

CURRICULUM VITAE
ANDREA N. LOMMEN

Department of Physics and Astronomy
Haverford College
Haverford, PA 19041

alommen@haverford.edu

Professional Employment

2019 July – Chair
John Farnham Professor
Department of Physics and Astronomy
Haverford College

2017 July – Professor
Department of Physics and Astronomy
Haverford College

2003 Jan – 2017 June Professor (as of 2016)
Chair (2013-2017)
Associate Professor (as of 2008)
Department of Physics and Astronomy
Franklin and Marshall College

(from July 2003) Director of Astronomy Program, Director of Grundy Observatory

2011 January – August Sabbatical at the Jodrell Bank Center for Astrophysics
Manchester, UK

2006 June – 2007 June Junior Faculty Leave at the Australia Telescope National Facility (ATNF)
Funded in part by Richard Manchester’s Federation Fellowship through ATNF’s
Distinguished Visitor’s Program

2002 Jan – Dec NSF Mathematical and Physical Sciences Distinguished
International Postdoctoral Research Fellow
Anton Pannekoek Institute, University of Amsterdam

Education

2001 October Ph.D. in Astrophysics
University of California, Berkeley
Thesis: *Precision Timing of Millisecond Pulsars*
Adviser: Prof. Don Backer

1997 May M.A. in Astronomy
University of California, Berkeley

1993 December M.S. in Physics
University of Pennsylvania, Philadelphia
Thesis: *Structure and phase transition of the
6,5-annulene isomer of C₆₁H₂*
Published in Physical Review B (see publications below)

1991 June B.A. with honors in Physics
Carleton College, Northfield, MN
Thesis: *Superfluid States in Neutron Stars*
Adviser: Prof. Joel Weisberg

Consulting/Service to the Scientific Community

2019-20 Served on the National Academy Decadal Review of Astronomy Committee on Particle
Astrophysics and Gravitation

Ongoing Regular referee for Astrophysical Journal, Monthly Notices of the
Royal Astronomical Society, Classical and Quantum Gravity, Physical Review Letters, and
the American Journal of Physics
status of the APS

Consulting/Service continued

2013	Elected to the Executive board of the American Physical Society (APS) Topical Group in Gravitational and General Relativity, during which we got promoted to Division
2012	Served as reviewer for NASA Postdoctoral Program
2012 & 2016	Served on National Science Foundation Panels for grants in Gravity and Mid-Scale Innovations Program
2011	Founding chair of the International Pulsar Timing Array Steering Committee See www.ipta4gw.org for more information.
2007-2010	Founding chair of the North American Nanohertz Observatory of Gravitational Waves See nanograv.org for more information.
2008-2011	Representative from Pulsar Timing Arrays to the Gravitational Wave International Committee, the world's principal guidance organization for Gravitational Wave Research, composed of the heads of gravitational wave experiments worldwide
2008-2012	Served on Program Advisory Committee for the Laser Interferometer Gravitational Wave Observatory (LIGO)
2008-present	Served on Square Kilometer Array Science Working Group
2008-2010	Served on Gravitational Wave International Committee Thesis Prize Committee
Years confidential	Served on NSF committee to review the National Astronomy and Ionospheric Center's Annual Progress Report and Program Plan (APRPP)
2009	External Reviewer for Hampden-Sydney College Physics Department

Impact Factors of Journals in which my articles appear

All impact factors are reported from 2013-4 using

URL http://www.citefactor.org/journal-impact-factor-list-2014_0-A.html

Journal name	Impact Articles	
	Factor	Published
Reports on Progress in Physics	15.633	1
Astrophysical Journal (ApJ)	6.28	24
Physics Today	5.893	1
Monthly Notices of the Royal Astronomical Society (MNRAS)	5.226	3
Classical and Quantum Gravity	3.103	3

Invited Review Articles (All are peer-refereed and published)

Lommen, A., "Pulsar timing arrays: the promise of gravitational wave detection," (2015) *Reports on Progress in Physics*, 78:124901. This is an invited review of my field.

B. Berger, K. Danzmann, G. Gonzalez, Lommen, A., G. Mueller, A. Rudiger, & W. J. Weber, "Receiving Gravitational Waves," in "General Relativity and Gravitation: A Centennial Perspective" (2014) *Cambridge University Press*, a volume celebrating the centennial celebration of Einstein's most productive year. Edited by Abhay Ashtekar, Beverly K. Berger, James Isenberg, & Malcolm MacCallum.

Lommen, A., Demorest, P. "Pulsar Timing Techniques," (2013) *Classical and Quantum Grav.*, 30: 224001.

Invited Opinion Piece

Andrea N. Lommen. "Pulsar timing for gravitational wave detection." *Nature Astronomy*, 1:809–811, December 2017.

Refereed Publications, student co-authors shown in bold

- Hyo Sun Park** and Andrea Lommen. “The Earth term in pulsar timing residuals is out of phase among the pulsars”. *Published as a NANOGrav internal memo, arXiv e-prints*, page arXiv:2108.11405, August 2021.
- Dominick M. Rowan, Zaynab Ghazi, Lauren Lugo, Elizabeth Spano**, Andrea Lommen, Alice Harding, Christo Venter, Renee Ludlam, Paul S. Ray, Matthew Kerr, Zaven Arzoumanian, Slavko Bogdanov, Julia Deneva, Sebastien Guillot, Natalia Lewandowska, Craig B. Markwardt, Scott Ransom, Teruaki Enoto, Kent S. Wood, and Keith C. Gendreau. “A NICER View of Spectral and Profile Evolution for Three X-Ray-emitting Millisecond Pulsars”. *ApJ*, 892(2):150, April 2020.
- Slavko Bogdanov, Sebastien Guillot, Paul S. Ray, Michael T. Wolff, Deepto Chakrabarty, Wynn C. G. Ho, Matthew Kerr, Frederick K. Lamb, Andrea Lommen, Renee M. Ludlam, **Reilly Milburn, Sergio Montano**, M. Coleman Miller, Michi Bauböck, Feryal Özel, Dimitrios Psaltis, Ronald A. Remillard, Thomas E. Riley, James F. Steiner, Tod E. Strohmayer, Anna L. Watts, Kent S. Wood, **Jesse Zeldes**, Teruaki Enoto, Takashi Okajima, James W. Kellogg, Charles Baker, Craig B. Markwardt, Zaven Arzoumanian, and Keith C. Gendreau. “Constraining the Neutron Star Mass-Radius Relation and Dense Matter Equation of State with NICER. I. The Millisecond Pulsar X-Ray Data Set”. *ApJL*, 887(1):L25, Dec 2019.
- J. S. Hazboun, J. Simon, S. R. Taylor, M. T. Lam, S. J. Vigeland, K. Islo, J. S. Key, Z. Arzoumanian, P. T. Baker, A. Brazier, P. R. Brook, S. Burke-Spolaor, S. Chatterjee, J. M. Cordes, N. J. Cornish, F. Crawford, K. Crowter, H. T. Cromartie, M. DeCesar, P. B. Demorest, T. Dolch, J. A. Ellis, R. D. Ferdman, E. Ferrara, E. Fonseca, N. Garver-Daniels, P. Gentile, D. Good, A. M. Holgado, E. A. Huerta, R. Jennings, G. Jones, M. L. Jones, A. R. Kaiser, D. L. Kaplan, L. Z. Kelley, T. J. W. Lazio, L. Levin, A. N. Lommen, D. R. Lorimer, J. Luo, R. S. Lynch, D. R. Madison, M. A. McLaughlin, S. T. McWilliams, C. M. F. Mingarelli, C. Ng, D. J. Nice, T. T. Pennucci, N. S. Pol, S. M. Ransom, P. S. Ray, X. Siemens, R. Spiewak, I. H. Stairs, D. R. Stinebring, K. Stovall, J. Swiggum, J. E. Turner, M. Vallisneri, R. van Haasteren, C. A. Witt, and W. W. Zhu. “The NANOGrav 11-Year Data Set: Evolution of Gravitational Wave Background Statistics.” *arXiv e-prints*, page arXiv:1909.08644, Sep 2019.
- J. S. Deneva, P. S. Ray, A. Lommen, S. M. Ransom, S. Bogdanov, M. Kerr, K. S. Wood, Z. Arzoumanian, K. Black, J. Doty, K. C. Gendreau, S. Guillot, A. Harding, N. Lewandowska, C. Malacaria, C. B. Markwardt, S. Price, L. Winternitz, M. T. Wolff, L. Guillemot, I. Cognard, P. T. Baker, H. Blumer, P. R. Brook, H. T. Cromartie, P. B. Demorest, M. E. DeCesar, T. Dolch, J. A. Ellis, R. D. Ferdman, E. C. Ferrara, E. Fonseca, N. Garver-Daniels, P. A. Gentile, M. L. Jones, M. T. Lam, D. R. Lorimer, R. S. Lynch, M. A. McLaughlin, C. Ng, D. J. Nice, T. T. Pennucci, R. Spiewak, I. H. Stairs, K. Stovall, J. K. Swiggum, S. J. Vigeland, and W. W. Zhu. “High-precision X-Ray Timing of Three Millisecond Pulsars with NICER: Stability Estimates and Comparison with Radio.” *ApJ*, 874(2):160, Apr 2019.
- R. N. Caballero, Y. J. Guo, K. J. Lee, P. Lazarus, D. J. Champion, G. Desvignes, M. Kramer, K. Plant, Z. Arzoumanian, M. Bailes, C. G. Bassa, N. D. R. Bhat, A. Brazier, M. Burgay, S. Burke-Spolaor, S. J. Chamberlin, S. Chatterjee, I. Cognard, J. M. Cordes, S. Dai, P. Demorest, T. Dolch, R. D. Ferdman, E. Fonseca, J. R. Gair, N. Garver-Daniels, P. Gentile, M. E. Gonzalez, E. Graikou, L. Guillemot, G. Hobbs, G. H. Janssen, R. Karuppusamy, M. J. Keith, M. Kerr, M. T. Lam, P. D. Lasky, T. J. W. Lazio, L. Levin, K. Liu, A. N. Lommen, D. R. Lorimer, R. S. Lynch, D. R. Madison, R. N. Manchester, J. W. McKee, M. A. McLaughlin, S. T. McWilliams, C. M. F. Mingarelli, D. J. Nice, S. Osłowski, N. T. Palliyaguru, T. T. Pennucci, B. B. P. Perera, D. Perrodin, A. Possenti, S. M. Ransom, D. J. Reardon, S. A. Sanidas, A. Sesana, G. Shaifullah, R. M. Shannon, X. Siemens, J. Simon, R. Spiewak, I. Stairs, B. Stappers, D. R. Stinebring, K. Stovall, J. K. Swiggum, S. R. Taylor, G. Theureau, C. Tiburzi, L. Toomey, R. van Haasteren, W. van Straten, J. P. W. Verbiest, J. B. Wang, X. J. Zhu, and W. W. Zhu. “Studying the Solar system with the International Pulsar Timing Array.” *MNRAS*, 481(4):5501–5516, Dec 2018.

Z. Arzoumanian, P. T. Baker, A. Brazier, S. Burke-Spolaor, S. J. Chamberlin, S. Chatterjee, B. Christy, J. M. Cordes, N. J. Cornish, F. Crawford, H. Thankful Cromartie, K. Crowter, M. DeCesar, P. B. Demorest, T. Dolch, J. A. Ellis, R. D. Ferdman, E. Ferrara, W. M. Folkner, E. Fonseca, N. Garver-Daniels, P. A. Gentile, R. Haas, J. S. Hazboun, E. A. Huerta, K. Islo, G. Jones, M. L. Jones, D. L. Kaplan, V. M. Kaspi, M. T. Lam, T. J. W. Lazio, L. Levin, A. N. Lommen, D. R. Lorimer, J. Luo, R. S. Lynch, D. R. Madison, M. A. McLaughlin, S. T. McWilliams, C. M. F. Mingarelli, C. Ng, D. J. Nice, R. S. Park, T. T. Pennucci, N. S. Pol, S. M. Ransom, P. S. Ray, A. Rasskazov, X. Siemens, J. Simon, R. Spiewak, I. H. Stairs, D. R. Stinebring, K. Stovall, J. Swiggum, S. R. Taylor, M. Vallisneri, R. van Haasteren, S. Vigeland, W. W. Zhu, and NANOGrav Collaboration. “The NANOGrav 11 Year Data Set: Pulsar-timing Constraints on the Stochastic Gravitational-wave Background.” *ApJ*, 859(1):47, May 2018.

Zaven Arzoumanian, Adam Brazier, Sarah Burke-Spolaor, Sydney Chamberlin, Shami Chatterjee, Brian Christy, James M. Cordes, Neil J. Cornish, Fronefield Crawford, H. Thankful Cromartie, Kathryn Crowter, Megan E. DeCesar, Paul B. Demorest, Timothy Dolch, Justin A. Ellis, Robert D. Ferdman, Elizabeth C. Ferrara, Emmanuel Fonseca, Nathan Garver-Daniels, Peter A. Gentile, Daniel Halmrast, E. A. Huerta, Fredrick A. Jenet, Cody Jessup, Glenn Jones, Megan L. Jones, David L. Kaplan, Michael T. Lam, T. Joseph W. Lazio, Lina Levin, Andrea Lommen, Duncan R. Lorimer, Jing Luo, Ryan S. Lynch, Dustin Madison, Allison M. Matthews, Maura A. McLaughlin, Sean T. McWilliams, Chiara Mingarelli, Cherry Ng, David J. Nice, Timothy T. Pennucci, Scott M. Ransom, Paul S. Ray, Xavier Siemens, Joseph Simon, Renée Spiewak, Ingrid H. Stairs, Daniel R. Stinebring, Kevin Stovall, Joseph K. Swiggum, Stephen R. Taylor, Michele Vallisneri, Rutger van Haasteren, Sarah J. Vigeland, Weiwei Zhu, and NANOGrav Collaboration. “The NANOGrav 11-year Data Set: High-precision Timing of 45 Millisecond Pulsars.” *ApJS*, 235(2):37, Apr 2018.

Arzoumanian, Z.; Brazier, A.; Burke-Spolaor, S.; Chamberlin, S. J.; Chatterjee, S.; Christy, B.; Cordes, J. M.; Cornish, N. J.; Crowter, K.; Demorest, P. B.; Deng, X.; Dolch, T.; Ellis, J. A.; Ferdman, R. D.; Fonseca, E.; Garver-Daniels, N.; Gonzalez, M. E.; Jenet, F.; Jones, G.; Jones, M. L.; Kaspi, V. M.; Koop, M.; Lam, M. T.; Lazio, T. J. W.; Levin, L.; Lommen, A. N.; Lorimer, D. R.; Luo, J.; Lynch, R. S.; Madison, D. R.; McLaughlin, M. A.; McWilliams, S. T.; Mingarelli, C. M. F.; Nice, D. J.; Palliyaguru, N.; Pennucci, T. T.; Ransom, S. M.; Sampson, L.; Sanidas, S. A.; Sesana, A.; Siemens, X.; Simon, J.; Stairs, I. H.; Stinebring, D. R.; Stovall, K.; Swiggum, J.; Taylor, S. R.; Vallisneri, M.; van Haasteren, R.; Wang, Y.; Zhu, W. W.; NANOGrav Collaboration “The NANOGrav Nine-year Data Set: Limits on the Isotropic Stochastic Gravitational Wave Background,” (2016), *ApJ*, 821, 13.

The NANOGrav Collaboration; Arzoumanian, Zaven; Brazier, Adam; Burke-Spolaor, Sarah; Chamberlin, Sydney; Chatterjee, Shami; Christy, Brian; Cordes, James M.; Cornish, Neil; Crowter, Kathryn; Demorest, Paul B.; Dolch, Timothy; Ellis, Justin A.; Ferdman, Robert D.; Fonseca, Emmanuel; Garver-Daniels, Nathan; Gonzalez, Marjorie E.; Jenet, Fredrick A.; Jones, Glenn; Jones, Megan L.; Kaspi, Victoria M.; Koop, Michael; Lam, Michael T.; Lazio, T. Joseph W.; Levin, Lina; Lommen, Andrea N.; Lorimer, Duncan R.; Luo, Jing; Lynch, Ryan S.; Madison, Dustin; McLaughlin, Maura A.; McWilliams, Sean T.; Nice, David J.; Palliyaguru, Nipuni; Pennucci, Timothy T.; Ransom, Scott M.; Siemens, Xavier; Stairs, Ingrid H.; Stinebring, Daniel R.; Stovall, Kevin; Swiggum, Joseph K.; Vallisneri, Michele; van Haasteren, Rutger; Wang, Yan; Zhu, Weiwei “The NANOGrav Nine-year Data Set: Observations, Arrival Time Measurements, and Analysis of 37 Millisecond Pulsars,” (2015), *ApJ*, 813, 65.

The NANOGrav Collaboration; Arzoumanian, Z.; Brazier, A.; Burke-Spolaor, S.; Chamberlin, S. J.; Chatterjee, S.; Christy, B.; Cordes, J. M.; Cornish, N. J.; Demorest, P. B.; Deng, X.; Dolch, T.; Ellis, J. A.; Ferdman, R. D.; Fonseca, E.; Garver-Daniels, N.; Jenet, F.; Jones, G.; Kaspi, V. M.; Koop, M.; Lam, M. T.; Lazio, T. J. W.; Levin, L.; Lommen, A. N.; Lorimer, D. R.; Luo, J.; Lynch, R. S.; Madison, D. R.; McLaughlin, M. A.; McWilliams, S. T.; Nice, D. J.; Palliyaguru, N.; Pennucci, T. T.; Ransom, S. M.; Siemens, X.; Stairs, I. H.; Stinebring, D. R.; Stovall, K.; Swiggum, J.; Vallisneri, M.; van Haasteren, R.; Wang, Y.; Zhu, W. W. “NANOGrav Constraints on Gravitational Wave Bursts with Memory,” (2015), *ApJ*, 810, 150.

- Arzoumanian, Z., Brazier, A., Burke-Spolaor, S., Chamberlin, S. J., Chatterjee, S., Cordes, J. M., Demorest, P. B., Deng, X., Dolch, T., Ellis, J. A., Ferdman, R. D., Garver-Daniels, N., Jenet, F., Jones, G., Kaspi, V. M., Koop, M., Lam, M. T., Lazio, T. J. W., Lommen, A. N., Lorimer, D. R., Luo, J., Lynch, R. S., Madison, D. R., McLaughlin, M. A., McWilliams, S. T., Nice, D. J., Palliyaguru, N., Pennucci, T. T., Ransom, S. M., Sesana, A., Siemens, X., Stairs, I. H., Stinebring, D. R., Stovall, K., Swiggum, J., Vallisneri, M., van Haasteren, R., Wang, Y., Zhu, W. W., & NANOGrav Collaboration “Gravitational Waves from Individual Supermassive Black Hole Binaries in Circular Orbits: Limits from the North American Nanohertz Observatory for Gravitational Waves,” (2014), *ApJ*, 794, 141.
- Christy, B., **Anella, R.**, Lommen, A., Finn, L. S., **Camuccio, R.**, & **Handzo, E.** “Optimization of NANOGrav’s Time Allocation for Maximum Sensitivity to Single Sources,” (2014), *ApJ*, 794, 163.
- Simon, J.**, Lommen, A., Stappers, B., Finn, L.S., Jenet, F., Polin, A. “Gravitational Wave Hotspots: Ranking Potential Locations of Single-source Gravitational Wave Emission,” (2014) *ApJ*, 784: 60.
- Demorest, P., Ferdman, R., Gonzalez, M., Nice, D., Ransom, S., Stairs, I., Arzoumanian, Z., Cordes, J., Finn, L., Freire, P., Jenet, F., Kaspi, V., Lazio, J., Lommen, A., Lorimer, D., McLaughlin, M., Perrodin, D., Shannon, R., Siemens, X., & Stinebring, D. “Limits on the Stochastic Gravitational Wave Background from the North American Nanohertz Observatory for Gravitational Waves,” (2013) *ApJ*, 769: 94.
- Messenger, C., Lommen, A., Demorest, P., and Ransom, S. “A Bayesian parameter estimation approach to pulsar time-of-arrival analysis,” (2011) *Class. Quantum Grav.* 28, 055001.
- Burt, B. J.**, Lommen, A. N., Finn, L.S. “Sensitivity of Pulsar Timing Arrays to Gravitational Wave Single Sources: A First Cut,” (2011) *ApJ* 730: 17.
- Champion, D. J.; and 21 co-authors. “Measuring the Mass of the Solar System Planets Using Pulsar Timing,” (2010) *ApJ* 720L: 201.
- Finn, L. S. and Lommen, A. N. “Detection, Localization, and Characterization of Gravitational Wave Bursts in a Pulsar Timing Array,” (2010) *ApJ* 718: 1400.
- Demorest, P, Lazio, J, and Lommen, A, “Gravitational-wave detection via radio-pulsar timing,” (2010) *Physics Today*, Volume 63, Issue 1, Quick Study.
- Verbiest, J and 19 co-authors (2010), “Status Update of the Parkes pulsar timing array,” *Classical and Quantum Gravity*, Volume 27, Issue 8, pp. 084015.
- Hobbs, G and 57 co-authors, “The international pulsar timing array project: using pulsars as a gravitational wave detector,” (2010) *Classical and Quantum Gravity*, Volume 27, Issue 8, pp. 084013.
- Jenet, F.; Finn, L. S.; Lazio, J.; Lommen, A.; McLaughlin, M.; Stairs, I.; Stinebring, D.; Verbiest, J.; Archibald, A.; Arzoumanian, Z.; Backer, D.; Cordes, J.; Demorest, P.; Ferdman, R.; Freire, P.; Gonzalez, M.; Kaspi, V.; Kondratiev, V.; Lorimer, D.; Lynch, R.; Nice, D.; Ransom, S.; Shannon, R.; Siemens, X. “The North American Nanohertz Observatory for Gravitational Waves.” (2009) NANOGrav consortium’s submission to Astro2010’s Program Prioritization Panel on Particle Astrophysics and Gravitation.
- Arzoumanian, Z.; Bogdanov, S.; Cordes, J.; Gendreau, K.; Lai, D.; Lattimer, J.; Link, B.; Lommen, A.; Miller, C.; Ray, P.; Rutledge, R.; Strohmayer, T.; Wilson-Hodge, C.; Wood, K., “X-ray Timing of Neutron Stars, Astrophysical Probes of Extreme Physics” (2009) *Astro2010: The Astronomy and Astrophysics Decadal Survey*, Science White Papers, no. 6.
- G. Hobbs, F. Jenet, K. J. Lee, J. P. W. Verbiest, D. Yardley, R. Manchester, A. N. Lommen, W. Coles, R. Edwards, C. Shettigara, “TEMPO2, a new pulsar timing package. III: Gravitational wave simulation,” (2009) *MNRAS*, Volume 394, Issue 4, pp 1945.
- A. Lommen, **J. Donovan**, C. Gwinn, Z. Arzoumanian, A. Harding, M. Strickman, R. Dodson, P. McCulloch, and D. Moffett, “Correlation Between X-ray Light-Curve Shape and Radio Arrival Time in the Vela Pulsar,” (2007) *ApJ* 657: 436.
- J. van Leeuwen and 36 co-authors, “Arecibo and the ALFA Survey,” (2006) *Chin. J. Astron. Astrophys. Suppl.* 6:311.
- R. Ramachandran, D. Backer, P. Demorest, I. Cognard, and A. Lommen, “Multi-frequency timing of PSR B1937+21 – interstellar plasma weather,” (2006) *ApJ* 645:303.

- A. N. Lommen, **R. A. Kipphorn**, D. J. Nice, E. M. Splaver, I. H. Stairs, and D. C. Backer, “Parallax and Proper Motion of J0030+0451,” (2006) *ApJ* 642:1012.
- D. Lorimer and 36 co-authors, “Arecibo Pulsar Survey using ALFA. II. The young, highly relativistic binary pulsar J1906+0746,” (2006) *ApJ* 640: 428.
- D. J. Champion, D. R. Lorimer, M. A. McLaughlin, K. M. Xilouris, Z. Arzoumanian, P. C. C. Freire, A. N. Lommen, J. M. Cordes and F. Camilo, “Arecibo timing and single-pulse observations of 17 pulsars,” (2005) *MNRAS* 363:929.
- F. Jenet, T. Creighton, and A. Lommen, “Pulsar timing and the detection of black hole binary systems in globular clusters,” (2005) *ApJL* 627:125.
- E. M. Splaver, D. J. Nice, I. H. Stairs, A. N. Lommen, and D. C. Backer, “Masses, Parallax, and Relativistic Timing of the PSR J1713+0747 Binary System,” (2005) *ApJ* 620:405.
- F. A. Jenet, A. L. Lommen, S. L. Larson, and L. Wen, “Constraining the properties of supermassive black hole systems using pulsar timing: application to 3c66b,” (2004) *ApJ* 606: 799.
- D. R. Lorimer, M. A. McLaughlin, Z. Arzoumanian, K. M. Xilouris, J. M. Cordes, A. N. Lommen, A. S. Fruchter, A. M. Chandler, and D. C. Backer, “PSR J0609+2130: a disrupted binary pulsar?,” (2004) *MNRAS* 347:L21.
- M. A. McLaughlin, Z. Arzoumanian, J. M. Cordes, D. C. Backer, A. N. Lommen, D. R. Lorimer, and A. F. Zepka, “PSR J1740+1000: A Young Pulsar Well Out of the Galactic Plane,” (2002) *ApJ* 564:333.
- A. N. Lommen and D. C. Backer, “Using Pulsars to Detect Massive Black Hole Binaries via Gravitational Radiation: Sagittarius A* and Nearby Galaxies,” (2001) *ApJ* 562:297.
- W. Becker, J. Trumper, A. Lommen, and D. Backer, “Detection of 0030+04 in xrays,” (2000) *ApJ* 545:1015.
- A. N. Lommen, A. Zepka, D. C. Backer, M. McLaughlin, J. M. Cordes, Z. Arzoumanian, and K. Xilouris, “New Pulsars from an Arecibo Drift Scan Search,” (2000) *ApJ* 545:1007.
- A. N. Lommen, P. A. Heiney, G. B. M. Vaughan, P. W. Stephens, D. Liu, D. Li, A. L. Smith, A. R. McGhie, R. M. Strongin, L. Brard, and A. B. Smith, “Structure and phase transition of the 6,5-annulene isomer of $C_{61}H_2$,” (1994) *Phys.Rev.B* 49:12572.

Conference Proceedings

- Lommen, A. N. “Pulsar Timing: No Longer a Blunt Instrument for Gravitational Wave Detection” (2012) Journal of Physics Conference Series, 363:1:012029, the Proceedings of the Amaldi Meeting.
- Champion, D. J.; and 21 co-authors. “Measuring the Mass of the Solar System Planets Using Pulsar Timing,” (2011) Radio Pulsars: An Astrophysical Key to Unlock the Secrets of the Universe. AIP Conference Proceedings, Volume 1357, pp. 93-96.
- Verbiest, J and 19 co-authors, “Status Update of the Parkes pulsar timing array,” (2010) Publications of the Astronomical Society of Australia, Volume 26, Issue 2, pp. 103-109.
- Hobbs, G.; Jenet, F.; Lommen, A.; Coles, W.; Verbiest, J. P. W.; Manchester, R. “Using pulsars to limit the existence of a gravitational wave background,” (2008) 40 YEARS OF PULSARS: Millisecond Pulsars, Magnetars and More. AIP Conference Proceedings, Volume 983, pp. 630-632.
- A. Lommen, J. Donovan, Z. Arzoumanian, A. Harding, M. Strickman, C. Gwinn, R. Dodson, P. McCulloch, and D. Moffett, (2008) “Observed X-ray/Radio Correlation in the Vela Pulsar,” 40 YEARS OF PULSARS: Millisecond Pulsars, Magnetars and More. AIP Conference Proceedings, Volume 983, pp. 69-73.

Conference Proceedings, cont'd

- Lommen, A. N.; Kipphorn, R. A.; Nice, D. J.; Splaver, E. M.; Stairs, I. H.; Backer, D. C. (2007) "Observed luminosity difference between isolated and binary MSPs" Proceedings of the 363. WE-Heraeus Seminar on Neutron Stars and Pulsars 40 years after the discovery. Edited by W. Becker and H. H. Huang. p.96.
- Lommen, A. N.; Donovan, J.; Gwinn, C.; Arzoumanian, Z.; Harding, A.; Strickman, M.; Dodson, R.; McCulloch, P.; Moffett, D. (2007) "Correlations between pulsed X-ray flux and radio arrival time in the Vela pulsar" Proceedings of the 363. WE-Heraeus Seminar on Neutron Stars and Pulsars 40 years after the discovery. Edited by W. Becker and H. H. Huang. p.16.
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- Jenet, F. A.; Lommen, A.; Larson, S. L.; Wen, L. (2005) "Constraining the Properties of the Proposed Super-Massive Black Hole System in 3C66B: Limits from Pulsar Timing," Binary Radio Pulsars, ASP Conference Series, Vol. 328, Proceedings of the conference held 11-17 January, 2004, Aspen, Colorado. Edited by F. A. Rasio and I. H. Stairs. p.399.
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- D. C. Backer, A. H. Jaffe, and A. N. Lommen (2004) "Massive Black Holes, Gravitational Waves and Pulsars," in *Coevolution of Black Holes and Galaxies*, 439.
- J. Donovan, A. Lommen, Z. Arzoumanian, A. Harding, M. Strickman, C. Gwinn, R. Dodson, P. McCulloch, and D. Moffett (2004) "Correlations Between X-ray and Radio Pulses in Vela," in *IAU Symposium*, p. 335.
- M. A. McLaughlin, D. R. Lorimer, D. J. Champion, K. Xilouris, Z. Arzoumanian, D. C. Backer, J. M. Cordes, A. S. Fruchter, and A. N. Lommen (2004) "New Pulsars from Arecibo Drift-Scan Searches," in *IAU Symposium*, p. 127.
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- A. N. Lommen (2002), "New Limits on Gravitational Radiation using Pulsars," in *Neutron Stars, Pulsars, and Supernova Remnants*, p. 114.
- A. Somer[Lommen] (2000) "New Pulsars from Arecibo Drift Scan Search," in *Astronomical Society of the Pacific Conference Series*, p. 17.
- A. Rots, K. Jahoda, D. Macomb, A. Lyne, V. Kaspi, R. Manchester, R. Pace, M. Bailes, D. Backer, and A. Somer[Lommen], (1998) "Absolute Timing of X-Ray Emission from Pulsars with RXTE," in *Neutron Stars and Pulsars: Thirty Years after the Discovery*, p. 379.

Radio Appearances

WITF SmartTalk with Scott Lemar

Feb 18, 2016

40-minute Interview as an expert on the recent announcement of gravitational waves

URL <http://www.witf.org/smart-talk/2016/02/smart-talk-gravitational-wave-discovery-gas-industry-is-down.php>

Grants Awarded

- 2021 Co-I, NSF Physics Frontier Center (PFC) \$17M
(over 5 years) of which Haverford receives \$152,000. *NANOGrav Physics Frontier Center*
- 2019 PI, Single Source Funding under NASA Neutron Star Interior Composition ExploreR \$248k
(over 2 years)
- 2017 PI, Single Source Funding under NASA Neutron Star Interior Composition ExploreR \$50k
(over 2 years)
- 2015 Co-I, NSF Physics Frontier Center (PFC) \$14.5M
(over 5 years) of which F&M receives \$398,000. *NANOGrav Physics Frontier Center*
- 2010 Co-I, NSF International Partnerships in Research and Education (PIRE) \$6.5M
(over 5 years) of which F&M received \$477,000. *An International Pulsar Timing Array for Gravitational Wave Detection*. Please see nanograv-pire.wvu.edu.
- 2008 NSF CAREER \$654,917 (over 5 years)
Gravitational Wave Detection Using Pulsars
- 2005-9 Pennsylvania Space Grant Consortium sub-award \$70,000 (over 4 years) for
Franklin and Marshall's Undergraduate Observing Program
- 2005 Research Corporation Cottrell College Science Award
\$37,000 over two years for *Pulsar Timing Array: A Nanohertz Gravitational Wave Telescope*
- 2002-4 Delaware Space Grant Consortium awarded \$15,328 (over 2 years) for
Franklin and Marshall's Undergraduate Observing Program
- 2002 – 03 NSF Mathematical and Physical Sciences Distinguished
International Postdoctoral Research Fellow, University of Amsterdam
- 1997 – 2000 Received \$8,500 over 3 years, from the Graduate Student
Instructor Training and Research Center to develop pedagogy course
in Astronomy Department to train new Teaching Assistants

Invited Talks

- 2021 Oct *Navigating a Universe of Black Hole Binaries* High Energy Theory Seminar
at Johns Hopkins University
- 2021 February *it Nanohertz Gravitational Waves and Space-based Navigation using Pulsars* 43rd
COSPAR National Assembly, Australia
- 2019 June *Pulsar Timing Array* Lecture at IPTA Student Week,
National Center for Radio Astronomy, Pune University, Pune, India
- 2019 June *The History of the Pulsar Timing Array* International Pulsar Timing Array Meeting
National Center for Radio Astronomy, Pune University, Pune, India
- 2019 May *Novel Detection Method for Single Sources of Gravitational Waves* TAPIR Seminar,
Caltech University

Invited Talks cont'd

- 2019 April *NICER: One Year +* , Colloquium, Jet Propulsion Laboratory
Pasadena, CA
- 2019 March *Pulsar Noise Spectra Using NICER* ,
Center for Computational Astrophysics, Flatiron Institute, New York
- 2019 February *The Mediocre Pulsar Timing Array* ,
Northwestern University Center for Interdisciplinary Exploration and Research
in Astrophysics (CIERA)
- 2018 October *NICER: One Year +* , Joel Fest
Carleton College
- 2018 June *The Future of the International Pulsar Timing Array* , Moderated Discussion
International Pulsar Timing Array Meeting, Albuquerque, NM
- 2017 Oct *Einstein's Last Legacy: Wrinkles in Space Time* Colloquium,
Swarthmore College
- 2016 Sept *Einstein's Last Legacy: Wrinkles in Space Time* PA Young Women in Physics Conference,
Bucknell University
- 2016 July *The International Pulsar Timing Array*, The 21st International Conference on General
Relativity and Gravitation, Columbia University, New York
- 2015 October *The Bridge*, Fall Meeting of the North American Nanohertz Observatory of
Gravitational Waves, Caltech.
- 2015 Mar *Pulsar Timing Arrays: No Longer a Blunt Instrument for Gravitational Wave Detection*,
National Radio Astronomy Observatory: Green Bank Telescope
- 2015 Jan *Detecting Gravitational Waves of Galactic and AU scales*,
Special Session of the American Astronomical Society Meeting: Seattle, WA
- 2014 Sept *Pulsar Timing Arrays: No Longer a Blunt Instrument for Gravitational Wave Detection*,
National Radio Astronomy Observatory: Charlottesville
- 2014 June *Introduction to Pulsar Timing for Gravitational Wave Detection*,
IPTA Meeting in Banff
- 2014 Apr *Einstein's Last Legacy: Measuring Wrinkles in Space-time*,
Central Pennsylvania Consortium Astronomers' Meeting, FM
- 2014 Apr *Measuring Einstein's Last Great Legacy: Wrinkles in Space-Time*,
University of Cincinnati
- 2014 Apr *Pulsar Timing Arrays: No Longer a Blunt Instrument for Gravitational Wave Detection*,
Goddard Space Flight Center
- 2014 Jan *A Crash Course in Pulsar Timing*, American Astronomical Society Meeting
Special Session entitled "Emerging Impacts on Structure Formation and AGN Science
from NanoHz Gravitational Wave Studies", Washington, D.C.
- 2013 Oct *Gravitational Waves at Arecibo*, The Arecibo Observatory 50th Anniversary Celebration,
Arecibo, Puerto Rico
- 2013 May *Pulsar Timing Arrays: No Longer a Blunt Instrument for Gravitational Wave Detection*,
University of Amsterdam, part of a symposium entitled "Latest results from the
Neutron-Star Laboratory"
- 2013 April *Pulsar Timing Arrays (tests of GR with PTAs)*
Montana State University, part of a workshop entitled "Gravitational Wave Tests of
Alternative Theories of Gravity in the Advanced Detector Era."
- 2013 Feb *Pulsar Timing Arrays: No Longer a Blunt Instrument for Gravitational Wave Detection*,
Penn State University Astrophysics Colloquium
- 2013 Jan *Gravitational Wave Detection Using Pulsars*, Seoul National University,
Seoul, South Korea
- 2012 June *Optimizing Pulsar Timing Arrays*, International Pulsar Timing Array Meeting,
Sydney, Australia
- 2012 May *Pulsar Timing Arrays: No Longer a Blunt Instrument for Gravitational Wave Detection*,
University of Maryland
- 2012 May *Big Science at Small Colleges*,
University of Maryland
- 2012 April *Pulsar Timing Arrays: No Longer a Blunt Instrument for Gravitational Wave Detection*,
APS Meeting, Atlanta, GA
- 2012 March *Pulsar Timing Arrays: No Longer a Blunt Instrument for Gravitational Wave Detection*,
University of Florida, Gainesville

2012 January *Pulsar Timing Arrays: No Longer a Blunt Instrument for Gravitational Wave Detection*, AAS Meeting, Austin, Special Session on Gravitational waves

2011 July *Pulsar Timing Arrays: No Longer a Blunt Instrument for Gravitational Wave Detection*, Imperial College of London Department of Physics and Astronomy, UK

2011 July *Measuring Einstein's Last Great Legacy: Wrinkles in Space-Time*, Young European Radio Astronomers Conference, Jodrell Bank, UK

2011 April *The North American Nanohertz Observatory of Gravitational Waves*, University of Glasgow

2011 March *The Current Status of Pulsar Timing*, Fab Five Fest (Cordes, Hankins, Rankin, Rickett, & Weisberg), Arecibo, PR

2010 December *The North American Nanohertz Observatory of Gravitational Waves*, The Perimeter Institute, Ontario Canada

2010 October *Gravitational Waves 2010 Workshop* at the William I. Fine Theoretical Physics Institute at the University of Minnesota

2010 October *The North American Nanohertz Observatory of Gravitational Waves*, Colloquium, University of Oregon

2010 June *Gravitational Wave Basics, the Big Picture*, June, 2010, opening talk at the first annual International Pulsar Timing Array Summer School, Leiden, Netherlands

2010 June *Einstein's New Messengers* (panel presentation with Kip Thorne and Rei Weiss), World Science Festival, New York City

2010 April Colloquium, University of Wisconsin, Milwaukee

2010 March Colloquium, University of Chicago

2010 March Colloquium, Fermilab National Accelerator Laboratory

2010 March 11 Public Lecture *Measuring Einstein's Last Great Legacy: Wrinkles in Space-Time*, West Virginia University

2010 February Seminar *Gravitational Wave Detection Using Pulsars*, Princeton University

2010 February *The North American Nanohertz Observatory of Gravitational Waves*, LIGO/VIRGO Consortium Meeting, Arcadia, CA

2010 January *Gravitational Wave Burst Detection Using Pulsars*, National Radio Science Meeting, URSI, Boulder Colorado

2009 December Colloquium, University of Michigan, Ann Arbor

2009 November *Gravitational Wave Burst Detection Using Pulsars*, National Academy of Science Kavli Frontier of Science Workshop, Irvine, CA

2009 June Presented the case for the North American Nanohertz Observatory of Gravitational Wave to the Particle Astrophysics and Gravitation Program Prioritization Panel of the Astro2010 Decadal Survey, conducted by the National Academy, Pasadena.

2009 April *Gravitational Wave Detection Using Pulsars*, a special session at the American Physics Society meeting entitled "Women and Minorities in Gravity"

2009 February *Gravitational Wave Burst Detection Using Pulsars*, Colloquium, Albert Einstein Institute, Hanover, Germany

2009 February *Gravitational Wave Burst Detection Using Pulsars*, Penn State University

2009 January *Gravitational Wave Detection Using Pulsars*, American Astronomical Society meeting, Long Beach, CA

2008 February *NANO-Grav: North American Nano-Hertz Observatory of Gravitational Waves* Naval Research Laboratory

2007 December *NANO-Grav: North American Nano-Hertz Observatory of Gravitational Waves* 12th Annual Gravitational Wave Detection Analysis Workshop, sponsored by the Laser Interferometer Gravitational Wave Observatory (LIGO) at MIT

2007 September *Pulsar Array Gravitational Wave Observatory*, Frontiers of Astronomy with the World's Largest Radio Telescope, Washington, DC

2007 April Colloquium, *A Porsnickety Pulsar Experiment*, Swinburne University, Melbourne, Australia

2007 May Colloquium, *A Porsnickety Pulsar Experiment*, University of Sydney, Australia

2006 October Colloquium, *New Limits on Gravitational Radiation Using Pulsars*, ATNF, Sydney, Australia

2006 November *Gravitational Wave Burst Detection*, Orange Pulsar Meeting, Orange, Australia

2006 October Guest Speaker at the Amateur Astronomy Club of New South Wales, Australia

2005 July *Using a Single Pulsar, What can you do?* Nanohertz Gravitational Wave Detection Using Radio Pulsars, Penn State University

2004 October	<i>What will be the interplay between gravitational wave astronomy and currently traditional forms of astronomy?</i> Imagining the Future: Gravitational Wave Astronomy, Penn State University
2004 May	<i>Constraints from Pulsar Timing</i> , Conference: Making Waves with Intermediate-Mass Black Holes, Penn State University
2004 March	Colloquium, Arecibo Observatory, Arecibo, Puerto Rico
2003 November	<i>Gravitational Wave Observations with Pulsar Timing Arrays</i> Second Gravitational Wave Phenomenology Workshop, Penn State University
2003 July	<i>Constraints on 3c66B using Pulsar Timing</i> International Astronomy Union Symposium, Sydney, Australia, July 2003
2003 April	Colloquium, MIT
2001 June	<i>Limits on Gravitational Radiation from SagA* Using the Pulsar Timing Array</i> , AAS Meeting, Pasadena
2001 February	<i>Is the Galactic Center Massive Black Hole a Binary?</i> University of Amsterdam, University of Utrecht, and ASTRON/JIVE

Contributed Talks

2017 October	<i>Update on NICER Science</i> NANOGrav meeting, Lafayette College, Pennsylvania
2017 June	<i>Update on NICER Science</i> IPTA Meeting in Paris, France
2007 August	<i>Observed X-ray/Radio Correlation in the Vela Pulsar</i> 40 Years of Pulsars, McGill University, Montreal, Canada
2007 March	<i>Gravitational Wave Burst Detection</i> Pulsar Searching and Thai-ming, Krabi, Thailand
2006 May	<i>The relationship between X-ray and radio emission in the Vela Pulsar</i> Neutron Stars and Pulsars, 363rd Heraeus Seminar at the Physics Center Bad Honnef, Germany,
2004 April	<i>Finding Black Hole Binaries using Pulsars</i> Annual Meeting of CPC Astronomers, Gettysburg College
2004 January	<i>Finding Black Hole Binaries in Globular Clusters using Pulsars</i> Aspen Winter Conference on Binary Radio Pulsars, Aspen, Colorado
2003 October	<i>New Limits on Gravitational Wave Background Using Pulsars</i> Pulsar Meeting, Crete, Greece

Conferences Organized

2018 October	NANOGrav Fall Meeting, Green Bank, WV
2015 May/June	SOC for the Aspen Center for Physics Workshop: “CSI PTA: Computation, Systematics, and Inference for Pulsar-Timing Arrays, and Beyond”
2014 May	SOC for LISA (Laser Interferometer Space Array) Symposium, Gainesville, FL
2013 October	NANOGrav Fall Meeting, Lancaster, PA
2012 June	IPTA Annual Science meeting, Sydney, Australia
2012 February	NANOGrav spring meeting, Arecibo, PR
2011 March	The Fab Five Fest, honoring the contributions of Tim Hankins, Joanna Rankin, Barney Rickett Jim Cordes, and Joel Weisberg, Arecibo, PR
2010 September	The North American Pulsar Timing Array, Lancaster, PA
2007 September	The North American Pulsar Timing Array, Charlottesville, Virginia
2005 July	Nanohertz Gravitational Wave Detection Using Radio Pulsars, Center for Gravitational Wave Physics, Penn State University

Active Observing Proposals (Time granted at major telescopes)

Arecibo Telescope	<i>Precision Millisecond Pulsar Timing</i> by Nice, Demorest, Ferdman, Lommen, & Stairs Twelve hours every 3 weeks to time 10 pulsars
Green Bank Telescope	<i>Detecting nHz Gravitational Radiation using a Pulsar Timing Array</i> by Demorest, Jacoby, Ferdman, Stairs, Nice, Lommen, Ransom, Bailes, and Cognard, Monthly Observations of 11 Millisecond Pulsars

All Former Research Students and what they did next

Aliaksandra Levina '23	Not done yet!
Hedy Goodman '23	Not done yet!
Danika Rasumussen '23	Not done yet!
Hyo Sun Park '23	Not done yet!
Jack Crump '23	Not done yet!
Romana Hladkey '22	Not done yet!
Nathaniel Ruhl '22	Not done yet!
Noah Schwab '22	Not done yet!
Jesse Zeldes '22	Not done yet!
Zaynab Ghazi '22	Not done yet!
Sergio Montano '21	Teaching Private High School
Lauren Lugo '21	Not done yet!
Elizabeth Spano '21	Law School at St. Johns in Queens
Zhihan Yuan '20	Graduate School in Physics, University of Toronto
Lamiaa Dakir '20	Technology program at BNY Mellon
Sadie Kenyon-Dean '20	Teaching Math at Revolution Independent School
Sydney Dorman '20	Not done yet!
Dominick Rowan '20	Graduate School Astrophysics, Ohio State University
Elizabeth Teng '20	Graduate School Astrophysics, Northwestern University
Liam Lynch '19	Goldman Sachs software engineer
Andrew Evans '19	Private School Teacher, applying to Law School
Horace Facey '19	Medical School
Hannah Griggs '19	Graduate Student at Georgia Institute of Technology
Filip Keri '18	Software Engineer
Thomas Brazovskis '18	
Yaoyue Liang '17	Applying to graduate schools in both Astrophysics and Engineering
Caitlin Rose '16	Graduate Student at University of Wisconsin, Milwaukee, Astrophysics
Emma Handzo '14	was a Graduate Student at UT Brownsville in Astrophysics and is now in business school at Johns Hopkins
Alex Grassi '13	Unknown
Ryan Anella '13	Employed at PIMCO, NYC
Stephanie Douglas* '12	PhD student, Astrophysics, Columbia University
Brian Burt '10	Master's degree, Astrophysics, Northern Arizona University, 2012 Now a research assistant at MIT
Arpita Roy '09	PhD student, Astrophysics, Caltech then transferred to Penn State
Isaac Waldstein '08	Masters student, Physics, City College of New York
Rebecca Sobel* '08	PhD student, Astrophysics, MIT
Joseph Simon '07	PhD student, University of Milwaukee, WI
Timothy Falkner '07	PhD student, Physics, University of Maine
Richard Kipphorn* '06	Graduate Student at Cornell (MA 2008), now Research Associate 1010Data, New York
Frederika Edgington-Giordano* '05	Masters in Astrophysics at Northern Arizona University, 2007 Now a Planetarium Educator at Hudson River Museum
Jana Bilikova* '04	PhD, Astrophysics, University of Illinois, Urbana-Champaign Now faculty at Santa Monica College
Jennifer Donovan* '03	PhD at Columbia University (2009), now Science Staff at the National Radio Astronomy Observatory (ALMA support)

*Received honors at graduation.

Service to Colleges (Haverford (starting in 2017) and Franklin and Marshall College (before 2017))

2019-	Chair of Physics and Astronomy
2018-	Started and led Diversity Reading Group for faculty and staff
2013-14, 2016-	Chair of Physics and Astronomy
2013-14	Provost Search Committee
2012-13	Chair of the Faculty Centers Project Advisory Committee
2011-2014	Professional Standards Committee
Fall 2010	Chair of the Common Hour Committee

- 2003-2010 Other committee service includes the Fringe Benefits committee, the Science Technology and Society committee, the Athletics and Recreation Committee, and the College Communications Committee, and Presenting for Promotion Cases.
- 2008-2012 Led trip each year for undergraduate women to visit a graduate physics department, Penn State, U. Maryland, and UPenn. This is part of an F&M program designed to promote women in physics and astronomy sponsored by a grant from the Clare Booth Luce Foundation.
- 2005-2014 Guest Lecturer in various courses including *Time, Science and Religion* (Murray), *Science Fiction* (Mueller), *Modern Dance* (Vail) , *Unwrapping Christmas* (Battistini), and *Groove, Time, Rhythm, and Culture* (Butterfield)
- 2009-11 Choreographer in F&M Fall Dance Concert.

Outreach to the Community

- 2008-2013 Founded the Mid-Atlantic Relativity Initiative in Education (MARIE) under the auspices of an NSF CAREER Award, an astronomy outreach program in the local high school
- all years Hosted various events at the Grundy Observatory.
- 2004 - present Annually donate several Grundy Observatory nights to local non-profits for auction.