Michael G. Marino

Excellence Cluster 'Universe'
Physik-Department
Technische Universität München
Boltzmannstr. 2
80805 Munich
Germany

Phone: +49 89 35831 7149
Mobile: +49 176 66830986

email: michael.marino@mytum.de

Education

2010 PhD in Physics, University of Washington, Seattle, Washington

2005 MSc in Physics, University of Washington, Seattle, Washington

2004 BS in Physics, *Summa cum laude*, University of Notre Dame, Notre Dame, Indiana

2004 BA in Philosophy, *Summa cum laude*, University of Notre Dame, Notre Dame, Indiana

Awards & honors

2012 Henderson Prize, Oustanding PhD Thesis, Physics Department, University of Washington

2007 Sebastian Karrer Prize, Physics Department, University of Washington

2006 DNP Travel Award, APS Meeting, Dallas, Texas

2005 Sebastian Karrer Scholarship, Physics Department, University of Washington

2004–2005 Mellam Fellowship, Physics Department, University of Washington

2004 Outstanding Senior Physics Major Award, Physics Department, University of Notre Dame

2004 Elected Member, Phi Beta Kappa, Notre Dame Chapter, Epsilon of Indiana

Journal articles

2012 M. Auger et al. (EXO Collaboration), *Search for neutrinoless double-beta decay in ^{136}Xe with exo-200*, *Phys. Rev. Lett.* **109** (Jul, 2012) 032505.

2012 A. Dobi et al. (EXO Collaboration), *Xenon purity analysis for EXO-200 via mass spectrometry*, *Nucl.Instrum.Meth.* **A675** (2012) 40–46.

2011 N. Ackerman et al. (EXO Collaboration), *Observation of two-neutrino double-beta decay in ^{136}Xe with the exo-200 detector*, *Phys. Rev. Lett.* **107** (Nov, 2011) 212501.

2011 C. E. Aalseth et al. (CoGeNT Collaboration), *Search for an annual modulation in a p-type point contact germanium dark matter detector*, *Phys. Rev. Lett.* **107** (Sep, 2011) 141301.

2011 C. E. Aalseth et al. (CoGeNT Collaboration), *Results from a search for light-mass dark matter with a p-type point contact germanium detector*, *Phys. Rev. Lett.* **106** no. 13, (2011) 131301.

2011 M. Boswell et al. (MaGe Collaboration), *Mage-a geant4-based monte carlo application framework for low-background germanium experiments*, *IEEE Trans. Nucl. Sci.* **58** no. 3, (2011) 1212 –1220.

2011 R. J. Cooper, D. C. Radford, K. Lagergren, J. F. Colaresi, L. Darken, R. Henning, M. G. Marino, and K.M. Yocum, *A pulse shape analysis technique for the* Majorana *experiment*, *Nucl. Inst. & Meth. A* **629** no. 1, (2011) 303 – 310.

2008 C. E. Aalseth et al. (CoGeNT Collaboration), *Experimental constraints on a dark matter origin for the DAMA annual modulation effect*, *Phys. Rev. Lett.* **101** no. 25, (2008) 251301. Erratum: Phys. Rev. Lett. **102**, 109903 (2009).

2008 J. A. Detwiler, R. Henning, R. A. Johnson, and M. G. Marino, *A generic surface sampler for monte carlo simulations*, *IEEE Trans. Nucl. Sci.* **55** (2008) 2329–2333.

2007 M. G. Marino et al., *Validation of spallation neutron production and propagation within Geant4*, *Nucl. Inst. & Meth. A* **582** no. 2, (2007) 611 – 620.

2004 Y. Qiang et al., *Synthesis of core-shell nanoclusters with high magnetic moment for biomedical applications*, *IEEE Trans. Magn.* **40** no. 6, (2004) 3538–3540.

2002 J. J. Kolata et al., *Elastic scattering and transfer in the $^{8}Li + ^{208}Pb$ system near the coulomb barrier*, *Phys. Rev. C* **65** no. 5, (2002) 054616.

Presentations

2010 "Searching for low-mass WIMPs: Dark matter from the tabletop", E-18 Seminar, Technische Universität München, Garching, Germany. *Invited Talk*

2010 "Searching for low-mass WIMPs: Dark matter from the tabletop", Research Progress Seminar, Physics Division, Lawrence Berkeley National Laboratory, Berkeley, California. *Invited Talk*

2010 "Searching for low-mass WIMPs: Dark matter from the tabletop", Max-Planck-Institut

für Physik, Munich, Germany *Invited Talk*

2010 "Searching for low-mass WIMPs: Dark matter from the tabletop", Max-Planck-Institut für Kernphysik, Heidelberg, Germany *Invited Talk*

2010 "Dark matter searches with low-noise ionization germanium detectors", Workshop on Germanium-Based Detectors and Technologies, Berkeley, California. *Invited Talk*

2010 "P-type point contact detectors for the MAJORANA experiment", Los Alamos National Lab, Los Alamos, New Mexico. *Invited Talk*

2009 "The MAJORANA neutrinoless double-beta decay experiment", DPF Meeting, Detroit, Michigan. *Talk*

2008 "Novel germanium detectors for the MAJORANA experiment", National Nuclear Physics Summer School, George Washington University, Washington, D.C. *Talk*

2007 "Validation of neutron transportation and production in Geant4", TRIUMF Summer Institute, Vancouver, British Columbia. *Talk*

2006 "Implementation of a generic surface sampler using Geant4", IEEE Nuclear Science Symposium, San Diego, California. *Poster*

2006 "The proposed MAJORANA $0\nu\beta\beta$ experiment", Neutrino Conference 2006, Santa Fe, New Mexico. *Poster*

2006 "An update on the MAJORANA-GERDA simulation package (MaGe)", APS Meeting, Dallas, Texas. *Talk*

2003 "ZFC/FC Simulations of Nano-clusters in Metallic Matrices", Research Experience for Undergraduates Colloquium, University of Idaho. *Talk*

2002 "Monte Carlo Analysis of UCN Transport Properties", Research Experience for Undergraduates/Research Experience for Teachers Colloquium, University of Notre Dame. *Talk*

Relevant Professional Experience

2010–present *Postdoktorand*, EXC 'Universe', Technische Universität München, Munich, Germany

- Member of the EXO collaboration (Analysis and Simulation software development)
- Member of the TUM nEDM experiment (DAQ hardware and software development)

2005–2010 *Graduate Research Assistant*, CENPA, University of Washington, Seattle, Washington
Advisor: John F. Wilkerson

- Member of the MAJORANA collaboration
- Member of the CoGeNT collaboration
- Software: (i) neutron simulations to determine systematic errors of neutron background estimates, (ii) primary and collaborative contribution to the design, implementation and testing of several analysis software packages for the MAJORANA experiment, including a modular framework for pulse-shape analysis, an encapsula-

tion package for serializing and storing data and metadata, and a ROOT-based package for processing ORCA binary files

- Hardware: (i) design, development and testing of digitizers within the ORCA DAQ program (ii) design, development, and testing of software framework for embedded processors for the ORCA program, including low-level Linux driver design and implementation, (iii) full design, testing, and deployment of a fully digital, ORCA-based DAQ for a p-type point-contact germanium detector at Soudan Underground Lab.
- Analysis: (i) determination of fast digitizer requirements for the MAJORANA experiment, (ii) full design and construction of an end-to-end solution for data flow and analysis for remote P-PC detector deployed at Soudan Underground Lab, (iii) calculation of relevant exclusion limits for dark matter for low-background, low-threshold germanium detectors.

2003 *Summer Research Assistant*, NSF Research Experience for Undergraduates Program, University of Idaho, Moscow, Idaho
Advisor: You Qiang

- Contributed to research concerning the magnetic properties of materials created using nano-cluster deposition techniques
- Performed Monte Carlo calculations to simulate Zero-Field Cooled/Field-Cooled (ZFC/FC) magnetization measurements of materials composed of nano-clusters in different matrices (metallic and non-metallic)
- Worked with nano-cluster deposition apparatus, helping to create samples of varying characteristics through different deposition techniques

2002 *Summer Research Assistant*, NSF Research Experience for Undergraduates Program, University of Notre Dame, Notre Dame, Indiana
Advisor: Alejandro Garcia

- Contributed to research concerning the measurement of the asymmetry of beta-decay of neutrons
- Performed Monte Carlo calculations analyzing the transport properties of ultra-cold neutrons (UCN) through guide pipes

2001–2002 *Tutor*, Learning Resource Center, University of Notre Dame, Notre Dame, Indiana

- Tutored individual first-year physics majors
- Led group collaborative learning sessions in physics for science and engineering majors

2001-2002 *Lab Assistant*, Nuclear Structure Laboratory, University of Notre Dame, Notre Dame, Indiana
Advisor: Larry Lamm

- Trained to run FN Tandem Accelerator (10 MV)
- Machined parts for research groups (mill experience, lathe experience, soldering experience)
- Maintained equipment in the laboratory (roughing pumps, cryostats, etc.)
- Assembled and maintained portions of beam line and related vacuum for various

research projects

Outreach Experience

2008-2009 *President.*, Career Development Organization of Physicists and Astronomers, University of Washington, Seattle, Washington

- Student-run organization focused on providing career resources for graduate students inside and outside of academia
- Planned and executed flagship event, 2008 Networking Day. Networking Day provides a forum to students to present their research to interested employers, obtain ideas for future careers.
- Planned career development workshops for students

Software and Computing

- Fluent in Fortran (simulation, theoretical calculations), C (Linux kernel, DAQ software, simulation), C++ (simulation, analysis, DAQ software), Obj-C (DAQ software), Scripting languages (Python, Bash, Tcsh), and debugging software (gdb, valgrind, kdb)
- Fluent in the software packages: ROOT, Geant4, CLHEP
- General experience with Perl, Mathematica, Databases (SQL, CouchDB), Javascript, HTML, XML, Qt