

# Gregory Ogin

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## Education:

**California Institute of Technology**, Pasadena, CA – PhD

Subject: Physics (optics, precision measurement)

Thesis: Measurement of Thermo-Optic Properties of Thin Film Dielectric Coatings

Advisers: Kenneth Libbrecht, Eric Black

Graduation: June, 2013 (thesis successfully defended August 10, 2012)

**University of St. Thomas**, St. Paul, MN – Bachelor of Science(2), Bachelor of Arts

Majors: Physics (BS), Electrical Engineering (BSEE), Applied Mathematics (BA)

Graduation: May, 2004

GPA: 3.91

**Konawaena High School**- Kealahou, HI – 1999

## Employment History:

**Assistant Professor of Physics** September 2014 – Present

Whitman College, Walla Walla, WA

-Joined LIGO Scientific Collaboration (LSC) on behalf of Whitman College to continue precision optics research, as well as contribute to and get students involved in the hunt for gravitational waves

**Visiting Assistant Professor** September 2013 – June 2014

Whitman College, Walla Walla, WA

-Taught introductory physics lecture and lab, worked on interaction and engagement techniques in a large lecture setting  
-Began research with nearby LIGO project, working with Whitman students both on and off site, helping with detector characterization efforts

- Delivered upper division optics class, focusing on modern optics and precision metrology techniques
- Taught quantum optics lab developed by Mark Beck to accompany quantum mechanics class. Includes experiments on single photon interference, quantum state tomography, and bell inequality violations among others

**Visiting Assistant Professor** September 2012 – May 2013

Pomona College, Claremont, CA

- Created and delivered solid state physics course with the dual goals of a) helping students learn basics of how to think about complex physics inside solid state matter, and b) exposing students to the incredibly wide variety of phenomena currently studied by groups around the world
- Taught sophomore level modern physics lab, including creation and development of Michelson interferometry lab using lock-in techniques to observe mirror motion on the order of  $10^{-12}$ m
- Co-taught senior seminar, emphasized presentation skills and the ability to communicate enthusiasm about one's research to future advisers, employers, clients.
- Co-taught junior lab, introduced lock-in techniques lab, successfully implemented LabVIEW temperature controller project with students.

**Research Assistant** June 2006 – August 2012

California Institute of Technology, Pasadena, CA

- Developed techniques for measurement of thermal noise parameters in optical coatings.
- Supervised summer undergraduates in 2008, 2009, 2010, taught research and lab skills, developed basic control theory primer for our group's students (in process of putting these into paper form for e.g. AJP)

**Lecturer in Physics and Astronomy** 2011-2012

Pomona College, Claremont, CA

- Taught lab section for Ph 41-42 (Calculus-based physics for non-majors)
- Took lead developing and updating labs on electronics and optics topics

**Teaching Assistant, Ph12 (Waves, QM, Stat Mech)** Fall 2011

California Institute of Technology, Pasadena, CA

- Taught Sophomore physics class, helped students understand concepts presented, develop problem solving skills (an area specifically lacking in lecture)

**Teaching Assistant, Caltech ALPhA Immersion**, August 11-13 2010 and August 10-12, 2011

- Assisted workshop participants in learning senior level optics labs from Caltech's Ph77 class, discussing the physics of the lab, common reactions of students, and logistics of setting up various experiments.

**Teaching Assistant, Ph1 (Analytical, E&M)** Spring 2011

California Institute of Technology, Pasadena, CA

- Taught analytic track E&M course to Caltech freshmen using Purcell's Electricity and Magnetism

**Private Tutor** January 2010 – Spring 2012

H-Bar Tutoring, Pasadena, CA

- Tutored high school students around the Pasadena area in various subjects including math (Algebra/Geometry through Calculus), Physics (regular and AP), and Chemistry (regular and AP)

**Teaching Assistant** Fall 2005 – Spring 2006

California Institute of Technology, Pasadena, CA

- Taught the optics track of a senior lab class (Ph77) under Eric Black. Topics included Rubidium spectroscopy, Fabry-Perot cavities, Pound-Drever-Hall Locking

**Post-Baccalaureate Research Assistant** June 2004 – August 2005

Los Alamos National Laboratory, Los Alamos, NM

- Contributed to a femtosecond frequency comb in the quantum ion trapping lab of Dana Berkeland, for precision measurement of optical reference frequencies.

**Los Alamos Summer School Research Assistant** June 2003 – August 2003

Los Alamos National Laboratory, Los Alamos, NM

- Worked on event-driven neural simulation code under Garrett Kenyon
- Described and documented code for mentor and postdoc students, analyzed potential uses in visual cortex simulation

**Research Assistant** Summer 2001 – Spring 2004

University of St. Thomas Physics dept., St. Paul, MN

- Worked independently on development of inexpensive, modular, computer controlled high voltage power supplies
- Gained experience communicating with employers, defining ill-defined problems and expectations
- Extensive experience with electronics, analog and digital feedback

**Resident Adviser** September 2002 – Spring 2004

University of St. Thomas, St. Paul, MN

- Gained experience developing caring, respectful community among peers
- Gained experience enforcing policy, following administrative procedures
- Developed communication skills
- Worked in a group with other RAs to build larger community

**Committee Involvement:**

**Everhart Lecture Series Committee** 2007-2011 Lecture Series, chair for 2010 and 2011.

California Institute of Technology, Pasadena, CA

- Worked with multidisciplinary committee to select speakers with outstanding research skills and communication ability who could appeal to a broad audience of scientists
- Organized and coordinated three campus-wide lectures each spring

**Publication list**

Measurement of Thermo-Optic Properties of Thin Film Dielectric Coating Materials, G. Ogin, E. Black, E. Gustafson, K. Libbrecht, in preparation (based on thesis work)

Thermo-Optic Noise in Coated Mirrors for High-Precision Optical Measurements, M. Evans, S. Ballmer, M. Fejer, P. Fritschel, G. Harry, and G. Ogin  
Phys. Rev. D 78, 102003 (2008)

**Book Chapter**

Optical Coatings and Thermal Noise in Precision Measurement, edited by Harry, Bodiya, DeSalvo, Chapter 9: Thermo-Optic Noise by M. Evans and G. Ogin. Copyright 2012, Cambridge University Press

**LIGO Publications**

As a member of the LIGO Scientific Collaboration, I am listed as a contributor to the following collaboration papers. (LSC = LIGO Scientific Collaboration, VC = Virgo Collaboration)

Enhanced Sensitivity of the LIGO Gravitational Wave Detector by Using Squeezed States of Light, LSC, Nature Photonics, Vol 7, Issue 8, 613-619 (2013)

Einstein@Home All-Sky Search for Periodic Gravitational Waves in LIGO S5 Data, LSC, VC, Physical Review D, Vol 87, Issue 4, 042001 (2013)

Search for Gravitational Waves from Binary Black Hole Inspiral, Merger, and Ringdown in LIGO-Virgo Data from 2009-2010, LSC, VC, Physical Review D, Vol 87, Issue 2, 022002 (2013)

SWIFT Follow-Up Observations of Candidate Gravitational-Wave Transient Events, LSC, VC, Astrophysical Journal Supplement Series, Vol 203, Issue 2, 28 (2012)

Search for Gravitational Waves Associated with Gamma-Ray Bursts During LIGO Science Run 6 and Virgo Science Runs 2 and 3, LSC, VC, Astrophysical Journal, Vol 760, Issue 1, 12 (2012)

Search for Gravitational Waves from Binary Black Hole Inspiral, Merger, and Ringdown, LSC, Physical Review D, Vol 86, Issue 6, 069903 (2012)

Implications for the Origin of GRB 051103 from LIGO Observations, LSC, Astrophysical Journal, Vol 755, Issue 1, Article Number 2 (2012)

The Characterization of VIRGO Data and its Impact on Gravitational Wave Searches, LSC, VC, Classical and Quantum Gravity, Vol 29, Issue 15, Article Number 15502 (2012)

All-Sky Search for Gravitational-Wave Bursts in the Second Joint LIGO-Virgo Run, LSC, VC, Physical Review D, Volume 85, Issue 12, Article Number 122007 (2012)

Upper Limits on a Stochastic Gravitational-Wave Background Using LIGO and Virgo Interferometers at 600-1000 Hz, LSC, VC, Physical Review D, Vol 85, Issue 12, Article Number 122001 (2012)

Search for Gravitational Waves from Intermediate Mass Binary Black Holes, LSC, VC, Physical Review D, Vol 85, Issue 10, Article Number 102004 (2012)

First Low-Latency LIGO plus Virgo Search for Binary Inspirals and their Electromagnetic Counterparts, LSC, VC, Astronomy & Astrophysics, Vol 541, Article Number A155 (2012)

All-Sky Search for Gravitational Wave Bursts in the First Joint LIGO-GEO-Virgo Run, LSC, VC, Physical Review D, Vol 85, Issue 8, Article Number 089905 (2012)

Search for Gravitational Waves from Low Mass Compact Binary Coalescence in LIGO's Sixth Science Run and Virgo's Science Runs 2 and 3, LSC, VC, Physical Review D, Vol 85, Issue 8, Article Number 082002 (2012)

Implementation and Testing of the First Prompt Search for Gravitational Wave Transients with Electromagnetic Counterparts, LSC, VC, Astronomy & Astrophysics, Vol 539, Article Number A124 (2012)

All-Sky Search for Periodic Gravitational Waves in LIGO S5 the Full Data, LSC, VC, Physical Review D, Vol 85, Issue 2, Article Number 022001 (2012)

Directional Limits on Persistent Gravitational Waves Using LIGO S5 Science Data, LSC, VC, Physical Review Letters, Vol 107, Issue 27, Article Number 271102 (2011)

Beating the Spin-Down Limit on Gravitational Wave Emission from the Vela Pulsar, LSC, VC, Astrophysical Journal, Vol 737 Issue 2, Article Number 93 (2011)

Search for Gravitational Wave Bursts from Six Magnetars, LSC, VC, Astrophysical Journal Letters, Vol 734 Issue 2, Article Number L35 (2011)

Search for Gravitational Waves from Binary Black Hole Inspiral, Merger, and Ringdown, LSC, VC  
Physical Review D, Vol 83, Issue 12, Article Number 122005 (2011)

Search for Gravitational Waves Associated with the August 2006 Timing Glitch of the Vela Pulsar, LSC, VC  
Physical Review D, Vol 83, Issue 4, Article Number 042001 (2011)

Calibration of the LIGO Gravitational Wave Detectors in the Fifth Science Run, LSC, VC  
Nuclear Instruments & Methods in Physics Research A, Vol 624, Issue 1, pp 223-240 (2010)

Search for Gravitational Waves from Compact Binary Coalescence in LIGO and VIRGO Data from S5 and VSR1, LSC, VC  
Physical Review D, Vol 82, Issue 10, Article Number 102001

First Search for Gravitational Waves from the Youngest Known Neutron Star, LSC  
Astrophysical Journal, Vol 722, Issue 2, pp 1504-1513 (2010)

Predictions for the Rates of Compact Binary Coalescences Observable by Ground-Based Gravitational-Wave Detectors, LSC, VC  
Classical and Quantum Gravity, Vol 27, Issue 17, Article Number 173001 (2010)

Search for Gravitational-Wave Bursts Associated with Gamma-Ray Bursts Using Data from LIGO Science Run 5 and Virgo Science Run 1, LSC, VC  
Astrophysical Journal, Vol 715, Issue 2, pp 1438-1452 (2010)

Search for Gravitational-Wave Inspiral Signals Associated with Short Gamma-Ray Bursts During LIGO's Fifth and Virgo's First Science Run, LSC, VC  
Astrophysical Journal, Vol 715, Issue 2, pp 1453-1461 (2010)

All-Sky Search for Gravitational-Wave Bursts in the First Joint LIGO-GEO-Virgo Run, LSC, VC  
Physical Review D, Vol 81, Issue 10, Article Number 102001 (2010)

Searches for Gravitational Waves from Known Pulsars with Science Run 5 LIGO Data, LSC, VC  
Astrophysical Journal, Vol 713, Issue 1, pp 671-685 (2010)

Beating the Spin-Down Limit on Gravitational Wave Emission from the Crab Pulsar, LSC  
Astrophysical Journal Letters, Vol 706, Issue 1, pp L203-204 (2009)

Search for High Frequency Gravitational-Wave Bursts in the First Calendar Year of LIGO's Fifth Science Run, LSC  
Physical Review D, Vol 80, Issue 10, Article Number 102002 (2009)

Search for Gravitational-Wave Bursts in the First Year of the Fifth LIGO Science Run, LSC  
Physical Review D, Vol 81, Issue 10, Article Number 102001 (2009)

First LIGO Search for Gravitational Wave Bursts from Cosmic (super)Strings, LSC  
Physical Review D, Vol 80, Issue 6, Article Number 062002 (2009)

Search for Gravitational Wave Ringdowns from Perturbed Black Holes in LIGO S4 Data, LSC  
Physical Review D, Vol 80, Issue 6, Article Number 062001 (2009)

Stacked Search for Gravitational Waves from the 2006 SGR 1900+14 Storm, LSC  
Astrophysical Journal Letters, Vol 701, Issue 2, pp L68-L74 (2009)

An Upper Limit on the Stochastic Gravitational-Wave Background of Cosmological Origin, LSC, VC  
Nature, Vol 460, Issue 7258, pp 990-994 (2009)

Search for Gravitational Waves from Low Mass Compact Binary Coalescence in 186 Days of LIGO's Fifth Science Run, LSC  
Physical Review D, Vol 80, Issue 4, Article Number 047101 (2009)

Einstein@Home Search for Periodic Gravitational Waves in Early S5 LIGO Data, LSC  
Physical Review D, Vol 80, Issue 4, Article Number 042003 (2009)

Observation of a Kilogram-Scale Oscillator Near its Quantum Ground State, LSC  
New Journal of Physics, Vol 11, Article Number 073032 (2009)

LIGO: The Laser Interferometer Gravitational-Wave Observatory, LSC  
Reports on Progress in Physics, Vol 72, Issue 7, Article Number 076901 (2009)

Search for Gravitational Waves from Low Mass Binary Coalescences in the First Year of LIGO's S5 Data, LSC, Physical Review D, Vol 79, Issue 12, Article Number 122001 (2009)

All-Sky LIGO Search for Periodic Gravitational Waves in the Early Fifth-Science-Run Data, LSC  
Physical Review Letters, Vol 102, Issue 11, Article Number 111102 (2009)

Einstein@Home Search for Periodic Gravitational Waves in LIGO S4 Data, LSC  
Physical Review D, Vol 79, Issue 2, Article Number 022001 (2009)

First Joint Search for Gravitational-Wave Bursts in LIGO and GEO 600 Data, LSC  
Classical and Quantum Gravity, Vol 25, Issue 24, Article Number 245008 (2008)

Search for Gravitational-Wave Bursts from Soft Gamma Repeaters, LSC  
Physical Review Letters, Vol 101, Issue 21, Article Number 211102 (2008)

Beating the Spin-Down Limit on Gravitational Wave Emission from the Crab Pulsar, LSC  
Astrophysical Journal Letters, Vol 683, Issue 1, pp L45-L49 (2008)

Astrophysically Triggered Searches for Gravitational Waves: Status and Prospects, LSC, VC  
Classical and Quantum Gravity, Vol 25, Issue 11, Article Number 114051 (2008)