Chao Zhang

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A. EDUCATION

Hubei Normal College, Physics Education	B.S.	1996/9 – 2000/6
Huazhong Normal University, Astroparticle Physics	M.S.	2000/9 – 2003/6
Institute of High Energy Physics, Particle&Nuclear Physics	Ph.D.	2003/9 – 2007/6

B. APPOINTMENT

ARTS LLC	CEO	2016/10 - present
University of South Dakota	Research Assistant Professor	2011/6 – 2017/6
University of South Dakota	Postdoc	2008/5 – 2011/6
China Three Gorges University	Assistant Professor	2007/7 – 2008/5
BEAUTIFYSMILE LLC	CTO	2006/1 – 2007/7
Institute of High Energy Physics	Research Assistant	2003/9 – 2007/6

C. AWARD

1. Role: PI. Source: NSF of China #10747142; Project Title: *Study of gamma ray emit from merging clusters of galaxies*; Amount: ¥20,000(RMB); Period Covered: 01/01/2008-12/30/2009.
2. Role: junior personnel. Source: NSF PHY-1147715, NSF DUSEL S4, NSF PHY-1242640, NSF PHY-0758120, PHYS-0919278, PHYS-0758120, DOE DE-FG02-10ER46709.
3. Role: Co-PI. Source: NSF PHY-1506036; Project Title: *Undoped NaI/CsI Directly Coupled to PMTs at 77 K for Rare-Event Searches*; Amount: $347,525; Period Covered: 07/29/2015 – 07/28/2018.

D. EXPERIENCE

Teaching & Advising:

1. PHYS 120: General Physics I. (2007 @ CTGU, China)
2. PHYS 121: General Physics II. (2008 @ CTGU, China)
3. PHYS 330: Thermodynamics. (2007-2008 @ CTGU, China)
4. Nuclear Physics Lab (2013 @ USD)
5. PHYS-113L-U135-2016SP Introduction to Physics II Lab (2016 @ USD)
6. PHYS-111-U910-2017SU Introduction to Physics I (2017 @ USD)
7. PHYS-111L-U910-2017SU Introduction to Physics I Lab (2017 @ USD)
8. PHYS-113-U910-2017SU Introduction to Physics II (2017 @ USD)
9. PHYS-113L-U910-2017SU Introduction to Physics II Lab (2017 @ USD)
10. Advising graduate students for degree thesis: Xiaoyi Yang (2011-2012 @ USD), Nabin Poudyal (2012-2014 @ USD), Wenzhao Wei (2012-2016), Lu Whang (2014-2016), Ashok Tiwari (2015-2016 @ USD).
11. Advising undergraduates for honors thesis: Daniel Duncan (2014-2016 @ USD).

12. Advising undergraduates for summer research program: Fanyi Jian(2012 @ USD), Mitchell Wagner(2014 @USD), Linfan Zhang(2015 @ USD).

Research:

1. Taking a leading role in background characterization at Homestake Mine (SURF) for underground dark matter and neutrinoless double-beta decay experiments.
2. Built an online database for alpha induced neutron yield in materials - (http://neutronyield.usd.edu/).
3. As a task leader, participated the coding of LUX simulation package - LUXSim.
4. As a manager, built the simulation package for underground physics – AARMSim.
5. Taking a main role in Cosmogenic background evaluation for Long Baseline Neutrino Experiment.
6. Conducted a big liquid scintillation neutron detector (12L) for neutron measurement at surface and Soudan Mine underground.
7. Fixed the E0 transition missing issues in Geant4 (http://bugzilla-geant4.kek.jp/show_bug.cgi?id=957) which adopted by Geant4 latest version.
8. Active member in: L3+Cosmic collaboration, CLEAN/DEAP collaboration, LUX collaboration, Majorana collaboration, LBNE collaboration, AARM collaboration and CUBED collaboration.

E. RELEVANT PUBLICATIONS

1. "Cosmogenic Activation of Materials Used in Rare Event Search Experiments", **C. Zhang**, D.-M. Mei, V. A. Kudryavtsev, S. Fiorucci, AstroPart. Phys., 84(2016)62-69; arXiv 1603.0098.
2. "Measuring Muon-induced Neutrons with Liquid Scintillation Detector at Soudan Mine", **C. Zhang**, D.-M. Mei, Physical Review D 90 (12), 122003 (2014)
3. "Measuring Fast Neutrons with Large Liquid Scintillation Detector for Ultra-low Background experiments", **C. Zhang**, D.-M. Mei, P. Davis, B. Woltman, F. Gray, arXive:1304.4536, NIMA 729(2013)138-146, DOI: 10.1016/j.nima.2013.07.012
4. "Ionization Efficiency Study for Low Energy Nuclear Recoils in Germanium", D. Barker, W.-Z. Wei, D.-M. Mei and **C. Zhang**, arXiv:1304.6773, AstroPart. Phys. 48(2013)8-15.
5. "Measuring double-electron capture with liquid xenon experiments", D.-M. Mei, I. Marshall, W.-Z. Wei and **C. Zhang**, Phys. Rev. C 89, 014608 (2014)
6. "Muon-induced background study for an argon-based long baseline neutrino experiment", D. Barker, D.-M. Mei and **C. Zhang**, Phys. Rev. D 86, 054001(2012).
7. "Early Results on Radioactive Background Characterization for Sanford Laboratory and DUSEL Experiments", D.-M. Mei, **C. Zhang**, K. Thomas, F. Gray, Astroparticle physics 34 (2010) 33-39.
8. "Evaluation of (α,n) Induced Neutrons as a Background for Dark Matter Experiments", D.-M. Mei, **C. Zhang**, A. Hime, Nucl. Instr. And Meth. A 606 (2009) 651- 660.
9. "Cosmic ray muon flux at the Sanford Underground Laboratory at Homestake", F. E. Gray, C. Ruybal, J. Totushek, D.-M. Mei, K. Thomas, **C. Zhang**, NIMA 638(2011)63-66.
10. "LUXSim: A component-centric approach to low-background simulations", D. S. Akerib, **C. Zhang**, et. al. [LUX collaboration], NIMA 675(2012)63-77.
11. "The LUX dark matter search", D. N. Mckinsey, **C. Zhang**, et. al. [LUX collaboration], J. Phys.:Conf. Ser. 203(2010)012026

12. “The Majorana Experiment”, C. E. Aalseth, **C. Zhang**, et. al. [Majorana collaboration], Nucl. Phys. B – Proceedings Supplements, 217(2011) 44-46.
13. “The Majorana Demonstrator: A Search for Neutrinoless Double-beta Decay of Germanium-76”, C. E. Aalseth, **C. Zhang**, et. al. [Majorana collaboration], J. Phys.: Conf. Ser. 375(2012)042010
14. “The Majorana Project”, C. E. Aalseth, **C. Zhang**, et. al. [Majorana collaboration], J. Phys.: Conf. Ser. 203(2010)012057
15. “The Majorana neutrinoless double-beta decay experiment”, C. E. Aalseth, **C. Zhang**, et. al. [Majorana collaboration], Nuclear Science Symposium Conference Record, 2008. NSS ’08, IEEE
16. “The Large Underground Xenon (LUX) experiment”, D. S. Akerib, **C. Zhang**, et. al. [LUX collaboration], NIMA 704 (2013) 111-126
17. “The Majorana experiment: an ultra-low background search for neutrinoless double-beta decay”, D. G. Phillips II, **C. Zhang** et. al., [Majorana collaboration], J. Phys.: Conf. Ser. 381 (2012) 012044
18. “The Majorana Experiment”, E. Aguayo, **C. Zhang**, et. al. [Majorana collaboration], AIP Conf. Proc. 1417 (2011) 95-99.
19. “An ultra-low background PMT for liquid xenon detector”, D. S. Akerib, **C. Zhang**, et. al. [LUX collaboration], NIMA 703 (2013) 1-6.
20. “Dark matter sensitivities of the Majorana Demonstrator”, G. K. Giovanetti, **C. Zhang**, et. al. [Majorana collaboration], J. Phys.: Conf. Ser. 375 (2012) 012014
21. “Possibility to Detect Upgoing Sleptons”, **C. Zhang**, Y.-Q. Ma, Nucl. Phys. B(Proc. Suppl.) 175(2008)257-260
22. “Observation on Local Group using the Tibet Air Shower Array and the possible Relation with Dark Matter”, **C. Zhang**, H.-R. Wu and Y. Zhang, 29th ICRC 00(2005)101-104.
23. “Phenomenology of quintessino dark matter: Production of next lightest supersymmtric particle”, X.-J. Bi, J.-X. Wang, **C. Zhang** and X.-M. Zhang, Phys. Rev. D, 70 (2004) 123512.
24. “Test of Monte-Carlo model with the L3+C moun spectrum measurement”, Y.-Q. Ma, L.-K. Ding, H.-H. Kuang, **C. Zhang** and Q.-Q. Zhu, Nucl. Phys. B(Proc. Suppl.) 151(2006) 191-194.
25. “The solar flare of the 14th of July 2000(L3+C detector results)”, P. Achard, **C. Zhang**, et. al. [L3+C collaboration], Astronomy and Astrophysics, 456 (2006) 351-357.
26. “A search for flaring very-high energy cosmic gamma-ray sources with L3_C muon spectrometer”, P. Achard, **C. Zhang**, et. al. [L3+C collaboration], Astroparticle Physics 25(2006)298.
27. “Measurement of the shadowing of high-energy cosmic rays by the Moon: a search for TeV energy antiprotons”, P. Achard, **C. Zhang**, et. al. [L3+C collaboration], Astroparticle Physics 23 (2005) 411.
28. “Measurement of the atmospheric muon spectrum from 20 to 3000 GeV”, P. Achard, **C. Zhang**, et. al. [L3+C collaboration], Phys. Lett. B 598 (2004) 15.
29. “Colour Conductivity of a Quark Plasma at Finite Chemical Potential”, **C. Zhang**, X.-P. Zheng, J.-R. Li, CHIN. PHYS. LETT., 19(2002)912
30. “Kinetics of mean fields and cold dense quark matter color conductivity”, **C. Zhang**, X.-P. Zheng, HEP&NP(Chinese), 26(2002)613

31. "Kinetic-Theory Approach to the 'Hard Thermal Loop' Self-Energy Including Chemical Potential", **C. Zhang**, X.-P. Zheng, HEP&NP(Chinese), 27(2003)63.

F. PRESENTATIONS

1. "Study of Annual Modulation at Soudan Mine Using a Liquid Scintillation Detector", **Chao Zhang** and Dongming Mei, 2015 APS meeting, Baltimore, MD, Apr 11, 2015.
2. Fast Neutron Measurement at Soudan Mine Using Liquid Scintillation Detector", **Chao Zhang**, 2014 Workshop on Germanium-Based Detectors and Technologies, Vermillion, SD, Sep 14-17, 2014.
3. "Update on Measuring fast neutrons with large liquid scintillator for ultra-low background experiments", **Chao Zhang**, Dongming Mei, Keenan Thomas, Patrick Davis Brian Woltman and Frederick Gray, 2013 APSDNP meeting, Newport News, VA, Oct 24, 2013.
4. "Measuring fast neutrons with large liquid scintillator for ultra-low background experiments", **Chao Zhang**, Dongming Mei, Keenan Thomas, Patrick Davis Brian Woltman and Frederick Gray, 2012 APS meeting, Atlanta, GA, Apr 1, 2012.
5. "Cosmogenic background simulation for Homestake 4850 Level", **Chao Zhang**, AARM meeting, Minneapolis, Minnesota, Jun 23, 2012.
6. "Measuring fast neutrons with large liquid scintillator for ultra-low background experiments", **Chao Zhang**, Dongming Mei, Keenan Thomas, Patrick Davis Brian Woltman and Frederick Gray, 2012 APS DNP meeting, Newport Beach, CA, Oct 26, 2012.
7. "Update on Cosmogenic background for a LAr based surface detector", **Chao Zhang**, Dongming Mei, LBNE meeting, Deadwood, SD, Jul 29, 2012.
8. "LBNE simulation of Cosmogenic backgrounds", **Chao Zhang**, Dongming Mei, LBNE meeting, FermiLab, IL, Apr 28, 2012.
9. "Simulation of Cosmogenic Background for Davis Cavern at Homestake Mine", **Chao Zhang**, Dongming Mei, APS DNP Fall Meeting 2011, East Lansing, Michigan.
10. "Measuring High Energy Gamma Rays at the Homestake Mine for DUSEL Experiments", **Chao Zhang**, Dongming Mei, Keenan Thomas, Fred Gray, APS April Meeting 2011, Anaheim, CA.
11. "Update on External Background Characterization of Homestake Mine for Sanford Lab and DUSEL", **Chao Zhang**, Dongming Mei, Keenan Thomas, Fred Gray, APS DNP Fall Meeting 2010, Santa Fe, New Mexico.
12. "Improvement of GEANT4 Simulation in Nuclear Internal Conversion Model", **Chao Zhang**, Dongming Mei, APS April Meeting 2010, Washington DC.
13. "Monte Carlo Simulation of Homestake Background", **Chao Zhang**, Dongming Mei, APS April Meeting 2009, Denver, Colorado.
14. "A measurement of high multiplicity muon events with the L3_C detector", Chao Zhang, 30th ICRC, Merida(2007)
15. "Observation on Local Group using the Tibet Air Shower Array and the possible Relation with Dark Matter", 29th ICRC, Pune(2005).