

TARITREE M. WONGJIRAD

Curriculum Vitae

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EDUCATION

- Duke University, Durham, North Carolina
PhD Physics In Progress
National Science Foundation Graduate Fellow, Fall 2009-2012
Charles H. Townes Fellow, Fall 2008-2010.
Thesis Advisor: Kate Scholberg
- Yale University, New Haven, Connecticut
BS Physics, Intensive; BA Philosophy, May 2006
Physics Senior Thesis: Construction and Operation of a two-phase liquid xenon time-projection chamber using Gas Electron Multipliers. Advisor: Dan McKinsey
Philosophy Senior Thesis: Non-reductive properties in language. Advisor: George Bealer
- Century High School, Bismarck, North Dakota
Diploma, May 2002
Valedictorian

RESEARCH EXPERIENCE

- **Research Assistant, Duke University, Duke High Energy Physics Group**
Thesis Advisor: Kate Scholberg
August 2008-Present
Working towards my PhD thesis in neutrino physics. Currently I am working on the T2K neutrino oscillation experiment. For T2K, I have been writing an analysis routine that will try to use events in the Outer Detector of the Super-Kamiokande detector for studies of the incoming beam flux. Also, I worked on studying the backgrounds from cosmic rays for the CLEAR experiment, a proposed experiment that aims to study neutrino-nucleus coherent elastic scattering. I also am setting up an experimental setup to explore the whether nanocrystal particles can be used as a scintillation medium for particle detection.
- **Research Assistant, Yale University, Fleming High Energy Physics Group**
December 2007-August 2008
Helped the Fleming group commission a large liquid argon detector used to detect neutrinos produced by the NUMI beam at Fermi National Accelerator Laboratory. I assisted in building filters used to purify liquid argon and helped write the event simulation software. I also worked on event reconstruction.

- **Research Assistant**, *Yale University, McKinsey Particle Astrophysics Physics Group*
Fall 2003-December 2007

Worked for four years on several projects aiming to develop a dark matter detector using liquid xenon. I created several computer simulations using the particle tracking package, Geant4, to model, analyze and understand the experimental set-ups. I wrote software to monitor and record system variables such as temperature and pressure. I designed, built, and operated three apparatuses. One was a chamber for R&D work on Gas Electron Multipliers done by our group in conjunction with Professors Gai and Fleming. We aimed to develop Gas Electron Multipliers, or GEMS, for use in two-phase noble element detectors as an amplifier of electrons. Another apparatus was used to demonstrate a novel detector calibration method that utilized meta-stable xenon nuclei. Finally, I designed, built, and operated the cell used to measure the scintillation efficiency of liquid xenon for low energy nuclear recoils. I also contributed to the analysis of the data. My contribution to all of this work culminated in one referred article, one conference proceedings article, a poster presentation to fall 2006 APS meeting, and a talk at the APS 2008 meeting (see below).

- **Undergraduate Researcher**, *Yale, Schepartz Chemical Biology Lab*
Spring 2004

I conducted research that used phage display to optimize the binding of an engineered protein that would act as a cellular antagonist of the p53 tumor suppressor protein, hDM2. Contribution to work culminated in one referred article (see below).

TEACHING EXPERIENCE

- **Volunteer**, *Riverside High School, Durham, North Carolina, Spring 2009 to Present*.
Assist high school students in the Technology Student Association with different projects.
- **InSTEP Presenter**, *DePaul University, Chicago, IL, Summer 2008*
Planned and delivered presentation on Newton's Laws for a girls' science summer camp, InSPEC.
- **Tutor**, *Wilbur Cross High School, New Haven, Spring 2007*
Tutored student in Algebra II and SAT-prep.

WORK EXPERIENCE

- **Intern**, *Office of Senator Byron L. Dorgan, D-ND, Fall 2006-Spring 2007*
Assisted staff. Researched a wide variety of legislative issues. Focused mostly on trade and science issues.
- **Intern**, *Odyssey Research, Summer 2003*
Assisted clinical research coordinators with running their clinical pharmaceutical research.

PUBLICATIONS

- Curioni A, Fleming BT, Jaskierny W, Kendziora C, Krider J, Pordes S, Soderberg M, Spitz J, Tope T, Wongjirad T. "A Regenerable Filter for Liquid Argon Purification." arXiv:0903.2066. Accepted to NIM A on April 2nd, 2009.
- Ni K, Manzur A, Wongjirad T, Kastens L, and McKinsey DN. "Nuclear Recoil Scintillation Efficiency in Liquid Xenon at Low Energies." In preparation.
- Ni K, Hasty R, Wongjirad TM, Kastens L, Manzur A, McKinsey DN. "Preparation of Neutron-Activated Xenon for Liquid Xenon Detector Calibration." *NIM A* 2007 Nov 10; 582 (2): 569-574.
- Kritzer JA, Zutshi R, Cheah M, Ran FA, Webman R, Wongjirad TM, Schepartz A. "Miniature Protein Inhibitors of the p53-hDM2 Interaction." *Chembiochem*. 2006 Jan; 7(1):29-31.

PRESENTATIONS

- Wongjirad T for the CLEAR Collaboration. APS 2009 April Meeting.
- Wongjirad T. "Neutrino Detection Using Liquid Argon: First Results from the ArgoNeuT Experiment." Poster presentation at the Fermi National Accelerator Laboratory 2008 Users Meeting.
- Wongjirad T, Ni K, Kastens L, Manzur A, McKinsey DN. "Nuclear Recoil Scintillation Efficiency in Liquid Xenon at Low Energies." Talk given at the American Physical Society 2008 Conference.
- Gai M, Alon R, Breskin A, Cortesi M, McKinsey DN, Miyamoto J, Ni K, Rubin DAR, Wongjirad T. "Toward Application of a Thick Gas Electron Multiplier (THGEM) Readout for Dark Matter Detector." *Proc. 23rd Winter Workshop on Nuclear Dynamics*. arXiv: 0706.1106v1 2007
- "Low background Gas Electron Multipliers for dark matter search." Poster presentation at American Physical Society 2006 Conference.

REFERENCES

- **Professor Kate Scholberg** schol@duke.edu
Ann T. and Robert M. Bass Associate Professor of Physics (919) 660-2962
PhD advisor. Collaborator in the Super Kamiokande and T2K neutrino experiments.
- **Professor Bonnie Fleming** Bonnie.Fleming@yale.edu
Principle Investigator of the Fleming group (203) 432-3235
Currently an associate professor at Yale University
- **Professor Daniel McKinsey** Daniel.McKinsey@yale.edu
Principle Investigator of the McKinsey group. (203) 436-3825
Currently an associate professor at Yale University
- **Professor Moshe Gai** Moshe.Gai@yale.edu
Collaborator with the McKinsey group on Gas Electron Multiplier project. (203) 432-5195
Currently a Professor of Physics at University of Connecticut and an adjunct professor at Yale University

