Curriculum Vitae

I. Personal Information

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I.E. Educational Background

BS	Physics	University of Athens, Greece	1960
MS	Nuclear Engineering	MIT	1965
PhD	Physics	University of Maryland	1968

II. Research, Scholarly and Creative Activities

II.A. Books

"Waves and Instabilities in Space Plasmas", ed. P. Palmadesso and K. Papadopoulos, D. Reidel Co., Holland, 1979.

"Solar Terrestrial Physics: Present and Future", ed. D.M. Butler and K. Papadopoulos, NASA, NASA Reference Publication 1120, 1984.

II.C. Articles in Refereed Journals

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271. Eliasson, B. and K. Papadopoulos (2015), HF wave propagation and induced ionospheric turbulence in the magnetic equatorial region, *J. Geophys. Res.* 12, 2727-2742, doi:10.1002/2015JA022323
272. Wang, Y., W. Gekelman, P. Pribyl, B. Van Compernolle, and K. Papadopoulos (2015), Generation of Kinetic Shear Alfvén Waves by Repetitive Electron Heating, *J. Geophys. Res.*
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275. Vartanyan, A., G. Milikh , B. Eliasson , A. Najmi , M. Parrot , K. Papadopoulos (2015), Generation of whistler waves by continuous HF heating of the upper ionosphere, Radio Sci.,
276. Najmi, A., B. Eliasson , Xi Shao , G. Milikh , A. S. Sharma , K. Papadopoulos (2015), Theoretical studies of fast stochastic electron heating near the upper hybrid layer, Radio Sci.,.
277. Eliasson B., and K. Papadopoulos, Pitch angle scattering of relativistic electrons near electromagnetic ion cyclotron resonances in diverging magnetic fields, Plasma Phys. Control. 59, 104003 (2017).
278. A. Najmi, B. Eliasson, X. Shao, G. Milikh, A.S. Sharma, and K. Papadopoulos, Vlasov simulations of electron acceleration by radio frequency heating near the upper hybrid layer, Phys. of Plasmas, 24(10), doi: 10.1063/1.4999768 (2017).

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280. B. Eliasson & K. Papadopoulos, Pitch Angle scattering of relativistic electrons near EMIC resonances in diverging magnetic fields, Plasma Physics and Controlled Fusion, 59, 10, 10p., 104003 (Oct 2017)

281. B. Eliasson G.M. Milikh T.C. Liu, X. Shao & K. Papadopoulos, Simulations of the Generation of energetic electrons and the formation of descending artificial plasma layers during HF- Heating at Arecibo, Journal of Geophysical Research: Space Physics Vol 123, pp. 10301-10309 doi:10.1029/2018]A026073 (2018)

282. K.A. Zawdie, J.D. Huba, M.S. Dhadly, K. Papadopoulos, The Effect of Plasma Release on Equatorial Spread F – A Simulation Study, Journal: Frontiers in Astronomy and Space Sciences, Manuscript ID: 428495 (In Press)

Invited Presentations to International Meetings:

1. On the Physics of Upper Hybrid Turbulence, Triennial Earth-Sun Summit, 20-28 May, 2018, Leesburg, VA
2. ELF/VLF Antenna based on Superparamagnetic Nanoparticles, COSPAR 2018, July 15-20, 2018, Pasadena, CA
3. EMIIC Injection in space using a novel, compact Single Domain Nanoparticle Antenna, 2nd Asia Pacific Plasma Physics Conference, November 11-17, 2018, Kanazawa, Japan
4. Nanoparticle ELF antenna for triggering EMIC emissions in the Radiation Belts,
5. Workshop on Nonlinear Wave-Particle Interactions in Plasmas, November 19, Kyoto, Japan
6. **K. Papadopoulos**, ***On the Physics of High Beta Injections – Next Generations in Ionospheric Modification Techniques,*** 23th RF Ionospheric Interactions Workshop, University of Colorado, May 16, 2017
7. **K. Papadopoulos**, ***Active Experiments in Space – The next Step***, Workshop on Active Experiments in Space: Past Present and Future, Santa Fe, NM, September 10-15, 2017
8. **K. Papadopoulos**, ***Plasma Antenna Based on Super-Paramagnetic Nanoparticles (SPN)***,American Geophysical Union, Fall Meeting, New Orleans, December 11-15, 2017
9. Ionospheric modifications using mobile, high power HF transmitters based on HPM technology, ICOPS, May 2015, Belek, Antalya, Turkey.
10. K. Papadopoulos, Amir Najmi, and Bengt Eliasson, *New inroads on the physics of upper hybrid turbulence,* 41st COSPAR Scientific Assembly, Istanbul, Turkey 2016
11. K. Papadopoulos *Physics and Applications of Artificial Ionization Using High-Power Ionospheric Heater,* Technology Seminar Series, National Reconnaissance Office, April 14, 2016
12. K.Papadopoulos *Upper hybrid Turbulence in the magnetosphere,* 41st COSPAR Scientific Assembly, Istanbul, Turkey 2016
13. K Papadopoulos .C. Najmi and B. Eliasson *On the Physics of Upper Hybrid turbulence,* 22nd RF Ionospheric Interactions Workshop, Albuquerque NM, May 9-12, 2016
14. K A. Zawdie, J.D. Huba and K. Papadopoulos Is it possible to trigger (or suppress) Equatorial Spread F bubbles 22nd RF Ionospheric Interactions Workshop, Albuquerque NM, May 9-12, 2016
15. A new paradigm in sources and physics of high-power ionospheric modifications (invited review), 20th Annual RF Ionospheric Interactions workshop, Arecibo, Puerto-Rico. April 2014,
16. Upper hybrid effects in artificial ionization (invited talk), Fall AGU meeting, , San Francisco, California, December 2014
17. Destruction of a Magnetic Mirror-Trapped Hot Electron Ring by a shear Alfven Wave; Y. Wang, W. Gekelman, P. Pribyl, D. Papadopoulos' Invited Presentation 55th Annual Meeting of the APS Division of Plasma Physics, Nov. 12, 2013
18. Using Active Experiments to Probe Geo-space, Third International Conference: The Mechanics of the Magnetospheric System and Effects on the Polar Region, Torres del Paine, Patagonia, Chile, October 27- November 1, 2013
19. Controlled Wave Particle Interaction Studies in the Radiation Belts, Invited Presentation to Resonance Workshop September, 19, 2012, Kiev, Ukraine
20. Using Ionospheric Heaters to Explore the Physics of the Radiation Belts, Invited Talk to the 2013 Radiation Belt Workshop, June 30-July 3, 2013, Santorini, Greece
21. Langmuir Solitons and their Role in Artificial Ionization in Ionospheric Heating Experiments, Symposium "The Power of Plasma Theory," Leonid Rudakov 80th May 4, 2013, LaJolla, Ca
22. New Results on Artificial Plasma Layers; Combining the old with the new Invited Presentation, 19th Ionospheric Interactions Workshop April 23, 2013 Arecibo, PR
23. Controlled Wave Particle Interaction Studies in the Radiation Belts, Invited Presentation to

Resonance Workshop September, 19, 2012, Kiev, Ukraine

24. Injection of Shear Alfven Waves in the Inner Radiation Belt Using Arecibo Heater, Invited Talk to the 8th Annual RF Ionospheric Interactions Workshop 15-18 April, 2012, Santa Fe, NM
25. Shear Alfven Wave Injection in the Magnetosphere by Ionospheric Modifications in the Absence of Electrojet Currents, Invited Presentation Session SM 34A, AGU 2011 Fall Meeting, December 7, 2011, San Francisco.
26. Space as an Open Nonlinear Plasma Laboratory, Invited Presentation Session BM10, 53rd Annual Meeting of the APS, Plasma Physics Division, Salt Lake City, Utah, November 14, 2011.
27. Controlled Wave Particle Interaction Studies in the Radiation Belts, HAARP/ Resonanc

Workshop, November 8, 2011, UMCP.

28. Controlled Wave Particle Interaction Studies in the Radiation Belt, RBSP IWG APL, May 23, 2011.

29. Injection of shear Alfven Waves in the Radiation Belts using Arecibo, The Seventeenth Annual RF Ionospheric Interactions Workshop 17-20 April 2011 Santa Fe, New Mexico
30. Fundamental Physics Issues on Radiation Belts and Remediation, Invited Presentation at the 16th Annual RF ionospheric Interactions Workshop, April 20, 2010.
31. Fundamental Physics Issues on Radiation Belts and Remediation, Interim Review December 12, 2010 San Francisco, CA.
32. Space Radiation Environment and Reliability, invited talk, 34th Annual COMACT Conference, Orlando, FL, March 15-20, 2009.
33. Ionospheric ELF/ULF Generation without Needing Electrojects, invited presentation 15th Annual RF Ionospheric Interactions Workshop, Boulder, CO, April 21, 2009.
34. Using Space As a Nonlinear Plasma Laboratory, Presented at the 50th Annual Meeting of the Division of Plasma Physics, Dallas, TX, November 18, 2008.
35. Testing Plasma Physics in the Ionosphere, paper (D35), Presented at the 37th COSPAR Scientific Assembly, Montreal, CA, July 13-19, 2008.
36. The Ionosphere as an Open Plasma Laboratory - Celebration of 50th Anniversary of Sputnik, Russia Academy of Science, October 2007.
37. On the Interaction of Short Pulse Lasers with Semiconductors and Nano-Structures and its Technological Implications, Moscow, Russia, May 24, 2006.
38. ELF Generation and Propagation: Polar vs. Equatorial, February 28, 2006.
39. On the Physics of Ionospheric Heating and its Applications to Underground Exploration and Radiation Belt Control, Taipei, 2005.
40. Ionospheric VLF/ELF Generation, PARS Summer School, August 22, 2005.
41. Plasma Physics in Space the Applications View-Point, COSPAR, 2004.
42. Satellite Threat Due to High Altitude Nuclear Detonations, US Congress, 2004.
43. Effect of the Anomalous Electron Heating on the Ionospheric Potential in the LFM Global MHD Model, AGU Fall Meeting, San Francisco, CA, December 16, 2004.
44. Diagnostics for ELF/VLF Generation, the Tenth Annual RF Generation Ionosphere Interactions Workshop, Santa Fe, NM, April 18-21, 2004.
45. On the Physics of Artificially Stimulated Emissions (ASE), URSI Meeting, Boulder, Colorado, January 7, 2004.
46. Theory of Stimulated VLF Emissions a Review, Presentation to AFRL Workshop on Stimulated Precipitation of Energetic Particles, Stanford, CA, January 28-30, 2003.
47. HAARP A New Revolutionary Facility for Remote Sensing and Space Weather Applications, NATO Advanced Research Workshop Effects of Space Weather on Technology Infrastructure (ESPRIT), Rhodes, Greece March 25-29, 2003.
48. Brief Review of Space Weapons Systems, Presentation to "Future of Space" Meeting, Paris, France, April 1-2, 2003.
49. Plasma Physics in Space the Applications View-Point, Presentation in Symposium Honoring Leonid Rudakov 70th Birthday, May 15, 2003.
50. "The Threat: Nuclear Detonation in Space", The Federation of American Scientists, Panel on Weaponization of Space, Boston, Mass, July 2003.
51. Waves and Instabilities in Space Plasma, Tutorial presented at the Summer School on Basic Processes of Turbulent Plasmas, Halkidiki, Greece, September 22-25, 2003.
52. "Efficiency Scaling for Ionospheric ELF/VLF Generation, Holland, August 2002.
53. "COSPAR – Plasma Physics in Space – The Applications View Point",

54. ELF/VLF Generation in the Ionosphere State of the Art, Presentation to PARS Workshop, November 4, 2001.
55. "ELF Conversion Efficiency", at the Seventh Annual RF Ionospheric Interactions Workshop, Santa Fe, New Mexico, 29 April – 2 May 2001.
56. "The Role and Form of Modeling in Space Weather" (tutorial lecture), NATO Advanced Institute on Space Storms and Space Weather Hazards, Crete, Greece, June 22, 2000.
57. "Physics of Ionospheric VLF/ELF/ULF Generation and their use for Underground Imaging", January 14, 1999.
58. "Collisionless Shocks", Centennial APS Meeting, Atlanta, GA, March 24, 1999.
59. RF Ionospheric Interactions Workshop, Santa Fe, NM, April 14, 1999.
60. "Magnetospheric Modeling for Space Weather", University of Maryland, Meteorology Dept., October 21, 1999.
61. "Lighting", University of Maryland, East West Space Science Center, November 5, 1998.
62. "Low Frequency EM Imaging Using Only Magnetic Field Measurements", DARPA, October 15, 1998.
63. "On the Physics of Ionospheric VLF/ELF/ULF Generation and their Applications", University of Maryland, September 28, 1998.
64. "Modifying the Ionosphere to Image the Underground", Cambridge Symposium/Workshop on the Physics of Space Plasmas, Cascais, Portugal, June 29, 1998.
65. "On the Physics of Low Frequency Underground Imaging", DARPA, June 1998.
66. "From MT to GGT", presentation to Defense Intelligence Agency, April 1998.
67. "Tutorial Review – On the Physics of Ionospheric VLF/ELF/ULF Generation and their Applications", HAARP Santa Fe Meeting, New Mexico, April 19, 1998.
68. "Modeling of Geospace: An ISTP View of Substorms", 1998 Yosemite Workshop, Toward Solar Max 2000: The Present Achievements and Future Opportunities of ISTP and GEM, Yosemite, CA, February 10, 1998.
69. "ISTP Theory Examples", ISTP Meeting, Goddard Space Flight Center, Greenbelt, MD, November 5, 1997.
70. "The Physics of Substorms as Revealed by the ISTP", Symposium on Solar-Terrestrial Coupling Processes, Paros, Greece, June 23-27, 1997.
71. "Current Collection in Space Plasma from Langmuir to TSS-1R", Symposium on Solar-Terrestrial Coupling Processes, Paros, Greece, June 23-27, 1997.
72. "Computer Simulation of an Isolated Substorm: March 9, 1995", International Symposium Chapman Conference on "The Earth's Magnetotail: New Perspectives", Kanazawa, Japan, November 4-8, 1996.
73. "The TSS-1R Results – the Physics of Current Collection in Magnetized Plasmas Revised", American Physical Society Annual Meeting, November 11-15, 1996.
74. "Global MHD Simulations in Support of ISTP", International Symposium Encounter between Global Observations and Models in the ISTP ERA, Huntsville, AL, September 15-20, 1996.
75. "ELF Generation and Remote Sensing with Ionospheric Sources", General Assembly International Union of Radio Science, August 28 – September 5, 1996.
76. "The New "FACE" of Lightning, Red Sprites, Blue Jets and Gamma Rays, AAAS Meeting, Baltimore, Maryland, February 9, 1996.
77. "The New Face of Lightning – Red Sprites/Blue Jets/Gamma Ray Bursts/Radio Bursts", Hellenic Astronomical Society Meeting, Thessaloniki, Greece, June 29, 1995.

78. "The Plasma Physics of the TSS", TSS-R Astronaut Training Sessions, JSFC, Texas, May 10, 1995.
79. "Physics and Applications of Ionospheric VLF/ELF/ULF Generation", High Power RF Ionospheric Modification Workshop, Santa Fe, NM, April 22-26, 1995.
80. "The New "Face" of Lightning Optical Flashes, Gamma and Radio Bursts above the Clouds", 1995 Cambridge Symposium Workshop, Bermuda, February 20-25, 1995.
81. "High Altitude Lightning", Symposium Workshop for Bruno Coppi's 60th Birthday, MIT, Boston, Mass., January 19-20, 1995.
82. "Helicons in Ionospheric Modification Experiments", National Radio Science Meeting, Denver, CO, 1995.
83. "The Importance of the Helicon Mode on the Physics of the Lower Ionosphere", URSI, Boulder, CO, January 3-5, 1995.
84. "Response of a Magnetized Semiconductor Plasma to a Laser Pulse", Symposium on Strong Electromagnetic Field Interaction with Plasmas, College Park, MD, August 30, 1994.
85. "Applications & Research Opportunities Using HAARP", IV Suzdal URSI Symposium, Uppsala, Sweden, August 15-19, 1994.
86. "Transport Processes in Space Plasma – Conventional Thinking and New Trends", Gordon Research Conf. on Solar-Terrestrial Physics, Wolfeboro, NH, June 22, 1994.
87. "Overview of ELF/VLF Theoretical Program", NPRSC 1993 Workshop on Modification and Diagnosis of the Polar Ionosphere, UCLA, April 28-30, 1993.
88. "Remote Spectroscopy of the Atmosphere", Albuquerque, New Mexico, May 10, 1993.
89. "Helicons in Ionospheric Modifications Experiments", AGU Conference, San Francisco, CA, December 6, 1993.
90. "Transport Processes in Space Plasmas", AGU Chapman Conference, Linhue, Hawaii, February 17-21, 1992.
91. "Critical Ionization Velocity in Space", AIAA 30th Aerospace Science Meeting, Reno, Nevada, January 7-10, 1992.
92. "Status of ELF/VLF Generation", National Polar Radio-science Consortium (NPRSC) Workshop, Stanford, CA, April 1-3, 1992.
93. "Theoretical and Modeling Efforts in ISTP", IACG Workshop, Airle, Virginia, June 1-3, 1992.
94. "CIV Primary Instability", World Space Congress, Washington, DC, August 29, 1992.
95. "The Next Logical Step in Ionospheric Heaters", 3rd Suzdal Symposium on Ionospheric Modifications, Suzdal, USSR, September 10-15, 1991.
96. "The Role of Neutrals in Spacecraft Charging", Int. Meeting on Electrodynamics Tether, Varenna, Italy, September 20-25, 1991.
97. "CIV Triggering in Ba Injection Experiments", AGU-MSA Spring Meeting, Baltimore, MD, May 28-31, 1991.
98. "Review of Weakly Magnetized Plasma Processes in the Ionosphere", HAARP Diagnostics Workshop, Phillips Lab., Boston, Mass, May 1991.
99. "Future Directions for Numerical Simulations in Space Plasmas", XXIIIrd General Assembly of the URSI, Prague, Czechoslovakia, August 28 – September 5, 1990.
100. "A Comprehensive Analysis of Ba Injection Critical Velocity Experiments", XXVIII COSPAR Plenary Meeting, Hague, Holland, July 1990.

101. “Electrojet Modulation ELF Communications”, Advisory Group for Aerospace Research and Development, Bergen, Norway, June 1990.
102. “Recent Developments in Ionospheric Heating Radio Waves”, Topical Conference on Research Trends in Nonlinear and Relativistic Effects in Plasmas, La Jolla Institute, San Diego, February 5-8, 1990.
103. “The Physics of Ionospheric Breakdown”, Nonlinear Dynamics Conference, Ukrainian Academy of Sciences, October 1989.
104. “”The Physics and Limitations of Low Frequency Wave Emissions by Beam Injection in Space”, Workshop on Active Experiments, Northwestern University, September 14-16, 1988.
105. “Review of Ion Beam Propagation in Space”, Chapman Conference, Japan, October 1987.
106. “Theoretical Guide to Future Computer Simulation in Space”, XXII General Assembly of URSI, Tel Aviv, Israel, September 1987.
107. “RF Acceleration of Electrons in Space”, XXXI General Assembly of URSI, Tel Aviv, Israel, September 1987.
108. “Current Understanding and Issues on Electron Beam Injection in Space”, COSPAR Meeting, Toulouse, France, July 1-6, 1986.
109. “Theory of Nonlinear RF Plasma Interactions in Electron Acceleration in the Ionosphere”, Workshop on RF Interactions with Laboratory on Space Plasma, UCLA, Los Angeles, CA, April 1-2, 1986.
110. “Spontaneous Generation of ULF/ELF/VLF Current Loops in the Ionosphere”, USRI General Meeting, Boulder, CO, January 13-15, 1986.
111. “Neutral Gas Plasma Interactions in Space”, International School for Plasma Simulations, Kauai, Hawaii, February 3-16, 1985.
112. “Physics of Critical Ionization Velocity”, Trieste Plasma Physics College, Triests, Italy, May 27 – June 4, 1985.
113. “On the Shuttle Glow”, First Workshop on Spacecraft Glow, Huntsville, Alabama, 1984.
114. “The Microphysics of Collisionless Shocks”, AGU Chapman Conference on Collisionless Shocks, Napa Valley, CA, February 1984.
115. “Early Ionization and Coupling of AMPTE Releases to the Solar Wind Plasma”, Fall AGU Meeting, San Francisco, CA, December 5-9, 1983.
116. “Neutral Gas Plasma Interactions and Critical Ionization Phenomena in Space”, Twenty-fifth Annual Meeting of the Division of Plasma Physics, Los Angeles, CA, November 7-11, 1983.
117. “Review of Ionospheric VLF and ELF Injections”, International Symposium on Active Experiments in Space, Alpbach, Austria, May 24-28, 1983.
118. “Electron and Ion Beam Driven Plasma Discharges with Collective Dissipation”, Workshop on the Critical Velocity Effect, Munich, Germany, October 11-13, 1982.
119. “Studies of the Earth’s Bow Shock and Solar Energetic Electrons”, AGU Fall Meeting, San Francisco, CA, December 1981.
120. “Plasma Lasers in Space”, First International School of Plasma Astrophysics, Varenna, Italy, August 1981.
121. “Theory of High Much Number Magnetosonic Shocks”, ISEE Working Group Meeting, Meudon, France, July 1981.
122. “Critical Problems of High Mach Number Shocks”, Gordon Conference in Space Plasmas, Wolfsboro, NH, June 22-26, 1981.

123. "Beam Experiments from the Space Shuttle", IEEE Conference, Los Angeles, June 1981.
124. "Review of Space Plasma Simulations", IMS Assessment Symposium, Goddard Space Flight Center, May 20-22, 1981.
125. "Strong Turbulence and its Effects on D.C. Resistivity on Auroral Field Lines", AGU Spring Meeting, Baltimore, MD, May 1981.
126. "The Theory of Beam Plasma Discharge", NATO Advanced Research Institute in Active experiments in Space, Geilo, Norway, April 21-25, 1981.
127. 2nd Tiannual Greek Physical Society Meeting, Lesvos, Greece, September 18-21, 1980.
128. "Radio Physics of the Sun", IAU Symposium No. 86, College Park, MD, August 1-10, 1979.
129. Discussion Leader, Gordon Conference on Space Plasmas, June 1979.
130. School of Nonlinear Plasma Physics, Kiev, U.S.S.R., September 1979.
131. AGU Chapman Conference on Magnetospheric Substorms, Los Alamos, NM, October 1978.
132. International School on Plasma Physics, "Diagnostics for Fusion Plasmas", Varenna, Italy, September 1978.
133. European Geophys. Soc. Meeting., Strassburg, France, August 1978.
134. Workshop on Planetary and Astrophysical Magnetospheres, Snowmass, CO, August 1978.
135. APS Spring Meeting, Washington, DC, April 1978.
136. Invited Lecturer, International Magnetospheric Study (JMS) Boulder, CO, March 1978.
137. N.C. Christophilos Memorial Conference, Spetses, Greece, July 1977.
138. Invited Lecturer "Workshop on the Physics of Astrophysical Plasmas", Aspen, Co, June 1977.
139. Sixth International Conference on Plasma Physics and Controlled Nuclear fusion Research, Berchtesgaden, Germany, October 1976.
140. Invited Lecturer "International School of Plasma Physics" organized by the Georgian Academy of Science, Tbilissi, U.S.S.R., September 1976.
141. Gordon Conference on Plasma Physics (discussion leader), June 1976.
142. COSPAR Symposium on Active Experiments in Space, Boulder, CO, June 1976.
143. Annual U.R.S.I. Meeting, Boulder, CO, October 1975.
144. Thirteenth International Assembly I.A.G.A., Grenoble, France, September 1975.
145. Gordon Conference on Plasma Physics (discussion leader), June 1975.
146. I.E.E.E. Conference on Plasma Physics, Ann Arbor, May 1975.
147. Conference on Type III Solar Burst, Berkeley, CA, May 1975.
148. N.A.S.A. Workshop on Plasma Simulation, Washington, DC, January 1975.
149. Fifth International Conference on Plasma Physics and Controlled Nuclear Fusion Research, Tokyo, Japan, November 1974.
150. European Geophys. Soc. Meeting, Trieste, Italy, September 1974.
151. Plasma Astrophysics Workshop, Lake Tahoe, July 1974.
152. Substorm Conference, Bryce Mt., June 1974.
153. Asilomar Conference on Solar Wind, April 1974.
154. APS. Plasma Physics Meeting, Philadelphia, PA, November 1973

II.J. Sponsored Research

Office of Naval Research, Fundamental Physics Issues on Radiation Belt Dynamics and Remediation Available for Retrieval, $874,894, 03/22/2007-04/30/20014, lead investigator

NSF, Active Investigations of Criticasl Geo-space issues, $4,999,998, 10/01/2013-09/30/2018, lead investigator

AFOSR-Air Force Office of Scientific Research, Collaborative Research on Novel High Power Sources for and Physics of Ionospheric Modification, $1,650,000, 07/01/2013-06/30/2018, co-investigator

AFOSR-Air Force Office of Scientific Research, Collaborative Research on Novel High Power Sources for and Physics of Ionospheric Modification, $249,511, 12/15/2013-12/14/2016, co-investigator

AFOSR-Air Force Office of Scientific Research, Collaborative Research on Novel High Power Sources for and Physics of Ionospheric Modification, $131,250, 12/15/2013-12/14/2016, co-investigator

Office of Naval Research, Fundamental Physics Issues on Radiation Belt Dynamics and Remediation Available for Retrieval, $7,499,539, 03/22/2007-04/30/20014, lead investigator

NSF, Low Frequency Waves in the Ionosphere During HF Heating and Effects on the Ground and in the Magnetosphere, $100,000, 08/01/2013-07/31/2016, co-investigator

II.L.6. Other

II.N. Patents

Device

1. High power low frequency communications by ionospheric modification, US 5053783 A, 1991

2. Ground global tomography (CGT) using modulation of the ionospheric electrojets, US 5777476 A, 1996

3. Magnetized photoconductive semiconductor switch, US 5808349 A, 1998

4. Elf/Vlf wave generator using a virtual vertical electric dipole, WO 2006026052 A2, 2006

5. Radiation-protection device, US 8059332 B2, 2011

6. Method and apparatus for establishing low frequency/ultra low frequency and very low frequency communications, US 8299936 B2, 2012

7. System and method for reducing trapped energetic proton or energetic electron flux at low earth orbits, US 20130181145 A1, 2013

8. Laser proton acceleration for production of radionuclides, Patent pending (case # 61807218), 2013

II. Teaching, Mentoring and Advising.

II.A. Courses Taught

Include courses taught in the last five years. Indicate approximate enrollments and any unusual formats.

Spring 2013	PHYS8981	PRE-CANDIDACY RESEARCH (Individualized Instructor)	1 Lecture
Spring 2013	PHYS8996	DOC DISSERTATN RES (Individualized Instructor)	2 Lecture
Fall 2013	PHYS8981	PRE-CANDIDACY RESEARCH (Individualized Instructor)	1 Lecture
Fall 2013	PHYS8996	DOC DISSERTATN RES (Individualized Instructor)	2 Lecture

Spring 2012	PHYS8981	PRE-CANDIDACY RESEARCH (Individualized Instructor)	2 Lecture
Fall 2012	PHYS8981	PRE-CANDIDACY RESEARCH (Individualized Instructor)	3 Lecture

Spring 2011	PHYS2703	ELEC LIGHT REL MOD PHYS	1 Lecture
Spring 2011	PHYS8981	PRE-CANDIDACY RESEARCH1	2 Research
Fall 2011	PHYS8981	PRE-CANDIDACY RESEARCH2	1 Research

Spring 2010	PHYS2703	ELEC LIGHT REL MOD PHYS	6 Lecture
Spring 2010	PHYS8996	DOC DISSERTATN RES	1 Research

Spring 2009	PHYS2703	ELEC LIGHT REL MOD PHYS	4 Lecture
Spring 2009	PHYS3891	UNGRAD THESIS RES	1 Research
Spring 2009	PHYS8981	PRE-CANDIDACY RESEARCH1	1 Research
Fall 2009	PHYS8996	DOC DISSERTATN RES	1 Research

II.B. Teaching Innovations

II.B.1. Major Programs Established

II.B.2. Education Abroad Established

II.B.3. Software, Applications, Online Education, etc.

II.B.4. Instructional Workshops and Seminars Established

II.B.5. Course or Curriculum Development

II.B.6. Historical Innovations (10+ years ago)

Introduction of three honors courses

- Nuclear Era Nuclear Decisions
- Starwars Revisited
- Space- Science-Technology-Exploration

II.B.7. Other

II.C. Advising: Research or Clinical

II.C.1. Undergraduate

II.C.2. Master's

Kate Zawdie 2014

II.C.3. Doctoral

- Harvey Rowland, 1979
- Loukas Vlahos, 1979
- Sanjoy Ghosh, 1985
- Shing Fai Fung, 1985
- Ebraaham Moghaddam-Taaheri, 1986
- Kazuhiro Akimoto, 1986
- Homayoun Karimabadi, 1987
- Liang Lu, 1991
- Dimitris Vassiliadis, 1992
- Benard Vasquez, 1992
- Hau-Bei Zhou, 1994
- Juan Valdivia, 1997
- Michael Wiltberger, 1998
- Xi Shao, 2001
- Aleksandr Ukhorskiy, 2003
- Viatcheslav Merkine, 2004
- Alexey Karavaev, 2010
- Liang Lu, 1991
- Aram Vartanyan 2014
- Chris Najmi 2015
- Kate Zawdie 2015

III.C.4 Post-doctoral

- 28 post-doctoral associates

IV.A. Editorships, Editorial Boards, and Reviewing Activities

Include participation for journals and other learned publications (print and electronic).

IV.A.1. Editorships

- Editor Plasma Physics Series, Cambridge University Press (1989-2000)
- Associate Editor, Journal of Geophysical Research (1981-1984)

IV.A.2. Editorial Boards

- Correspondent "Comments on Plasma Physics' (1984-2000)

IV.A.3. Reviewing Activities for Journals and Presses

- Reviewer Physical Review Letters, Physical Review, Journal of Geophysical Research, Geoph. Rev. Lett., IEEE plasma Physics, Phys. Fluids, Ap. J, Ap J. Letters, Physics Letters, ete

IV.A.4. Reviewing Activities for Agencies and Foundations

- NSF, NASA, ONR, DARPA, DoE

IV.A.5. Reviewing Activities for Conferences

IV.A.6. Historical Editorships, etc. (10+ years ago)

IV.A.7. Other

IV.B. Committees, Professional & Campus Service

IV.B.1. Campus Service – Department

- Qualifying Committee Physics and Astronomy; Second year project Astronomy; Optical Telescope Astronomy

IV.B.2. Campus Service – College

Chair APT and Member College APT Committee several times

IV.B.3. Campus Service – University

- Member Campus University APT Committee
- Member Campus Senate

IV.B.4. Campus Service - Special Administrative Assignment

IV.B.5. Campus Service - Other

IV.B.6. Offices and Committee Memberships

- Member, Space Earth Science Advisory Committee (SESAC), (The Senior NASA Advisory Committee for the Office of Space and Applications), 1984-1987.
- Science Advisor, Office for Fusion Energy, Applied Physics Program 1978-1979

- Member, Space Science Board, Committee on Solar and Space Physics, National Academy of Sciences, 1983-1986
  Member, APS Fellowship Committee.(1997-1980)
- Member Committee on the role of high power, high frequency band transmitters in advancing ionospheric/thermospheric research, National Research Council, National Academy of Sciences, 2013.
- Member, Keyworth Briefing Committee on Space Physics, 1984.
- Member, Research and Analysis Review Committee, NASA, 1984.
- Member, Maxwell Prize Committee for Plasma Physics, APS, 1988.
- Member, Executive Committee Division of Plasma Physics (DPP), American Physical Society (APS), 1985-1988.
- Member, Program Committee DPP-APS, 1985, 1986, 1989.
- Member, Space Station Planning Committee on Plasma and Fusion Physics, 1985.
- Member, Space Plasma Physics and Astrophysics Panel, Physics Review Committee, National Academy of Sciences, 1983-1984.
- Chairman, Steering Committee "Assessment of the Status of Solar Terrestrial Physics", 1982-1983.
- Member, N.A.S.A., "Space Plasma Theory Panel", 1978.
- Member, Overview Committee, D.O.E., A.P.P. 5 year plan, 1980, 1985.
- Member, N.A.S.A., Advisory Panel on "Computer Simulations in Space Plasma", 1977.
- AIP Physics New Committee, 1979.
- National Academy of Science, NRC Postgraduate Advisor
- U.S. Delegate, I.A.E.A. Fusion Conference, 1971, 1974, 1976, 1978.
- Committee on Future Direction of HAARP, Chair Tony Tether, Director of DARPA (2001)
- Chairman, Committee on Scientific Program Using HAARP
- Member, Investigator Working Group the Tether Satellite Program
- Member, Council on Foreign Relations "The Study Group on United States Space Posture for 21st Century", 2003
- Member, Committee on Terrorism and the Nuclear Question, Eisenhower Institute, 2003
- Member Committee on the role of High-Power, High-Frequency-Band Transmitters in advancing Ionospheric/Thermospheric Research. National Research Council, National Academy of Sciences, 2013.

IV.B.7. Leadership Roles in Meetings and Conferences

- Organizing Committee, "N.C. Christophilos International Summer School and Conference on Plasma Physics", Spetses, Greece, 1977.
- Convener, "Symposium on Wave Instabilities in Space Plasmas", URSL XIX General Assembly, Helsinki, 1978
- Chairman, Gordon Conference on Space Plasmas, 1979.
- - Vice Chairman, Gordon Conference on Space Plasmas, 1978.
- Member, Program Committee "Second Workshop on Space Craft Glow", 1985.
- Member, Program Committee "Mediterranean School on Plasma Astrophysics", 1985

IV.B.8. Other Non-University Committees, Memberships, Panels, etc.

- Member SCS Advisory Board, George Mason University, 2003
- Reviewer Interdisciplinary Ph.D. Program in the Physical Sciences George Mason University, 2003

IV.C. External Service and Consulting

IV.C.1. Community Engagements, Local, State, National, International

IV.C.2. International Activities

IV.C.3. Corporate and Other Board Memberships

- Member APTI board of Directors
- VP APTI
- Members ISS board of directors
- Chairman. BAE Systems-ATI Science Advisory Board

IV.C.4. Entrepreneurial Activities

IV.C.5. Consultancies *(to local, state and federal agencies; companies; organizations)*

- APL, MITRE, SAIC, NRL, APTI and BAE Systems.

IV.C.6. Historical External Service and Consulting (10+ years ago)

IV.C.7. Other

IV.D. Non-Research Presentations

IV.D.1. Outreach Presentations

- Public Lecture :Radio Waves from Tesla and Marconi to Space Weather and HAARP, Emry-Riddle AU, November 12, 2014, Daytona FL

V. Awards, Honors and Recognition

V.1. Research Fellowships, Prizes and Awards

- Fellow, American Physical Society (**APS**, 1975)
- Fellow, The Washington Academy of Science (**WAS**, 1979)
- Corresponding Member, International Academy of Astronautics, (**IAA**, 2004)
- Navy Meritorious Civilian Service Award (1976) (Highest scientific award conferred by NRL)
- E.O. Hulbert Award for Outstanding Scientific Achievement (1977)
- The Washington Academy of Science Award for Scientific Achievement in the Physical Sciences (1978)
- The NASA Certificate of Commendation for Distinguished Service to Space Sciences (1986)
- The NASA Group Achievement Award (1998)
- DARPA Director Group Award for Significant Technical Achievement (2007)

V.2 Other Special Recognition

Festshrift Honoring the Career of Dennis Papadopoulos – Modern Challenges in nonlinear plasma physics; International Conference 15-19 June 2009 Sani Resort, Halkifiki, Greece (120 participants)