

Curriculum Vitae

Jonah B. Kanner

NASA Goddard Space Flight Center
Mail Code 663, Greenbelt, MD 20771

(301) 286-8760 • jonah.b.kanner@nasa.gov

Education and Employment:

NASA Postdoctoral Fellow, GSFC, 2011 - Present

Graduate: University of Maryland at College Park, 2005 - 2011

M.S. in Physics, 2008

Ph.D. in Physics, 2011

Faculty Advisor: Dr. Peter Shawhan

Dissertation Title: LOOC UP: SEEKING OPTICAL COUNTERPARTS TO GRAVITATIONAL WAVE SIGNALS

High School Physics Teacher, 2003 - 2004

Eleanor Roosevelt High School in Greenbelt, MD

Maryland State Certification in Secondary Education

Undergraduate: University of Maryland at College Park, 1999 - 2003

B.S. in Physics and Mathematics *with University Honors*, 2003

Awards and Fellowships:

NASA Postdoctoral Fellowship

Goddard Space Flight Center, 2011

Leon A. Herreid Science Scholarship

University of Maryland, 2011

Strauss Teaching Assistant

University of Maryland, 2002 - 2003

Presidential Scholarship

University of Maryland, 1999 - 2003

Current Research

LIGO Project, 2006 - Present

The Laser Interferometer Gravitational Wave Observatory project is currently seeking signals produced by bodies in distant space. The LIGO observatories are located in Louisiana and Washington state, and project members collaborate closely with similar observatories in Europe.

Short, transient signals of gravitational waves are expected to originate from violent astrophysical events such as supernovae and gamma-ray bursts - these are some of the most energetic events in the universe. My research focuses on the meeting point between gravitational wave observatories and traditional telescopes, so that they may jointly search for these rare but powerful explosions. I do this within the context of the LIGO Burst working group.

Here are some of my specific roles within LIGO:

EM Follow-up Observations

- Coordinated with astronomer partners in the ROTSE, QUEST, PTF, and Pi of the Sky collaborations to establish observing schedules and communication systems.
- Developed the LUMIN software package to interface with analysis pipelines, choose sky pointings, communicate with robotic telescopes, and display information on web pages.
- Created instructions for team to validate LIGO and Virgo triggers before sending to observatories.
- Participated on the team that validated triggers in low latency using available data quality information.
- Contributed to design of image processing pipeline to identify relevant transients in images.
- Investigated the X-ray transient background through the use of archived X-ray data, including the ROSAT All-Sky Survey and the XMM-Newton Slew Survey

Burst Data Analysis

- Contributed to the tuning of the Omega Pipeline analysis for the S5Y2/VSR1 Burst analysis and wrote some text for publication.
- Participated in reviews of Q-pipeline software for both the high frequency and low frequency searches of the S5 first year.
- Chaired the review committee for the Omega Pipeline S5Y2/VSR1 analysis.
- Co-chaired the “Position Reconstruction Challenge” to study and develop algorithms for source position estimation.

Observing and Detector Characterization

- Served several shifts, each one week long, as Science Monitor at LIGO Livingston observatory.
- Observed with the MDM 1.3 meter McGraw Hill Telescope and 2.4 meter Hiltner Telescope at Kitt Peak, AZ, as a 2007 pilot study for LOOC UP.

- Participated in Detector Characterization through a week long “Glitch Shift.”

Teaching Experience:

Private Tutor, University of Maryland, College Park, 2007 - 2011

Graduate Teaching Assistant, University of Maryland, College Park, 2005 - 2006

Summer Teaching Assistant with Center for Talented Youth, Baltimore, MD 2005

Summer Teaching Assistant with Center for Talented Youth, Santa Cruz, CA 2002 & 2004

High School Physics Teacher, Eleanor Roosevelt High School, Greenbelt, MD 2003 - 2004

Undergraduate Teaching Assistant, University of Maryland, College Park, 2002 - 2003

Math Tutor with Math Success Program, University of Maryland, College Park, 2001 - 2002

Undergraduate Research Experience:

Center for Superconductor Research

University of Maryland, College Park, 2001

Advisor: Steve Anlage

Volunteering and EPO:

Six Flags, Maryland 2011 - Present

Participated in NASA EPO physics day and teacher training

Physics is Phun, University of Maryland, College Park, 2005 - 2011 (Occasionally)

Assisted in physics demonstration program designed to interest young students

Science Fair Judge, Eleanor Roosevelt High School, 2008, 2009, 2010, & 2011, 2012

Science and Engineering Festival, Washington, DC 2010

Presented demos at LIGO exhibition

Maryland Day, University of Maryland, College Park, 2009

Presented “open house” physics demonstrations

Affiliations:

American Astronomical Society, 2009 - Present

American Physical Society, 2008 - Present

LIGO Scientific Collaboration, 2007 - Present

Selected Publications:

Jonah B. Kanner - Curriculum Vitae

- J. Kanner, J. Camp, J. Racusin, N. Gehrels, and D. White, “Seeking Counterparts to Advanced LIGO/Virgo Transients with Swift”, arXiv:1209.2342, Accepted for publication in ApJ
- J. Abadie *et al.* (LSC and Virgo Collaboration) and M. Boer, R. Fender, N. Gehrels, A. Klotz, E. O. Ofek, M. Smith, M. Sokolowski, B. W. Stappers, I. Steele, J. Swinbank, R. A. M. J. Wijers, “Implementation and testing of the first prompt search for electromagnetic counterparts to gravitational wave transients”, *A & A*, **539**, A124 (2012).
- J. Abadie *et al.* (LSC and Virgo Collaboration), “All-sky Search for Gravitational-Wave Bursts in the First Joint LIGO-GEO-Virgo Run”, *Phys. Rev. D* **81**, 102001 (2010).
- J. Kanner, T. L. Huard, S. Márka, D. C. Murphy, J. Pacionere, M. Reed, and P. Shawhan, “LOOC UP: locating and observing optical counterparts to gravitational wave bursts”, *Class. Quantum Grav.* **25**, 184034 (2009).
- B. Abbott *et al.* (The LIGO Scientific Collaboration) “Search for gravitational-wave bursts in the first year of the fifth LIGO science run”, *Phys. Rev. D* **80**, 102001 (2009).

Seminars and Invited Talks:

“Electromagnetic Follow-ups of GW events”

Gravitational Wave Physics and Astronomy Workshop

Hannover, Germany June 4, 2012

“Robotic Telescopes, 3 am Phone Calls, and the Real Time Search for Gravitational Waves”

Joint Conference of the NSBP and NSHP

Austin, TX September 23, 2011

“First Observational Steps Towards a New Astronomy”

High Energy Astrophysics Division Meeting

Newport, RI September 8, 2011

“Honey, LIGO’s on the phone!”

University of Maryland Gravity Theory Seminar

April 6, 2011

“Real Time Astronomy with Gravitational Waves”

NASA Goddard Space Flight Center

Greenbelt, MD Feb 8, 2011

“Real Time Multi-messenger Astronomy with Gravitational Waves”

University of Massachusetts, Amherst

November 11, 2010

“Gravitational Wave Bursts and Multi-Messenger Astrophysics”

Virginia Tech Institute for Particle, Nuclear, & Astronomical Sciences

Feb 20, 2009

“LOOC UP: Targeted transient searches with GW data”

Penn State University Center for Gravitational Wave Physics

Jan 29, 2008

“LOOC UP: Searching for Optical Counterparts of Gravitational Wave Burst Candidates”
University of Maryland Gravity Research Group
Sept 27, 2007

Other publications:

- B. P. Abbott *et al.* (LSC and Virgo Collaboration), “Search for Gravitational-Wave Bursts Associated with Gamma-Ray Bursts Using data from LIGO Science Run 5 and Virgo Science Run 1”, *Astrophys. J.* **715**, 1435-52 (2010).
- B. P. Abbott *et al.* (The LSC and Virgo Collaboration) plus S. Bgin, A. Corongiu, N. D’Amico, P. C. C. Freire, J. Hessels, G. B. Hobbs, M. Kramer, A. G. Lyne, R. N. Manchester, F. E. Marshall, J. Middleditch, A. Possenti, S. M. Ransom, I. H. Stairs, and B. Stappers, “Searches for Gravitational Waves from Known Pulsars with Science Run 5 LIGO Data”, *Astrophys. J.* **713**, 671 (2010).
- J. Abadie *et al.* (LSC and Virgo Collaboration), “Search for gravitational-wave inspiral signals associated with short Gamma-Ray Bursts during LIGO’s fifth and Virgo’s first science run”, *Astrophys. J.* **715**, 1453-61 (2010).
- J. Abadie *et al.* (LSC and Virgo Collaboration), “Predictions for the Rates of Compact Binary Coalescences Observable by Ground-based Gravitational-wave Detectors”, *Class. Quant. Grav.* **27**, 173001 (2010).
- B. Abbott *et al.* (The LIGO Scientific Collaboration), “Observation of a kilogram-scale oscillator near its quantum ground state”, *New J. Phys.* **11**, 073032 (2009).
- B. Abbott *et al.* (The LIGO Scientific Collaboration), “LIGO: The Laser Interferometer Gravitational-Wave Observatory”, *Reports on Progress in Physics* **72**, 076901 (2009).
- B. Abbott *et al.* (The LIGO Scientific Collaboration), “All-sky LIGO Search for Periodic Gravitational Waves in the Early S5 Data”, *Phys. Rev. Lett.* **102**, 111102 (2009).
- B. Abbott *et al.* (The LIGO Scientific Collaboration), “Search for High Frequency Gravitational Wave Bursts in the First Calendar Year of LIGO’s Fifth Science Run”, *Phys. Rev. D* **80**, 102002 (2009).
- B. Abbott *et al.* (The LIGO Scientific Collaboration), “Search for Gravitational Wave Ringdowns from Perturbed Black Holes in LIGO S4 Data”, *Phys. Rev. D* **80**, 062001 (2009).
- B. Abbott *et al.* (The LIGO Scientific Collaboration), “Search for Gravitational Waves from Low Mass Binary Coalescences in the First Year of LIGO’s S5 Data”, *Phys. Rev. D* **79**, 122001 (2009).
- B. P. Abott *et al.* (The LIGO Scientific Collaboration), “Search for Gravitational Waves from Low Mass Binary Coalescence in 186 Days of LIGO’s Fifth Science Run”, *Phys. Rev. D* **80**, 047101 (2009).
- B. P. Abott *et al.* (The LIGO Scientific Collaboration), “Stacked Search for Gravitational Waves from the 2006 SGR 1900+14 Storm”, *Astrophys. J. Lett.* **701**, L68-L74 (2009).
- B. P. Abott *et al.* (The LIGO Scientific Collaboration), “First LIGO Search for Gravitational Wave Bursts from Cosmic (Super)Strings”, *Phys. Rev. D* **80**, 062002 (2009).

- B. P. Abbott *et al.* (The LIGO Scientific Collaboration), “Einstein@Home search for periodic gravitational waves in early S5 LIGO data” *Phys. Rev. D* **80**, 042003 (2009).
- The LIGO Scientific Collaboration and The Virgo Collaboration, “An Upper Limit on the Stochastic Gravitational-Wave Background of Cosmological Origin”, *Nature* **460**, 990 (2009).
- B. Abbott *et al.* (The LIGO Scientific Collaboration), “Einstein@Home Search for Periodic Gravitational Waves in LIGO S4 Data”, *Phys. Rev. D* **79**, 022001 (2009).
- B. Abbott *et al.* (The LIGO Scientific Collaboration), “Search for Gravitational Wave Bursts from Soft Gamma Repeaters”, *Phys. Rev. Lett.* **101**, 211102 (2008).
- B. Abbott *et al.* (The LIGO Scientific Collaboration), “Beating the Spin-Down Limit on Gravitational Wave Emission from the Crab Pulsar”, *Astrophys. J. Lett.* **683**, L45 (2008).
- B. Abbott *et al.* (The LIGO Scientific Collaboration), “First Joint Search for Gravitational-Wave Bursts in LIGO and GEO 600 Data”, *Class. Quant. Grav.* **25**, 245008 (2008).

Contributed Talks:

Conferences:

“Performance study of the first low latency joint EM/GW search”

2011 Gravitational-wave Physics and Astronomy Workshop

Milwaukee, Wisconsin January 2011

“Seeking optical counterparts to gravitational wave event candidates”

2010 APS Meeting

Washington, DC February 2010

“Limits on GRB distances from LIGO and Virgo” (Poster)

215th American Astronomical Society Meeting

Washington, DC January 2010

“Wide field optical follow-up observations to gravitational wave triggers” (Poster)

13th Gravitational Wave Data Analysis Workshop

San Juan, Puerto Rico January 2009

“LOOC UP: Finding Optical Transients with LIGO and Virgo Data”

11th Eastern Gravity Meeting

State College, PA May 2008

“LOOC UP: Locating and Observing Optical Counterparts”

12th Gravitational Wave Data Analysis Workshop

Cambridge, MA December 2007

LSC/Virgo Collaboration Meetings:

“Optical Observations Update”

Krakow, Poland September 2010

“LOOC UP: First Light”

Arcadia, California March 2010

Jonah B. Kanner - Curriculum Vitae

“Wide Field Optical Follow-ups: Status and Plans”

Orsay, France June 2009

“Wide Field Optical Follow-ups”

College Park, MD December 2008

“Current and Prospective Burst Group Collaborations”

Orsay, France June 2008

“Burst Joint Analysis: JW1 Searches with LIGO and Virgo”

Pasadena, CA March 2008

“GW-Tapp: Coherent Follow-Up with X-Pipeline”

Cambridge, MA July 2007

“Tuning to Be: Developing a tuning method for LIGO-Virgo networks”

Baton Rouge, LA March 2007