



EDUCATION

- Sep 2013 – June 2014 **M.S., Physics** (*Summa Cum Laude*), Oregon State University
Advisor: Prof. Dr. Michael Zwolak
Thesis: *Redundant Information in a Spin System Beyond Pure Decoherence*
- Sep 2009 – June 2013 **Honors Baccalaureate**, Oregon State University
B.S., Physics (*Magna Cum Laude*); **B.S., Mathematics** (*Magna Cum Laude*)
Advisor: Prof. Dr. Albert Stetz
Thesis: *Writing a Detailed Introduction to String Theory*

AWARDS AND HONORS

- Apr 2017 *Graduate Assistant Award* – Honor for outstanding work as a physics graduate student at ASU
- Mar 2017 *CLAS Success Award* – Honor for outstanding work as a graduate student at ASU (\$200)
- Feb 2017 *ARCS Foundation Scholarship* – A single year scholarship awarded by Phoenix chapter of the ARCS Foundation for academic success at ASU (\$8.5k)
- Aug 2015–2016 *Wally-Stoelzel Physics Fellowship* – A single year fellowship awarded by ASU for academic record at ASU (\$3k/yr)
- May 2015–2016 *ASU Physics Department Summer Fellowship* – Summer fellowship awarded by ASU for research with the ASU Cosmology Department (\$1.5k/yr)
- Aug 2014 *OSU Distinguished Master's Thesis* – Recognized for scholarly achievement at the master's level (\$500)
- Aug 2014 *WAGS/UMI Innovation in Technology Nominee* – OSU nominee for distinguished Master's thesis competition
- Aug 2014 *Department of Physics Graduate Fellowship* – A single year fellowship awarded by ASU for outstanding academic record at OSU (\$5k)
- Sep 2009 – Jun 2013 *Presidential Scholarship* – A four year scholarship awarded by OSU for outstanding achievement at Corbett High School (\$9k/yr)
- Sep 2009 – Jun 2013 *Honors Scholar* – Member of the honors college at OSU with academic distinction
- Sep 2011 *Department of Science Scholarship* – A single year scholarship at OSU for exceptional work in the math and sciences (\$1k)
- Jun 2009 *Valedictorian* – Valedictorian at Corbett High School

EXPERIENCE



GRADUATE RESEARCH, ARIZONA STATE UNIVERSITY

- *Current Work*: Studying the connection between modified theories of gravity and thermodynamics. (Supervised by Dr. Parikh, Jan 2015 – *present*)
 - Derived the null energy condition from the second law of thermodynamics applied to a local horizon (see publications)
 - Derived classical equations of motion for an arbitrary equation of gravity arise from the first law of ‘spacetime thermodynamics’, and a first law of gravity (see publications)
 - Showed that the Ricci convergence condition remains stable under one-loop quantum corrections from the trace anomaly effective action (see publications)
 - Studying the microscopic origins of spacetime by looking at how “entanglement equilibrium” derives classical equations of motion for arbitrary theories of gravity
 - Studying how the Galileons might emerge from string theory
 - Seeing if axions might have observational effects on the stretched horizons outside of Kerr black holes
- *Research Rotation I*: Studied Lorentzian wormholes in modified gravity theories in arbitrary spacetime dimension. Proved that wormholes in dimension $D > 4$ in Einstein-Gauss-Bonnet gravity can be fully supported by ordinary matter. (Supervised by Dr. Easson, Aug 2014 – Dec 2014)

GRADUATE AND UNDERGRADUATE RESEARCH, OREGON STATE UNIVERSITY

- Researched Quantum Information, Quantum Decoherence, and the quantum-to-classical transition using analytical and computational techniques (May 2013 – *present*)
 - Developed a classical algorithm to compute mutual information in permutationally invariant spin systems with a computational speedup of: $2^{3N} \rightarrow N^4$; N spins
- Participated in Physics Education Research (June 2012 – Dec 2013):
 - Data collection and characterization; reviewed film of junior level *Paradigms in Physics* courses
 - Improved and replaced several MAPLE worksheets with MATHEMATICA notebooks used in *Paradigms in Physics* courses
 - Maintained and organized wiki website for Paradigms of Physics
- Surveyed several topics in string theory including: Light-cone, Lorentz covariant, and BRST quantizations of the bosonic string, superstrings, tachyon instability of D-branes, and supersymmetric black holes. Constructed a comprehensive set of notes aimed at teaching undergraduates the fundamentals of string theory (Mar 2012 – June 2013)

TEACHING, ARIZONA STATE UNIVERSITY

- Teaching assistant for multiple sections of PHY 122, 132, 113, 122 ProMod, 122 Online, lab portion of Introductory Physics with Calculus/Algebra based Physics (Aug 2014 – Present). Duties require
 - Directing each class period, assisting all students during experiments, and providing the occasional lecture



- Proctoring exams, grading lab reports and tests
- Holding office hours for students attending lab section, and additional office hours for intro. level physics students
- Mentor/In-class facilitator for the *Sundial Mentoring Program* (Jan – May 2015,2016)
 - Attend weekly lectures on research training for beginning undergraduate students
 - Mentor multiple students throughout the semester; introducing the students to research skills, how to prepare applications, personal statements, etc.

TEACHING, OREGON STATE UNIVERSITY

- Teaching assistant for the *Paradigms in Physics* program (Dec 2013 – June 2014). *Paradigms* is an alternative method for teaching upper division undergraduates, aimed at interactive learning and professional development. It is an intensive program for the students. A teaching assistantship requires
 - Proctoring exams, grading homework assignments and tests
 - Holding office hours for Paradigms in Physics students, and additional office hours for intro. level physics students
 - Attending all lectures (7 hrs/week) and review sessions, including directing some of the review sessions
- Private tutor for introductory physics, biomechanics, and introductory chemistry (Mar 2010 – July 2014)

PUBLICATIONS

1. Maulik Parikh & **Andrew Svesko**, *A First Law of Gravity* (in preparation, to be submitted to Physical Review D).
2. **Andrew Svesko** & Maulik Parikh, *Gravity From Thermodynamics: Beyond the Einstein Equation of State* (in preparation, to be submitted to Physical Review D).
3. Maulik Parikh & **Andrew Svesko**, *Logarithmic Corrections to Gravitational Entropy and the Null Energy Condition* (Accepted to PLB).
4. Maulik Parikh & **Andrew Svesko**, *Thermodynamic Origin of the Null Energy Condition*, ARXIV:1511.06460 hep-th, 2015 (Accepted to PRD).
5. **Andrew Svesko** & Michael Zwolak, *Redundant Information in a Spin System Beyond Pure Decoherence* (in preparation, to be submitted to Physical Review Letters).



PRESENTATIONS

1. *Why do Apples Fall? What Heat and Entropy have to say about Gravity*, Sundial Research Conference, at Arizona State University, Tempe, AZ, (Spring 2016,2017)
2. *Gravity From the Thermodynamics of Spacetime*, APS Four Corners Conference at Arizona State University, Tempe, AZ (Fall 2015)
3. *Redundant Information in a Spin System Beyond Pure Decoherence*, thesis defense presented at Oregon State University, Corvallis, OR (June 2014)
4. *Redundant Information in a Spin System Beyond Pure Decoherence*, research seminar presented at Oregon State University, Corvallis, OR (May 2014)
5. *Fragility of Information in a Symmetric Spin Environment*, poster presentation to prospective graduate students at Oregon State University, Corvallis, OR (March, 2014)
6. *A Detailed Introduction to String Theory*, poster presentation to Honor's college at Oregon State University, Corvallis, OR (May, 2013)

PROFESSIONAL MEMBERSHIPS

- American Physical Society (member since Sep 2010)
- Pi Mu Epsilon Society of Mathematics students at Oregon State University (invitation only) (member since May 2012)
- Society of Physics Students at Oregon State University (member since Sep 2010)

PROFESSIONAL DEVELOPMENT

- 2016 Graduate Teaching Workshops, Arizona State University
 - ProMod: Teaching Assistant Orientation for ProMod Physics Course
- 2014 Graduate Teaching Workshops, Arizona State University
 - TAD: Teaching Assistant/ Associate Development Orientation and Module
- 2013 Graduate Teaching Workshops, Oregon State University
 - CONNECT: New Graduate Teaching Assistant Orientation
 - Teaching Physics: Graduate Teaching Assistant in Physics Orientation

ADDITIONAL RESPONSIBILITIES AND SKILLS

- Performance Evaluation Committee – Student committee assessing performance of physics professors up for promotion/tenure (Oct 2012)
- Computer Skills: Mathematica, Matlab, Maple, Labview, C+, Python, Sage, L^AT_EX