

*Curriculum Vitae: Andras Kuthi*

**Born:** 10-08-1949, Budapest, Hungary.  
Married, two children

**Citizenship:** Naturalized US Citizen

**Education:** University of Uppsala, Uppsala, Sweden B.A. 1972,  
M.A. 1973

The Royal Institute of Technology, Stockholm, Sweden Ph.D. 1981  
Experimental Plasma Physics

**Positions:** NOVEM Co. 1998 – present  
Owner, Principal Scientist

Research Scientist 2001 – present  
Department of Electrical Engineering – Electrophysics  
University of Southern California  
Los Angeles, CA

Member of the Technical Staff 1996 - 1998  
Trikon Technologies (formerly Plasma and Materials Tech.),  
9255 Deering Ave., Chatsworth, CA 91311

Senior Physicist, 1991 - 1996  
First Point Scientific, Inc. (formerly John R. Bayless Co.),  
5330 Derry ave. Suite J, Agoura Hills, CA 91301

Research Physicist, 1983 1991  
Department of Physics, UCLA

Consulting Physicist, 1991  
Hughes Research Laboratories  
3011 Malibu Cyn. Rd, Malibu, CA 90265

Consulting RF Engineer, 1990 - 1991  
Plasma & Materials Technologies, Inc.  
9255 Deering Ave., Chatsworth, CA 91311

Research Engineer, 1975 1983  
Dept. of Fusion Research  
The Royal Inst. of Technology,  
S-10044 Stockholm, Sweden

Research Assistant, 1972 1975  
Department of Physics,  
University of Uppsala, Uppsala, Sweden.

## **Experience:**

**NOVEM Co.** (1998 - present): Owner, Principal Scientist. Responsible for Plasma Generation and RF power delivery systems, diagnostics, and control instrumentation development. Consultant to leading semiconductor tool manufacturers on issues of Plasma Physics and RF technology.

**UNIVERSITY OF SOUTHERN CALIFORNIA** (2001 – present): Research Scientist in the Pulsed Power Laboratory. Responsible for design, construction and testing of high voltage pulse generators from sub-nanosecond to microsecond pulse lengths for biological, combustion and aerospace applications and for experimental research into high current, high voltage, high repetition rate fast gas switches, semiconductor opening switches and magnetic pulse compression technology for compact pulsed power.

**TRIKON TECHNOLOGIES INC.** (1996 - 1998): Member of the Technical Staff. Responsible for advanced development of the MORI (M=0 Helicon) plasma source, extensions of the technology to 300mm wafer size, with special emphasis on the RF source and Bias subsystems and on high power density electrostatic chucks for oxide etch applications. Initiated extensions of the MORI source technology to gate oxide nitridation and boron implantation. Was in charge of development of efficient cleaning discharges for the MORI-based High Density Plasma CVD system.

**FIRST POINT SCIENTIFIC INC.** (1993 - 1996): Senior Physicist. Principal Investigator for two projects: (1) development of a high energy far infrared laser for plasma diagnostics and (2) development of a plasma centrifuge for material and medical isotope separation. Contributed extensively to projects in the areas of high energy electron beam generation, pulsed laser concepts for plasma diagnostics, electron-beam based methods for treatment of VOCs and NO<sub>x</sub> SO<sub>x</sub> emissions, and neutron sources for geophysical exploration.

**UNIVERSITY OF CALIFORNIA, LOS ANGELES** (1983 - 1991): Research Physicist in the Plasma Physics Laboratory, was responsible for experimental R&D projects in areas including: (1) plasmoid generation and transport; (2) magnetic plasma confinement based on rotating electromagnetic fields; (3) generation of high beta, high energy density reversed field configurations by radio frequency power; (4) radio frequency plasma torch concepts for the decomposition of hazardous wastes; (5) production and characterization of atmospheric pressure, high temperature, inductively generated plasmas. In the course of these and other projects he has designed and built high-power radiofrequency generators, plasma coupling antennas, vacuum systems, high power water cooled magnetic field coil systems, laser and microwave interferometers and reflectometers for plasma diagnostics, magnetic and electric probes and associated electronic equipment, laser light scattering diagnostic equipment and spectroscopic systems.

**PLASMA & MATERIALS TECHNOLOGIES** (Consultant, 1989 - 1995) Consulted on problems relating to RF plasma sources and the presence of high-power RF fields in different sensitive subsystems.

**HUGHES RESEARCH LABORATORIES, MALIBU** (Consultant, 1989 -1991): Contributed to the development of high current, high voltage plasma switches and high power microwave devices.

**PULSE SCIENCES, INC.** (Consultant, 1986 - 1989): Contributed extensively to R&D projects in the areas of: (1) RF ion source systems for rapid reactive etching of electronic devices; (2) advanced pulsed power concepts for high average power space applications and (3) rapid tunneling in hard rock using pulsed electrical discharge techniques.

**THE ROYAL INSTITUTE OF TECHNOLOGY, STOCKHOLM** (1975 - 1983): Research Engineer in the Department of Fusion Research. Was responsible for the development and operation of a variety of plasma confinement, heating and diagnostic systems.

Have taught several physics courses at the Universities and instructed graduate students concerning their thesis work. Published 33 scientific papers in refereed open literature, presented 95 papers at conferences and holds 22 patents, 5 other patents pending.

**Memberships:** *Institute of Electrical and Electronics Engineers.*

### **Publications - Andras Kuthi:**

1. "Measurement of the Electron Temperature Profiles in the F 1 Cold Gas Blanket Experiment by Hydrogen Line Spectroscopy" A. Kuthy, Nucl. Inst. & Methods 180 (1981) 17.
2. "An Interferometer and an Abel Inversion Procedure for the Measurement of the Electron Density Profile in a Cold Gas Blanket Experiment" A. Kuthy, Nucl. Inst. & Methods 180 (1981) 7.
3. "Radial Profiles of the Neutral Hydrogen Density in the F 1 Cold Gas Blanket Experiment" A. Kuthy, Physica Scripta 23 (1981) 807.
4. "The Scaling Laws of a Cold Gas Blanket Experiment" A. Kuthy, Nucl. Inst. & Methods 185 (1981) 343.
5. "The Effects of Radiating Impurities and Bohm Transport on a Cool Plasma Mantle" A. Kuthy, Physica Scripta 26 (1982) 27.
6. "Surface Magnetic Confinement in Toroidal and Linear Mirror Systems" A.Y. Wong, G. Dimonte, J. Ferron, M.Y. Fukao, K. Jones, A. Kuthi, K.L. Lam, B. Leikind, R.W. Schumacher, H. Stephanian, R. Suchanek, Nucl. Inst. & Methods 207 (1983) 207.
7. "Racetrack: A Novel Device for Basic Research on Magnetized Plasmas" A. Kuthi, H. Zwi, L. Schmitz, D. Chelf and A.Y. Wong, Rev. Sci. Instrum. 57 (1986) 2720.
8. "Mirror Ratio Scaling of Axial Confinement of Mirror Trapped Collisional Plasma" K.L. Lam, B.J. Leikind, A.Y. Wong, G. Dimonte, A. Kuthi, L. Olson, and H. Zwi, Phys. Fluids 29 (1986) 3433.
9. "Observations of Ionospheric Cavitons" A.Y. Wong, T. Tanikawa and A. Kuthi, Phys. Rev. Lett. 58 (1987) 1375.
10. "Stability of a Rotating Field Generated Mirror Equilibrium" A. Kuthi, Physics Letters A, 127 (1988) 431.
11. "Observation of radio frequency field induced plasma loss in a simple mirror" A. Kuthi, L. Olson, K.L. Lam, H. Zwi, and A.Y. Wong, Phys. Fluids 31 (1988) 1787.
12. "Observation of Stable High Beta Axisymmetric Plasma Equilibrium" A. Kuthi, H. Zwi, L. Schmitz, and A.Y. Wong, Physics of Fluids B 1 (1989) 2054.
13. "Observations of Steady State Field Reversed Equilibrium" H.R. Zwi, A. Kuthi, A.Y. Wong, B. Wells, Phys. Fluids B 3 (1991) 126.
14. "Balance of Angular Momentum and Energy in a Rotating-Field Generated Plasma Equilibrium" A. Kuthi, H.R. Zwi and A.Y. Wong, Phys. Plasmas 1 (1994) 3246.
15. "Electron Impact Dissociation of Molecular Nitrogen in Atmospheric-Pressure Nonthermal Plasma Reactors" B.M. Penetrante, M.C. Hsiao, B.T. Merritt, G.E. Vogtlin, P.H. Wallman, A.Kuthi, C.P. Burkhart, and J.R. Bayless, Appl. Phys. Lett 67 (1995) 3096.
16. "Electron Beam and Pulsed Corona Processing of Carbon Tetrachloride in Atmospheric Pressure Gas Streams" B.M. Penetrante, M.C. Hsiao, J.N. Bardsley, B.T. Merritt, G.E. Vogtlin, P.H. Wallman, A.Kuthi, C.P. Burkhart, and J.R. Bayless, Physics Letters A 209 (1995) 69.
17. "Electron Beam and Pulsed Corona Processing of Volatile Organic Compounds in Gas Streams" B.M. Penetrante, M.C. Hsiao, J.N. Bardsley, B.T. Merritt, G.E. Vogtlin, P.H. Wallman, A.Kuthi, C.P. Burkhart, and J.R. Bayless, Pure & Applied Chemistry, Vol. 68, No. 5, 1083 (1996).
18. "Identification of mechanisms for decomposition of air pollutants by non-thermal plasma processing", B. M. Penetrante, M. C. Hsiao, J. N. Bardsley, B. T. Merritt, G. E. Vogtlin, A. Kuthi, C. P. Burkhart and J. R. Bayless, Plasma Sources Sci. Technol. 6 (1997) 251–259.
19. "Decomposition of methylene chloride by electron beam and pulsed corona processing", Penetrante B.M.; Hsiao M.C.; Bardsley J.N.; Merritt B.T.; Vogtlin G.E.; Kuthi A.; Burkhart C.P.; Bayless J.R., Physics Letters A 235, No. 1, (1997) 76-82.
20. "Characterization of an azimuthally symmetric helicon wave high density plasma source" G.R Tynan, A.D. Bailey III,

- G.A. Campbell, R Charatan, A. de Chambrier, G. Gibson, D.J. Hemker, K. Jones, A. Kuthi, C. Lee, T. Shoji, and M. Wilcoxson, *J.Vac.Sci. Technol. A* 15(6) 1997.
21. "Primary decomposition mechanisms in electron-beam and electrical discharge processing of volatile organic compounds", B. M. Penetrante, M. C. Hsiao, J. N. Bardsley, B. T. Merritt, G. E. Vogtlin, A. Kuthi, C. P. Burkhart and J. R. Bayless, in *Environmental Applications of Ionizing Radiation*, Ed. William J. Cooper, Randy D. Curry, Kevin O'Shea, 1998, Chapter 19, p.305.
  22. "Pulse generators for pulsed electric field exposure of biological cells and tissues" M. Behrend, A. Kuthi, X. Gu, P. T. Vernier, L. Marcu, C. M. Craft, and M. A. Gundersen, *IEEE Transactions on Dielectrics and Electrical Insulation*, 10 (2003) 820-825.
  23. "Research Issues in Developing Compact Pulsed Power for High Peak Power Applications on Mobile Platforms", John A. Gaudet, Robert J. Barker, C. Jerald Buchenauer, Christos Christodoulou, James Dickens, Martin A. Gundersen, Ravinda P. Joshi, Hermann G. Krompholz, Juergen F. Kolb, Andras Kuthi, Mounir Laroussi, Andreas Neuber, William Nunnally, Edl Schamiloglu, Karl H. Schoenbach, J. Scott Tyo, and Robert J. Vidmar, *Proceedings of the IEEE*, Vol. 92, No. 7, July 2004.
  24. "Transient Plasma Ignition," J.B. Liu, F. Wang, G. Li, A. Kuthi, E. J. Gutmark, P.D. Ronney, and M.A. Gundersen, *IEEE Transactions on Plasma Science*, Vol. 33, No. 2, April 2005.
  25. "Transient Plasma Ignition of Quiescent and Flowing Air/Fuel Mixtures," F. Wang, J.B. Liu, J. Sinibaldi, C. Brophy, A. Kuthi, C. Jiang, P. Ronney, and M.A. Gundersen, *IEEE Transactions on Plasma Science*, Vol. 33, No. 2, April 2005.
  26. "Compact High Repetition Rate Pseudospark Pulse Generator," F. Wang, A. Kuthi, and M.A. Gundersen, *IEEE Trans. Plasma Science*, Vol. 33, No. 4. 1177 (2005).
  27. "Nanosecond Pulse Generator using Fast Recovery Diodes for Cell Electromanipulation," A. Kuthi, P. Gabrielsson, M. Behrend, P. T. Vernier, and M.A. Gundersen, *IEEE Transactions on Plasma Science*," Vol. 33, No. 4. 1192 (2005).
  28. "Toward Ultracompact Pseudospark Switches," C. Jiang, A. Kuthi, and M.A. Gundersen, *Applied Physics Letters* 86, 024105 (2005).
  29. "Pseudospark Electron Beam as an Excitation Source for EUV Generation," C. Jiang, W. Hartmann, A. Kuthi, and M.A. Gundersen, *Applied Physics Letters*, 87, 13 (2005) 131501.
  30. "Pseudospark based pulse generator for corona assisted combustion experiments" A. Kuthi, J. Liu, C. Young, and M. A. Gundersen, *Combustion Processes in Propulsion*, Ed. Gabriel D. Roy, Chapter 5, page 315 (2006).
  31. "Diode Opening Switch Based Nanosecond High Voltage Pulse Generators for Biological and Medical Applications", Tao Tang Fei Wang Kuthi, A. Gundersen, M.A., *IEEE Transactions on Dielectrics and Electrical Insulation*, Vol. 14, No. 4, p. 878-883 (2007).
  32. "Compact Subnanosecond Pulse Generator Using Avalanche Transistors for Cell Electroperturbation Studies", Krishnaswamy, P. Kuthi, A. Vernier, P.T. Gundersen, M.A., *IEEE Transactions on Dielectrics and Electrical Insulation*, Vol. 14, No. 4, p 873-877 (2007).
  33. "Nanosecond Plasma Ignition for Improved Performance of an Internal Combustion Engine", Cathey, C.D. Tao Tang Shiraishi, T. Urushihara, T. Kuthi, A. Gundersen, M.A., *IEEE Transactions on Plasma Science*, Vol.35., No. 6., p. 1664-1668 (2007).

### *Conferences:*

1. "Boundary Layer Analysis of Cold Blanket Systems" B. Lehnert, B. Bonnevier, J.R. Drake, A. Kuthy, D. Olsson, E. Tennfors and B. Wilner, 7th Int. Conf. on Plasma Phys. and Controlled Nucl. Fusion Res., Innsbruck (1978) IAEA CN 37/X 3.
2. "Experimental Studies of Scaling Laws in a Cold Mantle" J.R. Drake and A. Kuthy, 9th European Conf. on Contr. Fusion and Plasma Physics, Oxford (1979) AP 25.
3. "Plasma Losses Due to Magnetic Guarding of Internal Ring Supports" A. Kuthi, R.W. Schumacher, M.Y. Fukao, L.

Wang and A.Y. Wong, Bull. Am. Phys. Soc. 27 18 (1982) 4R8.

4. "Measurement of Radial Potential Profiles in an ECRH Heated Mirror Trapped Plasma" L. Olson, A.Y. Wong, A. Kuthi, B.J. Leikind and K.L. Lam, Bull. Am. Phys. Soc. 28 8 (1983) 1V9.
5. "Endloss Measurements in Mirror Trapped Collisional Plasmas" K.L. Lam, B.J. Leikind, A.Y. Wong, G. Dimonte, A. Kuthi, L. Olson and H. Zwi, Bull. Am. Phys. Soc. 28 8 (1983) 1V10.
6. "On the Generation of Azimuthal Current in Mirror Confined Rotating Plasmas" A. Kuthi, Bull. Am. Phys. Soc. 28 8 (1983) 3S7.
7. "The Stability of Axisymmetric Plasma Equilibria Maintained by a Rotating Magnetic Field" H. Sanuki, R. Ferraro, A. Kuthi and I. Gledhill, Bull. Am. Phys. Soc. 29 8 (1984) 5S15.
8. "ICRF Heating in a Surface Magnetic Field Stabilized Mirror" A. Kuthi, K.L. Lam, H. Zwi, L. Olson and A.Y. Wong, Bull. Am. Phys. Soc. 29 8 (1984) 6W7.
9. "Observations of MHD activity in the UCLA LAMEX" H. Zwi, B.J. Leikind, K.L. Lam, A. Kuthi and A.Y. Wong, Bull. Am. Phys. Soc. 29 8 (1984) 6W9.
10. "Observations of a Negative Potential on the LAMEX Device" L. Olson, A.Y. Wong, B.J. Leikind, A. Kuthi, K.L. Lam and H. Zwi, Bull. Am. Phys. Soc. 29 8 (1984).
11. "RACETRACK Mirror A Device for High Beta Plasma Confinement and Basic Plasma Physics" A. Kuthi, A.Y. Wong, L. Schmitz, D.Chelf, H. Zwi, K.L. Lam, L. Olson and B.J. Leikind, Bull. Am. Phys. Soc. 30 9 (1985) 1R39.
12. "Hot Electron Instability Observed in a Single Cell Mirror" L. Olson, K.L. Lam, A. Kuthi, B.J. Leikind, H. Zwi and A.Y. Wong, Bull. Am. Phys. Soc. 30 9 (1985) 1R40.
13. "Axial Loss of Collisionless and Collisional Plasmas in a Magnetic Mirror with Electrostatic Potential" K.L. Lam, L. Olson, B.J. Leikind, A. Kuthi, H. Zwi and A.Y. Wong, Bull. Am. Phys. Soc. 30 9 (1985) 1R41.
14. "Direct Observation of Density Profile Modification During HF Heating of the Ionosphere" T. Tanikawa, A.Y. Wong, T. Crowley and A. Kuthi, Bull. Am. Phys. Soc. 30 9 (1985) 4R2.
15. "Laboratory Experiment on the Interaction of a Monochromatic Whistler Wave with an Electron Beam" P. Straus, A. Kuthi, A.Y. Wong and G. Dimonte, Bull. Am. Phys. Soc. 30 9 (1985) 7P6.
16. "Control of Potential Profile in a Magnetic Mirror Using Rotating Magnetic Fields" A. Kuthi, Bull. Am. Phys. Soc. 30 9 (1985) 9S25.
17. "Mirror Ratio Scaling of Axial Loss of Electrostatically confined Electrons in a Magnetic Mirror" K.L. Lam, L. Olson, A. Kuthi and A.Y. Wong, Bull. Am. Phys. Soc. 31 9 (1986) 4S20.
18. "Reduction in Fluctuation Level with a Hot Electron Component" L. Olson, K.L. Lam, A. Kuthi and A.Y. Wong, Bull. Am. Phys. Soc. 31 9 (1986) 4S21.
19. "Properties of MHD modes in the UCLA Racetrack Mirror and Stabilization by Magnetic Octopole Fields" L. Schmitz, A. Kuthi, H. Zwi and A.Y. Wong, Bull. Am. Phys. Soc. 31 9 (1986) 4S22.
20. "Studies of Ponderomotive Forces in RACETRACK" H. Zwi, A. Kuthi, L. Schmitz and A.Y. Wong, Bull. Am. Phys. Soc. 31 9 (1986) 4S23.
21. "Plasma Production by Radiofrequency Power in the UCLA RACETRACK Mirror" A. Kuthi, H. Zwi, L. Schmitz and A.Y. Wong, Bull. Am. Phys. Soc. 31 9 (1986) 4S24
22. "Interchange Stabilization by Energetic Particles" L. Olson, K.L. Lam, A. Kuthi, and A.Y. Wong, Bull. Am. Phys. Soc. 32 (1987) 1902, paper 7W4.
23. "High Beta Stable Axisymmetric Equilibrium in a Toroidal Mirror" A.Kuthi, Bull. Am. Phys. Soc. 32 (1987) 1937, invited paper 9I6.
24. "Direct Observation of the Electron Loss Cone Population in the UCLA Racetrack Mirror" L. Schmitz, A. Kuthi, H. Zwi, and A.Y. Wong, Bull. Am. Phys. Soc. 32 (1987) 1783, paper 3W24.

25. "Measurements of RF fields by Electron Beams in RACETRACK" H. Zwi, A. Kuthi, L. Schmitz and A.Y. Wong, Bull. Am. Phys. Soc. 32 (1987) 1783, paper 3W25.
26. "Observation of Stable Axisymmetric Mirror Equilibrium at Arbitrary Beta" A. Kuthi, H. Zwi, L. Schmitz and A.Y. Wong, Bull. Am. Phys. Soc. 32 (1987) 1783, paper 3W26.
27. "Formation and decay of a high beta plasma equilibrium driven by rotating magnetic fields" A. Kuthi, H. Zwi, and A.Y. Wong, IEEE Int. Conf. on Plasma Science, Seattle (1988).
28. "Spatial and temporal decay of a field reversed configuration generated by rotating electromagnetic fields" A. Kuthi, H. Zwi, B. Wells, and A.Y. Wong, Bull. Am. Phys. Soc. 33 (1988) 2002, paper 5W6.
29. "High beta reversed field experiments with steady state current drive" H. Zwi, A. Kuthi, B. Wells, and A.Y. Wong, Bull. Am. Phys. Soc. 33 (1988) 2002, paper 5W7.
30. "Electron beam current injection in RACETRACK" B. Wells, A. Kuthi, H. Zwi, and A.Y. Wong, Bull. Am. Phys. Soc. 33 (1988) 1947, paper 4P4.
31. "Power deposition and field penetration in a field reversed configuration generated by rotating magnetic fields" A. Kuthi, H. Zwi, B. Wells, and A.Y. Wong, 8th Topical Conf. on Radiofrequency Heating in Plasmas, Irvine CA, (1989).
32. "Scaling laws of toroidally coupled RF driven Field-Reversed Configurations" A. Kuthi, US-Japan Workshop on Field-Reversed Configurations with Steady State High Temperature Fusion Plasmas, Nov. 7-8, 1989.
33. "Transport in a steady-state rigid rotor FRC" A. Kuthi, H. Zwi, and A.Y. Wong, IEEE International Conference on Plasma Science, Oakland, CA, May 21-23 1990, 3P4-2.
34. "Low frequency oscillations about an axisymmetric equilibrium in the RACETRACK" R.L. Moore, and A. Kuthi, Bull. Am. Phys. Soc. 34 (1989) 3Q14.
35. "Scaling studies of a rotating field generated FRC" A. Kuthi, H. Zwi, T. Fukuchi, and A.Y. Wong, Bull. Am. Phys. Soc. 34 (1989) 7R21.
36. "Fluid equilibrium and rotating field penetration on a steady-state, highly ionized FRC" H. Zwi, A. Kuthi, A.Y. Wong, and T. Fukuchi, Bull. Am. Phys. Soc. 34 (1989) 7R22.
37. "Measurement of electron temperature profiles by spectral line ratios in a rotating field generated FRC" T. Fukuchi, A. Kuthi, B. Morley, H. Zwi, and A.Y. Wong, Bull. Am. Phys. Soc. 34 (1989) 8Q11.
38. "Steady-state Reversed-Field Experiments with High Power RF Current Drive in RACETRACK" A. Kuthi, H.R. Zwi, T. Fukuchi, and A.Y. Wong, Bull. Am. Phys. Soc. 35 (1990).
39. "Experimental Scaling Studies of Steady-State Field-Reversed Configurations" A. Kuthi, H.R. Zwi, and A.Y. Wong, Workshop on Physics of Alternative Magnetic Confinement, Varenna (1990).
40. "Steady-State High-Beta Plasma Equilibria Generated by RF Current Drive" A. Kuthi, High Beta Workshop, General Atomics, San Diego, July 15-17, 1991.
41. "Ignition Characteristics of the Thin-Wire Discharge" A. Kuthi, J.R. Bayless and C. Burkhart, 46th Annual Gaseous Electronics Conf., Montreal (1993), paper LA-10.
42. "Non-Thermal Plasma Techniques for Abatement of Volatile Organic Compounds and Nitrogen Oxides" B.M. Penetrante, M.C. Hsiao, J.N. Bardsley, B.T. Merritt, G.E. Vogtlin, P.H. Wallman, A.Kuthi, C.P. Burkhart, and J.R. Bayless, Workshop on Plasma Based Environmental Technologies, Berlin (1995).
43. "Predictive Modeling and Experimental Characterization of Non-Thermal Plasma Treatment of Gaseous Emissions" B.M. Penetrante, M.C. Hsiao, B.T. Merritt, G.E. Vogtlin, P.H. Wallman, A.Kuthi, C.P. Burkhart, and J.R. Bayless, Workshop on the Treatment of Gaseous Emissions via Plasma Technology, Gaithersburg (1995).
44. "Electron Beam and Pulsed Corona Processing of Volatile Organic Compounds in Gas Streams" B.M. Penetrante, M.C. Hsiao, J.N. Bardsley, B.T. Merritt, G.E. Vogtlin, P.H. Wallman, A.Kuthi, C.P. Burkhart, and J.R. Bayless, 12th International Symposium on Plasma Chemistry, Minneapolis (1995), Invited paper C.1.01.

45. "Electron Beam and Pulsed Corona Processing of Volatile Organic Compounds and Nitrogen Oxides" B.M. Penetrante, M.C. Hsiao, J.N. Bardsley, B.T. Merritt, G.E. Vogtlin, P.H. Wallman, A.Kuthi, C.P. Burkhart, and J.R. Bayless, 10th IEEE International Pulsed Power Conference, Albuquerque (1995).
46. "Comparison of Electron Beam and Pulse Corona Processing of Carbon Tetrachloride in Dry Air Streams" B.M. Penetrante, M.C. Hsiao, J.N. Bardsley, B.T. Merritt, G.E. Vogtlin, P.H. Wallman, A.Kuthi, C.P. Burkhart, and J.R. Bayless, Workshop on the Treatment of Gaseous Emissions via Plasma Technology, Gaithersburg (1995).
47. "Plasma-Assisted Decomposition of Hydrocarbons Using Electron Beam and Pulsed Corona Processing" B.M. Penetrante, M.C. Hsiao, J.N. Bardsley, B.T. Merritt, G.E. Vogtlin, P.H. Wallman, A.Kuthi, C.P. Burkhart, J.R. Bayless, 48th Gaseous Elect. Conf., Berkeley (1995).
48. "Non-Thermal Plasma Techniques for Abatement of Volatile Organic Compounds and Nitrogen Oxides" B.M. Penetrante, M.C. Hsiao, J.N. Bardsley, B.T. Merritt, G.E. Vogtlin, P.H. Wallman, A. Kuthi, C.P. Burkhart and J.R. Bayless, Workshop on Plasma Based Environmental Technologies, Berlin, Germany, Dec. 6, 1995.
49. "Basic energy efficiency of plasma production in electrical discharge and electron beam reactors", B.M. Penetrante, M.C. Hsiao, J.N. Bardsley, B.T. Merritt, G.E. Vogtlin, A. Kuthi, C.P. Burkhart, J.R. Bayless, Symposium on non-thermal plasma technology for air contaminant control, Tokyo (Japan), 1 Nov 1996.
50. "Micropulser for real-time microscopy of cell electroperturbation" Matthew Behrend, Andras Kuthi, Tom Vernier and Martin Gundersen, 2002 Power Modulator Conference, Hollywood, CA
51. "Compact nanosecond pulse generator for cell electroperturbation experiments" Andras Kuthi, Tom Vernier, Kathy Gu, and Martin Gundersen, 2002 Power Modulator Conference, Hollywood, CA
52. "Pseudospark based pulse generator for corona assisted combustion experiments" Andras Kuthi, Jianbang Liu, Clayton Young, and Martin Gundersen, 2002 Power Modulator Conference, Hollywood, CA
53. "GaAs and Si FET-type Switches for Repetitive Pulsed Power Applications" Xianyue Gu, Andras Kuthi, P. Hadidzad, C. Myles, Tom Vernier and Martin Gundersen, 2002 Power Modulator Conference, Hollywood, CA
54. "Pseudospark based pulse forming circuit for transient plasma ignition experiments", Fei Wang, Andras Kuthi, and Martin Gundersen, 2003 IEEE Pulsed Power Conference, paper T3-8
55. "Electrical modeling of pulsed power systems for biomedical applications", Panduka Wijetunga, Xianyue Gu, P. Thomas Vernier, Andras Kuthi, Matthew Behrend and Martin A. Gundersen, 2003 IEEE Pulsed Power Conference, Invited paper, T7-1,2
56. "Marx generator using pseudospark switches", Andras Kuthi, Ray Alde, Martin Gundersen and Andreas Neuber, 2003 IEEE Pulsed Power Conference, paper W8-1
57. "Nanosecond rise time minipulser for cell electroperturbation", Xianyue Gu, Panduka Wijetunga, Andras Kuthi, Matthew Behrend and Martin A. Gundersen, 2003 IEEE Pulsed Power Conference, paper MP-86
58. "Advanced multi-gap pseudospark switch", Andras Kuthi, Brian Eccles, Qingfang Yao, Chunqi Jiang, Klaus Frank and Martin Gundersen, 2003 IEEE Pulsed Power Conference, paper MP-87
59. "Rapid charger for high repetition rate pulse generator", Andras Kuthi, Clayton Young, Fei Wang, Panduka Wijetunga, and Martin Gundersen, 2003 IEEE Pulsed Power Conference, paper MP-88
60. "Solid state tlt for spark gap triggering", Matthew Behrend, Andras Kuthi, and M. Gundersen, 2003 IEEE Pulsed Power Conference, paper MP-90
61. "Direct mosfet drive 20 nanosecond compact inductive adder", Matthew Behrend, Andras Kuthi, Mya Mya Thu, Qiong Shui, Panduka Wijetunga, and M. Gundersen, 2003 IEEE Pulsed Power Conference, paper MP-91
62. "Compact High Repetition Rate Pseudospark Pulse Generator for Transient Plasma Ignition", Fei Wang, Andras Kuthi and Martin Gundersen, 2004 Power Modulator Conference, San Francisco, CA
63. "Four-channel pulse generator for real-time biological investigations", Martin A. Gundersen, Matthew R. Behrend, Sun Yinghua, P. Thomas Vernier, A. Kuthi, Proceedings of the 26th international power modulator symposium and 2004 high

voltage workshop, p. 210-215.

64. "Flyback resonant charger for high repetition rate pseudospark pulse generator" F. Wang, A. Kuthi, C. Jiang, Q. Zhou, M. A. Gundersen, 26<sup>th</sup> Int. Power Modulator Symposium, 2004 and 2004 High-Voltage Workshop, p. 85-88
65. "Feedback stabilized pseudospark switch for fast rise marx generator application", Andras Kuthi, Peter Gabrielsson, and Martin Gundersen, 2004 Power Modulator Conference, San Francisco, CA
66. "DC to 1 gigahertz multikilovolt voltage probe", M.R. Behrend, A. Kuthi, M.A. Gundersen, 26<sup>th</sup> Int. Power Modulator Symposium, 2004 and 2004 High-Voltage Workshop, p. 341-343.
67. "Bipolar nanosecond pulse generation using transmission lines for cell electro-manipulation", A. Kuthi, M. Behrend, T. Vernier and M. Gundersen, 2004 Power Modulator Conference, San Francisco, CA
68. "Nanosecond pulse generator using a fast Recovery diode", A. Kuthi, P. Gabrielsson, M. Behrend and M. Gundersen, 2004 Power Modulator Conference, San Francisco, CA
69. "Small pseudospark switches", C. Jiang, A. Kuthi and M. A. Gundersen, 2004 IEEE International Conference on Plasma Science, Baltimore, paper 4D10
70. "Transient plasma ignition of quiescent and flowing fuel mixtures", F. Wang, J.B. Liu, J. Sinibaldi, C. Brophy, A. Kuthi, C. Jiang, P. Ronney and M. A. Gundersen, 2004 IEEE International Conference on Plasma Science, Baltimore, paper 6D6
71. "Transient Plasma Ignition of Hydrocarbon-Air Mixtures in Pulse Detonation Engines", F. Wang, C. Jiang, A. Kuthi and M. Gundersen, 42nd AIAA Aerospace Sciences Meeting and Exhibit, Reno, Nevada, Jan. 5-8, 2004
72. "Plasma generation with a thin-wire discharge for use as pseudospark discharge initiation", A. Kuthi, C. Jiang and M. A. Gundersen, 2004 IEEE International Conference on Plasma Science, Baltimore, paper 7P36
73. "Marx generator using dense plasma switches", A. Kuthi, P. Gabrielson, and M. A. Gundersen, 2004 IEEE International Conference on Plasma Science, Baltimore, paper 7P40
74. "Catheter electrode studies for ultra-short high-field pulses", Thu, M. Behrend, M.R. Vernier, P.T. Sun, Y. Kuthi, A. Marcu, L. Gundersen, M.A., Power Modulator Symposium, 2004 and 2004 High-Voltage Workshop.
75. "Technology for Transient Plasma Ignition", F. Wang, A. Kuthi, and M. Gundersen, 43rd AIAA Aerospace Sciences Meeting and Exhibit, Reno, Nevada, Jan. 10-13, 2005
76. "Paschen Characteristics Of The Pseudospark Discharge" A. Kuthi and M. A. Gundersen, 2005 IEEE Int. Conf. on Plasma Science, poster 10337.
77. "Solid-State Nanosecond Pulse Generator For Transient Plasma Ignition" F. Wang, T. Tang, C. Cathey, A. Kuthi and M. A. Gundersen, 15<sup>th</sup> Int. Pulsed Power Conference, Monterey, CA. (2005) paper 10123
79. "Nanosecond Pulse Generator Using Diode Opening Switch for Cell Electroperturbation Studies" T. Tang, F. Wang, A. Kuthi, M. Gundersen, 15<sup>th</sup> Int. Pulsed Power Conference, Monterey, CA. (2005) paper 10275
80. "Small BLT Switch for Compact Pulsed Power Studies" C. Jiang, A. Kuthi, M.A. Gundersen, 15<sup>th</sup> Int. Pulsed Power Conference, Monterey, CA. (2005) paper 10305
81. "Electroporation of Mammalian Cells Visualized with Fluorescent Semiconductor Nanocrystals (Quantum Dots)", Yinghua Sun, P. Thomas Vernier, Jingjing Wang, Andras Kuthi, Laura Marcu, Martin A. Gundersen, Proceedings of the Material Research Society, 2005.
82. "Large Area Atmospheric Pressure Dielectric Discharge using a High-Power Plasma Switch", P. Bletzinger, D. Trump, J. Williamson, B. Ganguly, M. Gundersen and A. Kuthi, 44th AIAA Aerospace Sciences Meeting and Exhibit, Reno, Nevada, Jan. 9-12, 2006
83. "Design of 60kV 20ns solid state Pulse generator Based on magnetic reactor driven diode opening switch", T. Tang, A. Kuthi, F. Wang and M. A. Gundersen, 27th International Power Modulator Conference 2006, Washington D. C., May 14-18th, 2006.
84. "Pseudospark-based power modulator technology for transient plasma ignition", F. Wang, C. Cathey, A. Kuthi, T. Tang,

- H. Chen, and M. A. Gundersen, 27th International Power Modulator Conference 2006, Washington D. C., May 14-18th, 2006.
85. "High Voltage, Small Back-Lighted Thyratrons", H. Chen, A. Kuthi, C. Jiang and M. A. Gundersen, 27th International Power Modulator Conference 2006, Washington D. C., May 14-18th, 2006.
  86. "Transient Plasma Ignition for Delay Reduction in Pulse Detonation Engines", Charles Cathey, Fei Wang, Tao Tang, Andras Kuthi, Martin A. Gundersen, Jose O. Sinibaldi, Chris Brophy, Ethan Barbour, Ronald K. Hanson, John Hoke, Fred Schauer, Jennifer Corrigan and John Yu, 45th AIAA Aerospace Sciences Meeting and Exhibit, 8 - 11 January 2007, Reno, Nevada
  87. "Compact Subnanosecond Pulse Generator using Avalanche Transistors", Krishnaswamy, P. Kuthi, A. Vernier, T. Gundersen, M., IEEE 34th International Conference on Plasma Science, 2007.
  88. "Enhanced OH Chemiluminescent Emission from Transient Plasma Ignited Methane-Air Mixtures Relative to Spark Ignition", Cathey, C.D. Kuthi, A. Hai Wang Gundersen, M.A., IEEE Pulsed Power and Plasma Science, 2007.
  89. "Solid State Pulse Adding System for Transient Plasma Ignition", Tao Tang, D.R. Singleton, Hao Chen, C.D. Cathey, A. Kuthi, and M.A. Gundersen, IEEE Pulsed Power and Plasma Science, 2007.
  90. "High Density Plasma in a High Pressure Hydrogen Capillary Discharge", Hao Chen Kallos, E. Muggli, P. Kuthi, A. Katsouleas, T.C. Gundersen, M.A., IEEE Pulsed Power Plasma Science, 2007.
  91. "Small Back-Lighted Thyratrons", H Chen, C Jiang, A Kuthi, MA Gundersen, J Dickens, IEEE 34th International Conference on Plasma Science, 2007.
  92. "High Density Plasma in a High Pressure Hydrogen Capillary Discharge", Hao Chen, Efthymios Kallos, Patric Muggli, Andras Kuthi, Thomas C. Katsouleas and Martin A. Gundersen, IEEE 34th International Conference on Plasma Science, 2007.
  93. "Broadband Power Measurement of High-Voltage, Nanosecond Electric Pulses for Biomedical Applications", J. Sanders, C. Jiang, A. Kuthi, M.A. Gundersen, IEEE International Power Modulators and High Voltage Conference, 2008.
  94. "Applications of Power Modulator Technology to Ignition and Combustion", D. Singleton, C. Cathey, A. Kuthi, M. A. Gundersen, IEEE International Power Modulators and High Voltage Conference, 2008.
  95. "Nanosecond Pulse Generator with Scalable Pulse Amplitude", J. Sanders, A. Kuthi, M.A. Gundersen, IEEE International Power Modulators and High Voltage Conference, 2008.

***Laboratory Reports not published elsewhere:***

1. "Experiment on Magnetoacoustic Mode Excitation in the F IV A Device" M. Bures and A. Kuthy, TRITA PFU 80 08 (1980).
2. "Transport in a Multicomponent Cool Plasma Blanket" J.R. Drake, A. Kuthy and M. Tendler, TRITA PFU 1982 04.
3. "Measurements of Plasma Losses Due to Magnetic Guarding of Internal Ring Supports" A. Kuthi, R.W. Schumacher, M.Y. Fukao, L. Wang, K.L. Lam, K. Jones and A.Y. Wong, UCLA PPG 655 (1983).
4. "A Holographic Grating Polychromator with Fibre Entrance and Exits For Laser Scattering Experiments" A. Kuthi, S. Lindau and J. Tonks, TRITA PFU 1984 09.
5. "A Double Heterodyne Interferometer for the Measurement of Plasma Density Profile in a Single Discharge of EXTRAP" A. Kuthi, E. Lagerstrom and J. Tonks, The Royal Inst. of Tech, Stockholm, 1984.
6. "Observation of Stable Axisymmetric Mirror Equilibrium at Arbitrary Beta" A. Kuthi, H. Zwi, L. Schmitz, and A.Y. Wong, UCLA PPG 1078 (1987).
7. "Power deposition and field penetration in a field reversed configuration generated by rotating magnetic fields" A. Kuthi, H. Zwi, B. Wells, and A.Y. Wong, UCLA PPG 1240 (1989).
8. "Steady state field reversed configuration equilibrium in RACETRACK" H. Zwi, A. Kuthi, A.Y. Wong, B. Wells, and S.

Loucks, UCLA PPG 1239 (1989).

9. "Unsuccessful search for the d(d,p) reaction in deuterium loaded thin palladium foil" A. Kuthi and M. Simon, UCLA PPG 1241 (1989).
10. "Radiofrequency Plasma Torch for Decomposition of Hazardous Waste" A. Kuthi, R. Wuerker, and A.Y. Wong, UCLA 1990.

### *Patents*

1. "Electrodeless Plasma Apparatus and Methods for the Dissociation of Hazardous Waste" US Pat. # 5,288,969.
2. "Semiconductor process chamber electrode" US Pat. # 6,106,663
3. "Plasma processing system apparatus and method for delivering RF power" US Pat. #6,242,360
4. "Temperature control system for plasma processing apparatus" US Pat. #6,302,966
5. "Method and apparatus for producing uniform Process Rates" US Pat. #6,320,320
6. "Plasma processing systems" US Pat. #6,341,574
7. "Method and apparatus for producing uniform process rates" US Pat.#6,518,705
8. "System, Apparatus, and Method for Processing Wafer Using Single Frequency RF Power in Plasma Processing Chamber" US Pat. #6,562,190
9. "Apparatus for controlling the voltage applied to an electrostatic shield used in a plasma generator" US Pat. #6,592,710
10. "Method and apparatus for producing uniform processing rates" US Pat. #6,653,791
11. "Apparatus and methods for improving the stability of RF power delivery to a plasma load" US Pat. #6,838,832
12. "Plasma processor with electrode simultaneously responsive to plural frequencies" US Pat. #6,841,943
13. "Method and apparatus for producing uniform process rates" US Pat.#6,842,147
14. "Plasma processor apparatus and method, and antenna" US Pat. #6,876,155
15. "Apparatus and method for controlling the voltage applied to an electrostatic shield used in a plasma generator" US Pat. #6,974,550
16. "Megasonic cleaning efficiency using auto-tuning of an RF generator at constant maximum efficiency" US Pat. #6,995,067
17. "System, method and apparatus for automatic control of an RF generator for maximum efficiency"
18. US Pat. #6,998,349
19. "Apparatus and methods for minimizing arcing in a plasma processing chamber" US Pat. #7,086,347
20. "Reducing plasma ignition pressure" US Pat. #7,193,173
21. "System, method and apparatus for automatic control of an RF generator for maximum efficiency" US Pat. #7,326,581
22. "Method for adjusting voltage on a powered Faraday shield" US Pat. #7,413,673
23. "Bevel etcher with gap control" US Pat. Appl. 20080179297
24. "methods of and apparatus for measuring and controlling wafer potential in pulsed rf bias processing", US Pat. Appl. WO/2008/036210