

**DONNA L. KUBIK**

**June 19, 2011**

**Resume**

Fermilab  
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*Employment*

- Engineering Physicist, 2007 – present, Fermilab, Batavia, IL 60510.
- Research technician/teaching assistant, 2001-2006, Northern Illinois University, DeKalb, IL 60115.
- Senior technical aide, 2000-2001, Fermi National Accelerator Laboratory, Batavia, IL 60510.
- Electrical engineer, 1998-2000, Arecibo Observatory, Arecibo, PR 00612.
- Accelerator operator/technician, 1995-1998, Laboratory for Elementary Particle Physics, Ithaca, NY 14853.
- Teaching assistant, 1994-1995, Binghamton University, Binghamton, NY 13902.
- Accelerator operator/technician/programmer, 1986-1992, Fermi National Accelerator Laboratory, Batavia, IL 60510.
- Accelerator operator/technician, 1985-1986, University Hospital, Seattle, WA 98195.
- Accelerator operator, 1984-1985, Lawrence Berkeley National Laboratory, Berkeley, CA 94720.
- Accelerator operator/technician, 1982-1984, Nuclear Physics Laboratory, Seattle, WA 98195.
- Laboratory aide, 1976-1983, University of Washington, 1976-1983, Seattle, WA 98195.

*Education*

- Master of Science Degree in Physics, Northern Illinois University, 2007.  
Thesis title: “Gravitational Lensing Systems Found in the SDSS”
- Master of Science Degree in Electrical Engineering. Binghamton University. 1998.  
Thesis title: “Modeling 1/f Noise in HEMTs using PSPICE”
- Bachelor of Science Degree in Electrical Engineering. Binghamton University. 1995.

*Research Experience*

- **At Fermilab:**
- QUIET (CMB polarization project)
  1. Warm and cold testing of QUIET W-band receiver modules. For example, perform Y factor measurements to learn about receiver noise.
  2. Performing QUIET data quality checks for W-band observations.
  3. Participated in the final calibration run for QUIET W-band observations. Spent 2 weeks at the QUIET telescope in Chile for the calibration run.
- Germanium detector
  1. Commissioning a Canberra Ge detector to 1) measure backgrounds for dark matter and other low background studies. 2) investigate variable radioactive decay rates.

- DES (Dark Energy Survey)
  1. Over ~2 years, characterized 240 CCDs for the Dark Energy Survey Camera (DECam): developed software, worked with optical test bench setup, analyzed the test results.
  2. Investigated the magnitude of the depth of focus issue in the 250 um-thick DES CCDs for the four DES filter bands (g, r, i, z).
- SiDet (Silicon Detector facility)
  1. Responsible for ESD (Electro Static Damage) safety in SiDet's cleanrooms and labs
  2. Teach an ESD safety course.
  3. Responsible for organizing activities in Sidet's cleanrooms, monitoring particle counts, humidity, and temperature
  4. Responsible for cleanroom humidifiers (including maintenance) and air conditioning systems
  5. Responsible for alarm systems for house vacuum, etc.

**At Northern Illinois University:**

- Designed cooling and housing for a CMOS x-ray camera used for imaging at the Advanced Photon Source (APS) at Argonne National Laboratory.
- Fabricated and tested components for a scintillator-based calorimeter for an International Linear Collider (ILC) detector.
- Developed a photogrammetric method of stress analysis to test thin, nonstandard windows for liquid hydrogen absorbers, major components of a muon cooling channel for a muon collider or neutrino factory.
- Taught introductory astronomy, supervised honors students' observing projects at Davis Hall Observatory, managed the observatory, conducted weekly public observing sessions, and commissioned electronic control (GOTO) for the Davis Hall Observatory telescopes.
- Worked on beam diagnostics (especially transition radiation detectors) and accelerator alignment at the new University of Maryland Electron Ring (UMER). UMER will be used to study the dynamics of both particle beams and galaxies. Laboratory stellar dynamics follows from the Coulomb nature of the gravitational and electrostatic force. Both scale as the inverse-square of the separation between interacting particles, therefore similarities in the evolutionary dynamics of stellar and charged-particle systems are expected.

**At Fermilab:**

- I left Arecibo Observatory in 2000 to move to Chicago to help my parents who were experiencing health problems. The Cryogenic Dark Matter Search (CDMS) at Fermilab had a one-year position available. Studying dark matter perfectly matched my interest in astronomy and cosmology. I tested the electronics that provide the interface between the CDMS detector and data acquisition system and participated in the design of the CDMS trigger and filter electronics.

**At Arecibo Observatory:**

- Showing interest in astronomical observing, my engineering job at the observatory evolved into Service Observer Specialist, in which I performed observations for

astronomers in absentia. Assisted in Very Long Baseline Interferometry (VLBI) in which the Arecibo radio telescope participated in Space VLBI with the Highly Advanced Laboratory for Communications and Astronomy (HALCA), an 8-meter radio-astronomy satellite.

- Documented the observatory's timing system  
[http://www.naic.edu/~astro/aotms/timing/total\\_timing.pdf](http://www.naic.edu/~astro/aotms/timing/total_timing.pdf)
- Built a remote monitoring system for the telescope's helium compressors  
<http://www.naic.edu/~astro/aotms/electronics/compressors.pdf>
- Attended the Berkeley Illinois Maryland Association (BIMA) Summer School at Hat Creek, CA. Observed HCN and HCO<sup>+</sup> in the star forming region, S106. The 3 mm rotational transition of HCO<sup>+</sup> in S106 had been mapped when the BIMA array was comprised of only three dishes. These earlier maps were compared to those derived using the expanded 10-element array.
- Attended the week-long course on radio interferometry at the National Radio Astronomy Observatory (NRAO) Synthesis Imaging Summer School in Socorro, NM.
- **At accelerator laboratories:**
- Intrigued by the mystery of the acceleration of cosmic rays, I worked as an accelerator operator and technician at several particle accelerators, including a Van de Graff, a heavy ion linear accelerator, a medical cyclotron, the p+p- collider at Fermilab, and the e+e- collider at Cornell. I also developed a data acquisition system to monitor magnet and press parameters during construction of prototype Superconducting Super Collider (SSC) dipoles at Fermilab.

#### **At University of Washington:**

- My first research experience was working on the NASA-supported Japanese-American Collaborative Emulsion Experiment (JACEE), a series of balloon-borne lead-emulsion chambers designed to directly measure the primary composition and spectra of cosmic rays at energies in the region of 1 TeV - 1000 TeV.

#### **Publications**

- "Development of Photogrammetric Methods of Stress Analysis and Quality Control", D. Kubik, J. A. Greenwood, *Technical Sciences*, **6**, 2003. physics/0311008
- "Small Scintillating Cells as the Active Elements in a Digital Hadron Calorimeter for the e+e- Linear Collider Detector", A. Dyshkant et al. *J.Phys.* **G30**:N1, 2004.
- "Current LH2 Absorber R & D in Mucool", M.A.C. Cummings et al. *J. Phys.* **G29**:1689-1692, 2003.
- "Convection-type LH2 Absorber R & D for Muon Ionization Cooling", S. Ishimoto et al. *Nucl. Instrum. Meth. A* **503**:396-400, 2003.