

## PAUL J. KOLODZY, PhD

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### ***Wireless Consultant – Kolodzy Consulting. (2004-)***

Dr. Paul Kolodzy is currently an independent telecommunications consultant to Government and commercial clients. He also consults on EO and RF sensing, electronic warfare, and ASW technologies. His areas of expertise include the development of advanced component, device, and system technology; advanced architectures; interference analysis; and spectrum policy, regulation and acquisition. Activities include start-up companies, large telecommunications service providers, equipment providers, and component developers. He has been active in broadcast; cellular including 700 MHz, AWS-1, AWS-3, and AWS4; and public safety spectrum policy and regulation. Current research includes the development of interference metrics for communication systems such as the interference temperature, interoperability between wideband data systems and DTV signals within US TV spectra, physical limitations of current device technologies and impact for spectrum policy, and dynamic spectrum policy.

Dr. Kolodzy has 14 years of supporting DARPA as a subject matter expert. This includes developing strategic plans, new start development (>100 successful new starts), Program Manager Recruiting (>40 PM hires), senior leadership strategies and presentations, technology investigations, and senior leadership recruiting.

Dr. Kolodzy is also currently a member of the National Research Council Panel on Counter-UAS; Founder and Executive Committee Member of the IEEE Dynamic Spectrum Access Network Symposium, and a member of the Commerce Spectrum Management Advisory Committee (FACA controlled). Former member of five NRC/NAS studies and FCC Technology Advisory Committee (FACA Controlled).

### ***Founder (2004), General Chair (2005), and Chair of Steering Committee (2004- ) of IEEE Dynamic Spectrum Access Network Conference***

The Dynamic Spectrum Access Network Symposium is a forum to discuss the advanced research and development of new methods to access the radio frequency spectrum for consumer, commercial, scientific, and government applications. Due to the complexities inherent in dynamic spectrum access, the research and development spans the technology, economic, policy and legal communities. DySPAN aims to provide an open forum to address the challenges and opportunities of new access techniques. 2005 conference drew 310+ participants, 2007 conference drew 300 participants. This is the premier conference for spectrum access and utilization technology research as well as policy and economic research for spectrum access.

***Director - Wireless Network Security Center, Stevens Institute of Technology. (2002 – 2004)***

Director of the Center for Wireless Network Security (WiNSeC) at Stevens Institute of Technology from November 2002 to August 2004. WiNSeC provides leadership in advanced technology to provide secure, interoperable wireless operations for consumer, commercial, financial, defense, and public safety applications under duress and within complex environments. This was the first center in the US specific to wireless network security which has grown to be a significant initiative with the US R&D funding agencies. Initiated the center and within 18 months obtained research grants from US Army Research and Development Centers and that National Science Foundation. Researched included new interoperability methods from multi-networking of disparate physical layers; wireless security using propagation artifacts for cryptographic protection; wireless security via multi-path tracking; and millimeter wave LAN technology. I was a member of the faculty in the schools of Engineering and Technology Management.

***Senior Spectrum Policy Advisor - Federal Communications Commission (FCC). (2002)***

Director of Spectrum Policy Task Force charged with developing the next generation spectrum allocation and licensing processes. A contentious topic that requires a thorough understanding of the impact of advanced technology, economic and business forces, as well as the legal authority. Extensive research was conducted into: 1) technology trends for communications systems that would impact spectrum policy within the next 10-15 years; 2) economics impact of communications technology and policy to determine the relationship between the spectrum policy and national economic benefit; 3) international spectrum policy trends and the determination of limitations of the statutes and international standards; and 4) proposed changes to US spectrum policy inclusive of the interference metrics and policy domains. Task Force output was a set of proposals to include changes to FCC rules and new legislative actions to significantly enhance the nation's ability to provide access to the spectrum at its highest and best use. The SPTF report is currently used as the blueprint for spectrum policy in the US as well as the template for other spectrum investigations around the world including Japan and Germany.

***Program Manager - Defense Advanced Projects Agency (DARPA) (1999-2002)***

Program Manager for communications programs to develop generation-after-next offensive and defensive capabilities. DARPA is world renown for the successful development of high risk, high payoff technologies and is commonly called the venture capital organization of the US Department of Defense. .

A successful program for the development, demonstration, and transition of a man-portable software definable radio prototype was accomplished. Incorporated the use of advanced materials, techniques, and leveraging, as well as coping, with advances in the commercial sector to develop the neXt Generation (XG) program. XG is a key enabling spectrum utilization project using dynamic frequency assignments that has profound impact to commercial and military spectrum policy. In addition, I developed and executed research projects in new materials for RF devices, software definable radios, cognitive radios, advanced electronic warfare projects. The SUO-SAS (small unit

operations – situation awareness system) research included peer-to-peer mobile ad-hoc networking; multi-QoS networks; and 20-2500 MHz physical layer radio. Initiated the research into the first multi-physical layer communications systems combining UHF and millimeter wave modems utilizing both omni and highly directional antennas.

***Director – Sanders, A Lockheed Martin Company (1996-1999)***

Director of Signal Processing and Strategic Initiatives and reported to the Vice President of Advanced Technology and Chief Technology Officer. Sanders was (recently sold to BAE) the premier electronic warfare company in the United States. Responsibilities included managing the advanced technology focused on Information Warfare, Electronic Warfare, and Signal Intelligence techniques. I directed research in advanced signal processing techniques for image processing for UV and infrared sensing; automated and multi-lingual speech processing; ultra-scalable multi-processor workstations; and multi-user detection of communications signals.

***Group Leader/Staff Member – Massachusetts Institute of Technology - Lincoln Laboratory (1985-1996)***

I held both staff and management positions in the area of Optical Systems for Laser Radars, Signal Processing, and Target Recognition for Acoustics, RF (SAR), and Optical signatures. I initiated research at MIT Lincoln Laboratory into automated image processing of laser radar imagery; multi-sensor fusion of laser radar, passive infrared, radar, and non-imaging sensors; neural network learning algorithms; advanced acoustic equalization algorithms incorporating both spectral and temporal trending; and automatic target recognition with acoustic and laser radar imagery.

***Education***

PhD, Chemical Engineering, 1986, Case Western Reserve University  
MS, Chemical Engineering, 1983, Case Western Reserve University  
BS, Chemical Engineering, 1983, Purdue University

***Awards***

Office of the Secretary of Defense: Exceptional Public Service Award, March 2002

***Synergistic activities***

Founding Member, Chair – Steering Committee – IEEE DySPAN Conference	2004-
Charter Member, Higher Education Wireless Access Consortium	2003-
Chairman, FCC Spectrum Policy Task Force	2002
Program-Committee Chair: National Symposium on Sensor and Data Fusion	1995-97

***Collaborators and other affiliations***

Member Commerce Spectrum Management Advisory Committee	2014-
Appointed to Enforcement Sub-Committee	2014-
Member, National Research Council Study on Active Sensing	2013-
Member, PCAST Study on Realizing the Full Potential Of Government-Held Spectrum to Spur Economic Growth,	2011-2012
Member, National Academy of Science Study on Scientific Uses of RF Spectrum	2007-2010
Member, National Academy of Science Study on Advanced Spectrum Policy	2003-2005
Appointed to the FCC Technology Advisory Committee	2003-2005
Member of IEEE	2002-
Member of AFCEA	2003-

### ***Presentations and Publications (partial)***

Bagley, Z. et al. *Hybrid optical radio frequency airborne communications*, Optical Engineering, Volume: 51 Issue: 5, May 2012

Stotts, L; Kolodzy, P; Pike, A; et al.; *Free-space optical communications link budget estimation*; Applied Optics Vol 49 Issue 28; Pages: 5333-5343; Oct 2010

Stotts, L; Andrews, L; Cherry, P.; et al.; *Hybrid Optical RF Airborne Communications*; Proceedings of the IEEE Vol 97 Issue: 6 Special Issue Pages: 1109-1127; JUN 2009

Pike H A; Stotts, L; P. Kolodzy, P; and Northcott, M; *Parameter Estimates For Free Space Optical Communications*, in Imaging and Applied Optics, OSA Technical Digest, Optical Society of America, 2011

Larry B. Stotts, Paul Kolodzy, Alan Pike, Buzz Graves, Dave Dougherty, and Jeff Douglass, *Free-space optical communications link budget estimation*, Appl. Opt. 49, 5333-5343, 2010

Stotts L, et al, *Hybrid Optical RF Communications*, Proceedings of the IEEE (Volume: 97, Issue: 6), 2009.

Newman T, et al. *Measurements and Analysis of Secondary User Device Effects on Digital Television Receivers*; EURASIP Journal on Advances in Signal Processing – Special Issue on “Dynamic Spectrum Access for Wireless Networking”, August 2009.

Stotts L, Seidel S, Krout T, and Kolodzy, P; *MANET GATEWAYS: Radio Interoperability via the Internet, not the Radio*, IEEE Communications Magazine, June 2008.

Kolodzy, P. *Dynamic Spectrum Management – Promises and Challenges*, Invited, Keynote Presentation to ISWCS (International Symposium on Wireless Communication Systems), Valencia, Spain, September 2006

Kolodzy, P. (Fette, B – editor) Chapter 2 - *Communications Policy and Spectrum Management*, in *Cognitive Radio Technology*, published by Elsevier, 2006.

Kolodzy, P. “*Interference Temperature: A Metric for Dynamic Spectrum Utilization*”, International Journal of Network Management, John Wiley & Sons, 2006.

Kolodzy, P. “*Dynamic Spectrum Policies: Promises and Challenges*”, CommLaw Conspectus, 2004

Kolodzy, P. “*FCC Spectrum Policy Task Force Report*”, [www.fcc.gov/sptf](http://www.fcc.gov/sptf), November 2001.

Kolodzy, P. “*The Future of Mobile Wireless Communications*”, Invited, Keynote Presentation to MobiCom 2003 (Mobile Computing and Communications Conference), San Diego, CA, September 2003

Kolodzy, P. “*Future Technology and Policy Challenges for Commercial Telecommunications*”, Invited, World-Class Expert Panel, Nokia Innovations Group, President and President-North American Strategy Meeting, Napa Valley, CA, October 2003

Kolodzy, P. “*Spectrum Management and Policy Directions for NSF*”, Invited, NSF Spectrum Working Group, Washington, DC, May 2003

Kolodzy, P. “*Spectrum Policy Challenges*”, Invited, Interchange Conference between FCC and Academic Researchers, Quello Center, December 2003

Kolodzy, P. Invited and Paid, Participation in the UK Spectrum Management Advisory Group, London October 2003

Kolodzy, P. “*Technology-Policy Interplay*”, Invited, IEEE Communications, in preparation.

Kolodzy, P. “*New Directions for Spectrum Management*, International Software Definable Radio Conference, London, June 2003

Kolodzy, P. “*The Promises and Challenges for Software Definable Radios*”, Invited, Military Radios Symposium, Washington DC, September 2003

Kolodzy, P. “*The role of cognitive radio on novel spectrum management*”, Invited (and paid) Speaker to European Commission, DG Information Society (INFSO), October, 2003

Kolodzy, P. (Chairman) *FCC Spectrum Policy Task Force Report*, [www.fcc.gov/sptf](http://www.fcc.gov/sptf), November 2002.

Kolodzy, P. *Technology and Future Spectrum Technology*, Keynote at World Wireless Congress 2002 Conference in San Francisco.

Kolodzy, P. *Advanced Communication Technology* presented at Wireless World Research Forum, March 2002.

Kolodzy, P. *Small Unit Operations Situational Awareness System (SUO SAS)* Presented at MILCOM 2001, October, 2001, Washington, DC.

Kolodzy, P. Multiple articles published with Signal Magazine (2000-2002) on technology under

my sponsorship in Transparent Antennas, Software Definable Radios, Electronic Warfare, and Opportunistic Spectrum Use.

Kolodzy, P. *Spectrum Policy: Technology Leading to New Directions*, Keynote at National Spectrum Manager Association (NSMA) 2002.

Kolodzy, P. *A DARPA Perspective on Broadband Wireless Systems* Presented at International Symposium on Advanced Radio Technologies, September, 2000, Boulder Colorado

Kolodzy, P. *Sensor/Data Fusion and Formal Methods* Presented at 1998 Annual CDSP Research Workshop