Curriculum Vitae of J. Nicholas Laneman

Contact Information

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Summary

Dr. Laneman is Founding Director of the Wireless Institute in the College of Engineering, a Professor of Electrical Engineering, and a Fellow of the John J. Reilly Center for Science, Technology, and Values at the University of Notre Dame. He joined the faculty in August 2002 shortly after earning a Ph.D. in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology (MIT). His research and teaching interests are in *communications architecture*—a blend of information theory, error-control coding, signal processing for communications, network protocols, and hardware design—with current emphasis on wireless systems.

In addition to three conference best paper awards, Laneman has received a 2006 Presidential Early-Career Award for Scientists and Engineers (PECASE), a 2006 National Science Foundation (NSF) CAREER Award, a 2003 Oak Ridge Associated Universities (ORAU) Ralph E. Powe Junior Faculty Enhancement Award, and the 2001 MIT EECS Harold L. Hazen Graduate Teaching Award. He is an IEEE Fellow and has served as an Associate Editor for *IEEE Transactions on Communications* and a Guest Editor for Special Issues of *IEEE Transactions on Information Theory* and *IEEE Journal on Selected Areas in Communications*. He was also the first Online Editor for the IEEE Information Theory Society and currently serves on its Board of Governors.

Laneman is author or co-author on over 120 publications, including 40 journal articles and 3 invited book chapters, and has been recognized by Thomson Reuters as an ISI Highly Cited Researcher (2010, 2015). He is co-inventor on six U.S. patents and has several patents pending. He currently advises four Ph.D. students; ten Ph.D. degrees, thirteen M.S. degrees, and one B.S. honors degree have been earned under his supervision. All of these research efforts have been supported in part by over $10.5M in research funding, with Laneman serving as principal investigator on just over $3.7M.

Professional Preparation

2002	**Massachusetts Institute of Technology**, Cambridge, MA Ph.D. in Electrical Engineering and Computer Science *Thesis:* "Cooperative Diversity in Wireless Networks: Algorithms and Architectures"
1997	**Massachusetts Institute of Technology**, Cambridge, MA S.M. in Electrical Engineering and Computer Science *Thesis:* "Channel Estimation and Equalization for Spread-Response Precoding Systems"
1995	**Washington University**, St. Louis, MO B.S. in Electrical Engineering, *summa cum laude* B.S. in Computer Science, *summa cum laude*

Honors and Awards

2015	ISI Highly Cited, Thomson Reuters
2014	Fellow, IEEE
2011	Best Paper Award, SDR WInnComm
2010	Best Paper Award, SDR WInnComm-Europe
2010	ISI Highly Cited, Thomson Reuters
2009	Best Demo Award, MobiHoc
2008	Best Paper Award, ISSSTA
2008	First Place, McClosky Business Plan Competition, ND
2007	Senior Member, IEEE
2006	Presidential Early-Career Award for Scientists and Engineers (PECASE)
2006	Faculty Early-Career Development (CAREER) Award, NSF
2003	Ralph E. Powe Junior Faculty Enhancement Award, ORAU
2001	EECS Department Harold L. Hazen Teaching Award, MIT
1996–1999	Graduate Research Fellowship, NSF
1995	School of Engineering Class Valedictorian, Washington University

Professional Experience

Academic Appointments

2014– **University of Notre Dame**, Notre Dame, IN
Department of Electrical Engineering
Title: Professor

2012– **University of Notre Dame**, Notre Dame, IN
John J. Reilly Center for Science, Technology, and Values
Title: Fellow

2010– **University of Notre Dame**, Notre Dame, IN
Wireless Institute, College of Engineering
Title: Founding Director

2008–2014 **University of Notre Dame**, Notre Dame, IN
Department of Electrical Engineering
Title: Associate Professor

2008–2009 **Rice University**, Houston, TX
Department of Electrical and Computer Engineering
Title: Texas Instruments Visiting Associate Professor

2002–2008 **University of Notre Dame**, Notre Dame, IN
Department of Electrical Engineering
Title: Assistant Professor

1995–2002 **Massachusetts Institute of Technology**, Cambridge, MA
Department of Electrical Engineering and Computer Science
Title: Research Assistant and Graduate Fellow

1992–1995 **Washington University**, St. Louis, MO
Department of Electrical Engineering
Title: Research Assistant

Industrial Engagements

2011–2012 **L-3 Communications, Global Security and Engineering Solutions**, Rome, NY
Title: Consultant

2007–2009 **NuCrypt, Inc.**, Evanston, IL
Title: Consultant

2003–2004 **Institute for Defense Analyses**, Alexandria, VA
Title: Consultant

2001 **Caveo Technology, Inc.**, Cambridge, MA
Title: Consultant

2000 **TechOnLine, Inc.**, Bedford, MA
Title: Consultant

1998–1999 **Lucent Technologies, Bell Laboratories**, Murray Hill, NJ
Multimedia Communications Research Laboratory
Title: Summer Member of the Technical Staff and Consultant

1997 **MIT Lincoln Laboratory**, Lexington, MA
Satellite Communications Group
Title: Summer Staff Member

1995 **McDonnell Douglas Aerospace**, St. Louis, MO
Title: Contract Engineer

Research Advising

Ph.D. Theses Supervised (10)

1. W. Zhang, "The Role of Channel Correlation in Fading Communication Channels," Ph.D. dissertation, University of Notre Dame, Notre Dame, IN, July 2006.

2. D. Chen, "Diversity and Spectral Efficiency in Wireless Relay Networks," Ph.D. dissertation, University of Notre Dame, Notre Dame, IN, Dec. 2007.

3. S. Kotagiri, "State-Dependent Networks with Side Information and Partial State Recovery," Ph.D. dissertation, University of Notre Dame, Notre Dame, IN, Dec. 2007.

4. B. P. Dunn, "Overhead in Communication Systems as the Cost of Constraints," Ph.D. dissertation, University of Notre Dame, Notre Dame, IN, Dec. 2010.

5. M. L. Dickens, "Surfer: Any-Core Software Defined Radio," Ph.D. dissertation, University of Notre Dame, Notre Dame, IN, Apr. 2012.

6. U. Kumar, "Feedback Coding Schemes for Control over Gaussian Networks," Ph.D. dissertation, University of Notre Dame, Notre Dame, IN, Sept. 2012, co-advised with Vijay Gupta.

7. Z. Sun, "Performance Metrics, Sampling Schemes, and Detection Algorithms for Wideband Spectrum Sensing," Ph.D. dissertation, University of Notre Dame, Notre Dame, IN, Dec. 2013.

8. M. Khoshnevisan, "Intermittent Communication," Ph.D. dissertation, University of Notre Dame, Notre Dame, IN, Jan. 2014.

9. G. J. Bradford, "Rate, Reliability, and Delay of Wireless Relays," Ph.D. dissertation, University of Notre Dame, Notre Dame, IN, Aug. 2014.

10. E. MolavianJazi, "A Unified Approach to Gaussian Channels with Finite Blocklength," Ph.D. dissertation, University of Notre Dame, Notre Dame, IN, Aug. 2014.

M.S. Theses Supervised (13)

1. D. Chen, "Noncoherent Communication Theory for Cooperative Diversity in Wireless Networks," Master's thesis, University of Notre Dame, Notre Dame, IN, May 2004.

2. B. P. Dunn, "Delay Constrained Multimedia Communications: Comparing Source-Channel Approaches for Quasi-Static Fading Channels," Master's thesis, University of Notre Dame, Notre Dame, IN, Aug. 2005.

3. A. Crohas, "Practical Implementation of a Cognitive Radio System for Dynamic Spectrum Access," Master's thesis, University of Notre Dame, Notre Dame, IN, Aug. 2008.

4. G. J. Bradford, "A Framework for Implementation and Evaluation of Cooperative Diversity in Software-Defined Radio," Master's thesis, University of Notre Dame, Notre Dame, IN, Dec. 2008.

5. U. Kumar, "Network Communications with Feedback via Stochastic Approximation," Master's thesis, University of Notre Dame, Notre Dame, IN, Dec. 2009, co-advised with Vijay Gupta.

6. E. MolavianJazi, "Secure Communications over Arbitrarily Varying Wiretap Channels," Master's thesis, University of Notre Dame, Notre Dame, IN, Dec. 2009.

7. Z. Sun, "Design and Implementation of Sequence Detection Algorithms for Dynamic Spectrum Access," Master's thesis, University of Notre Dame, Notre Dame, IN, May 2010.

8. P. Hesami, "Low-Complexity Incremental Transmission for Multiple-Antenna Wireless Systems," Master's thesis, University of Notre Dame, Notre Dame, IN, Apr. 2011.

9. M. Khoshnevisan, "Optimal Power Allocation in Wireless Communications Subject to Several Power and Energy Constraints," Master's thesis, University of Notre Dame, Notre Dame, IN, Apr. 2011.

10. J. Masengesho, "Sequence Detection for Dynamic Spectrum Access," Master's thesis, University of Notre Dame, Notre Dame, IN, June 2012.

11. M. Cai, "Design and Implementation of a Distributed Spectrum Access System," Master's thesis, University of Notre Dame, Notre Dame, IN, Aug. 2014.

12. S. Golnarian, "Energy-Efficient and Queue-Aware Resource Allocation in Uplink OFDM Systems for Wireless M2M Communication," Master's thesis, University of Notre Dame, Notre Dame, IN, Dec. 2014.

13. N. G. Kleber, "Analysis of CSIR for an OFDM System Limited by a Frequency-Hopping Interferer," Master's thesis, University of Notre Dame, Notre Dame, IN, Dec. 2015.

B.S. Honors Theses Supervised (1)

1. R. L. Jones, III, "Measurements and Modeling of Primary User Activity for Dynamic Spectrum Access," Bachelor's thesis, University of Notre Dame, Notre Dame, IN, Apr. 2011.

Current Research Assistants

Graduate Students (4)

Mr. Mingming Cai (M.S., August 2014; Ph.D. in progress)

Mr. Sahand Golnarian (M.S., December 2014; Ph.D. in progress)

Mr. Nikolas Kleber (M.S., December 2015; Ph.D. in progress)

Mr. Hamed Pezeshki (Ph.D. in progress)

Past Research Assistants

Post-Doctoral Scholars (2)

Dr. Kambiz Azarian Yazdi (Ph.D., August 2006, Ohio State University; 2006–2007), now with Qualcomm

Dr. Matthieu Bloch (Ph.D., May 2008, Georgia Institute of Technology; 2008–2009), now faculty at Georgia Institute of Technology

Graduate Students (14)

Dr. Glenn Bradford (M.S., December 2008; Ph.D., August 2014), now with Intel

Dr. Deqiang Chen (M.S., May 2004; Ph.D., December 2007), now with Qualcomm

Ms. Alice Crohas (M.S., August 2008), now with Archos

Dr.. Michael Dickens (Ph.D., May 2012), now an Independent Consultant

Dr. Brian Dunn (M.S., August 2005; Ph.D., December 2010), now with SpiderCloud Wireless

Mr. Peyman Hesami (M.S., May 2011), now with Qualcomm

Dr. Mostafa Khoshnevisan (M.S., May 2011; Ph.D., January 2014), now with Qualcomm

Dr. Shivaprasad Kotagiri (Ph.D., December 2007), now with LSI Corporation

Dr. Utsaw Kumar (M.S., December 2009; Ph.D., August 2012), now with Intel

Mr. Joseph Masengesho (M.S., June 2012), now with Valence Health

Dr. Ebrahim MolavianJazi (M.S., December 2009; Ph.D., August 2014) now with Penn State

Mr. Dawei Shen (M.S., May 2006), now with MIT Media Lab

Dr. Zhanwei Sun (M.S., May 2010; Ph.D., December 2013), now with Qualcomm

Dr. Wenyi Zhang (M.S., May 2003; Ph.D., August 2006), now faculty at University of Science and Technology of China

Publications

All publications are available at: `http://www.nd.edu/~jnl/pubs/`.

Preprints and Submitted Journal Articles (4)

1. U. Kumar, J. N. Laneman, and V. Gupta, "Achievability over Gaussian Cascade and Relay Channels with Feedback," *IEEE Trans. Commun.*, July 2011, submitted for publication.

2. Z. Sun and J. N. Laneman, "A Unified Sub-Nyquist Sampling Structure for Wideband Spectrum Sensing," *IEEE Trans. Signal Processing*, Aug. 2013, submitted for publication.

3. M. Khoshnevisan and J. N. Laneman, "Intermittent Communication," *IEEE Trans. Inform. Theory*, Jan. 2014, submitted for publication.

4. G. J. Bradford and J. N. Laneman, "Rate, Reliability, and Delay Tradeoffs for Decode-and-Forward Relaying," *IEEE Trans. Wireless Commun.*, Nov. 2015, submitted for publication.

Refereed Journal Articles (36)

1. C.-E. W. Sundberg, D. Sinha, D. Mansour, M. Zarrabizadeh, and J. N. Laneman, "Multistream Hybid In Band On Channel FM Systems for Digital Audio Broadcasting," *IEEE Trans. Broadcast.*, vol. 45, no. 4, pp. 410–417, Dec. 1999.

2. J. N. Laneman and C.-E. W. Sundberg, "Soft Selection Combining for Terrestrial Digital Audio Broadcasting in the FM Band," *IEEE Trans. Broadcast.*, vol. 47, no. 2, pp. 103–114, June 2001.

3. J. N. Laneman and C.-E. W. Sundberg, "Reed-Solomon Decoding Algorithms for Digital Audio Broadcasting in the AM Band," *IEEE Trans. Broadcast.*, vol. 47, no. 2, pp. 115–122, June 2001.

4. J. N. Laneman, C.-E. W. Sundberg, and C. Faller, "Huffman Code Based Error Screening and Channel Code Optimzation for Error Concealment in Perceptual Audio Coding (PAC) Algorithms," *IEEE Trans. Broadcast.*, vol. 48, no. 3, pp. 193–206, Sept. 2002.

5. J. N. Laneman and G. W. Wornell, "Distributed Space-Time Coded Protocols for Exploiting Cooperative Diversity in Wireless Networks," *IEEE Trans. Inform. Theory*, vol. 49, no. 10, pp. 2415–2425, Oct. 2003.

6. J. N. Laneman, D. N. C. Tse, and G. W. Wornell, "Cooperative Diversity in Wireless Networks: Efficient Protocols and Outage Behavior," *IEEE Trans. Inform. Theory*, vol. 50, no. 12, pp. 3062–3080, Dec. 2004.

7. J. N. Laneman, E. Martinian, G. W. Wornell, and J. G. Apostolopoulos, "Source-Channel Diversity for Parallel Channels," *IEEE Trans. Inform. Theory*, vol. 51, no. 10, pp. 3518–3539, Oct. 2005.

8. W. Zhang and J. N. Laneman, "An Induced Additive-Noise Model for Non-Coherent Discrete-Time Memoryless Rayleigh Fading Channels," *IEEE Trans. Inform. Theory*, vol. 52, no. 4, pp. 1756–1764, Apr. 2006.

9. M. Sikora, J. N. Laneman, M. Haenggi, D. J. Costello, Jr., and T. E. Fuja, "Bandwidth- and Power-Efficient Routing in Linear Wireless Networks," *IEEE Trans. Inform. Theory*, vol. 52, no. 6, pp. 2624–2633, June 2006.

10. D. Chen and J. N. Laneman, "Modulation and Demodulation for Cooperative Diversity in Wireless Systems," *IEEE Trans. Wireless Commun.*, vol. 5, no. 7, pp. 1785–1794, July 2006.

11. A. Scaglione, D. Goeckel, and J. N. Laneman, "Cooperative Communications in Mobile Ad-Hoc Networks: Rethinking the Link Abstraction," *IEEE Signal Processing Mag.*, vol. 23, no. 5, pp. 18–29, Sept. 2006.

12. W. Zhang and J. N. Laneman, "How Good is Phase-Shift Keying for Peak-Limited Rayleigh Fading Channels in the Low-SNR Regime?" *IEEE Trans. Inform. Theory*, vol. 53, no. 1, pp. 236–251, Jan. 2007.

13. W. Zhang and J. N. Laneman, "Benefits of Spatial Correlation for Multi-Antenna Non-Coherent Communication over Fading Channels at Low SNR," *IEEE Trans. Wireless Commun.*, vol. 6, no. 3, pp. 887–896, Mar. 2007.

14. T. Wang, A. Cano, G. B. Giannakis, and J. N. Laneman, "High-Performance Cooperative Demodulation with Decode-and-Forward Relays," *IEEE Trans. Commun.*, vol. 55, no. 7, pp. 1427–1438, July 2007.

15. Özgür Oyman, J. N. Laneman, and S. Sandhu, "Multihop Relaying for Broadband Wireless Mesh Networks: From Theory to Practice," *IEEE Commun. Mag.*, vol. 45, no. 11, pp. 116–122, Nov. 2007.

16. S. Kotagiri and J. N. Laneman, "Multiple Access Channels with State Information Known to Some Encoders and Independent Messages," *EURASIP J. Wireless Comm. Net.*, vol. 2008, Feb. 2008.

17. D. Chen, K. Azarian, and J. N. Laneman, "A Case for Amplify-Forward Relaying in the Block-Fading Multiaccess Channel," *IEEE Trans. Inform. Theory*, vol. 54, no. 8, pp. 3728–3733, Aug. 2008.

18. M. L. Dickens, B. P. Dunn, and J. N. Laneman, "Design and Implementation of a Portable Software Radio," *IEEE Commun. Mag.*, vol. 46, no. 8, pp. 58–66, Aug. 2008.

19. D. Chen, M. Haenggi, and J. N. Laneman, "Distributed Spectrum-Efficient Routing Algorithms in Wireless Networks," *IEEE Trans. Wireless Commun.*, vol. 7, no. 12, pp. 5297 – 5305, Dec. 2008.

20. I. Krikidis, Z. Sun, J. N. Laneman, and J. Thompson, "Cognitive Legacy Networks via Cooperative Diversity," *IEEE Commun. Lett.*, vol. 13, no. 2, pp. 106–108, Feb. 2009.

21. W. Zhang, S. Kotagiri, and J. N. Laneman, "On Downlink Transmission Without Transmit Channel State Information and With Outage Constraints," *IEEE Trans. Inform. Theory*, vol. 55, no. 9, pp. 4240–4248, Sept. 2009.

22. I. Krikidis, J. N. Laneman, J. Thompson, and S. McLaughlin, "Protocol Design and Throughput Analysis for Multi-User Cognitive Cooperative Systems," *IEEE Trans. Wireless Commun.*, vol. 8, no. 9, pp. 4740–4751, Sept. 2009.

23. S. Kotagiri and J. N. Laneman, "Variations on Information Embedding in Multiple Access and Broacast Channels," *IEEE Trans. Inform. Theory*, vol. 56, no. 5, pp. 2225–2240, May 2010.

24. A. Zaidi, S. Kotagiri, J. N. Laneman, and L. Vandendorpe, "Cooperative Relaying with State Available Non-Causally at the Relay," *IEEE Trans. Inform. Theory*, vol. 56, no. 5, pp. 2272–2298, May 2010.

25. Z. Sun, G. J. Bradford, and J. N. Laneman, "Sequence Detection Algorithms for PHY-Layer Sensing in Dynamic Spectrum Access Networks," *IEEE J. Select. Topics Signal Processing.*, vol. 5, no. 1, pp. 97–109, Feb. 2011.

26. P. Hesami and J. N. Laneman, "Incremental Use of Multiple Transmitters for Low-Complexity Diversity Transmission in Wireless Systems," *IEEE Trans. Commun.*, vol. 60, no. 9, pp. 2522–2533, Sept. 2012.

27. P. Rost, G. Fettweis, and J. N. Laneman, "Energy- and Cost-Efficient Mobile Communication using Multi-Cell MIMO and Relaying," *IEEE Trans. Wireless Commun.*, vol. 11, no. 9, pp. 3377–3387, Sept. 2012.

28. M. L. Dickens, J. N. Laneman, and B. P. Dunn, "Seamless Dynamic Runtime Reconfiguration in a Sofware-Defined Radio," *J. Signal Process. Sys.*, vol. 69, no. 1, pp. 87–94, October 2012.

29. M. L. Dickens and J. N. Laneman, "On the Use of an Algebraic Language Interface for Waveform Definition," *Analog Integr. Circ. and Signal Process.*, vol. 73, no. 2, pp. 613–625, Nov. 2012.

30. M. Khoshnevisan and J. N. Laneman, "Power Allocation in MIMO Wireless Systems Subject to Simultaneous Power Constraints," *IEEE Trans. Commun.*, vol. 60, no. 12, pp. 3855–3864, Dec. 2012.

31. M. Bloch and J. N. Laneman, "Exploiting Partial Channel State Information for Secrecy over Wireless Channels," *IEEE J. Select. Areas Commun.*, vol. 31, no. 9, pp. 1840–1849, Sept. 2013.

32. M. Bloch and J. N. Laneman, "Strong Secrecy from Channel Resolvability," *IEEE Trans. Inform. Theory*, vol. 59, no. 12, pp. 8077–8098, Dec. 2013.

33. U. Kumar, J. Liu, V. Gupta, and J. N. Laneman, "Improving Control Performance across AWGN Channels using a Relay Node," *Int. J. Syst. Sci.*, vol. 45, no. 7, pp. 1579–1588, July 2014.

34. U. Kumar, J. Liu, V. Gupta, and J. N. Laneman, "Stability Across a Gaussian Product Channel: Necessary and Sufficient Conditions," *IEEE Trans. Automat. Contr.*, vol. 59, no. 9, pp. 2530–2535, Sept. 2014.

35. Z. Sun and J. N. Laneman, "Performance Metrics, Sampling Schemes, and Detection Algorithms for Wideband Spectrum Sensing," *IEEE Trans. Signal Processing*, vol. 62, no. 19, pp. 5107–5118, Oct. 2014.

36. E. MolavianJazi and J. N. Laneman, "A Second-Order Achievable Rate Region for Gaussian Multi-access Channels via a Central Limit Theorem for Functions," *IEEE Trans. Inform. Theory*, vol. 61, no. 12, pp. 6719–6733, Dec. 2015.

Book Chapters (3)

1. J. N. Laneman, *Cooperation in Wireless Networks: Principles and Applications*. Springer, 2006, ch. Cooperative Diversity: Models, Algorithms, and Architectures, pp. 163–188.

2. A. Scaglione, D. Goeckel, and J. N. Laneman, *Distributed Antenna Systems: Open Architecture for Future Wireless Communications*. Auerbach Publications, CRC Press, 2007, ch. Cooperative Communications in Mobile Ad-Hoc Networks: Rethinking the Link Abstraction, pp. 87–116.

3. E. Hardouin, J. N. Laneman, S. Hidetoshi, A. Golitschek, and O. Gonsa, *LTE - The UMTS Long Term Evolution: From Theory to Practice*, Second ed. John Wiley and Sons, 2011, ch. Relaying.

Refereed Conference Papers (56)

1. J. N. Laneman and G. E. Peterson, "Real-Time Learning of Aircraft Parameters Using Recursive Least-Squares to Train RBF Networks," in *Proc. Artificial Neural Networks in Engineering (ANNIE)*, St. Louis, MO, Nov. 1996.

2. J. N. Laneman and G. W. Wornell, "Robust Equalization for Spread-Response Precoding Systems," in *Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Seattle, WA, May 1998, pp. 3513–3516.

3. J. N. Laneman and G. W. Wornell, "Energy-Efficient Antenna Sharing and Relaying for Wireless Networks," in *Proc. IEEE Wireless Comm. and Networking Conf. (WCNC)*, Chicago, IL, Sept. 2000, pp. 7–12.

4. J. N. Laneman, G. W. Wornell, and D. N. C. Tse, "An Efficient Protocol for Realizing Cooperative Diversity in Wireless Networks," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Washington, DC, June 2001, p. 294.

5. J. N. Laneman and G. W. Wornell, "Distributed Space-Time Coded Protocols for Exploiting Cooperative Diversity in Wireless Networks," in *Proc. IEEE Global Comm. Conf. (GLOBECOM)*, Taipei, Taiwan, Nov. 2002, pp. 77–81.

6. J. N. Laneman, E. Martinian, G. W. Wornell, J. G. Apostolopoulos, and S. J. Wee, "Comparing Application- and Physical-Layer Approaches to Diversity on Wireless Channels," in *Proc. IEEE Int. Commun. Conf. (ICC)*, May 2003, pp. 2678–2682.

7. J. N. Laneman, "Limiting Analysis of Outage Probabilities for Diversity Schemes in Fading Channels," in *Proc. IEEE Global Comm. Conf. (GLOBECOM)*, San Francisco, CA, Dec. 2003, pp. 1242–1246.

8. J. N. Laneman and G. Kramer, "Window Decoding for the Multiaccess Channel with Generalized Feedback," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Chicago, IL, July 2004, p. 281.

9. J. N. Laneman, E. Martinian, and G. W. Wornell, "Source-Channel Diversity Approaches for Multimedia Communication," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Chicago, IL, July 2004, p. 393.

10. W. Zhang and J. N. Laneman, "Benefits of Correlated MIMO Schemes for Wideband Communication," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Chicago, IL, July 2004, p. 414.

11. M. Sikora, J. N. Laneman, M. Haenggi, D. J. Costello, Jr., and T. E. Fuja, "On the Optimum Number of Hops in Linear Ad Hoc Networks," in *Proc. IEEE Inform. Theory Workshop (ITW)*, San Antonio, TX, Oct. 2004, pp. 165–169.

12. J. N. Laneman, "Network Coding Gain of Cooperative Diversity," in *Proc. IEEE Military Comm. Conf. (MILCOM)*, Monterey, CA, Nov. 2004, pp. 106–112, invited paper.

13. D. Chen and J. N. Laneman, "Noncoherent Demodulation for Cooperative Diversity in Wireless Systems," in *Proc. IEEE Global Comm. Conf. (GLOBECOM)*, Dallas, TX, Nov. 2004, pp. 31–35.

14. W. Zhang and J. N. Laneman, "Recursive Training with Unitary Modulation for Correlated Block-Fading MIMO Channels," in *Proc. IEEE Workshop on Sig. Proc. Adv. in Wireless Comm. (SPAWC)*, New York, NY, June 2005, pp. 746–750.

15. C. T. K. Ng, J. N. Laneman, and A. Goldsmith, "The Role of SNR in Achieving MIMO Rates in Cooperative Systems," in *Proc. IEEE Information Theory Workshop (ITW)*, Punta del Este, Uruguay, Mar. 2006, pp. 288–292.

16. S. Kotagiri and J. N. Laneman, "Information Embedding in Degraded Broadcast Channels," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Seattle, WA, July 2006, pp. 494–498.

17. W. Zhang, S. Kotagiri, and J. N. Laneman, "Information Transmission over the Postal Channel with and without Feedback," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Seattle, WA, July 2006, pp. 2749–2753.

18. W. Zhang, S. Kotagiri, and J. N. Laneman, "Writing on Dirty Paper with Resizing and its Application to Quasi-Static Fading Broadcast Channels," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Nice, France, June 2007, pp. 381–385.

19. S. Kotagiri and J. N. Laneman, "Multiaccess Channels with State Information Known to One Encoder: A Case of Degraded Message Sets," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Nice, France, June 2007, pp. 1566–1570.

20. K. Azarian and J. N. Laneman, "Linear Space-Time Codes with Optimal Diversity-Multiplexing Tradeoff," in *Proc. IEEE Information Theory Workshop (ITW)*, Lake Tahoe, CA, Sept. 2007, pp. 483–486.

21. W. Chang, S. Kotagiri, J. N. Laneman, S.-Y. Chung, and Y.-H. Lee, "Compress-Forward Relaying over Parallel Gaussian Channels," in *Proc. Comp. Adv. Mult-Sensor and Adaptive Processing*, St. Thomas, US Virgin Islands, Dec. 2007, pp. 305–308.

22. B. P. Dunn and J. N. Laneman, "Rate-Delay Tradeoffs for Communicating a Bursty Source over an Erasure Channel with Feedback," in *Proc. Int. Zürich Seminar on Communications*, Zürich, Switzerland, Mar. 2008, pp. 136–139.

23. D. Chen and J. N. Laneman, "Joint Power and Bandwidth Allocation in Wireless Multihop Networks," in *Proc. IEEE Wireless Comm. and Networking Conf. (WCNC)*, Las Vegas, NV, Apr. 2008, pp. 990–995.

24. A. Zaidi, S. Kotagiri, J. N. Laneman, and L. Vandendorpe, "Cooperative Relaying with State Available at the Relay Only," in *Proc. IEEE Information Theory Workshop (ITW)*, Porto, Portugal, May 2008, pp. 139–143.

25. B. P. Dunn, M. L. Dickens, and J. N. Laneman, "Design and Implementation of a Portable Software Radio," in *Proc. Int. Symp. Adv. Radio Tech. (ISART)*, Boulder, CO, June 2008.

26. B. P. Dunn and J. N. Laneman, "Basic Limits on Protocol Information in Slotted Communication Networks," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Toronto, Canada, July 2008, pp. 2302–2306.

27. Özgür Oyman and J. N. Laneman, "Multihop Diversity in Wideband OFDM Systems: The Impact of Spatial Resuse and Frequency Selectivity," in *Proc. Int. Symp. Spread Spectrum Techniques and Applications (ISSSTA)*, Bologna, Italy, Aug. 2008, pp. 216–221.

28. M. L. Dickens, B. P. Dunn, and J. N. Laneman, "Portable Software Radios using Commodity Hardware and Open-Source Software," in *Proc. SDR*, Washington, DC, Oct. 2008.

29. P. Rost, G. Fettweis, and J. N. Laneman, "Opportunities, Constraints, and Benefits of Relaying in the Presence of Interference," in *Proc. IEEE Int. Commun. Conf. (ICC)*, Dresden, Germany, June 2009, pp. 1–5.

30. H. Sneessens, L. Vandendorpe, and J. N. Laneman, "Adaptive CF Relaying in Fading Environments with or without Wyner-Ziv Coding," in *Proc. IEEE Int. Commun. Conf. (ICC)*, Dresden, Germany, June 2009, pp. 1–5.

31. I. Krikidis, J. N. Laneman, J. Thompson, and S. McLaughlin, "Stability Analysis for Cognitive Radio with Cooperative Enhancements," in *Proc. IEEE Information Theory Workshop (ITW)*, Volos, Greece, June 2009, pp. 286–290.

32. B. P. Dunn, M. Bloch, and J. N. Laneman, "Secure Bits through Queues," in *Proc. IEEE Information Theory Workshop (ITW)*, Volos, Greece, June 2009, pp. 37–41.

33. A. Zaidi, S. Kotagiri, , J. N. Laneman, and L. Vandendorpe, "Multiaccess Channels with State Known to One Encoder: Another Case of Degraded Message Sets," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Seoul, Korea, July 2009, pp. 2376–2380.

34. U. Kumar, J. N. Laneman, and V. Gupta, "Coding Schemes for Additive Noise Channels with Noisy Feedback," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Seoul, Korea, July 2009, pp. 1258–1262.

35. U. Kumar, J. N. Laneman, and V. Gupta, "Cooperative Communications with Feedback via Stochastic Approximation," in *Proc. IEEE Information Theory Workshop (ITW)*, Taormina, Sicily, Oct. 2009, pp. 411–415, invited paper.

36. Z. Sun, I. Krikidis, J. N. Laneman, and J. Thompson, "Cognitive Radio Enhancements for Legacy Networks using Cooperative Diversity," in *Proc. IEEE Global Comm. Conf. (GLOBECOM)*, Honolulu, Hawaii, Dec. 2009, pp. 1–6.

37. G. J. Bradford and J. N. Laneman, "A Survey of Implementation Efforts and Experimental Design for Cooperative Communications," in *Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Dallas, TX, Mar. 2010, pp. 5602–5605, invited paper.

38. M. L. Dickens, B. P. Dunn, and J. N. Laneman, "Thresholding for Optimal Data Processing in a Software Defined Radio Kernel," in *Proc. Karlsruhe Workshop on Software Radios (WSR)*, Karlsruhe, Germany, March 2010.

39. Z. Sun, G. J. Bradford, and J. N. Laneman, "Sequence Detection Algorithms for Dynamic Spectrum Access Networks," in *Proc. IEEE Int. Dynamic Spectrum Access Networks (DySPAN) Symp.*, Singapore, Apr. 2010, pp. 1–9.

40. N. Dodson, G. J. Bradford, and J. N. Laneman, "A High Performance Transceiver RF Front-end Implementation," in *Proc. SDR*, Washington, DC, Nov.-Dec. 2010.

41. U. Kumar, V. Gupta, and J. N. Laneman, "Sufficient Conditions for Stabilizability over Gaussian Relay and Cascade Channels," in *Proc. IEEE Conf. Decision and Control (CDC)*, Atlanta, GA, Dec. 2010, pp. 4765–4770.

42. M. Khoshnevisan and J. N. Laneman, "Power Allocation in Wireless Systems Subject to Long-Term and Short-Term Power Constraints," in *Proc. IEEE Int. Commun. Conf. (ICC)*, Kyoto, Japan, June 2011, pp. 1–5.

43. M. L. Dickens, J. N. Laneman, and B. P. Dunn, "Seamless Dynamic Runtime Reconfiguration in a Software-Defined Radio," in *Proc. SDR WInnComm Europe*, Brussels, Belgium, June 2011.

44. E. MolavianJazi and J. N. Laneman, "Source-Channel Coding Tradeoff in Multiple Antenna Multiple Access Channels," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, St. Petersburg, Russia, Aug. 2011, pp. 1688–1692.

45. J. N. Laneman and B. P. Dunn, "Communications Overhead as the Cost of Constraints," in *Proc. IEEE Information Theory Workshop (ITW)*, Paraty, Brazil, Oct. 2011, pp. 365–369.

46. M. L. Dickens and J. N. Laneman, "On the Use of an Algebraic Language for Waveform Definition," in *Proc. SDR WInnComm*, Washington, DC, Nov.-Dec. 2011.

47. U. Kumar, V. Gupta, and J. N. Laneman, "On Stability Across a Gaussian Product Channel," in *Proc. IEEE Conf. Decision and Control (CDC)*, Orlando, FL, Dec. 2011, pp. 3142–3147.

48. G. J. Bradford and J. N. Laneman, "Low Latency Relaying Schemes for Next-Generation Cellular Networks," in *Proc. IEEE Int. Commun. Conf. (ICC)*, Ottawa, Canada, June 2012, pp. 4294–4299.

49. Z. Sun and J. N. Laneman, "Secondary Access Policy with Imperfect Sensing in Dynamic Spectrum Access Networks," in *Proc. IEEE Int. Commun. Conf. (ICC)*, Ottawa, Canada, June 2012, pp. 1752–1756.

50. E. MolavianJazi and J. N. Laneman, "Simpler Achievable Rate Regions for Multiaccess with Finite Blocklength," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Boston, MA, July 2012, pp. 36–40.

51. M. Khoshnevisan and J. N. Laneman, "Achievable Rates for Intermittent Communication," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Boston, MA, July 2012, pp. 1346–1350.

52. G. J. Bradford and J. N. Laneman, "Error Exponents for Block Markov Superposition Encoding with Varying Decoding Latency," in *Proc. IEEE Information Theory Workshop (ITW)*, Lausanne, Switzerland, Sept. 2012, pp. 237–241, invited paper.

53. M. Khoshnevisan and J. N. Laneman, "Achievable Rates for Intermittent Multi-Access Communication," in *Proc. IEEE Information Theory Workshop (ITW)*, Seville, Spain, Sept. 2013.

54. Z. Sun and J. N. Laneman, "Sampling Schemes and Detection Algorithms for Wideband Spectrum Sensing," in *Proc. IEEE Int. Dynamic Spectrum Access Networks (DySPAN) Symp.*, McLean, VA, Apr. 2014, pp. 541–552.

55. E. MolavianJazi and J. N. Laneman, "On the Second-Order Cost of TDMA for Gaussian Multiple Access," in *Proc. IEEE Int. Symp. Information Theory (ISIT)*, Honolulu, Hawaii, July 2014, pp. 266–270.

56. E. MolavianJazi and J. N. Laneman, "Coded Modulation for Gaussian Channels: Dispersion- and Entropy-Limited Regimes," in *Proc. IEEE Wireless Comm. and Networking Conf. (WCNC)*, New Orleans, LA, Mar. 2015, pp. 528–533.

Non-Refereed Conference Papers (25)

1. J. N. Laneman and G. W. Wornell, "Exploiting Distributed Spatial Diversity in Wireless Networks," in *Proc. Allerton Conf. Communications, Control, and Computing*, Monticello, IL, Oct. 2000.

2. S. Kotagiri and J. N. Laneman, "Achievable Rates for Multiple Access Channels with State Information Known at One Encoder," in *Proc. Allerton Conf. Communications, Control, and Computing*, Monticello, IL, Oct. 2004.

3. D. Chen and J. N. Laneman, "Cooperative Diversity for Wireless Fading Channels without Channel State Information," in *Proc. Asilomar Conf. Signals, Systems, and Computers*, Monterey, CA, Nov. 2004, pp. 1307–1312, invited paper.

4. W. Zhang and J. N. Laneman, "An Induced Additive-Noise Model for Non-Coherent Discrete-Time Memoryless Rayleigh Fading Channels," in *Proc. Conf. Inform. Sci. and Syst. (CISS)*, Baltimore, MD, Mar. 2005.

5. B. P. Dunn and J. N. Laneman, "Characterizing Source-Channel Diversity Approaches Beyond the Distortion Exponent," in *Proc. Allerton Conf. Communications, Control, and Computing*, Monticello, IL, Sept. 2005, invited paper.

6. S. Kotagiri and J. N. Laneman, "Reversible Information Embedding in Multi-user Channels," in *Proc. Allerton Conf. Communications, Control, and Computing*, Monticello, IL, Sept. 2005.

7. W. Zhang and J. N. Laneman, "How Good is Phase-Shift Keying for Peak-Limited Fading Channels in the Low-SNR Regime," in *Proc. Allerton Conf. Communications, Control, and Computing*, Monticello, IL, Sept. 2005.

8. J. N. Laneman, "On the Distribution of Mutual Information," in *Proc. Workshop on Information Theory and its Applications (ITA)*, San Diego, CA, Feb. 2006, invited paper.

9. D. Chen and J. N. Laneman, "The Diversity-Multiplexing Tradeoff for the Multi-Access Relay Channel," in *Proc. Conf. Inform. Sci. and Syst. (CISS)*, Princeton, NJ, Mar. 2006, pp. 1324–1328.

10. D. Chen, M. Haenggi, and J. N. Laneman, "Distributed Spectrum-Efficient Routing Algorithms in Wireless Networks," in *Proc. Conf. Inform. Sci. and Syst. (CISS)*, Baltimore, MD, Mar. 2007, pp. 649–654.

11. M. Bloch and J. N. Laneman, "On the Secrecy Capacity of Arbitrary Wiretap Channels," in *Proc. Allerton Conf. Communications, Control, and Computing*, Monticello, IL, Sept. 2008, pp. 818–825.

12. M. Bloch and J. N. Laneman, "Information-Spectrum Methods for Information-Theoretic Security," in *Proc. Workshop on Information Theory and its Applications (ITA)*, San Diego, CA, Feb. 2009, pp. 23–28, invited paper.

13. U. Kumar, V. Gupta, and J. N. Laneman, "On Communication across Line Networks with Feedback using Consensus Based Schemes," in *Proc. Workshop on Information Theory and its Applications (ITA)*, San Diego, CA, Feb. 2009, invited paper.

14. G. J. Bradford and J. N. Laneman, "An Experimental Framework for Evaluating Cooperative Diversity," in *Proc. Conf. Inform. Sci. and Syst. (CISS)*, Baltimore, MD, Mar. 2009, pp. 641–645.

15. E. MolavianJazi, M. Bloch, and J. N. Laneman, "Arbitrary Jamming Can Preclude Secure Communication," in *Proc. Allerton Conf. Communications, Control, and Computing*, Monticello, IL, Sept. 2009, pp. 1069–1075.

16. M. Khoshnevisan and J. N. Laneman, "Minimum Delay Communication in Energy Harvesting Systems over Fading Channels," in *Proc. Conf. Inform. Sci. and Syst. (CISS)*, Baltimore, MD, Mar. 2011, pp. 1–5.

17. P. Hesami and J. N. Laneman, "Limiting Behavior of Receive Antennae Selection," in *Proc. Conf. Inform. Sci. and Syst. (CISS)*, Baltimore, MD, Mar. 2011, pp. 1–6.

18. P. Hesami and J. N. Laneman, "Low-Complexity Incremental Use of Multiple Transmitters in Wireless Communication Systems," in *Proc. Allerton Conf. Communications, Control, and Computing*, Monticello, IL, Sept. 2011, pp. 1613–1618.

19. E. MolavianJazi and J. N. Laneman, "Multiaccess Communication in the Finite Blocklength Regime," in *Proc. Workshop on Information Theory and its Applications (ITA)*, San Diego, CA, Feb. 2012.

20. M. Khoshnevisan and J. N. Laneman, "Intermittent Communication and Partial Divergence," in *Proc. Allerton Conf. Communications, Control, and Computing*, Monticello, IL, Oct. 2012, pp. 656–662.

21. E. MolavianJazi and J. N. Laneman, "A Random Coding Approach to Gaussian Multiple Access Channels with Finite Blocklength," in *Proc. Allerton Conf. Communications, Control, and Computing*, Monticello, IL, Oct. 2012, pp. 286–293.

22. M. Khoshnevisan and J. N. Laneman, "Upper Bounds on the Capacity of Binary Intermittent Communication," in *Proc. Workshop on Information Theory and its Applications (ITA)*, San Diego, CA, Feb. 2013, pp. 1–6, invited paper.

23. E. MolavianJazi and J. N. Laneman, "On the Second-Order Coding Rate of Non-Ergodic Fading Channels," in *Proc. Allerton Conf. Communications, Control, and Computing*, Monticello, IL, Oct. 2013.

24. H. Pezeshki and J. N. Laneman, "Anywhere Decoding: Low-Overhead Basestation Cooperation for Interference and Fading-Limited Wireless Environments," in *Proc. Allerton Conf. Communications, Control, and Computing*, Monticello, IL, Oct. 2015.

25. M. Cai and J. N. Laneman, "Database- and Sensing-Based Distributed Spectrum Sharing: Flexible Physical-Layer Prototyping," in *Proc. Asilomar Conf. Signals, Systems, and Computers*, Monterey, CA, Nov. 2015, pp. 1051–1057, invited paper.

Technical Reports (5)

1. J. N. Laneman and C.-E. W. Sundberg, "Adaptive Soft Combining and Channel Decoding in the Presence of Fading and FM Intereference," Bell Labs, Lucent Technologies, Tech. Rep. BL011332-990226-05TM, Feb. 1999.

2. C.-E. W. Sundberg, D. Sinha, D. Mansour, M. Zarrabizadeh, and J. N. Laneman, "Multistream Hybrid In Band On Channel Systems for Digital Audio Broadcasting in the FM Band," Bell Laboratories, Lucent Technologies, Tech. Rep. 10009657-991025-31TM, Jan. 2000.

3. J. N. Laneman and C.-E. W. Sundberg, "Reed-Solomon Code Issues for Digital Audio Broadcasting Applications in the AM Band," Bell Laboratories, Lucent Technologies, Tech. Rep. 10009657-000320-04TM, Mar. 2000.

4. J. N. Laneman and G. W. Wornell, "Distributed Spatial Diversity Techniques for Improving Mobile Ad-Hoc Network Performance," in *Proc. ARL FedLab Symp. on Adv. Telecomm. & Inform. Distrib. Prog. (ATIRP)*, College Park, MD, Mar. 2000.

5. J. N. Laneman and G. W. Wornell, "An Efficient Protocol for Realizing Distributed Spatial Diversity in Wireless Ad-Hoc Networks," in *Proc. ARL FedLab Symp. on Adv. Telecomm. & Inform. Distrib. Prog. (ATIRP)*, College Park, MD, Mar. 2001.

Patents

1. "Soft-Selection Combining Based on Successive Erasures of Frequency Band Components in a Communication System", U.S. Patent 6,430,724, August 6, 2002.

2. "Channel Code Configurations for Digital Audio Broadcasting Systems and Other Types of Communication Systems", U.S. Patent 6,587,826, July 1, 2003.

3. "Error Screening based on Code and Control Information Consistency in a Communication System", U.S. Patent 6,662,339, December 9, 2003.

4. "Motion-Based Input System for Handheld Devices", U.S. Patent 6,861,946, March 1, 2005.

5. "Multi-Mode Decoding for Digital Audio Broadcasting and Other Applications," U.S. Patent 6,874,115, March 29, 2005.

6. "Sequence Detection Methods, Devices, and Systems for Spectrum Sensing in Synamic Spectrum Access Networks", U.S. Patent 8,838,520, September 16, 2014.

Research Funding

Active Grants

1. co-PI, National Science Foundation, $1,192,000 ($1,000,000 sponsor & $192,000 university cost-share) for "CPS: Synergy: Resilient Wireless Sensor-Actuator Networks", 10/2012-9/2015 (with M. Lemmon and H. Lin)

2. PI, National Science Foundation, $325,000 for "BWAC@NDWI: Broadband Wireless Access and Applications Center at the Notre Dame Wireless Institute", 8/2014–7/2019 (with B. Hochwald, T. Pratt, and A. Striegel)

3. co-PI, Huawei, $181,217 for "Research on Channel Estimation Technologies based on AoA/AoD in High Frequency Wireless Communication Systems", 6/2015–6/2016 (with B. Hochwald)

4. co-PI, IBM, $30,000 for "Wireless Stadium Research - Ad Hoc Video Pilot", 11/2015-10/2016 (with A. Striegel)

5. PI, InterDigital, $40,000 for "BWAC@NDWI Membership", 8/2015–7/2016 (with B. Hochwald, T. Pratt, and A. Striegel)

6. PI, Laboratory for Telecommunication Sciences, $80,001 for "BWAC@NDWI Membership", 8/2015–7/2016 (with B. Hochwald, T. Pratt, and A. Striegel)

Past Grants

1. Senior Personnel, Indiana Twenty-First Century Research and Technology Fund, $300,000 for "Indiana Center for Wireless Communications and Networking", 5/2003–5/2005 (with T. Fuja, D. Costello, and Y-F. Huang)

2. PI, Oak Ridge Associated Universities Ralph E. Powe Junior Faculty Enhancement Awards Program, $10,000 for "Source-Channel Diversity Methods for Wireless Communications", 6/2003–6/2004

3. co-PI, National Science Foundation, $299,993 for "SENSORS: Theory and Practice of Sensor Network Architectures", 9/2003–9/2006 (with M. Haenggi)

4. PI, University of Notre Dame, $9,177 for "Building 'Crystal Radio Sets' in Open-Source Software for Research, Education, and Outreach", 4/2005–3/2006

5. co-PI, National Science Foundation, $6,000 for "REU Supplement to 'Sensors: Theory and Practice of Sensor Network Architectures' ", 6/2005–6/2006 (with M. Haenggi).

6. co-PI, Motorola University Partnerships in Research, $67,220 for "Coding/Routing Interaction in Mesh Networks", 08/2005–07/2008 (with T. Fuja and D. Costello)

7. PI, National Science Foundation, $484,709 for "Delay-Constrained Multihop Transmission in Wireless Networks: Interaction of Coding, Channel Access, and Routing", 7/2005–6/2008 (with M. Haenggi, T. Fuja, and D. Costello)

8. PI, National Science Foundation, $456,371 ($400,002 sponsor & $56,369 university cost-share) for "CAREER: Towards a Renaissance in Finite-Blocklength Information Theory", 3/2006–2/2013

9. PI, National Institute of Justice, $606,192 ($550,000 sponsor & $56,192 university cost-share) for "Software-Defined Radio Technologies for Justice and Public Safety Communications", 9/2006-9/2011

10. PI, National Science Foundation, $441,824 ($400,000 sponsor & $41,824 university cost-share) for "Collaborative Research: NeTS-ProWin-NBD: A New Taxonomy for Cooperative Wireless Networking", 9/2006-8/2011 (with A. Scaglione, Z. Haas, and M. Gastpar)

11. co-PI, Crane Naval Surface Warfare Center, $3,951,537 ($3,684,537 sponsor & $267,000 university cost-share) for "Networked Sensing in Built and Natural Environments", 11/2006-11/2009 (with J.W. Talley, P.H. Bauer, M. Haenggi, M.D. Lemmon, T.L. Kijewski-Correa, and P.J. Antsaklis)

12. co-PI, National Science Foundation, $150,000 for "SystemWare: Retooling Systems Instruction in Electrical Engineering", 1/2008–12/2009 (with T. Fuja and M. Haenggi)

13. co-PI, Department of Defense, $259,874 for "NDMesh: A Testbed for Experimental Research and Education on Wireless Mesh Networks", 4/2008–3/2009 (with C. Poellabauer and A. Striegel)

14. PI, NVIDIA Corporation, $25,000 for "Hybrid CPU / GPU Software Radio Framework", 4/2009-3/2010

15. PI, Department of the Navy, $22,529 for "Software Tools for Power-Efficient Programming of Multi-Core Digital Signal Processors", 6/2009-4/2010 (subcontract through RFware LLC)

16. co-PI, National Science Foundation, $180,000 for "A Composable Hardware/Software Architecture for Instruction on Wireless Systems and Networks", 7/2010-6/2013 (with C. Poellabauer and M.B. Blake)

17. co-PI, GE Energy, $199,817 for "Coupling Low-Voltage Microgrids into Mid-Voltage Distribution Systems", 4/2011-4/2012 (with Y.-F. Huang, T. Pratt, K. Sauer, V. Gupta, and M. Lemmon)

18. PI, National Science Foundation, $381,155 for "CIF: Small: A Stochastic Approximation Approach to Network Communication with Feedback", 9/2009–8/2013 (with V. Gupta)

19. PI, National Science Foundation, $473,132 for "CCF: Small: Sensing-Based Dynamic Spectrum Access Networks: Modeling, Algorithms, & Experimental Validation", 9/2011–8/2014

20. PI, National Science Foundation, $14,554 for "Planning Grant: I/UCRC in Broadband Wireless Technologies and Applications", 3/2013–2/2014 (with B. Hochwald, A. Striegel, and M. Haenggi)

21. PI, Alcatel-Lucent, $40,000 for "BWAC@NDWI Membership", 8/2014–7/2015 (with B. Hochwald, T. Pratt, and A. Striegel)

22. PI, InterDigital, $40,000 for "BWAC@NDWI Membership", 8/2014–7/2015 (with B. Hochwald, T. Pratt, and A. Striegel)

23. PI, Laboratory for Telecommunication Sciences, $74,960 for "BWAC@NDWI Membership", 8/2014–7/2015 (with B. Hochwald, T. Pratt, and A. Striegel)

24. PI, Office of Naval Research, $49,661 for "BWAC@NDWI Membership", 8/2014–7/2015 (with B. Hochwald, T. Pratt, and A. Striegel)

25. PI, Sprint, $40,000 for "BWAC@NDWI Membership", 8/2014–7/2015 (with B. Hochwald, T. Pratt, and A. Striegel)

26. PI, National Instruments, $7,041.59 for "Wireless Innovation Workshop", 4/2015

27. PI, MIT Lincoln Laboratory, $85,029 for "Models, Theory, and Algorithms for Communication in the Presence of General Interference", 8/2014-8/2015

Presentations

Tutorials and Short Courses

1. "Theory and Strategies for Cooperative Communications", Three-hour tutorial at ISIT 2007, Nice, France (with G. Kramer)

2. "Communications Architecture for Wireless Relays: A Short Tutorial", One-hour tutorial at the Symposium on Information Theory in the Benelux 2009, Eindhoven, Netherlands

Invited Lectures

1. "Cooperative Diversity in Wireless Networks: Combating Multipath Fading using Multiple Protocol Layers"

    - Department of Electrical Engineering, University of Notre Dame, Notre Dame, IN, March 9, 2002
    - Department of Electrical Engineering, University of Missouri, Columbia, MO, April 4, 2002
    - Department of Electrical & Computer Engineering, University of Illinois, Urbana-Champaign, IL, May 1, 2002

2. "RF Communications 101: Combating Noise, Propagation Effects, and Interference", Institute for Defense Analysis (IDA), Alexandria, VA, March 14, 2003

3. "Source-Channel Diversity Approaches for Multimedia Communication"

- Department of Electrical & Computer Engineering, The Ohio State University, Columbus, OH, February 3, 2004
- Department of Electrical & Computer Engineering, Northwestern University, Evanston, IL, February 11, 2004
- Department of Electrical & Computer Engineering, University of Toronto, Toronto, Canada, March 8, 2004
- Distinguished Seminar Series, Department of Electrical & Computer Engineering, University of Waterloo, Waterloo, Canada, March 9, 2004

4. "Cooperative Diversity in Wireless Networks: Algorithms and Architectures"

    - Coding & Signal Transmission Group, Department of Electrical & Computer Engineering, University of Waterloo, Waterloo, Canada, March 8, 2004
    - MIT Lincoln Laboratory, Lexington, MA, May 12, 2004

5. "Wireless Communications Architecture Research at Notre Dame", Philips Research USA, Briarcliff Manor, NY, June 9, 2005

6. "The Role of Temporal Correlation in Communication over Fading Channels: An Exploration from Low to High SNR"

    - Bell Labs, Lucent Technologies, Murray Hill, NJ, August 18, 2005
    - WINLAB, Rutgers University, Piscataway, NJ, August 19, 2005
    - Department of Electrical Engineering and Computer Science, Yale University, New Haven, CT, October 20, 2005

7. "Resurrecting Finite Blocklength Information Theory for Analysis and Design of Wireless Network Architectures", Distributed Communications Group, Intel Research, Santa Clara, CA, April 15, 2006

8. "State-Dependent Multiaccess Channels with Some Informed Encoders", Department of Electrical and Computer Engineering, Rice University, Houston, TX, April 5, 2007

9. "Wireless Relays: From Multihop to Cooperative Diversity",

    - Cooperative Wireless Networks Workshop, Intel Research, Santa Clara, CA, April 12, 2006
    - Departmento de Ciência de Computadores, Universidade do Porto, Porto, Portugal, June 15, 2007
    - Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Barcelona, Spain, July 20, 2007
    - Fakultät für Elektrotechnik und Informationstechnik, Technischen Universität München (TUM), München, Germany, July 24, 2007
    - Broadband Communications and Wireless Systems (BCWS) Centre, Department of Systems and Computer Engineering, Carleton University, Ottawa, Canada, September 21, 2007
    - Research Seminar on Smart Antennas and Cooperative Communications, The Institution of Engineering and Technology, London, United Kingdom, October 22, 2007

10. "Asymmetry in State-Dependent Networks"

    - Départment d'Électricité, Université Catholique de Louvain, Louvain-La-Neuve, Belgium, July 12, 2007
    - Faculté Informatique et Communications, Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland, July 16, 2007
    - Departement Informationstechnologie und Elektrotechnik, Eldgenössische Technische Hochschule (ETH), Zürich, Switzerland, July 26, 2007

11. "RadioWare: Four Years of 'Software Radio' and Applications", Microsoft Research Cognitive Wireless Networking Summit, Seattle, WA, June 5, 2008

12. "Interoperable Communications Technology and Policy", Harvard Kennedy School Executive Session on Policing, Cambridge, MA, June 20, 2008

13. "Communications Architecture for Wireless Relays", iCORE Wireless Research Laboratory, Department of Electrical and Computer Engineering, University of Alberta, Edmonton, Canada, February 6, 2009

14. "Information Theory and Secure Communications Architecture"

    - Department of Electrical and Systems Engineering, Washington University, St. Louis, MO, February 27, 2009
    - Signals, Information, and Algorithms (SIA) Laboratory, Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, April 6, 2009
    - Division of Engineering and Applied Sciences, Harvard University, Cambridge, MA, April 9, 2009
    - Center for Information Science and Engineering (CISE), Department of Electrical and Computer Engineering, Boston University, Boston, MA, April 10, 2009
    - Department of Electrical and Computer Engineering, Texas A&M University, College Station, TX, April 14, 2009
    - Department of Electrical and Computer Engineering, University of Texas, Austin, TX, May 1, 2009
    - Forschungszentrum Telekommunikation Wien (FTW), Vienna Austria, June 3, 2009

15. "Relays Diversified", Edward van der Meulen Seminar on Relay Communication, Technische Universiteit Eindhoven, Eindhoven, Netherlands, May 27, 2009

16. "Experimental / Applied Wireless Research with Software-Defined Radio", Fort Wayne Wireless School, Indiana University-Purdue University Fort Wayne (IPFW), Fort Wayne, IN, June 18, 2009

17. "The Importance of Communications Architecture", Fakultät für Elektrotechnik und Informationstechnik, Technischen Universität München (TUM), München, Germany, November 5, 2009

18. "Sequence Detection Algorithms for Spectrum Sensing in Wireless Networks with Dynamic Spectrum Access"

    - Department of Electrical and Computer Engineering, Boston University, Boston, MA, April 22, 2010
    - Department of Electrical and Systems Engineering, University of Pennsylvania, Philadelphia, PA, March 15, 2011
    - Department of Electrical and Computer Engineering, Purdue University, West Lafayette, IN, November 10, 2011
    - Department of Electrical and Systems Engineering, Washington University, St. Louis, MO, March 16, 2012
    - Department of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, November 12, 2012
    - MIT Lincoln Laboratory, Lexington, MA, April 25, 2013

19. "Perspectives on Wireless Innovation in Academia", College of Engineering, Auburn University, Auburn, AL, August 25, 2014

20. "The Notre Dame Wireless Institute", Department of Electrical and Information Technology, Lund University, Lund, Sweden, September 28, 2015

Conference Presentations and Demonstrations

1. D. Chen and J. N. Laneman, "Achieving the Diversity-Multiplexing Tradeoff of the Multi-Access Relay Channel," in *MSRI Workshop on Mathematics of Relaying and Cooperation in Wireless Networks*, Berkeley, CA, Apr. 2006.

2. D. Chen and J. N. Laneman, "Diversity and Multiplexing in Multiuser Relay Channels," in *Proc. IEEE Comm. Theory Workshop*, Dorado, Puerto Rico, May 2006, invited presentation.

3. J. N. Laneman and J. Barros, "Rate-Equivocation Tradeoffs for General Eavesdropper Channels," in *Proc. Workshop on Information Theory and its Applications (ITA)*, San Diego, CA, Jan. 2007, invited presentation.

4. G. J. Bradford, B. P. Dunn, M. L. Dickens, Z. Sun, and J. N. Laneman, "Demonstration of Cooperative Diversity using a Custom Software-Defined Radio Prototype," in *Proc. ACM Int. Symp. on Mobile Ad Hoc Net. and Comp. (MobiHoc)*, New Orleans, LA, May 2009.

5. P. Rost, G. Fettweis, and J. N. Laneman, "Broadcast and Interference in Relay-Assisted Next-Generation Cellular Systems," in *Proc. IEEE Comm. Theory Workshop*, Napa Valley, CA, May 2009.

6. Z. Sun, G. J. Bradford, and J. N. Laneman, "Demonstration of Sequence Detection Algorithms for Dynamic Spectrum Access Networks," in *Proc. IEEE Int. Dynamic Spectrum Access Networks (DySPAN) Symp.*, Singapore, Apr. 2010.

Course Instruction and Development

Courses marked with "*" were either newly created or underwent significant development.

EE-563 – Random Variables and Stochastic Processes
Fall 2002

EE-698G / 87005 – Advanced Topics in Multiuser Communications *
Spring 2003, Fall 2006

EE-60563 – Random Vectors, Detection, & Estimation *
Fall 2003, Fall 2004

EE-354 / 30354 – Signals & Systems II
Spring 2004, Spring 2005, Spring 2006, Spring 2007

SC-190 – University Seminar on Nanotechnology
Guest Lecturer, Fall 2004

EE-80653 – Information Theory *
Fall 2005, Fall 2009, Fall 2015

EE-87109 – Advanced Topics in Information Theory *
Fall 2007

EE-60573 – Random Processes, Detection, and Estimation *
Spring 2008, Spring 2013

EE-60553 – Advanced Digital Communications *
Spring 2010, Spring 2011, Spring 2014, Spring 2015

ESTS/BAUG-40402 – Wireless Communications Survey *
Spring 2010, Spring 2012

EE-40453 – Communication Systems *
Fall 2010, Fall 2011, Fall 2012, Spring 2016

EE-87029 – Advanced Topics in Wireless Communications *
Fall 2013

Professional Service

Officer:	IEEE Information Theory Society Board of Governors, 2011–present IEEE Information Theory Society Online Editor, 2006–2010
Assoc. Editor:	*IEEE Trans. on Commun.* for "Cooperative Diversity", 7/2008–6/2011
Guest Editor:	*IEEE Trans. on Information Theory* Special Issue on Models, Theory and Codes for Relaying and Cooperation in Communication Networks, October 2007
	IEEE Journal on Selected Areas in Communications Special Issue on Cooperative Communications and Networking, February 2007

Conference Chairman: IEEE DySPAN, Baltimore, MD, April 2017

Workshop Organizer and Chair:

Mathematical Science Research Institute (MSRI) Workshop on Mathematics of Relaying and Cooperation in Communication Networks, Berkeley, CA, April 10-12, 2006

Technical Program Committee Member:

IEEE DySPAN 2015, Stockholm, Sweden, 2015
IEEE Workshop on Shared Spectrum Access for Radar and Communications (SSPARC), McLean, VA, 2014
IEEE Information Theory Workshop, Seville, Spain, 2013
IEEE Global Commun. Conf. (GLOBECOM), Anaheim, CA, 2012
IEEE Int. Commun. Conf. (ICC), Ottawa, 2012
IEEE Information Theory Workshop (ITW), Paraty, 2011
Int. Conf. Cognitive Radio Oriented Wireless Networks and Commun. (CrownCom), Hannover, 2009
IEEE Information Theory Workshop (ITW), Taormina, 2009
Symp. Model. & Opt. Mob. Ad-Hoc Wireless Net. (WiOpt), Seoul, 2009
IEEE Int. Symp. Inform. Theory (ISIT), Seoul, 2009
IEEE Int. Commun. Conf. (ICC), Dresden, 2009
IEEE Int. Symp. Inform. Theory (ISIT), Toronto, 2008
Symp. Model. & Opt. Mob. Ad-Hoc Wireless Net. (WiOpt), Berlin, 2008
IEEE Global Commun. Conf. (GLOBECOM), Washington, DC, 2007
IEEE Int. Conf. Wireless Net. & Comm. (WirelessCom), Vancouver, 2006
IEEE Wireless Commun. and Net. Conf. (WCNC), Las Vegas, 2006
IEEE Int. Conf. Wireless Net. & Commun. (WirelessCom), Maui, 2005
IEEE Signal Proc. Apps. for Wireless Commun. (SPAWC), New York, 2005

Session Organizer and Chair:

IEEE Information Theory Workshop (ITW), "Cooperative Wireless Networks", Taormina, 2009
IEEE Int. Workshop on Comp. Adv. in Multi-Sensor Adaptive Proc. (CAMSAP), "Distributed Signal Processing", St. Thomas, 2007
Asilomar Conf. on Signals, Systems, and Computers, "Cooperative Diversity", Monterey, 2007
IEEE Int. Symp. Inform. Theory (ISIT), "Recent Results", Seattle, 2006
IEEE Int. Symp. Inform. Theory (ISIT), "Recent Results", Seattle, 2006
IEEE Int. Workshop on Comp. Adv. in Multi-Sensor Adaptive Proc. (CAMSAP), "Cooperative Sensor Networks", Puerto Vallarta, 2005

Reviewer:

EURASIP Journal on Communications and Networking
European Transactions on Telecommunications
IEEE Communications Letters
IEEE Communications Magazine
IEEE Journal on Selected Areas in Communications
IEEE Signal Processing Letters
IEEE Transactions on Automatic Control
IEEE Transactions on Circuits and Systems II

IEEE Transactions on Communications
IEEE Transactions on Information Theory
IEEE Transactions on Signal Processing
IEEE Transactions on Vehicular Technology
IEEE Transactions on Wireless Communications
NOW Foundations and Trends in Networking
Proceedings of the IEEE
The Computer Journal
Elec. Telecomm. Res. Inst. (ETRI) Journal
IEEE Int. Symp. on Model., Anal., & Sim. of Wireless and Mob. Sys. (MSWiM)
IEEE Global Communications Conference (GLOBECOM)
IEEE Infocom
IEEE Information Theory Workshop (ITW)
IEEE Int. Communications Conf. (ICC)
IEEE Int. Conf. on Acoustics, Speech, & Sig. Proc. (ICASSP)
IEEE Int. Conf. on Wireless Net. & Comm. (WIRELESSCOM)
IEEE Int. Symp. on Information Theory (ISIT)
IEEE Military Communications Conf. (MILCOM)
IEEE Workshop on Sig. Proc. Adv. in Wireless Comm. (SPAWC)
IEEE Vehicular Technology Conf. (VTC)
IEEE Wireless Communications & Networking Conf. (WCNC)
Int. Conf. on Broadband Networks (BROADNETS)

Committee Member:

IEEE Information Theory Society James L. Massey Award Committee, 2015–present
IEEE Information Theory Society External Nominations Committee, 2015
IEEE Information Theory Society Membership and Chapters Committee, 2011–2014
IEEE Information Theory Society Online Committee, 2007–present
IEEE Information Theory Society Chapter Award Sub-Committee, 2006, 2011, 2012

Panelist: Army Research Office Reviewer
National Institute of Justice Scientific Review Panel
National Science Foundation Panelist

Member: Institute of Electrical and Electronics Engineers (IEEE)
IEEE Information Theory Society
IEEE Communications Society
IEEE Signal Processing Society
American Society for Engineering Education (ASEE)
Sigma Xi
Eta Kappa Nu
Tau Beta Pi

University Service

University

Provost Faculty Fellow, 2012–2014
Faculty Digital Learning Steering Committee, 2014–present
Faculty Advisory Board, Hesburgh Program in Public Service, 2012–2015
Committee on Multi-Disciplinary Research, 2011–2013
Committee on Research and Sponsored Programs, 2010–2013

College of Engineering

Computing Committee, 2007–2013

Department of Electrical Engineering

Appointments and Promotions Committee, 2014–2015
Computing Committee, 2003–present
Faculty Search Committee, 2009–2010
Graduate Admissions Committee, 2002–2003, 2006–2007, 2012–2013
Graduate Committee, 2006–2008, 2013–2015
IEEE Student-Branch Advisor, 2003–2008
Undergraduate Committee, 2003–2005, 2007–2008, 2009–2011, 2015–2017
Undergraduate Advising, 2003–2006