

Henning O. Back

Fermi National Accelerator Lab
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EDUCATION

Ph.D. in Physics *Virginia Tech, Blacksburg, VA* **2004**

Dissertation: “Internal Radioactive Source Calibration of the Borexino Solar Neutrino Experiment”

B.S. in Physics *Indiana University, Bloomington, IN* **1997**

GRANTS AND AWARDS

· U.S. Department of Energy grant number - DE-FG02-07ER41484 supporting proposal entitled “DUSEL R&D at the Kimballton Underground Facility” **2007-2010**

PROFESSIONAL EXPERIENCE

Associate Research Scholar *Princeton University, Princeton NJ* **2010-**

My work station is at Fermi National Accelerator Laboratory (Fermilab), Batavia, IL

For the DarkSide Dark Matter Search experiment (E1000) I manage all aspects of underground argon collection and purification. This includes the management of the operations of an argon gas extraction in Cortez (CO), and the construction, commissioning, and operation of all argon purification plants at Fermilab. Services include planning and scheduling, training and management of technical staff, specification and procurement of instrumentation and control devices, assembly and commissioning of hardware and software, preparation and presentation of reports and papers for collaborators and at workshops and conferences.

I also lead the Scintillation Efficiency of Noble Elements (Scene) project at Fermilab. Using a neutron beam at Notre Dame University, Scene is measuring the scintillation light production efficiency of liquid argon for nuclear recoil events (L_{eff}) in an electric field, and the free charge from the ionization events.

· Accomplishments

- Successfully produced better than 99.95% pure argon starting with CO₂ stream with 600 ppm argon.
- Doubled argon concentration and quadrupled production rate of the argon extraction plant in Colorado.
- Showed that argon scintillation is indeed dependent on electric field for low energy nuclear recoils.
- Elected to the Darkside Dark Matter experiment Steering Committee.
- Promoted from Associate Engineering Physicists to current position, which was created solely for me.

Research Assistant Professor *North Carolina State University, Raleigh NC* **2004–2010**

Coordinator for multi-institutional project to create an ultra-low radioactive background, high-purity Germanium (HPGe) detector that was enriched to 85% in ⁷⁶Ge, as a prototype for the Majorana neutrinoless double beta decay experiment.

Principle Investigator for R&D involving low-level radioactive contamination determination in materials for Darkmatter and Neutrino detectors and radon reduction in air for the Deep Underground Science and Engineering Laboratory (DUSEL).

Collaborator on the Low Energy Neutrino Spectrometer for measuring low energy solar neutrinos located at the Kimballton Underground Research Facility (KURF) in Virginia.

Postdoctoral work on the Ultra Cold Neutron A-correlation coefficient (UCNA) experiment at Los Alamos National Lab.

· Accomplishments

- Characterized the world’s only isotopically enriched, segmented, HPGe detector
- Grant proposal rated as “Must Fund” by NSF and awarded in full by the U.S. Dept. of Energy. U.S. (grant number DE-FG02-07ER41484)
- Elected young member of the Majorana Executive Committee (For Majorana experiment)
- Promoted from Postdoctoral Research Associate to Research Assistant Professor

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Graduate Research Assistant

Virginia Tech, Blacksburg, VA

1998–2004

Dissertation research was to establish a need and then to design, build, and test the calibration system for a 1400 ton liquid scintillator solar neutrino detector (Borexino). This included the apparatus for inserting calibration sources into the detector and the instruments based on CCD cameras to find the location of the calibration sources within the sources independent of the 2200 photomultiplier tubes.

• Accomplishments

- Source location system determined position of LED to better than 1 cm inside a 13 m diameter sphere.
 - Sigma Pi Sigma member – National Physics Honor Society
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