

# BENJAMIN SPEAKMAN

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## CAREER OBJECTIVES

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Research and Development Test Engineer: Focusing on product quality and reliability analysis.

## QUALIFICATIONS

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I am an experienced electrical test & reliability engineer, data analyst and software engineer with a background in particle physics. I have recently worked in semiconductor R&D, testing and analyzing non-volatile memory devices such as ST-RAM and ReRAM for future solid state drive (SSD) and non-volatile cache (NVC) memory markets. Before that, I worked in particle-physics research, where I modeled and simulated particle interactions, designed and developed analytical software, and administered Linux systems for distributed processing of Monte Carlo simulations.

## EDUCATION

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**PhD** in Particle Physics, University of Minnesota – Minneapolis, MN – **May, 2007**

Thesis Topic: “Atmospheric Electron Neutrinos in the MINOS Far Detector”

**BS** in Physics, University of Minnesota – Minneapolis, MN – **May, 1999** (Cum Laude)

## CORE COMPETENCIES

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- **Data Analysis:** Expert user of ROOT, Spotfire, and JMP analysis software packages; Experienced with product life and reliability analysis of memory devices; Expert in designing and programming Monte Carlo simulations; Expert in statistical pattern recognition methods.
- **Electrical Testing:** Expert with electrical laboratory testing equipment (for IC debugging and measurement); Expert with MOSAID memory tester and Cascade wafer prober; Experienced developing control and readout systems with National Instruments LabWindows/CVI and LabView.
- **Computing:** Expert user and administrator of Linux systems; Expert with MS Word, Excel and PowerPoint for documentation, analysis, and presentation purposes; Expert with software revision control using CVS/RCS and Subversion; Expert with Condor distributed processing.
- **Programming Languages:** Expert code developer in C++ (with object oriented emphasis) and C; Expert with Python and BASH scripting; Experienced with JavaScript, Perl, PHP, and HTML for web-site development.
- **Databases:** Expert user of MySQL; Experienced user of PostgreSQL; Expert with Relational DB layout and interface design.

## PROFESSIONAL EXPERIENCE

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2008/06 – **Seagate Technology**

Edina, MN

*Present* **Development Senior Engineer**

**Memory Products Group**

The Memory Products Group at Seagate Technology consists of 80 design, process, integration, and test engineers developing emerging non-volatile memory technologies for NAND flash replacement. My key responsibilities and accomplishments have been:

- Testing and analysis of STRAM devices and memory array circuits with a MOSAID tester.
- Lead team effort to produce comprehensive documentation of memory test and analysis.
- Design and implementation of magnetic response modeling software to find optimal design and placement of coils for magnetic field device.
- Design and construction of a magnetic field device to study physical properties of MTJ bits.

- Development of Python software to analyze memory array data from MOSAID tester.
- Design and implementation of MOSAID control software to manipulate magnetic fields, feedback device usability, and maintain test activity logs for RCCA studies.
- Developed test methods to measure magnetic energy barriers and predict device reliability.
- Regularly reported test and analysis results to process, design and integration groups.

2007/05 – **University of Minnesota** Minneapolis, MN

2008/06 **Research Associate** **MINOS and NOVA Experiments**

The NOVA experiment is a continuation of the MINOS experiment (described in the next work experience), using the same beam-line with two new detectors. This project will begin construction in 2011. As a post-doc, my responsibilities with these two experiments were:

- Design and implementation of neural-network and spatial clustering software to distinguish neutrino interaction types in NOVA far detector.
- Design of Java + MySQL QA tracking system for the NOVA module factory.
- Analysis of particle flux rate variation within the 11-year solar cycle, along with how this variation systematically effects MINOS atmospheric-neutrino measurements.
- Design and implementation of software to model the quantum-mechanical oscillation of particles as they pass through an oblate, multi-layered, multi-density Earth model.

2001/06 – **University of Minnesota (UMN)** Minneapolis, MN

2007/05 **Graduate Research Assistant** **MINOS Experiment**

The MINOS experiment is a collaboration of 100+ physicists from 32 institutions in 6 countries. This collaboration built two detectors and a neutrino beam to study the phenomenon of neutrino oscillation. As a MINOS graduate student, I was responsible for:

- Coordination of atmospheric-neutrino analysis efforts at the University of Minnesota.
- Design and implementation of pattern-recognition software to identify neutrino event types.
- Design and implementation of QA software to report status of detector electronics.
- Development of interface to MySQL relational database for electronic-channel mapping.
- Implementation of LabWindows/CVI software for scintillator and photo-detector QA.
- Linux systems administration for a multi-node cluster utilizing Condor distributed computing environment for batch processing of Monte Carlo simulations.
- Management of the computing resources team for the UMN high-energy physics group.

2000/08 – **University of Minnesota** Minneapolis, MN

2001/06 **Graduate Research Assistant** **Soudan2 Experiment**

The Soudan2 experiment preceded the MINOS experiment in the Soudan Mine, with a single underground detector to study atmospheric neutrinos. Early in my graduate school career, I lead a team project with responsibilities to:

- Design and implement an experiment to study simulated electron tracking in the Soudan2 detector using the EGS4 Monte Carlo software.
- Purchase, construct and administer a Linux computer farm for distributed processing of large-scale Monte Carlo simulations.

## PUBLICATIONS

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- Benjamin Speakman , UMN Thesis, June 2007
  - 2001 – 2008: Primary author on 5 MINOS Collaboration Notes and 2 Soudan2 Collaboration Notes
  - 2005 – 2008: Co-author on 10 MINOS Journal Publications and 3 Soudan2 Journal Publications.
- Complete publication and reference lists available upon request