Peter S. Shawhan

Curriculum Vitae – UMD format

I. Personal Information

Full name:	Peter Sven Shawhan
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Address:	Physical Sciences Complex (Building 415), room 2120 The University of Maryland College Park, MD 20742-2440
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Academic Appointments at UMD

- Professor, July 2017 – present
- Associate Professor, July 2012 – June 2017
- Assistant Professor, May 2006 – June 2012

Administrative Appointments at UMD

- Associate Chair for Graduate Education, Department of Physics, July 2014 – June 2019

Other Employment

- Senior Scientist, California Institute of Technology, 2002 – 2006
- Millikan Prize Postdoctoral Fellow, California Institute of Technology, 1999 – 2002

Educational Background

- The University of Chicago, September 1990 – August 1999
  - M.S. in Physics, December 1992
  - Ph.D. in Physics, December 1999
    Dissertation: "Observation of Direct *CP* Violation in $K_{S,L} \to \pi\,\pi$ Decays"
    Faculty advisor: Prof. Bruce D. Winstein
- Washington University in St. Louis, August 1986 – May 1990
  - A.B. (Physics major, Chemistry and Math minor), *summa cum laude*, May 1990

Professional Certifications, Licenses, and Memberships

- Fellow of the American Physical Society
- Member of the American Astronomical Society
- Life Member of the International Society on General Relativity and Gravitation
- Member of the American Association of Physics Teachers

II. Research, Scholarly, Creative and/or Professional Activities

Notes about authorship conventions:

Most of my research has been conducted within large collaborations, and I am a co-author on many papers as a result. The standard practice in these collaborations is to list all active members as authors, strictly alphabetically in most cases, to represent the contributions that all of us have made to the assembly, testing, infrastructure, operation, data analysis and internal review for the experiments and results.

In the bibliography below I use "*et al.*" to represent large, alphabetical blocks of 50 or more authors (over 1000 in some cases!). I identify the collaboration or collaborations using italics: *LSC* for the LIGO Scientific Collaboration (of which I have been a member since 1999), *KTeV* for the Kaons at the Tevatron collaboration (within which I did my Ph.D. research), and a number of others with which we have published joint papers occasionally. Since 2010 most LSC results have been produced together with LIGO's European counterpart, the Virgo Collaboration, and published with a merged alphabetical author list, represented here by *LSC+Virgo*.

My past and current graduate students Sean McWilliams, Jonah Kanner, Cregg Yancey and Min-A Cho have also been co-authors on the collaboration papers published during the time periods when they have been active as LSC members.

I have annotated a subset of the papers below, mainly to point out my contributions and those of my students when it was more than just co-authorship through collaboration membership. I also use stars (★) to highlight the papers which I and/or my students have led or for which we have played substantial roles in crafting the content of the paper.

Articles in Refereed Journals

Accepted, in press

ip3. R. Hamburg *et al.* (*Fermi-GBM+LSC+Virgo*), "A joint Fermi-GBM and LIGO/Virgo analysis of compact binary mergers from the first and second gravitational-wave observing runs", Astrophysical Journal **in press**

ip2. B. P. Abbott *et al.* (*LSC+Virgo*), "GW190425: Observation of a Compact Binary Coalescence with Total Mass ~ 3.4 $M_{\odot}$", Astrophysical Journal Letters **in press**

ip1. B. P. Abbott *et al.* (*LSC+Virgo+ASAS-SN+DLT40*), "Optically targeted search for gravitational waves emitted by core-collapse supernovae during the first and second observing runs of Advanced LIGO and Advanced Virgo", Physical Review D **in press**

Published

★229. B. P. Abbott *et al.* (*LSC+Virgo*), "A guide to LIGO-Virgo detector noise and extraction of transient gravitational-wave signals", Classical and Quantum Gravity **37**, 055002 (2020)

I helped to plan this paper, and edited it thoroughly in the final stages before submission.

228. B. P. Abbott *et al.* (*LSC+Virgo*), "Model comparison from LIGO-Virgo data on GW170817's binary components and consequences for the merger remnant", Classical and Quantum Gravity **37**, 045006 (2020)

227. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for gravitational waves from Scorpius X-1 in the second Advanced LIGO observing run with an improved hidden Markov model", Physical Review D **100**, 122002 (2019)

226. B. P. Abbott *et al.* (*LSC+Virgo+IPN*), "Search for gravitational-wave signals associated with gamma-ray bursts during the second observing run of Advanced LIGO and Advanced Virgo", Astrophysical Journal **886**, 75 (2019)

225. B. P. Abbott *et al.* (*LSC+Virgo*), "Tests of general relativity with the binary black hole signals from the LIGO-Virgo catalog GWTC-1", Physical Review D **100**, 104036 (2019)

224. B. P. Abbott *et al.* (*LSC+Virgo plus S. Shandera*), "Search for subsolar mass ultracompact binaries in Advanced LIGO's second observing run", Physical Review Letters **123**, 161102 (2019)

223. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for eccentric binary black hole mergers with LIGO and Virgo during the first and second observing runs", Astrophysical Journal **883**, 149 (2019)

222. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for intermediate mass black hole binaries in the first and second observing runs of the Advanced LIGO and Virgo network", Physical Review D **100**, 064064 (2019)

221. B. P. Abbott *et al.* (*LSC+Virgo*), "Binary Black Hole Population Properties Inferred from the First and Second Observing Runs of Advanced LIGO and Advanced Virgo", Astrophysical Journal Letters **882**, L24 (2019)

220. B. P. Abbott *et al.* (*LSC+Virgo*), "Directional limits on persistent gravitational waves using data from Advanced LIGO's first two observing runs", Physical Review D **100**, 062001 (2019)

219. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for the isotropic stochastic background using data from Advanced LIGO's second observing run", Physical Review D **100**, 061101(R) (2019)

218. B. P. Abbott *et al.* (*LSC+Virgo*), "GWTC-1: A Gravitational-Wave Transient Catalog of Compact Binary Mergers Observed by LIGO and Virgo during the First and Second Observing Runs", Physical Review X **9**, 031040 (2019)

★217. B. P. Abbott *et al.* (*LSC+Virgo*), "All-sky search for short gravitational-wave bursts in the second Advanced LIGO and Advanced Virgo run", Physical Review D **100**, 024017 (2019)

> My graduate student Min-A Cho contributed the section reporting on the O2 cosmic string cusp search.

216. B. P. Abbott *et al.* (*LSC+Virgo*) plus A. Pisarski, "All-sky search for continuous gravitational waves from isolated neutron stars using Advanced LIGO O2 data", Physical Review D **100**, 024004 (2019)

215. B. P. Abbott *et al.* (*LSC+Virgo*), "Tests of general relativity with GW170817", Physical Review Letters **123**, 011102 (2019)

214. B. P. Abbott *et al.* (*LSC+Virgo*), "Narrow-band search for gravitational waves from known pulsars using the second LIGO observing run", Physical Review D **99**, 122002 (2019)

213. B. P. Abbott *et al.* (*LSC+Virgo*) plus Z. Arzoumanian, S. Bogdanov, I. Cognard, A. Corongiu, T. Enoto, P. Freire, K. C. Gendreau, L. Guillemot, A. K. Harding, F. Jankowski, M. J. Keith, M. Kerr, A. Lyne, J. Palfreyman, A. Possenti, A. Ridolfi, B. Stappers, G. Theureau, and P. Weltervrede, "Searches for gravitational waves from

known pulsars at two harmonics in 2015-2017 LIGO data", Astrophysical Journal **879**, 10 (2019)

212. B. P. Abbott *et al.* (*LSC+Virgo*), "All-sky search for long-duration gravitational wave transients in the second Advanced LIGO observing run", Physical Review D **99**, 104033 (2019)

211. M. Soares-Santos *et al.* (*DES+LSC+Virgo*), "First measurement of the Hubble constant from a dark standard siren using the Dark Energy Survey galaxies and the LIGO/Virgo binary-black-hole merger GW170814", Astrophysical Journal Letters **876**, L7 (2019)

★210. B. P. Abbott *et al.* (*LSC+Virgo*), "Low-latency gravitational-wave alerts for multimessenger astronomy during the second Advanced LIGO and Virgo observing run", Astrophysical Journal **875**, 161 (2019)

My graduate student Min-A Cho was one of the two lead authors on this paper.

209. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for gravitational waves from a long-lived remnant of the binary neutron star merger GW170817", Astrophysical Journal **875**, 160 (2019)

208. B. P. Abbott *et al.* (*LSC+Virgo*), "Searches for continuous gravitational waves from fifteen supernova remnants and Fomalhaut b with Advanced LIGO", Astrophysical Journal **875**, 122 (2019)

207. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for transient gravitational wave signals associated with magnetar bursts during Advanced LIGO's second observing run", Astrophysical Journal **874**, 163 (2019)

206. B. P. Abbott *et al.* (*LSC+Virgo*), "Constraining the *p*-Mode–*g*-Mode Tidal Instability with GW170817", Physical Review Letters **122**, 061104 (2019)

★205. E. Burns *et al.* (*Fermi-GBM+LSC+Virgo*), "A *Fermi* Gamma-ray Burst Monitor search for electromagnetic signals coincident with gravitational-wave candidates in Advanced LIGO's first observing run", Astrophysical Journal **871**, 90 (2019)

204. A. Albert *et al.* (*ANTARES+IceCube+LSC+Virgo*), "Search for multimessenger sources of gravitational waves and high-energy neutrinos with Advanced LIGO during its first observing run, ANTARES and IceCube", Astrophysical Journal **870**, 134 (2019)

203. B. P. Abbott *et al.* (*LSC+Virgo*), "Properties of the binary neutron star merger GW170817", Physical Review X **9**, 011001 (2019)

202. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for sub-solar mass ultracompact binaries in Advanced LIGO's first observing run", Physical Review Letters **121**, 231103 (2018)

201. B. P. Abbott *et al.* (*LSC+Virgo*), "GW170817: Measurements of neutron star radii and the equation of state", Physical Review Letters **121**, 161101 (2018)

200. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for Tensor, Vector, and Scalar Polarizations in the Stochastic Gravitational-Wave Background", Physical Review Letters **120**, 201102 (2018)

199. B. P. Abbott *et al.* (*LSC+Virgo*), "Full Band All-sky Search for Periodic Gravitational Waves in the O1 LIGO Data", Physical Review D **97**, 102003 (2018)

★198. B. P. Abbott *et al.* (*LSC+Virgo*), "Constraints on cosmic strings using data from the first Advanced LIGO Observing run", Physical Review D **97**, 102002 (2018)

My graduate student Min-A Cho was an internal reviewer for this analysis and paper.

197. B. P. Abbott *et al.* (*KAGRA+LSC+Virgo*), "Prospects for observing and localizing gravitational-wave transients with Advanced LIGO, Advanced Virgo and KAGRA", Living Reviews in Relativity **21**, 3 (2018)

196. B. P. Abbott *et al.* (*LSC+Virgo*), "GW170817: Implications for the Stochastic Gravitational-Wave Background from Compact Binary Coalescences", Physical Review Letters **120**, 091101 (2018)

195. B. P. Abbott *et al.* (*LSC+Virgo*), "Effects of data quality vetoes on a search for compact binary coalescences in Advanced LIGO's first observing run", Classical and Quantum Gravity **35**, 065010 (2018)

194. B. P. Abbott *et al.* (*LSC+Virgo*), "All-sky search for long-duration gravitational wave transients in the first Advanced LIGO observing run", Classical and Quantum Gravity **35**, 065009 (2018)

★193. V. Connaughton, E. Burns, A. Goldstein, L. Blackburn, … P. Shawhan (12th author), … and P. Veres (total 28 authors), "On the Interpretation of the *Fermi*-GBM Transient Observed in Coincidence with LIGO Gravitational-wave Event GW150914", Astrophysical Journal **853**, L9 (2018)

192. B. P. Abbott *et al.* (*LSC+Virgo*) plus S. Buchner, I. Cognard, A. Corongiu, P. C. C. Freire, L. Guillemot, G. B. Hobbs, M. Kerr, A. G. Lyne, A. Possenti, A. Ridolfi, R. M. Shannon, B. W. Stappers, and P. Weltevrede, "First search for nontensorial gravitational waves from known pulsars", Physical Review Letters **120**, 031104 (2018)

191. B. P. Abbott *et al.* (*LSC+Virgo*) plus S. Buchner, B. Stappers, and P. Weltevrede, "First narrow-band search for continuous gravitational waves from known pulsars in advanced detector data", Physical Review D **96**, 122006 (2017)

190. B. P. Abbott *et al.* (*LSC+Virgo*), "GW170608: Observation of a 19 Solar-mass Binary Black Hole Coalescence", Astrophysical Journal Letters **851**, L35 (2017)

189. B. P. Abbott *et al.* (*LSC+Virgo*), "First low-frequency Einstein@Home all-sky search for continuous gravitational waves in Advanced LIGO data", Physical Review D **96**, 122004 (2017)

188. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for Post-merger Gravitational Waves from the Remnant of the Binary Neutron Star Merger GW170817", Astrophysical Journal Letters **851**, L16 (2017)

187. M. Walker, T. D. Abbott, S. M. Aston, G. González, D. M. Macleod, J. McIver, B. P. Abbott, R. Abbott, … P. Shawhan (162nd author), … and J. Zweizig (total 204 authors, alphabetical from B. P. Abbott onward), "Effects of transients in LIGO suspensions on searches for gravitational waves", Review of Scientific Instruments **88**, 124501 (2017)

186. B. P. Abbott *et al.* (*LSC+Virgo*), "On the Progenitor of Binary Neutron Star Merger GW170817", Astrophysical Journal Letters **850**, L40 (2017)

185. B. P. Abbott *et al.* (*LSC+Virgo*), "Estimating the Contribution of Dynamical Ejecta in the Kilonova Associated with GW170817", Astrophysical Journal Letters **850**, L39 (2017)

184. A. Albert *et al.* (*ANTARES+IceCube+Auger+LSC+Virgo*), "Search for High-energy Neutrinos from Binary Neutron Star Merger GW170817 with ANTARES, IceCube, and the Pierre Auger Observatory", Astrophysical Journal Letters **850**, L35 (2017)

183. B. P. Abbott *et al.* (*LSC+Virgo + 1M2H + Dark Energy Camera GW-EM Collab. & DES + DLT40 + Las Cumbres Observatory +VINROUGE + MASTER*), "A gravitational-wave standard siren measurement of the Hubble constant", Nature **551**, 85 (2017)

★182. B. P. Abbott *et al.* (*LSC+Virgo+Fermi-GBM+INTEGRAL*), "Gravitational Waves and Gamma-Rays from a Binary Neutron Star Merger: GW170817 and GRB 170817A", Astrophysical Journal Letters **848**, L13 (2017)

★181. B. P. Abbott *et al.* (*LSC+Virgo+over 2000 astronomers*), "Multi-Messenger Observations of a Binary Neutron Star Merger", Astrophysical Journal Letters **848**, L12 (2017)

This paper summarizes the very extensive observations and findings from the EM Follow-up project, involving LIGO+Virgo and several dozen astronomy teams, which I played a large role in setting up. Earlier in the year, I was quoted in an article about this project in Symmetry Magazine (https://www.symmetrymagazine.org/article/the-rise-of-ligos-space-studying-super-team).

★180. B. P. Abbott *et al.* (*LSC+Virgo*), "GW170817: Observation of gravitational waves from a binary neutron star inspiral", Physical Review Letters **119**, 161101 (2017)

This result was widely reported by the scientific and mainstream media. I was quoted in an article in The Indian Express (http://indianexpress.com/article/technology/science/ligo-now-detects-gravitational-waves-from-neutron-stars-merger-4895370/).

179. B. P. Abbott *et al.* (*LSC+Virgo*), "GW170814: A Three-Detector Observation of Gravitational Waves from a Binary Black Hole Coalescence", Physical Review Letters **119**, 141101 (2017)

178. B. P. Abbott *et al.* (*LSC+Virgo*) plus D. Steeghs and L. Wang, "Upper limits on gravitational waves from Scorpius X-1 from a model-based cross-correlation search in Advanced LIGO data", Astrophysical Journal **847**, 47 (2017)

177. B. P. Abbott *et al.* (*LSC+Virgo*), "All-sky search for periodic gravitational waves in the O1 LIGO data", Physical Review D **96**, 062002 (2017)

176. A. Albert *et al.* (*ANTARES Collaboration, IceCube Collaboration, and LSC+Virgo*), "Search for high-energy neutrinos from gravitational wave event GW151226 and candidate LVT151012 with ANTARES and IceCube", Physical Review D **96**, 022005 (2017)

175. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for intermediate mass black hole binaries in the first observing run of Advanced LIGO", Physical Review D **96**, 022001 (2017)

174. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for gravitational waves from Scorpius X-1 in the first Advanced LIGO observing run with a hidden Markov model", Physical Review D **95**, 122003 (2017)

173. B. P. Abbott *et al.* (*LSC+Virgo*), "GW170104: Observation of a 50-solar-mass binary black hole coalescence at redshift 0.2", Physical Review Letters **118**, 221101 (2017)

Paper presenting the third observation of gravitational waves from a binary black hole merger. Following the release of the paper, I was quoted in online articles by The Register (https://www.theregister.co.uk/2017/06/01/ligo_physicists_find_new_gravitational_wave/) and ROOM: The Space Journal (https://room.eu.com/news/a-third-success-for-ligo-as-more-gravitational-waves-detected), and did an interview for CuriosityStream that was used as part of a video piece entitled "Gravitational Waves: Rewinding Time".

172. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for gravitational waves associated with gamma-ray bursts during the first Advanced LIGO Observing Run and implications for the origin of GRB 150906B", Astrophysical Journal **841**, 89 (2017)

171. D. V. Martynov, V. V. Frolov, S. Kandhasamy, K. Izumi, H. Miao, N. Mavalvala, E. D. Hall, R. Lanza, B. P. Abbott, R. Abbott, T. D. Abbott, … P. Shawhan (108th author) … and J. Zweizig (total 149 authors, alphabetical after first 8 authors), "Quantum correlation measurements in interferometric gravitational wave detectors", Physical Review A **95**, 043831 (2017)

170. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for continuous gravitational waves from neutron stars in globular cluster NGC 6544", Physical Review D **95**, 082005 (2017)

169. B. P. Abbott *et al.* (*LSC+Virgo*) plus A. Vano-Vinuales, M. Boyle, T. Chu, D. Hemberger, I. Hinder, L. E. Kidder, G. Lovelace, S. Ossokine, M. Scheel, B. Szilagyi, and S. Teukolsky, "Effects of waveform model systematics on the interpretation of GW150914", Classical and Quantum Gravity **34**, 104002 (2017)

168. C. Blair, S. Gras, R. Abbott, S. Aston, J. Betzwieser, D. Blair, R. DeRosa, M. Evans, V. Frolov, P. Fritschel, H. Grote, T. Hardwick, J. Liu, M. Lormand, J. Miller, A. Mullavey, B. O'Reilly, C. Zhao, B. P. Abbott, T. D. Abbott, … P. Shawhan (162nd author) … and J. Zweizig (total 203 authors, alphabetical after first 18 authors), "First demonstration of electrostatic damping of parametric instability at Advanced LIGO", Physical Review Letters **118**, 151102 (2017)

167. B. P. Abbott *et al.* (*LSC+Virgo*) plus S. Buchner, I. Cognard, A. Corongiu, P. C. C. Freire, L. Guillemot, G. B. Hobbs, M. Kerr, A. G. Lyne, A. Possenti, A. Ridolfi, R. M. Shannon, B. W. Stappers, and P. Weltevrede, "First search for gravitational waves from known pulsars with Advanced LIGO", Astrophysical Journal **839**, 12 (2017)

166. B. P. Abbott *et al.* (*LSC*), "Calibration of the Advanced LIGO detectors for the discovery of the binary black-hole merger GW150914", Physical Review D **95**, 062003 (2017)

165. C. Biwer, D. Barker, J. C. Batch, J. Betzwieser, R. P. Fisher, E. Goetz, S. Kandhasamy, S. Karki, J. S. Kissel, A. P. Lundgren, D. M. Macleod, A. Mullavey, K. Riles, J. G. Rollins, K. A. Thorne, E. Thrane, T. D. Abbott, B. Allen, D. A. Brown, P. Charlton, S. G. Crowder, P. Fritschel, J. B. Kanner, M. Landry, C. Lazzaro, M. Millhouse, M. Pitkin, R. L. Savage, P. Shawhan, D. H. Shoemaker, J. R. Smith, L. Sun, J. Veitch, S. Vitale, A. J. Weinstein, N. Cornish, R. C. Essick, M. Fays, E. Katsavounidis, J. Lange, T. B. Littenberg, R. Lynch, P. M. Meyers, F. Pannarale, R. Prix, R. O'Shaughnessy, and D. Sigg, "Validating gravitational-wave detections: The Advanced LIGO hardware injection system", Physical Review D **95**, 062002 (2017)

164. B. P. Abbott *et al.* (*LSC+Virgo*), "Upper limits on the stochastic gravitational-wave background from Advanced LIGO's first observing run", Physical Review Letters **118**, 121102 (2017)

163. B. P. Abbott *et al.* (*LSC+Virgo*), "Directional limits on persistent gravitational waves from Advanced LIGO's first observing run", Physical Review Letters **118**, 121102 (2017)

162. B. P. Abbott *et al.* (*LSC+Virgo*), "All-sky search for short gravitational-wave bursts in the first Advanced LIGO run", Physical Review D **95**, 042003 (2017)

161. B. P. Abbott *et al.* (*LSC+Virgo*), "Exploring the sensitivity of next generation gravitational wave detectors", Classical and Quantum Gravity **34**, 044001 (2017)

160. J. L. Racusin, E. Burns, A. Goldstein, V. Connaughton, C. A. Wilson-Hodge, P. Jenke, L. Blackburn, M. S. Briggs, J. Broida, J. Camp, N. Christensen, C. M. Hui, T. Littenberg, P. Shawhan, L. Singer, J. Veitch, P. N. Bhat, W. Cleveland, G. Fitzpatrick, M. H. Gibby, A. von Kienlin, S. McBreen, B. Mailyan, C. A. Meegan, W. S. Paciesas, R. D. Preece, O. J. Roberts, M. Stanbro, P. Veres, B.-B. Zhang, plus M. Ackermann et al. (*Fermi LAT Collaboration*), "Searching the gamma-ray sky for counterparts to gravitational wave sources: *Fermi* Gamma-ray Burst Monitor and Large Area Telescope observations of LVT151012 and GW151226", Astrophysical Journal **835**, 82 (2017)

159. B. P. Abbott *et al.* (*LSC+Virgo*), "The basic physics of the binary black hole merger GW150914", Annalen der Physik **529**, 1600209 (2017)

158. B. P. Abbott *et al.* (*LSC+Virgo*), "The rate of binary black hole mergers inferred from Advanced LIGO observations surrounding GW150914", Astrophysical Journal Letters **833**, L1 (2016) ; supplementary material published in Astrophysical Journal Supplement Series **227**, 14 (2017)

157. B. P. Abbott *et al.* (*LSC+Virgo*), "Upper limits on the rates of binary neutron star and neutron star - black hole mergers from Advanced LIGO's first observing run", Astrophysical Journal Letters **832**, L21 (2016)

156. B. P. Abbott *et al.* (*LSC+Virgo*), "Results of the deepest all-sky survey for continuous gravitational waves on LIGO S6 data running on the Einstein@Home volunteer distributed computing project", Physical Review D **94**, 102002 (2016)

155. B. P. Abbott *et al.* (*LSC+Virgo*), "First targeted search for gravitational-wave bursts from core-collapse supernovae in data of first-generation laser interferometer detectors", Physical Review D **94**, 102001 (2016)

154. B. P. Abbott *et al.* (*LSC+Virgo*), "Binary black hole mergers in the first Advanced LIGO observing run", Physical Review X **6**, 041015 (2016)

153. B. P. Abbott *et al.* (*LSC+Virgo*), "Improved analysis of GW150914 using a fully spin-precessing waveform model", Physical Review X **6**, 041014 (2016)

152. B. P. Abbott *et al.* (*LSC+Virgo*), "Directly comparing GW150914 with numerical solutions of Einstein's equations for binary black hole coalescence", Physical Review D **94**, 064035 (2016)

151. B. P. Abbott *et al.* (*LSC+Virgo*), "Comprehensive all-sky search for periodic gravitational waves in the sixth science run LIGO data", Physical Review D **94**, 042002 (2016)

★150. B. P. Abbott *et al.* (*LSC+Virgo*) plus ~500 astronomers, "Localization and broadband follow-up of the gravitational-wave transient GW150914", Astrophysical Journal Letters **826**, L13 (2016); supplementary material published in Astrophysical Journal Supplement Series **225**, 8 (2016)

> I co-led this huge collaborative project and paper—with over 1500 authors, including about two dozen distinct teams of astronomers—along with Leo Singer (NASA Goddard) and Marica Branchesi (Urbino).

★149. V. Connaughton, E. Burns, A. Goldstein, L. Blackburn, M. S. Briggs, B.-B. Zhang, J. Camp, N. Christensen, C. M. Hui, P. Jenke, T. Littenberg, J. E. McEnery, J. Racusin, P. Shawhan, L. Singer, J. Veitch, C. A. Wilson-Hodge, P. N. Bhat, E. Bissaldi, W. Cleveland, G. Fitzpatrick, M. M. Giles, M. H. Gibby, A. von Kienlin, R. M. Kippen, S. McBreen, B. Mailyan, C. A. Meegan, W. S. Paciesas, R. D. Preece, O. J. Roberts, L. Sparke, M. Stanbro, K. Toelge, and P. Veres, "*Fermi* GBM observations of LIGO gravitational wave event GW150914", Astrophysical Journal Letters **826**, L6 (2016)

> I and some LSC colleagues worked with members of the *Fermi* Gamma-ray Burst Monitor (GBM) instrument team to do a deep analysis of GBM data around the time of the first detected gravitational-wave event. I mainly critiqued the analysis and helped revise the paper.

148. S. Adrián-Martínez *et al.* (*ANTARES Collaboration*, *IceCube Collaboration*, and *LSC+Virgo*), "High-energy neutrino follow-up search of gravitational wave event GW150914 with ANTARES and IceCube", Physical Review D **93**, 122010 (2016)

147. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for transient gravitational waves in coincidence with short-duration radio transients during 2007-2013", Physical Review D **93**, 122008 (2016)

★146. B. P. Abbott *et al.* (*LSC+Virgo*), "GW151226: Observation of gravitational waves from a 22-solar-mass binary black hole coalescence", Physical Review Letters **116**, 241103 (2016)

Paper presenting the second observation of gravitational waves from a binary black hole merger. I played an active role in revising this paper, along with many of my LSC+Virgo colleagues. The lead authors were Sarah Caudill, Laura Nuttall and Michael Landry. Following the release of the paper, I was quoted in the Washington Post (6/16/2016, page A16; also online at https://www.washingtonpost.com/news/speaking-of-science/wp/2016/06/15/ligo-scientists-announce-their-second-detection-of-gravitational-waves/) and online by NBC News (http://www.nbcnews.com/science/science-news/it-wasn-t-fluke-scientists-see-black-holes-collide-again-n593156), and was interviewed for a segment on German public radio (http://www.deutschlandfunk.de/himmlisches-weihnachtsgeschenk-astronomen-freuen-sich.676.de.html?dram:article_id=357412).

145. B. P. Abbott *et al.* (*LSC+Virgo*), "Properties of the binary black hole merger GW150914", Physical Review Letters **116**, 241102 (2016)

144. B. P. Abbott *et al.* (*LSC+Virgo*), "Observing gravitational-wave transient GW150914 with minimal assumptions", Physical Review D **93**, 122004 (2016)

143. B. P. Abbott *et al.* (*LSC+Virgo*), "GW150914: First results from the search for binary black hole coalescence with Advanced LIGO", Physical Review D **93**, 122003 (2016)

142. B. P. Abbott *et al.* (*LSC+Virgo*), "Characterization of transient noise in Advanced LIGO relevant to gravitational wave signal GW150914", Classical and Quantum Gravity **33**, 134001 (2016)

141. D. V. Martynov, E. D. Hall, B. P. Abbott, R. Abbott, … P. Shawhan (207th author), … and J. Zweizig (total 256 authors, alphabetical after lead authors Martynov and Hall), "Sensitivity of the Advanced LIGO detectors at the beginning of gravitational wave astronomy", Physical Review D **93**, 112004 (2016)

140. B. P. Abbott *et al.* (*LSC+Virgo*), "Tests of general relativity with GW150914", Physical Review Letters **116**, 221101 (2016)

139. B. P. Abbott *et al.* (*LSC*), "GW150914: The Advanced LIGO detectors in the era of first discoveries", Physical Review Letters **116**, 131103 (2016)

138. B. P. Abbott *et al.* (*LSC+Virgo*), "GW150914: Implications for the stochastic gravitational-wave background from binary black holes", Physical Review Letters **116**, 131102 (2016)

137. J. Aasi *et al.* (*LSC+Virgo*), "First low frequency all-sky search for continuous gravitational wave signals", Physical Review D **93**, 042007 (2016)

136. J. Aasi *et al.* (*LSC+Virgo*), "Search of the Orion spur for continuous gravitational waves using a loosely coherent algorithm on data from LIGO interferometers", Physical Review D **93**, 042006 (2016)

135. B. P. Abbott *et al.* (*LSC+Virgo*), "All-sky search for long-duration gravitational wave transients with initial LIGO", Physical Review D **93**, 042005 (2016)

134. B. P. Abbott *et al.* (*LSC+Virgo*), "Astrophysical implications of the binary black-hole merger GW150914", Astrophysical Journal Letters **818**, L22 (2016)

★133. B. P. Abbott *et al.* (*LSC+Virgo*), "Observation of gravitational waves from a binary black hole merger", Physical Review Letters **116**, 061102 (2016)

Paper presenting the breakthrough discovery of gravitational waves. I played an active role in outlining and revising this paper, along with many of my LSC+Virgo colleagues. The paper coordinating team was Peter Fritschel, Eric Chassande-Mottin, Stuart Anderson, Pia Astone, Maria Alessandra Papa and Joshua Smith. Media coverage was extensive. I was interviewed and appeared briefly on WRC Channel 4 News, and was quoted in articles in Down to Earth (http://www.downtoearth.org.in/news/universal-redux-53084), The National (http://www.thenational.ae/arts-life/the-review/why-albert-einstein-continues-to-make-waves-as-black-holes-collide#full), Gizmodo (http://gizmodo.com/physicists-are-freaking-out-about-gravitational-waves-a-1758605484), and The Diamondback (http://www.dbknews.com/2016/02/26/umd-research-gravitational-waves/).
It has been cited over 1300 times according to Web of Science.

132. B. P. Abbott *et al.* (*LSC+Virgo*), "Prospects for observing and localizing gravitational-wave transients with Advanced LIGO and Advanced Virgo", Living Reviews in Relativity **19**, 1 (2016)

131. Jr-Wei Tsai, John H. Simonetti, Bernadine Akukwe, Brandon Bear, Jonathan D. Gough, Peter Shawhan, and Michael Kavic, "Simultaneous observations of giant pulses from pulsar PSR B0950+08 at 42 and 74 MHz", Astronomical Journal **151**, 28 (2016)

I participated somewhat in obtaining this data and critiqued the analysis, which was mainly done by Jr-Wei Tsai. Author list is ordered by contributions, roughly, except that Kavic's role as team leader is represented by occupying the last position.

130. J. Aasi *et al.* (*LSC+Virgo*), "Searches for continuous gravitational waves from nine young supernova remnants", Astrophysical Journal **813**, 39 (2015)

★129. Cregg C. Yancey, Brandon E. Bear, Bernadine Akukwe, Kevin Chen, Jayce Dowell, Jonathan D. Gough, Jonah Kanner, Michael Kavic, Kenneth Obenberger, Peter Shawhan, John H. Simonetti, Gregory B. Taylor, and Jr-Wei Tsai, "Multi-messenger astronomy of gravitational-wave sources with flexible wide-area radio transient surveys", Astrophysical Journal **812**, 168 (2015)

My student Cregg Yancey was lead author of this paper along with Brandon Bear (Virginia Tech), and Michael Kavic (Long Island University). Jonah Kanner and I also did substantial work on editing the paper. Alphabetical author list after Yancey and Bear.

128. J. Aasi *et al.* (*LSC+Virgo*), "Characterization of the LIGO detectors during their sixth science run", Classical and Quantum Gravity **32**, 115012 (2015)

127. J. Aasi *et al.* (*LSC+Virgo*), "Directed search for gravitational waves from Scorpius X-1 with initial LIGO data", Physical Review D **91**, 062008 (2015)

126. J. Aasi *et al.* (*LSC*), "Advanced LIGO", Classical and Quantum Gravity **32**, 074001 (2015)

125. J. Aasi *et al.* (*LSC+Virgo*) plus R. Serafinelli, G. Ashton and S. Buchner, "Narrow-band search of continuous gravitational-wave signals from Crab and Vela pulsars in Virgo VSR4 data", Physical Review D **91**, 022004 (2015)

124. Jr-Wei Tsai, John H. Simonetti, Bernadine Akukwe, Brandon Bear, Sean E. Cutchin, Jayce Dowell, Jonathan D. Gough, Jonah Kanner, Namir E. Kassim, Frank K. Schinzel, Peter Shawhan, Gregory B. Taylor, Cregg C. Yancey, Leandro Quezada, and Michael Kavic, "Observations of giant pulses from pulsar B0950+08 using LWA1", Astronomical Journal **149**, 65 (2015)

I participated somewhat in obtaining this data and gave feedback on the analysis, which was mainly done by graduate student Jr-Wei Tsai under the supervision of his advisor Simonetti.

123. J. Aasi *et al.* (*LSC+Virgo*), "Searching for stochastic gravitational waves using data from the two colocated LIGO Hanford detectors", Physical Review D **91**, 022003 (2015)

122. J. Aasi *et al.* (*LSC+Virgo*), "Improved upper limits on the stochastic gravitational-wave background from 2009-2010 LIGO and Virgo data", Physical Review Letters **113**, 231101 (2014)

121. M. G. Aartsen *et al.* (*IceCube Collaboration* and *LSC+Virgo*), "Multimessenger search for sources of gravitational waves and high-energy neutrinos: Initial results for LIGO-Virgo and IceCube", Physical Review D **90**, 102002 (2014)

120. J. Aasi *et al.* (*LSC+Virgo*), "First all-sky search for continuous gravitational waves from unknown sources in binary systems", Physical Review D **90**, 062010 (2014)

119. J. Aasi *et al.* (*LSC+Virgo*), "Implementation of an $\mathcal{F}$-statistic all-sky search for continuous gravitational waves in Virgo VSR1 data", Classical and Quantum Gravity **31**, 165014 (2014)

118. J. Aasi *et al.* (*LSC+Virgo* and *IPN Collaboration*), "Search for gravitational waves associated with gamma-ray bursts detected by the Interplanetary Network", Physical Review Letters **113**, 011102 (2014)

117. J. Aasi *et al.* (*LSC+Virgo*), "Methods and results of a search for gravitational waves associated with gamma-ray bursts using data from the GEO 600, LIGO, and Virgo detectors", Physical Review D **89**, 122004 (2014)

116. J. Aasi *et al.* (*LSC+Virgo*), "Search for gravitational radiation from intermediate mass black hole binaries in data from the second LIGO-Virgo joint science run", Physical Review D **89**, 122003 (2014)

115. J. Aasi *et al.* (*LSC+Virgo*), "Search for gravitational wave ringdowns from perturbed intermediate mass black holes in LIGO-Virgo data from 2005-2010", Physical Review D **89**, 102006 (2014)

114. J. Aasi *et al.* (*LSC+Virgo* and *NINJA-2 Collaboration*), "The NINJA-2 project: Detecting and characterizing gravitational waveforms modelled using numerical binary black hole simulations", Classical and Quantum Gravity **31**, 115004 (2014)

113. J. Aasi *et al.* (*LSC+Virgo*), "Constraints on cosmic strings from the LIGO-Virgo gravitational-wave detectors", Physical Review Letters **112**, 131101 (2014)

112. J. Aasi *et al.* (*LSC+Virgo*), "Application of a Hough search for continuous gravitational waves on data from the fifth LIGO science run", Classical and Quantum Gravity **31**, 085014 (2014)

111. J. Aasi *et al.* (*LSC+Virgo*) plus 18 radio astronomers, "Gravitational waves from known pulsars: results from the initial detector era", Astrophysical Journal **785**, 119 (2014)

★110. J. Aasi *et al.* (*LSC+Virgo*) plus 35 astronomers, "First searches for optical counterparts to gravitational-wave candidate events", Astrophysical Journal Supplement **211**, 7 (2014)

> I coordinated the efforts of a large team to analyze image data from many different instruments and publish the search results. My former student Jonah Kanner was the lead author. It has been cited over 35 times, according to Web of Science.

109. J. Aasi *et al.* (*LSC+Virgo*), "Search for long-lived gravitational-wave transients coincident with long gamma-ray bursts", Physical Review D **88**, 122004 (2013)

108. J. Aasi *et al.* (*LSC+Virgo*), "Directed search for continuous gravitational waves from the Galactic center", Physical Review D **88**, 102002 (2013)

107. J. Aasi *et al.* (*LSC+Virgo*), "Parameter estimation for compact binary coalescence signals with the first generation gravitational-wave detector network", Physical Review D **88**, 062001 (2013)

106. Nils Anderson, John Baker, Krzystof Belczynski, … Peter Shawhan (39th author), … and Stan Whitcomb (total 46 authors, alphabetical), "The transient gravitational-wave sky", Classical and Quantum Gravity **30**, 193002 (2013)

> This paper is a summary report from a workshop about gravitational-wave burst sources and astrophysics, that I participated in.

105. J. Aasi *et al.* (*LSC*), "Enhanced sensitivity of the LIGO gravitational wave detector by using squeezed states of light", Nature Photonics **7**, 61 (2013)

> I was one of three internal reviewers to carefully check this paper before submission.
> Lead authors: Lisa Barsotti, Nergis Mavalvala and Daniel Sigg. It has been cited over 200 times, according to Web of Science.

104. S. Adrián-Martínez *et al.* (*ANTARES Collaboration* and *LSC+Virgo*), "A First Search for Coincident Gravitational Waves and High Energy Neutrinos Using LIGO, Virgo and ANTARES Data from 2007", Journal of Cosmology and Astroparticle Physics **6**, 008 (2013)

103. J. Aasi *et al.* (*LSC+Virgo*) plus D. P. Anderson, "Einstein@Home all-sky search for periodic gravitational waves in LIGO S5 data", Physical Review D **87**, 042001 (2013)

> I was one of two internal reviewers to carefully check this analysis and paper before submission.
> Lead author: Paoli Leaci.

102. J. Aasi *et al.* (*LSC+Virgo*), "Search for gravitational waves from binary black hole inspiral, merger, and ringdown in LIGO-Virgo data from 2009–2010", Physical Review D **87**, 022002 (2013)

101. P. A. Evans, J. K. Fridriksson, N. Gehrels, J. Homan, J. P. Osborne, M. Siegel, A. Beardmore, P. Handbauer, J. Gelbord, J. A. Kennea, M. Smith, Q. Zhu, and J. Aasi *et al.* (*LSC+Virgo*), "*Swift* follow-up observations of candidate gravitational-wave transient events", Astrophysical Journal Supplement **203**, 28 (2012)

100. J. Abadie *et al.* (*LSC+Virgo*) plus M. S. Briggs, V. Connaughton, K. C. Hurley, P. A. Jenke, A. von Kienlin, A. Rau, and X.-L. Zhang, "Search for gravitational waves associated with gamma-ray bursts during LIGO science run 6 and Virgo science runs 2 and 3", Astrophysical Journal **760**, 12 (2012)

99. J. Abadie *et al.* (*LSC*) plus M.A. Bizouard, A. Dietz, G.M. Guidi and M. Was, "Implications for the origin of GRB 051103 from LIGO observations", Astrophysical Journal **755,** 2 (2012)

98. J. Aasi *et al.* (*Virgo+LSC*), "The characterization of Virgo data and its impact on gravitational-wave searches", Classical and Quantum Gravity **29**, 155002 (2012)

97. J. Abadie *et al.* (*LSC+Virgo*), "All-sky search for gravitational-wave bursts in the second joint LIGO-Virgo run", Physical Review D **85**, 122007 (2012)

96. J. Abadie *et al.* (*LSC+Virgo*), "Upper limits on a stochastic gravitational wave background using LIGO and Virgo interferometers at 600-1000 Hz", Physical Review D **85**, 122001 (2012)

95. J. Abadie *et al.* (*LSC+Virgo*), "Search for gravitational waves from intermediate mass binary black holes", Physical Review D **85**, 102004 (2012)

94. J. Abadie *et al.* (*LSC+Virgo*), "First low-latency LIGO+Virgo search for binary inspirals and their electromagnetic counterparts", Astronomy & Astrophysics **541**, A155 (2012)

93. J. Abadie *et al.* (*LSC+Virgo*), "Search for gravitational waves from low mass compact binary coalescence in LIGO's sixth science run and Virgo's science runs 2 and 3", Physical Review D **85**, 082002 (2012)

★ 92. J. Abadie *et al.* (*LSC+Virgo*) plus C. Akerlof, 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, and W. Zheng, "Implementation and testing of the first prompt search for gravitational wave transients with electromagnetic counterparts", Astronomy & Astrophysics **539**, A124 (2012)

> My student Jonah Kanner and I were leaders of this project. Kanner was lead author on the paper together with Brennan Hughey. It has been cited over 45 times, according to Web of Science.

91. J. Abadie *et al.* (*LSC+Virgo*), "All-sky search for periodic gravitational waves in the full S5 LIGO data", Physical Review D **85**, 022001 (2012)

> I was one of two internal reviewers to carefully check this analysis and paper before submission. Lead author: Vladimir Dergachev.

90. J. Abadie *et al.* (*LSC+Virgo*), "Directional limits on persistent gravitational waves using LIGO S5 science data", Physical Review Letters **107**, 271102 (2011)

★ 89. Joshua R Smith, Thomas Abbott, Eiichi Hirose, Nicolas Leroy, Duncan Macleod, Jessica McIver, Peter Saulson, and Peter Shawhan, "A hierarchical method for vetoing noise transients in gravitational-wave detectors", Classical and Quantum Gravity **28**, 235005 (2011)

> Reports the implementation and performance of an analysis technique that I initiated along with a Maryland undergrad. Lead author: Joshua Smith (alphabetical after that).

88. The LIGO Scientific Collaboration (J. Abadie *et al.*), "A gravitational wave observatory operating beyond the quantum shot-noise limit", Nature Physics **7**, 962 (2011)

87. J. Abadie *et al.* (*LSC+Virgo*), "Beating the spin-down limit on gravitational wave emission from the Vela pulsar", Astrophysical Journal **737**, 93 (2011)

86. J. Abadie *et al.* (*LSC+Virgo*), "Search for gravitational waves from binary black hole inspiral, merger, and ringdown", Physical Review D **83**, 122005 (2011)

85. J. Abadie *et al.* (*LSC+Virgo*), "Search for gravitational wave bursts from six magnetars", Astrophysical Journal Letters **734**, L35 (2011)

> As Co-Chair of the LSC Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead author: Peter Kalmus.

84. E. Abouzaid *et al.* (*KTeV*), "Precise measurements of direct *CP* violation, *CPT* symmetry, and other parameters in the neutral kaon system", Physical Review D **83**, 092001 (2011)

> The final result paper from the experiment on which I did my Ph.D. research, in part repeating the analysis I did in my thesis with additional data. Lead author: Elizabeth Worcester.

83. J. Abadie *et al.* (*LSC*), "A search for gravitational waves associated with the August 2006 timing glitch of the Vela pulsar", Physical Review D **83**, 042001 (2011)

> As Co-Chair of the LSC-Virgo Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead author: James Clark.

82. J. Abadie *et al.* (*LSC+Virgo*), "Search for gravitational waves from compact binary coalescence in LIGO and Virgo data from S5 and VSR1", Physical Review D **82**, 102001 (2010)

81. J. Abadie *et al.* (*LSC*), "Calibration of the LIGO gravitational wave detectors in the fifth science run", Nuclear Instruments and Methods in Physics Research A **624**, 223 (2010)

80. J. Abadie *et al.* (*LSC+Virgo*), "First search for gravitational waves from the youngest known neutron star", Astrophysical Journal **722**, 1504 (2010)

    I was one of two internal reviewers to carefully check this analysis and paper before submission. Lead author: Karl Wette.

★ 79. S. Ballmer, S. Márka and P. Shawhan, "Feasibility of measuring the Shapiro time delay over meter-scale distances", Classical and Quantum Gravity **27**, 185018 (2010)

    Two colleagues and I developed a novel idea to test a fundamental aspect of gravity using laser interferometers such as LIGO. Equal contributions, alphabetical author list.

78. J. Abadie *et al.* (*LSC+Virgo*), "Predictions for the rates of compact binary coalescences observable by ground-based gravitational-wave detectors", Classical and Quantum Gravity **27**, 173001 (2010)

★ 77. J. Slutsky, L. Blackburn, D. A. Brown, L. Cadonati, J. Cain, M. Cavaglià, S. Chatterji, N. Christensen, M. Coughlin, S. Desai, G. González, T. Isogai, E. Katsavounidis, B. Rankins, T. Reed, K. Riles, P. Shawhan, J. R. Smith, N. Zotov, and J. Zweizig, "Methods for reducing false alarms in searches for compact binary coalescences in LIGO data", Classical and Quantum Gravity **27**, 165023 (2010)

    I developed some of the earliest methods described in this paper for "vetoing" instrumental glitches and applying data quality conditions to LIGO searches. Lead author: Jacob Slutsky (alphabetical after that).

76. J. Abadie *et al.* (*LSC+Virgo*), "Search for gravitational-wave inspiral signals associated with short gamma-ray bursts during LIGO's fifth and Virgo's first science run", Astrophysical Journal **715**, 1453 (2010)

75. B. P. Abbott *et al.* (*LSC+Virgo*), "Search for gravitational-wave bursts associated with gamma-ray bursts using data from LIGO science run 5 and Virgo science run 1", Astrophysical Journal **715**, 1438 (2010)

    As Co-Chair of the LSC-Virgo Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead authors: Patrick Sutton and Gareth Jones.

★ 74. J. Abadie *et al.* (*LSC+Virgo*), "All-sky search for gravitational-wave bursts in the first joint LIGO-GEO-Virgo run", Physical Review D **81**, 102001 (2010)

    I was a member of the core analysis team, wrote some sections of this paper, and as Co-Chair of the LSC-Virgo Burst Analysis Working Group, generally guided this analysis and paper to completion. My student Jonah Kanner led the internal review committee for a part of the analysis. Lead author: Sergey Klimenko. It has been cited over 30 times, according to Web of Science.

73. B. P. Abbott *et al.* (*LSC+Virgo*) plus S. Bégin, 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", Astrophysical Journal **713**, 671 (2010)

    I was one of two internal reviewers to carefully check this analysis and paper before submission. Lead author: Matthew Pitkin.

72. B. P. Abbott *et al.* (*LSC*), "Search for high frequency gravitational wave bursts in the first calendar year of LIGO's fifth science run", Physical Review D **80**, 102002 (2009)

    As Co-Chair of the LSC Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead author: Brennan Hughey.

71. B. P. Abbott *et al.* (*LSC*), "Search for gravitational-wave bursts in the first year of the fifth LIGO science run", Physical Review D **80**, 102001 (2009)

    I was part of the core team that did this analysis, in particular by choosing the data set selection criteria. Lead author: Michele Zanolin, with significant writing contributions from me and other team members.

70. B. P. Abbott *et al.* (*LSC*), "First LIGO search for gravitational wave bursts from cosmic (super)strings", Physical Review D **80**, 062002 (2009)

    As Co-Chair of the LSC Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead author: Xavier Siemens.

69. B. P. Abbott *et al.* (*LSC*), "Search for gravitational wave ringdowns from perturbed black holes in LIGO S4 data", Physical Review D **80**, 062001 (2009)

68. B. P. Abbott *et al.* (*LSC*), "Stacked search for gravitational waves from the 2006 SGR 1900+14 storm", Astrophysical Journal Letters **701**, L68 (2009)

    As Co-Chair of the LSC Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead author: Peter Kalmus.

67. B. P. Abbott *et al.* (*LSC*), "Search for gravitational waves from low mass binary coalescence in 186 days of LIGO's fifth science run", Physical Review D **80**, 047101 (2009)

66. B. P. Abbott *et al.* (*LSC*), "Einstein@Home search for periodic gravitational waves in early S5 LIGO data", Physical Review D **80**, 042003 (2009)

    I was one of two internal reviewers to carefully check this analysis and paper before submission. Lead author: Holger Pletsch.

65. The LIGO Scientific Collaboration & The Virgo Collaboration, "An upper limit on the stochastic gravitational-wave background of cosmological origin", Nature **460**, 990 (2009)

64. B. Abbott *et al.* (*LSC*), "Observation of a kilogram-scale oscillator near its quantum ground state", New Journal of Physics **11**, 073032 (2009)

    This paper reports on having "cooled" the LIGO mirrors, along one direction, to an extremely low effective temperature at which quantum effects become important. All members of the LIGO Scientific Collaboration are listed as authors due to our work in constructing and operating the detector instrumentation. This paper was selected by the editors of the journal as one of their "Best of 2009".

★ 63. B. Abbott *et al.* (*LSC*), "LIGO: The Laser Interferometer Gravitational-Wave Observatory", Reports on Progress in Physics **72**, 076901 (2009)

    I wrote a section of this paper. Lead authors: Peter Fritschel and Sam Waldman. This paper was selected by the editors of the journal as one of their "Highlights of 2009". As the most complete published description of the LIGO detectors for a period of several years, it has been cited over 600 times, according to Web of Science.

62. B. P. Abbott *et al.* (*LSC*), "Search for gravitational waves from low mass binary coalescences in the first year of LIGO's S5 data", Physical Review D **79**, 122001 (2009)

61. B. P. Abbott *et al.* (*LSC*), "All-sky LIGO search for periodic gravitational waves in the early fifth-science-run data", Physical Review Letters **102**, 111102 (2009)

    I was one of two internal reviewers to carefully check this analysis and paper before submission. Lead author: Vladimir Dergachev.

60. B. Abbott *et al.* (*LSC*), "Einstein@Home search for periodic gravitational waves in LIGO S4 data", Physical Review D **79**, 022001 (2009)

I was one of the early testers for the Einstein@Home project, and I led a team of three internal reviewers to carefully check this analysis and paper before submission. Lead author: Holger Pletsch.

59. B. Abbott *et al.* (*LSC*), "First joint search for gravitational-wave bursts in LIGO and GEO 600 data", Classical and Quantum Gravity **25**, 245008 (2008)

    As Co-Chair of the LSC Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead author: Ik Siong Heng. It was selected by the editors of Classical and Quantum Gravity as one of their "Highlights of 2008 and 2009".

58. B. Abbott *et al.* (*LSC*), "Search for gravitational wave bursts from soft gamma repeaters", Physical Review Letters **101**, 211102 (2008)

    As Co-Chair of the LSC Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead author: Peter Kalmus.

57. B. Abbott *et al.* (*LSC*), "Beating the spin-down limit on gravitational wave emission from the Crab Pulsar", Astrophysical Journal Letters **683**, L45 (2008)

    I led a team of three internal reviewers to carefully check this analysis and paper before submission. Lead authors: Matthew Pitkin, Joe Betzweiser.

56. B. Abbott *et al.* (*LSC*), "Search of S3 LIGO data for gravitational wave signals from spinning black hole and neutron star binary inspirals", Physical Review D **78**, 042002 (2008)

55. B. Abbott *et al.* (*LSC*) plus K. C. Hurley, "Implications for the origin of GRB 070201 from LIGO observations", Astrophysical Journal **681**, 1419 (2008)

    I was one of the first to argue for doing and publishing this analysis, and as Co-Chair of the LSC Burst Analysis Working Group, I helped to guide the analysis and paper to completion. Lead authors: Patrick Brady, Isabel Leonor, and Szabolcs Márka. It has been cited over 100 times, according to Web of Science.

54. L. Baggio *et al.* (*AURIGA Collaboration* and *LSC*), "A joint search for gravitational wave bursts with AURIGA and LIGO", Classical and Quantum Gravity **25**, 095004 (2008)

    As Co-Chair of the LSC Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead authors: Laura Cadonati, Silvia Poggi, Giovanni Prodi, Francesco Salemi.

53. B. Abbott *et al.* (*LSC*), "Search for gravitational waves associated with 39 gamma-ray bursts using data from the second, third, and fourth LIGO runs", Physical Review D **77**, 062004 (2008)

    As Co-Chair of the LSC Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead authors: Isabel Leonor and Soumya Mohanty.

52. B. Abbott *et al.* (*LSC*), "Search for gravitational waves from binary inspirals in S3 and S4 LIGO data", Physical Review D **77**, 062002 (2008)

51. B. Abbott *et al.* (*LSC*), "All-sky search for periodic gravitational waves in LIGO S4 data", Physical Review D **77**, 022001 (2008)

    I led a team of four internal reviewers to carefully check this analysis and paper before submission. Many authors contributed significantly to writing this paper.

50. B. Abbott *et al.* (*LSC*), "Upper limit map of a background of gravitational waves", Physical Review D **76**, 082003 (2007)

49. B. Abbott *et al.* (*LSC*), "Searches for periodic gravitational waves from unknown isolated sources and Scorpius X-1: Results from the second LIGO science run", Physical Review D **76**, 082001 (2007)

    I led a team of four internal reviewers to carefully check this analysis and paper before submission. Many authors contributed significantly to writing this paper.

★ 48. B. Abbott *et al.* (*LSC*), "Search for gravitational-wave bursts in LIGO data from the fourth science run", Classical and Quantum Gravity **24**, 5343 (2007)

I was the lead author of this paper in addition to co-leading the team that carried out this analysis. This paper was selected by the editors of Classical and Quantum Gravity as one of their "Highlights of 2007 and 2008". It has been cited over 60 times, according to Web of Science.

47. B. Abbott *et al.* (*LSC*), "Search for gravitational wave radiation associated with the pulsating tail of the SGR 1806-20 hyperflare of 27 December 2004 using LIGO", Physical Review D **76**, 062003 (2007)

As Co-Chair of the LSC Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead author: Luca Matone.

46. B. Abbott *et al.* (*LSC*) plus M. Kramer and A. G. Lyne, "Upper limits on gravitational wave emission from 78 radio pulsars", Physical Review D **76**, 042001 (2007)

I led a team of four internal reviewers to carefully check this analysis and paper before submission. Lead author: Matthew Pitkin.

45. B. Abbott *et al.* (*LSC* plus members of ALLEGRO experiment), "First cross-correlation analysis of interferometric and resonant-bar gravitational-wave data for stochastic backgrounds", Physical Review D **76**, 022001 (2007)

44. B. Abbott *et al.* (*LSC*), "Searching for a stochastic background of gravitational waves with the Laser Interferometer Gravitational-wave Observatory", Astrophysical Journal **659**, 918 (2007)

43. B. Abbott *et al.* (*LSC* and *TAMA Collaboration*), "Joint LIGO and TAMA300 search for gravitational waves from inspiralling neutron star binaries", Physical Review D **73**, 102002 (2006)

42. B. Abbott *et al.* (*LSC*), "Search for gravitational waves from binary black hole inspirals in LIGO data", Physical Review D **73**, 062001 (2006)

41. B. Abbott *et al.* (*LSC* and *TAMA Collaboration*), "Upper limits from the LIGO and TAMA detectors on the rate of gravitational-wave bursts", Physical Review D **72**, 122004 (2005)

As Co-Chair of the LSC Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead author: Patrick Sutton.

40. B. Abbott *et al.* (*LSC*), "First all-sky upper limits from LIGO on the strength of periodic gravitational waves using the Hough transform", Physical Review D **72**, 102004 (2005)

I led a team of four internal reviewers to carefully check this analysis and paper before submission. Lead authors: Alicia Sintes, Badri Krishnan.

39. B. Abbott *et al.* (*LSC*), "Upper limits on a stochastic background of gravitational waves", Physical Review Letters **95**, 221101 (2005)

38. B. Abbott *et al.* (*LSC*), "Search for gravitational waves from primordial black hole binary coalescences in the Galactic halo", Physical Review D **72**, 082002 (2005)

★ 37. B. Abbott *et al.* (*LSC*), "Search for gravitational waves from Galactic and extra-Galactic binary neutron stars", Physical Review D **72**, 082001 (2005)

I was part of the core team (~10 members) for this analysis and was one of three lead authors for the paper (with Gabriela González and Patrick Brady). It has been cited over 100 times, according to Web of Science.

★ 36. B. Abbott *et al.* (*LSC*), "Upper limits on gravitational wave bursts in LIGO's second science run", Physical Review D **72**, 062001 (2005)

I was part of the core team for this analysis and contributed to the writing and editing of this paper. Lead author: Erik Katsavounidis. It has been cited over 100 times, according to Web of Science.

35. B. Abbott *et al.* (*LSC*), "Search for gravitational waves associated with the gamma ray burst GRB030329 using the LIGO detectors", Physical Review D **72**, 042002 (2005)

I was one of two internal reviewers to carefully check this analysis and paper before it was submitted for publication. Lead author: Szabolcs Márka. It has been cited over 130 times, according to Web of Science.

34. B. Abbott *et al.* (*LSC*) plus M. Kramer and A. G. Lyne, "Limits on gravitational-wave emission from selected pulsars using LIGO data", Physical Review Letters **94**, 181103 (2005)

I led a team of four internal reviewers to carefully check this analysis and paper before submission. Lead author: Réjean Dupuis.

33. B. Abbott *et al.* (*LSC*), "Analysis of first LIGO science data for stochastic gravitational waves", Physical Review D **69**, 122004 (2004)

★ 32. B. Abbott *et al.* (*LSC*), "Analysis of LIGO data for gravitational waves from binary neutron stars", Physical Review D **69**, 122001 (2004)

I was a core member of the team (8 members) that performed this analysis and produced this paper. Lead authors: Patrick Brady and Gabriela González. It has been cited over 150 times, according to Web of Science.

31. B. Abbott *et al.* (*LSC*), "First upper limits from LIGO on gravitational wave bursts", Physical Review D **69**, 102001 (2004)

30. B. Abbott *et al.* (*LSC*), "Setting upper limits on the strength of periodic gravitational waves from PSR J1939+2134 using the first science data from the GEO600 and LIGO detectors", Physical Review D **69**, 082004 (2004)

29. B. Abbott *et al.* (*LSC*), "Detector description and performance for the first coincidence observations between LIGO and GEO", Nuclear Instruments and Methods in Physics Research A **517**, 154 (2004)

★ 28. A. Alavi-Harati *et al.* (*KTeV*), "Measurements of direct *CP* violation, *CPT* symmetry, and other parameters in the neutral kaon system", Physical Review D **67**, 012005 (2003)

This long paper describes the details of several related analyses, including the measurement of $\mathrm{Re}(\varepsilon'/\varepsilon)$ that was the topic of my Ph.D. dissertation. It has been cited over 140 times, according to Web of Science. Many of the concepts and figures are derived from my dissertation.

27. A. Alavi-Harati *et al.* (*KTeV*), "Search for the $K_L \to \pi^o\, \pi^o\, e^+\, e^-$ decay in the KTeV experiment", Physical Review Letters **89**, 211801 (2002)

26. A. Alavi-Harati *et al.* (*KTeV*), "Radiative decay width measurements of neutral kaon excitations using the Primakoff effect", Physical Review Letters **89**, 072001 (2002)

25. A. Alavi-Harati *et al.* (*KTeV*), "A measurement of the K_L charge asymmetry", Physical Review Letters **88**, 181601 (2002)

24. A. Alavi-Harati *et al.* (*KTeV*), "New measurement of the radiative K_{e3} branching ratio and photon spectrum", Physical Review D **64**, 112004 (2001)

23. A. Alavi-Harati *et al.* (*KTeV*), "First measurement of form factors of the decay $\Xi^o \to \Sigma^+\, e^-\, \bar{\nu}_e$", Physical Review Letters **87**, 132001 (2001)

22. A. Alavi-Harati *et al*. (*KTeV*), "Branching ratio measurement of the decay $K_L \to e^+ e^- \mu^+ \mu^-$", Physical Review Letters **87**, 111802 (2001)

21. A. Alavi-Harati *et al*. (*KTeV*), "Measurement of the branching ratio and form factor of $K_L \to \mu^+ \mu^- \gamma$", Physical Review Letters **87**, 071801 (2001)

20. A. Alavi-Harati *et al*. (*KTeV*), "First observation of the decay $K_L \to \pi^o e^+ e^- \gamma$", Physical Review Letters **87**, 021801 (2001)

    I was one of three "godfathers" who carefully reviewed this analysis and paper before it was submitted for publication.

19. A. Alavi-Harati *et al*. (*KTeV*), "Measurement of the branching ratio of $K_L \to e^+ e^- \gamma \gamma$", Physical Review D **64**, 012003 (2001)

18. A. Alavi-Harati *et al*. (*KTeV*), "Measurements of the rare decay $K_L \to e^+ e^- e^+ e^-$", Physical Review Letters **86**, 5425 (2001)

17. A. Alavi-Harati *et al*. (*KTeV*), "Measurement of the branching ratio and asymmetry of the decay $\Xi^o \to \Sigma^o \gamma$", Physical Review Letters **86**, 3239 (2001)

16. A. Alavi-Harati *et al*. (*KTeV*), "Study of the $K_L \to \pi^+ \pi^- \gamma$ direct emission vertex", Physical Review Letters **86**, 761 (2001)

15. A. Alavi-Harati *et al*. (*KTeV*), "Search for the decay $K_L \to \pi^o e^+ e^-$", Physical Review Letters **86**, 397 (2001)

    I was one of three "godfathers" who carefully reviewed this analysis and paper before it was submitted for publication.

14. A. Alavi-Harati *et al*. (*KTeV*), "Evidence for the decay $K_L \to \mu^+ \mu^- \gamma \gamma$", Physical Review D **62**, 112001 (2000)

13. A. Alavi-Harati *et al*. (*KTeV*), "Search for the decay $K_L \to \pi^o \mu^+ \mu^-$", Physical Review Letters **84**, 5279 (2000)

12. A. Alavi-Harati *et al*. (*KTeV*), "Search for the decay $K_L \to \pi^o \nu \bar{\nu}$ using $\pi^o \to e^+ e^- \gamma$", Physical Review D **61**, 072006 (2000)

11. A. Alavi-Harati *et al*. (*KTeV*), "Search for the weak decay of a lightly bound H^o dibaryon", Physical Review Letters **84**, 2593 (2000)

10. A. Alavi-Harati *et al*. (*KTeV*), "Observation of *CP* violation in $K_L \to \pi^+ \pi^- e^+ e^-$ decays", Physical Review Letters **84**, 408 (2000)

9. A. Alavi-Harati *et al*. (*KTeV*), "Search for light gluinos via decays containing $\pi^+ \pi^-$ or π^o from a neutral hadron beam at Fermilab", Physical Review Letters **83**, 2128 (1999)

8. A. Alavi-Harati *et al*. (*KTeV*), "Measurement of the branching ratio of $\pi^o \to e^+ e^-$ using $K_L \to 3\pi^o$ decays in flight", Physical Review Letters **83**, 922 (1999)

7. A. Alavi-Harati *et al*. (*KTeV*), "Measurement of the decay $K_L \to \pi^o \gamma \gamma$", Physical Review Letters **83**, 917 (1999)

★ 6. A. Alavi-Harati *et al*. (*KTeV*), "Observation of direct *CP* violation in $K_{S,L} \to \pi \pi$ decays", Physical Review Letters **83**, 22 (1999)

    I personally wrote almost all of this paper, which describes my Ph.D. dissertation results. It has been cited over 350 times, according to Web of Science.

5. A. Affolder *et al*. (*KTeV*), "Observation of the decay $\Xi^o \to \Sigma^+ e^- \bar{\nu}_e$", Physical Review Letters **82**, 3751 (1999)

4. J. Adams *et al*. (*KTeV*), "Search for the decay $K_L \to \pi^o \nu \bar{\nu}$ ", Physics Letters B **447**, 240 (1999)

3. J. Adams *et al*. (*KTeV*), "Measurement of the branching fraction of the decay $K_L \to \pi^+ \pi^- e^+ e^-$ ", Physical Review Letters **80**, 4123 (1998)

2. J. Adams *et al*. (*KTeV*), "Search for light gluinos via the spontaneous appearance of $\pi^+ \pi^-$ pairs with an 800 GeV/*c* proton beam at Fermilab", Physical Review Letters **79**, 4083 (1997)

★ 1. R. S. Kessler, A. Roodman, P. Shawhan, N. Solomey, B. Winstein, S. Hansen, H. Nguyen, R. Ray, R. Tschirhart, J. Whitmore, T. Nakaya, and M. Lindgren, "Beam test of a prototype CsI calorimeter", Nuclear Instruments and Methods in Physics Research A **368**, 653 (1996)

I was a key member of the team that assembled and tested the detector, collected the data at CERN, and analyzed the results. Lead author: Richard S. Kessler. For this paper, the author list is ordered by significance of contributions.

Published Conference Proceedings

Refereed Conference Proceedings

★pr12. Petr Hořava, Arif Mohd, Charles M. Melby-Thompson and Peter Shawhan, "GR 20 parallel session A3: modified gravity", General Relativity and Gravitation **46**, 1720 (2014)

Out of 24 talks in this session at the General Relativity 20 conference in Warsaw, I was one of three speakers selected to contribute a summary of my talk to be highlighted in the conference proceedings.

pr11. V. Predoi, J. Clark, T. Creighton, E. Daw, S. Fairhurst, I. S. Heng, J. Kanner, T. Regimbau, P. Shawhan, X. Siemens, P. Sutton, A. Vecchio, D. White, and G. Woan, "Prospects for Joint Radio Telescope and Gravitational Wave Searches for Astrophysical Transients", Classical and Quantum Gravity **27**, 084018 (2010)

This article, published in the proceedings of the Eighth Amaldi Conference on Gravitational Waves, describes the research of a working group that I and my student Jonah Kanner were active in. Lead author: Valeriu Predoi (alphabetical author list after that).

★pr10. Peter S. Shawhan, "Gravitational-Wave Astronomy: Observational Results and Their Impact", Classical and Quantum Gravity **27**, 084017 (2010)

This review of the current state of the field of gravitational-wave astronomy is based on the invited plenary talk I gave at the Eighth Amaldi Conference on Gravitational Waves in June 2009.

★ pr9. J. Kanner, T. L. Huard, S. Márka, D. C. Murphy, J. Piscionere, M. Reed, and P. Shawhan, "LOOC UP: Locating and Observing Optical Counterparts to Gravitational Wave Bursts", Classical and Quantum Gravity **25**, 184034 (2008)

This paper, written mainly by my grad student Jonah Kanner (alphabetical author list after him), describes a project led by Szabolcs Márka and me and carried out together with a small team of professional astronomers (Huard and Murphy), a Columbia University undergraduate student (Piscionere), and a high school student that I mentored at Maryland (Molly Reed). Published in the proceedings of the 12th Gravitational Wave Data analysis Workshop. It has been cited over 30 times, according to Web of Science.

pr8. L. Blackburn, L. Cadonati, S. Caride, S. Caudill, S. Chatterji, N. Christensen, J. Dalrymple, S. Desai, A. Di Credico, G. Ely, J. Garofoli, L. Goggin, G. González, R. Gouaty, C. Gray, A. Gretarsson, D. Hoak, T. Isogai, E. Katsavounidis, J. Kissel,

S. Klimenko, R. A. Mercer, S. Mohapatra, S. Mukherjee, F. Raab, K. Riles, P. Saulson, R. Schofield, P. Shawhan, J. Slutsky, J. R. Smith, R. Stone, C. Vorvick, M. Zanolin, N. Zotov, and J. Zweizig, "The LSC Glitch Group: Monitoring Noise Transients During the Fifth LIGO Science Run", Classical and Quantum Gravity **25**, 184004 (2008)

Published in the proceedings of the 12th Gravitational Wave Data analysis Workshop. My authorship on this paper is based on my contributions to detector characterization and the identification and cataloging of certain types of glitches. Alphabetical author list. Lead author: Shantanu Desai.

pr7. B. Abbott *et al.* (LSC+Virgo), "Astrophysically triggered searches for gravitational waves: status and prospects", Classical and Quantum Gravity **25**, 114051 (2008)

Article for the proceedings of the Seventh Amaldi Conference on Gravitational Waves. Lead author: Zsuzsa Márka.

pr6. B. Abbott *et al.* (LIGO Scientific Collaboration), "Search for Gravitational Wave Bursts in LIGO's Third Science Run", Classical and Quantum Gravity **23**, S29 (2006)

As Co-Chair of the LSC Burst Analysis Working Group, I helped to guide this analysis and paper to completion. Lead author: Lindy Blackburn.

★ pr5. Peter Shawhan and Evan Ochsner, "A New Waveform Consistency Test for Gravitational Wave Inspiral Searches", Classical and Quantum Gravity **21**, S1757 (2004)

This paper, for the proceedings of the Eighth Gravitational Wave Data Analysis Workshop, describes the research project that Ochsner did under my mentorship during the summer of 2003 and that I wrote up.

★ pr4. N. Christensen, P. Shawhan, and G. González (for the LIGO Scientific Collaboration), "Vetoes for Inspiral Triggers in LIGO Data", Classical and Quantum Gravity **21**, S1747 (2004)

This paper, for the proceedings of the Eighth Gravitational Wave Data Analysis Workshop, describes veto methods and performance studies that I developed with the other co-authors. Lead author: Nelson Christensen.

pr3. D. A. Brown, S. Babak, P. R. Brady, N. Christensen, T. Cokelaer, J. D. E. Creighton, S. Fairhurst, G. González, E. Messaritaki, B. S. Sathyaprakash, P. Shawhan, and N. Zotov, "Searching for Gravitational Waves from Binary Inspirals with LIGO", Classical and Quantum Gravity **21**, S1625 (2004)

This paper, for the proceedings of the Eighth Gravitational Wave Data Analysis Workshop, describes the methods used to search for binary inspiral signals during the time when I was an active member of that analysis team. Lead author: Duncan Brown (alphabetical after that).

★ pr2. P. S. Shawhan, "Fundamental Issues in Statistical Detection of Physical Phenomena", in the Proceedings of the Conference on Statistical Problems in Particle Physics, Astrophysics and Cosmology (PHYSTAT2003), SLAC-R-703, page 75 (2003)

A short paper based on a talk I gave at the PHYSTAT2003 conference.

pr1. S. Bose, B. Allen, M. Landry, A. Lazzarini, I. Leonor, S. Marka, T. Regimbau, J. Romano, P. Shawhan, D. Sigg, and J. Whelan, "Towards the First Search for a Stochastic Background in LIGO Data: Applications of Signal Simulations", Classical and Quantum Gravity **20**, S677 (2003)

With Daniel Sigg, I created the system for injecting simulated signals into the detector that is described in this paper. Lead author: Sukanta Bose (alphabetical after that).

Non-Refereed Conference Proceedings

★pn12. Peter S. Shawhan for the LIGO Scientific Collaboration and Virgo Collaboration, "LIGO in the O3 run, the 3rd LIGO detector, and 3G plans", in *Proceedings of Yamada Conference LXXI: GRBs in the Gravitational Wave Era* (2020)

pn11. J. R. Smith, M. S. Briggs, A. Bruno, E. Burns, R. Caputo, B. Cenko, A. Cucchiara, G. de Nolfo, S. Griffin, L. Hanlon, D. H. Hartmann, M. Hui, A. Joens, C. Kierans, D. Kocevski, J. Krizmanic, A. Lien, S. McBreen, J. E. McEnery, L. Mitchell, D. Morris, D. Murphy, J. S. Perkins, J. Racusin, P. Shawhan, T. Tatoli, A. Uliyanov, S. Walsh, and C. Wilson-Hodge, "BurstCube: Concept, Performance, and Status", Proceedings of the 35th International Cosmic Ray Conference (2019)

★pn10. Peter S. Shawhan, Patrick R. Brady, Adam Brazier, S. Bradley Cenko, Mario Jurić, and Erik Katsavounidis, "Data Analysis Challenges for Multi-Messenger Astrophysics", in Proceedings of Astronomical Data Analysis Software and Systems XVIII (ASP Conference Series Volume 523), p. 705

★pn9. Peter S. Shawhan, "Multi-Messenger Astrophysics", Proceedings of the 39th International Conference on High Energy Physics, Volume 1, pp. 40-49, PoS(ICHEP2018)695 (2019).

pn8. J. Racusin, J. S. Perkins, M. S. Briggs, G. de Nolfo, J. Krizmanic, R. Caputo, J. E. McEnery, P. Shawhan, D. Morris, V. Connaughton, D. Kocevski, C. Wilson-Hodge, M. Hui, L. Mitchell, and S. McBreen, "BurstCube: A CubeSat for gravitational wave counterparts", Proceedings of the 35th International Cosmic Ray Conference (2017)

pn7. J. S. Perkins, J. L. Racusin, M. S. Briggs, G. de Nolfo, J. Krizmanic, J. E. McEnery, P. Shawhan, D. Morris, and V. Connaughton, "BurstCube: A CubeSat for gravitational wave counterparts", Proceedings of the 2016 Huntsville GRB Symposium (2016)

pn6. Jordan Camp, Lindy Blackburn, Michael Briggs, Nelson Christensen, Valerie Connaughton, Leo Singer, Peter Shawhan, and John Veitch, "Planned search for LIGO-GBM coincidence in the first Advanced LIGO data run", Proceedings of the 50th Rencontres de Moriond: *Gravitation: 100 years after GR*, eds. E. Augé, J. Dumarchez, and J. T. Vân, pp. 319-322, (2015)

★pn5. Peter Shawhan and Carlo Ferrigno, "Planning for prompt follow-up of Gravitational Wave events", Proceedings of the 10th INTEGRAL Workshop: *A Synergistic View of the High-Energy Sky*, PoS Integral2014, 49 (2015)

★pn4. Peter S. Shawhan (for the LSC+Virgo), "Rapid Alerts for Following up Gravitational Wave Event Candidates", Proc. SPIE **8448**, *Observatory Operations: Strategies, Processes, and Systems IV*, 84480Q (2012)

Article based on a talk I gave at the SPIE Astronomical Telescopes + Instrumentation conference.

★pn3. P. S. Shawhan (for the LIGO Scientific Collaboration), "LIGO Data Analysis", Nuclear Instruments and Methods in Physics Research A **502**, 396 (2003)

This is a general overview of LIGO and LIGO data analysis I wrote for the proceedings of the Eighth International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT'2002).

★pn2. P. S. Shawhan, "The Search for Gravitational Waves with LIGO: Status and Plans", International Journal of Modern Physics A **16**, Suppl. 1C, 1028 (2001)

This is a very brief summary of LIGO for the proceedings of the 2000 Meeting of the American Physical Society Division of Particles and Fields.

pn1. F. L. Lang, P. Shawhan, R. Starr, C. W. Werntz, C. J. Crannell, D. P. Saltzberg, J. D. Brown, A. E. Champagne, and R. T. Kouzes, "Nuclear Gamma-Ray Fluence Ratios as a Diagnostic of Accelerated Particle Spectra in Solar Flares", Bulletin of the American Astronomical Society **21**, 833 (1989)

While an undergraduate, I spent three summers at Goddard Space Flight Center working with a research group preparing to make gamma-ray observations of the Sun. I analyzed data taken at the Princeton Cyclotron and collected additional angular distribution measurements from the published literature.

Conferences, Workshops, and Talks

For many of the talks and posters listed below, I was presenting on behalf of the LIGO Scientific Collaboration (or in recent years, on behalf of LSC+Virgo). However, I prepared and delivered all of these by myself, unless otherwise noted.

Invited Conference Talks

28. "LIGO in the O3 run, the 3rd LIGO detector, and 3G plans" (Peter S. Shawhan for *LSC+Virgo*) – Invited talk at Yamada Conference LXXI: Gamma-ray Bursts in the Gravitational Wave Era 2019, Yokohama, Japan, October 18, 2019
27. "Multi-Messenger Science Opportunities in the LIGO-India Era" (Peter Shawhan for *LSC+Virgo*) – Invited talk at Multi-Messenger Astronomy in the Era of LIGO-India, Khandala, India, January 15, 2019
26. "LIGO/Virgo gravitational wave observations, and what we are learning from the detected signals" – Invited talk at the 2018 Annual Meeting of the APS Mid-Atlantic Section, November 10, 2018
25. "Multi-Messenger Astrophysics: ICHEP2018 Highlights, and More" – Invited plenary talk at the International Conference on High-Energy Physics, Seoul, S. Korea, July 9, 2018
24. "Gravitational Waves: Detected Events, Implications, and Future Prospects" – Invited talk at the Topics in Astroparticle and Underground Physics (TAUP) conference, Sudbury, Ontario, Canada, July 24, 2017
23. "LIGO/Virgo Observing Runs and the EM Follow-up Campaign" – Invited talk at the 8th Huntsville Gamma-Ray Burst Symposium, Huntsville, AL, October 25, 2016
22. "Multi-wavelength Aspects of Gravitational-Wave Events" – Invited talk at the 11th INTEGRAL Conference, Amsterdam, October 10, 2016
21. "Gravitational Waves and Connections with Fermi" – Invited talk at the Sixth International Fermi Symposium, Washington, DC, November 9, 2015
20. "Plans for Gravitational Wave Observations and Rapid Alerts" – Invited talk at the 3rd Annual Symposium of the Innovative Area on Multi-messenger Study of Gravitational Wave Sources, Hiroshima, February 19, 2015
19. "Planning for Prompt Follow-up of Gravitational Wave Events" – Invited talk at the 10th INTEGRAL Conference, Annapolis, September 18, 2014
18. "Seeking Non-GR Signatures in GW Bursts" – Invited talk at the "Gravitational Wave Tests of Alternative Theories of Gravity in the Advanced Detector Era" workshop, Montana State University, April 6, 2013
17. "Rapid Alerts for Gravitational Wave Event Candidates" – Invited talk at the International Meeting on Transients & Timing, Pune (India), March 6, 2013

16. "Connecting the EM and GW Skies: What We've Managed To Do So Far" – Invited talk at the "Connecting the Electromagnetic and Gravitational Wave Skies in the Era of Advanced LIGO" workshop, Princeton, April 30, 2012
15. "Gravitational Wave Astronomy and Astrophysics: A Status Report" – Invited talk at the 78th Annual Meeting of the Southeastern Section of the American Physical Society, Roanoke (VA), October 22, 2011
14. "Electromagnetic Follow-ups of Gravitational Wave Candidates: First Steps and Future Prospects" – Invited talk at the Ninth Amaldi Conference on Gravitational Waves, Cardiff, July 15, 2011
13. "Prospects for Detecting Gravitational Waves from Supernovae" – Invited talk at the Gravitational Wave Physics & Astronomy Workshop, Milwaukee, January 27, 2011
12. "Gravitational Wave Burst Searches" – Invited talk at the Gravitational Waves 2010 Workshop, Minneapolis, October 16, 2010
11. "Searching for Alternative GW Bursts" – Invited session-chair talk at the Workshop on Gravitational Wave Tests of Alternative Theories of Gravity, Milwaukee, May 26, 2010
10. "Multi-Messenger Astronomy and Astrophysics with Gravitational-Wave Transients" – Invited talk at the "April Meeting" of the American Physical Society, Washington DC, February 15, 2010
9. "Darkness and Light: Status of LIGO and Virgo Searches for Black Hole Mergers and Other Signals" – Invited talk at the Matter and Electromagnetic Fields in Strong Gravity workshop, College Park (MD), August 27, 2009
8. "Gravitational-Wave Astronomy: Observational Results and Their Impact" – Invited talk at the Eighth Amaldi Conference on Gravitational Waves, New York, June 23, 2009
7. "High-Frequency Gravitational Waves: Recent Search Results and Future Prospects" – Special-session talk at the American Astronomical Society (AAS) Meeting, Long Beach, January 7, 2009
6. "Gravitational Wave Detection from the Ground Up" – Invited talk at the "From Quantum to Cosmos" workshop, Warrenton (VA), July 7, 2008
5. "Status of LIGO" – Invited talk at the 9th Gravitational Wave Data Analysis Workshop, Annecy (France), December 15, 2004
4. "Results from LIGO Searches for Binary Inspiral Gravitational Waves" – Invited talk at the "April Meeting" of the American Physical Society, Denver, May 4, 2004
3. "Status of LIGO" – Invited talk at the 7th Gravitational Wave Data Analysis Workshop, Kyoto, December 17, 2002
2. "LIGO Data Analysis" – Plenary talk at the Eighth International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT'2002), Moscow, June 26, 2002
1. "LIGO Commissioning Experience and Engineering Runs" – Invited talk at the 6th Gravitational Wave Data Analysis Workshop, Trento (Italy), December 14, 2001

Contributed (Non-Refereed) Conference Talks

18. "Next-Generation Science with Gravitational Waves and Other Messengers" (Peter Shawhan for *LSC+Virgo*) – 233rd Meeting of the American Astronomical Society, Seattle, January 7, 2019

17. "Transient Astrophysics Probe" (Peter Shawhan for the TAP Science Team) – 233rd Meeting of the American Astronomical Society, Seattle, January 6, 2019
16. "ISS-TAO: a Transient Astronomy Observatory with a Focus on X-rays" (Peter Shawhan for the ISS-TAO Science Team) – American Physical Society April Meeting, Columbus, April 14, 2018
15. "Opportunities for Multi-Messenger Science with Gravitational Waves" (Peter Shawhan, Leo Singer and Marica Branchesi for *LSC+Virgo*) – 228th Meeting of the American Astronomical Society, San Diego, June 13, 2016
14. "Prompt Alerts for Gravitational-Wave Event Candidates" – Hot-Wiring the Transient Universe IV, Santa Barbara, May 14, 2015
13. "Wide-field X-ray afterglow searches for gravitational wave events" (Peter Shawhan and Justin Tervala) – American Physical Society April Meeting, Baltimore, April 13, 2015
12. "Detectability of Scalar GW Bursts with LIGO and Virgo":
    - 17th Eastern Gravity Meeting, Morgantown (WV), May 16, 2014
    - 20th Int'l Conference on General Relativity & Gravitation, Warsaw, July 12, 2013
11. "Rapid Alerts for Following Up Gravitational Wave Event Candidates" – SPIE Astronomical Telescopes + Instrumentation, Amsterdam, July 5, 2012
10. "LIGO+Virgo Search for Gravitational-Wave Bursts Associated with GRBs" – American Physical Society April Meeting, Atlanta, April 2, 2012
9. "Gravitational-Wave Burst Search Using LIGO-GEO S5 and Virgo VSR1 Data" – 13th Gravitational Wave Data Analysis Workshop, San Juan (PR), January 19, 2009
8. "Recent and Ongoing Searches for Continuous-Wave GW Signals" – 11th Eastern Gravity Meeting, State College (PA), May 12, 2008
7. "Feasibility of Measuring the Shapiro Time Delay over Meter-scale Distances" (Peter Shawhan, Stefan Ballmer and Szabolcs Márka) – American Physical Society April Meeting, St. Louis, April 14, 2008
6. "Search for Gravitational Wave Bursts in Data from the LIGO S4 Run" – American Physical Society April Meeting, Dallas, April 25, 2006
5. "All-Sky Search for Gravitational Wave Bursts in LIGO S4 Data" – 10th Gravitational Wave Data Analysis Workshop, Brownsville (TX), December 16, 2005
4. "Statistics for Burst/Transient Signals: Setting Limits and Making Discoveries" – Statistics for Gravitational Wave Data Analysis, State College (PA), May 20, 2005
3. "Status of LIGO Searches for Binary Inspirals" – 20th Pacific Coast Gravity Meeting, Pasadena (CA), March 26, 2004
2. "LIGO Inspiral Veto Studies" (Peter Shawhan, Nelson Christensen and Gabriela González for the *LSC*) – 8th Gravitational Wave Data Analysis Workshop, Milwaukee, December 19, 2003
1. "Inspiral Waveform Consistency Tests" (Evan Ochsner and Peter Shawhan) – 8th Gravitational Wave Data Analysis Workshop, Milwaukee, December 19, 2003

Conference Posters (Non-Refereed)

11. "LIGO and Virgo Results from the O2 Observing Run" – 235th Meeting of the American Astronomical Society, Honolulu, January 4-8, 2020

10. "LIGO, Virgo, KAGRA and Beyond: The Future of Ground-Based Gravitational Wave Observatories" – The Space Astrophysics Landscape for the 2020s and Beyond, Potomac, MD, April 2019; SNEWS 2.0 Workshop, Sudbury, ON, Canada, June 2019
9. "The Latest News from LIGO and Virgo" – American Astronomical Society High Energy Astrophysics Division (AAS HEAD) meeting, Sun Valley, ID, August 2017
8. "What We've Learned from LIGO's Detection of Gravitational Waves" – Astrophysics in the Era of Gravitational Wave and Multimessenger Observations, Annapolis, MD, November 2016
7. "ETA: Explorer for Transient Astrophysics" – Gravitational Wave Physics and Astronomy Workshop, Hyannis, Massachusetts, June 15–18, 2016
6. "What We've Learned from LIGO's Detection of Gravitational Waves" – 228th Meeting of the American Astronomical Society, San Diego, June 13–15, 2016
5. "Advanced LIGO and Multi-Messenger Transient Searches" – 227th Meeting of the American Astronomical Society, Orlando, January 7, 2016
4. "Searches for Gravitational Waves from Gamma-Ray Bursts" – 221st Meeting of the American Astronomical Society, Long Beach, January 7, 2013
3. "All-Sky Gravitational Wave Surveys" (Jeremy Schnittman and Peter Shawhan) – Very Wide Field Surveys in Light of the Astro2010, Baltimore, June 13–16, 2011
2. "LOOC-UP: Seeking Optical Counterparts to Gravitational-Wave Signal Candidates" – 215th Meeting of the American Astronomical Society, Washington, DC, January 4, 2010
1. "Veto Selection for Gravitational Wave Event Searches" (Erik Katsavounidis and Peter Shawhan) – 11th Gravitational Wave Data Analysis Workshop, Potsdam (Germany), December 18–21, 2006

Conference Panels (Non-Refereed)

4. "Multimessenger Alert and Observing Strategies" – Supernova Neutrinos in the Multi-Messenger Era, SNEWS 2.0 Workshop, Sudbury, Ontario, Canada, June 16, 2019
3. "BoF session 6: Data analysis challenges for multi-messenger astrophysics" (convener) – Astronomical Data Analysis Software & Systems (ADASS) XXVIII, College Park, MD, November 13, 2018
2. "Astrophysics Panel 2: Gravitational-wave and Electromagnetic Observations" – Physics and Astrophysics at the Extreme (PAX) Workshop, State College, PA, December 2, 2016
1. "Multi–messenger astronomy with networks of GW detectors and EM/particle observatories" – Panel convener and moderator at Gravitational Wave Physics and Astronomy Workshop, Pune, India, December 19, 2013

Workshops

9. CiMMA 2018: Workshop on Cyberinfrastructure for Multi-Messenger Astrophysics (host), College Park, MD, May 23-24, 2018
8. "The LIGO-Virgo Follow-up Program: Current and Future" – Invited talk at the LSST Detection of Optical Counterparts of Gravitational Waves workshop, New York, May 13, 2017

7. "LIGO and Friends: Capabilities of the Evolving Network of Gravitational Wave Detectors" – Invited talk at the AMEGO Mission Concept Workshop, Greenbelt, MD, May 9, 2017
6. "The LV-EM Follow-up Program" – Invited talk at Fifth AMON workshop, State College, PA, December 3, 2016
5. "EM Partnerships and Multi-Messenger Astronomy: What Did and Did Not Work in O1" – Invited talk at the "LIGO Dawn 2016: Planning for the post-detection era in gravitational-wave detectors and astrophysics" workshop, Atlanta, July 7, 2016
4. "LIGO-Virgo Triggers for Multimessenger Science" – Invited talk at the Astrophysical Multimessenger Observatory Network (AMON) workshop, Penn State University, October 24, 2013
3. "Locating and Observing Optical Counterparts to Unmodeled Pulses in Gravitational Waves" – Invited talk at the Inaugural Workshop on Astrophysical Multimessenger Observatory Network (AMON), State College, PA, October 2, 2011
2. "The View from the Ground: Gravitational Wave Detectors and Data Analysis Techniques" – Invited talk and discussion at the "Probing the Distant Universe with Gravitational Waves" workshop at East Tennessee State University, Johnson City, Tennessee, November 4, 2005
1. "General Comments on LIGO Data Analysis" – Analysis Methods for Interferometric Gravitational-wave Observations from Space (AMIGOS) workshop, Pasadena, CA, October 13, 2005

Colloquia

10. "Cosmic Chirps: Gravitational Waves and what they are telling us about the Universe" – Physics & Astronomy Colloquium at University of Delaware, October 24, 2018
9. "In With a Bang: Gravitational Waves and Multi-Messenger Astronomy" – Physics Colloquium at University of California, Davis, April 23, 2018
8. "Probing Physics and Astrophysics with Gravitational Wave Observations" – Physics Colloquium at University of Maryland, October 18, 2016
7. "The Remarkable Story of LIGO's Detection of Gravitational Waves":
    - Physics Colloquium at Rutgers University, Sept. 28, 2016
    - Special Colloquium at University of Virginia, May 2, 2016
    - Physics Colloquium at Virginia Tech, April 27, 2016
    - Physics Colloquium at University of Maryland, February 23, 2016
6. "Homing In on Gravitational Waves" – Physics Colloquium at University of Maryland, September 13, 2011
5. "Tuning in to Gravitational Waves" – Physics Colloquium at:
    - Howard University, March 11, 2009
    - Virginia Tech, February 20, 2009
4. "LIGO Listens for Gravitational Waves" – Astrophysics Science Division Colloquium at NASA Goddard Space Flight Center, November 20, 2007
3. "LIGO Perks Up Its Ears" – Physics Colloquium at:
    - Kansas State University, August 27, 2007
    - University of Massachusetts–Amherst, March 10, 2006

- Syracuse University, March 2, 2006
- University of Maryland, February 27, 2006

2. "How to Catch a Gravitational Wave" – Physics Department Colloquium at University of California, Santa Barbara, November 14, 2000

1. "First ε′/ε Result from KTeV" – Wine-and-Cheese talk at Fermilab, February 24, 1999

   The first public announcement of this long-awaited result. Media coverage in Science (March 5, 1999, page 1428; http://www.sciencemag.org/news/1999/03/surprising-asymmetry-seen-kaon-decays) and Science News (March 6, 1999, page 148; https://www.sciencenews.org/archive/antimatter-matter-mirror-shows-warp).

Seminars

25. "LIGO-Virgo Gravitational-Wave Findings So Far, and Current Events" – U. of Maryland Space and Cosmic Ray Physics Seminar, October 21, 2019; also Mid-Atlantic Senior Physicists' Group Seminar, February 19, 2020
24. "Cosmic Chirps: Gravitational Waves and What They are Telling Us About the Universe" – Optics Department seminar, Delaware State University, June 6, 2018
23. "Gravitational Waves and How to Detect Them" and "Science with Gravitational-Wave Events" – Invited talks at the Fermi Summer School, Lewes Beach, June 4-5, 2018
22. "The Latest Gravitational-Wave Discovery from LIGO and Virgo: GW170817: A Golden Event" – U. of Maryland Space and Cosmic Ray Physics Seminar, October 23, 2017
21. "Probing Physics and Astrophysics with Gravitational Wave Observations" – Mid-Atlantic Senior Physicists' Group Seminar, January 18, 2017
20. "On the Hunt for Counterparts to Gravitational-Wave Events" – LUVOIR Seminar at NASA Goddard Space Flight Center, December 7, 2016
19. "The Remarkable Story of LIGO's Detection of Gravitational Waves" – Webcast seminar for the Virtual Institute of Astroparticle Physics, April 1, 2016
18. "Gravitational Waves and How to Detect Them" – Invited talk to students at the National Centre for Radio Astronomy, Pune, India, December 19, 2013
17. "Tuning In to Gravitational Waves" – Seminar at Towson University, April 26, 2013
16. "Hunting for Gravitational Wave Transients from Astrophysical Events" – Seminar at the Naval Research Lab's Radio Astrophysics and Sensing section, June 22, 2012
15. "Listening with Ears Wide Open for Gravitational Wave Bursts" – HEP-Astro Seminar at the University of Michigan, March 12, 2012
14. "Sources of Gravitational Waves" and "Observations of Gravitational Waves" – Invited talks at the 2011 SLAC Summer Institute, Menlo Park, August 2–3, 2011
13. "Formation and Likely Electromagnetic and Gravitational-Wave Signatures of the First Black Holes" – Invited talk at the Joint Space-Science Institute mini-symposium "Emerging from the Dark Ages", Goddard Space Flight Center, April 8, 2011
12. "Multi-Messenger Astronomy and Astrophysics with Gravitational-Wave Transients" – Webcast seminar for the Virtual Institute of Astroparticle Physics, May 14, 2010
11. "Recent Results from LIGO" – University of Maryland Gravity Theory Seminar, October 3, 2008
10. "What's Up with LIGO" – University of Maryland High Energy / Astrophysics Seminar, October 17, 2007

9. "Reaching for Gravitational Wave Bursts" – Center for Gravitational Wave Physics Seminar at Penn State University, March 27, 2007
8. "Spacetime Sirens" – Particle Physics Seminar at Columbia University, February 14, 2007

   Media coverage in *New Scientist* (October 20, 2007, page 62; https://www.newscientist.com/article/mg19626262-300-the-word-space-time-sirens/).
7. "A Grand Tour of Gravitational Wave Signals and Detection Methods" – LIGO Seminar at Caltech, March 30, 2006
6. "The Ins and Outs of Inspiral Searches" – Seminar at Syracuse University, March 3, 2006
5. "LIGO Perks Up Its Ears" – UCLA High-Energy / Astro-Particle Seminar, November 30, 2005
4. "First LIGO Search for Binary Inspirals" – Seminars for:
   - Caltech-JPL Association for Gravitational-Wave Research (CaJAGWR), March 11, 2003
   - Penn State Center for Gravitational Physics and Geometry, March 31, 2003
3. "The First LIGO Science Run" – High-Energy Physics Seminar at the University of Chicago, February 3, 2003
2. "Gravitational-Wave Astronomy" – Invited lecture at the Summer Science Program (an intensive residential program for talented high school students), Ojai (CA), July 10, 2001
1. "New Results from KTeV on CP Violation" – Invited talk at the "Spring School 99", Laboratori Nazionali di Frascati, Italy, April 12, 1999

Public Lectures

12. "Gravitational Waves: From Einstein's Bold Prediction To a New Kind of Astronomy" – public talk at the David M. Brown Planetarium, Arlington, VA, October 19, 2019
11. "Detecting Gravitational Waves: We Do It With Mirrors" – Science On Tap talk, College Park, MD, August 27, 2019
10. "New Astronomy with Gravitational Waves" – Talk for the Astronomical Society of Greenbelt, MD, April 25, 2019
9. "New Astronomy with Gravitational Waves" – Talk at the National Capital Astronomers monthly meeting, College Park, MD, December 8, 2018
8. "Extreme Gravity: Black Holes and the Universe" and "Ripples in Space and Time: Gravitational Waves" – Panel discussions highlighting NSF science programs in the Future Con track of Awesome Con, Washington, DC, March 30 and April 1, 2018
7. "Gravitational Waves: New Discoveries, New Astronomy" – Riderwood Science and Technology Lecture, Silver Spring, Maryland, December 7, 2017
6. "Cosmic Chirps: Gravitational Waves and what they are telling us about the Universe" – Public lecture at Laurentian University, Sudbury, Ontario, Canada, July 26, 2017
5. "A Celebration of Gravitational Waves" – Public panel discussion at the University of Maryland, November 1, 2016
4. "The Very First Chirp: LIGO and the Detection of Gravitational Waves" – Public lecture for the Washington Philosophical Society, May 6, 2016

3. "LIGO and the Detection of Gravitational Waves" – Public lecture at the University of Maryland for *Maryland Day*, April 30, 2016
2. "Listening to Gravity: The Sounds of Spacetime" – Public lecture at the University of Maryland for *Maryland Day*, April 26, 2008
1. "The Quest to Detect Gravitational Waves" – Public lectures at:
    - Sonoma State U. (in the "What Physicists Do" lecture series), March 8, 2004
    - Donald E. Bianchi Planetarium, California State University, Northridge, September 10, 2004

Professional and Extension Publications

Reports and Non-Refereed Monographs

★ 3. Unpublished white paper: K. E. Saavik Ford, Federico Fraschetti, Chris Fryer, Steven L. Liebling, Rosalba Perna, Peter Shawhan, Péter Veres, and Bing Zhang, "Multi-Messenger Astrophysics Opportunities with Stellar-Mass Binary Black Hole Mergers", March 2019, e-print https://arxiv.org/abs/1903.11116

I was the coordinating author and main editor of this paper, which was prepared for the Astro2020 decadal survey.

★ 2. Unpublished white paper: G. Allen, W. Anderson, E. Blaufuss, J. S. Bloom, P. Brady, S. Burke-Spolaor, S. B. Cenko, A. Connolly, P. Couvares, D. Fox, A. Gal-Yam, S. Gezari, A. Goodman, D. Grant, P. Groot, J. Guillochon, C. Hanna, D. W. Hogg, K. Holley-Bockelmann, D. A. Howell, D. Kaplan, E. Katsavounidis, M. Kowalski, L. Lehner, D. Muthukrishna, G. Narayan, J.E.G. Peek, A. Saha, P. Shawhan, and I. Taboada, "Multi-messenger Astrophysics: Harnessing the Data Revolution", July 2018, e-print https://arxiv.org/abs/1807.04780

I co-hosted (with Suvi Gezari) the workshop which produced this white paper, and helped to write the white paper.

1. Unpublished white paper: J. S. Bloom, D. E. Holz, S. A. Hughes, K. Menou, A. Adams, S. F. Anderson, A. Becker, G. C. Bower, N. Brandt, B. Cobb, K. Cook, A. Corsi, S. Covino, D. Fox, A. Fruchter, C. Fryer, J. Grindlay, D. Hartmann, Z. Haiman, B. Kocsis, L. Jones, A. Loeb, S. Marka, B. Metzger, E. Nakar, S. Nissanke, D. A. Perley, T. Piran, D. Poznanski, T. Prince, J. Schnittman, A. Soderberg, M. Strauss, P. S. Shawhan, D. H. Shoemaker, J. Sievers, C. Stubbs, G. Tagliaferri, P. Ubertini, and P. Wozniak, "Astro2010 Decadal Survey Whitepaper: Coordinated Science in the Gravitational and Electromagnetic Skies", February 2009, e-print http://arxiv.org/abs/0902.1527

Sponsored Research

Grants

- Peter Shawhan (PI) and Ho Jung Paik (CoI), "Technology Development for Mid-Frequency Gravitational-Wave Detector", National Science Foundation PHY-1912627, September 2019 to August 2021, $200,000
- Suvi Gezari (PI) and Peter S. Shawhan (CoI), "Workshop: Cyberinfrastructure for Multi-Messenger Astrophysics", National Science Foundation PHY-1838082, May 2018 to May 2019, $40,670

- Peter S. Shawhan (PI), "Multi-Messenger Astrophysics and Fundamental Physics Tests with Gravitational Waves", National Science Foundation PHY-1710286, September 2017 to August 2020, $360,000
- Peter S. Shawhan (PI), "Enabling Multi-Messenger Astrophysics in the Advanced LIGO Era", National Science Foundation PHY-1404121, September 2014 to August 2017, $360,000
- Peter S. Shawhan (PI), "Workshop: What's Next for LIGO", National Science Foundation PHY-1542132, May 2015 to April 2016, $9,987
- David Reitze (PI) with Co-Is Alan Weinstein, Peter Shawhan, Peter Couvares, and Patrick Brady, "The LIGO Open Science Center", National Science Foundation PHY-1210172, September 2012 to August 2014, $699,278. (Advisory role, no funding for UMD.)
- Peter S. Shawhan (PI), "Gravitational-Wave Science: Multi-Messenger Searches and Tests of Alternative Theories", National Science Foundation PHY-1068549, September 2011 to August 2014, $360,000
- Peter S. Shawhan (PI), "Gravitational Wave Burst Searches and Signal Validation" (renewal), National Science Foundation PHY-0757957, September 2008 to August 2011, $295,000
- Peter S. Shawhan and Jordan B. Camp (Co-PIs), "SGER: Application of the Hilbert-Huang Transform to LIGO Data Analysis", National Science Foundation PHY- 0738032, August 2007 to July 2009, $99,981
- Peter S. Shawhan (PI), "Gravitational Wave Burst Searches and Signal Validation", National Science Foundation PHY-0653421, September 2007 to August 2008, $50,000

Research Fellowships, Prizes and Awards

Was elected a Fellow of the American Physical Society, September 2019.

Kirwan Faculty Research and Scholarship Prize, September 2018.

University System of Maryland (USM) Board of Regents' Faculty Award for Excellence in Scholarship, Research, or Creative Activity, April 2018.

For the first direct detection of gravitational waves, I and my 1000+ colleagues in the LIGO Scientific Collaboration and Virgo Collaboration were named collectively as recipients of the 2016 Special Breakthrough Prize in Fundamental Physics (https://breakthroughprize.org/News/32), the 2016 Gruber Prize in Cosmology (http://gruber.yale.edu/cosmology/2016-gruber-cosmology-prize-citation), the 2017 Bruno Rossi Prize (https://head.aas.org/rossi/rossi.prize.html), and the Princess of Asturias Award for Technical & Scientific Research 2017 (http://www.fpa.es/en/princess-of-asturias-awards/laureates/2017-rainer-weiss-kip-s-thorne-barry-c-barish-and-ligo-scientific-collaboration.html).

Received the Richard A. Ferrell Distinguished Faculty Fellowship in August 2016 from the University of Maryland Department of Physics.

III. Teaching, Extension, Mentoring, and Advising

Courses Taught in the last five years

- PHYS 273: Waves (Spring 2020). 67 students.
- PHYS 171: Introductory Physics: Mechanics and Relativity (Fall 2016, 2017, 2018). Average of 53 students per year.
- PHYS 270: Electromagnetism, Light, Relativity and Modern Physics (Fall 2013, 2014, 2015). Average of 112 students per year.
- PHYS 375: Optics Lab (Spring 2013, 2014). Average of 27 students per year.
- PHYS 121: Fundamentals of Physics I (Fall 2010, 2011, 2012). Average of 200 students per year.
- PHYS 410: Classical Mechanics (Spring 2010, 2011, 2012). Average of 28 students per year.

Teaching Innovations

Course or Curriculum Development

- 2011-2012: Member of a special faculty committee within the Physics Department which considered and recommended a re-structuring of the physics major curriculum. Continued as member of the physics lab curriculum implementation committee.
- 2011-2012: Peripheral participant in the U. of Maryland Physics and Biology Curriculum Group, which developed a new introductory physics sequence for biology majors and pre-med students.
- 2007 and 2009: Revised PHYS 174 Lab Manual

Other

- Presented a talk about my use of laser pointers in my PHYS 171 course at the Innovations in Teaching and Learning Conference at the University of Maryland in April 2009: "Fifty red dots: Experience with a novel student response system"

Research Advising

Research advisor for undergraduate students

- Julia Codere (Spring 2019)
- Rachel Scrandis (Spring 2019)
- Jacob Grant (Summer 2017)
- Noah Kasmanoff (Fall 2016 through Summer 2017)
- Sara Negussie (GRAD-MAP Winter Workshop, January 2017)
- Christiane Ebongue (Spring and Fall 2014)
- Justin Tervala (Fall 2013 to Fall 2014)
- Scott Sullivan (Summer and Fall 2012 plus Summer 2013)
- Syed Ali (Fall 2011)
- Eddie Lister (Fall 2010)

- Patrick Jefferson (sophomore, Summer and Fall 2010)
- Rafael Rovirosa (rising sophomore, Summer 2010)
- Julia Ruth (entering freshman, Summer 2010)
- Sean Howell (freshman, Spring and Summer 2009)
- Doichin Denchev (sophomore, Spring 2008)
- Daniel Shafer (sophomore, Fall 2007 through Summer 2008)
- Vijay Kaul (sophomore, Fall 2006)

Earlier, while a Senior Scientist at Caltech:

- Chris Pointon (Summer 2006)
- Sebastian Cassel (Summer 2005)
- Sarah Caudill (Summer 2005)
- Matthew Wroten (Summer 2004)
- Evan Ochsner (Summer 2003)

Research advisor for doctoral students

- Max Trevor: Advisor beginning January 2020.
- Zhiyu Yin: Advisor beginning January 2020.
- Kavic Kumar: Advisor 2019–present.
- Sohitri Ghosh: Co-advisor (with Adjunct Prof. Jacob N. Taylor) 2019–present.
- Min-A Cho: Advisor 2013–2019. Received Ph.D. in Spring 2019. Dissertation: "Low-Latency Searches for Gravitational Waves and their Electromagnetic Counterparts with Advanced LIGO and Virgo".
- Cregg Yancey: Advisor 2010–2019.
- Stanislav Solomovich: Advisor 2009–2010.
- Jonah B. Kanner: Advisor 2006–2011. Receved Ph.D. in Fall 2011. Dissertation: "LOOC UP: Seeking Optical Counterparts to Gravitational Wave Signals". Awarded a NASA Postdoctoral Program Fellowship to work at Goddard Space Flight Center (with Dr. Jordan Camp). Currently a Senior Scientist at Caltech.
- Sean T. McWilliams: Co-advisor (with Dr. Joan Centralla of Goddard Space Flight Center) 2006–2008. Received Ph.D. in Spring 2008. Dissertation: "Applying Numerical Relativity to Gravitational Wave Astronomy". Went on to postdoctoral appointments at Princeton (with Frans Pretorius) and Columbia University (with Janna Levin). Currently Assistant Professor of Physics & Astronomy at West Virginia University.

Dissertation committee member for doctoral students

- Noah Sennett (Dec. 2019)
- Donggeun Tak (Aug. 2019) – Chair (dissertation supervised by adjunct prof. Julie McEnery)
- Megan Marshall Smith (July 2019) – Co-Chair (dissertation supervised by Jonathan McKinney)
- Israel Martinez Castellanos (July 2019)
- Min-A Cho (Dec. 2018) – Chair
- Jeffrey Magill (Sep. 2018) – Chair (dissertation supervised by Jeremy S. Perkins)

- Tingting Liu (July 2018)
- Andrew Hesse (May 2018)
- Krista Lynne Smith (July 2017)
- Joshua Wood (Aug. 2016)
- Ryan Maunu (July 2016)
- Chris Schroeder (Nov. 2015)
- Sylvia Zhu (Sep. 2015) – Chair (dissertation supervised by adjunct prof. Julie McEnery)
- Robert Hellauer (Aug. 2015)
- Siddharth Kumar (Dec. 2014)
- William McConville (Nov. 2014)
- Andrea Taracchini (July 2014)
- Anne Lohfink (April 2014)
- Clayton Davis (April 2014)
- Michael M. Hull (October 2012)
- Jonah Kanner (October 2011) – Chair
- William Darian Boggs (April 2011)
- Kenneth C. Rossato (March 2011)
- Ryan Behunin (Sep. 2010)
- Evan Ochsner (Aug. 2010)
- Krishna Venkateswara (Apr. 2010)
- Enrique Pazos (Nov. 2009)
- Sean T. McWilliams (March 2008) – Co-Chair
- David Garofalo (Jan. 2008)
- Violeta A. Prieto (Oct. 2007)
- Ardeshir Eftekharzadeh (Apr. 2007)
- Breno Imbiriba (Dec. 2006)

Directed research advisor for high school students

- Erchis Patwardhan (Summer 2016)
- Akshay Guthal (Summer and Fall 2013)
- Claire Hoffman (Summer 2009)
- Molly Reed (Summer 2007)

Advising: Other than Directed Research

- Academic advisor for about 4 undergraduate physics majors per year
- Academic advisor for about 3 Physics graduate students per year

Teaching Awards

- Named "Institution Faculty/Staff of the Month" by the U. of Maryland–College Park chapter of the National Residence Hall Honorary, December 2012.

IV. Service and Outreach

Editorships, Editorial Boards, and Reviewing Activities

Editorial Boards

- Editorial Board member for the journal *Classical and Quantum Gravity*, 2012–present.

Reviewing Activities for Journals and Presses

I have refereed articles for the journals:

- *Classical and Quantum Gravity*
- *General Relativity and Gravitation*
- *Physical Review Letters*
- *Physical Review D*
- *Astrophysical Journal Letters*
- *Monthly Notices of the Royal Astronomical Society*
- *Physics Letters B*
- *International Journal of Theoretical Physics*
- *Scientific Reports*
- *Journal of Physics: Conference Series*
- *Advances in Adaptive Data Analysis*

Reviewing Activities for Agencies and Foundations

- NSF proposal reviewer – 7 years
- NASA proposal reviewer – 3 years
- Israel Science Foundation proposal reviewer – 1 year

Committees, Professional & Campus Service

Campus Service – Department

- Faculty search committee (2020)
- On-campus outreach activities: occasional volunteer for Physics is Phun, Maryland Day, Physics Olympics, GRAD-MAP [Graduate Resources for Advancing Diversity with Maryland Astronomy and Physics], and Saturday Morning Physics.
- Physics Graduate Admissions Committee (member in 2011, 2012, 2013; and chaired it in 2015 through 2019)
- Physics Department Chair Search Committee (2015)
- Long-term coordinator for PHYS 121/122 course sequence (2011–2019)
- Equal Education and Employment Opportunity representative (2014–2015)
- Appointments, Promotions and Tenure Committee (2012–2014)
- Lecture-Demonstration Committee (2008–2010, 2013–2014)
- Physics Council (2007–2009, 2010–2014)
- Salary Advisory Committee (2010, 2011)

- Colloquium Committee (2008–2009)

Campus Service – College

- Joint Space-Science Institute Executive Committee member (2011–present)
- Organizing committee member for the Joint Space-Science Institute's "Astrophysics in the Era of Gravitational Wave and Multimessenger Observations" conference (2016)
- Organizing committee member for the Joint Space-Science Institute's "Multimessenger Astronomy in the Era of PeV Neutrinos" conference (2015)
- Co-Chair of Joint Space-Science Institute Prize Postdoc selection committee (2012)
- Chaired the organizing committee for the Joint Space-Science Institute's "Ins and Outs of Black Holes" conference (2010)

Campus Service – University

- Faculty member on Student Honor Council hearing boards (2012, 2013, 2014)
- Banneker Key Scholarship Selection Committee (2009, 2010, 2012)
- Campus Affairs Committee of the University Senate (2008–2010)

Offices and Committee Memberships

- Chair of the Division of Gravitational Physics (DGRAV) of the American Physical Society (APS), 2017–2018; and Past Chair, 2018–2019
- Chair-Elect of DGRAV, 2016–2017
- Vice Chair of the Topical Group on Gravitation of the APS, 2015–2016
- Gravitational Wave International Committee (GWIC) Thesis Prize Selection Committee, 2010 and 2011
- Nominating Committee for the American Physical Society's Topical Group on Gravitation, 2007–2009
- Caltech–JPL Association for Gravitational Wave Research (CaJAGWR) Executive Committee, 2001–2006; Chair of Executive Committee, 2005–2006

Leadership Roles in Meetings and Conferences

- International Advisory Committee for the SNEWS 2.0 Workshop, held in Sudbury, Ontario, Canada on June 14-17, 2019
- Host and Co-Chair of the Scientific Organizing Committee for the Gravitational Wave Physics & Astronomy Workshop (GWPAW), held in College Park, MD on December 1-4, 2018
- Scientific Organizing Committee member for the Eighth International Fermi Symposium, held in Baltimore on October 14-19, 2018
- Co-host of the NSF-sponsored "Workshop on Cyberinfrastructure for Multi-Messenger Astrophysics", held at the University of Maryland on May 23-24, 2018
- Scientific Organizing Committee for the Gravitational Wave Physics & Astronomy Workshop (GWPAW), held in Annecy, France from May 30 to June 2, 2017

- Host and Scientific Organizing Committee member for the "What Comes Next for LIGO" workshop in Silver Spring, MD on May 7-8, 2015
- Scientific Organizing Committee for the Gravitational Wave Physics & Astronomy Workshop (GWPAW) in 2012 (Hannover, Germany) and in 2013 (Pune, India)
- Organizing Committee for the Eighth Edoardo Amaldi Conference on Gravitational Waves (Amaldi 8), New York, 2009
- Scientific Program Committee for the "Statistics for Gravitational Wave Data Analysis" workshop (GravStat), Penn State, 2005
- Scientific Organizing Committee for the Gravitational Wave Data Analysis Workshop (GWDAW) in 2003 (Milwaukee), 2004 (Annecy, France), and 2007 (Cambridge, MA)
- Scientific Organizing Committee for the Conference on Statistical Problems in Particle Physics, Astrophysics, and Cosmology (PHYSTAT), 2003

Other Non-University Committees, etc.

- LIGO Scientific Collaboration Data Analysis Council (DAC) Co-Chair and LSC Executive Committee / Management Team member, 2017–present
- LIGO Scientific Collaboration Speakers Board, 2015–2017
- LIGO Academic Advisory Committee Co-Chair, 2012–2014
- Technical Advisor to the Caltech/MIT LIGO Oversight Committee, 2010–2013
- LIGO Scientific Collaboration Executive Committee, 2006–2012
- LIGO Laboratory Program Advisory Committee (PAC), 2009–2011
- LIGO Scientific Collaboration (and Virgo) Burst Analysis Working Group Co-Chair, 2004–2011

External Service and Consulting

International Activities

- Served as external evaluator for Ph.D. candidate Javed Rana Sk at Jawaharlal Nehru University, India, June 2019
- Served as external evaluator for Ph.D. candidate Om Sharan Salafia at Università degli Studi di Milano-Bicocca, January 2018
- Served as a *Rapporteur* (external examiner) for Ph.D. candidate Michał Wąs at Université Paris–Sud, Orsay, June 2011
- Served as an external examiner for Ph.D. candidate Karl Wette at The Australian National University, Nov 2009–Feb 2010
- Served on technical evaluation committee for two working groups of the Japanese Large-scale Cryogenic Gravitational-wave Telescope (LCGT) project, Sep 2009–Feb 2010

Consultancies

- Lecturer at the University of Texas, Brownsville, Center for Gravitational Wave Astronomy Summer School, summers of 2008 through 2012. Gave a 5-day lecture series (with Matlab-based exercises) about gravitational-wave data analysis each year.

Non-Research Presentations

Outreach Presentations (selected)

- Keynote speaker at the Baltimore Project ASTRO annual workshop, July 2016
- Presenter at *Worlds of Physics* session at the Mid-Atlantic Conference for Undergraduate Women in Physics (CUWiP), January 2014
- Featured presenter at Galway Elementary School "Science Night" in 2010 and 2011; also manned a demonstration table in 2013
- Manned the NSF LIGO and University of Maryland exhibits at the first USA Science and Engineering Festival in Washington, DC, October 2010. Also set up and manned the LIGO exhibit during the second and third Festivals in Washington, April 2012 and April 2014.
- Was the object of show-and-tell – during "P" week, as a Physicist – in Mrs. Wilson's kindergarten class at Galway Elementary School in February 2009. Taught the students about forces and springs using giant rubber bands, balls, and other demonstration items.

Media Contributions

Internet

- Interview podcast: "The Nobel Prize: A LIGO Q&A", produced by the Joint Quantum Institute, October 3, 2017, http://jqi.umd.edu/news/podcast/nobel-prize-ligo-qa
- Coordinator and lead internal reviewer (2012–2016) of public "science summaries" of LIGO research results, posted for the public at http://www.ligo.org/science/outreach.php .

Print Media

- Magazine article: Peter S. Shawhan, "Gravitational Waves and the Effort to Detect Them", *American Scientist*, July/August 2004, pages 350–357

Significantly Mentioned/Quoted in Media

- "Core Concept: Multimessenger astronomy probes deep-space events with an arsenal of lenses" by Stephen Ornes, *Proceedings of the National Academy of Sciences*, February 26, 2019, https://www.pnas.org/content/116/9/3354
- "How 3 Senior Physicists Crowdsourced Their Way to a Nobel Prize" by Steven Melendez, *Fast Company*, October 4, 2017, https://www.fastcompany.com/40476626/how-3-octogenarian-physicists-crowdsourced-their-way-to-a-nobel-prize
- "The gravitational 'chirp' explained", CBC News Sudbury, July 26, 2017, http://www.cbc.ca/news/canada/sudbury/cosmic-chirp-black-hole-1.4222873
- "The rise of LIGO's space-studying super-team" by Troy Rummler, *Symmetry*, June 27, 2017, https://www.symmetrymagazine.org/article/the-rise-of-ligos-space-studying-super-team