration, Abbasi et al.), submitted to *JCAP*; arXiv:2011.05096.

Measurement of the high-energy all-flavor neutrino-nucleon cross section with IceCube (IceCube Collaboration, Abbasi et al.), submitted to *Physical Review D*; arXiv:2011.03560.

Measurement of Astrophysical Tau Neutrinos in IceCube's High-Energy Starting Events (IceCube Collaboration), submitted to *Physical Review Letters*; arXiv:2011.03561.

The IceCube high-energy starting event sample: Description and flux characterization with 7.5 years of data (IceCube Collaboration), submitted to *Physical Review D*; arXiv:2011.03545.

Computational techniques for the analysis of small signals in high-statistics neutrino oscillation experiments (IceCube Collaboration), *Nucl. Instrum. Meth. A* **977** (2020), 164332; physics.data-an/1803.05390.

IceCube-Gen2: The Window to the Extreme Universe (IceCube Gen2 Collaboration, Aartsen et al.), Submitted to the *Journal of Physics G*; arXiv:2008.04323.

Cosmic Ray Spectrum and Composition from Three Years of IceTop and IceCube (IceCube Collaboration, K. Rawlins et al.), *Phys. Atom. Nucl.* **83** 2 280-284 (2020); DOI: 10.1134/S1063778820020234.

Measurements of Cosmic Ray Muon Distributions with IceTop and IceCube (IceCube Collaboration with K. Rawlins), *Phys. Atom. Nucl.* **83** 2 285-289 (2020) 2; DOI: 10.1134/S1063778820020246.

Cosmic Ray Spectrum from 250 TeV to 10 PeV using IceTop (IceCube Collaboration, Aartsen et al.), *Phys. Rev. D* **102** 122001 (2020); DOI: 10.1103/PhysRevD.102.122001.

## Refereed Publications & arXiv Papers

Searching for eV-scale sterile neutrinos with eight years of atmospheric neutrinos at the IceCube Neutrino Telescope (IceCube Collaboration, Aartsen et al.), *Phys. Rev. D* **102** 5 052009 (2020); DOI: 10.1103/PhysRevD.102.052009.

eV-Scale Sterile Neutrino Search Using Eight Years of Atmospheric Muon Neutrino Data from the IceCube Neutrino Observatory (IceCube Collaboration, Aartsen et al.), *Phys. Rev. Lett.* **125** 14 141801 (2020); DOI: 10.1103/PhysRevLett.125.141801.

IceCube Search for Neutrinos Coincident with Compact Binary Mergers from LIGO-Virgo's First Gravitational-wave Transient Catalog (IceCube Collaboration, Aartsen et al.), *Astrophys. J. Lett.* **898** 1 L10 (2020); astro-ph.HE/2004.02910.

IceCube Search for High-Energy Neutrino Emission from TeV Pulsar Wind Nebulae (IceCube Collaboration, Aartsen et al.), *Astrophys. J.* **898** 2 117 (2020); astro-ph.HE/2003.12071.

Combined search for neutrinos from dark matter self-annihilation in the Galactic Center with ANTARES and IceCube (ANTARES and IceCube Collaborations, A. Albert et al.), *Phys. Rev. D* **102** 8 082002 (2020); astro-ph.HE/2003.06614.

In-situ calibration of the single-photoelectron charge response of the IceCube photomultiplier tubes (IceCube Collaboration, Aartsen et al.), *JINST* **15** 06 06 (2020); physics.ins-det/2002.00997.

Characteristics of the diffuse astrophysical electron and tau neutrino flux with six years of IceCube high energy cascade data (IceCube Collaboration, M.G. Aartsen et al.), *Phys. Rev. Lett.* **125** 12 121104 (2020); astro-ph.HE/2001.09520.

Neutrino emission during the  $\gamma$ -suppressed state of blazars (with Emma Kun et al.); astro-ph.HE/2009.09792.

Black holes associated with cosmic neutrino flares (with Ali Kheirandish), *Nature Phys.* **16** 5 498-500 (2020); DOI: 10.1038/s41567-020-0864-2.

ANTARES and IceCube Combined Search for Neutrino Point-like and Extended Sources in the Southern Sky (IceCube Collaboration), *Astrophys. J.* **892** 92 (2020); astro-ph.HE/2001.04412.

A search for IceCube events in the direction of ANITA neutrino candidates (IceCube Collaboration), *Astrophys. J.* **892** 53 (2020); astro-ph.HE/2001.01737.

Observing EeV neutrinos through Earth: GZK and the anomalous ANITA events (with Ibrahim Safa, Alex Pizzuto, Carlos A. Argüelles, Raamis Hussain, Ali Kheirandish, and Justin Vandenbroucke,) *JCAP* **01** 012 (2020); hep-ph/1909.10487.

Neutrinos below 100 TeV from the Southern sky employing refined veto techniques to IceCube data (IceCube Collaboration), *Astrop. Phys.* **116** 102392 (2020); astro-ph.HE/1902.05792.

## Refereed Publications & arXiv Papers

Development of an analysis to probe the neutrino mass ordering with atmospheric neutrinos using three years of IceCube DeepCore data (IceCube Collaboration), *European Physical Journal C* **80** (2020) 0091; hep-ex/1902.07771.

Searches for neutrinos from cosmic-ray interactions in the Sun using seven years of IceCube data (IceCube Collaboration), submitted to *JCAP*; astro-ph.HE/1912.13135.

Constraints on Neutrino Emission from Nearby Galaxies Using the 2MASS Redshift Survey and IceCube (IceCube Collaboration), *JCAP* **7** 042 (2020); astro-ph.HE:1911.11809

Combined sensitivity to the neutrino mass ordering with JUNO, the IceCube Upgrade, and PINGU (IceCube-Gen2 and JUNO Collaborations), *Phys. Rev. D* **101** 032006 (2020); hep-ex/1911.06745

Neutrino astronomy with the next generation IceCube Neutrino Observatory (IceCube-Gen2 Collaboration), submitted to *Astro2020*; astro-ph.HE/1911.02561.

Time-integrated Neutrino Source Searches with 10 years of IceCube Data (IceCube Collaboration), *Phys. Rev. Lett.* **124** 051103 (2020); astro-ph.HE/1910.08488.

Design and Performance of the first IceAct Demonstrator at the South Pole (IceCube-Gen2 Collaboration), *JINST* **15** T02002 (2020); astro-ph.IM1910.06945.

A Search for Neutrino Point-Source Populations in 7 Years of IceCube Data with Neutrino-count Statistics (IceCube Collaboration), *Astrophys. J.* **893** 102 (2020); astro-ph.HE/1909.08623.

Efficient propagation of systematic uncertainties from calibration to analysis with the SnowStorm method in IceCube (IceCube Collaboration), *JCAP* **10** 048 (2019); hep-ex/1909.01530.

Search for PeV Gamma-Ray Emission from the Southern Hemisphere with 5 Years of Data from the IceCube Observatory (IceCube Collaboration), *Astrophys. J.* **891** 9 (2020); astro-ph.HE/1908.09918.

A Search for MeV to TeV Neutrinos from Fast Radio Bursts with IceCube (IceCube Collaboration), *Astrophys. J.* **890** 111 (2020); astro-ph.HE/1908.09997.

Velocity-independent constraints on spin-dependent DM-nucleon interactions from IceCube and PICO (PICO and IceCube collaborations); hep-ex/1907.12509.

Search for sources of astrophysical neutrinos using 7 years of IceCube cascade events (IceCube Collaboration), *Astrophys. J.* **886** 12 (2019); hep-ex/1907.06714.

Multimessenger search for the sources of cosmic rays using cosmic neutrinos (with Ali Kheirandish), *Front. Astron. Space Sci.* **6** 32 (2019).

Cosmic-Ray Spectrum and Composition from PeV to EeV Using 3 years of Data from IceTop and IceCube (IceCube Collaboration), *Phys. Rev. D* **100** 082002 (2019); hep-ex/1906.04317.

## Refereed Publications & arXiv Papers

Monitoring and Multi-Messenger Astronomy with IceCube (IceCube Collaboration), *Galaxies* **7** 40 (2019).

High-energy Galactic cosmic rays (Astro2020 Science White Paper) (with Frank Schröder, et al.); astro-ph.HE/1903.07713.

Astrophysics uniquely enabled by observations of high-energy cosmic neutrinos (Astro2020 Science White Paper) (with Markus Ackermann et al.); astro-ph.HE/1903.04334.

Fundamental physics with high-energy cosmic neutrinos (Astro2020 Science White Paper) (with Markus Ackermann et al.); astro-ph.HE/1903.04333.

Search for transient optical counterparts to high-energy IceCube neutrinos with Pan-STARRS1 (Pan-STARRS and IceCube collaborations), *Astron. Astrophys.* **626** A117 (2019); hep-ex/1901.11080.

Investigation of two Fermi-LAT gamma-ray blazars coincident with high-energy nus detected by IceCube (Fermi-LAT, ASAS-SN and IceCube collaborations), *Astrophys. J.* **880** 103 (2019); hep-ex/1901.10806.

Measurement of atmospheric tau neutrino appearance with IceCube DeepCore (IceCube Collaboration), *Phys. Rev. D* **99** 032007 (2019); hep-ex/1901.05366v1.

All-sky measurement of the anisotropy of cosmic rays at 10 TeV and mapping of the local interstellar magnetic field (HAWC and IceCube collaborations), *Astrophys. J.* **871** 96 (2019); astro-ph.HE/1812.05682.

Search for steady point-like sources in the astrophysical muon neutrino flux with 8 years of IceCube data (IceCube Collaboration), *Eur. Phys. J. C* **79** 234 (2019); astro-ph.HE/1811.07979.

On the neutrino flares from the direction of TXS 0506+056 (with Ali Kheirandish, et al.), *Astrophys. J.* **874** 1 L9 (2019); astro-ph.HE/1811.07439.

Detection of the temporal variation of the Sun's cosmic ray shadow with the IceCube detector (IceCube Collaboration), *Astrophys. J.* **872** 133 (2019); hep-ex/1811.02015.

Search for multi-messenger sources of gravitational waves and high-energy neutrinos with advanced LIGO during its first observing run (ANTARES, IceCube, LIGO, and Virgo collaborations), *Astrophys. J.* **870** 134 (2019); astro-ph.HE/1810.10693.

IceCube: Opening a new window on the Universe from the South Pole, *Int. J. Mod. Phys. D* **28** 03 1930007 (2018).

Measurements using the inelasticity distribution of multi-TeV neutrino interactions in IceCube (IceCube Collaboration), *Phys. Rev. D* **99** 032004 (2019); hep-ex/1808.07629.



## Refereed Publications & arXiv Papers

Joint constraints on Galactic diffuse neutrino emission from the ANTARES and IceCube neutrino telescopes (ANTARES and IceCube collaborations), *Astrophys. J. Lett.* **868** L20 (2018); astro-ph.HE/1808.03531.

Neutrino emission from the direction of the blazar TXS0506+056 prior to the IceCube-170922A alert (IceCube Collaboration), *Science* **361** 147 (2018); astro-ph.HE/1807.08794.

Multimessenger observations of a flaring blazar coincident with high-energy neutrino IceCube-170922A (IceCube, Fermi-LAT, MAGIC, AGILE, ASAS-HN, HAWC, H.E.S.S., INTEGRAL, Kanata, Kiso, Liverpool Telescope, Subaru, Swift/NuSTAR, VERITAS and VLA/178-403 collaborations and teams), *Science* **361** eaat1378 (2018); astro-ph.HE/1807.08816.

Constraints on minute-scale transient astrophysical neutrino sources (IceCube Collaboration), *Phys. Rev. Lett.* **122** 051102; astro-ph.HE/1807.11492.

Differential limit on the extremely high-energy cosmic neutrino flux in the presence of astrophysical background from 9 years of IceCube data (IceCube Collaboration), *Phys. Rev. D* **98** 062003 (2018); astro-ph.HE/1807.01820.

Opening a new window onto the Universe with IceCube (with Markus Ahlers), *Progress in Particle and Nuclear Physics* **102** 73 (2018); astro-ph.HE/1805.11112.

Search for neutrinos from decaying dark matter with IceCube (IceCube Collaboration), *Euro. Phys. J. C* **78** 831 (2018); astro-ph.HE/1804.03848.

High-energy astrophysical neutrinos, *Adv. Ser. Direct. High Energy Phys.* **28** 325 (2018).

A search for neutrino emission from fast radio bursts with 6 years of IceCube data (IceCube Collaboration), *Astrophys. J.* **857** 117 (2018); hep-ex/1712.06277.

Measurement of the multi-TeV neutrino cross section with IceCube using Earth absorption (IceCube Collaboration), *Nature* **551** 596 (2017); hep-ex/1711.08119.

Search for high-energy neutrinos from binary neutron star merger GW170817 with ANTARES, IceCube and the Pierre Auger Observatory (ANTARES, IceCube, Auger, LIGO Scientific and Virgo collaborations), *Astrophys. J. Lett.* **850** L35 (2017); astro-ph.HE/1710.05839.

Multi-messenger observations of a binary neutron star merger (IceCube Collaboration with LIGO Scientific and Virgo collaborations, et al), *Astrophys. J. Lett.* **848** L12 (2017); astro-ph.HE/1710.05833.

Search for non-standard neutrino interactions with IceCube DeepCore (IceCube Collaboration), *Phys. Rev. D* **97** 072009 (2018); hep-ex/1709.07079.

Neutrino interferometry for high-precision tests of Lorentz symmetry with IceCube (IceCube Collaboration), *Nature Physics* **14** 961 (2018); hep-ex/1709.03434.

## Refereed Publications & arXiv Papers

Measurement of atmospheric neutrino oscillations at 6-56 GeV with IceCube DeepCore (IceCube Collaboration), Phys. Rev. Lett. **120** 071801 (2018); astro-ph.HE/1707.07081.

Constraints on Galactic neutrino emission with 7 years of IceCube data (IceCube Collaboration), Astrophys. J. **849** 67 (2017); astro-ph.HE/1707.03416.

Identification of gamma-rays and neutrinos from the Cygnus-X complex considering radio gamma correlation (with Mehmet Gündüz et al.); astro-ph.HE/1705.08337.

Search for neutrinos from dark matter self-annihilations in the center of the Milky Way with 3 years of IceCube/DeepCore (IceCube Collaboration), Eur. Phys. Jour. C **77** 9 627 (2017); hep-ex/1705.08103.

Measurement of the  $\nu_\mu$  energy spectrum with IceCube-79 (IceCube Collaboration), Eur. Phys. J. C **77** 10 692 (2017); astro-ph.HE/1705.07780.

Search for astrophysical sources of neutrinos using cascade events in IceCube (IceCube Collaboration), Astrophys. J. **846** 2 136 (2017); astro-ph.HE/1705.02383.

Search for high-energy neutrinos from Gravitational Wave Event GW151226 and Candidate LVT151012 with ANTARES and IceCube (ANTARES, IceCube, LIGO Scientific and Virgo collaborations), Phys. Rev. D **96** 022005 (2017); astro-ph.HE/1703.06298.

IceCube: Neutrinos and multimessenger astronomy (with M. Ahlers), Progress of Theoretical and Experimental Physics **12** 12A105 (2017).

Gamma-ray puzzle in Cygnus X: Implications for high-energy neutrinos (with T. Yoast-Hull et al.), Phys. Rev. D **96** 4 043011 (2017); astro-ph.HE/1703.02590.

Extending the search for muon neutrinos coincident with gamma-ray bursts in IceCube data (IceCube Collaboration), Astrophys. J. **843** 112 (2017); astro-ph.HE/1702.06868.

Multiwavelength follow-up of a rare IceCube neutrino multiplet (IceCube Collaboration, ASAS-SN, The Astrophysical Multimessenger Observatory Network, Fermi, HAWC, LCO, MASTER, Swift and VERITAS collaborations), Astronomy and Astrophysics **850** L35 (2017); astro-ph.HE/1702.06131.

Search for sterile-neutrino mixing using 3 years of IceCube / DeepCore data (IceCube Collaboration), Phys. Rev. D **95** 112002 (2017); hep-ex/1702.05160.

IceCube in the era of multimessenger astrophysics, Mod. Phys. Lett. A **32** 2 1730010 (2017).

Astrophysical neutrinos and cosmic rays observed by IceCube (IceCube Collaboration), Advances in Space Research **62** 2902 (2018); astro-ph.HE/1701.03731.

The IceCube Realtime Alert System (IceCube Collaboration), Astropart. Phys. **92** 30 (2017); astro-ph.HE/1612.06028.

## Refereed Publications & arXiv Papers

Search for annihilating dark matter in the Sun with 3 years of IceCube data (IceCube Collaboration), *Eur. Phys. J. C* **77** 3 146 (2017); astro-ph.HE/1612.05949/ erratum 2019.

The IceCube Neutrino Observatory: Instrumentation and Online Systems (IceCube Collaboration), *J. Inst.* **12** P03012 (2017); astro-ph.IM/1612.05093.

The contribution of Fermi-2LAC blazars to the diffuse TeV-PeV neutrino flux (IceCube Collaboration), *Astrophys. J.* **835** 1 45 (2017); astro-ph.HE/1611.03874.

Very-high-energy gamma-ray follow-up program using neutrino triggers from IceCube (IceCube, MAGIC and VERITAS collaborations), *J. Inst.* **11** P11009 (2016); hep-ex/1610.01814.

All-sky search for time-integrated neutrino emission from astrophysical sources with 7 years of IceCube data, *Astrophys. J.* **835** 2 151 (2017); astro-ph.HE/1609.04981.

Prospects for detecting Galactic sources of cosmic neutrinos with IceCube: An update (with A. Kheirandish and V. Niro, *Astropart. Phys.* **86** 46 (2017); astro-ph.HE/1609.03072.

First search for dark-matter annihilations in the Earth with the IceCube Detector (IceCube Collaboration), *Eur. Phys. J. C* **77** 2 82 (2017); astro-ph.HE/1609.01492.

Observation and characterization of a cosmic-muon neutrino flux from the Northern Hemisphere using six years of IceCube data (IceCube Collaboration), *Astrophys. J.* **833** 3; astro-ph.HE/1607.08006.

Constraints on ultra-high-energy cosmic-ray sources from a search for neutrinos above 10 PeV with IceCube (IceCube Collaboration), *Phys. Rev. Lett.* **117** 241101 (2016); hep-ex/1607.05886.

Search for sources of high-energy neutrons with four years of data from the IceTop Detector (IceCube Collaboration), *Astrophys. J.* **830** 129 (2016); astro-ph.HE/1607.05614.

PINGU: A vision for neutrino and particle physics at the South Pole (The IceCube-Gen2 collaboration), *J. Phys. G* **44** 054006 (2017); hep-ex/1607.02671.

Neutrino oscillation studies with IceCube / DeepCore (IceCube Collaboration), *Nucl. Phys. B* **908** 161 (2016).

All-flavour search for neutrinos from dark-matter annihilations in the Milky Way with IceCube/DeepCore (IceCube Collaboration), *Eur Phys. J. C* **76** 531; astro-ph.HE/1606.00209.

High-energy neutrinos from recent blazar flares (with A. Kheirandish), *Astrophys. J.* **831** 1 12 (2016); astro-ph.HE/1605.06119.

Searches for sterile neutrinos with the IceCube Detector (IceCube Collaboration), *Phys. Rev. Lett.* **117** 071801 (2016); hep-ex/1605.01990.

IceCube seeks to expand (with Spencer Klein), *CERN Courier* **56** 6 40 (2016).

## Refereed Publications & arXiv Papers

Charm contribution to the atmospheric neutrino flux (with L. Wille), Phys. Rev. D **94** 1 014014 (2016); hep-ex/1605.01409.

The slope, curvature, and higher parameters in  $pp$  and  $\bar{p}p$  scattering, and the extrapolation of measurements of  $d\sigma(s, t) / dt$  to  $t = 0$  (with M.M. Block, *et al*), Phys. Rev. D **93** 11 114009 (2016); hep-ph/1605.00152.

Lowering IceCube's energy threshold for point-source searches in the Southern sky (IceCube Collaboration), Astrophys. J. L. **824** L28 (2016) ; astro-ph.HE/1605.00163v2.

Comment on "More on Heisenberg's model for high-energy nucleon-nucleon scattering", (with M.M. Block, *et al*), Phys. Rev. D **7 93** 078501 (2016) ; hep-ph/1604.01832.

Anisotropy in cosmic-ray arrival directions in the Southern Hemisphere with six years of data from the IceCube Detector (IceCube Collaboration), Astrophys. J. **826** 220 (2016); astro-ph.HE/1603.01227v2.

High-energy neutrino follow-up search of gravitational wave event GW150914 with ANTARES and IceCube (ANTARES, IceCube, LIGO Scientific and Virgo collaborations), Phys. Rev. D **93** 122010 (2016); astro-ph.HE/1602.05411.

An all-sky search for three flavors of neutrinos from gamma-ray bursts with the IceCube Neutrino Observatory (IceCube Collaboration), Astrophys. J. L. **824** L28 (2016); astro-ph.HE/1601.06484.

Upper limit on forward charm contribution to atmospheric neutrino flux (with L. Wille), hep-ph/1601.03044.

Improved limits on dark-matter annihilation in the Sun with the 79-string IceCube Detector and implications for supersymmetry (IceCube Collaboration), J. Cosmo. & Astro. Phys. **04** 022 (2016); hep-ph/1601.00653v2.

Search for correlations between the arrival directions of IceCube neutrino events and ultra-high-energy cosmic rays detected by the Pierre Auger Observatory and the Telescope Array (IceCube, Auger and Telescope Array collaborations), J. Cosmo. & Astro. Phys. **01** 037 (2016); astro-ph.HE/1511.09408v2.

Comprehensive fits to high energy data for  $\sigma$ ,  $\rho$ , and  $\beta$  and the asymptotic black-disk limit, with M.M. Block, *et al*); hep-ph/1511.02406.

First combined search for neutrino point-sources in the Southern Hemisphere with the ANTARES and IceCube neutrino telescopes (ANTARES and IceCube collaborations), Astrophys. J. **823** 65 (2016); hep-ex/1511.02149.

Searches for relativistic magnetic monopoles in IceCube (IceCube Collaboration), Eur. Phys. J. C **76** 133 (2016); astro-ph.HE/1511.01350.

## Refereed Publications & arXiv Papers

Search for astrophysical tau neutrinos in 3 years of IceCube data (IceCube Collaboration), Phys. Rev. D **93** 022001(2016); astro-ph.HE/1509.06212.

Search for transient astrophysical neutrino emission with IceCube-DeepCore (IceCube Collaboration), Astrophys. J. **816** 75 (2016); astro-ph.HE/1509.05029.

Measurement of muon annual modulation and muon-induced phosphorescence in NaI(Tl) crystals with DM-Ice17 (DM-Ice collaboration); physics.int-det/1509.02486.

A combined maximum-likelihood analysis of the high-energy astrophysical neutrino flux measured with IceCube (IceCube Collaboration), Astrophys. J. **809** 1 98 (2015); astro-ph.HE/1507.03991.

Evidence for astrophysical muon neutrinos from the Northern sky with IceCube (IceCube Collaboration), Phys. Rev. Lett. **115** 8 081102 (2015); astro-ph.HE/1507.04005.

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# International Cosmic Ray Conference (ICRC) Proceedings

2019 – Madison, Wisconsin

*Individuals posted their talks to: [arxiv.org/abs/1907.11699](https://arxiv.org/abs/1907.11699)*

Recent Results of Cosmic-Ray Measurements from IceCube and IceTop (IceCube Collaboration, Soldin *et al.*), PoS 014 (ICRC2019)

Results from IceCube (IceCube Collaboration, Williams *et al.*), PoS 016 (ICRC2019)

Search for Neutrinos in IceCube from the Local Anisotropic Universe using 2MRS (IceCube Collaboration, Sclafani *et al.*), PoS 1006 (ICRC2019)

Recent Results for All-Sky Time-Integrated Point Source Searches Using 10 yrs of IceCube Data (IceCube Collaboration, Carver *et al.*), PoS 851 (ICRC2019)

The Next Generation of IceCube Realtime Neutrino Alerts (IceCube Collaboration, Tung *et al.*), PoS 1021 (ICRC2019)

IceCube Search for Galactic Neutrino Sources Based on HAWC Observations of the Galactic Plane (IceCube Collaboration, Kheirandish *et al.*), PoS 932 (ICRC2019)

Neutrino Source Searches and a Realtime Neutrino Alert Stream in the Southern Sky with IceCube Starting Tracks (IceCube Collaboration, Mancina *et al.*), PoS 954 (ICRC2019)

Searching for High-Energy Neutrino Emission from TeV Pulsar-Wind Nebulae (IceCube Collaboration, Liu *et al.*), PoS 944 (ICRC2019)

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## International Cosmic Ray Conference (ICRC) Proceedings

Searching for Time-Dependent Neutrino Emission from Blazars (IceCube Collaboration, O'Sullivan et al.), PoS 973 (ICRC2019)

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IceCube Results and Limits on the Neutrino Production from 3FHL Blazars Using 8 yrs of Through-Going Muon Data from the Northern Hemisphere [poster] (IceCube Collaboration, M. Huber et al.), PoS 916 (ICRC2019)

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## International Cosmic Ray Conference (ICRC) Proceedings

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- Characterization of the Astrophysical Diffuse Neutrino Flux with High-Energy Starting Events and Prospects for Future Measurements with IceCube (IceCube Collaboration, Schneider et al.), PoS 1004 (ICRC2019)
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- A Novel Method of Rejecting Muon Backgrounds for the Detection of the Highest-Energy Neutrinos [poster] (IceCube Collaboration, Lu et al.), PoS 945 (ICRC2019)
- Search for Astrophysical Tau Neutrinos with an Improved Double-Pulse Method [poster] (IceCube Collaboration, Soedingrekso et al.), PoS 960 (ICRC2019)
- Measurement of the Multi-TeV Neutrino Cross-Section with IceCube Using Earth Absorption [poster] (IceCube Collaboration, Robertson et al.), PoS 990 (ICRC2019)
- Measurement of the Diffuse Muon Neutrino Flux Using Starting-Track Events in IceCube [poster] (IceCube Collaboration, Robertson et al.), PoS 1010 (ICRC2019)
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Studying the Temporal Variation of the Cosmic-Ray Sun Shadow Using IceCube Data (IceCube Collaboration, Tenholt, Desiati et al.), PoS 437 (ICRC2019)

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Cosmic-Ray Spectrum and Composition from PeV to EeV from the IceCube Neutrino Observatory (IceCube Collaboration, Andeen et al.), PoS 172 (ICRC2019)

Working-Group Report on the Combined Analysis of Muon Density Measurements from Eight Leading Air-Shower Experiments (IceCube Collaboration, Soldin et al.), PoS 214 (ICRC2019)

A Three-Dimensional Reconstruction of Cosmic-Ray Events in IceCube [poster] (IceCube Collaboration, Bai, Dvorak et al.), PoS 244 (ICRC2019)

Seasonal Variations of Atmospheric Muons in IceCube [poster] (IceCube Collaboration, Tilav et al.), PoS 894 (ICRC2019)

Simulation and Reconstruction Study of Surface Scintillator Array at the IceCube Observatory [poster] (IceCube Collaboration, Leszczyńska, Plum et al.), PoS 332 (ICRC2019)

Science Case of a Scintillator and Radio Surface Array at IceCube [poster] (IceCube Collaboration, Schröder et al.), PoS 418 (ICRC2019)

First Measurements of Prototype Radio Antennas for the IceTop Detector Array [poster] (IceCube Collaboration, Renschler et al.), PoS 401 (ICRC2019)

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Probing Neutrino Emission at GeV Energies from Compact Binary Mergers with IceCube (IceCube Collaboration, de Wasseige et al.), PoS 865 (ICRC2019)

First Search for GeV Neutrinos from Bright Gamma-Ray Solar Flares Using the IceCube Neutrino Observatory [poster] (IceCube Collaboration, de Wasseige et al.), PoS 1075 (ICRC2019)

Using SNOwGLoBES to Calculate Supernova Neutrino Detection Rates in IceCube Observatory [poster] (IceCube Collaboration, O'Sullivan et al.), PoS 975 (ICRC2019)

IceCube Supernova Search and Multi-Messenger Efforts [poster] (IceCube Collaboration, Fritz et al.), PoS 889 (ICRC2019)

Combined Search for Neutrinos from Dark-Matter Annihilation in the GC using ANTARES and IceCube (IceCube Collaboration, Iovine et al.), PoS 552 (ICRC2019)

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- Enabling a New Detection Channel for BSM Physics with *in-situ* Measurements of Ice Luminescence (IceCube Collaboration, Pollman et al.), PoS 983 (ICRC2019)
- Quest for New Physics Using Astrophysical Neutrino Flavour in IceCube [poster] (IceCube Collaboration, Farrag et al.), PoS 879 (ICRC2019)
- Search for a Dark-Matter Annihilation in the Center of the Earth with the IceCube Detector [poster] (IceCube Collaboration, Renzi et al.), PoS 541 (ICRC2019)
- The search for dark matter with metastable mediators with the IceCube observatory [poster] (IceCube Collaboration, Tönnis et al.), PoS 548 (ICRC2019)
- Dark-Matter Searches with the IceCube Upgrade [poster] (IceCube Collaboration, Baur et al.), PoS 506 (ICRC2019)
- Solar WIMP Annihilation Search with IceCube [poster] (IceCube Collaboration, Lazar, Liu et al.), PoS 527 (ICRC2019)
- Searches for Connections Between Dark Matter and Neutrinos with the IceCube High-Energy Starting-Event Sample IceCube [poster] (IceCube Collaboration, Djumović, Argüelles et al.), PoS 839 (ICRC2019)
- Light Diffusion in Birefringent Polycrystals and the IceCube Ice Anisotropy (IceCube Collaboration, Chirkin, Rongen et al.), PoS 839 (ICRC2019)
- The POCAM as Self-Calibrating Light Source for the IceCube Upgrade [poster] (IceCube Collaboration, Henningsen et al.), PoS 908 (ICRC2019)
- Calibration LEDs in the IceCube Upgrade D-Egg Modules [poster] (IceCube Collaboration, Kiriki et al.), PoS 923 (ICRC2019)
- The Camera System for the IceCube Upgrade [poster] (IceCube Collaboration, Kiriki et al.), PoS 923 (ICRC2019)
- The SpiceCore Hole Camera System [poster] (IceCube Collaboration, Jeong, Tönnis et al.), PoS 926 (ICRC2019)
- Improving the Muon-Track Reconstruction of IceCube [poster] (IceCube Collaboration, Bradascio et al.), PoS 846 (ICRC2019)
- Application of Deep Neural Networks to Event-Type Classification in IceCube [poster] (IceCube Collaboration, Kronmüller et al.), PoS 257 (ICRC2019)
- Capturing Cosmic-Ray Research and Researchers with Art (IceCube Collaboration, Madsen et al.), PoS 951 (ICRC2019)
- Synergy between Art and Science: Collaboration at the South Pole [poster] (IceCube Collaboration, Fortescue et al.), PoS 867 (ICRC2019)

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The IceCube Upgrade - Design and Science Goals (IceCube Collaboration, Ishihara et al.), PoS 1031 (ICRC2019)

A Multi-PMT Optical Module for the IceCube Upgrade [poster] (IceCube Collaboration, Classen et al.), PoS 855 (ICRC2019)

Electronics Development for the New Photo-Detectors (PDOM and D-Egg) for IceCube Upgrade [poster] (IceCube Collaboration, Nagai et al.), PoS 966 (ICRC2019)

Design and Performance of a UV-Calibration Device for the SpiceCore Hole [poster] (IceCube Collaboration, Brostean-Kaiser et al.), PoS 847 (ICRC2019)

An Acoustic Calibration System for the IceCube Upgrade [poster] (IceCube Collaboration, Weibusch et al.), PoS 1030 (ICRC2019)

Characterization of Two PMT Models for the IceCube Upgrade mDOM [poster] (IceCube Collaboration, van Eijk et al.), PoS 1022 (ICRC2019)

2017 – Busan, South Korea

*IceCube Collaboration contributions to the 2017 ICRC are grouped together on astro-ph.HE/ and .IM in 6 distinct files. Part I – Point source searches – astro-ph.HE/1710.01179; II – Atmospheric and astrophysical diffuse neutrino searches of all flavors – astro-ph.HE/1710.01191; III - Cosmic rays – astro-ph.HE/1710.01194; IV – Dark matter and exotic particles – astro-ph.HE/1710.01197; V – Neutrino oscillations and supernova searches – astro-ph.HE/1710.01201; and IceCube-Gen2 - astro-ph.IM/1710.01207*

Combined Analysis of Cosmic-Ray Anisotropy with IceCube and HAWC (IceCube Collaboration, Díaz-Vélez et al.), PoS 539 (ICRC2017); astro-ph.HE/1708.03005

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A Composition-Sensitive Log-Likelihood Ratio for Cosmic Rays and Gamma Rays (IceCube Collaboration, Pandya et al.), PoS 514 (ICRC2017); astro-ph.HE/1710.01194, p. 22 (poster)

Cosmic-Ray Anisotropy with 7 Years of Data from IceCube and IceTop (IceCube Collaboration, Bourbeau et al.), PoS 474 (ICRC2017); astro-ph.HE/1710.01194, p. 30 (poster)

Sensitivity of IceCube Cosmic-Ray Measurements to the Hadronic Interaction Models (IceCube Collaboration, De Ridder et al.), PoS 319 (ICRC2017); astro-ph.HE/1710.01194, p. 38 (poster)

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Impulsive Increase of Galactic Cosmic-Ray Flux Observed by IceTop (IceCube Collaboration, Evenson *et al.*), PoS 133 (ICRC2017); astro-ph.HE/1710.01194, p. 54

Performance of IceTop as Veto for IceCube (IceCube Collaboration, Pandya *et al.*), PoS 967 (ICRC2017); astro-ph.HE/1710.01194, p. 61 (poster)

Solar Atmospheric Neutrino Search with IceCube (IceCube Collaboration, S. In *et al.*), PoS 965 (ICRC2017); astro-ph.HE/1710.01194, p. 69 (poster)

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Search for Astrophysical Tau Neutrinos in 6 Years of High-Energy Starting Events in IceCube (IceCube Collaboration, Usner *et al.*), PoS 974 (ICRC2017); astro-ph.HE/1710.01191, p. 6

Multi-Flavour PeV Neutrino Search with IceCube (IceCube Collaboration, Lu Lu *et al.*), PoS 1002 (ICRC2017); astro-ph.HE/1710.01191, p. 14

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- Delayed Light Emission to Distinguish Astrophysical Neutrino Flavors in IceCube (IceCube Collaboration, Steuer *et al.*), PoS 1008 (ICRC2017); astro-ph.HE/1710.01197, p. 6 (poster)
- Search for Signatures of Heavy Decaying Dark Matter with IceCube (IceCube Collaboration, Stettner *et al.*), PoS 923 (ICRC2017); astro-ph.HE/1710.01197, p. 14
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- Measurement of Water Luminescence – A New Detection Method for Neutrino Telescopes (IceCube Collaboration, Pollman *et al.*), PoS 1060 (ICRC2017); astro-ph.HE/1710.01197, p. 46 (poster)
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- IceCube-Gen2: The Next-Generation Neutrino Observatory for the South Pole (IceCube Gen2 collaboration, van Santen *et al.*), PoS 991 (ICRC2017); astro-ph.HE/1710.01207, p. 6
- A Camera System for IceCube-Gen2 (IceCube Gen2 collaboration, Jeong *et al.*), PoS 1040 (ICRC2017); astro-ph.HE/1710.01207, p. 46 (poster)
- The mDom – A Multi-PMT Digital Optical Module for the IceCube-Gen2 Neutrino Telescope (IceCube Gen2 collaboration, Classen *et al.*), PoS 1047 (ICRC2017); astro-ph.HE/1710.01207, p. 54 (poster)
- The IceTop Scintillator Upgrade (IceCube Gen2 collaboration, Kunwar *et al.*), PoS 401 (ICRC2017); astro-ph.HE/1710.01207, p. 62 (poster)
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- All-Sky Search for Correlations in the Arrival Directions of Astrophysical Neutrino Candidates and Ultrahigh-Energy Cosmic Rays (IceCube, Auger and Telescope Array collaborations, Al Samarai, *et al.*), PoS 960 (ICRC2017); astro-ph.HE/1710.01179, p. 23

2015 – The Hague, Netherlands

IceCube Collaboration Contributions to the 2015 ICRC are grouped together on astro-ph.HE/ and .IM in 6 distinct files. Part I – Point source searches – astro-ph.HE/1510.05222; II – Atmospheric and astrophysical diffuse neutrino searches of all flavors – 1510.05223; III -

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*Cosmic rays – 1510.05225; IV – Dark matter and exotic particles – 1510.05226; V – Neutrino oscillations and supernova searches – 1510.05227; and IceCube-Gen2 – astro-ph.IM/1510.05228.*

Surface Muons in IceTop (IceCube Collaboration, Dembinski & Gonzalez *et al.*), PoS 267 (ICRC2015); astro-ph.HE/1510.05225 p. 21

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- A Search for Extremely High-Energy Neutrinos in 6 Years (of IceCube Data (*poster 3*) (IceCube Collaboration, Ishihara *et al.*), PoS 1064 (ICRC2015); astro-ph.HE/ 1510.05223 p. 13
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- Atmospheric Muon and Electron Neutrino Energy Spectrum from IceCube (*poster 2*) (IceCube Collaboration, Kuwabara *et al.*), PoS 1063 (ICRC2015); astro-ph.HE/1510.05223 p. 5
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- High-Energy Astrophysical Neutrino Flux Characteristics for Neutrino-Induced Cascades Using IC79- & 86-String IceCube Configurations (IceCube Collaboration, Niederhausen *et al.*), PoS 1109 (ICRC2015); astro-ph.HE/1510.05223 p. 59
- New Limit for Mildly Relativistic Magnetic Monopoles Obtained with IceCube (IceCube Collaboration, Obertacke *et al.*) PoS 1061 (ICRC2015); astro-ph.HE/1510.05226 p. 12
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Searching for TeV Gamma-Ray Emission Associated with IceCube High-Energy Neutrinos Using VERITAS (IceCube and VERITAS collaborations, Santander *et al.*), PoS 785 (ICRC2015); astro-ph.HE/1509.00517

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A Search for Neutrinos from Gamma-Ray Bursts with the IceCube Neutrino Detector (*poster 2*) (IceCube Collaboration, Brayeur and Casier *et al.*), PoS 1048 (ICRC2015); astro-ph.HE/1510.05222 p. 13

Online and Near Realtime Searches for Neutrinos from GRBs with IceCube (*poster 2*) (IceCube Collaboration, Felde *et al.*), PoS 1089 (ICRC2015); astro-ph.HE/1510.05222 p. 51

Recent Improvements in the Detection of Supernovae with the IceCube Observatory (*poster 3*) (IceCube Collaboration, Baum *et al.*), PoS 1096 (ICRC2015); astro-ph.HE/1510.05227 p. 5

Search for Sterile Neutrinos with the IceCube Neutrino Observatory (IceCube Collaboration, Wallraff *et al.*), PoS 1100 (ICRC2015); astro-ph.HE/1510.05227 p. 13

## International Cosmic Ray Conference (ICRC) Proceedings

Simulation Studies for a Surface Veto Array to Identify Astrophysical Neutrinos at the South Pole (*poster 2*) (IceCube Collaboration, Euler and Gonzales *et al.*), PoS 1070 (ICRC2015); astro-ph.IM/1510.05228 p. 6

Motivations and Techniques of a Surface Detector to Veto Air Showers for Neutrino Astronomy with IceCube at the Southern Sky (IceCube Collaboration, Auffenberg *et al.*), PoS 1156 (ICRC2015); astro-ph.IM/1510.05228 p. 70

A Precision Optical Calibration Module for IceCube-Gen2 (*poster 1*) (IceCube Collaboration, Krings *et al.*), PoS 1133 (ICRC2015); astro-ph.IM/1510.05228 p. 22

PINGU Camera (*poster 1*) (IceCube Collaboration, Bose and Rott *et al.*), PoS 1145 (ICRC2015); astro-ph.IM/1510.05228 p. 38

The IceCube-Gen2 High-Energy Array (IceCube Collaboration, Blaufuss *et al.*), PoS 1146 (ICRC2015); astro-ph.IM/1510.05228 p. 46

Generation-2 IceCube Digital Optical Module & DAQ (*poster 1*) (IceCube Collaboration, DuVernois *et al.*), PoS 1148 (ICRC2015); astro-ph.IM/1510.05228 p. 62

Multi-PMT Optical Modules for IceCube-Gen2 (*poster 1*) (IceCube Collaboration, Classen *et al.*), PoS 1147 (ICRC2015); astro-ph.IM/1510.05228 p. 54

A Dual-PMT Optical Module (D-Egg) for IceCube-Gen2 (*poster 1*) (IceCube Collaboration, Lu *et al.*), PoS 1137 (ICRC2015); astro-ph.IM/1510.05228 p. 30

Cosmic-Ray Science Potential for an Extended Surface Array at the IceCube Observatory (IceCube Collaboration, Seckel *et al.*), PoS 694 (ICRC2015); astro-ph.IM/1510.05228 p. 6

Status of the PINGU Detector (IceCube Collaboration, Clark *et al.*), PoS 1174 (ICRC2015); astro-ph.IM/1510.05228 p. 78

An Estimate of the Live Time of Optical Measurements of Air Showers at the South Pole (*poster*) (Segev BenZvi), CR-IN; [indico.cern.ch/event/344485/session/138/contribution/220](https://indico.cern.ch/event/344485/session/138/contribution/220)

Evaluation of Expected Solar Flare Neutrino Events in the IceCube Observatory (*poster 3*) (Gwenhaël De Wasseige *et al.*); [indico.cern.ch/event/344485/session/136/contribution/194](https://indico.cern.ch/event/344485/session/136/contribution/194)

Recent Results on Cosmic Ray Physics with the IceCube Observatory (IceCube Collaboration, Karg *et al.*), PoS 365 (ICRC2015)

Search for Point-Like Neutrino Sources over the Southern Hemisphere with the ANTARES and IceCube Neutrino Telescopes (ANTARES and IceCube collaborations, Martí and Finley *et al.*), PoS 1076 (ICRC2015)

Recent Observations of Atmospheric Neutrinos with the IceCube Observatory (IceCube Collaboration, Desiati *et al.*), highlight talk, PoS 028 (ICRC2015)

# International Cosmic Ray Conference (ICRC) Proceedings

2013 – Rio de Janeiro, Brazil

IceCube Collaboration Contributions to the 2013 ICRC are grouped together on [astro-ph.HE/](#) and [.IM](#) in 6 distinct files. *ICO-I is Point Source Searches, ICO-II is Atmospheric and Diffuse, ICO-III is Cosmic Rays, ICO-IV is Dark Matter and Exotic Particles, ICO-V is Neutrino Oscillations and Supernova, and ICO-VI is Ice Properties, Reconstruction and Future Developments.* Search at [143.107.180.38/indico/contributionListDisplay.py?confId=0](#)

Recent Highlights from IceCube (IceCube Collaboration, Klein *et al.*), *Braz. J. Phys.* **44** 5 540 (2014); [astro-ph.HE/1311.6519](#).

Measurement of the Cosmic-Ray Energy Spectrum with IceTop-73 (IceCube Collaboration, Gonzalez *et al.*), [cbpf.br/~icrc2013/proc\\_icrc2013.html](#) 0246; [astro-ph.HE/1309.7006](#) ICO-III 5.

Results from Low-Energy Neutrino Searches for Dark Matter in the Galactic Center with IceCube-DeepCore (IceCube Collaboration, Wolf *et al.*); [astro-ph.HE/1309.7007](#) ICO-IV 5.

Model Independent Search for GRB Neutrinos Interacting inside IceCube (IceCube Collaboration, Casey *et al.*), [cbpf.br/~icrc2013/proc\\_icrc2013.html](#) 0367; [astro-ph.HE/1309.6979](#) ICO-I 5.

Ground-Level Enhancement of May 17, 2012 Observed at South Pole (IceCube Collaboration, Kuwabara *et al.*), SH-EX 368; [astro-ph.HE/1309.7006](#) ICO-III 9.

Search for Extraterrestrial Neutrino-Induced Cascades Using IceCube 79-Strings (IceCube Collaboration, Lesiak-Bzdak *et al.*), [cbpf.br/~icrc2013/proc\\_icrc2013.html](#) 0370; [astro-ph.HE/1309.7003](#) ICO-II 5.

IceTop as a Veto in Astrophysical Neutrino Searches for IceCube (poster) (IceCube Collaboration, Auffenberg *et al.*), [cbpf.br/~icrc2013/proc\\_icrc2013.html](#) 373; [astro-ph.HE/1309.7010](#) ICO-VI 5.

IceVeto: An Extension of IceTop to Veto Horizontal Air Showers (poster) (IceCube Collaboration, Auffenberg *et al.*); [astro-ph.HE/1309.7010](#) ICO-VI 9.

An Update on Cosmic-Ray Anisotropy Studies with IceCube (IceCube Collaboration, Santander *et al.*); [astro-ph.HE/1309.7006](#) ICO-III 13.

Ultra-High-Energy Neutrino Alert System for GRB and Transient Astronomical Sources (IceCube Collaboration, Ishihara *et al.*), NU-EX 409; [astro-ph.HE/1309.6979](#) ICO-I 9.

Study of Time-Dependence of the Cosmic-Ray Anisotropy with IceCube and AMANDA (IceCube Collaboration, Karg *et al.*); [astro-ph.HE/1309.7006](#) ICO-III 17.

Measurement of the Atmospheric  $\nu_\mu$  Spectrum with IceCube-59 (poster) (IceCube Collaboration, Ruhe *et al.*); [astro-ph.HE/1309.7003](#) ICO-II 9.

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- Search for Relativistic Magnetic Monopoles with the IceCube Neutrino Telescope (IceCube Collaboration, Posselt *et al.*); astro-ph.HE/1309.7007 ICO-IV 5.
- An Improved Data Acquisition System for Supernova Detection with IceCube (IceCube Collaboration, Baum *et al.*); astro-ph.HE/ 1309.7008 ICO-V 5.
- Detection of Galactic-Core–Collapse Supernovae with IceCube (IceCube Collaboration, Kroll *et al.*); astro-ph.HE/1309.7008 ICO-V 9.
- Measurement of Neutrino Oscillations with the Full IceCube Detector (IceCube Collaboration, Yañez *et al.*); astro-ph.HE/1309.7008 ICO-V 13.
- Multipole Analysis with IceCube to Search for Dark Matter Accumulated in the Galactic Halo (IceCube Collaboration, Reimann *et al.*); astro-ph.HE/1309.7007 ICO-IV 13.
- Search for Sterile Neutrinos with the IceCube Neutrino Observatory (IceCube Collaboration, Wallraff *et al.*); astro-ph.HE/1309.7008 ICO-V 17.
- Earth WIMP Searches with IceCube (IceCube Collaboration, Kunnen *et al.*); astro-ph.HE/1309.7007 ICO-IV 17.
- The Future of Neutrino Oscillations with IceCube / DeepCore (IceCube Collaboration, Wiebusch *et al.*); astro-ph.HE/1309.7008 ICO-V 21.
- Searches for Multiple Neutrino Sources in the Cygnus Region and Beyond with Three Years of IceCube Data (IceCube Collaboration, Bernhard *et al.*); astro-ph.HE/ 1309.6979 ICO-I 12.
- Seasonal Variations of Atmospheric Neutrino Flux Detected by the IceCube Observatory (IceCube Collaboration, Gaisser *et al.*); astro-ph.HE/1309.7003 ICO-II 13.
- Cascade Reconstruction at the Glashow Resonance in IceCube (IceCube Collaboration, Kiryluk *et al.*); astro-ph.HE/1309.7003 ICO-II 17.
- High-Energy Gamma-Ray Follow-Up Program Using Neutrino Triggers from IceCube (IceCube Collaboration, Góra *et al.*); astro-ph.HE/1309.6979 ICO-I 16.
- Search for Multi-Flares of High-Energy Neutrinos from Active Galactic Nuclei with the IceCube Detector (IceCube Collaboration, Cruz Silva *et al.*); astro-ph.HE/1309.6979 ICO-I 20.
- Calculating Energy-Dependent Limits on Neutrino Point-Source Fluxes with Stacking and Unfolding Techniques in IceCube (IceCube Collaboration, Clevermann *et al.*); astro-ph.HE/1309.6979 ICO-I 24.
- Latest Results of Searches for Point and Extended Sources of Neutrinos with the IceCube Detector (IceCube Collaboration, Aguilar Sanchez *et al.*); astro-ph.HE/ 1309.6979 ICO-I 28.
- Study of the Sensitivity of IceCube / DeepCore to Atmospheric Neutrino Oscillations (IceCube Collaboration, Gross *et al.*); astro-ph.HE/1309.7010 ICO-VI 13.

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Probing Cosmic-Ray Production in Massive Open Star Clusters with Three yrs of IceCube Data (IceCube Collaboration, Gross *et al.*); astro-ph.HE/1309.6979 ICO-I 32.

Extending IceCube Low-Energy Neutrino Searches for Dark Matter with DeepCore (IceCube Collaboration, Flis *et al.*); astro-ph.HE/ 1309.7007 ICO-IV 21.

Apparent Optical Anisotropy of the South Pole Ice (IceCube Collaboration, Chirkin *et al.*); astro-ph.HE/1309.7010 ICO-VI 17.

Results and Future Developments of the Search for Subrelativistic Magnetic Monopoles with IceCube (IceCube Collaboration, Benabderrahmane *et al.*); astro-ph.HE/ 1309.7007 ICO-II 25.

Event Reconstruction in IceCube Based on Direct Event Re-Simulation (IceCube Collaboration, Chirkin *et al.*); astro-ph.HE/1309.7003 ICO-VI 21.

Detection of Tau Neutrinos in IceCube with Double Pulses (IceCube Collaboration, Williams *et al.*); astro-ph.HE/1309.7003 ICO-II 21.

Searches for Flaring and Periodic Neutrino Emission with Three Years of IceCube Data (IceCube Collaboration, Montaruli *et al.*); astro-ph.HE/1309.6979 ICO-I 36.

Observation of Very-High-Energy Neutrinos in IceCube (IceCube Collaboration, Kopper *et al.*); astro-ph.HE/1309.7003 ICO-II 25.

Search for Diffuse Astrophysical Neutrinos with Cascade Events in the IC-59 Detector (IceCube Collaboration, Schönwald *et al.*); astro-ph.HE/1309.7003 ICO-II 29.

100 TeV - PeV Air Showers with IceTop (IceCube Collaboration, Haj Ismail *et al.*); astro-ph.HE/1309.7006 ICO-III 21.

Exotic Signatures in IceCube from Physics beyond the Standard Model – Signal Simulations and Background Studies (IceCube Collaboration, Gerhardt *et al.*); astro-ph.HE/1309.7007 ICO-IV 29.

Seasonal Variation of the Muon Multiplicity in Cosmic at South Pole (IceCube Collaboration, de Ridder *et al.*); astro-ph.HE/1309.7006 ICO-VIII 25.

Robust Statistics in IceCube Initial Muon Reconstruction (IceCube Collaboration, Wellons *et al.*); astro-ph.HE/1309.7010 ICO-VI 25.

Measurement of Atmospheric Neutrino Oscillations with IceCube / DeepCore in its 79-String Configuration (IceCube Collaboration, Wiebusch *et al.*); astro-ph.HE/ 1309.7008 ICO-V 25.

Optical and X-Ray Follow-Up Analyses with IceCube (IceCube Collaboration, Voge *et al.*); astro-ph.HE/1309.6979 ICO-I 40.

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Measurement of the Cosmic-Ray Composition and Energy Spectrum between 1 PeV and 1 EeV with IceTop and IceCube (IceCube Collaboration, Feusels *et al.*), [cbpf.br/~icrc2013/proc\\_icrc2013.html](http://cbpf.br/~icrc2013/proc_icrc2013.html) 0861; [astro-ph.HE/1309.7006](http://astro-ph.HE/1309.7006) ICO-III 25.

Stacked Searches for High-Energy Neutrinos from Blazars with the IceCube Detector (IceCube Collaboration, Schatto *et al.*); [astro-ph.HE/1309.6979](http://astro-ph.HE/1309.6979) ICO-I 44.

Inclined Cosmic-Ray Air Showers in IceCube (IceCube Collaboration, Gonzalez *et al.*); [astro-ph.HE/1309.7006](http://astro-ph.HE/1309.7006) ICO-III 33.

The Effect of Snow Accumulation on Signals in IceTop (IceCube Collaboration, Rawlins *et al.*); [astro-ph.HE/1309.7006](http://astro-ph.HE/1309.7006) ICO-III 37.

Search for Prompt Neutrino Emission from Gamma-Ray Bursts with IceCube (IceCube Collaboration, Richman *et al.*); [astro-ph.HE/1309.6979](http://astro-ph.HE/1309.6979) ICO-VI 48.

2011 – Beijing, China

*IceCube Collaboration Contributions to the 2011 ICRC are grouped together on astro-ph.HE/ and .IM in 6 distinct files. I is Point Source Searches, II is Diffuse, III is Cosmic Rays, IV is Searches for Dark Matter and Exotic Particles, V is Future Developments, and VI is Oscillations, Supernova and Ice.*

IceCube: Astrophysics and Astroparticle Physics at the South Pole (IceCube Collaboration, Kolanoski *et al.*); [astro-ph.HE/1111.5188](http://astro-ph.HE/1111.5188)

Search for Atmospheric-Neutrino-Induced Particle Showers with IceCube-40 (poster) (IceCube Collaboration, Middell *et al.*), *in Proc. of the 32nd ICRC HE2.3 1097 (2011)*; [astro-ph.HE/1111.2736](http://astro-ph.HE/1111.2736) (IC II) p. 5

Search for a Diffuse Flux of Astrophysical Muon Neutrinos with the IceCube Detector (IceCube Collaboration, Schukraft, Grullon, Wallraff *et al.*), *in Proc. of the 32nd ICRC HE2.3 736 (2011)*; [astro-ph.HE/1111.2736](http://astro-ph.HE/1111.2736) (IC II) p. 13

Studies on the Unfolding of the Atmospheric Neutrino Spectrum with IC59 Using the TRUEE Algorithm (poster) (IceCube Collaboration, Milke *et al.*), *in Proc. of the 32nd ICRC HE2.2 833 (2011)*; [astro-ph.HE/1111.2736](http://astro-ph.HE/1111.2736) (IC II) p. 1

The Search for Extremely High-Energy Neutrinos with IceCube (IceCube Collaboration, Wissing Ishihara *et al.*), *Proc. of 32nd ICRC HE1.3 949 (2011)*; [astro-ph.HE/1111.2736](http://astro-ph.HE/1111.2736) (IC II) p. 25

New Background Rejection Methods for the GZK Neutrino Search with IceCube (poster) (IceCube Collaboration, Auffenberg *et al.*), *in Proc. of the 32nd ICRC HE2.3 778 (2011)*; [astro-ph.HE/1111.2736](http://astro-ph.HE/1111.2736) (IC II) p. 29

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The Baseline Capability of the Cosmogenic Neutrino Search with IceCube (poster) (IceCube Collaboration, Ishihara *et al.*), in Proc. of the 32nd ICRC HE1.3 773 (2011); astro-ph.HE/1111.2735 (IC II) p. 21

Search for Astrophysical Neutrino-Induced Cascades Using IC40 (poster) (IceCube Collaboration, Hickford, Pannin *et al.*), in Proc. of the 32nd ICRC OG2.1 759 (2011); astro-ph.HE/1111.2736 (IC II) p. 17

Observation of Atmospheric-Neutrino-Induced Cascades in IceCube with DeepCore (poster) (IceCube Collaboration, Ha *et al.*), in Proc. of the 32<sup>nd</sup> ICRC HE2.2 324 (2011); astro-ph.HE/1111.2736 (IC II) p. 9

Atmospheric Neutrino Oscillations with DeepCore (poster) (IceCube Collaboration, Xu *et al.*), in Proc. of 32nd ICRC HE2.2 329 (2011); astro-ph.HE/1111.2731 (IC VI) p. 1

Study of South Pole Ice Transparency with IceCube Flashers (poster) (IceCube Collaboration, Chirkin *et al.*), in Proc. of 32nd ICRC HE2.3 333 (2011); astro-ph.HE/1111.2731 (IC VI) p. 9

Cosmic-Ray Composition from the 40-String IceCube/IceTop Detectors (IceCube Collaboration, Andeen, Rawlins, Feusels *et al.*), in Proc. of the 32nd ICRC HE1.1 923 (2011); astro-ph.HE/1111.2735 (IC III) p. 5

The IceTop Air Shower Array: Detector overview, physics goals, and first result (IceCube Collaboration, Kolanoski *et al.*), in Proc. of 32nd ICRC HE1.2 807 (2011); astro-ph.HE/1111.2735 (IC III) p. 1

Measurements of the Air Shower Parameters with IceTop (IceCube Collaboration, Hussain *et al.*), in Proc. of 32nd ICRC HE1.2 336 (2011); astro-ph.HE/1111.2735 (IC III) p. 13

Seasonal Variations of High-Energy Cosmic-Ray Muons Observed by the IceCube Observatory as a Probe of Kaon/Pion Ratio (poster) (IceCube Collaboration, Desiati *et al.*), in Proc. of 32nd ICRC HE1.1 662 (2011); astro-ph.HE/1111.2735 (IC III) p. 9

Atmospheric Muon Spectrum from Catastrophic Energy Losses in IceCube (IceCube Collaboration, Xu, Berghaus *et al.*), in Proc. of the 32nd ICRC HE2.3 85 (2011); astro-ph.HE/1111.2735 (IC III) p. 25

Observation of Anisotropy in the Arrival Direction Distribution of Cosmic Rays at TeV Energies with IceCube (IceCube Collaboration, BenZvi, Santander, Toscano, Westerhoff *et al.*), in Proc. of the 32nd ICRC HE2.1 306 (2011); astro-ph.HE/1111.2735 (IC III) p. 41

Energy Dependence of the Large-Scale Galactic Cosmic-Ray Anisotropy Measured with IceCube (IceCube Collaboration, Abbasi, Desiati *et al.*), in Proc. of the 32nd ICRC HE1.1 305 (2011); astro-ph.HE/1111.2735 (IC III) p. 37

Measurement of the Solar Anisotropy with IceCube (poster) (IceCube Collaboration, Abbasi *et al.*), in Proc. of 32nd ICRC HE1.1 308 (2011); astro-ph.HE/1111.2735 (IC III) p. 45



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- Extensive Air Showers Measured by the 79-String IceCube Observatory at South Pole (poster) (IceCube Collaboration, Feusels, Tilav *et al.*), *in Proc. of the 32nd ICRC HE1.2 838 (2011)*; astro-ph.HE/1111.2735 (IC III) p. 17
- Simulation of IceTop VEM Calibration and the Dependency on the Snow Layer (poster)(IceCube Collaboration, Feusels for Van Overloop *et al.*), *in Proc. of the 32nd ICRC HE1.1 899 (2011)*; astro-ph.HE/1111.2735 (IC III) p. 21
- Study of High  $p_T$  Muons in IceCube (poster) (IceCube Collaboration, Gerhardt, Klein *et al.*), *in Proc. of 32nd ICRC HE2.1 323 (2011)*; astro-ph.HE/1111.2735 (IC III) p. 29
- Study of Forbush Decreases with IceTop (poster) (IceCube Collaboration, Kuwabara, Evenson *et al.*), *in Proc. of the 32nd ICRC SH2.6 921 (2011)*; astro-ph.HE/ 1111.2735 (IC III) p. 49
- Searching for PeV Gamma Rays with IceCube (IceCube Collaboration, Buitink *et al.*), *in Proc. of the 32nd ICRC HE1.1 939 (2011)*; astro-ph.HE/1111.2735 (IC III) p. 33
- Time-Independent Searches for Astrophysical Neutrino Sources with the Combined Data of 40 and 59 Strings of IceCube (poster)(IceCube Collaboration, Baker *et al.*), *in Proc. of the 32nd ICRC OG2.3 909 (2011)*; astro-ph.HE/1111.2741 (IC I) p. 1
- Search for Astrophysical Neutrinos from Extended and Stacked Sources with IceCube (poster) (IceCube Collaboration, Baker, Kurahashi *et al.*), *in Proc. of the 32nd ICRC OG2.1 796 (2011)*; astro-ph.HE/1111.2741 (IC I) p. 9
- Searches for Time-Variable Neutrino Point Sources with the IceCube Observatory (poster) (IceCube Collaboration, Baker *et al.*), *in Proc. of the 32nd ICRC OG2.3 784 (2011)*; astro-ph.HE/1111.2741 (IC I) p. 5
- Search for Galactic Cosmic-Ray Accelerators with the Combined IceCube 40-String and AMANDA Detectors (poster) (IceCube Collaboration, Odrowski, Resconi, Sestayo *et al.*), *in Proc. of 32nd ICRC HE2.3 320 (2011)*; astro-ph.HE/1111.2741 (IC I) p. 13
- Time-Dependent Search for Neutrino Multiflare Sources with the IceCube 59-String Data (poster) (IceCube Collaboration, Góra, Bernardini, Cruz Silva *et al.*), *in Proc. of the 32nd ICRC OG2.5 289 (2011)*; astro-ph.HE/1111.2741 (IC I) p. 17
- Limits on Neutrino Emission from Gamma-Ray Bursts with the 59-String IceCube Detector (IceCube Collaboration, Redl *et al.*), *in Proc. of the 32nd ICRC HE2.3 764 (2011)*; astro-ph.HE/1111.2741 (IC I) p. 29
- Optical Followup Program of IceCube Multiplets: Testing for Soft Relativistic Jets in Core-Collapse Supernovae (poster) (IceCube Collaboration, Franckowiak *et al.*, C. Akerlof *et al.*), *in Proc. of the 32nd ICRC HE2.3 445 (2011)*; astro-ph.HE/1111.2741 (IC I) p. 21
- SWIFT Followup of IceCube Multiplets (poster) (IceCube Collaboration, Homaier *et al.* & SWIFT collaboration, M. Smith *et al.*), *in Proc. of the 32nd ICRC HE2.3 535 (2011)*; astro-ph.HE/ 1111.2741 (IC I) p. 25

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- Detecting Neutrinos from Choked GRB with IceCube's DeepCore (poster) (IceCube Collaboration, Daughhetee, Taboada *et al.*), *in Proc. of the 32nd ICRC OG2.4 288 (2011)*; astro-ph.HE/1111.2741 (IC I) p. 33
- The Shadow of the Moon in Cosmic Rays Measured with IceCube (IceCube Collaboration, Boersma *et al.* & H. Stiebel), *in Proc. of the 32nd ICRC HE2.3 1235 (2011)*; astro-ph.HE/1111.2741 (IC I) p. 41
- Neutrino-Triggered High-Energy Gamma-Ray Follow-Up with IceCube (poster) (IceCube Collaboration, Gora, Franke, Bernardini *et al.*), *in Proc. of the 32nd ICRC HE2.3 334 (2011)*; astro-ph.HE/1111.2741 (IC I) p. 37
- First Step Toward a New Proton Decay Experiment in Ice (poster) (IceCube Collaboration, Odrowski *et al.*), *Proc. of 32nd ICRC HE3.2 325 (2011)*; astro-ph.IM/1111.2742 (IC V) p. 13
- The Radio Air Shower Test Array (RASTA) - Enhancing the IceCube Observatory (IceCube Collaboration, DuVernois *et al.*), *in Proc. of the 32nd ICRC HE1.4 1102 (2011)*; astro-ph.IM/1111.2742 (IC V) p. 5
- Status and Recent Results of the South Pole Acoustic Test Setup (IceCube Collaboration, Abdou *et al.*), *Proc. of the 32nd ICRC HE1.4 316 (2011)*; astro-ph.IM/1111.2742 (IC V) p. 1
- IceCube's In-Ice Radio-Frequency Extension (IceCube Collaboration, Landsman, Richman, Hoffman *et al.*), *Proc. of 32nd ICRC HE2.3 1236 (2011)*; astro-ph.IM/1111.2742 (IC V) p. 9
- Supernova Detection with IceCube and Beyond (poster) (IceCube Collaboration, Ribordy *et al.*), *in Proc. of the 32nd ICRC HE2.3 1137 (2011)*; astro-ph.HE/1111.2731 (IC VI) p. 5
- Search for Dark Matter in the Milky Way with IceCube (IceCube Collaboration, Rott, Bissok *et al.*), *in Proc. of the 32nd ICRC HE3.4 1187 (2011)*; astro-ph.HE/1111.2738 (IC IV) p. 9
- Indirect Search for Solar Dark Matter with AMANDA and IceCube (IceCube Collaboration, Engdegård *et al.*), *Proc. 32nd ICRC HE3.4 327 (2011)*; astro-ph.HE/1111.2738 (IC IV) p. 1
- Searches for Dark Matter Annihilations in the Sun with IceCube and DeepCore in the 79-String Configuration (poster) (IceCube Collaboration, Danninger, Strahler *et al.*), *in Proc. of the 32nd ICRC HE3.4 292 (2011)*; astro-ph.HE/1111.2738 (IC IV) p. 5
- Search Strategies for Dark Matter in Nearby Dwarf Spheroidal Galaxies with IceCube (IceCube Collaboration, Lünemann, Rott *et al.*), *in Proc. of the 32nd ICRC HE3.4 1024 (2011)*; astro-ph.HE/1111.2738 (IC IV) p. 13
- Search Strategies for Relativistic Magnetic Monopoles with the IceCube Neutrino Telescope (poster) (IceCube Collaboration, Posselt, Christy *et al.*), *in Proc. of the 32nd ICRC HE3.3 734 (2011)*; astro-ph.HE/1111.2738 (IC IV) p. 17

# International Cosmic Ray Conference (ICRC) Proceedings

2009 – Lodz, Poland

IceCube Collaboration Contributions to the 2009 ICRC are grouped together as *astro-ph.HE/10042093 (2010)*.

Sensor Development and Calibration for Acoustic Neutrino Detection in Ice (IceCube Collaboration, Bissok *et al.*), *in Proc. of the 31<sup>st</sup> ICRC HE2.4 903; astro-ph.IM/0907.3561*

Physics Capabilities of the IceCube DeepCore Detector (IceCube Collaboration, Wiebusch *et al.*), *in Proc. of the 31<sup>st</sup> ICRC OG2.5 1352; astro-ph.IM/0907.2263*

Large-Scale Cosmic-Ray Anisotropy with IceCube (IceCube Collaboration, Abbasi, Desiati *et al.*), *in Proc. of the 31<sup>st</sup> ICRC SH3.2 1340; astro-ph.HE/0907.0498*

Search for the Kaluza-Klein Dark Matter with the AMANDA / IceCube Detectors (IceCube Collaboration, Danninger, Han *et al.*), *in Proc. of the 31<sup>st</sup> ICRC HE2.3 1356; astro-ph.HE/0906.3969*

AMANDA 7-yr Multipole Analysis (IceCube Collaboration, Schukraft, Hülß *et al.*), *in Proc. of the 31<sup>st</sup> ICRC OG2.5 1127; astro-ph.HE/0906.3942*

Searches for WIMP Dark Matter from the Sun with AMANDA (IceCube Collaboration, Braun, Hubert *et al.*), *in Proc. of the 31<sup>st</sup> ICRC HE2.3 834; astro-ph.HE/0906.1615*

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Cosmic-Ray Composition Using SPASE-2 and AMANDA (IceCube Collaboration, Andeen *et al.*), *in Proc. of the 31<sup>st</sup> ICRC HE1.2 785*

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Search for High-Energetic Neutrinos from Supernova Explosions with AMANDA (IceCube Collaboration, Lennarz *et al.*), *in Proc. of the 31<sup>st</sup> ICRC OG2.5 1198*; astro-ph.HE/0907.4621

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Neutrino Triggered High-Energy Gamma-Ray Follow-Up with IceCube (IceCube Collaboration, Franke *et al.*), *in Proc. of the 31<sup>st</sup> ICRC OG2.5 987*

IceCube / AMANDA Combined Analyses for the Search of Neutrino Sources at Low Energies (IceCube Collaboration, Portello-Roucelle *et al.*), *in Proc. of the 31<sup>st</sup> ICRC OG2.5 1289*

First Search for Extraterrestrial Neutrino-Induced Cascades with IceCube (IceCube Collaboration, Kiryluk *et al.*), *in Proc. of the 31<sup>st</sup> ICRC OG2.5 882*; astro-ph.HE/0909.0989

Atmospheric Neutrino Oscillation Measurements with IceCube (IceCube Collaboration, Rott *et al.*), *in Proc. of the 31<sup>st</sup> ICRC HE 2.2 785*

Search for Ultra-High-Energy Neutrinos with AMANDA (IceCube Collaboration, Silvestri *et al.*), *in Proc. of the 31<sup>st</sup> ICRC OG2.5 549*

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Optical Follow-Up of High-Energy Neutrinos Detected by IceCube (IceCube and ROTSE collaborations, Francowiak *et al.*), *in Proc. of the 31<sup>st</sup> ICRC OG2.5 764*; astro-ph.HE/0909.0631

Search for GRB Neutrinos via a (Stacked) Time Profile Analysis (IceCube Collaboration, Duvoort *et al.*), *in Proc. of the 31<sup>st</sup> ICRC OG2.4 393*

Search for Neutrinos from GRBs with the IceCube 22-String Detector & Sensitivity Estimates for the Full Detector (IceCube Collaboration, Meagher *et al.*), *Proc. of the 31<sup>st</sup> ICRC OG2.4 1221*

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The Extremely High-Energy Neutrino Search with IceCube (IceCube Collaboration, Mase *et al.*), *in Proc. of the 31<sup>st</sup> ICRC HE1.4 861*

Study of Very Bright Cosmic-Ray Induced Muon Bundle Signatures Measured by the IceCube Detector (IceCube Collaboration, Ishihara *et al.*), *in Proc. of the 31<sup>st</sup> ICRC HE1.5 913*

Supernova Search with the AMANDA / IceCube Neutrino Telescopes (IceCube Collaboration, Kowarik *et al.*), *in Proc. of the 31<sup>st</sup> ICRC OG2.2 1251; astro-ph.HE/0908.0441*

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Study of High pT Muons in IceCube (IceCube Collaboration, Gerhardt *et al.*), *in Proc. of the 31<sup>st</sup> ICRC HE1.5 519; astro-ph.HE/0909.0055*

Search for High-Energy Tau Neutrinos in IceCube (IceCube Collaboration, Seo *et al.*), *in Proc. of the 31<sup>st</sup> ICRC OG2.5 1372*

Implementation of an Active Veto against Atmospheric Muons in IceCube DeepCore (IceCube Collaboration, Euler *et al.*), *in Proc. of the 31<sup>st</sup> ICRC OG2.5 1289*

Fundamental Neutrino Measurements with IceCube DeepCore (IceCube Collaboration, Grant *et al.*), *in Proc. of the 31<sup>st</sup> ICRC HE2.2 1336*

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2007 – Merida, Mexico

IceCube - Construction Status and Performance Results of the 22-String Detector (IceCube Collaboration, Karle *et al.*), *Proc. of the 30<sup>th</sup> ICRC 6 835 HE3.5; astro-ph/0711353, 7*

The Combined AMANDA and IceCube Neutrino Telescope (IceCube Collaboration, Gross *et al.*), *in Proc. of the 30<sup>th</sup> ICRC 3 1253 OG2.5; astro-ph/0711353, 11*

Performance of IceTop Array (IceCube Collaboration, Gaisser *et al.*), *in Proc. of the 30<sup>th</sup> ICRC 5 1001 HE1.5; astro-ph/0711353, 15*

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Heliospheric Physics with IceTop (IceCube Collaboration, Kuwabara et al.), in Proc. of the 30<sup>th</sup> ICRC 1 339 SH2.1; astro-ph/0711353, 19

Measuring Cosmic Ray Composition at the Knee with SPASE2 and AMANDA (SPASE2 and IceCube collaborations, Andeen et al.), in Proc. of the 30<sup>th</sup> ICRC 2 165 OG1.2; astro-ph/0711353, 23

Cosmic Rays in IceCube: Composition-Sensitive Observables (IceCube Collaboration, Song et al.), in Proc. of the 30<sup>th</sup> ICRC 6 143 HE1.2A; astro-ph/0711353, 27

Search for TeV Gamma Rays from Point Sources with SPASE-2 (IceCube Collaboration, James et al.), in Proc. of the 30<sup>th</sup> ICRC 2 735 OG2.2; astro-ph/0711353, 31

Study of High  $p_T$  Muons in Air Showers with IceCube (IceCube Collaboration, Klein et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1249 HE2.1; astro-ph/0711353, 35

IceTop/IceCube Coincidences (IceCube Collaboration, Bai et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1209 HE2.1; astro-ph/0711353, 39

Lateral Distribution of Air Shower Signals and Initial Energy Spectrum (IceCube Collaboration, Klepser et al.), in Proc. of the 30<sup>th</sup> ICRC 4 35 HE1.1A; astro-ph/0711353, 43

IceTop Tank Response to Muons (IceCube Collaboration, Demiroers et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1261 HE2.1; astro-ph/0711353, 47

Response of IceTop Tanks to Low-Energy Particles (IceCube Collaboration, Clem et al.), in Proc. of the 30<sup>th</sup> ICRC 1 237 SH1.8; astro-ph/0711353, 51

Testing Alternative Oscillation Scenarios with Atmospheric Neutrinos using AMANDA-II Data from 2000 to 2003 (IceCube Collaboration, Ahrens et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1295 HE2.2; astro-ph/0711353, 55

Atmospheric Muon Neutrino Analysis with IceCube (IceCube Collaboration, Pretz et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1315 HE2.2; astro-ph/0711353, 59

Muon Energy Reconstruction and Atmospheric Neutrino Spectrum Unfolding with the IceCube Detector (IceCube Collaboration, Zornoza et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1275 HE2.2; astro-ph/0711353, 63

Searches for a Diffuse Flux of Extra-Terrestrial Muon Neutrinos with AMANDA and IceCube (IceCube Collaboration, Hoshina et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1449 HE2.3; astro-ph/0711353, 67

Measurement of the Atmospheric Lepton Energy Spectra with AMANDA-II (IceCube Collaboration, München et al.), in Proc. of the 30<sup>th</sup> ICRC 3 1225 OG2.5; astro-ph/0711353, 71

Multi-Year Search for Ultra-High Energy Neutrinos with AMANDA-II (IceCube Collaboration, Gerhardt et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1429 HE2.3; astro-ph/0711353, 75

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- Likelihood Deconvolution of Diffuse Prompts and Extra-Terrestrial Neutrino Fluxes in the AMANDA-II Detector (IceCube Collaboration, Hill et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1453 HE2.3; astro-ph/0711353, 79
- Search for Neutrino-Induced Cascades with AMANDA Data taken in 2000-2004 (IceCube Collaboration, Tarasova et al.), in Proc. of 30<sup>th</sup> ICRC 5 1461 HE2.3; astro-ph/0711353, 83
- Very-High-Energy Electromagnetic Cascades in the LPM Regime with IceCube (IceCube Collaboration, Bolmont et al.), in Proc. of 30<sup>th</sup> ICRC 3 1245 OG2.5; astro-ph/0711353, 91
- IceCube Performance with Artificial Light Sources: the Road to a Cascade Analyses (IceCube Collaboration, Kiryluk et al.), in Proc. of the 30<sup>th</sup> ICRC 3 1233 OG2.5; astro-ph/0711353, 95
- Neutrino Point-Source Search Strategies for AMANDA-II and Results for 2005 data (IceCube Collaboration, Braun et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1437 HE2.3; astro-ph/0711353, 99
- Point-Source Analysis for Cosmic Neutrinos beyond PeV Energies with AMANDA and IceCube (IceCube Collaboration, Ackermann et al.), in Proc. of the 30<sup>th</sup> ICRC 4 1357 HE2.3; astro-ph/0711353, 103
- 9-String IceCube Point-Source Analysis (IceCube Collaboration, Finley et al.), in Proc. of the 30<sup>th</sup> ICRC 4 1389 HE2.3; astro-ph/0711353, 107
- Search for Signatures of Extra-Terrestrial Neutrinos with a Multipole Analysis of the AMANDA-II Sky Map (IceCube Collaboration, Hülß et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1405 HE2.3; astro-ph/0711353, 111
- Cluster Search for Neutrino Flares from Predefined Directions (IceCube Collaboration, Satalacka et al.), Proc. of the 30<sup>th</sup> ICRC 5 1353 HE2.3; astro-ph/0711353 115
- All-Sky Search for Transient Sources of Neutrinos using 5 Years of AMANDA-II data (IceCube Collaboration, Porrata et al.), in Proc. of 30<sup>th</sup> ICRC 5 1393 HE2.3; astro-ph/0711353, 119
- Neutrino Triggered Target of Opportunity (NToO) Test Run with AMANDA and MAGIC (IceCube Collaboration, Ackermann et al.), in Proc. of the 30<sup>th</sup> ICRC 3 1257 OG2.5; astro-ph/0711353, 123
- Detecting GRBs with IceCube and Follow-Up Observations (IceCube Collaboration, Kappes et al.), in Proc. of the 30<sup>th</sup> ICRC 3 1171 OG2.4; astro-ph/0711353, 127
- Search for Neutralino Dark Matter with the AMANDA Neutrino Telescope (IceCube Collaboration, Hubert et al.), in Proc. of the 30<sup>th</sup> ICRC 4 709 HE3.3; astro-ph/0711353, 131
- Prospect of Dark-Matter Detection in IceCube (IceCube Collaboration, Wikstrom et al.), in Proc. of the 30<sup>th</sup> ICRC 6 741 HE3.3; astro-ph/0711353, 135

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Search for Relativistic Magnetic Monopoles with AMANDA-II (IceCube Collaboration, Wissing et al.), in Proc. of the 30<sup>th</sup> ICRC 4 799 HE3.4; astro-ph/0711353, 139

Subrelativistic Particle Searches with the AMANDA-II Detector (IceCube Collaboration, Pohl et al.), in Proc. of the 30<sup>th</sup> ICRC 6 795 HE3.4; astro-ph/0711353, 143

Exotic Particle Searches with IceCube (IceCube Collaboration, Christy et al.), in Proc. of the 30<sup>th</sup> ICRC 6 795 HE3.4; astro-ph/0711353, 147

Effect of the Improved Data Acquisition System of IceCube on its Neutrino-Detection Capabilities (IceCube Collaboration, Chirkin et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1149 HE1.5; astro-ph/0711353, 151

Improved Cherenkov Light Propagation Methods for the IceCube Neutrino Telescope (IceCube Collaboration, Lundberg et al.), in Proc. of 30<sup>th</sup> ICRC 5 1519 HE2.4; astro-ph/0711353, 155

Reconstruction of High-Energy Muon Events in IceCube using Waveforms (IceCube Collaboration, Grullon et al.), in Proc. of the 30<sup>th</sup> ICRC 5 1457 HE2.3; astro-ph/0711353, 159

Radio Detection of GZK Neutrinos: AURA Status and Plans (IceCube Collaboration, Landsman et al.), in Proc. of the 30<sup>th</sup> ICRC 4 827 HE3.5; astro-ph/0711353, 163

The Highest Energy Neutrinos, highlight talk at the 30<sup>th</sup> Intl. Cosmic Ray Conference, Merida, Mexico (2007), Proc. of the 30<sup>th</sup> ICRC 1323 (2008); astro-ph/0714156.

### 2005 – Pune, India

Declination-dependent Study of AMANDA-II Atmospheric Neutrino Data (IceCube Collaboration, Halzen et al.), in Proc. of the 29<sup>th</sup> ICRC, 00 101.

An Investigation of Seasonal Variations in the Atmospheric Neutrino Rate with the AMANDA-II Neutrino Telescope (IceCube Collaboration, Ackerman et al.), in Proc. of 29<sup>th</sup> ICRC, 9 107.

Search for Diffuse Flux of Extraterrestrial Muon Neutrinos using AMANDA-II Data from 2000 to 2003 (IceCube Collaboration, Hodges *et al.*), in Proc. of 29<sup>th</sup> ICRC, 5 115.

Search for a Diffuse Flux of Non-Terrestrial Muon Neutrinos with the AMANDA Detector (IceCube Collaboration, Munich *et al.*), in Proc. of the 29<sup>th</sup> ICRC, 5 17.

Sensitivity of AMANDA-II to UHE Neutrinos (IceCube Collaboration, Gerhardt *et al.*), in Proc. of the 29<sup>th</sup> ICRC, 5 111.

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The Search for Neutrinos from Gamma-Ray Bursts with AMANDA (IceCube Collaboration, Kuehn *et al.*), in Proc. of the 29<sup>th</sup> ICRC, 5 131.



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Neutrino-Induced Cascades from GRBs with AMANDA-II (IceCube Collaboration, Hughey *et al.*), *in Proc. of the 29<sup>th</sup> ICRC*, **5** 119.

Air Showers with IceCube: First Engineering Data (IceCube Collaboration, Gaisser *et al.*), *in Proc. of the 29<sup>th</sup> ICRC*, **8** 315.

Calibration and Characterization of Photomultiplier Tubes of the IceCube Neutrino Detector (IceCube Collaboration, Miyamoto *et al.*), *in Proc. of the 29<sup>th</sup> ICRC*, **5** 63.

IceCube: Initial Performance (IceCube Collaboration, Chirkin *et al.*), *in Proc. of 29<sup>th</sup> ICRC*, **8** 303.

Simulation of a Hybrid Optical/Radio/Extension to IceCube for EeV Neutrino Detection (IceCube Collaboration, Besson *et al.*), *in Proc. of the 29<sup>th</sup> ICRC*, **5** 21; astro-ph/0512604.

Multiwavelength Comparison of Selected Neutrino Point Source Candidates (IceCube Collaboration, Ackermann *et al.*), *in Proc. of the 29<sup>th</sup> ICRC*, **00** 101.

A Search for High-Energy Muon Neutrinos from the Galactic Plane with AMANDA-II (IceCube Collaboration, Kelley *et al.*), *in Proc. of the 29<sup>th</sup> ICRC*, **5** 127; astro-ph/0509546.

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A Source-Stacking Analysis of AGN as a Neutrino Point Source Candidates with AMANDA (IceCube Collaboration, Gross *et al.*), *in Proc. of the 29<sup>th</sup> ICRC*, **5** 13.

Performance of AMANDA-II using Transient Waveform Recorders (IceCube Collaboration, Silvestri *et al.*), *in Proc. of the 29<sup>th</sup> ICRC*, **5** 431.

A Software Trigger for the AMANDA Neutrino Detector (IceCube Collaboration, Messarius *et al.*), *in Proc. of the 29<sup>th</sup> ICRC*, **5** 207.

Search for Neutralino Dark Matter with the AMANDA Neutrino Detector (IceCube Collaboration, Hubert *et al.*), *in Proc. of the 29<sup>th</sup> ICRC*, **9** 179.

Neutrino Astronomy with IceCube and AMANDA (IceCube Collaboration, Hill *et al.*), *in Proc. of the 29<sup>th</sup> ICRC*, **10** 213.

2003 – Tsukuba, Japan

Measurement of the Cosmic Ray Composition at the Knee with the SPASE-2/ AMANDA-B10 Detectors (SPASE and AMANDA collaborations, Rawlins *et al.*) *in Proc. of the 28<sup>th</sup> ICRC*, HE1.1 173.

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Simulation of Ice Cherenkov Detectors for IceTop (IceCube Collaboration, Stanev *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, HE1.5 965.*

IceTop: The Surface Component of IceCube (IceCube Collaboration, Gaisser *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, HE1.5 1117.*

Cosmic Ray Flux Measurement with AMANDA-II (AMANDA collaboration, Chirkin *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, HE2.1 1211.*

Search for High Energy Neutrinos of All Flavors with AMANDA II (AMANDA collaboration, Kowalski *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, HE2.3 1301.*

Search for Extraterrestrial Point Sources of Neutrinos with AMANDA-II (AMANDA collaboration, Karle *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, HE2.3 1305.*

AMANDA-B10 Limit on UHE Muon-Neutrinos (AMANDA collaboration, Hundertmark *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, HE2.3 1309.*

Atmospheric Neutrino and Muon Spectra Measured with the AMANDA-II Detector (AMANDA collaboration, Geenan *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, HE2.3 1313.*

Search for Diffuse Fluxes of Extraterrestrial Muon-Neutrinos with the AMANDA Detectors (AMANDA collaboration, Hill *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, HE2.3 1317.*

Online Search for Neutrino Bursts from Supernovae with the AMANDA Detector (AMANDA collaboration, Feser *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, HE2.3 1325.*

New Capabilities of the AMANDA-II High Energy Neutrino Detector (AMANDA collaboration, Wagner *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, HE2.3 1365.*

The IceCube High Energy Neutrino Telescope (IceCube Collaboration, Yoshida *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, HE2.3 1369.*

Response of AMANDA-II to Cosmic Ray Muons (AMANDA collaboration) *in Proc. of the 28<sup>th</sup> ICRC, HE2.3 1373.*

Search for Muons from WIMP Annihilation in the Center of the Earth with the AMANDA-B10 Detector (AMANDA collaboration, Olbrechts *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, HE3.3 1677.*

Searching for High Energy Muon Neutrinos from Gamma-Ray Bursts with AMANDA (AMANDA collaboration, Hill *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, OG2.4 2717.*

Recent Results from the AMANDA Neutrino Telescope (AMANDA collaboration, Köpke *et al.*) *in Proc. of the 28<sup>th</sup> ICRC, 8 323.*

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2001 – Hamburg, Germany

Analysis of Atmospheric Muons with AMANDA (AMANDA collaboration, Desiati *et al.*), in Proc.of the 27<sup>th</sup> ICRC, HE 2.1 HE205 985.

Calibration and Survey of AMANDA with SPASE (SPASE and AMANDA collaborations, Bai *et al.*), in Proc.of the 27<sup>th</sup> ICRC, HE 2.1 HE205 977.

Observation of High Energy Atmospheric Neutrinos with AMANDA (AMANDA collaboration, Wiebusch *et al.*) in Proc.of the 27<sup>th</sup> ICRC, HE 2.3 18:12 1109.

Search for a Diffuse Flux from Sources of High Energy Neutrinos with AMANDA-B10 (AMANDA collaboration, Hill *et al.*) in Proc.of the 27<sup>th</sup> ICRC, HE 2.3 18:24 1113.

Search for Cascade-like Events in the AMANDA-B10 Detector (AMANDA collaboration, Taboada *et al.*) in Proc.of the 27<sup>th</sup> ICRC, HE 2.3 18:36 1117.

Supernova Neutrino-Burst Search with the AMANDA Detector (AMANDA collaboration, Neunhoffer *et al.*) in Proc.of the 27<sup>th</sup> ICRC, HE 2.3 HE231 1125.

The AMANDA Search for High Energy Neutrinos from Gamma-Ray Bursts (AMANDA collaboration, Hardtke *et al.*) in Proc.of the 27<sup>th</sup> ICRC, HE 2.3 HE 232 1121.

Performance of the AMANDA-II Detector (AMANDA collaboration, Wischnewski *et al.*) in Proc.of the 27<sup>th</sup> ICRC, HE 2.3 HE233 1105.

A Method to Detect UHE Neutrinos with AMANDA (AMANDA collaboration, Hundertmark *et al.*) in Proc. of the 27<sup>th</sup> ICRC, HE 2.3 HE236 1129.

Time Calibration of the AMANDA Neutrino Telescope with Cosmic Ray Muons (AMANDA collaboration, Cowen *et al.*) in Proc. of the 27<sup>th</sup> ICRC, HE 2.3 HE 237 1133.

Potential of AMANDA-II in HE Neutrino Astrophysics (AMANDA collaboration, Barwick *et al.*) in Proc. of the 27<sup>th</sup> ICRC, HE 2.5 19:24 1101.

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Science Potential of the IceCube Detector (AMANDA collaboration, Spiering *et al.*) in Proc. of the 27<sup>th</sup> ICRC, HE 2.5 HE256 1242.

Search for Relativistic Monopoles with the AMANDA Detector (AMANDA collaboration, Niessen *et al.*) in Proc. of the 27<sup>th</sup> ICRC, HE 3.4 HE 315 1496.

Performance Studies for the IceCube Detector (IceCube Collaboration, Leuthold *et al.*) in Proc. of the 27<sup>th</sup> ICRC, 1241.

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1999 – Salt Lake City, Utah

From the First Neutrino Telescope, the Antarctic Muon and Neutrino Detector Array AMANDA, to the IceCube Observatory (AMANDA collaboration, Halzen *et al.*), *in Proc. of the 26<sup>th</sup> ICRC*, HE6.3.01 **2 428**.

Observation of Atmospheric Neutrino Events with AMANDA (AMANDA collaboration, Karle *et al.*) *in Proc. of the 26<sup>th</sup> ICRC*, HE4.2.05 **2 221**.

Nearly Vertical Upgoing Muons in the AMANDA B-10 Detector (AMANDA collaboration, Dahlberg *et al.*), *in Proc. of the 26<sup>th</sup> ICRC*, HE5.3.06 **2 348**.

Seasonal Variation of the Muon Flux Seen by AMANDA (AMANDA collaboration, Bouchta *et al.*) *in Proc. of the 26<sup>th</sup> ICRC*, HE3.2.11 **2 108**.

AMANDA Search for High-Energy Neutrinos Accompanying Gamma-Ray Bursts (AMANDA collaboration, Bay *et al.*) *in Proc. of the 26<sup>th</sup> ICRC*, E4.2.06 **2 225**.

Supernova Burst Analysis with the AMANDA Neutrino Telescope (AMANDA collaboration, Wischnewski *et al.*) *in Proc. of the 26<sup>th</sup> ICRC*, HE4.2.07 **2 229**.

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## Conference Presentations and Proceedings

The IceCube Upgrade (IceCube Collaboration, Delia Tosi et al.), 5<sup>th</sup> Workshop of the SCAR Astronomy and Astrophysics from Antarctica (ScarAAA2019), Mont Blanc, Switzerland; [docushare.icecube.wisc.edu/dsweb/Get/Document-86650/IceCubeUpgrade\\_v2.pdf](https://docushare.icecube.wisc.edu/dsweb/Get/Document-86650/IceCubeUpgrade_v2.pdf)

Recent Results from the IceCube Neutrino Observatory (IceCube Collaboration, Jim Madsen et al.), ScarAAA2019; [docushare.icecube.wisc.edu/dsweb/Get/Document-86625/IceCubeResults\\_SCAR\\_AAA\\_2019\\_final.pdf](https://docushare.icecube.wisc.edu/dsweb/Get/Document-86625/IceCubeResults_SCAR_AAA_2019_final.pdf)

Recent IceCube Measurements Using High-Energy Neutrinos (IceCube Collaboration, Hans Niederhausen et al.), 18<sup>th</sup> Conf. on Elastic and Diffractive Scattering (EDS Blois 2019), Quy Nhon, Vietnam; [docushare.icecube.wisc.edu/dsweb/Get/Document-86714/Niederhausen%20slides.pdf](https://docushare.icecube.wisc.edu/dsweb/Get/Document-86714/Niederhausen%20slides.pdf)

Searching for the Galactic Sources of High-Energy Neutrinos (IceCube Collaboration, Ali Kheirandish et al.), IGC@25: Multimessenger Universe, State College, Pennsylvania (2019); [docushare.icecube.wisc.edu/dsweb/Get/Document-86715/Kheirandish%20slides.pdf](https://docushare.icecube.wisc.edu/dsweb/Get/Document-86715/Kheirandish%20slides.pdf)

Cosmic-Ray Composition and Spectrum from 3 PeV to 1 EeV Using the IceCube and IceTop Detectors (IceCube Collaboration, Katherine Rawlins et al.), Intl. Symposium on Cosmic Rays and Astrophysics (ISCRA 2019), Moscow, Russia; [docushare.icecube.wisc.edu/dsweb/Get/Document-86656/iscra\\_composition\\_v3.pdf](https://docushare.icecube.wisc.edu/dsweb/Get/Document-86656/iscra_composition_v3.pdf)

Measurements of Cosmic-Ray Muon Distributions with IceTop and IceCube (IceCube Collaboration, Katherine Rawlins et al.), ISCRA 2019; [docushare.icecube.wisc.edu/dsweb/Get/Document-86655/iscra\\_muons\\_v3.pdf](https://docushare.icecube.wisc.edu/dsweb/Get/Document-86655/iscra_muons_v3.pdf)

Expected Spectra of Muon-Induced Cascades in IceCube (IceCube Collaboration, Semyon Khokhlov et al.), ISCRA 2019; [docushare.icecube.wisc.edu/dsweb/Get/Document-86672/proceedings\\_Khokhlov.pdf](https://docushare.icecube.wisc.edu/dsweb/Get/Document-86672/proceedings_Khokhlov.pdf)

High-Energy Neutrino Astronomy: Current Status and Prospects (IceCube Collaboration, Gwenhaël de Wasseige et al.), European Physics Society Conf. on High-Energy Physics (EPS HEP 2019), Ghent, Belgium, PoS EPS-HEP2019 (2020), 042; [docushare.icecube.wisc.edu/dsweb/Get/Document-87087/de%20Wasseige%20HE%20nu%20slides.pdf](https://docushare.icecube.wisc.edu/dsweb/Get/Document-87087/de%20Wasseige%20HE%20nu%20slides.pdf)

Detection of a Neutrino Event at the Glashow Resonance Energy in IceCube (IceCube Collaboration, Christian Haack et al.), EPS HEP 2019; [indico.cern.ch/event/577856/contributions/3422129/](https://indico.cern.ch/event/577856/contributions/3422129/)

Neutrino Oscillations in IceCube (IceCube Collaboration, Christian Haack et al.), EPS HEP 2019; [indico.cern.ch/event/577856/contributions/3457522/](https://indico.cern.ch/event/577856/contributions/3457522/)

IceCube's Latest and IceCube-Gen2 Prospectives (IceCube Collaboration, Alessio Porcelli et al.), 15<sup>th</sup> Intl. Conf. on the Dark Side of the Universe, Buenos Aires, Argentina (2019); [docushare.icecube.wisc.edu/dsweb/Get/Document-87091/Porcelli%20slides.pdf](https://docushare.icecube.wisc.edu/dsweb/Get/Document-87091/Porcelli%20slides.pdf)

## Conference Presentations and Proceedings

Results and Highlights from IceCube (IceCube Collaboration, Tianlu Yuan et al.), Precision Investigations of the Neutrino Sector, Menlo Park, California (2019);  
[docushare.icecube.wisc.edu/dsweb/Get/Document-86787/pins19.pdf](https://docushare.icecube.wisc.edu/dsweb/Get/Document-86787/pins19.pdf)

Cosmic Neutrinos and the Cosmic-Ray Accelerator TXS 0506+056, 36<sup>th</sup> International Cosmic Ray Conference, Madison, WI (2019); [astro-ph.HE/1909.09468](https://astro-ph.HE/1909.09468).

Neutrino oscillations and PMNS unitarity with IceCube/DeepCore and the IceCube Upgrade (IceCube Collaboration, Tom Stuttard et al.), PoS NuFact2019 099 (2020);  
[pos.sissa.it/369/099/pdf](https://pos.sissa.it/369/099/pdf)

Probing Beyond Standard Model Physics via Oscillations with IceCube DeepCore (IceCube Collaboration, S. Blot et al.), J. Phys. Conf. Ser. **1468** 1 012168 (2020);  
[iopscience.iop.org/article/10.1088/1742-6596/1468/1/012168/pdf](https://iopscience.iop.org/article/10.1088/1742-6596/1468/1/012168/pdf)

D-Egg: new optical sensors for the IceCube Upgrade and Gen2 (IceCube Collaboration, Aya Ishihara et al.), J. Phys. Conf. Ser. **1468** 1 012166 (2020);  
[iopscience.iop.org/article/10.1088/1742-6596/1468/1/012166/pdf](https://iopscience.iop.org/article/10.1088/1742-6596/1468/1/012166/pdf)

Physics Potential of the IceCube Upgrade (IceCube Collaboration, Wing Yan Ma et al.), J. Phys. Conf. Ser. **1468** 1, 012169 (2020); [iopscience.iop.org/article/10.1088/1742-6596/1468/1/012169/pdf](https://iopscience.iop.org/article/10.1088/1742-6596/1468/1/012169/pdf)

Status of standard oscillation physics with IceCube DeepCore (IceCube Collaboration, J.P. Yanez et al.), J. Phys. Conf. Ser. **1468** 1 012122 (2020);  
[iopscience.iop.org/article/10.1088/1742-6596/1468/1/012122/pdf](https://iopscience.iop.org/article/10.1088/1742-6596/1468/1/012122/pdf)

Search for Dark Matter and BSM Physics with the IceCube Neutrino Observatory (IceCube Collaboration, Aguilar Sanchez et al.), PoS NuFact2019 11 (2020); [pos.sissa.it/369/110](https://pos.sissa.it/369/110)

IceCube Search for Galactic Neutrino Sources based on Very High Energy  $\gamma$ -ray Observations (IceCube and HAWC Collaborations, Ali Kheirandish et al.), J. Phys. Conf. Ser. **1468** 1 012081 (2020); [astro-ph.HE/2001.08524](https://astro-ph.HE/2001.08524).

High-energy particle physics with IceCube (IceCube Collaboration, Tianlu Yuan et al.), J. Phys. Conf. Ser. **1468** 1 012140 (2020); [hep-ex/2001.08657](https://hep-ex/2001.08657).

Indirect Dark Matter Searches with IceCube (IceCube Collaboration, Morten Medici et al.), J. Phys. Conf. Ser. **1342** 1 012074 (2020); [iopscience.iop.org/article/10.1088/1742-6596/1342/1/012074/pdf](https://iopscience.iop.org/article/10.1088/1742-6596/1342/1/012074/pdf)

Testing the Neutrino Mass Ordering with Four Years of IceCube/DeepCore Data (IceCube Collaboration, Martin Leuermann et al.), J. Phys. Conf. Ser. **1342** 1 012030 (2020);  
[iopscience.iop.org/article/10.1088/1742-6596/1342/1/012030/pdf](https://iopscience.iop.org/article/10.1088/1742-6596/1342/1/012030/pdf)

## Students

### Graduates

M. Chaves, Calculation of Multiple Bremsstrahlung in Gauge Theories (1982).

Jean-René Cudell, Experimental Challenges to the Standard Model: A Reevaluation (1987).

Choong Sun Kim, The Standard Model with Three Generations (1988).

Robert S. Fletcher, Effects of Soft Gluons at High Energy Colliders (1990).

Stéphane Keller, Hadronic Structure of the Photon (1991).

Kavoos Deilamian, Spectroscopic Test of the Symmetrization Postulate and Pauli Exclusion Principle (1991).

Mary Louise Stong, Two-Loop Corrections and Top Threshold Effects in Calculation of Observables at Z Peak (1993).

Timothy Stelzer, Radiation Patterns in Diffractive and Electroweak Events (1993).

Ricardo Vázquez, Física de Partículas a Altas Energías y Astrofísica (Santiago de Compostella, Spain); On the Precision of Tests of the Quantum Structure of the Standard Model (Madison) (both 1994).

Vijaya Kandahadai, Transparency Measurements of the South Pole Ice: Implications for AMANDA (1995).

Lori Gray, On the Architecture of High Energy Neutrino Telescopes (1996).

John Jacobsen, Simulating the Detection of Muons and Neutrinos in Deep Antarctic Ice (1996).

Igor Liubarski, Corporeal Manifestations in the Antarctic Muon and Neutrino Detector Array (1997).

Kevin Stenson, A Study of  $D^0$  Production from 500 GeV  $\pi^-$ -Nucleon Interactions (1998).

Scott Radeztsky, A Dalitz Analysis of the Decay  $D_s^+ \rightarrow \pi^+ \pi^- \pi^+$  (1999).

Tyce de Young, Observation of Atmospheric Neutrinos with the Antarctic Muon and Neutrino Detector Array (2001).

Rellen Hardtke, Search for Gamma Ray Bursts with the AMANDA Detector (2002).

Dan Hooper, Astroparticle Physics beyond the Standard Model (2003).

David Steele, Search for Extraterrestrial Point Sources with the AMANDA-II Detector (2003).

## Students

Magdalena Gonzalez, Gamma Ray Bursts: Their High Energy Emission as Observed by EGRET (2005).

Melanie Clarke, Search for Gamma Ray Bursts with the AMANDA Detector (2005).

Michael Stamatikos, Probing for Correlated Neutrino Emission from Gamma-Ray Bursts with Antarctic Cherenkov Telescopes: A Theoretical Modeling and Analytical Search Paradigm in the Context of the Fireball Phenomenology (2005).

Aongus Ó Murchadha, The Search for Galactic Cosmic-Ray Sources with IceCube (2011).

Nathan Whitehorn, A Search for High-Energy Neutrino Emission from Gamma-Ray Bursts (2012).

Benedikt Riedel, Modeling and Understanding Supernova Signals in the IceCube Neutrino Observatory (2014).

Carlos Alberto Argüelles Delgado, New Physics with Atmospheric Neutrinos (2015).

Ali Kheirandish, Particle Astrophysics with Cosmic Neutrinos (2016).

Kevin Ghorbani, The Search for Sterile Neutrinos with IceCube (2018).

Logan Wille, Search for Tau Neutrinos Using IceCube (2019).

## Invited Talks

Vosbergen Conference, Vlieland, Netherlands (1967 and 1968).

International Conference on High Energy Physics, Lund, Sweden (mini-rapporteur, 1969).

Symposium on  $\pi\pi$  Scattering, Niels Bohr Institute, Copenhagen, Denmark (1969).

Rencontres de Moriond, Meribel, France (1971).

International Conference on High Energy Physics, Chicago, Illinois (mini-rapporteur, 1973).

Rencontres de Moriond, Meribel, France (1973).

Nimrod Lecture at Rutherford Laboratory, Oxford, England (1973).

International Summer Institute on Particle Interactions at Very High Energies, Louvain, Belgium (1973).

Total Cross Sections and High- $p_T$  Phenomena above ISR Energies, at the 1974 June Meeting of the American Physical Society, Salt Lake City, Utah. Bull. Am Phys. Soc. II **15** 648 (1974).

ANL Summer Study on Polarized Proton Experiments and Beams (1974).

Canadian Physical Society, Montreal, Quebec (1975).

Probing the New Particles with Hadron Beams, International Conf. on Production of Particles with New Quantum Numbers, University of Wisconsin, Madison (1976).

Conference on Charm, University of Leuven, Belgium (1977).

Cosener's House Meeting on New Accelerators, Abingdon, Oxford, England (1978).

Sixth International Workshop on Weak Interactions, Ames, Iowa (1978).

Meeting of the American Physical Society, Blacksburg, Virginia (1979).

US – Japan Seminar on Cosmic Ray Physics, University of Delaware (1979).

Workshop on a Central Detector Facility for the Fermilab  $\bar{p}p$  Collider, Fermilab (1981).

XXI<sup>st</sup> Cracow School of Theoretical Physics (1981).

Second Topical Workshop on Forward Collider Physics, Madison, Wisconsin (1982).

Workshop on Very High Energy Interactions in Cosmic Rays, University of Pennsylvania (1982).

British Forum on High Energy Physics (1982).

Workshop on ISABELLE Experiments, Brookhaven (1982).

## Invited Talks

Annual Symposium on Theoretical Physics, Rutherford Appleton Laboratory, Oxford, England (1982).

Japanese Physical Society Meeting (1982).

Tsukuba Workshop on  $\bar{p}p$  Colliders, Tsukuba University, Japan (1983).

Meeting of the Physical Society of Finland (1983).

CDF Forward Components Workshop, University of Wisconsin, Madison (1984).

Oregon Workshop on Super High Energy Physics, Eugene, Oregon (1984).

Wisconsin Association of Physics and Science Teachers, Madison, Wisconsin (1985).

8<sup>th</sup> International Conf. on Ultra-Relativistic Nucleus-Nucleus Collisions, Lawrence Berkeley Laboratory (1986).

VI<sup>th</sup> Astrophysics Meeting on Accretion Processes in Astrophysics, Les Arcs, France (1986).

Lewis Center for Physics: Workshop on Binary X-ray Sources, Princeton, New Jersey (1986).

Neutrino Masses and Neutrino Astrophysics, Ashland, Wisconsin (1987).

From Colliders to Supercolliders, Madison, Wisconsin (1987).

Landelijk Seminarie, NIKHEF, Amsterdam, Netherlands (1987).

INFN-Eloisatron Project International Workshop on Very High Energy Proton-Proton Physics, Erice, Italy (1987).

Aspen Winter Physics Conference on Elementary Particle Physics (1988).

QCD in Astrophysics, Fermilab (1988).

TeV Physics, Johns Hopkins Workshops on Current Problems in Particle Physics (1988).

Snowmass 88, Aspen, Colorado (1988).

APS Meeting of the Division of Particles and Fields, Storrs, Connecticut (1988).

Fifth International Symposium on Very High Energy Cosmic Ray Interactions, Lodz, Poland (1988).

Beyond the Standard Model, Iowa State University, Ames (1989).

Symposium on Collider Phenomenology, Argonne National Laboratory, Illinois (1989).

## Invited Talks

Astrophysics and Particle Physics, San Miniato, Italy (1989).

21<sup>st</sup> International Cosmic Ray Conference, Adelaide, Australia (1989).

Z Phenomenology Symposium, Madison, Wisconsin (1990).

Polarized Collider Workshop, Penn State University (1990).

International Conference on High Energy Gamma-Ray Astronomy, University of Michigan, Ann Arbor (1990).

Astrophysical Aspects of the Most Energetic Cosmic Rays, Kofu, Yamanashi, Japan (1990).

Symposium for the 60<sup>th</sup> Birthday of R.J.N. Phillips, Rutherford Appleton Laboratory, Oxford, England (1990).

SSC Physics Symposium, University of Wisconsin, Madison (1990).

APS Division of Particles and Fields, Vancouver, Canada (1991).

22<sup>nd</sup> International Cosmic Ray Conference, Dublin (1991).

The Many Aspects of Neutrino Physics, Fermilab (1991).

SSC Full Acceptance Detector Organizational Meeting, Stanford (1992).

Second Gleb Wataghin Summer School on High Energy Phenomenology, State University of Campinas, Brazil (1992).

International Symposium on Neutrino Telescopes for the 400<sup>th</sup> Anniversary of Galileo, appointed by the Serenissima Republic of Venice, Italy (1992).

Gordon Research Conference, Proctor Academy, Andover, New Hampshire (1992).

SSC Physics Symposium, University of Wisconsin, Madison (1992).

CDF Workshop on Forward Physics, Fermilab (1992).

Workshop on Small-x and Diffractive Physics at the Tevatron, Fermilab (1992).

DAPHNE and Other Topics in Particle Physics, Frascati, Italy (1992).

Dertig Jaar Instituut Theoretische Fysica te Leuven, Belgium (1992).

American Physical Society Meeting, Astrophysics Division, Washington, DC (1992).

SSC Physics Symposium, University of Wisconsin, Madison (1993).



## Invited Talks

Workshop on Physics at Current Accelerators and the Supercollider, Argonne National Laboratory (1993).

Escuela Latino Americana de Fisica, Mar del Plata, Argentina (1993).

Summer Symposium on Physics at the CERN Large Hadron Collider and Astroparticle Physics, Uto, Sweden (1993).

TAUP 93: Theory and Phenomenology in Astroparticle and Underground Physics, Gran Sasso, Italy (1993).

XXIII International Symposium on Multiparticle Dynamics, Aspen, Colorado (1993).

New Physics at New Facilities, Case Western Reserve University, Cleveland (1993).

Aspen Winter Conference, "Particle Physics before the Year 2000," Aspen, Colorado (1994).

JPL/Caltech Neutrino Astrophysics Technology Workshop, Pasadena, California (1994).

Workshop on Gamma-Gamma Colliders, Lawrence Berkeley Laboratory, Berkeley, California (1994).

International Symposium on Very High Energy Cosmic Ray Interactions, Waseda University, Tokyo, Japan (1994).

APS Division of Particles and Fields Meeting, Albuquerque, New Mexico (1994).

Cosmic Rays: Physics and Astrophysics (with T. Gaisser et al.), National Academy of Sciences, research briefings, NAS/NRC, Washington, DC (1994).

CAM 94 Physics Meeting, Cancun, Mexico (1994).

LBL Meeting on Physics and Simulation Issues for  $\text{km}^3$  Neutrino Astronomy, Berkeley, California (1995).

Arkansas Space Grant Consortium (1995).

Antarctic Experimenters Meeting, NSF, Washington, DC (1995).

TAUP 95: IV<sup>th</sup> International Workshop on Theoretical and Phenomenological Aspects of Underground Physics, Toledo, Spain (1995).

WIN 95: XV<sup>th</sup> Workshop on Weak Interactions and Neutrinos, Talloires, France (1995).

Topics in the Weak Interaction, Vanderbilt University, Nashville, Tennessee (1996).

## Invited Talks

US Meeting on Future Prospects for Kilometer-Scale Neutrino Detectors, Jet Propulsion National Laboratory, Pasadena, California (1996).

International Symposium on the Occasion of the Retirement of Martin Block from Northwestern University, Evanston, Illinois (1996).

Nordita/Uppsala Astroparticle Workshop on High Energy Neutrino Astronomy, Uppsala, Sweden (1996).

Workshop on High Energy Neutrino Astronomy, Aspen Center for Physics Summer Program, Aspen, Colorado (1996).

IV Gleb Wataghin School on High Energy Phenomenology, Campinas, Brazil (1996).

International Workshop, "New Worlds in Astroparticle Physics," Algarve, Portugal (1996).

XXI School on Theoretical Physics, Silesia, Poland (1996).

Third Workshop on Small-x and Diffractive Physics, Argonne National Laboratory (1996).

HEPAP Subpanel on Planning for the Future of US High Energy Physics, Stanford Linear Accelerator Center (1997).

Symposio en Honor de José Adem, Cinvestav, Mexico (1997).

ADM60-FEST: Topical Issues in Deep Inelastic Scattering, Durham, England (1997).

Vietnam School on Cosmic Ray Physics, Hanoi, Vietnam (1997).

Aspen Winter Conference on Particle Physics, Aspen, Colorado (1998).

Aspen Rotary Club, Aspen, Colorado (1998).

IceCube Neutrino Detector Workshop, University of California, Irvine (1998).

Workshop on Perspectives of High-Energy Particle Astrophysics: Physics at Cosmic Accelerators, Burg Liebenzell, Germany (1998).

TASI-98, Boulder, Colorado (1998).

South African Institute of Physics Conference (SAIP98), Cape Town, South Africa (1998).

Erice Summer School, Palermo, Italy (1998).

Aspen Winter Conference on Particle Physics, "Advances in Particle Physics: Recent Results and Open Questions," Aspen, Colorado (1999).

Fred Reines Memorial Symposium, University of California, Irvine (1999).

## Invited Talks

Gamma Ray Burst Workshop, Institute for Theoretical Physics, University of California, Santa Barbara (1999).

Workshop on Particle Astrophysics with High Energy Neutrinos, Arlington, Virginia (1999).

National Academy Decadal Review, Atlanta, Georgia (1999).

Inner-Outer Space, Fermilab (1999).

Neutrino Summer, CERN, Switzerland (1999).

Low Energy Neutrino Workshop, INP, University of Washington, Seattle (1999).

New Perspectives, Fermilab (1999).

QCD (Multiparticle Production), Brown University, Providence, Rhode Island (1999).

OWL/Airwatch Workshop, University of California, Los Angeles (1999).

7<sup>th</sup> Course: Current Topics in Astrofundamental Physics, International School of Astrophysics "D. Chalonge," Erice, Italy (1999).

American Astronomical Society, Atlanta, Georgia (2000).

Aspen Summer Workshop: Neutrinos with Mass (2000).

Scandinavian Summer School, Niels Bohr Institute, Copenhagen, Denmark (2000).

Nederlandse Natuurkundige Vereniging, Amsterdam, Netherlands (2000).

Snowmass 2001: The Future of Particle Physics.

Green Bay Retired Men's Club (2001).

18<sup>th</sup> International Workshop on Weak Interactions and Neutrinos, Christchurch, New Zealand (2002).

Aspen Winter Conference on Ultra-High-Energy Particles from Space, Aspen, Colorado (2002).

Aspen Winter Conference on High-Energy Particle Physics, Aspen, Colorado (2002).

Michaelfest, Liverpool, England (2002).

Symposium on Neutrinos and Particle Astrophysics, Beijing, China (2002).

School on Neutrino Physics and Astrophysics (NEUPAST), Trieste, Italy (2002).

## Invited Talks

Lion's Club, Madison, Wisconsin (2002).

Symposium on Neutrino Astronomy for High School Teachers, Antwerp, Belgium (2002).

10<sup>th</sup> International Workshop on Neutrino Telescopes, Venice, Italy (2003).

VERITAS collaboration Meeting, Adler Planetarium, Chicago, Illinois (2003).

Int'l Workshop on UHE Neutrino Telescopes, Chiba University, Chiba, Japan (2003).

127<sup>th</sup> Natl. Mtg. on the American Association of Physics Teachers, Madison, Wisconsin (2003).

Nijmegen 03: International Summer School on Particle and Nuclear Astrophysics, Nijmegen, Netherlands (2003).

COSMO 03: Intl. Workshop on Particle Physics and the Universe, Ambleside, England (2003).

NSF Symposium, "The Universe from the Ground Up," Ground-Based Astronomy in the 21<sup>st</sup> Century, Washington, DC (2003).

Kavli-CERCA Conference on the Future of Cosmology, Case Western Reserve University, Cleveland, Ohio (2003).

Teachers Experiencing Antarctica and the Arctic (TEA), Polar Science Seminar, Crystal Lake, Illinois (2003).

219<sup>th</sup> Reunion, Nederlandse Astronomen Club, University of Nijmegen, Netherlands (2003).

6<sup>th</sup> RESCUE International Symposium, Frontier in Astroparticle Physics and Cosmology, University of Tokyo, Tokyo, Japan (2003).

42<sup>nd</sup> Junior Science, Engineering and Humanities Symposium, Madison, Wisconsin (2004).

3<sup>rd</sup> International Workshop on Ultra High Energy Cosmic Rays, Leeds, England (2004).

International WE-Heraeus Summer School, "Physics with Cosmic Accelerators," Bad Honnef, Germany (2004).

Intl. Saltdome Shower Array Workshop (SaISA 2005), SLAC, Stanford, California (2005).

Annual Meeting of the German Physical Society, "Einstein and the Year of Physics," Berlin, Germany (2005).

Midwest Regional Polar Science Workshop, St. Benedictine University, Lisle, Illinois (2005).

XXII Intl. Symposium on Lepton-Proton Interactions at High Energy, Uppsala, Sweden (2005).

TeV Particle Astrophysics Workshop, Fermilab, Batavia, Illinois (2005).

## Invited Talks

LHC Summer School, Maria Laach, Germany (2005).

Madrid Neutrino Mini-Workshop, "What is the Neutrino," U. Autonoma, Madrid, Spain (2005).

Joint Annual Conf. of the National Society of Black Physicists and the National Society of Hispanic Physicists, San Jose, California (2006).

Be-Poles, Brussels, Belgium (2006).

Science@Poles, joint meeting of Italian, French and US polar programs. Embassy of Italy, Washington, DC (2006).

The Multi-Messenger Approach to High-Energy Gamma-Ray Sources, Barcelona, Spain (2006).

Eleventh Marcel Grossman Meeting on General Relativity, Berlin, Germany (2006).

PASCOS 2006, Ohio State University (2006).

German School of Particle Astrophysics, Erlangen, Germany (lecturer – 2006).

CHIPP Workshop on Neutrino Physics, Bern, Switzerland (2006).

XXIII Texas Symposium on Relativistic Astrophysics – Texas in Melbourne, Australia (2006).

Colliders to Cosmic Rays 2007, Granlibakken, Tahoe City, California (intro. lecture – 2007).

XII International Workshop on Neutrino Telescopes, Venice, Italy (2007).

The Violent Universe Winter School, Les Houches, France (lecturer – 2007).

Ultra-High–Energy Cosmic Rays, Neutrinos and Photons, Penn State University (2007).

Dark Side of the Universe 2007 Workshop (DSU07), University of Minnesota (2007).

30<sup>th</sup> International Cosmic Ray Conference, Merida, Mexico (highlight talk - 2007).

10<sup>th</sup> Intl. Conf. on Topics in Astroparticle and Underground Physics, Sendai, Japan (2007).

Abelson Advancing Science Seminar, AAAS, Washington DC (2007).

The Centenary of the Birth of Professor Marian Miesowicz, University of Krakow, Poland (2007).

PASC Winter School, Sesimbra, Portugal (2007).

Neutrino Oscillations in Venice, Venice, Italy (2008).

Huberfest, University of Wisconsin, Madison (2008).

## Invited Talks

Carolina International Symposium on Neutrino Physics, South Carolina (2008).

Neutrino 2008, Organizer with J. Adams and S. Parke, Christchurch, New Zealand (2008).

AAS Meeting, St. Louis (2008).

50 years of MPI for Physics in Munich, Munich, Germany (2008).

Neutrino Frontiers, University of Minneapolis, Minneapolis (2008).

PANIC 08, Student Day Lecturer on Particle Astrophysics, Eilat, Israel (2008)

Discrete 08, Valencia University, Valencia, Spain (2008).

XIII International Workshop on Neutrino Telescopes, Venice, Italy (2009).

National Science Teacher Association, New Orleans, Louisiana (2009).

American Association of Physics Teachers, Harrisburg, Pennsylvania (2009).

American Association for Physics Teachers, Boston University (2009).

Multi-Messenger Relativistic Astrophysics, Georgia Tech (2009).

Nuclear Physics talk, APS Meeting, San Diego, California (2009).

Antarctic Deepfreeze Association Reunion, Middleton, Wisconsin (2009).

XXIèmes Rencontres de Blois, Windows on the Universe, Blois, France (2009).

Summer School on Nuclear and Particle Astrophysics, University of Washington, Seattle (2009).

Intl. Summer School on Particle and Nuclear Astrophysics, Nijmegen, Netherlands (2009).

COSMO 09: Intl. Workshop on Particle Physics and the Universe, Geneva, Switzerland (2009).

Meeting Honoring the 100<sup>th</sup> Anniversary of the Birthday of Gunnar Kallen, Lund, Sweden (2010).

Karpathian Summer School, Bucharest, Romania (2010).

Erice Summer School, Italy (2010).

Tokyo Summer School, Japan (2010).

Space Place, UW-Madison (2010).

Christmas Meeting, Barcelona, Spain (2010).

## Invited Talks

EPS Meeting on Nuclear Physics in Astrophysics, Eilat, Israel (2011).

Multi-Messenger Astronomy of Cosmic Rays, Kavli Workshop, Beijing, China (2011).

Experiments on the Cosmic Frontier, Fermilab (2011).

Swieca Summer School on Particles and Fields, Campos de Jordao, Sao Paulo, Brazil (2011).

2nd Intl. Conference on Advancements in Nuclear Instrumentation, Measurement Methods and their Applications (ANIMMA), Ghent, Belgium (2011).

51st Cracow School of Theoretical Physics: Soft Side of the LHC, Zakopane, Poland (2011).

Intl. Workshop on Cosmic Rays and Cosmic Neutrinos: Looking at the Neutrino Sky (NUSKY), Trieste, Italy (2011).

European Physical Society Intl. Europhysics Conference on High Energy Physics, Grenoble, France (2011).

XIIIth Intl. Workshop on Neutrino Factories, Super Beams and Beta Beams (NuFact 11), CERN.

Dark Matter Underground and in the Heavens, CERN, Geneva, Switzerland (2011).

ECFA Meeting, CERN, Geneva, Switzerland (2011).

Radiography of the Earth, University of Tokyo, Japan (2011).

Quantum Universe 2, Groningen, Netherlands (2012).

Public Lecture, Edgewood College, Madison, Wisconsin (2012).

100 Years of Cosmic Particles, Victor Hess Symposium, Vienna, Austria (2012).

University of Geneva, Switzerland (2012).

World Science Festival, New York, New York (2012).

University of Wisconsin Alumni, Pittsburgh, Pennsylvania (2012).

11<sup>th</sup> Intl. Conference on Nucleus-Nucleus Collisions, San Antonio, Texas (2012) – public lecture.

Technical University of Munich Affiliated Professor Lecture, Munich, Germany (2012).

Erice Summer School, Italy (2012).

Dark Attack, Ascona, Switzerland (2012).

## Invited Talks

100 Years of Cosmic Rays, Bad Saarow, Germany (2012).  
International Astronomical Union, Beijing, China (2012).  
Neutrino Oscillation Workshop, Conca Specchiulla, Italy (2012).  
Cycle of Cosmology and Astrophysics, Madrid, Spain (2012).  
Texas Symposium on Relativist Astrophysics, São Paulo, Brazil (2012).  
9<sup>th</sup> Intl. Symposium on Cosmology and Particle Astrophysics, Taipei, Taiwan (2012).  
NASA / Goddard Space Flight Center, Greenbelt, Maryland (2013).  
American Physical Society, Denver, Colorado (2013).  
Cosmic Frontier Workshop, Stanford, Menlo Park, California (3 talks, 2013).  
Jefferson Laboratory, Newport News, Virginia (2013).  
Institute for Advanced Study, Princeton, New Jersey (2013).  
International Cosmic Ray Conference, Rio de Janeiro, Brazil (highlight talk, 2013).  
Pontecorvo 100, Pisa, Italy (2013).  
150<sup>th</sup> Anniversary of the German Astronomical Society, Tübingen, Germany (2013).  
Trevorfest, Tucson, Arizona (2013).  
CosPA, Honolulu, Hawaii (2013).  
MERCUR Winter School, Bad Honnef, Germany (2014).  
Erlangen School for Astroparticle Physics, Bärnfels, Germany (2014).  
Masterclass for Ph.D. Students, Veldhoven, Netherlands (2014).  
IDPASC School, Braga, Portugal (2014).  
Neutrinos Beyond IceCube, Arlington, Virginia (2014).  
Art of Experiment, Honoring David Nygren, Berkeley, California (2014).  
ARENA 2014, Annapolis, Maryland  
Royal Swedish Academy of Sciences (public lecture – 2014).



## Invited Talks

CosmoParticle Physics in Belgium, Gent University (2014).

SWAPS, Geneva, Switzerland (2014).

International Meeting for Large Neutrino Infrastructures, Paris, France (2014).

MIAPP Workshop, Garching, Germany (2014).

Frontiers of Fundamental Physics, Marseille, France (2014).

High Energy Astrophysics Division, American Astronomical Society, Chicago, Illinois (2014).

Multiple Messengers and Challenges in Astroparticle Physics, Gran Sasso (2014).

Ultra High Energy Cosmic Rays, Springdale, Utah (2014).

International Committee for Future Accelerators, Beijing, China (2014).

Neutrinos: Recent Developments and Future Challenges, Santa Barbara, California (2014).

Multimessenger Astronomy in the Era of PeV Neutrinos, Annapolis, MD (2014).

The Physics of Neutrinos, Brussels, Belgium (2015).

The Successful Story of Neutrino Telescopes, Venice, Italy (2015).

American Physical Society, Baltimore, MD; also at CalTech, Pasadena, CA (2015).

Rencontres de Blois, Particle Physics and Cosmology, France (2015).

Solvay-Francqui Workshop, *Neutrinos: From Reactors to the Cosmos*, Brussels (2015).

Workshop on Weak Interactions and Neutrinos (WIN2015), Heidelberg, Germany (2015).

European Physical Society Conference on High Energy Physics, Vienna, Austria (2015).

Canadian Association of Physics, Edmonton, Alberta (2015).

Invisibles 15 Workshop, Madrid, Spain (2015).

Marcel Grossman Meeting, Rome, Italy (2015).

Summer Program for Physics, Aspen, Colorado (2015).

Opening lecture, SLAC Summer Institute, Menlo Park, California (2015).

NuAtmospheres, Royal Society of London, UK (2015).

## Invited Talks

TEXAS Symposium, Geneva, Switzerland (2015).

Very High Energy Particle Astrophysics, Honolulu, Hawaii (2016).

UCLA Dark Matter Symposium, Los Angeles, California (2016).

David Cline Memorial, Los Angeles, California (2016).

Intl. Conf. on Computational Photography (ICCP 2016), Northwestern, Evanston, Illinois (2016).

Pheno 2016, Pittsburgh, Pennsylvania (2016).

QCD-21, Paris, France (2016).

53<sup>rd</sup> Course of the International School of Subnuclear Physics, Erice, Italy (2016).

20<sup>th</sup> Course of the International School of Cosmic Ray Astrophysics, Erice, Italy (2016).

Aspen Summer Physics Program (2016).

14<sup>th</sup> Workshop on Non-Perturbative Quantum Chromodynamics, Paris (2016).

54<sup>th</sup> Course New Physics Frontiers in the LHC-2, Erice, Italy (2016).

School for Cosmic Ray Physics, Erice (2016).

RAPP Center Inauguration, Bochum, Germany (2016).

KVAB Forward Look, Palace of the Academies, Brussels, Belgium (2016).

Universidad Autónoma de Madrid, Spain (2016).

École Polytechnique Fédérale de Lausanne, Switzerland (2016).

International Symposium on Parity Violation and Neutrino Physics, Shanghai, China (2016).

Sources of Galactic Cosmic Rays, Paris, France (2016).

High Energy Neutrino and Cosmic-Ray Astrophysics, Weizmann Institute, Rehovot, Israel (2016).

XLV Intl. Meeting for Fundamental Physics, Granada, Spain (2017).

Nederlandse Astronomenconferentie, Nijmegen, Netherlands (2017).

Veritas 10-Year Celebration, Tucson, Arizona (2017).

Tri-Institute Summer School on Elementary Particle Physics, Sudbury, Ontario (2017).

## Invited Talks

Physics Summer School, Aspen, Colorado (2017).

Dark Matter, Neutrinos and Their Connections, Odense, Denmark (2017).

Cosmo 2017, Paris, France (2017).

RAPP Center Inauguration, Bochum, Germany (2017).

Erice Summer School, Neutrinos in Cosmology, in Astro, in Particle and in Nuclear Physics, Erice, Italy (2017).

Perspectives in Astroparticle physics from High Energy Neutrinos (PAHEN), Naples, Italy (2017).

Supernova Neutrino OBServations (SNOBS), Mainz, Germany (2017).

10th Anniversary of Gravitation Astroparticle Physics Amsterdam (GRAPPA), Amsterdam, Netherlands (2017).

The Transient Universe, Singapore (2018)

American Astronomical Society, Ft. Washington, Maryland (2018).

High Energy Universe: Gamma Ray, Neutrino and Cosmic Ray Astronomy Workshop, Munich, Germany (2018).

Pierre Binétruy: From Theory to Strategy of Discovery, Paris, France (2018).

Phenomenology 2018, Pittsburgh, Pennsylvania (2018).

Conference on the Intersections of Particle and Nuclear Physics (CIPANP), Palm Springs, California (2018).

Particles. Strings & COSmology (PASCOS), Cleveland, Ohio (2018).

Astrophysics – MAGIC, La Palma, Canary Islands (2018).

Erice International School of Subnuclear Physics 54<sup>th</sup> Course Particle Physics: Yesterday, Today and Tomorrow, Erice, Italy (2018).

15<sup>th</sup> Marcel Grossman Meeting, Rome, Italy (2018).

Tri-Institute Summer School in Elementary Particles, Waterloo, Ontario, Canada (2018).

Intl. School of Cosmic Ray Astrophysics 21<sup>st</sup> Course, Italy (2018).

Particle Flavour Fever Summer School, Paul Scherrer Institute, Zuz, Switzerland (2018).

## Invited Talks

Julius Wess Lectures at Karlsruhe Institute of Technology, Germany (2018).

$\int d k \Pi$  Doktoratskolleg Particles and Interactions Summer School, Hirschwang, Austria (2018).

Searching for the Sources of Galactic Cosmic Rays, Paris, France (2018).

Annual Theory Meeting, Durham, UK (2018).

Kaczmarczik Lecture, Philadelphia, Pennsylvania (2018).

57<sup>th</sup> Intl. Winter Meeting on Nuclear Physics, Bormio, Italy (2019).

Ewan Lecture, Queens University, Kingston, Ontario, Canada (2019).

XVII Intl. Workshop on Neutrino Telescopes, Venice, Italy (2019).

Cluster of Excellence Inauguration, Mainz, Germany (2019).

1<sup>st</sup> CTA Science Symposium, Bologna, Italy (2019).

CERN Council Open Symposium on the Update of European Strategy for Particle Physics, Granada, Spain (2019).

HTCondor Meeting, Madison, Wisconsin (2019).

DC Meets Madison, Washington, DC (2019).

Invisibles19 Workshop, Valencia, Spain (2019).

59<sup>th</sup> Cracow School of Theoretical Physics, Zakopane, Poland (2019).

New Windows to the Universe Summer School, Santander, Spain (2019).

Great Lakes Cosmology Workshop, Rochester, New York (2019).

INSS International Neutrino Summer School, Fermilab, Chicago, Illinois (2019).

SLAC Summer Institute, Menlo Park, CA (2019).

36<sup>th</sup> International Cosmic Ray Conference, Madison, WI (2019).

Brookhaven Forum 2019 (BF2019): Particle Physics and Cosmology in the 2020s, Brookhaven, New York (2019)

Multi-Messenger Astrophysics in the Gravitational Wave Era, Yukawa Institute, Kyoto, Japan (2019)

## Invited Talks

Gunnar Källén Symposium “The Elusive Neutrino,” Lund University, Lund, Sweden (2019).

Particle Physics Christmas Lecture, Oxford, UK (2019).

AMEGO Splinter Meeting, AAS Hawaii, Honolulu, Hawaii (2020).

Padova Excellence School of Physics of the Universe, Asiago, Italy (2020).

Neutrino 2020, Headline Talk, Fermilab, Chicago (2020).

Cosmic Rays and Neutrinos in the Multi-Messenger Era, APC Paris, France (2020).

## Colloquium and Seminar Talks

1966 – 1967

University of Leiden

1969 – 1970

CERN

E.T.H., Zurich

University of Liège, Belgium

1970 – 1971

Duality for Pedestrians, lectures delivered at the Belgian-Dutch Summer School and the  
CERN Academic Program

E.T.H., Zurich

Rutherford Laboratory

University of Durham

University of Birmingham

Westfield College, London

University of Nice

1971 – 1972

University of Wisconsin (colloquium)

Northwestern University

Michigan State University

Arizona State University (colloquium)

CERN

Rutherford Laboratory

Case Western Reserve University

Fermilab

University of Minnesota.

1972 – 1973

University of Illinois

Fermi Institute, University of Chicago

Argonne National Laboratory (2 separate visits)

Rutherford Laboratory

Model Independent Features of Diffraction, lectures delivered at the Summer Institute on  
Particle Interactions, Louvain, Belgium

1974 – 1975

Louisiana State University (colloquium)

McGill University

University of Wisconsin (colloquium)

University of Indiana

1976 – 1977

Rutherford Laboratory (Nimrod Lecture)

University of Liverpool (colloquium)

Imperial College

## Colloquium and Seminar Talks

University of Oxford  
University of Durham  
University of Birmingham  
University of Southampton  
University of Cambridge, D.A.T.M.P.  
Cavendish Laboratory, Cambridge  
University College, London  
Westfield College, London  
University of Leuven  
University of Mons  
University of Antwerp  
University of Wuppertal  
University of Bielefeld  
University of Liverpool (high-energy physics seminar)

### 1977 – 1978

Iowa State University  
University of Toronto  
Fermilab  
University of Chicago  
Ohio State University  
McGill University

### 1978 – 1979

University of Delaware (colloquium)  
University of Louvain-la-Neuve  
University of Paris-Sud  
Rutherford Laboratory  
University of Hawaii  
Mathematics Department, University of Wisconsin

### 1979 – 1980

Duke University (seminar and colloquium)  
Fermilab  
DESY  
University of Zaragoza  
University of Madrid  
University of Barcelona  
University of Hawaii  
University of Oregon  
University of California – Berkeley  
University of Washington – Seattle

### 1980 – 1981

Fermilab  
Johns Hopkins University (colloquium)  
Argonne National Laboratory (colloquium)  
University of Louvain

## Colloquium and Seminar Talks

University of Liège  
Rice University (colloquium)  
Texas A & M (colloquium)  
University of Wisconsin – Madison (colloquium)  
University of Wisconsin – Parkside (colloquium)  
University of Wisconsin – Madison (lecture for HS students visiting campus)  
Rutherford Laboratory  
University of Durham  
University of Liverpool

### 1981 – 1982

University of Michigan  
University of Guelph (colloquium)  
Purdue University (nuclear physics and theory seminars)  
University of California  
University of Hawaii (colloquium)  
University of Arizona  
Argonne National Laboratory

### 1982 – 1983

Rutherford Laboratory  
University of Cambridge  
University of Durham  
University of Leuven  
University of Brussels  
University of Arizona (colloquium)  
University of Liverpool  
University of Leeds (colloquium)  
University College, London  
University of Tokyo  
Waseda University, Tokyo  
University of Tokyo, Institute for Nuclear Study  
University of Tokyo (nuclear physics seminar)  
Hiroshima University  
University of Bristol (colloquium)  
Imperial College  
University of Southampton  
KEK – Tsukuba  
Tokyo Metropolitan University  
Tokyo Metropolitan University (experimental seminar)  
University of Tokyo, Komaba  
Kyoto University  
Kyoto University, Research Institute for Fundamental Research  
Kobe University  
Osaka City University  
University of Helsinki  
Yuvaskula University, Finland  
Nordita, Copenhagen



## Colloquium and Seminar Talks

1983 – 1984

Duke University (colloquium)  
Carnegie-Mellon University  
University of Durham

1984 – 1985

Interagency Colloquium, Washington, DC  
Northwestern University (colloquium)  
University of Wisconsin – Madison (mathematics department)  
University of Oregon  
Fermilab  
University of Durham  
University of Manchester  
Westfield College, London  
Cavendish Laboratory, Cambridge

1985 – 1986

McGill University (seminar and colloquium)  
Duke University (colloquium)  
University of Tokyo, Institute for Nuclear Study  
Tokyo Metropolitan University

1987 – 1988

University of British Columbia (colloquium)  
Rice University (colloquium)  
Argonne National Laboratory (colloquium)  
University of Kansas  
Johns Hopkins University  
McGill University  
Rutgers University  
Harvard University  
University of Wisconsin – Platteville (public lecture)  
University of Durham

1988 – 1989

Penn State University (colloquium)  
Northwestern University (colloquium)  
Louisiana State University (colloquium)  
University of Michigan  
Los Alamos National Laboratory (colloquium)  
Fermilab  
McGill University

1989 – 1990

University of California, Riverside (colloquium)

## Colloquium and Seminar Talks

1990 – 1991

Fermilab  
University of Guelph (colloquium)  
KEK – Tsukuba  
University of Iowa (colloquium)  
Purdue University  
University of Hawaii

1991 – 1992

The New Astronomy, lectures at the II<sup>nd</sup> Gleb Wataghin Summer School, São Paulo, Brazil  
Northwestern University (colloquium)  
Rice University (colloquium)  
Florida State University (colloquium)  
University of Utah (colloquium)  
Fermilab (colloquium)  
Indiana University (colloquium)  
Ohio University (colloquium)  
University of Chicago  
University of Hawaii

1992 – 1993

University of Leuven (colloquium)  
University of Liège (colloquium)  
Nagoya University (colloquium)  
University of New Mexico (colloquium)  
University of Louvain-la-Neuve  
Brookhaven National Laboratory  
University of Hawaii

1993 – 1994

University of Cincinnati (colloquium)  
University of Michigan  
California Institute of Technology  
University of Santiago de Compostella  
Stanford Linear Accelerator Center (SLAC) (colloquium)  
University of Wisconsin – River Falls ( $\Sigma\Pi\Sigma$  colloquium)  
National Science Foundation (colloquium)

1994 – 1995

University of Pittsburgh (colloquium)  
Lawrence Radiation Laboratory, Berkeley (colloquium)  
University of California, Berkeley  
Ecole Polytechnique, Paris  
Argonne National Laboratory (colloquium)  
Fermilab  
Carleton University, Ottawa  
McGill University

## Colloquium and Seminar Talks

Iowa State University (colloquium)  
University of Arkansas, Little Rock  
University of Arkansas, Pine Bluff (public lecture)  
California Institute of Technology  
University of Hawaii (colloquium)  
University of Florida (colloquium)  
Los Alamos National Laboratory (colloquium)  
Los Alamos National Laboratory (astrophysics seminar)

### 1995 – 1996

DESY-Zeuthen (colloquium)  
DESY-Hamburg (colloquium)  
State University of New York, Buffalo (colloquium)  
Johns Hopkins University (particle physics seminar and colloquium)  
Rice University (colloquium)  
New Mexico State University (astronomy seminar and colloquium)  
Fermilab (colloquium)  
Northwestern University (colloquium)  
Columbia University  
University of Stockholm (colloquium)  
University of Guelph (colloquium)  
Argonne National Laboratory  
University of North Carolina  
Duke U  
Electroweak Interactions: Loop for Cyclists, lectures presented at the IV<sup>th</sup> Gleb Wataghin  
School on HE Phenomenology, UNICAMP, Campinas, Brazil

### 1997

Case Western Reserve University (colloquium)  
Penn State University  
University of California, San Diego (colloquium)  
CINVESTAV, Mexico City  
UNAM, Mexico City (colloquium)  
University of Illinois, Urbana-Champaign  
University of Indiana (colloquium)  
Wayne State University (colloquium)

### 1998

Ohio State University (colloquium)  
Michigan State University (colloquium)  
Space Place, UW–Madison  
Uppsala University  
Jefferson National Laboratory, Newport News, VA  
Seoul National University  
Korean Institute for Advanced Studies  
Yonsei University, Seoul  
NASA Goddard Space Flight Center (colloquium)  
McGill University (colloquium)

## Colloquium and Seminar Talks

Columbia University (colloquium)

1999

SLAC (experimental physics seminar)  
California Institute of Technology (experimental physics seminar)  
University of California, Berkeley (LBNL research progress meeting)  
CERN (laboratory colloquium)  
Argonne National Laboratory (theory seminar)  
Clark Atlanta University (seminar)  
Stanford University (colloquium)  
Uppsala University (public lecture)  
CERN (theory seminar)  
University of Washington, Institute for Nuclear Physics (seminar)  
University of Chicago, Enrico Fermi Institute for Nuclear Physics (seminar)  
University of California, Los Angeles (experimental physics seminar)  
Iowa State University (colloquium)  
University of Utrecht (experimental physics seminar)  
26<sup>th</sup> Intl. Cosmic Ray Conference: Symposium on the Observation of EHE Particles & Neutrinos, & Symposium for Gaurang Yodh, Salt Lake City, UT

2000

University of Illinois, Chicago (colloquium)  
University of Kentucky (colloquium)  
University of Vienna (colloquium)  
University of Brussels (public lecture)  
Aspen Center for Physics  
Stanford University (colloquium)  
Argonne National Laboratory (Dept. of Physics colloquium)  
University of Illinois (high-energy physics seminar)

2001

Naval Research Laboratory, Washington, DC (colloquium)  
University of Alabama (colloquium)  
Fermilab (colloquium)  
Massachusetts Institute of Technology (colloquium)  
University of Wuppertal (public lecture)

2002

National Taiwan University (colloquium)  
Michigan State University (colloquium)  
Princeton University (colloquium)  
Oklahoma State University (colloquium)  
Durham University, England (colloquium)  
Imperial College, London  
National Research Council  
University of Wisconsin roundtable talk

## Colloquium and Seminar Talks

2003

Carnegie Mellon University (colloquium)  
University of California, Los Angeles (colloquium)  
Max Planck Institute, Munich (colloquium)  
University of Rome (colloquium)  
Katholieke Universiteit, Leuven (colloquium)  
WARF Trustees, Madison (after dinner talk)  
Science Visitors Board, Madison (after-dinner talk)  
Melbourne University (colloquium)  
University of Chicago (colloquium)  
Atmospheric and Oceanographic Sciences, Madison (colloquium)  
Toronto University (colloquium)  
Perimeter Institute, Waterloo, Ontario (colloquium)

2004

University of Dortmund (colloquium)  
DESY – Zeuthen (colloquium)  
University of Minnesota (colloquium)  
University of Florida (colloquium)  
Rutgers University (colloquium)  
Fermilab (wine and cheese colloquium)  
SLAC (high-energy experimental physics seminar)

2005

Kavili Institute, Santa Barbara  
Rotary Club, Madison  
Oxford University (public lecture)  
Argonne National Laboratory (colloquium)  
University of Connecticut (colloquium)  
University of Groningen (colloquium)  
University of Amsterdam (colloquium)  
University of Utrecht (colloquium)  
Illinois Institute of Technology, Chicago (colloquium)  
University of Illinois (colloquium)  
Vanderbilt University (colloquium)

2006

Perimeter Institute (colloquium)  
University of Guelph (colloquium)  
University of Waterloo (colloquium)  
Syracuse University (colloquium)  
Southern University, Baton Rouge (public lecture)  
DESY – Hamburg (Jentschke lecture)  
Princeton University (Spitzer lectures)  
Annual Meeting of Wisconsin Orthopedic Surgeons  
Princeton University (colloquium)  
CERN (colloquium)  
Pisa University (colloquium)

## Colloquium and Seminar Talks

2007

Brookhaven National Laboratory (colloquium)  
EPFL Lausanne (colloquium)  
University of Wisconsin, Milwaukee (colloquium)

2008

Harvard University (colloquium)  
Brown University (colloquium)  
Wichita State University (Watkins lecture)  
University of California, Davis (colloquium)  
Rice University (colloquium)  
Bonn University (colloquium)  
Aachen University (colloquium)  
Humboldt University (colloquium)  
Carnegie Mellon University (colloquium)  
University of Wisconsin (Fourth Tuesday Science Lecture)  
Goddard Space Flight Center, Washington, DC (colloquium)  
Penn State University (colloquium and astrophysics seminar)  
Barcelona, Spain (colloquium)

2009

Pennsylvania State University (public lecture)  
Virginia Tech, Blacksburg, Virginia (colloquium)  
Pennsylvania State University, Mont Alto (public lecture)  
MIT, Boston (colloquium)  
University of Leuven, Belgium (colloquium)  
Gotheborg University, Sweden (colloquium)  
University of Wuppertal, Germany (colloquium)  
Center for Cosmology and AstroParticle Physics, Ohio State (public lecture)

2010

University of Utah (colloquium)  
University of New Mexico (colloquium)

2011

University of Illinois at Chicago (colloquium)  
Washington University at Saint Louis (colloquium)  
Bochum University, Germany (colloquium)  
Laboratório de Instrumentação e Física Experimental de Partículas, Lisbon, Portugal  
(public lecture)  
Cline Observatory at Guilford College, Greensboro, North Carolina (colloquium and  
public lecture)  
Duke University, North Carolina (colloquium)

2012

West High School Madison (class lecture)  
Edgewood College, Madison (colloquium)

## Colloquium and Seminar Talks

Wisconsin Institute of Discovery (public lecture)  
University of Geneva (colloquium)  
Pittsburgh Badgers (public lecture)  
New York Science Festival (panel and salon on neutrinos)  
Technical University Munich (colloquium)  
University of Wisconsin-Milwaukee (colloquium)  
Taiwan National University (colloquium)  
Fundacion BBVA, Madrid (public lecture)  
Space Place Madison (public lecture)

2013

Goddard Space Flight Center, Maryland (colloquium)  
SLAC, Stanford University (colloquium)  
State University of New York at Stony Brook (colloquium)  
Frontiers of Science, Salt Lake City, Utah (public lecture)  
University of Toronto (colloquium)  
High Energy Seminar, Enrico Fermi Institute, University of Chicago  
Radboud University, Nijmegen (colloquium)  
Valencia University (colloquium)

2014

University of Massachusetts, Amherst (colloquium)  
University of Washington (colloquium)  
Technische Universität Dresden, Germany (colloquium)  
Institut Astrophysique de Paris, France  
Università di Roma Sapienza, Italy  
Universität Heidelberg, Germany  
Aspen Center for Physics High Energy Neutrino Workshop  
University of Notre Dame (colloquium)  
University of Florida (colloquium)  
Swedish Physics Society (colloquium)  
Brussels IceCube Software Bootcamp  
Ohio State University (colloquium)  
Purdue University (colloquium)  
Indiana University (colloquium)  
Korean Physical Society (colloquium)  
Florida State University (colloquium)

2015

University of Valencia (colloquium)  
Caltech (colloquium)  
Universiteit Antwerpen (colloquium)  
University of Texas-Arlington (colloquium)  
Virtual Institute of Astroparticle Physics (VIA) lecture  
Fermilab (public lecture)  
Aspen Institute for Physics (public lecture and colloquium)  
Marquette University (public lecture)  
University of Houston (colloquium)

## Colloquium and Seminar Talks

Rutgers University (colloquium)  
UW Alumni Association, New York (public lecture)  
University of Michigan (colloquium)  
Walker Lecture, University of Michigan (public lecture)  
Belgian Society for Cosmology and Particle Physics (colloquium)  
University of Houston (colloquium)  
University of Texas, Austin (colloquium)  
Columbia University (colloquium)  
University of New York at Buffalo (colloquium)  
University of California at Davis (colloquium)

2016

Humboldt Kolleg on Particle Physics, Kitzbuhel, Austria  
Georgia Institute of Technology (public lecture)  
University of Münster, Germany  
University of California, Davis  
Université de Genève, Switzerland

2017

Kiel University, Germany (colloquium)  
Kiwanis, Madison  
Fermilab, Chicago (colloquium)  
University of Minnesota, Minneapolis (colloquium)  
University of Virginia, Charlottesville (public lecture)  
Madison West Businessmen Association, Madison  
Madison Science Museum, Madison  
Southern Methodist University (public lecture), University Park, Texas  
50<sup>th</sup> Anniversary Physical Sciences Laboratory, Stoughton  
German Physical Society, Berlin (public lecture)  
JGU University, Mainz, Germany (colloquium)  
Accademia dei Lincei, Rome (public lecture)  
All-Amsterdam Physics Colloquium, Amsterdam  
National Science Teachers Association, Milwaukee

2018

William & Mary University, Williamsburg, Virginia (colloquium)  
Astronomy Day Keynote, University of South Dakota, Vermilion, SD  
Roma Tre, INFN, Italy (colloquium)  
Christian-Albrechts Universität, Kiel, Germany (colloquium)  
Carnegie Mellon University and Pittsburgh University joined colloquium, Pennsylvania  
KIT, Karlsruhe, Germany (colloquium)  
Wisconsin Science Festival (public lecture)  
WARF Lecture, Wisconsin Institutes for Discovery (public lecture)  
Queens University, Kingston, Ontario (colloquium)  
Wayne State University, Detroit, Michigan (colloquium)  
Rome University, Italy (colloquium)



## Colloquium and Seminar Talks

2019

Niels Bohr Institute, Copenhagen, Denmark (colloquium)  
Tufts University, Boston, Massachusetts (colloquium)  
University of Florida, Gainesville (colloquium and HEP seminar)  
FAU Erlangen-Nurnberg, Germany (colloquium)  
Erlangen, Germany (colloquium)  
JINR, Dubna, Russia  
The MIT Club at Washington DC, Washington (public lecture)

2020

University of Padua, Padua, Italy (colloquium)  
University of California, Irvine  
Notre Dame, South Bend, Indiana (colloquium)  
University of Hawaii, Honolulu (colloquium)  
University of Sao Paulo, San Carlos, Brazil (colloquium)  
University of Sao Paulo, Sao Paulo, Brazil (colloquium)

## Service

### Committees and Panels

- 2020 DOE CAREER Awards Selection Panel  
Science Advisory Committee, University of Santiago de Compostella, Spain  
Program Advisory Committee, Fermilab  
CCAPP Review Committee, The Ohio State University, Columbus, Ohio  
High Level Strategy Group for the Latin American Strategy Forum for Research Infrastructure
- 2019 DOE CAREER Awards Selection Panel  
Science Advisory Committee, University of Santiago de Compostella, Spain (chair)  
Program Advisory Committee, Fermilab
- 2018 Instituto de Fisica Corpuscular Advisory Committee, Valencia, Spain  
IIHE Advisory Committee, Vrije University, Brussels, Belgium (chair)  
Program Advisory Committee, Fermilab
- 2017 Program and Science Advisory Committees, Fermilab  
HEPAP Operations Review, Washington  
Instituto de Fisica Corpuscular Advisory Committee, Valencia, Spain  
Theoretical Nuclear Physics Review Panel, NSF, Washington
- 2016 Spinoza Prize Committee, Utrecht, Netherlands  
Max Planck Institute - Munich Advisory Committee  
Advisory Committee for the Utah Telescope Array, Chair  
Alpha Magnetic Spectrometer (AMS) Review
- 2015 Vrije Universiteit Brussel Advisory Committee  
Astroparticle Physics European Consortium (ApPEC) Advisory Committee  
Spinoza Prize Committee, Utrecht, Netherlands  
Auger Upgrade Advisory Committee  
Max Planck Institute - Munich Advisory Committee  
Advisory Committee for the Utah Telescope Array, Chair
- 2014 HEP Review of Cosmic Frontier Program Experimental Operations  
Spinoza Prize Committee, Utrecht, Netherlands  
P5 (Particle Physics Project Prioritization Panel), US Department of Energy Selection Committee  
Astroparticle Physics European Consortium
- 2013 Review Committee of the Institute for Cosmic Ray Research, University of Tokyo, Japan  
Max Planck Institute - Munich Advisory Committee  
Auger Upgrade Advisory Committee  
Auger Finance Board  
Vrije University Brussels High Energy Physics Advisory Committee  
Astroparticle Physics European Consortium (APPEC)

## Service

- P5 (Particle Physics Project Prioritization Panel), US Department of Energy Selection Committee
- 2012 Review of Operations of Particle Astrophysics Experiments for Department of Energy, Washington DC  
Advisory Committee for the Utah Telescope Array, Chair  
KIT-Karlsruhe Review of Selected Physics Programs  
Munich Institute for Astro- and Particle Physics (MIAPP) Advisory Committee  
Member of the International Neutrino Commission, Kyoto, Japan
- 2011 Director's Review of Pierre Auger Observatory, Fermilab, Illinois  
Karlsruhe KCETA Advisory Committee, Germany  
ASPERA Evaluation Committee, Paris, France  
ECFA Committee for Future Large Infrastructures for Neutrino Oscillation Experiments, Daresbury, UK  
Director's Review of Pierre Auger Observatory, Fermilab, Illinois  
Committee on Space Research, Associate
- 2010 KCETA Advisory Committee, Karlsruhe, Germany  
Committee of Visitors of the Department of Energy, Division of High-Energy Physics: Chair for Particle Astrophysics  
Advisory Committee for the Utah Telescope Array, Chair
- 2009 Advisory Committee of the Max Planck Institute for Nuclear Physics, Heidelberg, Germany  
CCAPP Advisory Board, The Ohio State University
- 2008 KIT Advisory Committee, Karlsruhe, Germany  
Comité d'Evaluation du APC, Paris, France
- 2007 Sudbury Neutrino Detector Advisory Committee  
Comité d'Evaluation du CPPM à Marseille, France (chair)  
Canada Foundation for Innovation (CFI) review of Cryopit at SNOLab, Ottawa (chair)  
KVI Groningen Advisory Committee  
Max Planck Institute Scientific Council (Munich).
- 2005 NSF Review of proposals submitted for NUSEL (National Underground Science and Engineering Laboratory)  
Sudbury Neutrino Detector Advisory Committee
- 2004 Ad Hoc Advisory Committee, Cosmic Ray Group, U of Utah (chair)
- 2003 Sudbury Neutrino Detector Advisory Committee
- 2001 Member of SAGENAP, Washington, DC  
Keck Advisory Committee, University of California – Berkeley  
NASA Review of Astrophysics Proposals, Washington, DC  
NSF Review Panel of the NUSEL Underground Laboratory

## Service

- Ad Hoc Advisory Committee, Cosmic Ray Group, U of Utah (chair)  
Sudbury Neutrino Detector Advisory Committee  
Keck Advisory Committee, University of California - Riverside
- 2000 Ad Hoc Advisory Committee, Cosmic Ray Group, University of Utah (chair)  
Sudbury Neutrino Detector Advisory Committee  
Keck Advisory Committee, University of California - Riverside
- 1999 Sudbury Neutrino Detector Advisory Committee  
Keck Advisory Committee, University of California - Riverside
- 1998 Ad Hoc Advisory Committee, Cosmic Ray Group, University of Utah (chair)  
Keck Advisory Committee, University of California - Riverside
- 1995 Ad Hoc Advisory Committee, Cosmic Ray Group, University of Utah  
Review of the Auger Project, Fermilab (chair)
- 1995 Visiting Committee, Bartol Research Institute
- 1994 California Institute of Technology (Jet Propulsion Laboratory)  
Neutrino Astronomical Observatory (member of Local Working Group)  
DOE Committee Review of Lawrence Radiation Laboratory, Berkeley  
Blue Ribbon Panel on South Pole Station Redevelopment  
National Research Council, Committee on Cosmic Rays  
Visiting Committee, Bartol Research Institute
- 1993 Ad Hoc Advisory Committee, Cosmic Ray Group, University of Utah  
DOE Committee Review of Lawrence Radiation Laboratory, Berkeley  
Visiting Committee, Bartol Research Institute
- 1992 Visiting Committee, Bartol Research Institute
- 1991 Visiting Committee, University of Utah, Department of Physics
- 1989 Space Station Attached Payloads Review Panel
- 1988 NSF Review of Science and Technology Centers:  
Review of University of Utah's Fly's Eye Facility
- 1987 DOE Committee Review of Argonne National Laboratory  
NSF Committee Review of University of Chicago
- 1986 Panel Review of the Research and Technology Grants of the NASA Astrophysics  
Program
- 1984 DOE Committee Review of Brookhaven National Laboratory

## **Service**

### **University Committees**

- 2015 Search Committee for Vice Chancellor of Research
- 2005 – 2008 Committee on Honorary Degrees
- 2003 Campus Research Computing Committee
- 1999 – 2003 Council of the Space Science and Engineering Center
- 1995 Committee on Vilas, Hilldale and Bascom Selections
- 1992 – 1993 Computer Sciences L & S Review Committee (chair)  
Committee on Vilas, Hilldale and Bascom Selections

## Courses Summary

### Courses Taught by Year

Academic Year	Course # (Fall)	Course # (Spring)
1972 – 73	--	731
1973 – 74	732	107
1974 – 75	107	103
1975 – 76	104	103
1976 – 77	104	--
1977 – 78	107	202
1978 – 79	208	--
1979 – 80	202	170 (U of Hawaii)
1980 – 81	801	--
1981 – 82	109	735
1983 – 84	109	735
1984 – 85	107	109
1985 – 86	109	103
1986 – 87	--	735
1987 – 88	109	505
1988 – 89	109	109
1989 – 90	109	801
1990 – 91	735	109
1991 – 92	--	735
1992 – 93	835	109
1993 – 94	835	109
1994 – 95	835	835
1995 – 96	801	109
1996 – 97	109	109
1997 – 98	109	109
1998 – 99	801	--
1999 – 2000	109	--
2003 – 04	--	107
2004 – 05	805	109
2006 – 07	109	--
2007 – 08	109	--
2008 – 09	805	--
2009 – 10	107	--
2010 – 11	107	--
2011 – 12	--	107
2014 – 15	--	535
2015 – 16	--	535
2016 – 17	--	107
2019 – 20	109	--

## Funding History

### Grants and Contracts since 1980

National Science Foundation (NSF) ( <i>IceCube</i> )	\$8,240,000	2019
	\$8,240,000	2018
	\$8,240,000	2017
	\$8,240,000	2016
	\$6,900,000	2015
	\$8,280,000	2014
	6,900,000	2013
	1,950,000	2012
	9,320,000	2011
	9,460,000	2010
	11,300,000	2009
	13,300,000	2008
	17,000,000	2008
	27,000,000	2007
	52,000,000	2006
	48,000,000	2005
NSF ( <i>GLOW Project, M. Livny, PI – CS Department</i> )	1,186,405	2004
NSF ( <i>IceCube</i> )	42,000,000	2003 – 04
NSF ( <i>IceCube</i> )	15,000,000	2001 – 02
National Science Foundation ( <i>AMANDA, shared with B. Morse</i> )	1,246,000	2004 – 08
	800,000	2003 – 04
	750,000	2002 – 03
	850,000	2001 – 02
	850,000	2000 – 01
National Science Foundation ( <i>AMANDA, shared with B. Morse</i> )	2,785,682	1997 – 2000
	628,600	1996 – 97
National Science Foundation ( <i>AMANDA, shared with B. Morse</i> ) (Academic Research Infrastructure)	950,000	1995 – 99
NSF ( <i>GASP, shared with B. Morse</i> )	50,234	1994 – 95
National Science Foundation ( <i>AMANDA, shared with B. Morse</i> )	450,000	1994
National Science Foundation ( <i>GASP, shared with B. Morse</i> )	65,060	1994
National Science Foundation ( <i>AMANDA, shared with B. Morse</i> )	490,938	1993
National Science Foundation ( <i>GASP, shared with B. Morse</i> )	617,350	1992 – 95
NSF ( <i>AMANDA, shared with B. Morse</i> )	321,654	1992
National Science Foundation ( <i>Exploratory grant “Muon and Neutrino Detection in South Pole Ice” shared with B. Price et al., U. of California, Berkeley</i> )	50,000	1990
Balzan Prize	369,385	2016 - 2017
Polar Ice Coring Office (PICO) ( <i>AMANDA, shared with B. Morse</i> )	130,205	1993
University of Alaska, Fairbanks	12,290	1993
Wallenberg Foundation, Sweden ( <i>AMANDA, shared w/ B. Morse</i> )	238,156	1993
Berkeley Particle Astrophysics Center ( <i>shared w/B. Price et al.</i> )	80,000	1993 – 94
	100,000	1992 – 93
Department of Energy ( <i>shared w/V. Barger, T. Han &amp; F. Petriello</i> )	514,571	2006 – 07

## Funding History

Department of Energy <i>(shared with V. Barger &amp; T. Han)</i>	471,000	2005 – 06
Department of Energy <i>(shared w/Barger, Han &amp; M.G. Olsson)</i>	485,000	2004 – 05
Department of Energy <i>(shared w/Barger, Han, Olsson &amp; D. Zeppenfeld)</i>	665,000	2003 – 04
	685,000	2002 – 03
	700,000	2001 – 02
Department of Energy Graduate Fellowship	\$56,590	1998 – 2001
Department of Energy <i>(shared with Barger, Han, Olsson &amp; Zeppenfeld)</i>	760,000	2000 – 01
	800,000	1999 – 2000
	785,000	1998 – 99
Department of Energy <i>(shared with Barger, Olsson &amp; Zeppenfeld)</i>	725,000	1997 – 98
	620,000	1996 – 97
	646,000	1995 – 96
	680,000	1995
Department of Energy <i>(shared with Barger &amp; Olsson)</i>	725,000	1994
	755,000	1993
	705,000	1992
	806,000	1991
	750,000	1990
	750,000	1989
	685,000	1988
	615,000	1987
	535,000	1985 – 86
	425,000	1984 – 85
	355,000	1983 – 84
	320,000	1982 – 83
	290,000	1981 – 82
	227,000	1980 – 81
National Science Foundation <i>(shared with Barger, Han, (US – Brazil Cooperative Research) &amp; Zeppenfeld; also S. Pakvasa &amp; X. Tata, U of Hawaii)</i>	17,050	1998 – 2001
National Science Foundation <i>(shared with Barger (US – Japan Cooperative Research) &amp; Zeppenfeld; also P. Langacker, U of PA, &amp; Pakvasa &amp; Tata, U of Hawaii)</i>	30,000	1995 – 98
National Science Foundation <i>(shared with Barger (US – Brazil Cooperative Research) &amp; Zeppenfeld)</i>	10,000	1992 – 94
Texas National Research Laboratory Commission <i>(shared with Barger, Olsson &amp; Zeppenfeld)</i>	100,000	1993 - 94
	100,000	1992 - 93
	130,000	1991 – 92
Hilldale Professorship	25,000	2018 - 19
	25,000	2017 - 18
	25,000	2016 - 17
	25,000	2015 - 16
	25,000	2014 - 15
	25,000	2013 - 14
	25,000	2012 - 13
	25,000	2011 – 12
	25,000	2010 – 11
	25,000	2009 – 10
25,000	2008 – 09	
25,000	2007 – 08	
25,000	2006 – 07	



## Funding History

	25,000	2005 – 06
	25,000	2004 – 05
	25,000	2003 – 04
	25,000	2002 – 03
	25,000	2001 – 02
	25,000	2000 – 01
	25,000	1999 – 2000
	25,000	1998 – 99
	25,000	1997 – 98
	25,000	1996 – 97
	25,000	1995 – 96
	25,000	1994 – 95
	20,000	1993 – 94
	20,000	1992 – 93
	20,000	1991 – 92