EDBERTHO LEAL-QUIROS, Ph.D.*

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Polytechnic University of Puerto Rico (Since August 1998 Until March 2007)
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DEGREES

- Ph.D., Nuclear Engineering, University of Missouri - Columbia, 1989
- M.S., Physics, University of California, Los Angeles (UCLA), 1986
- Magister Scientiae, Applied Physics, National University of Colombia, Santa Fe de Bogotá, 1977
- B.S., Physics, National University of Colombia, Santa Fe de Bogotá, 1973

ACADEMIC POSITIONS

- **Director**, Scientific Research & Development, and Full Professor. Polytechnic University of Puerto Rico, Aug. 1998 – February 2007.
- **Joint Faculty Member**, Nuclear Science & Engineering Institute, University of Missouri, Columbia, August 2003 – present
- **Professor,** Graduate School of Management and Electrical Engineering Department, Polytechnic University of Puerto Rico, Aug. 1998 - present
- **Dean of Science and Technology**, Metropolitan University of Puerto Rico, 1997-1998
- **Clinical Faculty of Radiation Oncology**, Medical College of Virginia (MVC), Virginia Commonwealth University, 1994 – June 1996
- **Research - Assistant Professor and Deputy Director**, Fusion Plasma Laboratory, University of Missouri - Columbia, Jan. 1987 - June 1990
- **Professor of Applied Physics**, Metropolitan University, Simon Bolivar University and Central University of Venezuela, Caracas, 1977 – 1983
- **Physics Professor**, Andes University and National University of Colombia, 1971 - 1976

OTHER POSITIONS (WORK EXPERIENCE)

- **Nuclear Systems Engineer**, **Nuclear Quality Analyst**, and **Nuclear Power Operations Instructor**, Virginia Power, North Anna Nuclear Power Station, June 1990 - June 1996
- **Research Associate IV,** Cryogenics, Los Alamos National Laboratory, Los Alamos, New Mexico, May 1986 - Dec. 1986
- **Research Associate** in Mirror Plasma, the Tokamak and Non-Neutral Plasma, & **TA** of the Plasma Physics Laboratory, UCLA, Los Angeles, California, 1984 - 1986

FIELDS OF SPECIALIZATIONS

- Wide research experience in Radiation Oncology, Laser Optics, Cryogenics, Ion Sources, Linear Accelerators, Plasma Devices and Nuclear Reactors
- Expert in Plasma Production and extensive background in High-Density Plasma, Devices Design, Plasma Heating and Plasma Diagnostic for many applications

- Participated in teams that designed, built and tested several High-Density and Fusion Devices
- Invented several Analyzers for Plasma and Fusion Diagnostics and Disclosures
- Instructor of Plasma Physics, Nuclear Sciences, Medical Physics, Laser Laboratories and Nuclear Power Operations
- Instructor of Plasma Physics, Nuclear Sciences Medical Physics, Laser Laboratories and Nuclear Power Operations
- Developed and taught many courses for Graduates and Undergraduates in several engineering fields including Nuclear, Mechanical, Electrical, Chemical, Industrial, Medical Physics and Bioengineering
- Extensive Management, Nuclear, Quality Assurance, Trend and Failure Analysis Experience
- Has published more than thirty scientific papers in international scientific journals and presented more than one hundred papers in national and international conferences

ADDITIONAL EXPERIMENTAL EXPERIENCE

- **Designed, built and tested**: Ion Energy Analyzers of Retarded Field, Microwave Interferometers, Single and Double Langmuir Probes, Proton Source from Lithium, Emissive Probes, Magnetic Probes, Diamagnetic Loops, Rogowski Coils, Electron Guns, Ion Sources, Velocity Filters, Electrostatic Analyzers of 127o, Mass Spectrometers, Faraday Cups, Wien Filters, Microwave Antennas, Microwave Lenses, Plasma Machines, Single and Double Plasma Devices, Mirror Machines, Cusp, Tokamak, Electron Cyclotron Resonance (ERC - sources)

- **Experience with:** High Vacuum Technology, Cryogenics Technology, Heat Transfer Experiments, Oil Analysis, Vibration Analysis, Infrared Thermography and HDR (High Dose Radiation) for Cancer Treatment

- **First Magister Scientiae Thesis**: "Design and Construction of EXB Separators: Wien Filters for Ions and Electrons"

- **Ph.D. Dissertation**: "Novel Diagnostic Probes and Analyzers for RF and Microwave Heated Plasmas and Controlled Fusion Research: the Hyperbolic Energy Analyzer, the Variable Energy Analyzer, the Magnetic Dipole Analyzer and the Double Energy Analyzer."

NUCLEAR POWER PLANTS AND NUCLEAR RESEARCH REACTORS EXPERIENCE

1990 to 1996:

Virginia Power, North Anna Nuclear Power Station, Mineral, Virginia

- Responsible for the Development of the Trend Analysis and Nuclear Quality Analysis, a Group of Quality Assurance , for North Anna Nuclear Power Station in conjunction with Surry Nuclear Power Station and the Corporate Office of Virginia Power at Innsbrook. The mission of the Analysis Group is to track, trend, and perform analysis (including statistical analysis) of equipment components , systems, Human Performance, Programmatic and Organizational Issues using several Internal data Bases QATTs, DRs and external reports: INPO, SOER, NUS, LERs, NRC-IRs, NPRDS, WPTS, Predictive Analysis, Maintenance, HPES.

- Designed, tested and presently maintain with Surry and Corporate Trend Analysts, the Quality Assurance Tracking and Trending Computer Program (QATT) of Virginia Power Nuclear Quality Analysis, Nuclear Power Plant Systems, Periodical tests, Radiation Monitor Systems, Vibration Analysis, Infrared Thermography, Containment Leak Detection, Infrared Thermography, Databases, Nuclear Quality Assurances (QA) monitoring assessments, Trend Analysis, NRC Papers Analysis and identification of Applications to Nuclear Quality Assurance, and Instructor of many courses in the Nuclear Training Department.

1989 to 1990:

Georgia Power, E.I. Hatch Nuclear Power Plant, Baxley , Georgia

- Nuclear Plant Systems, Radiation Detection and Health Physics Theory and Laboratory and Instructor of many courses in the Nuclear Sciences Program of the American Technical Institute (ATI) in the utility.

1988 to 1989:

University of Missouri-Rolla Reactor (UMR), Rolla, Missouri

- Different Reactor parameter measurements, Flux Calculations, startup and shutdown experiments, Reactor Safety, etc.

1987 to 1989:

Missouri University Research Reactor (MURR), Columbia, Missouri

- Different experiments: Temperature and void coefficients, Neutron Flux distribution, Reactivity Control, Reactor Safety, Activation Analysis, Rod worth, Start up, Radiation Protection, Health Physics, Radio-Chemistry, and Upgrade Power Studies.

1978 to 1979:

Venezuelan Institute of Scientific Research (IVIC), Caracas, Venezuela

- Activation Analysis and Industry Applications of Radioisotopes.

1972 to 1975:

Nuclear Science Institute of Colombia (IAN), Bogotá, Colombia

- Nuclear Physics and Radiation Detection. Introduction to Activation Analysis.

INVENTIONS (DISCLOSURES OF PATENTS)

- Stigmatic ExB Separator Tilted-Pole Wien Filter, No. 90UMC011
- Variable Energy Analyzer (VEA), No. 90UMC015
- Hyperbolic Energy Analyzer (HEA), No. 90UMC012
- Magnetic Moment Analyzer (μ-Meter), No. 90UMC013
- Pitch Angle Detector (PADE), No. 90UMC014
- High Intensity Proton Beam System

PROFESSIONAL ACTIVITIES

- American Physical Society Lifetime Member
- American Nuclear Society Lifetime Member.
- *Chairman of ANS Virginia Section in 1995*
- *Chairman Founder of ANS - North Anna Nuclear Power Branch 1994*
- Sigma Xi Research Society
- AAEE American Association of Engineering Education
- American Vacuum Society
- Institute of Electrical and Electronics Engineers (IEEE)
- Fusion Power Associates
- *Health Physics Society*
- Society of Hispanic Professional Engineers (SHPE)

COLLABORATORS AND CO-EDITORS

- ***NASA Goddar Space Fly Center :*** *Gilberto Colon, Orlando Figueroa, Aidee Maldonado.*
- ***Naval Research Laboratory (NRL), Washington, DC:*** Robert Meger, Darrin Leonhaert, David Blackwell, Scott Walton, Donald Murphy, Richard Fernsler
- ***National Research Council, Ottawa, Canada:*** Emilio Panarella
- ***University of Missouri-Columbia:*** Tushar Gosh, Mark Prelas, M. West, W. Miller, F. Golshani, R. Tompson, S. Loyalka, C. Kwon
- ***University of Puerto Rico Rio Piedras:*** Carlos Cabrera, Gerardo Morel, Peter Fung.
- ***Solena Group, Washington, DC:*** Robert Do, R. Vélez
- ***University of Puerto Rico, Mayagüez, Puerto Rico:*** Priestley, J. Benitez

GRANTS AND PROJECTS AT POLYTECHNIC UNIVERSITY OF PUERTO RICO, (PUPR).

- "The Solar Probe Thermal Risk Reduction"
  NASA, APL-JHU and PUPR Summer 2006.
  $109,000.00
  Principal Investigator –PUPR

- "Increasing Retention in Core Pre Engineering Courses using the Integrated Instructional Delivery System (IDS)"
  U.S Department of Education/ Minority Science and Engineering Improvement Program (MSEIP), PUPR 2000-2002
  $274,824.66
  Principal Investigator

- "MU/PUPR Minority-Majority University Partnership in Nuclear Engineering and Health Physics" 2003 to 2006
  U.S Department of Energy.
  $100,087.00
  Co Principal Investigator, PUPR

- "Title V"
  U.S. Department of Education
  $1,122,763.92
  Director Activity II, PUPR 2001-2006

- "Living with a Star I"
  NASA-PUPR 2002
  $47,500.00
  Principal Investigator

- "Living with a Star II"
  NASA-PUPR 2005
  $65,500.00
  Principal Investigator

- "Introduction to Pollution Protection of the Earth System (ESSE 21)"
  NASA. USRA-PUPR 2004-2007
  $70,000.00
  Principal Investigator

- "Curriculum Improvement Partnership Award Program for Minority Serving Institutions (CIPA)"
  NASA . HBCU-PUPR 2001-2004
  $300,000.00
  Principal Investigator

- "The Midwest Nuclear Science &Engineering Consortium"
  U.S. Department of Energy/University of Missouri
  $40,000.00 per year for 3 years (2003-2006)
  Co Principal Investigator

- "Puerto Rico Space Grant Consortium"
  NASA
  $10,000.00 per year for 10 years
  PUPR -Affiliate Member 1999-2007

- "Partnership for Innovation"
  National Science Foundation
  $60,000.00
  PUPR-Affiliate Member 2003-2005

PUBLICATIONS

TECHNICAL JOURNALS and BOOKS

- "An Assessment of Power Generated with Plasma Processing of Sludge from Wastewater Treatment Plants", Edbertho Leal-Quiros, Ph.D and C. Villafane, IEEE Transactions on Plasma Science, December 2007.

- "Prototiype Plasma Flux Analyzer" Edbertho Leal-Quiros. Current Trends in International Fusion Research-Proceedings of the fourth Symposium, Pag 489-503. Edited by Charles D. Orth and Emilio Panarella. NRC Research Press, National Research Council of Canada, Ottawa , ON K1A 0R6 Canada, 2007

- "Fundamentals of Pollution Control of the Planet Earth Systems" Edbertho Leal-Quiros, Aluisio Pimenta,Hugo Pelaez and Maximo Cerame Vivas. NASA-ESE21. Edited by Polytecnic University of Puerto Rico, June 2007. (English)

- Fundamentos del control de la contaminación de los sistemas del Planeta Tierra. Edbertho Leal-Quiros, Aluisio Pimenta,Hugo Pelaez and Maximo Cerame Vivas. NASA-ESE21. Edited by Polytecnic University of Puerto Rico, June 2007. (Spanish)

- "Plasma Processing of Municipal Solid Waste", Dr. Edbertho Leal-Quirós, Brazilian Journal of Physics, Vol. 34, No.4B, December 2004.

- "Electron Beam Diagnostics in Plasma Based on Electron Beam Ionization". Darrin Leonhardt, Edbertho Leal-Quiros, David Blackwell, Scott Walton, Donald Murphy, Richard Fernsler, Robert Meger. US Naval Research Laboratory, Plasma Physics Division, 54th Annual Gaseous Electronics Conference, October 9-12, 2001, Pennsylvania State University State College, Pennsylvania. (GEC01 – RF1.005).

- "Electron Beam Diagnostics in Plasma Bases on Electron Beam Ionization". Darrin Leonhardt, Edbertho Leal-Quiros, David Blackwell, Scott Walton, Donald Murphy, Richard Fernsler, Robert Meger. US Naval Research Laboratory, Plasma Physics Division. 2001 Gaseous Electronics Conference.

- "Fundamentals of Physics", David Halliday, Robert Resnick, Jearl Walker. 6th. Edition, John Wiley and Sons, 2001. ISBN # 0-471-33235-6 (V.1) Edbertho Leal, Polytechnic University of Puerto Rico, External Reviewer.

- "Imaging of High Energy Particulate and Electromagnetic Radiation Using Diamond Sensors". M. Prelas, M. West, W. Miller, F. Golshani, R. Tompson, E. Leal, S. Loyalka, T. Gosh, C. Kwon. Nuclear Engineering Program and Particulate System, Research Center, University of Missouri-Columbia; Polytechnic University of Puerto Rico," Current Trends in International Fusion Research. Proceedings to the Second Symposium, edited by E. Panarella, NRC Research Press, National Research Council of Canada, Ottawa, ONK1A 0R6 Canada, pp 485--504 (2002).

- "Calculation of the SO_2 Concentration at Any Location from a Coal Power Plant using Sutton Equation", presented at the Pan-American Congress of Engineering COPIMERA, Quito, Ecuador, (November, 2000).

- "Diagnostics for Electron–Beam Produced Process Plasma", D.D. Blackwell, S.G. Walton, D. Leonhardt, D.P. Murphy, R.F. Fernsler, E. Leal-Quiros, W.E. Amatucci and R.A. Meger. Plasma Physics Division, US Naval Research Laboratory, DC 20375-5346. 2000 Gaseous Electronics Conference.

- "Journal of Wide Bandgap Materials", Vol. 7, No. 1 - July 1999. Edbertho Leal, Polytechnic University of Puerto Rico. Associate Editor..

- "Advanced Analyzers and Probes for Fusion-Plasma Diagnostics", Current Trends in International Fusion Research. Proceedings to the Second Symposium, edited by E. Panarella, NRC Research Press, National Research Council of Canada, Ottawa, ONK1A 0R6 Canada, pp 1-23 (1999).

- "The Feasibility of Diamond as a Detector Material in Plasma Diagnostics". M. West, M. Prelas, E. Leal, R. Tompson, T. Ghosh, S. Loyalka, F. Goshani, C.W. Kwon. ", Current Trends in International Fusion Research. Proceedings to the Third Symposium, Washington, March 8-12, 1999.

- "Advanced Analyzers and Probes for Fusion-Plasma Diagnostics", Current Trends in International Fusion Research. Proceedings to the Second Symposium, edited by E. Panarella, NRC Research Press, National Research Council of Canada, Ottawa, ONK1A 0R6 Canada, pp 1-23 (1999).

- "Advanced Analyzers and Probes for Fusion-Plasma Diagnostics", Current Trends in International Fusion Research. Proceedings to the Second Symposium, edited by E. Panarella, NRC Research Press, National Research Council of Canada, Ottawa, ONK1A 0R6 Canada, pp 1-23 (1999).

- "The Identification of Hot Electron Rings in Spindle Cusp Using a Magnetic Dipole Analyzer". E. Leal-Quiros and Mark A. Prelas. Fusion Technology, Vol. 20 No. 4 (Dec. 1991).

- "The Hyperbolic Energy Analyzer: A Novel Diagnostic - Ion Probe". E. Leal-Quiros, Mark A. Prelas and Eduardo García-Otero, Proceedings of the 10th International Workshop on ECR Ion Sources. ORNL and US-DOE. Conf. 9011136, pages 97-119. Editors: F.W. Meyer and M.I. Kirkpatrick. (Jan. 1991).

- "Plasma Diagnostics Part I and Part II", E. Leal-Quiros. Polymerization and Plasma Surface Modification of Materials. Editor H. Yashuda, (May 1990).

- "Focused High Intensity Proton Beam from Lithium Source by Using EXB Stigmatic Selector", E. Leal-Quiros and M.A. Prelas. Rev. Sci. Instrum, 61 (1) 636 (Jan 1990).

- "Electron Population in the Hot Electron Ring Region of Mirrors and Cusps, Measured by a Hyperbolic Energy Analyzer". E. Leal-Quiros, M.A. Prelas and Eduardo García-Otero. Rev. Sci. Instrum. 61 (10), 3304 (Oct. 1990).

- "Advanced Analyzers and Probes for Transport Studies in Mirrors", E. Leal-Quiros and M.A. Prelas. DOE Q - 115 US - Japan Workshop on Magnetic Mirrors. University of Wisconsin, Madison (Sept. 25-29, 1990).

- "Cold Fusion Experiments Using Maxwellian Plasmas and Sub-Atmospheric D. Deuterium Gas", M.A. Prelas, F. Boody, W. Gallagher, E. Leal-Quiros, D. Mencin and S. Taylor. Journal Fusion Energy, Vol. 9, No. 3, 309 (1990).

- "Magnetic Cusp Contours and Measured ECRH Surfaces", M.A. Prelas, E. Leal-Quiros, J.F. Kunze, T.J. Dolan, F.P. Boody, W. Miller, W. Wei, G. Gu, J. Javedani, T. Pennington, R. Hane, M. Mosquera and J. Burnett. Fusion Technology, 15 (2), 1119 (April 1989).

- "Plasma Parameter Measurements with the Variable Energy Analyzer and the Magnetic Moment Meter". E. Leal-Quiros, M.A. Prelas, Proc. 16th European Conference on Controlled Fusion and Plasma Physics, Venice. Vol. 13B, Part IV, p. 1529 (March 1989).

- "A new Tilted Poles Wien Filter with Enhanced Performance", E.Leal-Quiros, M.A. Prelas. Rev. Sci. Instrum. 60 (3), 350 (March 1989).

- "EXB Wien Analyzers", E. Leal-Quiros, M.A. Prelas, Rev. Sci. Instrum, 59, 1738. (August 1988).

- "An Enhancement of Ion Energy Spectra and Sensitivity in Multigrid Energy Analyzer with Retarding Grid Potential: The Variable Energy Analyzer (VEA)". E. Leal-Quiros and M.A. Prelas. IEEE Transaction on Plasma Science. Vol. 16, No. 6,66 (December 1988).

- "The Physicist in Venezuela", E. Leal-Quiros. EIDOS, Rev. of Metropolitan University, Caracas, Venezuela (1983).

- "The Variable Energy Analyzer of Retarded Field", E. Leal-Quiros, Rev. of Simon Bolivar University, Caracas (1983). Oral Presentation in the Radiation on Plasma College ICTP, Trieste, Italy (1983).

- "The Noise", E. Leal-Quiros, Environmental Ministry of Venezuela Government, Caracas, Venezuela (1981).

- "Several Experiments with Two Kinds of Wien Filters", E. Leal-Quiros, Rev. of Simon Bolivar University, Caracas, Venezuela (1981). Oral presentation at The International Center for Theoretical Physics, Spring College on Plasma Physics and Fusion, ICTP, Trieste, Italy (1981).

- "Some Experimental Facts that Indicate the Elimination of Astigmatism in Ion Beams with Separators EXB". E. Leal-Quiros, Journal of Applied Physics 52, 1152, (March 1981).

- "A Variable Geometry Analyzer with External Micrometrical Control", J. Puerta, E. Leal, G. Donoso. Abstract to the IEEE International Conference on Plasma Science, 1, 21 (1981)".

- "Stellar Evolution and the Hertzprung Russell Diagram", E. Leal-Quiros, Internal Publications of the National Astronomical Observatory of Colombia, Santa Fe De Bogotá (November 1972).

- "Review on Electromagnets Design and Construction Manual", E. Leal-Quiros, Rev. Col. Física, Vol. 13,74 (1973).

PROCEEDINGS AND PRESENTATIONS,

- "Power Generated with Plasma Processing of Sludge from WaterTreatment Plants", Dr. Edbertho Leal-Quirós and Carlos Villafañe, 2nd International Workshop and Exhibition on Plasma Assisted Combustion (IWEPAC), Quality Inn Governor, Falls Church, Virginia, September 19-21, 2006.

- "Moon-Mars Exploration: The NASA mission" and "Plasma Processing of Municipal Solid Waste", Dr. Edbertho Leal-Quirós, SAEED MOFTEE Auditorium, Faculty of Engineering & Technology, Mechanical Engineering Department, University of Jordan, February 27, 2006.

- "Integration of an Optimal Cooling System to the PUPR Plasma Machine", Dr. Edbertho Leal-Quirós (Mentor), David Leal Escalante, Lenuel Rodríguez, Samuel Jiménez and Dennis Morales, Second Exhibition of Scientific Research Posters and Capstones Design by PUPR Students and Faculty", Polytechnic University of Puerto Rico Library, November 23, 2005.

- "Determination of Plasma Parameters in the PUPR Mirror and Cusp Plasma Machine Via Electrostatic Probe Methods", Dr. Edbertho Leal-Quirós (Mentor), Ryan Meyer, Miguel Rivera, Franklyn Colmenares, David Leal Escalante, Ramon Rivera, Dr. Angel Gonzales, Second Exhibition of Scientific Research Posters and Capstones Design by PUPR Students and Faculty", Polytechnic University of Puerto Rico Library, November 23, 2005.

- "Determination of the Local Magnetic Dipole Moment of the Plasma at the PUPR Cusp-Mirror Machine", Edbertho Leal-Quirós (Mentor), Second Exhibition of Scientific Research Posters and Capstones Design by PUPR Students and Faculty", Polytechnic University of Puerto Rico Library, November 23, 2005.

- "Vacuum Technology", Dr. Edbertho Leal-Quirós (Mentor), Ramón Rivera, Second Exhibition of Scientific Research Posters and Capstones Design by PUPR Students and Faculty", Polytechnic University of Puerto Rico Library, November 23, 2005.

- "Impendance Mismatch Study Between the Microwave Power Generator and the PUPR Plasma Machine", Dr. Edbertho Leal-Quirós (Mentor), Franklyn Colmenares, Ryan Mayer, Ramón Rivera, Natyaliz Zavala, Kabir Encarnación Jorge Gaudier, Ligeia Castellanos, David Leal Escalante, Second Exhibition of Scientific Research Posters and Capstones Design by PUPR Students and Faculty", Polytechnic University of Puerto Rico Library, November 23, 2005.

- "Identification of Electron Cyclotron Resonance Heating (ECR) Surfaces in the PUPR-Plasma Device Operating in the Cusp And Mirror Mode", Dr. Edbertho Leal-Quirós (Mentor), Franklyn Colmenares, David Leal Escalante, Second Exhibition of Scientific Research Posters and Capstones Design by PUPR Students and Faculty", Polytechnic University of Puerto Rico Library, November 23, 2005.

- "The Magnetic Moment Analyzer Experimental Measurements", . Edbertho Leal-Quirós, IPELS 05 Workshop, Tromso, Norway, July 4-8, 2005.

- "Advanced Analyzers and Probes For Fusion Plasma Diagnostic", Dr. Edbertho Leal-Quirós, TVI Community College, Albuquerque, New Mexico, May 31-June 4, 2005.

- "Plasma Processing of Waste For Our Environment's Protection", Dr. Edbertho Leal-Quirós, TVI Community College, Albuquerque, New Mexico, May 31-June 4, 2005.

- "World Status of Fusion Research", Dr. Edbertho Leal-Quirós, TVI Community College, Albuquerque, New Mexico, May 31-June 4, 2005.

- "Determination of the Local Magnetic Dipole Moment of the Plasma at the PUPR Cusp-Mirror Machine", *Edbertho Leal-Quiros,* XI Latin American Workshop on Plasma Physics (XI – LAWPP) OC– 3, Mexico City, 5 – 9 December 2005.

- "Independence mismatch study between the microwave power generator and the PUPR Plasma Machine, Jorge R. Gaudier, L. Castellanos, K. Encarnación, N. Zavala, N. Farahat, L. León, M. A. Rivera, David Leal, R. Rivera, F. Colmenares, R. Meyer and *Edbertho Leal-Quiros*", XI Latin American Workshop on Plasma Physics (XI – LAWPP) PSI-3, Mexico City, 5 – 9 December 2005.

- "Plasma Processing of Municipal Solid Waste", Dr. Edbertho Leal-Quiros, X Latin American Workshop on Plasma Physics XLAWPP, 7th Meeting on Plasma Physics EBFP, Hotel Fazenda Fonte, Colina Verde, Sao Pedro, Brazil, November 30th – December 5th, 2003.

- "Determination of Plasma Parameters in the PUPR Mirrors and Cusp Plasma Machine via Electrostatic Probe Methods", Ryan M. Meyer, M. A. Rivera, F. Colmenares, David Leal, Ramón Rivera, G. Lleonart, Angel González, and *Edbertho Leal-Quiros*. XI Latin American Workshop on Plasma Physics (XI – LAWPP) PSI-10, Mexico City, 5 – 9 December 2005.

- "Hydrogen Storage in Diamond Powder Utilizing NaF Plasma Surface Treatment for Fuel Cell Applications", David A. Leal, F. Colmenares, M. A. Prelas, *Edbertho Leal-Quiros* and T. K. Ghosh. XI Latin American Workshop on Plasma Physics (XI – LAWPP) PS2-4, Mexico City, 5 – 9 December 2005.

- "Integration of an Optimal Cooling System to the PUPR Plasma Machine", David A. Leal, L. Rodríguez, S. Jiménez and D. Morales, G. Burgos and *Edbertho Leal-Quiros*, Second Exhibition of Scientific Research Posters and Capstone Design by PUPR Students and Faculty, Polytechnic University, San Juan PR, November 23 – December – 23 / 2005.

- "Experimental Design of a High Vacuum System for PUPR Plasma Machine", Ramón Rivera Varona, F. Colmenares, G. Lleonart, David Leal Escalante, *Edbertho Leal-Quiros,* Second Exhibition of Scientific Research Posters and Capstone Design by PUPR Students and Faculty, Polytechnic University, San Juan PR, November 23 – December – 23 / 2005.

- "Identification of Electron Cyclotron Resonance Heating (ECR) Surfaces in the UPPR – Plasma Device Operating in the Cusp and Mirror Mode" David Leal Escalante and Franklyn Colmenares, A. González and *Edbertho Leal-Quiros*. Second Exhibition of Scientific Research Posters and Capstone Design by PUPR Students and Faculty, Polytechnic University, San Juan PR, November 23 – December – 23 / 2005.

- "The Magnetic Moment Analyzer", Dr. Edbertho Leal-Quirós, IPELS 05 Workshop, Tromso, Norway, July 4-8, 2005.

- "Basic Plasma Diagnostic; Probes & Analyzers", Dr. Edbertho Leal-Quirós, TVI Community College, Albuquerque, New Mexico, May 31-June 4, 2005.

- "Advanced Analyzers and Probes For Fusion Plasma Diagnostic", Dr. Edbertho Leal-Quirós, TVI Community College, Albuquerque, New Mexico, May 31-June 4, 2005.

- "Plasma Processing of Waste For Our Environment's Protection", Dr. Edbertho Leal-Quirós, TVI Community College, Albuquerque, New Mexico, May 31-June 4, 2005.

- "World Status of Fusion Research", Dr. Edbertho Leal-Quirós, TVI Community College, Albuquerque, New Mexico, May 31-June 4, 2005.

- "Status of Investigation and Mars Exploration by NASA", Dr. Edbertho Leal, Floral Park Salon, Library of Polytechnic University of Puerto Rico, August 27, 2003.

- "Magmavication-Vitrification, Gasification and Generation of Energy with High Temperature Plasma Processing of Waste", E. Leal-Quiros, Ph.D., 5th Symposium on Current Trends in International Fusion Research, Washington DC, March 24-28, 2003.

- "Status of Fusion in the World", Dr. Edbertho Leal, Encuentro de la Red de Astronomía de Colombia, Salón Rojo, Tequendama Hotel, Bogotá, Colombia, August 16, 2003.

- "Status of Investigation and Mars Exploration by NASA", Dr. Edbertho Leal, Encuentro de la Red de Astronomía de Colombia, Salón Rojo, Tequendama Hotel, Bogotá, Colombia, August 16, 2003.

- "Introduction to Nuclear Power Plant", Dr. Edbertho Leal-Quiros, Naval Research Laboratory NRL, Washington DC, September 2002.

- "Plasma Flux Analyzer", E. Leal-Quiros, Ph.D., 4th Symposium on Current Trends in International Fusion Research", Washington DC, March 12-16, 2001.

- "Dispersal of Pollutants in the Atmosphere – Calculation of SO_2 Concentration at Any Location from a Coal Power Plant using Sutton Equation", Presentation to the College of Engineers and Architects of Puerto Rico, COINAR 2001, March 30, 2001.

- "Estatus de Investigación en Fusión en el Mundo", Edbertho Leal-Quiros, Ph.D., T.J. Dolan, Ph.D., D.F. Duchs, C. Orth, J. Reece Roth, G.V. Oost, E. Panarella, June 2001.

- "Journal of Wide Bandgap Materials", Associate Editor, Sage Publications, Volume 1-10, ISSN 1524-511X, October 2001-Present.

- "Calculation of the SO_2 Concentration at Any Location from a Coal Power Plant Using Sutton Equation", Edbertho Leal-Quiros, Ph.D., XVIII COPIMERA Congress, Quito, Ecuador, November 26-30, 2001.

- "Electron Beam Diagnostic in Plasma Bases on Electron Beam Ionization", Darrin Leonhardt, Edbertho Leal-Quiros, David Blackwell, Scott Walton, Donald Murphy, Richard Fernsler, Robert Meger. Gaseros Electronics Conference, US Naval Research Laboratory, Plasma Division, 2001.

- "The Flux Analyzer (Γ-Analyzer)", E. Leal-Quiros, Current Trends in International Fusion Research – Fourth Symposium. Edited by Charles D. Orth, E. Panarella and R. Post, NRC Research Press, NRC of Canada, Ottawa, ON KIA 0R6 Canada, 2001.

- "Fundamentals of Physics", David Halliday, Robert Resnick, Jearl Walker, 6th Edition, John Wiley and Sons, 2001, ISBN # 0-471-33235-6 (V.1), Edbertho Leal-Quiros, PhD., Polytechnic University of Puerto Rico, *External Reviewer*.

- CP1 68 "The Double Energy Analyzer", Edbertho Leal-Quiros, Ph.D., Scientific Research and Development Director, Polytechnic University of Puerto Rico. 42nd Annual Meeting of the Division of Plasma Physics and the 10th International Congress on Plasma Physics, Quebec City, Canada (October 23-27, 2000).

- "Measurements of Distribution Functions, Densities and Temperatures of Electrons and Ions using a Novel Plasma Diagnostic Device: The Hyperbolic Energy Analyzer (HEA)". Edbertho Leal-Quiros, Ph.D., IX Latin American Workshop in Plasma Physics, La Serena, Chile (November 13-17, 2000).

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