

Joshua R. Smith

The Nicholas and Lee Begovich Center for Gravitational-Wave Physics and Astronomy
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Appointments

- 2016– Dan Black Director of Gravitational-Wave Physics and Astronomy
2018– Professor of Physics
California State University Fullerton (CSUF)
- 2014–2018 Associate Professor of Physics
CSUF
- 2010–2014 Assistant Professor of Physics
CSUF
- 2007–2009 Postdoctoral Research Associate in Physics
Syracuse University
- 2006–2007 Postdoctoral Fellow in Physics
Albert Einstein Institute Hannover / EGO-Virgo

Education

- 2002–2006 Ph.D. Physics (*Dr. rer. nat.*), Leibniz Universität Hannover
- Advisor: Karsten Danzmann
 - Thesis: “Formulation of Instrument Noise Analysis Techniques and Their Use in the Commissioning of the Gravitational Wave Observatory GEO 600”
- 1998–2002 B.Sc. Physics, Syracuse University
- Advisor: Peter Saulson
 - Thesis: “Thermal Noise Associated with Silicate Bonding”

Leadership

- 2012– Director, The Nicholas and Lee Begovich Center for Gravitational Wave Physics and Astronomy, CSUF
- 2022– Director of Instruments and Observatories, Cosmic Explorer Project
- 2019-2021 LIGO Scientific Collaboration Program Committee Member
- 2016–2017 Executive Committee Member, APS Far West Section
- 2011–2015 Chair, Detector Characterization Group, LIGO Scientific Collaboration
- 2011–2015 Executive Committee Member, LIGO Scientific Collaboration
- 2008– Council Member, LIGO Scientific Collaboration
- 2008–2010 Co-chair, Glitch Working Group, LIGO Scientific Collaboration

Research Interests

Experimental gravitational-wave physics and astronomy; Gravitational-wave detector optics and technology; Optical interference coatings; Scientific computing and infrastructure

Awards and Recognition

2017	Orange County's 100 Most Influential, Orange County Register, [link]
2017	American Astronomical Society Bruno Rossi Prize, 1/1000 awardees from LIGO Team, [link]
2017	Princess of Asturias Award for Technical and Scientific Research, 1/1000 awardees from LIGO, [link]
2016	Outstanding Untenured Faculty Member, College of Natural Sciences and Mathematics, CSUF
2016	Orange County's 100 Most Influential, Orange County Register, [link]
2016	Gruber Cosmology Prize, 1/1000 awardees from the LIGO Discovery Team, [link]
2016	Special Breakthrough Prize, 1/1000 awardees from the LIGO Contributors, [link]
2015	Cottrell Scholar, Research Corporation for Science Advancement, [link]
2014	40 Under 40, OC Metro Magazine, [link]
2013	NSF CAREER Award, [link]

Selected Publications

CSUF co-authors are shown in bold and CSUF student co-authors are indicated with an additional asterisk. A complete list is at the end of this document and on [Google Scholar](#).

1. "Observation of Gravitational Waves from a Binary Black Hole Merger," B.P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration), *Phys. Rev. Lett.* **116** 061102 (2016). [\[PRL\]](#), [\[arXiv\]](#).
2. "A Horizon Study for Cosmic Explorer: Science, Observatories, and Community," Matthew Evans, Rana X Adhikari, Chaitanya Afle, Stefan W. Ballmer, Sylvia Biscoveanu, Ssohrab Borhanian, Duncan A. Brown, Yanbei Chen, Robert Eisenstein, **Alexandra Gruson***, Anuradha Gupta, Evan D. Hall, Rachael Huxford, Brittany Kamai, Rahul Kashyap, Jeff S. Kissel, Kevin Kuns, **Philippe Landry**, Amber Lenon, **Geoffrey Lovelace**, Lee McCuller, Ken K. Y. Ng, Alexander H. Nitz, **Jocelyn Read**, B. S. Sathyaprakash, David H. Shoemaker, Bram J. J. Slagmolen, **Joshua R. Smith**, Varun Srivastava, Ling Sun, Salvatore Vitale, Rainer Weiss, Report number: CE-P2100003, 2021. [\[arXiv\]](#)
3. "A hierarchical method for vetoing noise transients in gravitational-wave detectors," **J. R. Smith, T. Abbott***, E. Hirose, N. Leroy, D. MacLeod, J. McIver, P. Saulson, P. Shawhan, *Class. Quantum Grav.* **28** 235005 (2011). [\[CQG\]](#), [\[arXiv\]](#).
4. "The path to the enhanced and advanced LIGO gravitational-wave detectors," **J.R. Smith** for the LIGO Scientific Collaboration, *Class. Quantum Grav.* **26** 114013 (2009). [\[CQG\]](#). A Classical and Quantum Gravity [Highlight](#) of 2009-2010.

5. “Cosmic Explorer: The U.S. Contribution to Gravitational-Wave Astronomy beyond LIGO,” David Reitze, Rana X Adhikari, Stefan Ballmer, Barry Barish, Lisa Barsotti, GariLynn Billingsley, Duncan A. Brown, Yanbei Chen, Dennis Coyne, Robert Eisenstein, Matthew Evans, Peter Fritschel, Evan D. Hall, Albert Lazzarini, Geoffrey Lovelace, Jocelyn Read, B. S. Sathyaprakash, David Shoemaker, **Joshua Smith**, Calum Torrie, Salvatore Vitale, Rainer Weiss, Christopher Wipf, Michael Zucker, Astro2020 Decadal Survey ground-based technology development white paper, 2019. [[arXiv](#)]
6. “Identifying correlations between LIGO’s astronomical range and auxiliary sensors using lasso regression,” **M. Walker**, A.F. Agnew, **J. Bidler***, A.P. Lundgren, **A. Macedo***, D. Macleod, T.J. Massinger, O. Patane*, **J.R. Smith**, *Class. Quantum Grav.* **35** 225002 (2018). [[CQG](#)], [[arXiv](#)].
7. “Gravitational-wave physics with Cosmic Explorer: Limits to low-frequency sensitivity,” ED Hall, K Kuns, **JR Smith**, Y Bai, C Wipf, S Biscans, RX Adhikari, K Arai, S Ballmer, L Barsotti, Y Chen, M Evans, P Fritschel, J Harms, B Kamai, JG Rollins, D Shoemaker, BJJ Slagmolen, R Weiss, and H Yamamoto, *Phys. Rev. D* **103**, 122004 (2021). [[PRD](#)], [[arXiv](#)]
8. “In-vacuum measurements of optical scatter versus annealing temperature for amorphous Ta2O5 and TiO2:Ta2O5 thin films,” **Elenna M. Capote***, **Amy Gleckl***, **Jazlyn Guerrero***, **Michael Rezac***, **Robert Wright**, and **Joshua R. Smith**, *J. Opt. Soc. Am. A* **38**, 534-541 (2021). [[JOSA A](#)], [[arXiv](#)]
9. “LigoDV-web: Providing easy, secure and universal access to a large distributed scientific data store for the LIGO Scientific Collaboration,” **J.S. Areeda**, **J.R. Smith**, A.P. Lundgren, E. Maros, D.M. Macleod, J. Zweizig, *Astronomy and Computing* **18** 27–34 (2017). [[ASCOM](#)], [[arXiv](#)].
10. “Optical scatter of quantum noise filter cavity optics,” **D. Vander-Hyde***, C. Amra, M. Lequime, F. Magaña-Sandoval, **J.R. Smith**, *Class. Quantum Grav.* **32** 135019 (2015). [[CQG](#)], [[arXiv](#)].
11. **C. Padilla***, P. Fritschel, **F. Magaña-Sandoval***, **E. Muniz***, **J.R. Smith**, L. Zhang. “Low scatter and ultra-low reflectivity measured in a fused silica window.” *Applied Optics*, **53** 1315-1321 (2014). Included in Spotlight on Optics. [[AO](#)], [[arXiv](#)].
12. “Large-angle scattered light measurements for quantum-noise filter cavity design studies,” **Fabian Magaña-Sandoval***, Rana X. Adhikari, Valera Frolov, Jan Harms, **Jacqueline Lee***, Shannon Sankar, Peter R. Saulson, and **Joshua R. Smith**, *JOSA A*, Vol. 29, Issue 8, pp. 1722-1727 (2012). [[JOSAA](#)], [[arXiv](#)].
13. “Apparatus to Measure Optical Scatter of Coatings Versus Annealing Temperature,” **JR Smith**, RX Adhikari, **KM Aleman***, **A Avila-Alvarez***, G Billingsley, **A Gleckl***, **J Guerrero***, A Markosyan, S Penn, **JA Rocha***, **D Rose***, **R Wright**, in Optical Interference Coatings Conference (OIC) 2019, OSA Technical Digest (Optical Society of America, 2019), paper FA.2. [[OSA](#)], [[arXiv](#)].
14. “Imaging Scatterometer for Observing Changes to Optical Coatings During Air Annealing,” **Michael Rezac***, **Daniel Martinez***, **Amy Gleckl***, and **Joshua R. Smith**, *Optica Technical Digest* (2022). [[arXiv](#)]
15. “Gravity Spy: Integrating Advanced LIGO Detector Characterization, Machine Learning, and Citizen Science,” M Zevin, S Coughlin, S Bahaadini, E Besler, N Rohani, S Allen, M Cabero, K Crowston, A K Katsaggelos, S L Larson, T K Lee, C Lintott, T B Littenberg, A Lundgren, C Oosterlund, **J R Smith**, L Trouille, V Kalogera, *Class. Quantum Grav.* **34** 6 (2017). [[CQG](#)], [[arXiv](#)].
16. “Machine learning for Gravity Spy: Glitch classification and dataset,” S. Bahaadini, V. Noroozi, N. Rohani, S. Coughlin, M. Zevin, **J.R. Smith**, V. Kalogera, A. Katsaggelos, *Information Sciences* **444** 172-186 (2018). [[INS](#)].

17. “Measurement and simulation of laser power noise in GEO600,” **J.R. Smith**, J. Degallaix, A. Freise, H. Grote, M. Hewitson, S. Hild, H. Lück, K.A. Strain and B. Willke, *Class. Quantum Grav.* **25** 035003-035015 (2008). [[CQG](#)].
18. “Linear projection of technical noise for interferometric gravitational-wave detectors,” **J.R. Smith**, P. Ajith, H. Grote, M. Hewitson, S. Hild, H. Lück, K.A. Strain, B. Willke, J. Hough and K. Danzmann, *Class. Quantum Grav.* **23** 527-537, (2006). [[CQG](#)].
19. “Feedforward correction of mirror misalignment fluctuations for the GEO 600 gravitational wave detector,” **J.R. Smith**, H. Grote, M. Hewitson, S. Hild, H. Lück, M. Parsons, K.A. Strain and B. Willke, *Class. Quantum Grav.* **22** 3093-3104, (2005). [[CQG](#)].
20. “Commissioning, characterization, and operation of the dual-recycled GEO 600,” **J.R. Smith** et al., *Class. Quantum Grav.* **21** S1737-S1745, (2004). [[CQG](#)].
21. “Mechanical loss associated with silicate bonding of fused silica,” **J.R. Smith**, G.M. Harry, J.C. Betzwieser, A.M. Gretarsson, D.A. Guild, S.E. Kittelberger, M.J. Mortonson, S.D. Penn and P.R. Saulson, *Class. Quantum Grav.* **20** 5039-5047, (2003). [[CQG](#)]. A Classical and Quantum Gravity [Highlight](#) of 2003-2004.

Book chapters:

22. Lück, H, Smith J., Punturo M. (2021) Third-Generation Gravitational-Wave Observatories. In: Bambi C., Katsanevas S., Kokkotas K.D. (eds) Handbook of Gravitational Wave Astronomy. Springer, Singapore. [[Springer](#)]
23. Chapter 14: Diagnostic methods for gravitational-wave detectors. J. McIver, T.J. Massinger, F. Robinet, **J. Smith**, **M. Walker**. Book Chapter in Advanced Interferometric Gravitational-Wave Detectors. Eds. P. Saulson, D. Reitze, H. Grote. 100 Years of General Relativity. World Scientific Publishing. July 2019. [[WS](#)]
24. Chapter 11: “Optical Scatter.” Optical Coatings and Thermal Noise in Precision Measurement. **Joshua Smith** and Michael Zucker. Eds. G. M. Harry, T. Bodiya, R. DeSalvo. Cambridge: Cambridge University Press, 2012. Print. ISBN:9781107003385. [[CUP](#)].

External Grants

- | | |
|------|---|
| 2022 | (PI) National Science Foundation, PHY-2207998, “RUI: Advancing gravitational-wave optics to further explore the cosmos,” \$355,683, pending. |
| 2022 | (Co-PI) National Science Foundation, PHY-2219109, “The CSUF-led partnership for inclusion of underrepresented groups in gravitational-wave astronomy,” \$1,180,214, awarded 2022-2027. |
| 2021 | (Senior Personnel) National Science Foundation, PHY-2110594, “Data Handling and Analysis Infrastructure for Gravitational-wave Astronomy,” \$753,324 awarded 2021-2025. |
| 2020 | (PI) National Science Foundation, PHY-2019184 “MRI: Acquisition of a Cryogenic Testbed for Advancing Gravitational-Wave Observation Technology,” \$159,934 awarded 2020-2023. |
| 2018 | (PI) National Science Foundation, PHY-1807069, “RUI: Improving LIGO optics and data quality to increase the rate and accuracy of gravitational-wave observations,” \$299,538 awarded 2018-2021. [link] |

- 2018 (Co-PI) National Science Foundation, PHY-1836734, “Collaborative Research: The Next Generation of Gravitational Wave Detectors,” **\$211,283 awarded 2018-2021.** [\[link\]](#)
- 2017 (Co-PI) National Science Foundation, PHY-1708035, “Data Handling and Analysis Infrastructure for Gravitational-wave Astronomy,” **\$634,196 awarded 2017-2021.** [\[link\]](#)
- 2017 (Co-PI) National Science Foundation, PHY-1708035, “Collaborative Research: LSC Center for Coatings Research,” **\$152,650 awarded 2017-2020.** [\[link\]](#)
- 2015 (Co-PI) National Science Foundation, AST-1559694, “Catching a new wave: the CSUF-Syracuse partnership for inclusion of underrepresented groups in gravitational-wave astronomy,” **\$937,368 awarded 2016-2021.** [\[link\]](#)
- 2015 (Co-PI) National Science Foundation (NSF), “INSPIRE: Glitch Zoo: Teaming Citizen Science with Machine Learning to Deepen LIGO’s View of the Cosmos,” **\$67,500 awarded 2015-2018.** [\[link\]](#)
- 2014 (Co-PI) National Science Foundation (NSF) PHY-1429873, “MRI: Acquisition of a high-performance computer cluster for gravitational-wave astronomy with Advanced LIGO,” **\$119,791 awarded 2014-2017.** [\[link\]](#)
- 2013 (PI) NSF PHY-1255650, “CAREER: Gravitational-Wave Detector Characterization and Science Education in the Advanced LIGO Era,” **\$450,000, awarded 2013-2018.** [\[link\]](#)
- 2012 (Senior Personnel) NSF PHY-1104371, “Data Handling and Analysis Infrastructure for Advanced LIGO and Beyond,” \$9,000,000 all institutions, **\$675,000 CSUF subcontract, awarded 2012-2017.** [\[link\]](#)
- 2011 (Senior Personnel) National Science Foundation, PHY-0600953, “Enabling Gravitational-Wave Astronomy on the LIGO Data Grid,” **\$125,000 one-year subcontract to CSUF, awarded 2011-2012.** [\[link\]](#)
- 2010 (PI) NSF PHY-0970147, “RUI: LIGO detector characterization and optical scatter research,” **\$240,000, awarded 2010-2013.** [\[link\]](#)
- 2010 (PI) Research Corporation for Science Advancement, Cottrell College Science Award # 19838, “Extending the astronomical reach of gravitational-wave detectors with all-reflective interferometry,” **\$35,000, awarded 2010-2012**

Internal Grants

- 2012 (Co-PI) Faculty Enhancement and Instructional Development Grant, “Enhancing student learning with improved manuals for advanced physics laboratory classes,” with Greg Childers, **\$5,247, funded 2012-2013**
- 2011 (PI) CSUF Office of the Associate Vice President for Graduate Programs and Research, Center and Institute Planning and Expansion Program, “Three-year plan for funding and expansion of the Gravitational-Wave Physics and Astronomy Center (GW PAC),” **\$15,000, funded 2011-2012**

Technology Transfers

- 2015 A. Avila Alvarez, J. Rocha, L. Hargreaves, J. Smith, “InstruTech Hornet 402 Vacuum Gauge Control VI,” [\[NI.com\]](#).
- 2015 A. Avila Alvarez, E. Muniz, J. Rocha, J. Smith, “Driver VIs for Innolight Mephisto S Laser Line,” [\[NI.com\]](#).

Courses Taught

ASTR101	Introduction to Astronomy, Fa21, Sp18, Sp17, Sp15, Sp14, Fa13
ASTR101L	Introduction to Astronomy Lab, Fa18, Fa13
PHYS120	Introduction to Astronomy, Sp13, Fa12, Fa11
PHYS225	Calculus-based Fundamental Physics: Mechanics, Fa10, Sp10
PHYS300	Mathematical Methods for Physics, Sp21
PHYS315	Computational Physics, Fa15, Sp17, Sp21
PHYS380	Methods Experimental Phys, Fa15
PHYS411	Modern Optics, Fa18, Fa16, Fa14
PHYS455	Introduction to Quantum Physics, Sp22
PHYS481	Experimental Physics, Sp12, Sp19, Sp22
PHYS482	Modern Optics Laboratory, Sp11
PHYS520	Graduate Mechanics, Fa19, Fa20

Professional Membership

2019–	Member, Cosmic Explorer Project; Member, Cosmic Explorer Consortium
2015–	Member, Optica (formerly the Optical Society of America (OSA))
2011–	Member, Society for Advancement of Chicanos and Native Americans in Science (SACNAS)
2011–	Member, American Astronomical Society (AAS)
2007–	Member, American Physical Society (APS), Topical Group on Gravitation, CA/NY Sections
2000–	Member, LIGO Scientific Collaboration

Service

2022	Examiner for the PhD-thesis of M.Sc. Philip Koch, Leibniz Universität Hannover, Germany
2021	Chair, STEM Symposium “Cosmic Explorer: Science, Observatories, and Community for the US’s Next Generation Gravitational-Wave Observatory”, SACNAS NDiSTEM Conference
2021	Chair, Department Personnel Committee, Department of Physics, CSUF
2019–2020	Member, Department Personnel Committee, Department of Physics, CSUF
2019	Member, National Science Foundation, Physics Committee of Visitors
2019	Scientific Organizing Committee, Sixth Physics and Astrophysics at the Extreme (PAX) meeting, Cascina, Italy
2019	Reviewer, Program Performance Review, CSUF Department of Mathematics
2018–2021	Advisory panelist, Classical and Quantum Gravity, [link]
2017–2020	Co-Chair, Speaker’s Board, LIGO Scientific Collaboration
2013–	Reviewer, National Science Foundation, Physics

- 2012– Referee, Optical Society of America Publishing (*Optics Letters, Applied Optics, JOSA A*)
- 2011–2016 Faculty Advisor, Physics Club, CSUF Department of Physics
- 2011–2016 Member, Radiation Safety Committee, CSUF (campus-wide)
- 2011– Member, Diversity Working Group, LIGO Scientific Collaboration
- 2010– Referee, Institute of Physics Publishing (*Classical and Quantum Gravity*)
- 2010–2015 Member, Website Committee (ad hoc), CSUF Department of Physics
- 2016–2017 Chair, Department Personnel Committee, Department of Physics, CSUF
- 2016–2017 Member, College of Natural Sciences and Mathematics Faculty Awards Committee, CSUF
- 2015–2016 Member, Search Committee for Dean of the College of Natural Sciences and Mathematics, CSUF
- 2013,2015 Member, Faculty Search Committee, Department of Physics, CSUF
- 2015–2017 PhD Qualifying Exam Committee Member for Robert Stone and Guillermo Valdes, University of Texas Brownsville / Rio Grande Valley and University of Texas at San Antonio
- 2014–2015 Member, Program Performance Review Committee, CSUF Department of Physics
- 2014–2015 Reviewer, NASA Postdoctoral Program
- 2011–2012 Member, Student Research Advisory Committee (formerly PURE), CSUF (campus-wide)
- 2011–2015 Member, MOU Review Committee, LIGO Scientific Collaboration
- 2010–2013 Member, Safety Committee, CSUF College of NSM
- 2010–2011 Member, Curriculum Committee, CSUF Department of Physics
- 2008–2015 Reviewer, Advanced LIGO Acceptance (2014–2015), Enhanced LIGO Calibration (through 2010), Advanced LIGO Data Acquisition System Design (through 2010), Gingin High Power Test Facility (through 2012)

Invited Presentations

- 2022 “Measuring Waves of Gravity from Across the Universe with Laser Interferometry,” Physics Program Colloquium, Bard College, Annondale on Hudson, NY
- 2021 “Third generation ground-based gravitational-wave observatories: detector technology and scientific themes,” Miami 2021 topical physics conference (Virtual)
- 2021 “Cosmic Explorer Science and Project,” 6th Dawn Meeting on Global Strategies for Gravitational Wave Astronomy (Virtual)
- 2019 “The Next Generation of Earthbound Laser Interferometric Gravitational-Wave Detectors,” Gravitational Waves in the Adirondacks, Blue Mountain Lake, NY
- 2019 “Apparatus to Measure Optical Scatter of Coatings Versus Annealing Temperature,” Optical Interference Coatings 2019, Optical Society of America, Santa Ana Pueblo, NM
- 2019 “Using optics and precision metrology to measure black holes and neutron stars across the universe,” Ventura section of Optical Society of America, Simi Valley, CA
- 2018 “Observing the universe with waves of gravity,” with Geoffrey Lovelace, Fullerton Public Library

- 2018 “Observing black holes and neutron stars from across the universe with gravity,” Physics Department Colloquium, Syracuse University, Syracuse, NY
- 2017 “Undergraduate research helping to observe black hole mergers from across the universe,” 2017 CSU STEM Conference, Los Angeles, CA
- 2017 “Using precision optics and metrology to measure black hole mergers from across the universe with LIGO,” Optical Society of America Optical Design and Fabrication Congress, Denver, CO
- 2017 “Observing Black Holes From Across the Universe,” Public Lecture at the Fullerton Community Center, Fullerton, CA
- 2017 “The impact of philanthropic support for student engagement in gravitational-wave science,” 2017 Ontiveros Legacy Society Recognition Luncheon, CSU Fullerton, Fullerton, CA
- 2016 “The discovery of gravitational waves from merging black holes,” STEM Seminar, Cypress College, Cypress, CA
- 2016 “Observing black hole mergers from across the universe with LIGO,” Physics Colloquium, CSU Northridge, Northridge, CA
- 2016 “Observing black hole mergers from across the universe with LIGO,” Astrophysics Seminar, UC Irvine, Irvine, CA
- 2016 “Using optics and precision metrology in LIGO to measure black hole mergers from across the universe,” 2nd Annual Photonics Society Banquet, UC Santa Barbara, Santa Barbara, CA
- 2016 “Using optics and precision metrology in LIGO to measure black hole mergers from across the universe,” Optical Society of Southern California Meeting, Fullerton, CA
- 2016 “Current and future gravitational-wave discoveries with the Laser Interferometer Gravitational-Wave Observatory, LIGO,” Cal State Long Beach Colloquium, Long Beach, CA
- 2016 “Current and future gravitational-wave discoveries with LIGO,” SLAC experimental seminar, Stanford Linear Accelerator, Menlo Park, CA
- 2015 “Einstein’s Gravitational Waves - Future Discoveries,” STEM event, Santiago Canyon College, Orange, CA
- 2014 “Gravitational-Wave Astronomy with LIGO,” Physics Colloquium, CSU Fresno, Fresno, CA
- 2014 “Einstein’s Gravitational Waves,” with Jocelyn Read and Geoffrey Lovelace, Fullerton Public Library
- 2014 “Exploring the gravitational-wave sky with LIGO,” California State University Northridge, Physics and Astronomy Colloquium, Northridge, CA
- 2013 “Detector characterization to prepare for the first gravitational-wave detections,” Gravitational Wave Physics and Astronomy Workshop, Pune, India
- 2013 “Gravitational-Wave Astronomy with LIGO: Opening a New Window on the Universe,” Orange County Astronomers General Meeting, Chapman University, Orange CA
- 2013 “Research in Gravitational-Wave Astronomy and Physics at Cal State Fullerton,” Introductory remarks at Discover STEM Event, Cypress College, Cypress, CA
- 2013 “Gravitational-Wave Astronomy with LIGO: Opening a New Window on the Universe,” CSUF Osher Lifelong Learning Institute Science Series, Fullerton, CA
- 2012 “Gravitational-Wave Astronomy with LIGO,” Cal Poly Pomona Physics and Astronomy Seminar, Pomona, CA

- 2012 “Fighting Noise in the LIGO Interferometers,” 2012 SACNAS National Conference, Scientific Symposia Session, Seattle, WA
- 2012 “Venus, a nice place to live?,” public lecture, Fullerton Arboretum Venus Transit Viewing, Fullerton, CA
- 2012 “Gravitational-wave astronomy with LIGO and Virgo,” UC Irvine High-Energy Physics Seminar, Irvine, CA
- 2011 “Exploring the transient universe with gravitational waves,” American Physical Society April Meeting, Anaheim, CA
- 2010 “Extending the range of gravitational-wave astronomy,” Colloquium, Louisiana State University, Baton Rouge, LA
- 2010 “Searching for gravitational-wave bursts with LIGO, GEO 600 and Virgo,” 19th International Conference on General Relativity and Gravitation (GR19), Mexico City, Mexico
- 2009 “Toward Gravitational-Wave Detection and Astronomy With LIGO,” Colloquium, Syracuse University, Syracuse, NY
- 2008 “Toward Gravitational-Wave Detection and Astronomy With LIGO,” Colloquium, California State University, Fullerton, CA

All Publications

Within each year, papers are ordered by the degree of CSUF co-author contributions, with the papers most directly contributed to listed first.

2022

1. “Imaging Scatterometer for Observing Changes to Optical Coatings During Air Annealing,” **Michael Rezac***, **Daniel Martinez***, **Amy Gleckl***, and **Joshua R. Smith**, *Optica Technical Digest* (2022). [[arXiv](#)]

2021

2. Lück, H, Smith J., Punturo M. (2021) Third-Generation Gravitational-Wave Observatories. In: Bambi C., Katsanevas S., Kokkotas K.D. (eds) *Handbook of Gravitational Wave Astronomy*. Springer, Singapore. [[Springer](#)]
3. “A Horizon Study for Cosmic Explorer: Science, Observatories, and Community,” Matthew Evans, Rana X Adhikari, Chaitanya Afle, Stefan W. Ballmer, Sylvia Biscoveanu, Ssohrab Borhanian, Duncan A. Brown, Yanbei Chen, Robert Eisenstein, **Alexandra Gruson***, Anuradha Gupta, Evan D. Hall, Rachael Huxford, Brittany Kamai, Rahul Kashyap, Jeff S. Kissel, Kevin Kuns, **Philippe Landry**, Amber Lenon, **Geoffrey Lovelace**, Lee McCuller, Ken K. Y. Ng, Alexander H. Nitz, **Jocelyn Read**, B. S. Sathyaprakash, David H. Shoemaker, Bram J. J. Slagmolen, **Joshua R. Smith**, Varun Srivastava, Ling Sun, Salvatore Vitale, Rainer Weiss, Report number: CE-P2100003, 2021. [[arXiv](#)]
4. “Gravitational-wave physics with Cosmic Explorer: Limits to low-frequency sensitivity,” ED Hall, K Kuns, **JR Smith**, Y Bai, C Wipf, S Biscans, RX Adhikari, K Arai, S Ballmer, L Barsotti, Y Chen, M Evans, P Fritschel, J Harms, B Kamai, JG Rollins, D Shoemaker, BJJ Slagmolen, R Weiss, and H Yamamoto, *Phys. Rev. D* 103, 122004 (2021). [[PRD](#)], [[arXiv](#)]
5. “In-vacuum measurements of optical scatter versus annealing temperature for amorphous Ta₂O₅ and TiO₂:Ta₂O₅ thin films,” **Elena M. Capote***, **Amy Gleckl***, **Jazlyn Guerrero***, **Michael Rezac***, **Robert Wright**, and **Joshua R. Smith**, *J. Opt. Soc. Am. A* 38, 534-541 (2021). *JOSA A*, [[arXiv](#)]

6. “GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo during the First Half of the Third Observing Run,” R. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration), *Phys. Rev. X* 11, 021053 (2021). [[PRX](#)], [[arXiv](#)]
7. “3G R&D: R&D for the Next Generation of Ground-based Gravitational-wave Detectors,” David McClelland, Harald Lueck, Rana Adhikari, Masaki Ando, GariLynn Billingsley, Geppo Cagnoli, Matt Evans, Martin Fejer, Andreas Freise, Paul Fulda, Eric Genin, Gabriela González, Jan Harms, Stefan Hild, Giovanni Losurdo, Ian Martin, Anil Prabhakar, Stuart Reid, Fulvio Ricci, Norna Robertson, Jo van den Brand, Benno Willke, Michael Zucker, Alessandro Bertolini, Stefan Danilishin, Francesco Fidecaro, Gianluca Gemme, Giles Hammond, James Lough, Ettore Majorana, Ando Massaki, **Joshua Smith**, Helios Vocca, Krishna Venkateswara, Robert L. Ward, Kazuhiro Yamamoto, Michele Punturo, David Reitze, Peter Couvares, Stavros Katsanevas, Takaaki Kajita, Vicky Kalogera, Sheila Rowan, Gary Sanders, B.S. Sathyaprakash, David Shoemaker, Report of the Gravitational Wave International Committee, 2021. [[arXiv](#)]
8. “LIGO detector characterization in the second and third observing runs,” D Davis, **JS Areeda**, ..., **O Patane***, ..., **JR Smith**, et al 2021 *Class. Quantum Grav.* 38 135014. [[CQG](#)], [[arXiv](#)]
9. “Reducing Scattered Light in LIGO’s Third Observing Run,” S Soni, **JS Areeda**, ..., **O Patane***, ..., **JR Smith**, et al 2021 *Class. Quantum Grav.* 38 025016. [[CQG](#)], [[arXiv](#)]

2020

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