

- ◇ **Valedictorian** **Taylorsville High School**
Utah USA
1996
Numerous awards, including Sterling scholar

- PRIOR RESEARCH ◇ **Big Bang nucleosynthesis** **Physics, The Ohio State University**
Summer 2000, 2001: Research Experience for Undergraduates (REU)
Advisor: Robert Scherrer
 - **Computational modelling** of Big Bang nucleosynthesis. Research over two summers using **Monte Carlo method** to model the abundance of light elements created during the Big Bang. Modified legacy **Fortran** code, and extended with **C/C++**, **Perl**, and **Bash** code to take into account inhomogeneous neutrino concentration. publication: see below

- ◇ **Scanning capacitance microscopy** **Physics, University of Utah**
1998-2000: Undergraduate Semiconductor research
Advisor: Clayton Williams
 - **Computational modelling** of semiconductor imaging techniques. Used **finite element method** to create detailed models of electron/hole concentration and drift velocities in doped semiconductor samples. Developed code in **C/C++** and **Bash** as well as a proprietary language.
 - Designed and constructed an **experimental probe** to measure the dielectric constant of thin films on semiconductor surfaces. Custom **hardware programming**. publication: see below

- COMPUTER SKILLS ◇ **Unix administration, 16 years** **Debian Linux, FreeBSD, OpenBSD, Solaris**
1995-Present
Dedicated web, email, and file servers for small organizations. Security, backup servers, firewalling. Networking and employee workstations. Focus mostly on Debian GNU/Linux
- ◇ **Scientific modelling, 2+ years** **C/C++, Fortran, Bash, Perl**
1998-2001
Monte Carlo, Finite Element Method. Undergraduate research
- ◇ **Application development, 2 years** **C/C++**
1996-1998
Industry accounting software development. Major software releases, quality assurance
- ◇ **Programming languages, 16 years**
1995-Present
Experienced C/C++ developer. Various levels of exposure to Fortran, Python, Perl, Bash, Java, PHP, MySQL, MATLAB, Mathematica, Maple, etc
- ◇ **Technical writing, 15 years**
1996-Present
Corporate software documentation, esp. internal documentation for technical staff. Author of popular GNU/Linux documentation
<http://www.spencerstirling.com/computergeek/computernotes.html>
- ◇ **Microsoft Windows administration, 2+ years**
1996-1998
Small business (50+ employees) corporate networking.
- ◇ **In-person technical support, 2+ years**
1996-Present
Excellent oral communication skills. Provided advanced technical support (both in-person and over phone) in corporate environment. Continue to provide support for small nonprofit

- INDUSTRY EXPERIENCE
- ◇ **Linux administrator** **World Institute for Conservation and Environment**
2001-Present Shepherdstown, West Virginia USA
 - Web and email servers, file servers, backup servers, firewalling, and security
 - ◇ **C/C++ programmer** **Create-A-Check, Inc.**
1996-1998 Salt Lake City, Utah USA
 - C/C++ custom programming (accounting software).
 - Designed and implemented product testing infrastructure, responsible for major software releases.
 - Author of large amount of internal technical documentation.
 - Provided advanced support to customers with escalated issues beyond abilities of regular support.
 - Small (50+ machines) corporate MS Windows network management.
- MANAGEMENT
- ◇ **Co-managed research group of 7 PhD students** for three years at University of Utah. Fully supervised group for one year while main boss was in China.
 - ◇ **Ribbon Categories for Physicists** **Physics, University of Utah**
Summer 2009 - Spring 2010 Utah, USA
Organized year-long intensive seminar with four physics graduate students. Several times per week, 2 – 3 hours per session. Focused on collaborative learning and research related to modular tensor categories. Students alternated speaking in highly-interactive environment. I organized and strongly guided the discussion. Seminar resulted in high-quality publications.
 - ◇ **TQFTTQC** **Mathematics and Physics, University of Utah**
Fall 2008 - Spring 2010 Utah USA
Organized two-year seminar called Topological Quantum Field Theory and Topological Quantum Computing between the mathematics and physics departments. Formal style, hosted guests from premier institutions worldwide. Speakers came from TQFT, quantum computing, and condensed matter communities. Also local faculty, postdocs, and grad students invited to speak often.
- TEACHING EXPERIENCE
- ◇ **Assistant Professor** **Mathematics and Physics, University of Utah**
2008 - 2010 Utah USA
Partial differential equations for engineers, Quantum field theory (with Carleton Detar), Graduate statistical mechanics (with Daniel Mattis), Algebra for business and social science, Precalculus
 - ◇ **Assistant Instructor** **Mathematics, University of Texas at Austin**
2005 - 2008 Texas USA
Calculus, Precalculus, Math for elementary educators
 - ◇ **Teaching Assistant** **Mathematics, University of Texas at Austin**
2004 - 2005 Texas USA
Honors differential equations (under William Guy), Vector calculus (under Charles Friedman), Calculus (under Efraim Armendariz),
 - ◇ **Teaching Assistant** **Physics, University of Utah**
1998 - 2001 Utah USA
Mechanics, wave phenomena, electromagnetism (under Charlie Jui, Pierre Sokolsky, Gale Dick each for 1 year)
- FEATURED SPEAKER
- ◇ **SIAM-North Carolina State U**
Recent progress in exactly-soluble models of topological phases
 - ◇ **University of Texas at Austin, Texas** (September 2010)
Levin-Wen models and Turaev-Viro TQFTs
Quantum Teleportation and Quantum Communication (public lecture)

- ◇ **Fudan University**, Shanghai, China (July 2010)
Topological Phases and Emergent Phenomena in Physics
- ◇ **Macalester College**, St. Paul, Minnesota (April 2010)
Quantum Invariants of 3-Manifolds and Modular Categories conference
- ◇ **Baylor University**, Waco, Texas (Oct. 2009)
Fusion Categories and Applications conference
- ◇ **University of Queensland**, Quantum Information Science Initiative,
Brisbane, Australia (Feb. 2008)
2-week featured lecturer - mini-course about TQFTs and modular tensor categories
- ◇ **Texas A&M**, College Station, Texas (Apr. 2008)

CONFERENCE
PRESENTA-
TIONS

- ◇ **Algebraic Aspects of Quantum Computation**, SIAM-North Carolina State U: Raleigh,
NC (October 2011)
- ◇ **Topological Phases and Emergent Phenomena in Physics**, Fudan University:
Shanghai, China (July 2010)
- ◇ **Strongly-Correlated Systems and Tensor Categories**
Institute for Advanced Study, Tsinghua University
Beijing, China (June 2010)
- ◇ **Quantum Invariants of 3-Manifolds and Modular Categories**, Macalester College:
St. Paul, Minnesota (2010)
- ◇ **Fusion Categories and Applications**, Baylor University: Waco, Texas (2009)
- ◇ **Modular Categories and Applications**, Indiana University: Bloomington, Indiana
(2009)
- ◇ **NSF-CBMS Conference on Knots and Topological Quantum Computing**, Uni-
versity of Central Oklahoma: Edmond, Oklahoma (2008)
- ◇ **Oporto Conference on Knot Homology and Physics**, University of the Algarve:
Faro, Portugal (2007)
- ◇ **Texas Geometry and Topology Conference**, Rice University: Houston, Texas (2006)
- ◇ **Texas Geometry and Topology Conference**, University of Texas at Austin: Austin,
Texas (2005)
- ◇ **Texas Geometry and Topology Conference**, Texas Tech: Lubbock, Texas (2005)
- ◇ **Loop Quantum Gravity in the Americas**, Perimeter Institute: Waterloo, Ontario
(2004)

PUBLICATIONS

- ◇ Yuting Hu, Spencer D. Stirling, Yong-Shi Wu, *Ground state degeneracy in doubled topological phases*,
arXiv:1103. Submitted to Phys. Rev. Lett.
- ◇ Spencer D. Stirling, *Counterexamples in the Levin-Wen model, group categories, and Turaev unimodality*,
arXiv:1004.1737.
- ◇ Spencer D. Stirling and Yong-Shi Wu, *Braided categorical quantum mechanics I*,
arXiv:0909.0988. Accepted by Log. Meth. Comp. Sc.
- ◇ Spencer D. Stirling, *Abelian Chern-Simons theory with toral gauge group, modular tensor categories, and group categories*,
arXiv:0807.2857. Under review by Comm. Math. Phys.
- ◇ Spencer D. Stirling and Robert J. Scherrer, *Big bang nucleosynthesis with gaussian inhomogenous neutrino degeneracy*,
Phys. Rev. D66 (2002) 043531.

- ◇ V.V. Zavyalov, J.S. McMurray, S.D. Stirling, C.C. Williams, and H. Smith, *Two dimensional dopant and carrier profiles obtained by scanning capacitance microscopy on an actively biased cross-sectioned metal-oxide-semiconductor field-effect transistor*, J. Vac. Sci. Technol. B 18, 549 (2000).

AWARDS

- ◇ **Geometry Research Group Fellowship**, Department of Mathematics, University of Texas at Austin (2007)
- ◇ **NSF VIGRE Fellowship**, Department of Mathematics, University of Texas at Austin (2001, 2003)
- ◇ **Theoretical Physics (TPU) Fellowship**, Utrecht University, the Netherlands (2002)
- ◇ **International Study Abroad Scholarship**, University of Texas at Austin (2002)
- ◇ **NSF REU Research Scholarship**, Department of Physics, The Ohio State University (2000)
- ◇ **University of Utah, 1996-2001**
 - Honors at Entrance Scholarship
 - Kennecott Scholarship
 - Semiconductor Research Corporation Research Scholarship
 - Utah Mathematics Faculty Nominee Scholarship
 - Stephen E. Newman, Jr. Mathematics Scholarship
 - Physics Outstanding Junior Scholarship
 - Physics Outstanding Sophomore Scholarship
- ◇ **Taylorville High School, 1996**
 - Valedictorian
 - Sterling Scholar

INTERESTS

Hiking/mountaineering, camping, skiing. Music and movies. GNU/Linux.