

**Tiffany Summerscales Ph.D.**  
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**EDUCATION:**

- Penn State University, University Park, PA 1999-2006
  - Graduated with a Ph.D. in Physics May 2006
  - Dissertation: Gravitational Wave Astronomy with LIGO: From Data to Science
- Andrews University, Berrien Springs, MI 1995-1999
  - B. S. in Mathematics and Physics June 1999

**EXPERIENCE:**

- Assistant Professor of Physics, Andrews University 2006-present
- Graduate Research Assistant, Penn State University 2000-2006
- Graduate Teaching Assistant, Penn State University 1999-2006

**AWARDS:**

- College of Arts & Sciences Excellence Award May 2010

**HONOR & PROFESSIONAL SOCIETY MEMBERSHIPS:**

- Sigma Xi – The Scientific Research Society 2010-present
- Pi Mu Epsilon – Mathematics Honor Society 2007-present
- American Physical Society 2001-present
- Sigma Pi Sigma – Physics Honor Society 1998-present

**PROFESSIONAL ACTIVITIES:**

**TEACHING:**

- PHYS 141, 142 General Physics
- PHYS 141-L, 142-L General Physics Lab
- PHYS 235 MATLAB
- PHYS 280 Topics in Physics: MATLAB
- PHYS 280 Topics in Physics Lab
- PHYS 295 Independent Study
- PHYS 377, 477 Advanced Physics Lab I & II
- PHYS 430 Thermodynamics & Statistical Mechanics
- HONS 497H Senior Honors Research
- PHYS 495 Independent Study
- PHYS 690 Independent Study
- MSCI 665 Prep for Comprehensive Exams
- MSCI 670 Comprehensive Exams
- IDSC 575 Math & Science Seminar
- IDSC 698 Project
- PHYS 690 Independent Study

- AP Physics II

## SERVICE:

- Chair of the Architecture Program Review Panel 2010-2011
- Chair of the Undergraduate Program Review Committee 2009-present
- Member of the Professional Recommendations Committee 2010-present
- Member of the Advancement Criteria Committee 2009-present
- Faculty Representative to the Goldwater Foundation 2008-present
- Member of Educational and Public Outreach Working group of the LSC 2008-present
- Member of General Education Sub-Committee: Composition, Communication & Computers 2007-2011
- Member of General Education Sub-Committee: Arts & Humanities 2007-2011
- Member of Honors Council 2007-present
- Member of Undergraduate Council 2007-present
- Vice-Chair of Undergraduate Council 2008-present
- Member of Accreditation Self-Study Sub-Committee: Acquisition, Discovery & Application of Knowledge 2007-2008
- Science enrichment activities for 7<sup>th</sup>-8<sup>th</sup> grade Topics in Science at RMES 2006-present
- Member of the Editorial Board of The Gravitational Lens Newsletter 2006-2007

## Internal Talks

- Andrews University Eigen\*Talk Feb 2011
  - Gravitational Waves: A New Kind of Astronomy
- Andrews University Center for Teaching & Learning Excellence Workshop Apr 2011
  - Student Engagement (Panel Discussion)
- Andrews University Center for Teaching & Learning Excellence Wed Workshop Nov 2008
  - Assessment of Classroom Learning: Four Diverse Approaches (Panel Discussion)
- Andrews University Eigen\*Talk Nov 2006
  - Cosmic Ripples: LIGO's Search for Gravitational Waves
- Andrews University Departmental Assembly Mar 2006
  - How to Catch a Gravitational Wave: Doing Astronomy with Wrinkles in Spacetime

## RESEARCH/SCHOLARSHIP:

### Mentored Student Research Projects

- Working with students Michael McMearty and Chris Greenley to evaluate the effectiveness of the Maximum Entropy Algorithm in recovering gravitational waveforms associated with Gamma Ray Bursts. Fall 2010 – present
- Worked with students Garret Catron and Andrew Hoff to evaluate the effectiveness of the Maximum Entropy Algorithm in waveform recovery. Fall 2010, Spring 2011
- Worked with Eric Schull to apply a gravitational waveform recovery algorithm to LIGO data associated with gamma ray burst events. Spring 2009
- Worked with Jason Lee on his senior honors project. The project involved applying a gravitational waveform recovery method to LIGO data from times associated with soft gamma repeater events in hopes of finding gravitational waves associated with the events. Jason presented his findings at the April APS meeting. Spring 2008
- Advised masters student Philip Roberts who spent six months at one of the LIGO sites learning how to run the LIGO detectors and assisting with commissioning efforts. Spring, Summer 2008
- Worked with student Nicholas Valles to develop a website for the automated collection and display of data quality information. Nick presented his work at the March 2008 LIGO Scientific Collaboration Fall 2007

- Meeting
- Worked with Philip Roberts on his senior honors project. The project involved developing and implementing a new method to recover gravitational wave signals from a network of interferometric detectors Spring 2006
- Worked with students Nicholas Valles and Jonathon Van Ornam to build a list of LIGO data quality issues based on observations recorded in the electronic detector logs. A website was created to post the list and data quality “flags” covering a few months for each observatory site were recorded. The website is located at <http://www.andrews.edu/~tzs/detchar/> Fall 2006

### Invited Talks

- Hope College Physics Colloquium
  - Cosmic Ripples: LIGO’s Search for Gravitational Waves Apr 2007
- MIT LIGO Seminar
  - Extracting Supernova Physics from a LIGO Detection Apr 2006
- Pacific Union College
  - LIGO: Viewing the Universe with Wrinkles in Spacetime Feb 2006
- Center for Gravitational wave Physics Sources and Simulations Seminar
  - LIGO Supernova Astronomy with Maximum Entropy Jan 2006

### Contributed Talks

- LIGO Scientific Collaboration (LSC) Meetings
  - Data Quality Flagging S5 Elog Entries Mar 2007
  - LSC Proposal: Andrews University Gravitational Wave Group Aug 2006

### Grants Awarded

- National Science Foundation Award No. PHY-0969810, “RUI: Gravitational Waveform recovery from a network of detectors” Apr 2010

### Peer Reviewed Journal Articles

- J. Abadie, et. al. “Search for gravitational waves from binary black hole inspiral, merger and ringdown”, Phys. Rev. D 83 (2011) 122005, arXiv/1102.3781
- J. Abadie, et. al. “Search for gravitational wave bursts from six magnetars”, Ap. J. 734 (2011) L35, arXiv/1011.4079
- J. Abadie, et. al. “A search for gravitational waves associated with the August 2006 timing glitch of the Vela pulsar”, Phys. Rev. D 83 (2011) 042001, arXiv/1011.1357
- J. Abadie, et. al. “Predictions for the Rates of Compact Binary Coalescences Observable by Ground-based Gravitational-wave Detectors”, Class. Quantum Grav. 27 (2010) 173001, arXiv/1003.2480
- J. Abadie, et. al. “All-sky search for gravitational-wave bursts in the first joint LIGO-GEO-Virgo run”, Phys. Rev. D 81 (2010) 102001, arXiv/1002.1036
- J. Abadie, et. al. “Search for gravitational-wave inspiral signals associated with short Gamma-Ray Bursts during LIGO’s fifth and Virgo’s first science run”, Ap. J. 715 (2010) 1453, arXiv/1001.0165
- B. Abbott, et. al. “Searches for gravitational waves from known pulsars with S5 LIGO data”, Ap. J. 713 (2010) 671, arXiv/0909.3583
- B. Abbott, et. al. “Search for gravitational-wave bursts associated with gamma-ray bursts using data from LIGO Science Run 5 and Virgo Science Run 1”, Ap. J. 715 (2010) 1438, arXiv/0908.3824

- B. Abbott, et. al. "An upper limit on the stochastic gravitational-wave background of cosmological origin", *Nature* 460 (2009) 990, arXiv/0910.5772
- B. Abbott, et. al. "Observation of a kilogram-scale oscillator near its quantum ground state", *New J. Phys* 11 (2009) 073032
- B. Abbott, et. al. "Search for gravitational waves from low mass compact binary coalescence in 186 days of LIGO's fifth science run", *Phys. Rev. D* 80 (2009) 047101, arXiv/0905.3710
- B. Abbott, et. al. "Einstein@Home search for periodic gravitational waves in early S5 LIGO data", *Phys. Rev. D* 80 (2009) 042003, arXiv/0905.1705
- B. Abbott, et. al. "Search for gravitational wave ringdowns from perturbed black holes in LIGO S4 data", *Phys. Rev. D* 80 (2009) 062001, arXiv/0905.1654
- B. Abbott, et. al. "Search for gravitational-wave bursts in the first year of the fifth LIGO science run", *Phys. Rev. D* 80 (2009) 102001, arXiv/0905.0020
- B. Abbott, et. al. "Stacked Search for gravitational waves from the 2006 SGR 1900+14 Storm", *Astrophys. J. Lett.* 701 (2009) L68-L74, arXiv/0905.0005
- B. Abbott, et. al. "Search for high frequency gravitational wave bursts in the first calendar year of LIGO's fifth science run", *Phys. Rev. D* 80 (2009) 102002, arXiv/0904.4910
- B. Abbott, et. al. "First LIGO search for gravitational wave bursts from cosmic (super)strings", *Phys. Rev. D* 80 (2009) 062002, arXiv/0904.4718
- B. Abbott, et. al. "Search for gravitational waves from low mass binary coalescences in the first year of LIGO's S5 data", *Phys. Rev. D* 79 (2009) 122001, arXiv/0901.0302
- B. Abbott, et. al. "All-sky LIGO Search for periodic gravitational waves in the early S5 data", *Phys. Rev. Lett.* 102 (2009) 111102, arXiv/0810.0283
- B. Abbott, et. al. "LIGO: The Laser Interferometer Gravitational-Wave Observatory", *Rep. Prog. Phys.* 72 (2009) 076901, arXiv/0711.3041
- B. Abbott, et. al. "The Einstein@Home search for periodic gravitational waves in LIGO S4 data", *Phys. Rev. D* 79 (2009) 022001, arXiv/0804.1747
- B. Abbott, et. al. "Search for Gravitational-Wave Bursts from Soft Gamma Repeaters", *Phys. Rev. Lett.* 101 (2008) 211102, arXiv/0808.2050
- M. Cavaglià, M. Hendry, D. Ingram, S. Milde, D. Reitze, K. Riles, B. Schutz, A. Stuver, T. Summerscales, J. Thacker, C. Torres, D. Ugolini, M. Vallisneri, A. Zerneno, "Gravitational-wave Astronomy: Opening a New Window on the Universe for Students, Educators and the Public", *Astronomical Society of the Pacific Conference Series*, 400 (2008) 328, arXiv/0806.3764
- B. Abbott, et. al., "First joint search for gravitational-wave bursts in LIGO and GEO 600 data", *Class. Quantum Grav.* 25 (2008) 245008, arXiv/0807.2834
- K. Hayama, S. Desai, K. Kotake, S. Mohanty, M. Rakhmanov, T. Summerscales, S. Yoshida, "Determination of the angular momentum distribution of supernovae from gravitational wave observations", *Class. Quantum Grav.* 25 (2008) 184022, arXiv/0807.4514
- K. Hayama, S. Desai, S. Mohanty, M. Rakhmanov, T. Summerscales, S. Yoshida, "Source Triacking for Sco X-1", *Class. Quantum. Grav.* 25 (2008) 184021, arXiv/ 0807.4171
- K. Hayama, S. Desai, S. Mohanty, M. Rakhmanov, T. Summerscales, S. Yoshida, "Searches for gravitational waves associated with pulsar glitches using a coherent network algorithm", *Class. Quantum Grav.* 25 (2008) 184016, arXiv/0807.3983

- S. Desai, K. Hayama, S. Mohanty, M. Rakhmanov, T. Summerscales, S. Yoshida, "Proposed method for searches of gravitational waves from PKS 2155-304 and other blazar flares", *Class. Quantum Grav.*, 25 (2008) 184024, arXiv/0804.3393
- B. Abbott, et. al. "Astrophysically triggered searches for gravitational waves: status and prospects", *Class. Quantum Grav.* 25 (2008) 114051, arXiv/0802.4320
- K. Hayama, S. Mohanty, M. Rakhmanov, S. Desai, and T. Summerscales, "Monitoring Sco X-1 for the detection of gravitational waves with networks of gravitational wave detectors", *J. Phys.: Conf. Ser.* 120 (2008) 032009
- B. Abbott, et. al. "Beating the spin-down limit on gravitational wave emission from the Crab pulsar", *ApJ Lett.*, 683 (2008) L45, arXiv/0805.4758
- B. Abbott, et. al., "Implications for the Origin of GRB 070201 from LIGO Observations", *ApJ.*, 681 (2008) 1419, arXiv/0711.1163
- T. Summerscales, A. Burrows, L.S. Finn, C. Ott, "Maximum Entropy for Gravitational Wave Data Analysis: Inferring the Physical Parameters of Core-Collapse Supernovae", *ApJ.*, 678 (2008) 1142, arXiv/0704.2157
- B. Abbott, et. al. "Search for gravitational waves from binary inspirals in S3 and S4 LIGO data", *Phys. Rev. D*, 77 (2008) 062002, arXiv/0704.3368
- B. Abbott, et. al, "Search for gravitational waves associated with 39 gamma-ray bursts using data from the second, third and fourth LIGO runs", *Phys. Rev. D*, 77 (2008) 062004, arXiv/0709.0766
- B. Abbott, et. al. "Search of S3 LIGO data for gravitational wave signals from spinning black hole and neutron star binary inspirals", *Phys. Rev. D*, 78 (2008) 042002, arXiv/0712.2050
- L. Baggio, et. al. "A joint search for gravitational wave bursts with AURIGA and LIGO", *Class. Quantum Grav.*, 25 (2008) 095004, arXiv/0710.0497
- B. Abbott, et. al. "All-sky search for periodic gravitational waves in LIGO S4 data", *Phys. Rev. D*, 77 (2008), 022001, arXiv/0708.3818
- B. Abbott, et. al. "Search for gravitational-wave bursts in LIGO data from the fourth science run", *Class. Quantum Grav.*, 24 (2007) 5343-5369, arXiv/0704.0943
- B. Abbott, et. al. "Searches for periodic gravitational waves from unknown isolated sources and Scorpius X-1: Results from the second LIGO science run", *Phys. Rev. D*, 76 (2007), 082001, gr-qc/0605208
- B. Abbott, et. al. "Upper limit map of a background of gravitational waves", *Phys. Rev. D*, 76 (2007), 082003, astro-ph/0703234
- B. Abbott, et. al. "Search for gravitational wave radiation associated with the pulsating tail of the SGR 1806-20 hyperflare of 27 December 2004 using LIGO", *Phys. Rev. D*, 76 (2007), 062003, astro-ph/0703419
- B. Abbott, et. al. "Upper limits on gravitational wave emission from 78 radio pulsars", *Phys. Rev. D*, 76 (2007), 042001, gr-qc/0702039
- B. Abbott, et. al. "First cross-correlation analysis of interferometric and resonant-bar gravitational-wave data for stochastic backgrounds", *Phys. Rev. D*, 76 (2007), 022001, gr-qc/0703068
- B. Abbott, et. al. "Searching for a Stochastic Background of Gravitational Waves with LIGO", *ApJ.* 659 (2007), 918, astro-ph/0608606
- B. Abbott, et. al. "Joint LIGO and TAMA300 Search for Gravitational Waves from Inspiralling Neutron Star Binaries", *Phys. Rev. D*, 73 (2006), 102002, gr-qc/0512078
- B. Abbott, et. al. "Search for gravitational wave bursts in LIGO's third science run", *Class. Quantum Grav.*, 23 (2006), S29-S39, gr-qc/0511146

- B. Abbott, et al. "Search for gravitational waves from binary black hole inspirals in LIGO data", Phys. Rev. D, 73 (2006), 062001, gr-qc/0509129
- B. Abbott, et al. "Upper Limits on a Stochastic Background of Gravitational Waves", Phys. Rev. Lett., 95 (2005), 221101, astro-ph/0507254
- B. Abbott, et al. "First all-sky upper limits from LIGO on the strength of periodic gravitational waves using the Hough transform", Phys. Rev. D, 72 (2005), 102004, gr-qc/0508065
- B. Abbott, et al. "Upper limits from the LIGO and TAMA detectors on the rate of gravitational-wave bursts", Phys. Rev. D, 72 (2005), 122004, gr-qc/0507081
- B. Abbott, et al. "Search for Gravitational Waves from Primordial Black Hole Binary Coalescences in the Galactic Halo", Phys. Rev. D, 72 (2005), 082002, gr-qc/0505042
- B. Abbott, et al. "Search for gravitational waves from galactic and extragalactic binary neutron stars", Phys. Rev. D, 72 (2005), 082001, gr-qc/0505041
- B. Abbott, et al. "Upper limits on gravitational wave bursts in LIGO's second science run", Phys. Rev. D, 72 (2005), 062001, gr-qc/0505029
- B. Abbott, et al. "A Search for Gravitational Waves Associated with the Gamma Ray Burst GRB030329 Using the LIGO Detectors.", Phys. Rev. D, 72 (2005), 042002, gr-qc/0501068
- B. Abbott, et al. "Limits on Gravitational-Wave Emission from Selected Pulsars Using LIGO Data", Phys. Rev. Lett., 94 (2005), 181103, gr-qc/0410007
- J. McNabb, M. Ashley, L.S. Finn, E. Rothhoff, A.L. Stuver, T.Z. Summerscales, P. Sutton, M.M. Tibbits, K.A. Thorne, and K. Zaleski, "Overview of the BlockNormal Event Trigger Generator", Class. Quantum Grav. 21 (2004), S1705S1710, gr-qc/0404123
- B. Abbott, et al. "Analysis of the first LIGO science data for stochastic gravitational waves", Phys. Rev. D, 69 (2004), 122004, gr-qc/0312088
- B. Abbott, et al. "First upper limits from LIGO on gravitational wave bursts", Phys. Rev. D, 69 (2004), 102001, gr-qc/0312056
- B. Abbott, et al. "Analysis of LIGO data for gravitational waves from binary neutron stars", Phys. Rev. D, 69 (2004), 122001, gr-qc/0308069
- B. Abbott, et al. "Setting upper limits on the strength of periodic gravitational waves from PSR J1939+2134 using the first science data from the GEO 600 and LIGO detectors", Phys. Rev. D, 69 (2004), 082004, gr-qc/0308050
- B. Allen, G. Woan, et al. "Upper limits on the strength of periodic gravitational waves from PSR J1939+2134", Class. Quantum Grav. 21 (2004), S1705S1710, gr-qc/0311023
- B. Abbott, et al. "Detector description and performance for the first coincidence observations between LIGO and GEO", Nucl. Instrum. Methods A, 517 (2004), 154179, gr-qc/0308043