Justin A. Ellis

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EDUCATION

7/2011–8/2014	**Ph.D Student in Physics** Center for Gravitation, Cosmology and Astrophysics, UWM, Milwaukee WI
8/2009–6/2011	**Ph.D Student in Physics** West Virginia University, Morgantown WV
1/2007–6/2009	**B.S. in Physics (Mathematics, Astronomy minor)** West Virginia University, Morgantown WV
8/2004–12/2006	**B.S. Student in Mathematics** Shepherd University, Shepherdstown WV

RESEARCH EXPERIENCE

9/2014 – present	**Einstein Postdoctoral Fellow** Jet Propulsion Laboratory, California Institute of Technology, Pasadena CA
7/2011–8/2014	**Graduate Research Assistant** Center for Gravitation, Cosmology and Astrophysics, UWM, Milwaukee WI **Advisor:** Dr. Xavier Siemens
8/2009–6/2011	**Graduate Research Assistant** Dept. of Physics, West Virginia University, Morgantown WV **Advisor:** Dr. Maura McLaughlin
6/2008–6/2009	**Undergaduate Research Assistant** Dept. of Physics, West Virginia University, Morgantown WV **Advisor:** Dr. Earl Scime
8/2005–12/2006	**Undergaduate Research Assistant** Dept. of Environmental Sciences, Shepherd University, Shepherdstown WV **Advisor:** Dr. Jason Best

RESEARCH INTERESTS

Detection of gravitational waves through pulsar timing, ground or space based interferometers; Bayesian inference; data analysis techniques; compact objects, including neutron stars, black holes, and white dwarfs; simulation of gravitational radiation from varying sources to gain relevant astrophysical insight; alternative theories of gravity; cosmology, dark matter, dark energy; early universe high energy physics.

TEACHING EXPERIENCE

8/2009–8/2010	Physics 111 (calculus based introductory physics) Lab Instructor Dept. of Physics, West Virginia University
1/2010–8/2010	Physics 111 (calculus based introductory physics) Tutor Dept. of Physics, West Virginia University
1/2008–6/2008	Physics 111 (calculus based introductory physics) Lab Instructor Dept. of Physics, West Virginia University
8/2007–12/2007	Physics 101 (algebra based introductory physics) Lab Instructor Dept. of Physics, West Virginia University

AWARDS & HONORS

2014	Einstein Fellowship (JPL/Caltech)
2013	Distinguished Dissertation Fellowship (UWM)
2013	NASA Wisconsin Space Grant Consortium Fellowship
2012	Blue Apple Award (22nd Midwest Relativity Meeting)
2012	NASA Wisconsin Space Grant Consortium Fellowship
2011	Best Graduate Student Oral Presentation (West Virginia Academy of Science)
2009	Outstanding Physics Senior Award (WVU)
2008	Reddy Scholarship for Academic Excellence
2008	Eberly College of Arts and Sciences Award for Academic Excellence
2004–2008	West Virginia Promise Scholarship

ORGANIZATIONS

2010–present	Member of IPTA (International Pulsar Timing Array)
2010–present	Member of AAS (American Astronomical Society)
2010–present	Member of ASAP (Arecibo Science Advocacy Partnership)
2009–present	Member of NANOGrav (North American Nano-hertz Observatory for Gravitational Waves)
2008–present	Member of the American Physical Society
2008–present	Member of Phi Sigma Theta National Honor Society
2007–present	Member of Golden Key National Honor Society

SELECTED CONFERENCES AND SEMINARS

International Pulsar Timing Array (IPTA) Collaboration Meeting, Banff, Canada, June 16–27 2014, "The IPTA continuous wave search project." (invited talk).

American Physical Society (APS) April Meeting, Savannah GA, April 5–8, 2014, "NANOGrav Limits on Gravitational Waves from Individual Supermassive Black Hole Binaries in Circular Orbits" (talk)

American Astronomical Society (AAS) 223rd Meeting, Washington DC, January 6–10 2014, "I get by with a little help from my friends: Enhancing PTA sensitivity to GWs using EM counterparts" (talk).

CaJAGWR Seminar, Caltech, Pasadena CA, October 8 2013, "Gravitational Wave Detection with Pulsar Timing Arrays" (talk)

Jet Propulsion Laboratory Seminar, Pasadena CA, October 7 2013, "Gravitational Wave Detection with Pulsar Timing Arrays" (talk)

Wisconsin Space Grant Consortium Conference, Milwaukee WI, August 14 2013, "Searching for Gravitational Waves using Pulsar Timing Arrays" (talk).

10th Edoardo Amldi Conference on Gravitational Waves, Warsaw Poland, July 10 2013, "Continuous Gravitational Wave Search Methods and Results from PTAs" (talk).

Cambridge University Seminar, Cambridge UK, July 1 2013, "Searching for Gravitational Waves using Pulsar Timing Arrays" (invited talk).

International Pulsar Timing Array (IPTA) Collaboration Meeting, Krabi Beach Thailand, June 24–28 2013, "Single Source Detection and Upper Limits with IPTA data" (invited talk).

Physical Applications of Millisecond Pulsars, Aspen CO, January 19–25 2013, "When Will We Detect GWs?" (talk).

American Astronomical Society (AAS) 221st Meeting, Long Beach CA, January 6–11 2013, "Gravitational Wave Searches with Pulsar Timing Data" (talk).

22nd Midwest Relativity Meeting , Chicago, Illinois, September 28–29, 2012, "Gravitational Wave Searches with Pulsar Timing Arrays." (talk).

International Astronomy Union (IAU) Meeting, Beijing China, August 19–31, 2012, "Gravitational Wave Searches in Pulsar Timing Data" (talk).

International Pulsar Timing Array (IPTA) Collaboration Meeting, Kiama Australia, June 25–29, 2012, "An Overview of Single-Source Detection Algorithms" (invited talk).

American Astronomical Society (AAS) 219th Meeting, Austin Texas, January 8–12 2012, "Bayesian Methods for Covariance Estimation of Pulsar Timing Residuals" (poster).

21st Midwest Relativity Meeting , Urbana, Illinois, November 4–5 2011, "Detection Methods for Continuous Gravitational Waves Using Pulsar Timing Arrays" (talk).

9th Edoardo Amaldi Conference on Gravitational Waves, Cardiff, Wales, July 10–15 2011, "Detection Methods for Continuous GWs Using PTAs" (poster).

International Pulsar Timing Array (IPTA) Collaboration Meeting, Morgantown/Snowshoe, West Virginia, June 6–17 2011, "Detection of Continuous Gravitational Waves with Pulsar Timing Arrays" (talk).

American Astronomical Society (AAS) 217th Meeting, Seattle, Washington, January 9–12 2011,"Continuous Gravitational Wave Searches in Pulsar Timing Data" (poster).

International Pulsar Timing Array (IPTA) Collaboration Meeting, Leiden, Netherlands, June 21 – July 2 2010, "The impact of a stochastic gravitational-wave background on pulsar timing parameters" (poster).

50th Annual Meeting of the Division of Plasma Physics (DPP), Dallas Texas, November 17–21 2008, "A magneto-optic probe for magnetic fluctuation measurements" (poster).

PUBLICATIONS

S. Chamberlin, J. Creighton, **J. A. Ellis**, L. Price, J. Romano, and X. Siemens, "A Practical Application of the Optimal Statistic for Stochastic Gravitational Wave Background Searches in Pulsar Timing Data," *in preparation* (2014).

Z. Arzoumanian, A. Brazier, S. Burke-Spolaor, S. J. Chamberlin, S. Chatterjee, J. M. Cordes, P. B. Demorest, X. Deng, T. Dolch, **J. A. Ellis**, R. D. Ferdman, L. S. Finn, N. Garver-Daniels, F. Jenet, G. Jones, V. M. Kaspi, M. Koop, M. Lam, T. J. W. Lazio, A. N. Lommen, D. R. Lorimer, J. Luo, R. S. Lynch, D. R. Madison, M. McLaughlin, S. T. McWilliams, D. J. Nice, N. Palliyaguru, T. T. Pennucci, S. M. Ransom, A. Sesana, X. Siemens, I. H. Stairs, D. R. Stinebring, K. Stovall, J. Swiggum, M. Vallisneri, R. van Haasteren, Y. Wang, and W. W. Zhu, "NANOGrav Limits on Gravitational Waves from Individual Supermassive Black Hole Binaries in Circular Orbits,"*arXiv:1404.1267* (2014).

X. Siemens, **J. A. Ellis**, F. Jenet, and J. D. Romano, "The stochastic background: scaling laws and time to detection for pulsar timing arrays, " *Classical and Quantum Gravity* **30** (2013) no. 22, 224015.

J. A. Ellis, "A Bayesian analysis pipeline for continuous GW sources in the PTA band," *Classical and Quantum Gravity* **30** (2013) no. 22, 224004.

J. A. Ellis, X. Siemens, and R. van Haasteren, "An Efficient Approximation to the Likelihood for Gravitational Wave Stochastic Background Detection Using Pulsar Timing Data," *ApJ* **769** (May, 2013) 63.

P. B. Demorest, R. D. Ferdman, M. E. Gonzalez, D. Nice, S. Ransom, I. H. Stairs, Z. Arzoumanian, A. Brazier, S. Burke-Spolaor, S. J. Chamberlin, J. M. Cordes, **J. A. Ellis**, L. S. Finn, P. Freire, S. Giampanis, F. Jenet, V. M. Kaspi, J. Lazio, A. N. Lommen, M. McLaughlin, N. Palliyaguru, D. Perrodin, R. M. Shannon, X. Siemens, D. Stinebring, J. Swiggum, and W. W. Zhu, "Limits on the Stochastic Gravitational Wave Background from the North American Nanohertz Observatory for Gravitational Waves," *ApJ* **762** (Jan., 2013) 94.

J. A. Ellis, X. Siemens, and S. Chamberlin, "Results of the First IPTA Closed Mock Data Challenge," `arXiv:1210.5274` (Oct., 2012) .

J. A. Ellis, X. Siemens, and J. D. E. Creighton, "Optimal Strategies for Continuous Gravitational Wave Detection in Pulsar Timing Arrays," *ApJ* **756** (Sept., 2012) 175.

J. Ellis, F. A. Jenet, and M. A. McLaughlin, "Practical Methods for Continuous Gravitational Wave Detection Using Pulsar Timing Data," *ApJ* **753** (July, 2012) 96.

J. A. Ellis, M. A. McLaughlin, and J. P. W. Verbiest, "The impact of a stochastic gravitational-wave background on pulsar timing parameters," *MNRAS* **417** (Nov., 2011) 2318–2329.

W. Przybysz, **J. A. Ellis**, S. Thakur, A. Hansen, R. Hardin, S. Sears, and E. Scime, "A magneto-optic probe for magnetic fluctuation measurements.," *Rev Sci Instrum* **80** (2009) no. 10, 103502.