

Jonathan Wells, Ph.D., M.B.A.

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Wireless Communications Expertise

- Cellular Networks (2G, 3G, 4G, GSM, GPRS, EDGE, UMTS, WCDMA, HSPA, HSDPA, HPSA+, LTE and LTE-Advanced)
- Cellular Infrastructure Equipment (Base Stations, Backhaul and Handsets)
- Radio Frequency (RF), Microwave and MM-Wave Devices, Systems and Networks
- RF Design, including RF Assemblies, Subassemblies and Components
- Wireless Standards, Rules and Regulations (3GPP, 3GPP2, FCC, ETSI, CEPT)
- Intellectual Property, Patent Infringement and Litigation Support

Professional Summary

Dr. Wells has over 25 years of wireless communications experience gained from working in three continents. He is currently an independent consultant providing expertise on cellular technologies, wireless devices, network infrastructure and wireless rules and regulations to a client base of attorneys, intellectual property organizations, investment and research institutions, public listed and private companies. Dr. Wells has over 40 academic and commercial publications and presentations, and is lead inventor on several patents. He is Senior Member of the IEEE and is author of “Multi-Gigabit Microwave and Millimeter-Wave Wireless Communications,” Artech House, 2010.

Employment History

2007 to present **AJIS Consulting, Pleasanton, CA** *Independent Consultant*

Provide independent technical consulting on wireless communications and emerging wireless fields.

- Expert witness and expert consulting support of 2G, 3G and 4G wireless patent litigation.
- Analysis of cellular and mobile wireless patents and infringing equipment.
- Cellular backhaul and wireless technology technical and industry analysis for analysts, investment and research institutions. Research and publication of analyst reports.
- Wireless product development and marketing strategies.
- Specialized technical workshops on various wireless technologies; including cellular networks, mm-wave radios, security sensors and short range radios.
- Specialized global regulatory tasks and product approvals.

2005 to 2007 **GigaBeam Corporation, Herdon, VA**
Director Product Management and Global Regulatory Affairs

Responsible for product strategy for industry-transforming high speed mm-wave product.

- Initiated market development in over 40 countries including in Europe, Canada, Caribbean, Latin America, Middle East and Asia.
- Participated and drove standard development in FCC, CEPT and ETSI technical meetings.

2000 to 2004 **Stratex Networks (now Aviat Networks), San Jose, CA**
Director Product Development

Responsible for global product development of high-end digital microwave radios primarily for cellular backhaul applications.

- Led RF/microwave development team of 35 engineers based in two continents.
- Technical leadership of flagship Eclipse product, shipping over 250,000 units.
- Technical management of overseas manufacturing subcontractors.

1998 to 2000 **Adaptive Broadband (now GE Digital Energy), Rochester, NY**
1999-2000: Director Wideband Products, 1998-9: Engineering Group Leader

Full responsibility for the Terrestrial Infrastructure Group, providing telecommunications products for cellular and private network applications.

- P&L responsibility for \$4M wireless division.
- Responsible for the development of a family of digital radios and associated switching / multiplexing equipment.

1994 to 1998 **MAS Technology (now Aviat Networks), Wellington, New Zealand**
1995-98: RF Group Manager, 1994-95: Senior RF Design Engineer

Responsible for RF hardware development for cellular and telecommunications applications.

- Developed three generations of wireless transmission, switching and multiplexing products.
- Design and sustaining responsibility for satellite ground station terminals.
- Responsible for company's European regulatory approvals.

1993 to 1994 **Matra Marconi Space, Portsmouth, UK** *Senior Design Engineer*

- Developed GaAs MMIC mixer and MIC transmitter board for two satellite payloads.
- Theoretical analysis and modeling of low noise VCOs.

1990 to 1992 **University of Bath, Bath, UK** *Post Doctoral Research Officer*

- Fabricated novel quantum amplifiers in clean room environment.
- Developed computer models to predict mm-wave performance of semiconductor devices.

1987 to 1990 **British Aerospace (Filton), Bristol, UK** *Engineer (part time)*

- Designed and fabricated novel mixer devices, to support PhD research.

1985 to 1986 **Plessey Research (Caswell), Northampton, UK** *Engineer*

- Developed high speed fiber optic transmitter / receiver devices.

Education

<u>Year</u>	<u>College/University</u>	<u>Degree / Certification</u>
2004	Stanford Executive Institute, Stanford University, CA, USA	Graduated from 10-day, full-time executive management course
1998	Massey University, New Zealand	M.B.A. (Graduated top 10% of class with Distinction)
1991	University of Bath, United Kingdom	Ph.D., Microwave Physics (Sponsored by British Aerospace)
1987	University of Bath, United Kingdom	B.Sc., Physics with Physical Electronics (Graduated 3 rd in class with 1 st Class Honors)

Expert Witness Experience

Sept 2014 to Present	<i>Ericsson v. TCL Communication Technology Holdings</i> , 2:14-cv-677 Case: Patent infringement case related to a cellular LTE communication patent Role: Consulting expert for plaintiff.
Jan 2014 to Aug 2014	<i>Cell and Network Selection v. AT&T et al</i> , 6:13-cv-00403-LED-KNM Case: Patent infringement case related to a 4G/LTE communication patent Role: Testifying expert for plaintiff.
Jan 2014 to Present	<i>Cell and Network Selection v. MetroPCS et al</i> , 6:13-cv-00404-LED-KNM Case: Patent infringement case related to a 4G/LTE communication patent Role: Testifying expert for plaintiff. Provided two Expert Reports. Deposed.
Jan 2014 to Present	<i>Adaptix v. Ericsson et al</i> , 6:12-cv-00049, 00050 and 00369 Case: Patent infringement case related to five 4G/LTE communication patents Role: Testifying expert for plaintiff. Provided two Expert Reports. Deposed.
Jan 2014 to Present	<i>Adaptix v. Alcatel-Lucent et al</i> , 6:12-cv-00022, 00122 and 00123 Case: Patent infringement case related to five 4G/LTE communication patents Role: Testifying expert for plaintiff. Provided two Expert Reports. Deposed.
Oct 2013 to Jan 2014	<i>Ericsson v. Samsung</i> , 6:12-cv-895 Case: Patent infringement case related to 13 wireless communication patents Role: Testifying expert for defendant.
Oct 2013 to Jan 2014	<i>Ericsson v. Samsung</i> , 6:12-cv-894 Case: Patent infringement case related to 11 wireless communication patents Role: Testifying expert for defendant.
June 2013 to Dec 2013	<i>Adaptix v. Ericsson</i> , ITC Inv. No. 337-TA-871 Case: ITC hearing related to 4G/LTE wireless communication patent Role: Testifying expert for complainant. Provided Expert Report and Witness Statement. Deposed.

- Mar 2013 to Present *Mobile Telecommunication Technologies v. BlackBerry*, 3:12-CV-1652-M
Case: Patent infringement case related to five wireless communications patents
Role: Testifying expert for plaintiff.
- Mar 2013 to Present *Mobile Telecommunication Technologies v. Sprint*, 2:12-cv-832-JRG-RSP
Case: Patent infringement case related to five wireless communications patents
Role: Testifying expert for plaintiff.
- Jan 2013 to May 2014 *TracBeam v. Google*, 6:13-cv-93-LED
(severed from *TracBeam v. AT&T et al*, 6:11-cv-00096)
Case: Patent infringement case related to two cellphone location patents
Role: Testifying expert for defendant. Provided Expert Report. Deposed.
- Jan 2013 to Sept 2013 *Ericsson v. Samsung*, ITC Inv. No. 337-TA-862
Case: ITC hearing related to seven 2G, 3G, 4G/LTE and Wi-Fi patents
Role: Testifying expert for respondent. Provided two Expert Reports and two Witness Statements. Deposed. Testified at hearing.
- Jan 2013 to June 2013 *EON v. AT&T et al*, 3:11-cv-01555-FAB
Case: Patent infringement case related to wireless communications patent
Role: Consulting expert for plaintiff.
- Nov 2012 to Present *Cormany et. al. v. Fireman's Fund Insurance Company*, CIVDS1100146
Case: Breach of contract case involving location via cell phone
Role: Testifying expert for plaintiff. Provided technical analyses. Deposed.
- Oct 2012 to Present *Drivertech v. R+L Carriers*, 2:08-cv-00862
Case: Patent infringement case related to wireless communications patent
Role: Consulting expert for defendant. Provided technical analyses.
- May 2012 to April 2013 *Sparkes Cable Company v. Rancho San Antonio Retirement Housing Corp.*, 112-CV-225390
Case: Breach of contract related to telecommunications network
Role: Consulting expert for defendant. Provided technical analyses.
- April 2012 to Sept 2012 *EON v. T-Mobile et al*, 6:10-cv-00379-LED
Case: Patent infringement case related to wireless communications patent
Role: Testifying expert for plaintiff. Provided Expert Report and Declarations. Deposed.
- March 2012 to April 2012 *Baker v. SLG Group*, CV-2010-901219
Case: Civil case involving location via cell phone
Role: Consulting expert for plaintiff. Provided technical analyses.
- Sept 2011 to July 2012 *Samsung v. Apple*, CV 11-02079
Case: Patent infringement case related to 3G WCDMA patent
Role: Consulting expert for defendant. Provided technical analyses.
- Mar 2011 to July 2013 *Wi-LAN v. Alcatel-Lucent et al*, 6:10-cv-00521-LED
Case: Patent infringement case related to four 3G HSPA patents

- Role: Testifying expert for plaintiff. Provided two Expert Reports, Supplement to Expert Report and Declarations. Deposed. Testified at trial.
- Oct 2010 to Jan 2011 *People of the State of California v. Wandrey*, CR920809
Case: Criminal murder case involving location via cell phone
Role: Consulting expert for defendant. Provided technical analyses.
- Sept 2010 to Oct 2010 *People of the State of California v. Tran*, CC826024
Case: Criminal murder case involving location via cell phone
Role: Consulting expert for defendant. Provided technical analyses.
- May 2010 to Apr 2011 *People of the State of California v. Rivas & Carrillo*, SS090603A/B, SS110071A/B
Case: Criminal murder case involving location via cell phone
Role: Testifying expert for defendant. Provided Expert Report. Testified at trial.
- June 2009 to June 2010 *American Traffic Solutions v. Redflex Traffic Systems*, CV 08-2051-PHX-FJM
Case: Unfair competition related to FCC authorization of speed radars
Role: Testifying expert for plaintiff. Provided Expert Report, Supplement to Expert Report and Declarations.

Professional Affiliations and Achievements

- 2011 – Present Toastmasters International
- 2008 – Present Member, IEEE Consultants' Network of Silicon Valley (CNSV). (Treasurer, 2013-14; Co-chair, Intellectual Property Special Interest Group (IP SIG), 2010-12)
- 1995 – Present Senior Member, Institute of Electrical and Electronic Engineers (IEEE). (Member since 1995; Senior Member since 1999; Member, IEEE Communications Society; Member, IEEE Microwave Theory and Techniques Society)
- 2013 Guest speaker, UC Berkeley course IEOR 190G: Wireless and Mobile Devices Patents – Patent Engineering
- 2011 – 2012 Technical Reviewer, Wireless and Cellular Communication Systems, International Microwave Symposium (IMS2011 and IMS2012)
- 2010 Guest speaker, Carnegie Mellon University (CMU) course 96-833: Fundamental Consulting Skills
- 2009 Reviewer for US Government's Broadband Technology Opportunity Program (BTOP) and Broadband Initiatives Program (BIP), part of American Recovery and Reinvestment Act of 2009
- 2009 Selected Expert Advice columnist for Microwave Journal
- 2009 Organizer and session chair, International Microwave Symposium (IMS2009)
- 2008 Co-chair and organizer, IWPC workshop on Millimeter-Wave Security Sensors

2008	Co-chair, IWPC workshop on Extending the Life of GSM & EDGE Networks
2008	Co-chair, IWPC workshop on Wireless IP/Ethernet Backhaul for Next Generation Mobile Networks
2005 – 2006	Member, European Conference of Postal and Telecommunications Administrations Spectrum Engineering Group 19 (CEPT SE19)
2005 – 2006	Member, European Telecommunications Standards Institute Transmission and Multiplex Group 4 (ETSI TM4)
2002 – 2006	Member and deputy chair, Wireless Communications Association (WCA) 40+ GHz Spectrum Development Committee
2001 – 2004	Member, Cal Poly Electrical Engineering Industrial Advisory Committee
1993 – 2002	Member, Institution of Electronic Engineers (MIEE)
1995	Registered as Chartered Engineer (CEng)

Publications and Presentations

Books and Published Research Reports

J.A. Wells, “*Backhaul for Small Cells*, 2nd Edition” Mobile Experts, USA, Nov. 2012

J.A. Wells, “*Backhaul for Small Cells*,” Mobile Experts, USA, Oct. 2011

J.A. Wells, “*Multi-Gigabit Microwave and Millimeter-Wave Wireless Communications*,” Artech House, Boston, Sept. 2010 (ISBN 1608070824)

J.A. Wells, “*Venture Capital: Does It Exist In New Zealand?*” MBA Thesis, Massey University, 1998

J.A. Wells, “*The Design and Optimisation of a Millimetre-Wave Balanced Mixer*,” PhD Thesis, University of Bath, 1991

Journal and Magazine Publications

J.A. Wells, “The Seven Rules for Hiring a Wireless Technology Expert,” *New Matter; Official Publication of the Intellectual Property Section of the State Bar of California*, Vol. 35, No. 4, pp. 5-6, Dec. 2010

J.A. Wells, “MM-Waves in the Living Room: The Future of Wireless High Definition Multimedia Connectivity,” *Microwave Journal*, Vol. 52, No.8, pp. 72-84, Aug. 2009

J.A. Wells, “Faster Than Fiber: The Future of Multi-Gb/s Wireless,” *IEEE Microwave Magazine*, Vol. 10, No.3, pp. 104-112, May 2009 (Invited Paper)

J.A. Wells, “Multigigabit Wireless Technology at 70, 80 and 90 GHz,” *RF Design*, pp. 50-58, May 2006

J.A. Wells, “Gigabit per Second Wireless Backhaul at 70 and 80 GHz for WiMAX Networks,” *Focus on Technology* supplement in *Wireless Design and Development*, pp. S6-S8, May 2006

J.A. Wells, "New Multi-Gigabit Wireless Systems Satisfy High Security Rapid Response Applications," *Military Embedded Systems*, Vol. 2, No. 1, pp. 22-26, Spring 2006

J.A. Wells, "Multi-Gigabit Connectivity at 70, 80 and 90 GHz," *Microwave Journal*, pp. 128-135, July 2005

J.A. Wells, "Millimeter Wave Point-To-Point Radios," *Applied Microwave and Wireless*, pp. 81-82, Aug. 2002 (Guest Editorial)

J.A. Wells and N.J. Cronin, "Theoretical Analysis of Air Bridging and Back Etching Techniques on the Shunt Capacitance of Planar Subharmonic Mixer Diodes," *IEE Proceedings - Part H*, Vol. 140, No. 6, pp. 474-80, Dec. 1993

J.A. Wells and N.J. Cronin, "Frequency Dependant Simulation of Planar Millimeter-Wave Mixer Diodes," *17th International Conference on Infra-Red and Millimeter Waves Digest*, USA, pp. 214-5, Dec. 1992

J.A. Wells and N.J. Cronin, "Determination and Reduction of the Capacitance Associated with the Bonding Pads of Planar Millimeter-Wave Mixer Diodes," *IEEE Microwave and Guided Wave Letters*, Vol. 2, No. 7, pp. 297-9, July 1992

J.A. Wells and N.J. Cronin, "Planar Schottky-Diode Devices for Millimetre-Wave Balanced Mixer Applications," *21st European Microwave Conference Digest*, Germany, pp. 370-5, Sept. 1991

N.J. Cronin, R. James and J.A. Wells, "Subharmonic Mixers for Short Millimetre Wavelengths," *16th International Conference on Infra-Red and Millimeter Waves Digest*, Switzerland, p. 143, Aug. 1991

J.A. Wells, N.J. Cronin and P.H. Reece, "A Rugged 94GHz Crossbar Balanced Mixer," *IEE Proceedings - Part H*, Vol. 137, No. 4, pp. 235-7, Aug. 1990

J.A. Wells, N.J. Cronin and P.H. Reece, "A Rugged 94GHz Millimetre-Wave Balanced Mixer," *1st International Conference on Millimeter Waves and Far-Infrared Technology Digest*, China, pp. 254-6, June 1989

Online Publications

J.A. Wells, "Backhaul for small cells: A 1.5 billion dollar market opportunity," *EE Times*, Design Article, Nov. 2011

J.A. Wells, "The Gigabit Millimeter-Wave Superhighway," *Microwave Journal*, Expert Advice Blog, Aug. 2009 (Invited Column)

Lectures and Conference Presentations

"SON [Self-Organizing Networks]: The Enabling Technology in Small Cell Networks," *Wireless Communications Alliance (WCA)*, USA, April 2014 (Panel Moderator)

"Feeding the Beast – The Road to 5G Backhaul," *Wireless Communications Alliance (WCA)*, USA, April 2013 (Invited Panelist)

"The Mobile Patent Wars: An Introduction to the Technology behind the Ongoing Smartphone Litigation," *UC Berkeley course IEOR 190G: Wireless and Mobile Devices Patents – Patent Engineering*, USA, March 2013

- “Mobile Patent Wars,” *IEEE-SCV Communications Society*, USA, May 2012 (Invited Panelist)
- “Building a Successful Consulting Practice,” *Carnegie Mellon University (CMU) course 96-833: Fundamental Consulting Skills*, USA, May 2011
- “Faster Than Fiber: Enabling Multi-Gigabit Wireless Communication Links,” *IEEE International Microwave Symposium IMS 2009*, USA, June 2009
- “The Future of Cellular Infrastructure,” *IEEE CNSV*, USA, Mar. 2009
- “Wireless Backhaul Trends: The Future Role of Wireless, Fiber Optics and Copper Wire,” *IEEE-SCV Communications Society*, USA, Oct. 2008
- “Millimeter-Wave Sensor Systems Benchmarking for Security Applications,” *IWPC Workshop on MM-Wave Sensors for Layered Security of Critical Infrastructure*, USA, April 2008
- “Marketing for Translators and Interpreters,” *Northern California Translators Association Workshop*, USA, Mar. 2007
- “WiFiber: New Spectrum Links for Wireless Gigabit Transmission,” *ACM/IEEE conference on Supercomputing SC06*, USA, Nov. 2006
- “WiFiber Wireless Fiber: Ultra High Data Rate Radios,” *Wireless Fibre Amsterdam*, The Netherlands, Sept. 2006 (Keynote Speaker)
- “Gbps+ Wireless Local Loop: Transforming Last Mile Economics,” *USTA Webinar*, Aug. 2006
- “WiFiber: New Spectrum Links for Wireless Gigabit Local Broadband,” *Internet 2 Spring Meeting*, USA, April 2006
- “Multi-Gigabit Wireless Backhaul at 70 and 80 GHz for WiMAX Networks,” *PTC’06*, USA, Jan. 2006
- “Future Trends in MM-Wave Radios for Wireless Backhaul Applications,” *IWPC Workshop on Millimeter Wave Backhaul and 60 GHz Unlicensed Band Radios*, USA, June 2002
- “Millimeter Wave Point-To-Point Radios for Carrier Class Access and Transport Applications,” *8th WCA Technical Symposium Proceedings*, USA, Feb. 2002
- “Commercial Opportunities at 94 GHz,” *IEEE MTT-S International Microwave Symposium*, USA, May 2001 (Invited Panelist)
- “Research and Development at MAS Technology,” *New Zealand Communications Research Workshop 1997*, New Zealand, May 1997 (Invited Paper)
- “Overcoming RF Technical Difficulties in Moving from QPSK to 16 QAM Modulation,” *New Zealand Communications Research Workshop 1997*, New Zealand, May 1997
- “Modern Microwave Technology,” *VHF Convention 1995*, New Zealand, April 1995
- “100W 2GHz Linear FET Amplifier Design,” *VHF Convention 1995*, New Zealand, April 1995
- “Low Phase Noise Oscillator Design for Wide band Radio Applications,” *4th New Zealand Communications Workshop*, New Zealand, Sept. 1994
- “Numerical Modeling of Millimeter-Wave Schottky Diodes,” *2nd UK-Japan N+N Meeting on Terahertz Technology*, Japan, July 1992

“Planar Schottky-Diode Devices for Millimetre-Wave Balanced Mixer Applications,” *21st European Microwave Conference Digest*, Germany, Sept. 1991

“A Rugged 94GHz Millimetre-Wave Balanced Mixer,” *1st International Conference on Millimeter Waves and Far-Infrared Technology Digest*, China, June 1989

Patents

US 7,623,829, “Transceiver power detection and control architecture,” issued Nov 24, 2009

US 7,236,745, “Transceiver power detection architecture,” issued June 26, 2007

CN 1,757,186, “Transceiver power detection architecture,” published Apr 5, 2006

EP 1,599,952, “Transceiver power detection architecture,” published Nov 30, 2005

WO 2004/080035, “Transceiver power detection architecture,” published Sept 16, 2004