Dr. Bryant T. Wysocki

Education:

- **USAF Air War College**, Currently Enrolled: Estimated Completion Date: Dec 2018
- **PhD in Electrical and Computer Engineering** (2011), Cornell University, Ithaca, NY
  Secondary PhD concentration: **Engineering Management**
- **Measurement and Signature Intelligence Graduate Certification, MASINT** (2005)
  Air Force Institute of Technology, WPAFB, OH
- **MS Engineering Physics** (2005), Air Force Institute of Technology, (R&D Award)
- **BS in Electrical Engineering** (2001), West Virginia University, (Magna Cum Laude)
- **BS in Computer Engineering** (2001), West Virginia University, (Magna Cum Laude)

Acquisition Professional Development Program Certifications:

- Member Acquisition Corps Professional
- DoD Acquisitions Certified in Engineering Level 3
- DoD Acquisitions Certified in Science and Technology Management Level 3

Work Experience:

Feb 15 – Present: Chief Engineer AFRL Information Directorate, DR-IV, Series: 0801,
Air Force Research Laboratory (AFRL) Information Directorate, Rome, NY
Directorate leadership team ~1200 on-site personnel
Position Scope: Directly responsible for development and implementation of engineering policies, processes, regulation compliance, R&D vision, program oversight, workforce development, and deployment strategies for C4I and Cyber Systems across the Tech Directorate's (TD) $1.6B+ budget involving ~1200 on-site personnel, ~600 S&T contractual efforts, and 100+ national and international partners.
Duties and accomplishments: Provides authoritative engineering and technical leadership as Chief Engineer and member of the Directorate Top 4 which also includes the Director, Chief Scientist, and Deputy Director. In this capacity, I providing senior-level management of all science and technology efforts within the lab's C4I and cyber portfolio with emphasis on innovation, security, interoperability, and integration into AF and joint weapons systems and networks. I also sit on the Management Council where I optimize the coordinated development of S&T programs, facilities, and personnel to enhance nearly 60 S&T programs across three sites and 32 laboratories. Additionally serves on the Directorate Technology Council, the authoritative TD S&T review body, by leading strategy to task within the organization's four Core Technical Competencies of: 1. Cyber Science, 2. Communications and Dissemination, 3. Autonomy C2 and Decision Support, and 4. Processing and Exploitation. Provides executive leadership as Chair of Technical Review Board and approval authority for all directorate

operational tests and demonstrations. As TD Security Engineering Lead, I developed the first AFRL policy on system security engineering and cyber resiliency with the creation of a Directorate Cyber Vulnerability Assessment Team and supporting guidance, AFRL/RI OI 61-104. This effort was highlighted as a TD strength in the FY 2018 Scientific Advisory Board Review. I chair the Business Process Working Group and led efforts to streamline the investment strategy processes saving over 2000 hours of cumulative workforce effort per year. Led AFRL collaborations with the Cyber Resiliency Steering Group and Cyber Resiliency Office for Weapons Systems by coordinating the development of mission thread analysis methodologies, direct support of NDAA 1647, and through the development of cyber tools for vulnerability assessments. Additionally serves on the AFRL Engineering Council which oversees the systems engineering, program management, and technology deployment of over $3.7B in DoD projects across 9 national AFRL Directorates. Represents AFRL and influences high-level leadership across government, academic, and industrial partners with experience in public speaking, international event planning, leading cross-organizational teams, and interfacing with congressional and government leaders. My efforts have directly contributed to the Information Directorate's status as a national asset and leader for the AF in intellectual property development, warfighter transitions, patents, licenses, technology transfer, and start-up business development. I lead engineering for the nation's premier C4I and cyber research laboratory.

May 12 – Feb 15 Technical Lead Neuromorphic Computing, Rank: DR-III, Series: 0855, AFRL Information Directorate, Rome, NY. Led multiple teams (up to 20 SMEs).
Position Scope: Led AFRL/RI's Computational Intelligence R&D Team and built an impactful and internationally recognized program in the areas of machine learning, nano electronics, hardware security, and neuromorphic computing for big data processing & exploitation.
Duties and accomplishments: Directed team of 9+ S&Es and executed over $1.5M of AFRL funded R&D through collaborations and partnerships in the DoD, academia, and industry. Also served as DARPA-appointed Contracting Office's Representative for the Physical Intelligence and Synapse programs valued together at over $27.5M resulting in new high performance computing (HPC) architectures currently undergoing flight testing through AFRL for intelligence applications using HPCs at the tactical edge. Co-inventor on patent for cyber-security hardware to reduce supply chain risks. Represented AFRL internationally at workshops and conferences focused on C4I and cyber technologies while building strong collaborations in neuromorphic computing across organizations such as National Security Agency (NSA), Army Research Laboratory, Sandia National Laboratories, national universities, and within AFRL. Oversaw an additional $1.5M+ OSD-funded effort with Nobel Prize winning team at the Neuro Science Institute--resulted in a new class of spiking neuron models for autonomous systems. In 2015, we published the world's first ever demonstration of hardware temporal encoding for information processing and fusion, which is now the foundation of the first operational analog integrated circuit (IC) delayed feedback reservoir computing system. This combined work laid the foundation for what is now a flagship AFRL effort with a cumulative budget over $25M, maturing hardware based machine learning from basic science to operational application. I authored 4 successfully funded proposals and likewise led 17 professional events and published 22 peer reviewed journal and conference papers, one patent, plus additional technical book chapters during this time.

Sep 11 – May 12 **Technical Lead - Computational Intelligence Group - BAH Corporate Science Team,** Booz Allen Hamilton (BAH), Rome, NY. **Position Scope:** Led C4I and Cyber for the Corporate Basic Science Team comprised of 21 PhD level scientists whose technical expertise is recognized throughout the defense, civil, and security government agencies.
Sep 9 – Aug 11 **Chief - Integration and Transition Branch,** AFRL Information Directorate, Rome, NY. **Position Scope:** Led multiple teams (up to 25 SMEs) and an 11 member research branch in the R&D of advanced computer architectures for C4I processing and exploitation spanning over $16M in developmental programs
Nov 8 – Sep 9 **Deputy Chief - Electro-Optic Components Branch,** AFRL Sensors Directorate, Rome, NY, **Position Scope**: Organized and led branch of 20 people across two sites: responsible for all R&D programs, personnel, and equipment and directed operations of remote site: 10 people, 12 labs, $40M state-of-art facility, $4M annual budget. Led BRAC Realignment.
Jun 05 – Oct 07 **Quantum and Photonics Research Engineer**, AFRL Sensors Directorate, Rome, **Position Scope**: - Managed 10 person $3M in-house electro-optic component development program, planned and executed experiments for the advancement of ISR systems, designed and demonstrated the world's most stable pulsed erbium laser for Laser Radar use
Aug 03 – Jun 05 **Graduate Student/Officer,** AFIT, Department of Engineering Physics, WPAFB, Dayton, OH, **Position Scope**: Led 5 member multidisciplinary research team (AFRL/Raytheon). First to theoretically predict and experimentally verify electron/hole transport behavior in IR detectors under extreme excitation / laser jamming, Research Excellence Award
Aug 01 – Aug 03 **Lead Spacecraft Engineer,** 4th Space Operations Squadron, Air Force Space Command, Schriever Air Force Base, CO, **Position Scope**: Directed 10 military and contractor engineers in support and operation of the $31B Milstar Satellite Constellation
Jan 98 – May 01 **Engineering Student/Active Duty Military Scholarship/Fellowship** USAF Air Education and Training Command at West Virginia University, Morgantown, WV **Position Scope**: Airman Education and Commissioning Program Fellowship, MSEE & MSCpE
Sep 93 – Jan 98 **Nuclear Weapons Maintenance Technician,** 509 Bomb Wing: B-2 Program, WAFB, Knob Noster, MO, **Position Scope:** Performed and managed maintenance, inspection, storage, handling, modification, accountability and repair of nuclear weapons, weapon components, and specialized test equipment, Hand selected for first B-2 support team
Sep 91 – Sep 93 **Nuclear Weapons Maintenance Team Member,** Unites States Air Force Europe (USAFE)/NATO, Ghedi Air Base, Italy, **Position Scope:** Managed the maintenance and inspection of all specialized weapons, equipment, and facilities, supported NATO strike mission

Patent:
U.S. Patent 8,680,90, McDonald, N., Van Nostrand, J.E., Wysocki, B.T., Bishop, S.M. and Cady, N.C., The United States of America, 2014. ***Hardware based random number generator***.

Selected Publications: ***(10 of 34 provided due to space prioritization)***
Shafin, R., Liu, L., Ashdown, J., Matyjas, J., Medley, M., Wysocki, B., Yi, Y. 2018, *Realizing Green Symbol Detection Via Reservoir Computing*: An Energy-Efficiency Perspective, IEEE ICC 2018 Green Communications Systems and Networks Symposium. Best Paper Award

Merkel, C., Kudithipudi, D., Suri, M. and Wysocki, B., 2017. *Stochastic CBRAM-Based Neuromorphic Time Series Prediction System*. ACM Journal on Emerging Technologies in Computing Systems

Zhao, C., Wysocki, B.T., Thiem, C.D., McDonald, N.R., Li, J., Liu, L. and Yi, Y., 2016. *Energy efficient spiking temporal encoder design for neuromorphic computing systems*. IEEE Transactions on Multi-Scale Computing Systems

Kudithipudi, D., Saleh, Q., Merkel, C., Thesing, J. and Wysocki, B., 2016. *Design and analysis of a neuromemristive reservoir computing architecture for biosignal processing.* Frontiers in neuroscience

Rajendran, J., Karri, R., Wendt, J.B., Potkonjak, M., McDonald, N., Rose, G.S. and Wysocki, B., 2015. *Nano meets security: Exploring nanoelectronic devices for security applications.* Proceedings of the IEEE

Zhao, C., Wysocki, B.T., Liu, Y., Thiem, C.D., McDonald, N.R. and Yi, Y., 2015. *Spike-time-dependent encoding for neuromorphic processors.* ACM Journal on Emerging Technologies in Computing Systems

Wysocki, B., McDonald, N., Thiem, C., Rose, G. and Gomez, M., 2014. *Hardware-based computational intelligence for size, weight, and power constrained environments*. In Network Science and Cybersecurity (pp. 137-153). Springer

Wysocki, B., McDonald, N., Thiem, C., Renz, T. and Bohl, J., 2014. *Neuromorphic Computing for Very Large Test and Evaluation Data Analysis*. AIR FORCE RESEARCH LAB ROME NY INFORMATION DIRECTORATE.

Bucklew, V., Wysocki, B., & Pollock, C. (2012). *Femtosecond carrier dynamics in photoexcited highly ordered pyrolytic graphite films*. Optical Materials

Wysocki, B.T. and Marciniak, M.A., 2008. *Discrimination between electronic and optical blooming in an InSb focal-plane array under high-intensity excitation*. Infrared Physics & Technology

Selected Special Awards – Limited to C4I and Cyber specific recognition

- **Exemplary Civilian Service Award** (2018) - Distinguished leadership to advance the state of the art in Command & Control, Computers, Communications, Cyber and Intelligence (C5I) technology
- **AFRL Critical Engineering Position Leadership Recognition** (2017) - Outstanding contributions in systems engineering and science and technology program leadership
- **IEEE Leadership Award** (2016) - Awarded for exceptional engineering leadership in the local, national, and international levels
- **AFRL Notable Achievement Awards** (9 time recipient: 2013-2015) – Awarded for outstanding contributions to the Air Force Research Laboratory mission
- **Air Force Office of Scientific Research Star Team Award** (2014) - Excellence in basic research performed within AFRL's nine technology directorates
- **MVEEC Engineer of the year Award** (2014) - Awarded by the Mohawk Valley Engineers Executive Council for outstanding scientific and community leadership

- **AFRL Scientific/Technical Achievement Award** (Individual 2013) - Conferred for notable and distinguished in-house technical achievements across all AFRL directorates
- **AFRL/RI Basic Research Award** (2013) - Given for outstanding advancements in basic research with the Information Directorate
- **AFRL/RI Research and Technology Team Award** (2013) - Awarded to the Information Directorate team that has demonstrated the most outstanding in-house R&D
- **Major General John C. Toomay Award** (2011) - Conferred annually for scientific advancements, increased operational capability, or significant test achievements, that are clearly outstanding and of exceptional value to AFRL/RI
- **The Air Force Meritorious Service Medal** (2011) – Leadership in support of AFRL
- **USAF Scientific Achievement Award** (Four time recipient 2006-2009) - For scientific or technological accomplishments contributing to the armed services and the public
- **Academic Research Excellence Award** (2005) - The International Association of Old Crows: awarded for outstanding research in the science and practice of Electronic Warfare (EW), Information Operations (IO), and related disciplines

Select External Activities:

I am an adjunct professor at the State University of New York (SUNY) Polytechnic Institute where I taught nanoelectronics and sponsored students to conduct AFRL relevant research. I am currently a member of the University of Pittsburg's Swanson Scholl of Engineering Board of visitors where I provide direct input to university leadership on curriculum development, technology trends, and AFRL requirements for future science and technology leaders. I also served (2011-2014) on the Regional Board of Directors and STEM Coordinator for the Cornell Cooperative Extension and affiliated Oneida County 4-H Youth Development Organization. I published 34 refereed journal and conference papers and four technical book chapters with extensive experience leading and organizing international technical events to include the following recent activities:

- Program Committee, 19th International Conference on Neural Information Processing (ICONIP 2012)
- Conference organizer and Session Chair, International Network Science and Reconfigurable Systems for Cybersecurity (NSRC) Conference (2012)
- Conference Committee Member, SPIE Photonic Applications for Aviation, Aerospace, Commercial, and Harsh Environments V, (2013-2014)
- Special Session Chair, Neuromorphic Science and Technology for Cybersecurity, International Joint Conference on Neural Networks (2013)
- Conference Organizer & Workshop Lead, AFCEA C4I Technology Review Days (2014)
- Session Chair and Expert Panel Member on strategic vision, SPIE Defense-Security-and Sensing (2014)
- General Chair of IEEE International Symposium on Computational Intelligence for Security and Defense Applications (2015)
- Conference Session Organizer, SPIE Machine Intelligence and Bio-inspired Computations (2013-2014-2015)
- Guest Editor for SPIE Optical Computing Journal, Quantum Communication and Computations (2017)

- Special Session Chair on Reservoir Computing, International Joint Conference on Neural Networks (2017)

I am a sought after public speaker on science and innovation. In addition to technical conference presentations, I am an AFRL spokesperson at national and International leadership events. A sample of my recent talks are shown below:

- Expert panel member, 3rd International Conference on Computing for Geospatial Research and Applications (2012)
- Invited Speaker, Sandia National Laboratories, AFRL/RI in-house research
- Invited Plenary Speaker, Early Childhood Educators Conference (2014)
- Invited Plenary Keynote, Cyber-Sci DoD Industry Conference (2014)
- Invited Tutorial Speaker, Designing STEM Activities to Compliment Neural Development in Children, NY State Union of Teachers Conference (2014)
- Invited Speaker & Expert Panel member, AFCEA 14th Annual Air Force IT Day (2015)
- Keynote speaker representing AFRL, Technology First 10th Annual Taste of IT! (2016)
- Invited Speaker on C4I and Cyber Innovation, AFCEA Boston New Horizons (2017)
- Distinguished Seminar Speaker, Technical Challenges in a Rapidly Evolving Domain, Boise State University (2018)