Curriculum Vitae - Dr. Paul B. Demorest

Contact Information

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Education

2002–2007	Ph.D., Physics, University of California, Berkeley. Dissertation: *Measuring the Gravitational Wave Background using Precision Pulsar Timing*. Advisor: Prof. Donald Backer.
2000–2002	M.A., Physics, University of California, Berkeley.
1996–2000	B.A., Physics, University of California, Berkeley. GPA: 3.8. Honors: High distinction in general scholarship.

Research Experience

2019–present	Group Lead for VLA/VLBA Science Support, National Radio Astronomy Observatory, Socorro, NM.
2018–present	Scientist, National Radio Astronomy Observatory, Socorro, NM.
2014–2018	Associate Scientist, National Radio Astronomy Observatory, Socorro, NM.
2011–2014	Assistant Scientist, National Radio Astronomy Observatory, Charlottesville, VA.
2010–2011	Senior Research Associate, National Radio Astronomy Observatory, Charlottesville, VA.
2007–2010	Jansky Fellow, National Radio Astronomy Observatory, Charlottesville, VA.
2003–2007	Graduate Student Researcher, Astronomy Department, UC Berkeley. Supervisor: Prof. Donald Backer.

2001–2003	Graduate Student Researcher, Space Sciences Laboratory, UC Berkeley. Supervisor: Dr. Dan Werthimer.

Teaching Experience

2009–present	Mentor, NRAO Research Experience for Undergraduates summer program.
2000–2002	Graduate Student Instructor, Advanced Undergraduate Lab (Physics 111), UC Berkeley.
2000–2004	Private tutoring in Physics, undergraduate and graduate level.

Professional Memberships

2007–present	Member, American Astronomical Society.
2014–present	Member, International Astronomical Union.
2007–present	Member, North American Nanohertz Observatory for Gravitational Waves (NANOGrav).

Committee Service

2017–present	PhD Thesis Committee for K. McElroy, NM Tech.
2014–present	NRAO observing proposal Science Review Panel (intermittent).
2020	ngVLA System Requirements Review panel.
2019	ngVLA Stakeholder Readiness Review panel.
2017–2019	NRAO Scientist Performance Review Committee.
2014–2019	NANOGrav Management Team.
2017	VLA Sky Survey Critical Design Review panel.
2015–2017	NRAO Jansky Fellowship Selection committee.
2016	Chair, ASTRON APERTIF Radio Transient System Critical Design Review panel.
2015	PhD Thesis Committee for T. Pennucci, Univ. of Virginia.
2014	SKA Central Signal Processor Preliminary Design Review panel.
2012	NRAO CDL Assistant Director search committee.
ongoing	Referee for ApJ, AJ, MNRAS, Phys. Rev., PASP, PASA.

Meeting Organization

2018	LOC Chair, International Pulsar Timing Array conferences, New Mexico.
2017	Organizer, NANOGrav Timing Group Workshop, NRAO, Socorro.
2016	SOC, Synthesis Imaging Workshop, NRAO, Socorro.
2016	Session organizer, URSI National Radio Science Meeting, Boulder, CO.
2013	SOC, NANOGrav Spring 2013 workshop, NRAO, Green Bank.
2012	SOC chair, NANOGrav Fall 2012 workshop, Oberlin.
2011	Local organizer, NANOGrav Fall 2011 workshop, NRAO, Charlottesville.
2010	Co-organizer, IPTA 2010: Detecting Gravitational Waves with Pulsars, Lorentz Center, Leiden, Netherlands.
2009	Main organizer, NANOGrav Fall 2009 Workshop, NRAO, Charlottesville.
2008–2009	Co-organizer, TUNA weekly lunch talk series, NRAO/UVa, Charlottesville.
2008	Local organizer, 2008 NRAO Postdoctoral Symposium, Charlottesville.
2007	Local organizer, North American Pulsar Timing Meeting, NRAO, Charlottesville.

Research Presentations, past five years

2019/02	NRAO Colloquium (Socorro)
2019/01	LANL Astrophysics Seminar (Los Alamos)
2018/06	Astrophysical Frontiers (Portland)
2018/06	IPTA 2018 (Albuquerque)
2017/08	URSI General Assembly (Montreal)
2017/08	US Radio Futures III, invited (Berkeley)
2017/05	NRAO Lunch Talk (Socorro)
2016/08	US Radio Futures II, invited (Baltimore)
2016/06	IPTA 2016, invited (Stellenbosch)
2016/05	Netron Stars in the Multimessenger Era, invited (Athens, OH)
2016/03	ASTRON Colloquium (Netherlands)
2016/01	URSI National Radio Science Meeting, invited (Boulder)

2015/12	US Radio Science Futures, invited (Chicago)
2015/12	Science at Low Frequencies II, invited (Albuquerque)
2015/11	New Mexico Tech Physics Colloquium (Socorro)
2015/10	China-US Radio Astronomy Meeting, invited (Shanghai)
2015/03	CIFAR Cosmology and Gravity, invited (Banff)
2015/01	AAS Meeting (Seattle)

Socorro, NM, July 24, 2020

Refereed Publications

[1] *The MeerKAT telescope as a pulsar facility: System verification and early science results from MeerTime*
M. Bailes, A. Jameson, F. Abbate, E. D. Barr, N. D. R. Bhat, L. Bondonneau, M. Burgay, S. J. Buchner, F. Camilo, D. J. Champion, I. Cognard, **P. B. Demorest**, P. C. C. Freire, T. Gautam, M. Geyer, J. M. Griessmeier, L. Guillemot, H. Hu, F. Jankowski, S. Johnston, A. Karastergiou, R. Karuppusamy, D. Kaur, M. J. Keith, M. Kramer, J. van Leeuwen, M. E. Lower, Y. Maan, M. A. McLaughlin, B. W. Meyers, S. Osłowski, L. S. Oswald, A. Parthasarathy, T. Pennucci, B. Posselt, A. Possenti, S. M. Ransom, D. J. Reardon, A. Ridolfi, C. T. G. Schollar, M. Serylak, G. Shaifullah, M. Shamohammadi, R. M. Shannon, C. Sobey, X. Song, R. Spiewak, I. H. Stairs, B. W. Stappers, W. van Straten, A. Szary, G. Theureau, V. Venkatraman Krishnan, P. Weltevrede, N. Wex, T. D. Abbott, G. B. Adams, J. P. Burger, R. R. G. Gamatham, M. Gouws, D. M. Horn, B. Hugo, A. F. Joubert, J. R. Manley, K. McAlpine, S. S. Passmoor, A. Peens-Hough, Z. R. Ramudzuli, A. Rust, S. Salie, L. C. Schwardt, R. Siebrits, G. Van Tonder, V. Van Tonder, and M. G. Welz
PASA, 37:e028, July 2020.
arXiv:2005.14366

[2] *Discovery of a pulsar wind nebula around B0950 + 08 with the ELWA*
D. Ruan, G. B. Taylor, J. Dowell, K. Stovall, F. K. Schinzel, and **P. B. Demorest**
MNRAS, 495(2):2125–2134, May 2020.
arXiv:2005.03303

[3] *The NANOGrav 11 yr Data Set: Constraints on Planetary Masses Around 45 Millisecond Pulsars*
E. A. Behrens, S. M. Ransom, D. R. Madison, Z. Arzoumanian, K. Crowter, M. E. DeCesar, **P. B. Demorest**, T. Dolch, J. A. Ellis, R. D. Ferdman, E. C. Ferrara, E. Fonseca, P. A. Gentile, G. Jones, M. L. Jones, M. T. Lam, L. Levin, D. R. Lorimer, R. S. Lynch, M. A. McLaughlin, C. Ng, D. J. Nice, T. T. Pennucci, B. B. P. Perera, P. S. Ray, R. Spiewak, I. H. Stairs, K. Stovall, J. K. Swiggum, and W. W. Zhu
Astrophysical Journal, 893(1):L8, April 2020.
arXiv:1912.00482

[4] *Modeling the Uncertainties of Solar System Ephemerides for Robust Gravitational-wave Searches with Pulsar-timing Arrays*
M. Vallisneri, S. R. Taylor, J. Simon, W. M. Folkner, R. S. Park, C. Cutler, J. A. Ellis, T. J. W. Lazio, S. J. Vigeland, K. Aggarwal, Z. Arzoumanian, P. T. Baker, A. Brazier, P. R. Brook, S. Burke-Spolaor, S. Chatterjee, J. M. Cordes, N. J. Cornish, F. Crawford, H. T. Cromartie, K. Crowter, M. DeCesar, **P. B. Demorest**, T. Dolch, R. D. Ferdman, E. C. Ferrara, E. Fonseca, N. Garver-Daniels, P. Gentile, D. Good, J. S. Hazboun, A. M.

Holgado, E. A. Huerta, K. Islo, R. Jennings, G. Jones, M. L. Jones, D. L. Kaplan, L. Z. Kelley, J. S. Key, M. T. Lam, L. Levin, 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. K. Swiggum, R. van Haasteren, C. A. Witt, and W. W. Zhu
Astrophysical Journal, 893(2):112, April 2020.
arXiv:2001.00595

[5] *The Karl G. Jansky Very Large Array Sky Survey (VLASS). Science Case and Survey Design*
M. Lacy, S. A. Baum, C. J. Chandler, S. Chatterjee, T. E. Clarke, S. Deustua, J. English, J. Farnes, B. M. Gaensler, N. Gugliucci, G. Hallinan, B. R. Kent, A. Kimball, C. J. Law, T. J. W. Lazio, J. Marvil, S. A. Mao, D. Medlin, K. Mooley, E. J. Murphy, S. Myers, R. Osten, G. T. Richards, E. Rosolowsky, L. Rudnick, F. Schinzel, G. R. Sivakoff, L. O. Sjouwerman, R. Taylor, R. L. White, J. Wrobel, H. Andernach, A. J. Beasley, E. Berger, S. Bhatnager, M. Birkinshaw, G. C. Bower, W. N. Brandt, S. Brown, S. Burke-Spolaor, B. J. Butler, J. Comerford, **P. B. Demorest**, H. Fu, S. Giacintucci, K. Golap, T. Güth, C. A. Hales, R. Hiriart, J. Hodge, A. Horesh, Ž. Ivezić, M. J. Jarvis, A. Kamble, N. Kassim, X. Liu, L. Loinard, D. K. Lyons, J. Masters, M. Mezcua, G. A. Moellenbrock, T. Mroczkowski, K. Nyland, C. P. O'Dea, S. P. O'Sullivan, W. M. Peters, K. Radford, U. Rao, J. Robnett, J. Salcido, Y. Shen, A. Sobotka, S. Witz, M. Vaccari, R. J. van Weeren, A. Vargas, P. K. G. Williams, and I. Yoon
PASP, 132(1009):035001, March 2020.
arXiv:1907.01981

[6] *The NANOGrav 11 yr Data Set: Evolution of Gravitational-wave Background Statistics*
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
Astrophysical Journal, 890(2):108, February 2020.
arXiv:1909.08644

[7] *A repeating fast radio burst source localized to a nearby spiral galaxy*
B. Marcote, K. Nimmo, J. W. T. Hessels, S. P. Tendulkar, C. G. Bassa, Z. Paragi,

A. Keimpema, M. Bhardwaj, R. Karuppusamy, V. M. Kaspi, C. J. Law, D. Michilli, K. Aggarwal, B. Andersen, A. M. Archibald, K. Bandura, G. C. Bower, P. J. Boyle, C. Brar, S. Burke-Spolaor, B. J. Butler, T. Cassanelli, P. Chawla, **P. B. Demorest**, M. Dobbs, E. Fonseca, U. Giri, D. C. Good, K. Gourdji, A. Josephy, A. Yu. Kirichenko, F. Kirsten, T. L. Landecker, D. Lang, T. J. W. Lazio, D. Z. Li, H. H. Lin, J. D. Linford, K. Masui, J. Mena-Parra, A. Naidu, C. Ng, C. Patel, U. L. Pen, Z. Pleunis, M. Rafiei-Ravandi, M. Rahman, A. Renard, P. Scholz, S. R. Siegel, K. M. Smith, I. H. Stairs, K. Vanderlinde, and A. V. Zwaniga
Nature, 577(7789):190–194, January 2020.
arXiv:2001.02222

[8] *Relativistic Shapiro delay measurements of an extremely massive millisecond pulsar*
H. T. Cromartie, E. Fonseca, S. M. Ransom, **P. B. Demorest**, Z. Arzoumanian, H. Blumer, P. R. Brook, M. E. DeCesar, T. Dolch, J. A. Ellis, R. D. Ferdman, E. C. Ferrara, 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, and W. W. Zhu
Nature Astronomy, 4:72–76, January 2020.
arXiv:1904.06759

[9] *The NANOGrav 11 yr Data Set: Limits on Gravitational Wave Memory*
K. Aggarwal, Z. Arzoumanian, P. T. Baker, A. Brazier, P. R. Brook, S. Burke-Spolaor, S. Chatterjee, J. M. Cordes, N. J. Cornish, F. Crawford, H. T. Cromartie, K. Crowter, M. DeCesar, **P. B. Demorest**, T. Dolch, J. A. Ellis, R. D. Ferdman, E. C. Ferrara, E. Fonseca, N. Garver-Daniels, P. Gentile, D. Good, J. S. Hazboun, A. M. Holgado, E. A. Huerta, K. Islo, R. Jennings, G. Jones, M. L. Jones, D. L. Kaplan, L. Z. Kelley, J. S. Key, M. T. Lam, T. J. W. Lazio, L. Levin, 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, J. Simon, R. Spiewak, I. H. Stairs, D. R. Stinebring, K. Stovall, J. K. Swiggum, S. R. Taylor, M. Vallisneri, R. van Haasteren, S. J. Vigeland, C. A. Witt, and W. W. Zhu
Astrophysical Journal, 889(1):38, January 2020.
arXiv:1911.08488

[10] *The International Pulsar Timing Array: second data release*
B. B. P. Perera, M. E. DeCesar, **P. B. Demorest**, M. Kerr, L. Lentati, D. J. Nice, S. Osłowski, S. M. Ransom, M. J. Keith, Z. Arzoumanian, M. Bailes, P. T. Baker, C. G. Bassa, N. D. R. Bhat, A. Brazier, M. Burgay, S. Burke-Spolaor, R. N. Caballero, D. J. Champion, S. Chatterjee, S. Chen, I. Cognard, J. M. Cordes, K. Crowter, S. Dai, G. Desvignes, T. Dolch, R. D. Ferdman, E. C. Ferrara, E. Fonseca, J. M. Goldstein, E. Graikou, L. Guillemot, J. S. Hazboun, G. Hobbs, H. Hu, K. Islo, G. H. Janssen, R. Karuppusamy, M. Kramer, M. T. Lam, K. J. Lee, K. Liu, J. Luo, A. G. Lyne, R. N.

Manchester, J. W. McKee, M. A. McLaughlin, C. M. F. Mingarelli, A. P. Parthasarathy, T. T. Pennucci, D. Perrodin, A. Possenti, D. J. Reardon, C. J. Russell, S. A. Sanidas, A. Sesana, G. Shaifullah, R. M. Shannon, X. Siemens, J. Simon, R. Spiewak, I. H. Stairs, B. W. Stappers, J. K. Swiggum, S. R. Taylor, G. Theureau, C. Tiburzi, M. Vallisneri, A. Vecchio, J. B. Wang, S. B. Zhang, L. Zhang, W. W. Zhu, and X. J. Zhu
MNRAS, 490(4):4666–4687, December 2019.
arXiv:1909.04534

[11] *Non-detection of fast radio bursts from six gamma-ray burst remnants with possible magnetar engines*
Yunpeng Men, Kshitij Aggarwal, Ye Li, Divya Palaniswamy, Sarah Burke-Spolaor, K. J. Lee, Rui Luo, **P. B. Demorest**, Shriharsh Tendulkar, Devansh Agarwal, Olivia Young, and Bing Zhang
MNRAS, 489(3):3643–3647, November 2019.
arXiv:1908.10222

[12] *A Search for Late-time Radio Emission and Fast Radio Bursts from Superluminous Supernovae*
C. J. Law, C. M. B. Omand, K. Kashiyama, K. Murase, G. C. Bower, K. Aggarwal, S. Burke-Spolaor, B. J. Butler, **P. B. Demorest**, T. J. W. Lazio, J. Linford, S. P. Tendulkar, and M. P. Rupen
Astrophysical Journal, 886(1):24, November 2019.
arXiv:1910.02036

[13] *The NANOGrav 11 yr Data Set: Limits on Gravitational Waves from Individual Supermassive Black Hole Binaries*
K. Aggarwal, Z. Arzoumanian, P. T. Baker, A. Brazier, M. R. Brinson, 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, J. S. Hazboun, A. M. Holgado, E. A. Huerta, K. Islo, R. Jennings, G. Jones, M. L. Jones, A. R. Kaiser, D. L. Kaplan, L. Z. Kelley, J. S. Key, M. T. Lam, T. J. W. Lazio, L. Levin, 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, J. Simon, R. Spiewak, I. H. Stairs, D. R. Stinebring, K. Stovall, J. Swiggum, S. R. Taylor, J. E. Turner, M. Vallisneri, R. van Haasteren, S. J. Vigeland , C. A. Witt, W. W. Zhu, and NANOGrav Collaboration
Astrophysical Journal, 880(2):116, August 2019.
arXiv:1812.11585

[14] *Unusually Bright Single Pulses from the Binary Pulsar B1744-24A: A Case of Strong Lensing?*

A. V. Bilous, S. M. Ransom, and **P. B. Demorest**
Astrophysical Journal, 877(2):125, June 2019.
arXiv:1811.05766

[15] *A Radio Source Coincident with the Superluminous Supernova PTF10hgi: Evidence for a Central Engine and an Analog of the Repeating FRB 121102?*
T. Eftekhari, E. Berger, B. Margalit, P. K. Blanchard, L. Patton, **P. B. Demorest**, P. K. G. Williams, S. Chatterjee, J. M. Cordes, R. Lunnan, B. D. Metzger, and M. Nicholl
Astrophysical Journal, 876(1):L10, May 2019.
arXiv:1901.10479

[16] *VLA Observations of Single Pulses from the Galactic Center Magnetar*
R. S. Wharton, S. Chatterjee, J. M. Cordes, G. C. Bower, B. J. Butler, A. T. Deller, **P. B. Demorest**, T. J. W. Lazio, and S. M. Ransom
Astrophysical Journal, 875(2):143, April 2019.
arXiv:1905.00632

[17] *High-precision X-Ray Timing of Three Millisecond Pulsars with NICER: Stability Estimates and Comparison with Radio*
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
Astrophysical Journal, 874(2):160, April 2019.
arXiv:1902.07130

[18] *The NANOGrav 12.5 yr Data Set: The Frequency Dependence of Pulse Jitter in Precision Millisecond Pulsars*
M. T. Lam, M. A. McLaughlin, Z. Arzoumanian, 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, D. R. Lorimer, R. S. Lynch, C. Ng, D. J. Nice, T. T. Pennucci, S. M. Ransom, R. Spiewak, I. H. Stairs, K. Stovall, J. K. Swiggum, S. J. Vigeland, and W. W. Zhu
Astrophysical Journal, 872(2):193, February 2019.
arXiv:1809.03058

[19] *The NANOGrav 11 yr Data Set: Solar Wind Sounding through Pulsar Timing*
D. R. Madison, J. M. Cordes, Z. Arzoumanian, S. Chatterjee, K. Crowter, M. E. DeCesar, **P. B. Demorest**, T. Dolch, J. A. Ellis, R. D. Ferdman, E. C. Ferrara, E. Fonseca,

P. A. Gentile, G. Jones, M. L. Jones, M. T. Lam, L. Levin, D. R. Lorimer, R. S. Lynch, M. A. McLaughlin, C. M. F. Mingarelli, C. Ng, D. J. Nice, T. T. Pennucci, S. M. Ransom, P. S. Ray, R. Spiewak, I. H. Stairs, K. Stovall, J. K. Swiggum, and W. W. Zhu
Astrophysical Journal, 872(2):150, February 2019.
arXiv:1808.07078

[20] *Tests of gravitational symmetries with pulsar binary J1713+0747*
W. W. Zhu, G. Desvignes, N. Wex, R. N. Caballero, D. J. Champion, **P. B. Demorest**, J. A. Ellis, G. H. Janssen, M. Kramer, A. Krieger, L. Lentati, D. J. Nice, S. M. Ransom, I. H. Stairs, B. W. Stappers, J. P. W. Verbiest, Z. Arzoumanian, C. G. Bassa, M. Burgay, I. Cognard, K. Crowter, T. Dolch, R. D. Ferdman, E. Fonseca, M. E. Gonzalez, E. Graikou, L. Guillemot, J. W. T. Hessels, A. Jessner, G. Jones, M. L. Jones, C. Jordan, R. Karuppusamy, M. T. Lam, K. Lazaridis, P. Lazarus, K. J. Lee, L. Levin, K. Liu, A. G. Lyne, J. W. McKee, M. A. McLaughlin, S. Osłowski, T. Pennucci, D. Perrodin, A. Possenti, S. Sanidas, G. Shaifullah, R. Smits, K. Stovall, J. Swiggum, G. Theureau, and C. Tiburzi
MNRAS, 482(3):3249–3260, January 2019.
arXiv:1802.09206

[21] *PSR J2234+0611: A New Laboratory for Stellar Evolution*
K. Stovall, P. C. C. Freire, J. Antoniadis, M. Bagchi, J. S. Deneva, N. Garver-Daniels, J. G. Martinez, M. A. McLaughlin, Z. Arzoumanian, 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, P. A. Gentile, M. L. Jones, M. T. Lam, D. R. Lorimer, R. S. Lynch, C. Ng, D. J. Nice, T. T. Pennucci, S. M. Ransom, R. Spiewak, I. H. Stairs, J. K. Swiggum, S. J. Vigeland, and W. W. Zhu
Astrophysical Journal, 870(2):74, January 2019.
arXiv:1809.05064

[22] *The NANOGrav 11-year Data Set: Pulse Profile Variability*
P. R. Brook, A. Karastergiou, M. A. McLaughlin, M. T. Lam, Z. Arzoumanian, S. Chatterjee, J. M. Cordes, K. Crowter, M. DeCesar, **P. B. Demorest**, T. Dolch, J. A. Ellis, R. D. Ferdman, E. Ferrara, E. Fonseca, P. A. Gentile, G. Jones, M. L. Jones, T. J. W. Lazio, L. Levin, D. R. Lorimer, R. S. Lynch, C. Ng, D. J. Nice, T. T. Pennucci, S. M. Ransom, P. S. Ray, R. Spiewak, I. H. Stairs, D. R. Stinebring, K. Stovall, J. K. Swiggum, and W. W. Zhu
Astrophysical Journal, 868(2):122, December 2018.
arXiv:1810.08269

[23] *Studying the Solar system with the International Pulsar Timing Array*
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Software Packages

As part of my research, I regularly contribute to a number of community-maintained, open-source software packages. Several of these are standard tools used by astronomers world-wide for pulsar data analysis, while others are instrument code that is used in various backend systems at radio telescopes. Here is a brief summary of notable software

contributions I have made. Other smaller efforts are collected on my github page at `http://github.com/demorest/`.

DSPSR `http://dspsr.sourceforge.net`
DSPSR is a set of software for pulsar-specific processing of baseband radio data. This is used in a number of real-time backend systems (including at the VLA) as well as for offline analysis. I have made major contributions including adding support for several data formats, and cyclic spectroscopy, as well as assorted small features/fixes.

guppi_daq `http://github.com/demorest/guppi_daq`
guppi_daq is the real-time software for the GUPPI and PUPPI pulsar backends. It receives data from the FPGA hardware and performs coherent dedispersion, folding, and data recording. It has also been used as the basis for later-generation instrument software. I was the primary author of this package.

nanopipe `http://github.com/demorest/nanopipe`
nanopipe is the main data calibration pipeline used for the NANOGrav project. I was the primary author of this package.

PINT `http://github.com/nanograv/pint`
PINT is new pulsar timing analysis package that intends to replace the aging TEMPO and TEMPO2. I have made major contributions to the overall design of the software.

PSRCHIVE `http://psrchive.sourceforge.net`
PSRCHIVE is a general-purpose set of data calibration, reduction and analysis software for pulsar timing and polarimetry. I have made significant contributions including adding support for many data formats, tools for RFI removal, algorithms for time-of-arrival measurement, and assorted smaller features and fixes.

psrfits_utils `http://github.com/demorest/psrfits_utils`
psrfits_utils is a lightweight package for reading and writing data in the standard PSRFITS format. I co-authored this package with S. Ransom. I have also made contributions to the definition and ongoing evolution of the PSRFITS format.

realfast `http://github.com/realfastvla`
realfast is a project for commensal fast transient detection at the VLA, and relies on a set of custom software packages. I have made major contributions to the code for interfacing with the VLA monitor and control software, and authored new GPU-based code for interferometric gridding and imaging.

sdmpy `http://github.com/demorest/sdmpy`
sdmpy is a python package for reading and writing the Science Data Model (SDM;

used for VLA data), written from scratch with no dependence on CASA. It has specialized functionality for pulsar imaging data and fast transient analysis. I was the primary author of this package.

TEMPO `http://tempo.sourceforge.net`
TEMPO is a long-existing standard package for analyzing pulsar time of arrival data, and has been a fundamental component of pulsar astronomy for decades. Although the origins of the software by far pre-date me, I have made recent significant contributions inluding addition of new fitting algorithms, support for new data formats, and ongoing maintenance and fixes.