

Curriculum Vitae
Dr. Charles A. Eldering

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AREAS OF SPECIALIZATION: Generation, management, and utilization of intellectual property including patent application drafting and prosecution, infringement analysis, portfolio mining, market analysis, business and licensing strategies. Extensive technical and market expertise in the areas of telecommunications, e-commerce, digital video, microelectronics and optics.

EDUCATION:

- 1989 University of California; Davis, California
Ph.D. Electrical Engineering
- 1985 Syracuse University; Syracuse, New York
M.S. Solid State Science and Technology
- 1981 Carnegie Mellon University; Pittsburgh, Pennsylvania
B.S. Physics

OTHER PROFESSIONAL QUALIFICATIONS:

Registered U.S. Patent Agent. Registration No. 39,180

EMPLOYMENT HISTORY:

May 2000 to present:

Expanse Bioinformatics, Inc., (formerly Expanse Networks)
Chairman, President

December 1997 to December 2013:

Technology, Patents & Licensing, Inc. (now TechPats)
Founder and President

February 1998 to 2010:

Progress & Freedom Foundation, Washington, DC
Adjunct Fellow

October 1995 to November 1997:

Next Level Communications, Rohnert Park, CA
Director, Advanced Systems Engineering

September 1993 to September 1995:

General Instrument Corporation, Hatboro, PA
Manager, Fiber-to-the-Curb/Switched Digital Video Systems; March 1995 to September 1995
Manager, Broadband Systems Engineering; January 1994 to March 1995
Senior Project Engineer, Systems Engineering; September 1993 to December 1993

January 1990 to August 1993:

Alcatel, Madrid, Spain
Senior Engineer/Manager, Fiber in the Loop R&D; October 1990 to August 1993
Consultant; January 1990 to September 1990

June 1986 to August 1990:

University of California, Davis, CA
Researcher, Department of Electrical and Computer Engineering

October 1981 to May 1986:

United States Air Force, Rome Laboratory, Rome, NY
Officer

PPC Exhibit 2020
Corning v. PPC
IPR2016-01573

EXPERT WITNESSING:

1. Unified Patents Inc. v. Hybrid Audio, LLC, No. IPR2016-01265 (PTAB).
2. Unified Patents Inc. v. Qurio Holdings, Inc., No. IPR2015-01991 (PTAB).
3. Unified Patents Inc. v. Rothschild Connected Devices Innovations, LLC, No. IPR2016-00535 (PTAB).
4. Unified Patents Inc. v. FO2GO LLC, No. IPR2016-00454 (PTAB).
5. Unified Patents Inc. v. Nonend Inventions, NV, No. IPR2016-00174 (PTAB).
6. Unified Patents Inc. v. iMTX Strategic, LLC, No. IPR2015-01061 (PTAB).
7. Unified Patents Inc. v. TransVideo Electronics, Ltd., No. IPR2015-01519 (PTAB).
8. *PPC Broadband, Inc. d/b/a PPC v. Times Fiber Communications, Inc.*, United States District Court for the Northern District of New York (Civil Action No. 5:13-cv-460-TJM-DEP)
9. *PPC Broadband, Inc. d/b/a PPC v. Corning Gilbert, Inc.*, United States District Court for the Northern District of New York (Civil Action No. 5:13-cv-00538-GLS-DEP).
10. *In the Matter of Certain Coaxial Cable Connectors and Components Thereof and Products Containing Same*, United States International Trade Commission, Washington, D.C. (Investigation No. 337-TA-938)(PPC Broadband, Inc., Complainant; Corning Optical Communications RF, LLC, Respondent).
11. *Netflix, Inc., v. OpenTV, Inc.*, No. IPR2014-00252 (PTAB).
12. *John Mezzalingua Associates, Inc. d/b/a PPC v. Corning Gilbert Inc.*, United States District Court for the District of Arizona (Case No. 2: 12-CV-12-02208-SMM).
13. *Corning Gilbert Inc., v. PPC Broadband, Inc.*, No. IPR2013-00345 (PTAB).
14. *Corning Gilbert Inc., v. PPC Broadband, Inc.*, No. IPR2013-00340 (PTAB).
15. *Corning Gilbert Inc., v. PPC Broadband, Inc.*, No. IPR2013-00342 (PTAB).
16. *Corning Gilbert Inc., v. PPC Broadband, Inc.*, No. IPR2013-00346 (PTAB).
17. *Corning Gilbert Inc., v. PPC Broadband, Inc.*, No. IPR2013-00347 (PTAB).
18. *PPC Broadband, Inc. v. Corning Gilbert Inc.*, United States District Court for the Northern District of New York (Civil Action No. 5:13-cv-1310).
19. *PPC Broadband, Inc. d/b/a PPC v. Corning Gilbert, Inc.*, United States District Court for the Northern District of New York (Civil Action No. 11-cv-00761-GLS-DEP).
20. *Corning Gilbert, Inc. v. The United States of America, et al.* in the United States Court of International Trade (Case No. 11-00511).
21. *Parus Holdings, Inc. v National Airtran Airways, Inc., Airtran Holdings, Inc., Airtran Holdings, LLC* in the United States District Court for the Middle District of Florida, Tampa Division (Case No. 8:11-cv-01685-EAK-TBM).

22. *John Mezzalingua Associates, Inc. d/b/a PPC v. International Communications Manufacturing Corporation, Randall A. Holliday, and Belden Inc.* in the United States District Court for the Western District of Wisconsin (Case No. 3:11-cv-00424-bbc).
23. *eTool Development, Inc., and eTool Patent Holdings Corp. v National Semiconductor Corporation* in the United States District Court for the Eastern District of Texas, Marshall Division (Case No. 2:08-cv-196).
24. *John Mezzalingua Associates, Inc. d/b/a PPC, Inc. v. PCT International, Inc.* in the United States District Court for the Western District of Texas, San Antonio Division (Case No. 5:09-cv-00410-RF).
25. *John Mezzalingua Associates, Inc. d/b/a PPC, Inc. v. PACE Electronics, Inc. (d/b/a PACE International) and Perfect 10 Antenna Company* in the United States District Court for the Western District of Minnesota (Case No. 0:10-cv-00064 MJD/JJG).
26. *Certain Coaxial Cable Connectors and Components Thereof and Products Containing Same*, United States International Trade Commission, Washington, D.C. (Investigation No. 377-TA-650)(John Mezzalingua Associates, Inc. d/b/a PPC, Inc., Complainant; Hanjiang Fei Yu Electronics Equipment Factory, Zhongguang Electronics, Yangzhou Zhongguang Electronics Co., Ltd., and Yangzhou Zhongguang Foreign Trade Co., Ltd., Respondents).
27. *Arrow Communication Laboratories, Inc. v. John Mezzalingua Associates, Inc.*, in the Northern District of New York (Civil Action No. 05-CV-1456 (NAM/DEP) (Lead Case); 05-CV-0703 (NAM/DEP) (Member Case)).
28. *Agrizap Inc. v. Woodstream Corporation* in the United States District Court for the Eastern District of Pennsylvania (Case No. 04-CV-03925-RK).
29. *John Mezzalingua Associates, Inc. d/b/a PPC, Inc. v. Corning Gilbert, Inc.* in the United States District Court for the Western District of Wisconsin (Case No. 03-C-0354-S).
30. *John Mezzalingua Associates, Inc. d/b/a PPC, Inc. v. Arris International, Inc.* in the United States District Court for the Western District of Wisconsin (Case No. 03-C-0353-C).
31. *Arris International, Inc., and Randall A. Holliday, v. John Mezzalingua Associates, Inc. d/b/a PPC* in the United States District Court for the District of Colorado, Denver Division (Case No. CA 01-WM-2061).

REVIEWED PUBLICATIONS:

1. Eric E. Bensen, Charles A. Eldering, Jim Longacre, Anthony W. Shaw, Daniel H. Sherr, Matthew W. Stavish, and John M. White, "Patent Commentaries Analyzing the America Invents Act," *Lexis Nexis*, 2011.
2. Malcolm T. "Ty" Meeks and Charles A. Eldering, PhD, "Patent Valuation: Aren't We Forgetting Something? Making the Case for Claims Analysis in Patent Valuation by Proposing a Patent Valuation Method and a Patent-Specific Discount Rate Using the CAPM", *Northwestern Journal of Technology and Intellectual Property*, (Fall, 2010) Vol. 9, No. 3.
3. C.A. Eldering, "Technology and Competition: A Five-Year Outlook for the Telecommunications Marketplace," in *Communications Deregulation and FCC Reform*, J.A. Eisenach and R.J. May, eds. (Kluwer Academic Publishers, 2001).
4. S.C. Durant, E.J. Basinski, K.L. Cerrone, C.A. Eldering and M. Ishimaru, "Patent Portfolio Development," in *Electronic Software Patents: Law and Practice*, S.W. Lundberg and S.C. Durant, eds. (BNA Books, 2000).

5. C.A. Eldering, "Patents and Telecommunications", Guest Editorial in *IEEE Communications Magazine*, vol. 38, no. 7, p. 96 (July 2000).
6. C.A. Eldering, M.L. Sylla, J.A. Eisenach, "Is There a Moore's Law for Bandwidth?," in *IEEE Communications Magazine*, vol. 37, no. 10, pp. 117-121 (October 1999).
7. C.A. Eldering, "Impact and Results of Telecommunications Deregulation," Guest Editorial in *IEEE Communications Magazine*, vol. 37, no. 10, p. 98 (October 1999).
8. C.A. Eldering, "Prospects for Broadband Deployment in a Deregulated Environment", Guest Editorial in *IEEE Communications Magazine*, vol. 36, no. 7, p. 86 (July 1998).
9. S. Wang, S.T. Kowel, C.A. Eldering, "Differential Detection with Polymer-Based Etalon Modulators," *IEEE Journal of Lightwave Technology*, vol. 16, no. 3, pp. 448-452 (March 1998).
10. C.A. Eldering, J.P. Blasko, A. Brown, "Comparative Analysis of Provisional Patents Under US and UK Law," *Journal of the Patent and Trademark Office Society*, vol. 79, no. 11, pp. 791-881 (November 1997).
11. C.A. Eldering, "Customer Premises Equipment for Residential Broadband Networks," *IEEE Communications Magazine*, vol. 35, no. 6, pp. 114-121 (June 1997).
12. N. Omoigui, M. Sirbu, C.A. Eldering, and N. Himayat, "Comparing Integrated Broadband Architectures from an Economic and Public Policy Perspective," in *The Internet and Telecommunications Policy Research*, G.W. Brock and G.L. Rosston, eds. (Lawrence Erlbaum Associates, NJ, 1996).
13. C.A. Eldering, N. Himayat and F.M. Gardner, "CATV Return Path Characterization for Reliable Communications," *IEEE Communications Magazine*, vol. 33, no. 8, pp. 62-69 (August 1995).
14. D. Shen, S.T. Kowel, and C.A. Eldering, "Amorphous Silicon Thin-Film Photodetectors for Optical Interconnection," *Optical Engineering*, vol. 34, no. 3, pp. 881-886 (March 1995).
15. C.A. Eldering, F. Herrerias, R. Martín, P.J. García, "Burst Mode Clock Recovery System for Fiber Optic Receivers," *IEEE Journal of Lightwave Technology*, vol. 12, no. 2, pp. 271-279 (February 1994).
16. C.A. Eldering, "Theoretical Determination of Sensitivity Penalty for Burst Mode Fiber Optic Receivers," *IEEE Journal of Lightwave Technology*, vol. 11, no. 12, pp. 2145-2149 (December 1993).
17. C.A. Eldering and A. Martín, "An Out-of-Band Signalling Technique for Passive Optical Networks," *International Journal of Digital and Analog Communication Systems*, vol. 6, pp. 49-52 (1993).
18. C.A. Eldering, A. Dienes, and S.T. Kowel, "Time Response Limitations of Etalons as Calculated From Frequency Analysis," *Optical Engineering*, vol. 32, no. 3, pp. 464-468 (March 1993).
19. S.T. Kowel and C.A. Eldering, "Polymer Etalons and Free Space Interconnects," in *Polymers for Lightwave and Integrated Optics: Technology and Applications*, Lawrence A. Hornak, Editor (Marcel Dekker, 1992).
20. C.A. Eldering, A. Knoesen and S.T. Kowel, "Use of Fabry-Perot Devices for the Characterization of Polymeric Electro-Optic Films," *Journal of Applied Physics*, vol. 69, no. 6, pp. 3676-3686 (March 15, 1991).
21. C.A. Eldering, S.T. Kowel, M.A. Mortazavi and P. Brinkley, "Electro-Optic Polymer Materials and Devices for Global Optical Interconnects," *Applied Optics*, vol. 29, no. 8, pp. 1142-1149 (March 1990).
22. C.A. Eldering, S.T. Kowel, and A. Knoesen, "Electrically Induced Transmissivity Modulation in Polymeric Thin Film Fabry-Perot Etalons," *Applied Optics*, vol. 28, no. 20, pp. 4442-4445 (October 1989).
23. C.A. Eldering, S.T. Kowel, A. Knoesen, B.L. Anderson and B.G. Higgins, "Characterization of

24. S.T. Kowel, R. Selfridge, C.A. Eldering, N. Matloff, P. Stroeve, B. Higgins, M.P. Srinivasan and L.B. Coleman, "Future Applications of Ordered Polymeric Thin Films," in *Thin Solid Films*, vol. 152, pp. 377-403 (1987).

PUBLICATIONS IN CONFERENCE PROCEEDINGS:

1. C.A. Eldering, "An Overview of Wired Broadband Access Systems," *Proceedings of the IEEE Sarnoff Symposium on Advances on Wired and Wireless Communications*, pp. 1-7 (Trenton, NJ, March 19, 1997).
2. R. Mason, N. Himayat, C.A. Eldering, N. Omoigui, M. Sirbu "Overview of Hybrid Fiber-Coax and Fiber-in-the-Loop Architectures," *Proceedings of the 1995 National Fiber Optic Engineers Conference*, pp. 284-291 (Boston, MA, June 18-22, 1995).
3. C.A. Eldering, F.M. Gardner, N. Himayat, "Performance Comparison of Multiple-Access Techniques in Hybrid Fiber-Coax Return Systems," *1995 Optical Fiber Conference Technical Digest* (San Diego, CA, Feb 26- Mar 3, 1995).
4. N. Himayat, C.A. Eldering, M. Kolber, E. Dickinson, "Characteristics of Hybrid Fiber-Coax Return Systems," *1995 SCTE Conference on Emerging Technologies Proceedings Manual* (Orlando, FL, Jan 4-6, 1995).
5. C.A. Eldering, M. Kauffman, D. Grubb, S. Warwick, and G. Hawley, "Engineering Requirements for Hybrid Fiber-Coax Telephony Systems," *1994 NCTA Technical Papers* (New Orleans, LA, May 23-25, 1994).
6. D.S. Shen, S.T. Kowel, and C.A. Eldering, "Amorphous Silicon Thin Film Photodetectors for Optical Interconnection", *Proceedings of the International Parallel Processing Symposium* (Cancún, Mexico, April 26-29, 1994).
7. C.A. Eldering, G. Van der Plas, and J. De Groote, "Burst and Bit Synchronization Methods for Passive Optical Networks," *Proceedings of the Fourth IEEE Workshop on Local Optical Networks* (Versailles, France, September 1992).
8. C.A. Eldering and A. Martín, "System Specification and Requirements for Fiber in the Loop Systems," *Proceedings of SPIE Symposium on Opto-Electronics/Fibers* (Boston, MA, September 1992).
9. C.A. Eldering, F. Neira and J. Rueda, "The First Generation of Fiber Provided Subscriber Services for Spain," *Proceedings, Telco 92* (Madrid, Spain, May 1992).
10. P.J. García, R. Martín, C.A. Eldering, A. Martín, "Consideraciones de Diseño de Sistemas TDM/TDMA por Fibra Optica para el Area de Distribución de Abonados," *Proceedings, TELECOM I+D* (Madrid, Spain, November 1991).
11. C.A. Eldering, S. Allaire, A. Martín, R. Martín, F. Marcel, "Transmitter and Receiver Requirements for Time Division Multiple Access Passive Optical Networks," *Proceedings of the Third IEEE Workshop on Local Optical Networks* (Tokyo, Japan, September 1991).
12. J. Rueda García and C.A. Eldering, "Subscriber Loop Optical Distribution Architecture (SODA): A Cost Effective TDM/TDMA Fiber System," *Fiber Networks for Telephony and CATV*, SPIE vol. 1578, pp. 68-78 (Boston, MA, September 1991).
13. D. Yankelevich, A. Knoesen, C.A. Eldering and S.T. Kowel, "Reflection-Mode Polymeric Interference Modulators," *Proceedings of the SPIE Symposium on Optical Applied Science and Engineering* (San Diego, CA, August 1991).
14. C.A. Eldering, A. Knoesen and S.T. Kowel, "Characterization of Polymeric Electro-Optic Films Using Metal Mirror/Electrode Fabry-Perot Etalons," *Nonlinear Optical Properties of Organic Materials III*, SPIE Vol. 1337, pp. 348-357 (San Diego, CA, July 1990).

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