

**SUMMARY VITAE: Orlando Auciello (Distinguished Endowed Chair Professor, University of Texas-Dallas)**

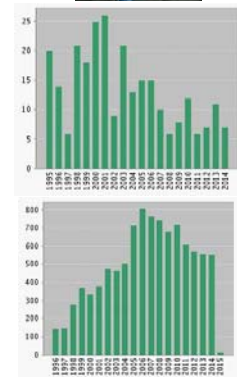


**EDUCATION:** Ph.D. (Physics)-1976, M.S. (Physics)-1973; Physics Institute “Balseiro”,

University of Cuyo, Argentina

EE 1963-1970, Nacional University of Cordoba (Elec. Eng), Argentina

**RESEARCH AREAS:** Auciello is directing several basic and applied research programs on different fields, namely: 1) science and technology of multi-component oxide thin films and application to devices (ferroelectric memories, nanoscale CMOS devices, photovoltaic energy generation / storage devices, high-frequency devices, piezoelectric thin films for MEMS/NEMS devices (sensors and actuators); 2) science and technology of a novel ultrananocrystalline diamond (UNCD) film, developed and patented at Argonne, and application to multifunctional devices (RF MEMS/NEMS; electron field emission cathodes (for flat panel displays, mass spectrometers, X-ray sources); components with high tribological performance (UNCD-coated mechanical pump seals, gears and other components); electrodes for fuel cells, catalysis, water purification, and for neural stimulation; implantable biomedical devices (artificial retina to restore sight to people blinded by retina degeneration), coating for artificial heart valves, stents, artificial joints (hips, knees); platform for developmental biology (cell growth and differentiation); biosensors. **The UNCD film technology is commercialized in industrial products by Advanced Diamond Technologies, Company founded by Auciello and colleagues-2003-present, profitable 2014), and biomedical products by Original Biomedical Implants (OBI-USA, 2013-present) and OBI-México, 2016-present.**



Sum Times Cited:  
10,019  
Sum Times Cited:  
9,358  
w/o self citation  
Citing Articles: 7,111  
Citing Articles: 6,920  
w/o self citations

**RESEARCH INNOVATIONS: Seminal Work/First to report**

- **2009-present:** started new field of R&D on ferroelectric thin films for a new generation of high-density memories, high efficiency photovoltaic devices, and superlattice of dielectric oxides with giant dielectric constant ( $\geq 1000$ ) for integrated energy generation/storage systems and **UNCD coatings for components of new generation of Li-ion batteries (LIBs) with  $\geq 10x$  longer life/safer/lighter than current LIBs.**
- **2008-present:** Started new field of developmental biology based on novel patented ultrananocrystalline diamond (UNCD) films scaffolds suitable for growing embryonic stem cells for differentiation into other human body cells.
- **2001-present:** Developed UNCD as hermetic/ bioinert/ coating for encapsulation of Si-microchip implantable inside the eye as artificial retina to restore partial sight to people blinded by genetically-induced death of photoreceptors (DOE funded program resulted in development of the Argus II device now implanted in blinds).
- **1996-present:** Co-inventor of UNCD film technology and developer of many first applications of UNCD films (new MEMS/NEMS technology, 1<sup>st</sup> field emission cathodes, 1<sup>st</sup> mechanical pump seals and gears coated with UNCD (now in the market), 1<sup>st</sup> electrodes for fuel cells catalysis, and water purification, 1<sup>st</sup> electrodes for neural stimulation (underway), 1<sup>st</sup> hermetic coating for implantable microchips, 1<sup>st</sup> UNCD coatings for a new generation of biocompatible implantable devices (for treatment of eye-related conditions).
- **1996-present:** pioneered the science and technology of novel high-K dielectric multifunctional nanolaminates, which enable several firsts: oxygen diffusion barrier to integrate dissimilar materials for new generation of MEMS/NEMS devices, high-frequency devices, super-capacitors, and implantable biomedical devices.
- **1986-1990:** Pioneered the first grow of high-temperature superconductor YBCO films and ferroelectric thin films with unique properties that resulted in insertion into ferroelectric memories, now in commercial smart card.

**RESEARCH OUTPUT SUMMARY**

**FULL RESUME: TABLE OF CONTENTS: Pages 2-101**

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1986 - 2011 Average/Yr; AucielloPI (Auciello Co-PI)	Ph.D. (M.S) Graduated	Patents Issued	Publication				Conference/Talks					
			Books/ Book series	Book Chapter	Review Journal (Special Journal Eds)	Invited Review Conf	Conf Organize (Session Chair)	Plenary	Keynote	Invited	NATO/ PASI Schools	Invited Seminars/talks at Institutions
\$560K (\$1.2 Mill)	13 (6)	19	20 (2)	27	45 (26)	45	43 (54)	11	7	98	3 (3)	121

## CURRICULUM VITAE

**Orlando Auciello (Distinguished Endowed Chair Professor, University of Texas-Dallas)**

**BIRTHPLACE:** Cordoba, Argentina

**CITIZENSHIP:** USA

**USA Security Clearance:** Q (2005-2012)

**PRESENT ADDRESS:** University of Texas at Dallas, Materials Science Department  
and Bioengineering Department  
800 W Campbell Rd, RL 10  
Richardson, TX, 75040  
Phone: 972-883-4731  
FAX: 630-252-4289  
e-mail: orlando.auciello@utdallas.edu

### EDUCATION

**1976** Ph.D. (Physics) Physics Institute, "Dr. Balseiro", Atomic Energy Commission  
and National University of Cuyo, Argentina.

**1973** M.Sc. (Physics) Physics Institute, "Dr. Balseiro", Atomic Energy Commission  
and National University of Cuyo, Argentina.

**1964-70** Electronic Engineering National University of Cordoba, Argentina.

### LANGUAGES

Spanish, English (speaking, reading and writing fluently)  
Italian (reasonable understanding, some speaking)  
Portuguese (reasonable understanding, little speaking)

**POSTGRADUATE STUDIES** (summer schools, short term courses, etc.)

**1978** ISAACS-NATO Scholarship, NATO Advanced Study Institute  
on the Physics and Applications of Ion Beam Interaction with  
Solids. ISAACS-State University of New York at Albany, NY.

**1976-77** Scholarship, Materials Science, McMaster University

**1973-76** Research Scholarship, Argentine National Research Council.

## **POSITIONS OR EMPLOYMENT (Including Expertise)**

- 2013-present**
- Endowed Chair Professor, University of Texas at Dallas, Depts. of Materials Science and Engineering and Bioengineering
  - Adjunct Professor, University of Colorado-Colorado Springs (2011- present)
  - Adjunct Professor, Michigan State University (2011- present)
- 2010-2012**
- Argonne Distinguished Fellow, Argonne National Laboratory, Materials Science Division, Argonne, IL
- 1996-2010**
- Senior Scientist, Argonne National Laboratory, Materials Science Division, Argonne, IL (Science and Technology of Thin Films: High Tc Superconductors, Ferroelectric, Electro-optic, Hard Coatings, Wide Bandgap Materials (GaN, Diamond); Application to Devices).
  - Adjunct Professor, Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC (same expertise as above). Also Adjunct Professor at University of Illinois-Chicago and University of Colorado-Colorado Springs.
- 1988-1996**
- Member Technical Staff, Microelectronics Center of North Carolina (Non-Profit Laboratory), Research Triangle Park, NC (Science and Technology of Thin Films: High Tc Superconductors, Ferroelectric, Electro-optic, and Diamond Materials; Application
  - Adjunct Professor, Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC.
- 1988-1996**
- Permanent Associate Researcher, Argonne National Laboratory, Argonne, IL. (Ion Interaction with Solids and Thin Films: Fundamentals and Processing).
- 1994**
- Invited Guest Scientist, University of Wuppertal, Wuppertal, Germany (diamond films).
- 1986-1988**
- Summer Associate Faculty Researcher, Argonne National Laboratory, Argonne, IL (HTSC and ferroelectric films).
- 1985-1988**
- Associate Professor, Department of Nuclear Engineering, North Carolina State University, Raleigh, NC (Science of Plasma Interaction with Materials).
- 1984**
- Summer Guest Scientist, Plasma Physics Laboratory, Princeton University (Science of Plasma Interaction with Materials).
- 1979-84**
- Senior Research Associate, Institute for Aerospace Studies, University of Toronto, Canada (Science of Plasma-Surface Interaction
- 1977-79**
- Postdoctoral Research Associate - McMaster University, Hamilton, Canada. Under contract from Cutler Hammer, Inc., Milwaukee, USA (Plasma Interaction with Materials: Application to Electrical Contacts).
- 1976-77**
- Fellowship, Argentinian National Council for Science and Technology (Ion Beam Interaction with Solids).

## PROFESSIONAL EXPERIENCE

### BASIC RESEARCH

#### Experimental

**Research on Biomaterials: Understanding fundamental biological processes at the interface between biological environment and a novel ultrananocrystalline diamond films as a bioinert / biocompatible coating for encapsulation of microchips implantable in the human body (artificial retina to restores sight to people blinded by genetically-induced degeneration of photoreceptors; UNCD coating for a new generation of artificial joints-hips and knees; UNCD coating of polymers; UNCD coatings for many other implantable biomedical devices); research to understand the stem cells/UNCD interface for UNCD as a new platform for developmental biology (growth and differentiation of stem cells).**

**Research on Multifunctional Oxide Thin Films: Understanding the synthesis and composition-microstructure-property relationships of ferroelectric oxide films (and application to a new generation of non-volatile ferroelectric random access memories-FeRAMs), high-dielectric constant thin films (and applications to a new generation of nanoelectronic devices and supercapacitors for energy storage), and biocompatible oxide films for application in implantable medical devices.**

**Atomic Collision in Gases:** charge exchange processes

**Plasmas:** plasma transport processes and application to HTSC film growth

#### Plasma-Materials Interaction and Processing

Fusion Technology: plasma-surface interaction processes (sputtering, chemical etching)

Materials Processing: etching and thin film synthesis (metals and oxides)

#### Ion Beam-Materials Interaction and Processing

Basic physics (ion implantation, gas trapping in films, ion bombardment-induced surface topography) and application to thin film synthesis (high temperature superconductors, ferroelectrics, electro-optics, semiconductors, metals). Basic phenomena in materials and electron emission processes in emissive flat panel displays

#### Laser Beam-Materials Interaction and Processing

Basic physics of laser ablation and application to materials processing (laser ablation-deposition of high temperature superconducting, ferroelectric, electro-optic, and metallic films).

#### Synthesis of Thin Films via Sol-Gel and Chemical Vapor-Deposition (CVD)

Science of ferroelectric, corrosion resistance, and diamond films; application to devices: Field emission cathodes, MEMS).

#### Development and Use of *In Situ* and *In Situ*, Real-Time Characterization Techniques for Studies of Thin Film Growth and Device Related Processes

- Development and use of a time-of-flight ion scattering and recoil spectroscopy (TOF-ISARS) technique to study oxide, nitride, and many other film growth processes.
- Development and use of an MOCVD system attached to a port of the Advanced Photon Source at Argonne National Laboratory to study oxide and nitride film growth processes via *in situ* synchrotron x-ray scattering.
- Development and use of an atomic force microscope piezoresponse imaging technique for nanoscale studies of ferroelectric domain dynamics in ferroelectric thin films.

## **PROFESSIONAL EXPERIENCE (Continuation)**

### **BASIC RESEARCH (Continuation)**

#### **Experimental (Continuation)**

- Contribute to develop and use extensively a synchrotron x-ray scattering technique to perform *in situ*, real-time studies of ferroelectric domain dynamics.
- Contribute in the use of *in situ* TEM characterization techniques to perform *in situ* studies of thin film microstructural evolution during electric field excitation or mechanical deformation and to study ferroelectric domain dynamics.

#### **Nanoscience and Nanotechnology**

- Fabrication of nanostructures (ferroelectric nanocapacitors) using focused ion beam and other nanofabrication methods (dip pen method and e-beam lithography) to study ferroelectric domain dynamics at the nanoscale.
- Synthesis and characterization of ultrananocrystalline diamond thin films and investigation of electron field emission processes and mechanical and tribological properties and application to field emission and MEMS/NEMS devices.

#### **Theoretical**

- Transport processes in plasma (analytical and computer simulation).
- Plasma-materials interaction phenomena (radiation damage processes).
- Ion bombardment-induced photon emission from solids.
- Ion bombardment-induced surface topography on solids: mechanisms and their importance in microelectronic circuit patterning, thin films and other technologies.
- Computer simulation of sputtering/scattering processes in ion-solid interaction and film synthesis

### **APPLIED RESEARCH**

- **Development and application of a novel ultrananocrystalline diamond (UNCD) film as a bioinert / biocompatible coating for encapsulation of microchips implantable in the human body (artificial retina to restores sight to people blinded by genetically-induced degeneration of photoreceptors; UNCD coating for a new generation of artificial joints- hips and knees; UNCD coating of polymers; UNCD coatings for many other implantable biomedical devices); research to understand the stem cells/UNCD interface for UNCD as a new platform for developmental biology (growth and differentiation of stem cells).**
- **Development of integration processes and device design for non-volatile ferroelectric random access memories-FeRAMs, high-dielectric constant thin films-based new generation of nanoelectronic devices and supercapacitors for energy storage, and biocompatible oxide films for implantable medical devices.**
- Cold cathode and emissive flat panel display technology.
- Development of computer-controlled laser and ion beam sputter-deposition techniques for production of multicomponent and multilayered thin films.
- Multicomponent Oxide Thin Film-Based Devices (non-volatile ferroelectric memories, integrated thin film waveguides, thin film second harmonic generation).
- Development of a Cu-based alloys for high power industrial electrical switches.
- Fabrication of passive devices for microelectronics application using ion implantation.

## **PROFESSIONAL EXPERIENCE (Continuation)**

### **APPLIED RESEARCH (Continuation)**

#### **SYSTEMS ENGINEERING AND INSTRUMENTATION**

- Experience in TEM, SEM, STM, AFM, AES, SIMS, RBS, and Synchrotron X-ray Based Materials Science.
- Expertise in design and construction of plasma devices, ion beam systems, plasma-, ion-, and laser beam-based thin film deposition systems, MOCVD systems, ultra-high vacuum systems and components (manipulators).

#### **TEACHING EXPERIENCE**

<b>2012-present</b>		<b>Endowed Chair Professor (University of Texas at Dallas)</b>
<b>2010-present</b>		<b>Adjunct Professor (Michigan State University)</b>
<b>2004-present</b>		<b>Adjunct Professor (University of Colorado-Colorado Spring)</b> Graduate Student Thesis Direction: Science and Technology of Non-Volatile FeRAMs
<b>2001-2012</b>		<b>Adjunct Professor (University of Illinois-Chicago)</b> Graduate Student Thesis Direction: MEMS
<b>1989-2000</b>		<b>Adjunct Professor (North Carolina State University):</b> Graduate Student Teaching and Thesis Direction: Techniques and Fundamentals for Synthesis of Thin Films for Advanced Microtechnologies.
<b>1985-1988</b>		<b>Associate Professor (NCSU):</b> Graduate and Undergraduate Teaching; Plasma-Surface Interaction, Plasma Technology (Laboratory), Basic Atomic and Nuclear Physics, Engineering Design, Materials, Fusion Technology, Plasma Technology (Basic Concepts), Vacuum Technology.
<b>1977</b>	<b>Demonstrator</b>	Thin Films Formation (McMaster University, Canada).
<b>1977</b>	<b>Assistantship</b>	Electronic Properties of Materials (McMaster University, Canada).
<b>1976</b>	<b>Assistantship</b>	Introduction to Materials Science (McMaster University, Canada).

**PROFESSIONAL EXPERIENCE (Continuation)****TEACHING EXPERIENCE (continuation)****Direction or Co-Direction of Thesis****Theses in Progress**

Patrick Conlin, PhD, UTD	Materials Science and Technological development for New Generation of Li-Ion Batteries with $\geq 10x$ Longer life and Safer”	<b>2016-</b>
Alejandro Abraham, PhD,UTD	Science of Stem Cells Growth and Differentiation on on the Surface of Ultrananocrystalline Diamond (UNCD) Flms	<b>2016-</b>
Karam Kang, MS, UTD	Science and Technology of Biocompatible Ultrananocrystalline Diamond (UNCD) Coating for Encapsulation of Dental Implants	<b>2016-</b>
Jesus Alcantar, PhD, U. Sonora-México	Fundamental and Appled Science of Diamond Films for Micro/Nanoelectronics Devices	<b>2014-</b>
Gabriela Montaña, PhD U. Sonora-México	Science and Techology of Ultrananocrystalline Diamond Scaffolds for Cell Growth and Differentiation	<b>2014-</b>
Karime Ramos, PhD U. Sonora-México	Development of Cell Gorwth and Differentitaion Process	<b>2014-</b>

**Theses Completed**

Carolina Duran, MS, UTD	Science and Technology of Ultrannocrystalline Diamond (UNCD) Films as Coatings for Dental Implants	<b>2016</b>
Jeffrey Klug, Ph D. (Northwestern University)	Science and technology of multiferroic thin films and application to multifunctional devices”	<b>2010</b>
David Comstock, Ph.D. (NWU)	Synthesis of ultrananocrystalline diamond thin films and characterization of electronic structure and properties using AFM potentiometric techniques”	<b>2010</b>

**Theses Completed**

Ying C. Chen, Ph. D, (Tsinghua U)	Studies of Bias Enhanced Nucleation and Growth of Nanocrystalline Diamond Films	<b>2009</b>
Wei Fan, Ph.D. (NWU)	Synthesis and Characterization of High Dielectric Constant Oxide Films for Integrated Circuit Gate Oxides”	<b>2004</b>
T. Corrigan, Ph.D. (NWU)	Synthesis and Characterization of Nanocrystalline Diamond Films for Field Emission Devices	<b>2000</b>

**PROFESSIONAL EXPERIENCE (Continuation)**  
**TEACHING EXPERIENCE (continuation)**  
**Direction or Co-Direction of Thesis (Continuation)**  
**Theses Completed (Continuation)**

D. Thomas, MS (NCSU)	Pulsed Laser Ablation Deposition and Characterization of Multilayered Ferroelectric Thin Films for Capacitors for Non-volatile Memories.	<b>1998</b>
J. Im, Ph. D. (Northwestern Univ.)	Studies of SBT Thin Film Growth Processes Using In Situ Ion Scattering and Recoil Spectroscopy	<b>1998</b>
M. Vellaikal, Ph. D. (NCSU)	CVD Synthesis and Characterization of Ferroelectric Thin Films	<b>1996</b>
A. Chow, Ph. D. (NCSU)	Synthesis and Electro-optic Characterization of KNbO <sub>3</sub> Films for Integrated Waveguides	<b>1995</b>
H.N. Al-Shareef, Ph. D (NCSU)	Structure - Property Relationship of Sol - Gel - Deposited Ferroelectric Thin Films.	<b>1994</b>
K.S. Gifford, Ph. D. (NCSU)	Fatigue and Aging Phenomena in Ion Beam Sputter-Deposited Ferroelectric Thin Films	<b>1994</b>
R. Dat, Ph.D. (NCSU)	Pulsed Laser Ablation-Deposition and Characterization of Pb(ZrTi)O Ferroelectric Capacitors for Non-Volatile Memories	<b>1994</b>
R. Woolcott, MS (NCSU)	Synthesis and Processing of High Temperature Superconducting Thin Films and Properties Optimization for Application to Devices	<b>1993</b>
L. M. Mantese, MS (NCSU)	Laser Ablation-Deposition of Ferroelectric Thin Films: Processes and Film Properties	<b>1992</b>
T. M. Graettinger, Ph.D. (NCSU)	Automated Ion Beam Sputter-Deposition and Characterization of Electro-optic Thin Films	<b>1991</b>
C.N. Soble II, MS (NCSU)	Ion Beam Computer Controlled Sputter-Deposition and Characterization of High Temperature Superconducting Films.	<b>1991</b>
S.H. Rou, Ph.D. (NCSU)	Microstructural Characterization of Multicomponent Oxide Thin Films	<b>1990</b>
J. Stock, MS (NCSU)	Ablation of Materials Under High Heat Flux Exposure.	<b>1989</b>
S. Athavale, M.N.E. (NCSU)	Inelastic Processes in Low Temperature Plasmas	<b>1989</b>



**PROFESSIONAL EXPERIENCE (Continuation)**  
**TEACHING EXPERIENCE (continuation)**  
**Direction or Co-Direction of Thesis (Continuation)**  
**Theses Completed (Continuation)**

**Member of Graduate Student Advisory Committees**

Angelica Azcati, PhD	(UTD)	(Graduated, 2016)
Shakil Mohammed, PhD	(UTD)	(Graduated, 2016)
Jonathan Reeder, PhD	(UTD)	(Graduated, 2016)
Yang Xi, PhD	(UTD)	(Graduated, 2016)
Carolina Duran, MS	(UTD)	(Graduated, 2016)
Jeffrey Klug, PhD	(NWU)	(Graduated, 2010)
David Comstock PhD	(NWU)	(Graduated, 2010)
Ying C. Chen, PhD	(Tsinghua U)	(Graduated, 2009)
Kurt Ruthe, PhD	(NWU)	(Graduated, 2004)
Xiwei Chen, PhD	(NWU)	(Graduated, 2000)
P. De Luca PhD	(NWU)	(Graduated, 1999)
N. Ponaawala MS	(NWU)	(Graduated, 1999)
J. Lennon, PhD	(UNC)	(Graduated, 1996)
J. Liu, PhD	(UNC)	(Graduated, 1996)
M. Denker, PhD	(UNC)	(Graduated, 1994)
R. Chapman, MS	(NCSU)	(Graduated, 1992)
R.C. Glass, PhD	(NCSU)	(Graduated, 1991)
Do Hee Hahn, PhD	(NCSU)	(Graduated, 1989)
S.T. Mahmood, PhD	(NCSU)	(Graduated, 1988)
T.A. Treado, PhD	(NCSU)	(Graduated, 1988)
K.M. Al-Otaibi, MS	(NCSU)	(Graduated, 1987)
A.C. Gami, MS	(NCSU)	(Graduated, 1987)

**PROFESSIONAL EXPERIENCE (Continuation)**

**DIRECTION OR CO-DIRECTION OF RESEARCH BY NATIONAL OR FOREIGN PROFESSIONALS AND/OR SCHOLARS, AND POSTDOCS**

- E. de Obaldia (Research Scientist)** “Science and Technology of Multifunctional Oxide and Nanoacarbon Films”  
**(University of Texas at Dallas, 2015-present).**
- G. Lee (Research Scientist)** “Science and Technology of Multifunctional Oxide Films”  
**(University of Texas at Dallas, 2012-2016).**
- P. Gurman (Research Scientist)** Science and Technology of Ultrananocrystalline Diamond Films for Biomedical Devices”  
**(University of Texas at Dallas, 2012-2016).**
- G. Lee (Postdoc)** “Science and Technology of Multiferroic Thin Films”  
**(Argonne National Laboratory, 2010-2012).**
- J.H. Park (Postdoc)** “Science and Technology for NEMS Logic”  
**(Argonne National Laboratory, 2010-2012).**
- Wei Li (Postdoc)** “Science and Technology of Bioinert/Biocompatible Coatings for Artificial Retina Microchip Encapsulation, and High-K Dielectric Films for Microchip Energy Storage Embedded Capacitor  
**(Argonne National Laboratory, 2007-2011).**
- D. Wang (postdoc)** Research on Ultrananocrystalline Diamond Films as Field Emitter Cathodes for Mass Spectrometer for Deep Space Exploration **(Argonne National Laboratory, 2010).**
- Srinath Balachandran (postdoc)** “Research on Ultrananocrystalline Diamond Films as as Dielectric Layer for High-Efficiency RF MEMS Switches **(Argonne National Laboratory, 2008-2009).**
- James Birrell (Term Staff Scientist)** “Research on Ultrananocrystalline Diamond Films as Encapsulating Coating for Artificial Retina Eye Implantable Si Microchip and for New MEMS/NEMS Technology” **(Argonne National Laboratory, 2006-2007).**
- Sudarsan Srinivasan (Postdoc)** “Fundamental and Applied Science of Ferroelectric/ Piezoelectric-Diamond Hybrid Heterostructures for High-Performance MEMS/NEMS Devices  
**(Argonne National Laboratory, 2005-2008).**
- Bing Shi (Postdoc)** “Investigation of Ultrananocrystalline Diamond as a Bioinert / Biocompatible Coating for Biomedical Devices”  
**(Argonne National Laboratory, 2005-2008).**
- Ill-Seok Kim (Postdoc)** “Synthesis and Characterization of Thin Films for High-Performance Batteries” **(Argonne National Laboratory, 2004-2007).**

**PROFESSIONAL EXPERIENCE (Continuation)**

**DIRECTION OR CO-DIRECTION OF RESEARCH BY NATIONAL OR FOREIGN PROFESSIONALS AND/OR SCHOLARS, AND POSTDOCS (Continuation)**

- Chao Liu (Postdoc)** “Synthesis of C60 Endoedaly Incorporated Nitrogen for Quantum Computing based on Cubits” (**Argonne National Laboratory, 2004-2007**).
- Wei Fan (Postdoc)** “Synthesis and Characterization of High Dielectric Constant Oxide Films for Integrated Circuit Gate Oxides”, (**Argonne National Laboratory, 2004-2005**).
- James Birrell (Postdoc)** “Synthesis and Characterization of Ultrananocrystalline Diamond Thin Films for MEMS Devices and Fabrication of MEMS Structures” (**Argonne National Laboratory, 2003-2005**).
- Jian Wang (Postdoc)** "Surface Functionalization of Ultrananocrystalline Diamond Thin Films for Biomolecular Materials Integration" (**Argonne National Laboratory, 2003-2006**).
- Singchen Xiao (Postdoc)** "Synthesis and Properties of Ultrananocrystalline Diamond Thin Films for Biodevices" (**Argonne National Laboratory, 2002-2006**).
- J. Gerbi (Postdoc)** ""Synthesis and Properties of Ultrananocrystalline Diamond Thin Films for Microelectronic Devices", (**Argonne National Laboratory, 2002-2005**).
- I. Abdel-Motaleb (Associate Researcher-NIU)** "Electron Emission and Electronic Properties of UNC Films" (**Argonne National Laboratory, 2001-2004**).
- M.Q. Ding** (Visiting Scientist, Beijing, China) “Synthesis and Characterization of Field Emission Properties of Ultrananocrystalline Diamond Thin Films”, (**Argonne National Laboratory, 2001-2002**).
- M. Angadi** (Visiting Scientist, “Ferroelectric Cathodes” (**Argonne National Laboratory, 1997-2001**).
- B. Battacharya** (postdoc, ANL) “Development of Ultrananocrystalline Diamond Films-Based MEMS Technology” (**Argonne National Laboratory, 1999-2000**).
- A. Yjatissa** (Postdoc, ANL) “Synthesis of Nanocrystalline Diamond Films and Integration into Microelectromechanical (MEMS) Devices” (**Argonne National Laboratory, 1999-2000**).

**PROFESSIONAL EXPERIENCE (Continuation)**

**DIRECTION OR CO-DIRECTION OF RESEARCH BY NATIONAL OR FOREIGN PROFESSIONALS AND/OR SCHOLARS, AND POSTDOCS (Continuation)**

- J. Im** (Postdoc, ANL) "Synthesis and Characterization of High Dielectric Constant Thin Films for Microwave Devices" (**Argonne National Laboratory, 1998-2000**).
- J. Tucek** (Postdoc, ANL) "Synthesis and Characterization of Li-Based Alloy Coatings for Field Emission Cold Cathodes" (**Argonne National Laboratory, 1998-2000**).
- A. Dhote** (Postdoc, ANL) "*In Situ* Characterization of Multicomponent Oxide Thin Films Growth and Interface Processes via Time-Of-Flight Ion Scattering and Recoil Spectroscopy" (**Argonne National Laboratory, 1997-1999**).
- P. Bachmann** (Postdoc, ANL) "Synthesis and Characterization of BST Thin Films for Microwave Devices" (**Argonne National Laboratory, 1997-2000**).
- C. Bjormander** (Fellow of the Nat. Research Council, Sweden) "Science and Technology of Ferroelectric Thin Films via CVD Synthesis" (**Argonne National Laboratory, 1997**).
- S. Werner** (Research Scientist Under a Scholarship of the German Minister of Science and Technology, Germany) "Pulsed Laser Ablation-Deposition and Characterization of Layered Ferroelectric Thin Films for Non-volatile Memory Capacitors" (**NCSU, 1995-1996**).
- R. Spitzel** (Visiting Research Scientist, from University of Wuppertal, Wuppertal, Germany) "Electron Emission Characterization of Diamond Films Selectively Grown on Silicon Field Emitter Arrays" (**MCNC, 1995**).
- J.K. Lee** (Research Scientist, Korea Institute of Science and Technology, South Korea) "Pulsed Laser Ablation-Deposition and Characterization of Ferroelectric Thin Films for Non-Volatile Memories" (**NCSU, 1994-1995**).
- D. Lichtenwalner** (Postdoctoral), "Ion Beam Sputter-Deposition of High Temperature Superconducting and Electro-optic Thin Films" (**NCSU, 1990-1994**).
- X. Chen** (Postdoctoral) "Electrical Characterization of Ferroelectric Thin Films" (**NCSU, 1991-1994**).
- S.H. Rou** (Postdoctoral) "Electron Microscopy Characterization of Multicomponent Oxide Thin Films" (**NCSU, 1990-1992**).
- K. Christensen** (Postdoctoral) "Electron Microscopy Characterization of Thin Films" (**NCSU, 1991-1992**).
- P.D. Hren** (Postdoctoral), "Electron Microscopy Characterization of Multicomponent Oxide Thin Films" (**NCSU, 1989-1992**).
- M.S. Ameen** (Research Scientist), "Ion Beam Sputter-Deposition of Multicomponent Oxide Thin films" (**NCSU, 1988-1991**).
- A. Subrahmanyam** (Scholar, Inst. of S&T, India) "Basic Phenomena in Ion Beam Sputter-Deposition of Multicomponent Oxide Thin Films" (**NCSU, 1990**).

## **PROFESSIONAL EXPERIENCE (Continuation)**

### **DIRECTION OR CO-DIRECTION OF RESEARCH BY NATIONAL OR FOREIGN PROFESSIONALS AND/OR SCHOLARS, AND POSTDOCS (Continuation)**

**A. Gras-Marti** (Scholar, University of Alicante, Spain) "Transport Processes in Plasma-Assisted Deposition of High Temp. Superconducting Thin films"(NCSU, 1989)

**A. Gras-Marti** (Scholar, University of Alicante, Spain) "Transport Processes in Plasma-Assisted Deposition of High Temperature Superconducting Thin films" (NCSU, July 1989).

**J.A. Valles-Abarca** (Scholar, University of Alicante, Spain) "Transport Processes in Plasma-Assisted Deposition of High Temperature Superconducting Thin films" (NCSU, July 1988).

## **INDUSTRIAL AND ENTREPRENEURIAL ACTIVITIES**

- Advanced Diamond Technologies, co-founded by O. Auciello, J.A. Carlisle, and Neil Kane in 2003. ADT was spun-off from a National Laboratory to commercialize the ultrananocrystalline diamond (UNCD) thin film technology developed and patented at Argonne. The founders pioneered the first breakthrough model for spinning-off a company from a National Laboratory, with DOE approval that the founding scientists and Argonne have equity in the company. This action started a new model for spinning-off companies from National Labs, and other companies were spun-off using the model pioneered by the ADT founders. O. Auciello is currently equity holder investor and consultant to ADT and work on joint projects as well as help on technology directions for ADT.
- O. Auciello co-founded Original Biomedical Implants (OBI-USA, 2013-present), focused on development and commercialization of a new generation of implantable biomedical devices. OBI was incorporated in Delaware (July 2013) (further info provided on request).
- O. Auciello co-founded Original Biomedical Implants (OBI-Mexico, 2016-present); This Company has been incorporated in Mexico to develop and commercialize biomedical implants based on the biocompatible corrosion resistant UNCD coating.
- Research and development on thin films for microelectronic devices (CMOS) (MCNC, Center for Microelectronics, Research Triangle Park, NC) (1989-1996).
- Research and development on Cu-based alloys for electrical switches (contract from Cutler-Hamer, Milwaukee, Later, Eaton Corporation (1977-1979).

## **MANAGEMENT EXPERIENCE**

- Management of Multimillion Dollar programs funded by DARPA to develop several technologies: a) ferroelectric thin films for non-volatile ferroelectric memories (1988-1996), b) emissive flat panel displays (1993-2000), c) High-K dielectric thin films for high-frequency devices (1997-2001), d) Co-Integration of Multi-functional Diamond MEMS Technology with High-Performance CMOS for DC to GHz Frequency Applications (2004-2009), e) Low Power Piezoactuated NEMS Logic (2007-2012).
- Scientific and managerial co-direction of large University research programs involving senior research scientists, postdoctoral, and several graduate students (1985-1996), (2012-present)
- Direction of a research program on metallization and semiconductor thin film synthesis for microcircuit fabrication in the ULSI scale at MCNC, Electronic Technologies Division (1988-1996).

## AWARDS

- 2015** **Finalist Texas Tech Titan Award (2<sup>nd</sup> Prize), Inventor of the Year:** for development of unique ultrananocrystalline diamond coating commercialized in industrial, high-tech and medical devices.
- 2011** **R&D 100 Award** for “Integrated Radio Frequency (RF) Microelectromechanical System (MEMs) Switch/Complementary Metal-Oxide Semiconductor Device”.
- 2010** **Named Argonne Distinguished Fellow of Argonne National Laboratory; this is the laboratory’s highest scientific and engineering honor, equivalent to an endowed chair at a top-ranked university, recognizing sustained outstanding scientific and engineering research and outstanding technical leadership of major, complex, high-priority projects.**
- 2009** **Elected Fellow of the Materials Research Society,** for outstanding contributions to the science and technology of multifunctional thin films.  
**Elected Fellow of the AAAS,** for scientifically and socially distinguished efforts to advance materials science and its applications for the improvement of life.  
**R&D Editors’ Choice Top 100 Award selected among all 100 Awards given in 2009,** for development of an artificial retina to restore sight to people blinded by retina degeneration (Award went to the DOE team of researchers from five National Laboratories, four Universities and Second Sight (the Company marketing the device)  
**R&D 100 Award,** for development of an artificial retina to restore sight to people blinded by retina degeneration (Award went to the DOE team of researchers from five National Laboratories, four Universities and Second Sight (the Company marketing the device)
- 2008** **University of Chicago Distinguished Performance Award,** for outstanding performance in science at Argonne National Laboratory in 2007-2008.  
**R&D 100 Award (2008):** for breakthrough commercialization of ultrananocrystalline diamond-coated mechanical pump seals as one of the 100 most innovative ideas of the year.
- 2007** **Prof. “Honoris Causa” of National University of Cordoba-Argentina,** for outstanding contributions to the science and technology of thin films for multifunctional devices.
- 2006** **Federal Laboratory Consortium Award:** for breakthrough transfer of ultrananocrystalline diamond film technology from a national laboratory to the market via creation of Advanced Diamond Technologies, Inc, a new model where founding scientists and the national laboratory hold equity in the company.

## AWARDS (Continuation)

- 2003** **Hispanic Engineering National Achievement Award**, for outstanding technical accomplishments in the general field of science and technology of thin films.
- R&D 100 Award (2003)**: for development of large area ultrananocrystalline diamond (UNCD)/IPLAS technology developed by **O. Auciello**, J.A. Carlisle, D. M. Gruen, Ralf Spitzel, and Hildegard Sung-Spitzel as one of the 100 most innovative ideas of the year.
- American Vacuum Society Student Award to Wei Fan**: for work on novel high-k dielectric thin films under the direction of **O. Auciello**.
- 2000** **International Symposium of Integrated Ferroelectrics Outstanding Achievement Award**, for outstanding contributions to the field of integrated ferroelectrics.
- 1998** **Materials Research Society Recognition**, for outstanding contributions to the MRS as one of the first three members of the MRS Bulletin Volume Organizer Team (1998).
- 1997** **DOE-BES Award**, for Significant Implication for Department of Energy Related Technologies.
- Argonne National Laboratory Year Award**, for outstanding research on ferroelectric thin films and coatings for field emission devices.
- 1995** **R. Bunshah Award (American Vacuum Society)**; for work on "*In Situ*, Real-Time Characterization of Film Growth Processes Using a Novel Time-of-Flight Ion Beam Surface Analysis Technique" (jointly with A.R. Krauss, D.M. Gruen, and A.J. Schultz).
- 1992** **Best Paper**, presented at the American Vacuum Society Short Courses, North Carolina Chapter, "Pulsed Laser Ablation-Deposition of Ferroelectric Thin Films and Characterization," by R. Dat, D.J. Lichtenwalner, **O. Auciello**, and A.I. Kingon.
- 1990** **Materials Research Society Student Award**, won by **S.H. Rou**, a Ph.D. student under Profs. **O. Auciello** and A.I. Kingon direction for the paper "Microstructural Studies on Ion Beam Sputter-Deposited KNbO<sub>3</sub> Thin Films", MRS National Spring Symposium, San Francisco.
- 1989** **Best Paper Award**, for a paper presented at the Symposium on Current Research in Materials Science: "Computer-Controlled Ion Beam Sputter-Deposition of Electro -optic Thin Films and Their Characterization", Materials Research Society, North Carolina Chapter, Raleigh, North Carolina.

## **ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES**

### **Member of Scientific Societies**

American Association for the Advancement of Science  
American Vacuum Society  
Materials Research Society  
IEEE Society  
The Planetary Society

### **Member of Honor Societies**

Sigma XI

### **Journals Refereed**

Appl. Phys. Lett., Appl. Surf. Sci., J. of Appl. Phys., J. Nucl. Mater., J. of Phys. D: Applied Physics, J. Vac. Sci. Technol., Materials and Manufacturing Processes, Nucl. Instr. & Meth., Phys. Rev. Lett., Radiation Effects, Superconducting Science and Technology, Surface Science, Thin Solid Films.

### **Proposal Reviews**

National Science Foundation, Department of Energy, Army Research Office, USA.  
Member Special Review Panel (Department of Energy), USA. Intern. Science Foundation, USA.

### **Consulting**

Advanced Diamond Technologies, Inc: Technology of Ultrananocrystalline Diamond Films”  
(Founder and consultant, **2004- present**)

Paratek, Inc, USA :

Science and Technology of Thin Films for High-Frequency Devices, (**2005-2008**)

Corium Industries, Inc., USA:

"Development of Advanced New Materials (Bulk and Film) for Application in Modern Technologies (Microelectronics, Electric Power, Plasma Devices)." (**1988-1991**).



**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**General, Membership in Scientific Committees, Scientific Societies Boards, Others**

- 2014** Past President of the Materials Research Society
- 2013** President of the Materials Research Society
- 2012** Vice President of the Materials Research Society for 2012 to become President in 2013  
Distinguished Endowed Chair Professor, University of Texas at Dallas
- 2011** Elected Vice President of the Materials Research Society for 2012 to become President in 2013
- 2010** Reviewer of DOE funded Research Program at the University of Michigan, Materials Science Department.  
  
Invited by the US Department of State to represent the USA in a USA-Argentina meeting to discuss cooperation in science and technology, September 2-3, 2010.
- 2006-2010** Member Review Committee for NASA Nanotechnology Center at University of Puerto Rico -Rio Piedras, Puerto Rico.
- 2005** Member Review Committee for Universities Nanotechnology Program in Spain.  
**Elected Chairman of the External Relations and Volunteer Involvement Committee** (Materials Research Society, USA).
- 2004** Elected Permanent Co-Chair of the International Symposium on Integrated Ferroelectrics.  
**Nominated for President of the Materials Research Society-USA**
- 2003-** Member Advisory Board Nanotechnology World Forum, Headquarters in Chicago, USA.  
Member and Vice-Chair of the International Relations Committee of the Materials Research Society.
- 2002** Member of MRS Governing Council reorganizing the whole Government of the MRS and elected Chair of the External Relations and Volunteer Committee within the New MRS Governing Council.
- 2003-2010** Co-Chair International Relations Committee (MRS-USA)
- 2002-2010** Associate Editor, Journal of Materials Research (MRS-USA)
- 2001-** Associate Editor, Integrated Ferroelectrics  
**present**
- 2000-** Member by election of the Materials Research Society Governing Council  
**2003**
- 2000** Elected Councilor of the Materials Research Society (2000-2003).
- 2000-** Associate Editor, Applied Physics Letters  
**present**

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**General, Membership in Scientific Committees, Boards, Others**

- 2000-** Member Scientific Advisory Board to Associate Laboratory Director, Argonne.  
**2001** National Laboratory.
- 2000** Member Review Panel for Research Programs, National Science Foundation.
- 1999** Member Review Panel for Research Programs, National Science Foundation.
- 1998** Member Editorial Board, MRS Bulletin 1998.  
Member Review Panel for Research Programs, National Science Foundation.
- 1997-** Member Editorial Board, Integrated Ferroelectrics (International Journal).
- 1995-** Member Editorial Board, Research Trends (International Journal).
- present**
- 1994 -** Member Editorial Board, Vacuum (International Journal).  
**present**
- 1992** Member Review Panel for Research Programs of the Department of Energy.  
Member Review Panel for Research Programs, National Science Foundation.
- 1999** **Elected Councilor of the Materials Research Society (2000-2003).**
- 1998** **Elected Chairman**, Advisory Board of the International Symposium on Integrated Ferroelectrics, 1998-2000.
- Member of the first annual MRS Bulletin organizing board**, Materials Research Society.
- Invitation** to write an article for Physics Today on the Physics of Ferroelectric Memories.
- 1997-** **Associate Editor**, Integrated Ferroelectrics (International Journal)  
**Pres** (Gordon and Breach Publishers).
- 1996** **Guest Editor**, MRS Bulletin on "Science and Technology of Electroceramic Thin Films," (June and July, 1996).
- 1995-** **Member, Editorial Board** of Research Trends (International Journal).  
**1999**
- 1994-** **Member, Editorial Board**, "Vacuum" (International Journal).  
**2012.** (Elsevier Science Publishers).
- 1994** **Translation to Chinese**, of the book "Plasma Diagnostics," vols. 1 and 2, **O. Auciello** and D.L. Flamm (eds.), Academic Press (1990), Academia Sinica (1994).
- Citation in Who's Who in the World**, 11th Edition, 1993-1994.
- 1992** **Citation in Who's Who in Science and Engineering**, 1st Edition, March 1992.

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**General, Membership in Scientific Committees, Boards, Others**

- 1991 Department of Energy Recognition**, for achievement in co-inventing and developing an "Automated Ion Beam Sputter- and Laser Ablation-Deposition System for Production of Multicomponent/Multilayer Thin Films".
- 1989 Translation of the paper** "A Critical Comparison of Reactive Etching of Materials in Microelectronics, Fusion and Space Technologies, " by **O. Auciello**, D.E. Ibbotson, and D.L. Flamm., Nucl. Instr. Meth. in Phys. Res. B23 (1987) 419, **to Russian, in the book "Particle Interaction with Matter", a selection of key papers by scientists of the Western World, E.C. Mashkova (Ed.), MIRV Publishers, Moscow (1989) p. 309-345.**
- 1989 Member Organizing Committee**, American Vacuum Society High Temperature Superconductor Topical Conference, USA.
- 1988 President**, Materials Research Society, North Carolina Chapter, USA.  
**Invitation**, to Nominate a Candidate for the Tokyo Prize on Technology, Japan.  
**Summer Faculty Research Scientist**, Argonne National Laboratory, Argonne, IL, USA.
- 1987- Permanent Faculty Research Scientist**, Argonne National  
**1996** Laboratory, Argonne, IL, USA.
- 1987 Summer Faculty Research Scientist**, Argonne National Laboratory, Argonne, IL, USA.  
**Vice-President**, Materials Research Society, North Carolina Chapter.
- 1986 Summer Faculty Research Scientist**, Argonne National Laboratory, Argonne, IL, USA.

## ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)

### Recognitions in Media for Research at University of Texas at Dallas

#### **2017 Featured in Video Interview by the Materials Research Society:**

MRS Bulletin Material Matters | Orlando Auciello on biomedical materials innovation  
“After one year of fundamental studies, in six months we got approval from the FDA of Argentina, and we already did the first clinical trial on a person.” MRS Bulletin’s Sabrina Sartori, from the University of Oslo, talks with Orlando Auciello, Endowed Chair Professor at the University of Texas, Dallas and co-founder of Advanced Diamond Technologies, Inc. and Original Biomedical Implants. Auciello covers entrepreneurship stemming from a US national laboratory, the synergistic relationship between basic and applied research, and regional approaches to taking materials innovation to the market. He is an MRS Fellow and former president of the Materials Research Society (2013).

[https://www.youtube.com/watch?v=-Izbi\\_244lc&feature=youtu.be](https://www.youtube.com/watch?v=-Izbi_244lc&feature=youtu.be)

#### **2015 Featured in University of Texas-Dallas Web site as finalist in the Texas Tech Titan Award as Inventor of the Year**

**2014 Lab-Grown Diamonds Could Give Medical Implants New Shine** (Lauren Silverman, reporter), KERA (associated to National Public Radio) broadcast on January 8, 2014 (8:20 and 6:20 pm): For the past decade, UTD professor Orlando Auciello has been obsessed with growing diamonds. But instead of trying to create the biggest gem possible, he’s been trying to craft the thinnest possible layer of diamond. This thin coating could advance everything from hip implants to hydraulic pumps - See more at: <http://breakthroughs.kera.org/#sthash.pK9azriv.dpuf>

**Lab-Grown Diamonds Could Give Medical Implants New Shine (UT Daily, The University of Texas System News):** For the past decade, UTD professor Orlando Auciello has been obsessed with growing diamonds. But instead of trying to create the biggest gem possible, he’s been trying to craft the thinnest possible layer of diamond.

**2013 University of Texas at Dallas Press Release (December 19, 2013):** Materials Scientist's Research Contributes To Invention Recognized by Time Magazine (A device created by an interdisciplinary group of researchers, including a UT Dallas professor (O. Auciello), was recently named one of the [best inventions of 2013 by Time magazine](#).

**TIME magazine named the Argus II device, which restore partial vision to blind people by retinitis picmentosa, one of the top 25 inventions of 2013 (O. Auciello was member of the team** of researchers, from 5 National Labs, 4 Universities, and Second Sight (the company implanting the device commercially in the USA and Europe), whom developed the device (for which they received a R&D 100 Award and the R&D 100 Award Editors’ Choice for top R&D 100 Award for 2009).

**2012 Journal of Applied Polymer Science:** Startups in materials science: interview with Orlando Auciello, March 4, 2013 By [Stefano Tonzani](#)

## ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)

### Recognitions in Media for Research at Argonne

- 2010** Interviewed by Channel 7 TV and La Nación and Clarín Newspapers in Buenos Aires to discuss our research on nanotechnology at ANL, September 2, 2010.
- 2009** “Featured in “La Nación” (Largest circulation Newspaper in Argentina) for contribution in large team to research and development of artificial retina to restore sight to people blinded by retina degeneration”.
- 2007** “Featured in National and Provincial (Córdoba) TV and Newspapers in Argentina for contribution in large team to research and development of artificial retina to restore sight to people blinded by retina degeneration”.
- 2006** “Featured in Tribology and Lubrication Technology Article: Application of Ultrananocrystalline Diamond Coatings”.
- 2005** “Featured in Hispanic Radio Program profiling Hispanic scientists at the forefront of science in the USA”.
- 2004** Featured in TV program “Diagnóstico” (Channel 13, Santiago-Chile). One-hour program on Artificial Retina Program to develop device to restore sight to people blinded by retina degeneration. O. Auciello is the PI of the Argonne program in a Multi-Institutional Program (Four National Laboratories, Two Universities and Second Sight (Company in California to market the device) funded by DOE.
- 2003** **Featured in Chicago Tribune**, (February 3, 2003) for work on artificial retina. **Featured in Argonne’s Web front page**, for work on development of artificial retina. **Featured in Argonne’s Frontier publication**, for work on science of ferroelectric films. Mass-Produced Diamond Films <http://www.rdmag.com/> (R&D Magazine, September 2003) 3 local tech innovations in magazine's top 100 <http://www.suntimes.com/output/zinescene/cst-fin-ecol22.html> (R&D 100 Chicago Sun-Times, October 2003). Energy Department-Funded Projects Win 35 Research and Development Award [http://www.energy.gov/engine/content.do?PUBLIC\\_ID=14191&BT\\_CODE=PR\\_PRESSRELEASES&TT\\_CODE=PRESSRELEASE](http://www.energy.gov/engine/content.do?PUBLIC_ID=14191&BT_CODE=PR_PRESSRELEASES&TT_CODE=PRESSRELEASE), [http://www.science.doe.gov/Sub/Accomplishments/100\\_awards/2003rd100.htm?PUBLIC\\_ID=14123&BT\\_CODE=PR\\_PRESSRELEASES&TT\\_CODE=PRESSRELEASE](http://www.science.doe.gov/Sub/Accomplishments/100_awards/2003rd100.htm?PUBLIC_ID=14123&BT_CODE=PR_PRESSRELEASES&TT_CODE=PRESSRELEASE) (DOE office of Science). Argonne technologies win R&D 100 awards <http://www.anl.gov/OPA/local/news/an030818.html#story1> (Argonne News August 2003)-Large-Area Ultrananocrystalline Diamond Film and Deposition System. Diamond film may enable critical new sensors for bioterror ([http://www.eurekalert.org/pub\\_releases/2003-03/uow-dfm030403.php](http://www.eurekalert.org/pub_releases/2003-03/uow-dfm030403.php) (EurekAlert, March 2003) [http://www.usatoday.com/tech/news/techinnovations/2003-03-05-bio-sensor\\_x.htm](http://www.usatoday.com/tech/news/techinnovations/2003-03-05-bio-sensor_x.htm) (USATODAY March 2003). A Gem of an Idea Against Germ Attacks: Researchers Study Using Diamonds in Bio-Weapon Detectors, <http://abcnews.go.com/sections/scitech/FutureTech/futuretech030325.html> (ABC News). Argonne a ray of hope in fight to restore sight; The quest to restore partial vision to those blinded by disease is being advanced with the use of a microscopic crystalline substance <http://pqasb.pqarchiver.com/chicagotribune/index.html?ts=1068393199> (Chicago Tribune, Feb 3, 2003).

## ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)

### Recognitions in Media for Research at Argonne

- 2002** Rewiring the retina: National labs, universities, and at least one private company are exploring ways to help people blinded by retinal disease. <http://www.machinedesign.com/ASP/strArticleID/55982/strSite/MDSite/viewSelectedArticle.asp> (Machine Design) Secretary Abraham announces next steps for artificial retina project: Abraham tours Doheny Eye Institute at Keck School of Medicine, lauds scientific & engineering breakthroughs for patients with retinal disorders [http://www.eurekalert.org/pub\\_releases/2002-11/ddoe-saa112502.php](http://www.eurekalert.org/pub_releases/2002-11/ddoe-saa112502.php) (EurekAlert, November 2002).

Senate Subcommittee on Energy Testimony by Secretary of Energy Spencer Abraham

[http://www.energy.gov/engine/content.do?PUBLIC\\_ID=13884&BT\\_CODE=PR\\_CONGRESSTEST&TT\\_CODE=PRESSRELEASE](http://www.energy.gov/engine/content.do?PUBLIC_ID=13884&BT_CODE=PR_CONGRESSTEST&TT_CODE=PRESSRELEASE) (DOE office of Science)

Artificial Retina Project

[http://sc.doe.gov/Science\\_News/feature\\_articles\\_2002/November/Artificial\\_Retina/Artificial-Retina.htm](http://sc.doe.gov/Science_News/feature_articles_2002/November/Artificial_Retina/Artificial-Retina.htm)  
(DOE Office of Science, November 2002)

Artificial retina in sight at Argonne <http://www.anl.gov/OPA/news02/news021211.htm> (Argonne News December 2002)

Top 10 DOE Science Achievements in 2002: #1. Helping the Blind to See

[http://www.er.doe.gov/Sub/Accomplishments/top\\_10.htm](http://www.er.doe.gov/Sub/Accomplishments/top_10.htm) (DOE Office of Science). The Artificial Retina Project was selected at the #1 Science Achievement for DOE in 2002. This Project and our role in it was featured in several press releases and newspapers:

Argonne a ray of hope in fight to restore sight ; The quest to restore partial vision to those blinded by disease is being advanced with the use of a microscopic crystalline substance

<http://pqasb.pqarchiver.com/chicagotribune/index.html?ts=1068393199> (Chicago Tribune, February 3, 2003)

Rewiring the retina: National labs, universities, and at least one private company are exploring ways to help people blinded by retinal disease.

<http://www.machinedesign.com/ASP/strArticleID/55982/strSite/MDSite/viewSelectedArticle.asp> (Machine Design)

Secretary Abraham announces next steps for artificial retina project: Abraham tours Doheny Eye Institute at Keck School of Medicine, lauds scientific & engineering breakthroughs for patients with retinal disorders [http://www.eurekalert.org/pub\\_releases/2002-11/ddoe-saa112502.php](http://www.eurekalert.org/pub_releases/2002-11/ddoe-saa112502.php) (EurekAlert, November 2002)

Senate Subcommittee on Energy Testimony by Secretary of Energy Spencer Abraham

[http://www.energy.gov/engine/content.do?PUBLIC\\_ID=13884&BT\\_CODE=PR\\_CONGRESSTEST&TT\\_CODE=PRESSRELEASE](http://www.energy.gov/engine/content.do?PUBLIC_ID=13884&BT_CODE=PR_CONGRESSTEST&TT_CODE=PRESSRELEASE) (DOE office of Science)

Artificial Retina Project

[http://sc.doe.gov/Science\\_News/feature\\_articles\\_2002/November/Artificial\\_Retina/Artificial-Retina.htm](http://sc.doe.gov/Science_News/feature_articles_2002/November/Artificial_Retina/Artificial-Retina.htm)  
(DOE Office of Science, November 2002).

<http://www.techtransfer.anl.gov/awards/rd100short.html#unccd> (R&D 100, ANL Tech Transfer)

Top 10 DOE Science Achievements in 2002: #1. Helping the Blind to See

[http://www.er.doe.gov/Sub/Accomplishments/top\\_10.htm](http://www.er.doe.gov/Sub/Accomplishments/top_10.htm) (DOE Office of Science). The Artificial Retina Project was selected at the #1 Science Achievement for DOE in 2002. This Project and our role in it was featured in several press releases and newspapers.

## **ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**

### **Recognitions in Media for Research at Argonne**

**2002** Artificial retina in sight at Argonne <http://www.anl.gov/OPA/news02/news021211.htm> (Argonne News December 2002).

A number of press releases and popular articles appeared in connection with our article that appeared in Nature-Materials [Nature-Materials 1, 253-257 (2002)]:

Researchers developing biological-attack sensor.

DIAMOND FILMS FOR BIOSENSING: New method yields stable films useful for detecting biomolecules <http://pubs.acs.org/cen/topstory/8048/8048notw6.html> (C&E News) DNA prefers diamond [http://www.trnmag.com/Stories/2002/121102/DNA\\_prefers\\_diamond\\_121102.html](http://www.trnmag.com/Stories/2002/121102/DNA_prefers_diamond_121102.html) (TRN Magazine)

Diamond Film May Enable Critical New Sensors For Bioterror

<http://www.sciencedaily.com/releases/2003/03/030305081021.htm> (Science Daily)

Diamond film may enable critical new sensors for detecting dangerous biological agents,

[http://www.brightsurf.com/news/march\\_03/EDU\\_news\\_030503\\_c.html](http://www.brightsurf.com/news/march_03/EDU_news_030503_c.html) (BrightSurf.com)

Diamond film may yield sensors for bioterror <http://www.news.wisc.edu/view.html?get=8350> (UW-Madison press release)

Diamond Film May Enable Critical New Sensors For Bioterror <http://www.spacedaily.com/news/terrorwar-03b.html> (Space Daily December 2002)

Sensors coming to detect bioterror [http://www.electroline.com.au/elc/feature\\_article/item\\_052003b.asp](http://www.electroline.com.au/elc/feature_article/item_052003b.asp) (Electroline)

Diamonds Are for Terror <http://www.odysseymagazine.com/pages/ss/technology.php> (Odyssey Magazine)

Diamonds are an anti-terror expert's best friend

<http://www.spectrum.ieee.org/WEBONLY/newslog/news03-20-03.html> (IEEE Spectrum, April 2003).

New sensors designed to thwart bioterror <http://www.e4engineering.com/item.asp?id=48070> (e4engineering.com).

## **ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**

### **Invited Speaker at Institutions**

- 2017** **Invited Lecturer**, McMaster University, March 18, 2017  
**Invited Lecturer**, IISER, Pune, India, March 8, 2017  
**Invited Lecturer**, Trinity College Dublin, January 22, 2017
- 2016** **Invited University Lecturer**, University of Texas at Arlington, January 29, 2016.  
**Invited Lecturer**, University of Texas-San Antonio, November, 2016.
- 2015** **Invited Talk**, Texas A&M University, October 14, 2015.  
**Invited Talk**, Vanderbilt University, July 14, 2015.  
**Keynote Talk**, UTD Eric Jonsson School Industrial Advisory Council, May 1, 2015.  
**Invited Speaker, National University of Singapore-Nanotechnology Institute**, May 22, 2015.  
**Invited Talk**, University of Houston, May 15, 2015.
- 2014** **Invited Speaker, Tulane University**, New Orleans, September 2014.  
**Invited Speaker, NCSU**, North Carolina, USA, August 2014.  
**Invited Speaker, UNIST**, Ulsan, South Korea, July 2014.  
**Invited Speaker, Yonsei University**, Seoul, South Korea, July 2014.  
**Invited Speaker, Kookmin University (KMU)**, visit to establish collaborations between UTD and KMU, Seoul, South Korea, July 2014.  
**Invited Speaker, University of Texas at San Antonio**, San Antonio, USA  
**Invited Lecturer, Kookmin University (KMU)**, 1<sup>st</sup> Workshop KMU-UTD In-Fusion Center, Research and Educational Program, Seoul, South Korea, May 2014.  
**Invited Speaker, University of Virginia**, Virginia. USA, April 2014.
- 2013** **Invited Speaker, Saltillo Institute of Technology**, Saltillo, Mexico (Talk on Innovation and Technology Transfer), November 2013.  
**Invited Speaker, University of Texas-Arlington**, November 2013.  
**Invited Speaker, MIT**, June 2013  
**Invited Speaker, University of Texas Southwestern Medical Center**, June 2013.  
**Invited Speaker, Methodist Medical Research Institute**, May 2013.  
**Invited Speaker, Samsung** (Seoul, Korea), February 2013.
- 2012** **Invited Talk, California NanoSystems Institute, UCLA**, January 2012.  
**Argonne National Laboratory Colloquium Talk**, ANL-MSD, January 12, 2012.  
**Invited Talk, PNNL**, February 2012  
**Invited University Seminar, University of Texas-Dallas**, February 2012.  
**Invited Talk at Weill Cornell Medical College**, New York, February 2012.  
**Invited Seminar, University of Texas-Dallas**, April 2012.  
**Invited talk to INTEL via Internet**, June 2012.  
**Invited Talk at ITRI**, Taiwan, June 2012.  
**Invited Talk at Sungkyunkwan University**, Seoul, Korea, July 2012  
**Invited Speaker at Samsung** (Seoul, Korea), July 2012.

### **ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**

#### **Invited Speaker at Institutions (Continuation)**



**2011 Special Invitation to give Industrial Talk at Samsung, Seoul, Korea, December 2011**

**University Seminars:**

University of Texas-Dallas, October 2011

Michigan State University, November 2011

Hope College, November 2011

**Lecture, Winter Enhancement Program, King Abdullah University of Science and Technology (KAUST),** “Science and Technology of Multifunctional UNCD Films and Application to Biomedical Devices”, January 26, 2011, KAUST, Jeddah, Saudi Arabia.

**Lecture, Winter Enhancement Program, King Abdullah University of Science and Technology (KAUST),** “Science and Technology of Multifunctional UNCD Thin Films and Application to Multifunctional Devices for Energy”, January 25, 2011, KAUST, Jeddah, Saudi Arabia.

**2010 Seminar, Institute of Vacuum Microelectronics,** “Science and Technology of Multifunctional UNCD Thin Films and Application to Multifunctional Devices”, July 2 2010, Beijing, China.

**Seminar, Pacific Northwest National Laboratory,** “Science and Technology of Multifunctional Thin Films and Application to Multifunctional Devices”, March 11, 2010.

**Seminar, Nanjing University,** “Science and Technology of Multifunctional Thin Films and Application to Multifunctional Devices”, May 13, 2010, Nanjing, China.

**2009 Seminar, University of Southern Florida,** “Science and Technology of Ultrananocrystalline Diamond Thin Films”, Tampa, FL, November 11, 2009.

**Seminar, Purdue University,** “Science and Technology of Multifunctional Thin Films and Applications to Multifunctional Devices”, Lafayette, IN, October 2, 2009.

**2008 Colloquium, National University of Technology Beijing, China,** “Science and Technology of Multifunctional Oxide Thin Films and Applications to Multifunctional Devices”, Beijing, China, July 7, 2008.

**Colloquium, International Institute of Microelectronics, Beijing, China,** “Science and Technology of Multifunctional Ultrananocrystalline Diamond Thin Films and Applications to Multifunctional Devices”, Beijing, China, July 8, 2008.

**Lecture, International Center for Materials Physics, Shenyang, China,** “Science and Technology of Oxide Thin Films and Applications to Multifunctional Devices”, Shenyang, China, July 8, 2008.

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**Invited Speaker at Institutions (Continuation)**

- 2008 Lecture, International Center for Materials Physics, Shenyang, China,**  
 “Science and Technology of Multifunctional Ultrananocrystalline Diamond Thin Films and Applications to Multifunctional Devices”, Shenyang, China, July 2008.  
**University of Chicago Brain Institute,** Science and Technology of Multifunctional Ultrananocrystalline Diamond Thin Films and Applications to Novel Neural Prosthesis”, June 20, 2008.  
**University Seminar, Cheng Kung University, Taiwan**  
 “Science and Technology of Multifunctional Ultrananocrystalline Diamond Thin Films and Applications to Multifunctional Devices”, May 30, 2008.  
**University of Chicago Medical School, Department of Pathology,** Science and Technology of Multifunctional Ultrananocrystalline Diamond Thin Films and Applications to Biomedical Devices”, April 20, 2008.  
**University of Texas-Dallas,** Science and Technology of Multifunctional Thin Films and Application to Multifunctional Micro and Nano-Devices, Dallas, TX, April 7, 2008.  
**University of Texas-San Antonio,** Science and Technology of Multifunctional Thin Films and Application to Multifunctional Micro and Nano-Devices, San Antonio, TX, April 8, 2008.
- 2007 Colloquium, Universidad Nacional de Córdoba, Córdoba Argentina,** “Science and Technology of UNCD films and Applications to Biomedical Devices and Biosensors”, November 2007.  
**Colloquium, University of Pennsylvania, Philadelphia, PA,** “Science and Technology of Multifunctional Thin Films”, April 2007.  
**Seminar, Cabot Microelectronic, Aurora, USA,** “Science and Technology of Multifunctional Thin Films and Applications to Multifunctional Devices”, February 2007.
- 2006 Seminar, North Carolina State University, Raleigh, NC,** “Science and Technology of Ultrananocrystalline Diamond Thin Films”, April 2006.
- 2005 Seminar, Universidad Nacional de la Plata, La Plata, Argentina,** “Ultrananocrystalline Diamond (UNCD) Film as a Passive and Active Biomaterial for Biomedical Devices and Biosensors”, September 1, 2005.  
**Colloquium, Purdue University,** “Science and Technology of Multifunctional Thin Films and Interfaces: A Vision to Nanoscience and Nanotechnology, May 13, 2005.  
**Invited Lecture, Wuhan University, China,** “Science and Technology of Multifunctional Thin Films and Interfaces: A Vision to Nanoscience and Nanotechnology, April 14, 2005.

## **ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**

### **Invited Speaker at Institutions (Continuation)**

- 2005 Colloquium, Notre Dame University**, “Science and Technology of ultrananocrystalline diamond (UNCD) films for Biomedical Devices and Biosensors”, February 15, 2005.
- Seminar, University of South Florida, Tampa, FL**, “Science and Technology of Ultrananocrystalline Diamond Films and Application to Micro- and Nanoscale Multifunctional Devices”, O. Auciello, Oct. 29, 2004.
- Seminar, University of Florida, Gainesville, FL**, “Science and Technology of Multifunctional Thin Films and Interfaces: A Vision to Nanoscience and Nanotechnology”, Oct. 28, 2004.
- Seminar, Illinois Institute of Technology**, “Science and Technology of Multifunctional Thin Films and Interfaces: A Vision to Nanoscience and Nanotechnology”, Oct.15, 2004.
- Seminar:** “Science and Technology of Multifunctional Thin Films and Interfaces”, **O. Auciello**, Seminar at Custom Board of Chicago, October 7, 2004.
- Invited Speaker, Cornell University, Materials Science and Engineering, Ithaka, New York**, Science and Technology of Ultrananocrystalline Diamond Films and Applications to Micro and Nanoscale Multifunctional Devices”, February 5, 2004.
- 2003 Invited Speaker**, University of Central Florida, “Science and Technology of Ultrananocrystalline Diamond Films and Applications to Macro, Micro and Nanoscale Multifunctional Devices”, October 10, 2003.
- Invited Speaker**, University of Central Florida “Science and Technology of Multifunctional Thin Films and Interfaces: A Vision to Nanoscience and Nanotechnology”, October 31, 2003.
- Invited Speaker, Illinois Institute of Technology Academic Seminar Series:** Talk on “Science and Technology for Development of an Artificial Retina”, Chicago, IL.
- Invited Speaker, Lions Club-Oakbrook:** Talk on “Towards an Artificial Retina to Restore Sight to People Blinded by Retina Degeneration”, Oakbrook, IL.
- Invited Speaker, University of Virginia**, “Science and Technology of Ultrananocrystalline Diamond”, Charlottesville, VA,
- Invited Speaker, Lawrence Livermore Laboratory:** Laboratory Seminar on “Science and Technology of Ultrananocrystalline Diamond Thin Films”, Livermore, CA.
- 2003 Invited Speaker, North Carolina State University-Materials Science Department Colloquium:** “Science and Technology of Ultrananocrystalline Diamond Thin Films”, Raleigh, NC.
- 2002 Invited Speaker**, DELCO, Inc., Kokomo, Indiana, USA.
- Invited Speaker**, Motorola, Arizona, USA.
- Invited Speaker**, Texas Instrument, Texas, USA.
- Invited Speaker**, INTEL, Inc. Santa Clara, USA.
- Invited Speaker**, University of Albany, NY, USA.

## **ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**

### **Invited Speaker at Institutions (Continuation)**

- 2001 Invited Speaker**, Universidad Nacional de Rosario, Argentina.

- Invited Speaker**, Zongzhang University, Guangzhou, China.  
**Invited Speaker**, Northwestern University, Evanston, USA.  
**Invited Speaker**, Neutron Research Group, Argonne National Laboratory, USA
- 2000** **Invited Speaker**, Northwestern University, Evanston, USA.  
**Invited Speaker**, University of Illinois-Chicago, Chicago, USA.  
**Invited Speaker**, Universidad de Colombia-Manizales, Manizales, Colombia.  
**Invited Speaker**, Universidad del Valle, Cali, Colombia  
**Invited Speaker**, Rhein-Westfalia Technische Hochschule Aachen, Aachen, Germany.
- 1999** **Invited Speaker**, University of Houston, Texas, USA.  
**Invited Speaker**, Northwestern University, Evanston, Illinois, USA
- 1998** **Invited Speaker**, Siemens, AG, Munich, Germany.  
**Invited Speaker**, Ecole Polytechnique Federale de Lausanne, Switzerland.  
**Invited Speaker**, Symetrix, Colorado Springs, Colorado, USA.  
**Invited Speaker**, Motorola, Phoenix, Arizona, USA.  
**Invited Speaker**, Motorola, Austin, Texas, USA.  
**Invited Speaker**, Sematech, Palo Alto, California, USA.  
**Invited Speaker**, Hewlett Packard, Palo alto, CA, USA
- 1997** **Invited Speaker**, Pohang University, Pohang, South Korea.  
**Invited Speaker**, Korea Institute of Science and Technology, Cheongryang, Korea.  
**Invited Speaker**, Arizona State University, Arizona, USA.  
**Invited Speaker**, Argonne National Laboratory, Argonne, Illinois, USA.
- 1995** **Guest Editor**, MRS Bulletin on "*In Situ*, Real-Time Characterization of Thin Film Growth Processes," (May, 1995).  
**Invited Speaker**, University of Maryland, Maryland, USA.  
**Invited Speaker**, Toshiba Corporation, Kawasaki, Japan.
- 1995** **Invited Speaker**, Fujitsu Corporation, Tsukuba, Japan.  
**Invited Speaker**, Mitsubishi Electronics Corporation, Japan.
- 1994** **Guest Scientist and Speaker**: University of Wuppertal, Germany.  
**Invited Speaker**, University of Wuppertal, Wuppertal, Germany.  
**Invited Speaker**, Iowa State University, Iowa, USA.
- 1993** **Invited Speaker**, Wake Forest University, Winston-Salem, USA.  
**Invited Speaker**, University of North Carolina, Chapel Hill, USA.  
**Invited Speaker**, University of New York at Albany, Albany, USA.  
**Invited Speaker**, University of Missouri-Rolla, USA.  
**Invited Speaker**, University of North Carolina, Charlotte, USA.  
**Invited Speaker**, Naval Research Laboratory, Washington, DC, USA.

## **ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**

### **Invited Speaker at Institutions (Continuation)**

- 1992** **Invited Speaker**, Philips Research Laboratory, Eindhoven, The Netherlands.

- Invited Speaker**, University of Wuppertal, Wuppertal, Germany.
- Invited Speaker**, Daimler-Benz Materials Science Laboratory, Stuttgart, Germany.
- Invited Speaker**, Universidad Nacional de Buenos Aires, Buenos Aires, Argentina.
- 1991** **Invited Speaker**, University of Texas at Arlington, USA.  
**Invited Speaker**, North Carolina State University, USA.
- 1990** **Invited Speaker**, Argonne National Laboratory, USA.  
**Invited Speaker**, Sandia National Laboratory, USA.  
**Invited Speaker**, Oak Ridge National Laboratory, USA.  
**Invited Speaker**, Institut für Kernfusion, KFA-Jülich, Germany.  
**Invited Speaker**, University of Wuppertal, Germany.  
**Invited Speaker**, Thomson CSF, France.  
**Invited Speaker**, Centre des Materiaux Supraconducteurs, University Caen, France.
- 1989** **Invited Speaker**, Technological University of Virginia, VA, USA.
- 1984** **Invited Speaker**, Nagoya University and Atomic Energy Commission, Japan.  
**Guest Scientist**, Plasma Physics Laboratory, Princeton University, Princeton, NJ, USA.  
**Invited Speaker**, North Carolina State University, Raleigh, NC, USA.
- 1983** **Invited Speaker**, Institut für Chemie, KFA-Jülich, West Germany.  
**Invited Speaker**, Max-Planck Institut für Plasmaphysik, Garching, Germany.
- 1982** **Invited Speaker**, IBM Thomas J. Watson Research Center, Yorktown Heights, N.Y., USA.
- 1981** **Invited Speaker**, Atomic Energy Commission, Bariloche, Argentina.  
**Invited Speaker**, The University of Western Ontario, London, Canada.
- 1979** **Invited Speaker**, Institut für Chemie, KFA-Jülich, West Germany.

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**Conference Organization**

- 2018 Member Organizing Committee, XXIII Latin American Symposium on Solid State Physics, Bariloche, Argentina, April 10-13, 2018.**
- 2017 Member Organizing Committee, International Symposium on Integrated Functionalities, Deli, India, December 2017.**
- 2016 Member Organizing Committee, New Diamond and Nanocarbon Conference, Xi'An, China,**
- 2015 Co-Chair and Organizer, International Symposium on Integrated Ferroelectrics-International Symposium on Applications of Ferroelectrics and Piezoresponse Force Microscopy Conference, Singapore, May 24-27, 2015.**
- 2014 Co-Chair and Organizer, New Diamond and Nanocarbon Conference, Chicago, USA.**
- 2013 Member International Advisory Committee, Nanotechnology Materials and Device Conference, IEEE Organization, Tainan, Taiwan.  
Symposium Co-organizer/Co-Chair, Innovation and Technology Transfer, SBPMat-Brazil.  
Member of Organizing Committee, IUMRS-ICAM meeting, Kyoto, Japan.  
Conference Co-organizer and Co-Chair, International Symposium on Integrated Functionalities, Texas-Dallas, USA.**
- 2012 Conference Co-Chair, International Materials Research Congress, Cancun-Mexico,  
Conference Co-Chair, International Symposium on Integrated Functionalities, Hong Kong,  
Conference Co-Chair, 21th New Diamond and Nanocarbon International Conference, San Juan-Puerto Rico.**
- 2011 Conference Co-Chair, Carbon-Based Nanomaterials and Devices, Suzhou, China,  
Member of Organizing Committee, "Workshop on Technologies for Future Micro/Nano Manufacturing", Napa Valley, CA, USA  
Symposium Co-Chair, MRS Spring 2011 Symposium "New Functional Materials and Emerging Device Architectures for Non-volatile Memories, San Francisco, USA**
- 2010 Program Co-Chair, 1st International Symposium on Integrated Functionalities", San Juan, Puerto Rico,  
Program Co-Organizer and Co-Chair, Symposium on MEMS Beyond Silicon, SPIE Conference on Micro- and Nanotechnology Sensors, Systems, and Applications, Orlando, FL, USA.**
- 2009 Program Chair, 21<sup>th</sup> International Symposium on Integrated Ferroelectrics", Colorado Springs, Colorado, USA.  
Member International Advisory Committee, 3<sup>th</sup> New Diamond Nanocarbon International Conference, Traverse City, Michigan, USA.  
Organizer/Chair Diamond Commercialization Session, 3<sup>th</sup> New Diamond Nanocarbon International Conference, Traverse City, Michigan, USA.**

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**Conference Organization (Continuation)**

- 2008 Member Organizing Committee**, 20<sup>th</sup> International Symposium on Integrated Ferroelectrics”, Singapore.
- Member International Advisory Committee**, 2<sup>th</sup> New Diamond Nanocarbon International Conference, Taipei, Taiwan.
- Member Organizing Committee**, 2<sup>th</sup> Materials Research Society (USA) Symposium on Materials Science and Technology for Non-Volatile Memories, San Francisco, USA.
- 2007 Member Organizing Committee**, Conference on Nanoscience and Nanotechnology for Biological/Biomedical/Chemical Sensing, Hong Kong, China.
- Member Organizing Committee**, 19<sup>th</sup> International Symposium on Integrated Ferroelectrics”, Bordeaux, France.
- 2006 Member Advisory Committee**, “First International Symposium on Transparent Oxides”, Crete-Greece.
- Member International Advisory Committee**, ICNDST/ADC 2006 Joint Conference, Raleigh, North Carolina, USA.
- Member Organizing Committee**, 18<sup>th</sup> International Symposium on Integrated Ferroelectrics”, Oahu, Hawaii, April 24-27, 2006.
- Chair, MRS Symposium “Science and Technology of Nonvolatile Memories”**, MRS Spring Meeting, San Francisco, USA.
- 2005 Member Scientific Committee**, 11<sup>th</sup> International Meeting on Ferroelectricity, Foz de Iguzu, Brazil.
- Member Organizing Committee**, Advanced Diamond Conference/Nanocarbon 2005, Argonne National Laboratory, Argonne, IL, USA.
- Co-Organizer, Science and Technology of Nanostructured Diamond and Related Thin films for MemS/NEMS, Biodevices and Biosensors, MRS Symposium at the MRS Spring Meeting**, O. Auciello, J.A. Carlisle, and R. Nemanich (Co-Chairs), San Francisco, USA.
- 2004 Named Permanent Co-Chair** of the International Symposium on Integrated Ferroelectrics, March 2004.
- Member Advisory Board**, 16<sup>th</sup> International Symposium on Integrated Ferroelectrics, Gyeongju, Korea, April 5-8, 2004.

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**Conference Organization (Continuation)**

**2003 Symposium Co-Organizer and Chair:** “Microelectromechanical Systems (MEMS): International Union of Materials Research Societies-International Conference in Asia 2003, Singapore.

**Symposium Co-Organizer:** “Synchrotron Research in Materials Science”: XII International Conference on Materials”, Cancún, Mexico.

**2002 Symposium Chairman,** “Materials for MEMS”, International Conference on Metallurgical Coatings and Thin Films”, San Diego, CA, USA.

**Member Advisory Board,** 14<sup>th</sup> International Symposium on Integrated Ferroelectrics, Nara, Japan.

**2001 Member Advisory Board,** 1<sup>st</sup> International Workshop of Ferroelectric Memories”, Tokyo, Japan.

**Symposium Chairman,** “Materials for MEMS”, International Conference on Metallurgical Coatings and Thin Films”, San Diego, CA, USA.

**Co-Technical Program Chairman,** 13th International Symposium on Integrated Ferroelectrics, Colorado Springs, CO, USA.

**2000 Chairman,** Symposium L, Materials Research Society Spring Meeting: “Recent Developments in Oxide and Metal Epitaxy-Theory and Experiment”

**1999 Co-Chairman, Symposium U, Materials Research Society Spring Meeting:** “*In Situ Monitoring and Modeling*”, San Francisco, USA.

**1998 Technical Program Chairman,** 10th International Symposium on Integrated Ferroelectrics, Monterey, CA, USA.

**Co-Chairman,** 9th International Conference on Vacuum Microelectronics, North Carolina, USA.

**1997 Organizer of Symposium Session,** 9th International Symposium on Integrated Ferroelectrics, Santa Fe, New Mexico, USA.

**1996 Organizer of Symposium Session,** 8th International Symposium on Integrated Ferroelectrics, Tempe, Arizona, USA.

**1995 Organizer of Symposium Session,** 7th International Symposium on Integrated Ferroelectrics, Colorado Springs, CO, USA.

**1994 Organizer of Symposium Session,** 6th International Symposium on Integrated Ferroelectrics, Monterey, CA, USA.

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**Conference Organization (Continuation)**



- 1993 Member International Advisory Committee**, 9th International Conference on Thin Films, Vienna, Austria.
- 1992 Member International Advisory Committee**, 7th Latin-American Symposium on Surface Science and 1st Ibero-American Congress on Surface Science and Applications, Bariloche, Argentina.
- 1991 Member Organizing Committee**, Symposium on Advanced Materials Processing, MRS-NC Chapter, Research Triangle Park, NC, USA.
- 1990 Member Organizing Committee**, Symposium on High Temperature Superconducting Materials Processing, International Conference on Materials and Manufacturing Processes, Paris, France.
- 1989 Member Organizing Committee**, Symposium on High Temperature Superconducting Materials, American Vacuum Society, Boston, MA, USA.
- 1988 Symposium Organizer**, MRS-NC Chapter on Processing of Advanced Materials, Research Triangle Park, NC, USA.
- 1987 Symposium Organizer**, SEM International Conference, Hamilton, Canada.
- 1987 Symposium Organizer**, MRS-NC Chapter, Spring Meeting on "Plasma-Surface Interaction and Processing of Materials, Research Triangle Park, NC, USA.

### **Summer Schools Organization**

- 2009 Director, Organizer and Lecturer**, PanAmerican Advanced Study Institute on "Science and Technology for a new Generation of Neural Prosthetics", Buenos Aires, Argentina.
- 2002 Director, Organizer and Lecturer**, Pan-American Advanced Study Institute on "Science and Technology of Ferroelectric Thin Films", Rosario, Argentina.
- 1996 Lecturer**, Short Course on Epitaxial Metal Oxide Films and Heterostructures, Materials Research Society Fall Symposium, Boston, USA.
- 1995 Lecturer**, Short Course on Epitaxial Metal Oxide Films and Heterostructures, Materials Research Society Fall Symposium, Boston, USA.
- 1994 Director, and Lecturer**, NATO Advanced Research Workshop on "Science and Technology of Electroceramic Thin Films," Villa del Mare, Italy.
- 1992 Director, and Lecturer**, NATO Advanced Study Institute on "Multicomponent and Multilayered Thin Films for Advanced Microtechnologies: Techniques, Fundamentals, and Devices," Bad Widsheim, Germany.

### **ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)** **Conference Organization (Continuation)**

- 1988 Director, and Lecturer**, NATO Advanced Study Institute on "Plasma-Surface Interaction and Processing of Materials," Alicante, Spain.
- 1985 Lecturer**, NATO Advanced Study Institute on "Theory and Application of Ion Bombardment-Induced Erosion and Topography Evolution of Materials," Crete, Greece.
- 2016 Session Chair, New diamond and Nnoacarbon Conference, Xi'An, China**, May 22-26, 2016.
- 2015 Session Chair, Joint International Symposium on Integrated Functionalities- International Symposium on Applications of Ferroelectrics and Piezoresponse Force Microscopy Conference**, Singapore, May 24-27, 2015.
- 2014 Session Chair**, ISIF 2014, April 2014.
- 2013 Plenary Session Chair**, SBPMat-Brazil.  
**Symposium (Innovation and Technology Transfer) Co-Chair**, SBPMat-Brazil.  
**Plenary Session Chair**, International Symposium on Integrated Functionalities.  
**Session Chair**, New Diamond Nanocarbon Conference 2013. Singapore.
- 2012 Session Chair**, Symposium AAA: "The Business of Nanotechnology", Materials Research Society Fall Meeting, Boston, USA.  
**Plenary Session Chair**, International Materials Research Congress, Cancun-Mexico.  
**Plenary Session Chair**, International Symposium on Integrated Functionalities, Hong Kong.  
**Plenary Session Chair, 21th New Diamond and Nanocarbon International Conference**, San Juan-Puerto Rico.
- 2011 Plenary Session Chair**, "Workshop on Technologies for Future Micro/Nano Manufacturing", Napa Valley, CA.  
**Session Chair**, International Symposium on Integrated Functionalities, Cambridge, UK.
- 2010 Session Chair**, 1st International Symposium on Integrated Functionalities", San Juan, Puerto Rico.  
**Session Chair**, MRS Spring 2011 Symposium "New Functional Materials and Emerging Device Architectures for Non-volatile Memories, San Francisco, USA.
- 2009 Plenary Session Chair**, 21<sup>th</sup> International Symposium on Integrated Ferroelectrics", Colorado Springs, Colorado, USA.  
**Organizer/Chair Diamond Commercialization Session**, 3<sup>th</sup> New Diamond Nanocarbon International Conference, Traverse City, Michigan, USA.
- 2008 Session Chair**, 20<sup>th</sup> International Symposium on Integrated Ferroelectrics", Singapore.  
**Session Chair**, 2<sup>th</sup> New Diamond Nanocarbon International Conference, Taipei, Taiwan.  
**Session Chair**, 2<sup>th</sup> Materials Research Society (USA) Symposium on Materials Science and Technology for Non-Volatile Memories, San Francisco, USA.
- 2007 Session Chair**, Conference on Nanoscience and Nanotechnology for Biological/Biomedical/Chemical Sensing, Hong Kong, China.  
**Session Chair**, 19<sup>th</sup> International Symposium on Integrated Ferroelectrics", Bordeaux, France.

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**Conference Organization (Continuation)**

- 2006** **Session Chair**, Workshop on “Telemedicine for the Future Battlefield”, Alexandria, VA, USA.  
**Session Chair**, 15<sup>th</sup> International Symposium on Integrated Ferroelectrics, Oahu, Hawaii, USA  
**Session Chair**, MRS Symposium on “Science and Technology of Nonvolatile Memories”, San Francisco, CA, USA.
- 2005** **Session Chair**, Advanced Diamond Conference/Nanocarbon 2005, Argonne,  
**Session Chair**, 17<sup>th</sup> International Symposium on Integrated Ferroelectrics, Shanghai, China.
- 2004** **Session Chair**, MRS Spring Meeting: “High-k Dielectric Session”, San Francisco, CA.  
**Session Chair**, 16<sup>th</sup> International Symposium on Integrated Ferroelectrics.
- 2003** **Session Chair and Panelist**, Nanotechnology Session: NanoEngineering World Forum, Marborough, MS.  
**Session Chair and Panelist**, Nano-Biosensors and Nanotechnology Sensors Session, Nanosensors Conference, Chicago, IL.  
**Session Chairman**, 15<sup>th</sup> International Symposium on Integrated Ferroelectrics, Colorado Spring, CO.
- 2002** **Session Chairman**, MRS Fall 02 Meeting: Symposium "Surface Engineering for MEMS", Boston, USA.  
**Session Chairman**, 14<sup>th</sup> International Symposium on Integrated Ferroelectrics, Nara, Japan.  
**Symposium Chairman**, “Materials for MEMS”, International Conference on Metallurgical Coatings and Thin Films”, San Diego, CA, USA.
- 2001** **Symposium Chairman**, “Materials for MEMS”, International Conference on Metallurgical Coatings and Thin Films”, San Diego, CA, USA.  
**Tutorial Chairman**, 13<sup>th</sup> International Symposium on Integrated Ferroelectrics.
- 2000** **Session Chairman**, Symposium L, Materials Research Society Spring Meeting: “Recent Developments in Oxide and Metal Epitaxy-Theory and Experiment”  
**Session Chairman**, International Symposium on Integrated Ferroelectrics: “Novel Characterization Techniques”.
- 1999** **Session Chairman**, 11<sup>th</sup> International Symposium on Integrated Ferroelectrics, Colorado Springs, CO.
- 1998** **Session Chairman**, 11<sup>th</sup> International Vacuum Microelectronics Conference, Asheville, NC.

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**Conference Organization (Continuation)**

- 1997** **Session Chairman**, 9th International Symposium on Integrated Ferroelectrics, Santa Fe, New Mexico, USA.  
**Session Chairman**, 9th International Meeting on Ferroelectrics, Seoul, Korea.  
**Session Chairman**, 6<sup>th</sup> MRS Symposium on Ferroelectric Thin Films, Boston, MS.
- 1996** **Session Chairman**, 8th International Symposium on Integrated Ferroelectrics, Tempe, Arizona, USA.
- 1995** **Session Chairman**, 7th International Symposium on Integrated Ferroelectrics, Colorado Springs, USA.
- 1994** **Session Chairman**, 6th International Symposium on Integrated Ferroelectrics, Monterey, CA, USA.  
**Session Chairman**, MRS Fall Symposium "Ferroelectric Thin Films IV," Boston, USA.  
**Session Chairman**, NATO Advanced Research Workshop, Villa del Mare, Italy.  
**Session Chairman**, MRS Symposium "Thin Film Oxide Heterostructures," San Francisco, CA, USA.  
**Session Chairman**, Workshop on Ferroelectric Thin Films, Stockholm, Sweden.
- 1993** **Session Chairman**, 9th International Conference on Thin Films, Vienna, Austria.
- 1992** **Session Chairman**, 4th International Symposium on Integrated Ferroelectrics, Monterey, CA, USA.  
**Session Chairman**, 7th Latin-American Symposium on Surface Science and 1st Ibero-American Conference in Vacuum and Surface Science, Bariloche, Argentina.
- 1992** **Session Chairman**, NATO Advanced Study Institute on "Multicomponent and Multilayered Thin Films for Advanced Microtechnologies," Bad Windsheim, Germany.
- 1991** **Session Chairman**, Symposium on Ferroelectric Thin Films, Materials Research Society Fall Meeting, Boston, MA, USA.  
**Session Chairman**, Symposium on Advanced Materials Processing, MRS-NC Chapter, Research Triangle Park, NC, USA.
- 1990** **Symposium Chairman**, International Conference on Coatings and Thin Films, San Diego, CA, USA.  
**Symposium Chairman**, International Conference on Materials and Manufacturing Processes, Paris, France.

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**Conference Organization (Continuation)**

- 1989** **Session Chairman**, 12th "W. Brandt" Workshop on Penetration of Particles in

Matter, San Sebastian, Spain.

**1988 Session Chairman**, NATO/ASI "Plasma-Surface Interaction and Processing of Materials," Alicante, Spain.

**Session Chairman**, MRS-NC Chapter on Processing of Advanced Materials, Research Triangle Park, NC, USA.

**1987 Session Chairman**, 11th International Workshop on Particle Penetration in Solids, Alicante, Spain.

**Chairman**, SEM International Conference, Hamilton, Canada.

**Chairman**, MRS-NC Chapter, Spring Meeting on "Plasma-Surface Interaction and Processing of Materials, Research Triangle Park, NC, USA.

**Chairman**, MRS-NR Section Fall Meeting--Processing of Advanced Materials, Research Triangle Park, NC, USA.

**1986 Session Chairman**, Workshop on Plasma Modification of Surfaces, Princeton, NJ, USA.

**Session Chairman**, 7th International Conference on Plasma-Surface Interaction in Controlled Fusion Devices, Princeton, NJ, USA.

## **ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**

### **Invited Speaker at Conferences**

**2017 Plenary Speaker**, 6<sup>th</sup> Congreso de Ingeniería, Ciencias y Tecnología, Universidad Tecnológica de Panamá, Ciudad de Panamá, Panamá, Octubre 11-13, 2017.

- Invited Speaker**, 14<sup>th</sup> IMF 2017, San Antonio, September 4-8, 2017.
- Plenary Speaker**, Internaitonal Materials Research Congress, Cancun-México, August 20-25, 2017.
- Plenary Speaker**, Diamond and Carbon Materials and Graphene and Semiconductors, July 17-18, 2017 Chicago, USA.
- Plenary Speaker**, 2<sup>nd</sup> Annual Conference and Expo on Biomaterials, March 27-28, 2017 Madrid, Spain.
- Plenary Speaker**, ICARBM-2017, Pune, India, March 8-10, 2017
- 2016** **Plenary Speaker**, Symposium on Multifunctional Materials, University of Texas at San Antonio, December 5, 2016.
- Keynote Speaker**, Lithium Battery Power, Advances in Chemistry, Materials and Modeling, November 1-2, 2016.
- Keynote Speaker**, Biomedical Engineering Society (BMES) Annual Meeting, Minneapolis, MN, October 5-8, 2016.
- Invited Panelist**, “Transfer Science form the Laboratory to the Market”, Small Business Leadership Conference, June 7, 2016.
- Invited Speaker**, New Diamond and Nanocarbon (NDNC)-2016 International Conference, Xi’an, China. May 22-26, 2016.
- Invit Invited Speaker**, MRS Spring Meeting, March 28-April 1, 2016.
- Invited Speaker**, MRS Spring Meeting, March 28-April 1, 2016.
- 2015** **Invited Speaker, Materials Day Workshop**, Univ. of Texas-San Antonio, August 2015.
- Lecturer, ISAF-ISIF-PFM International Conference**, May 24-25, 2015.
- Invited Speaker, ISAF-ISIF-PFM International Conference**, May 24-25, 2015.
- Invited Talk**, ICMCTF, Symposium D: Coatings for Biomedical and Healthcare Applications, April 20-24, 2015.
- Keynote Speaker, ENM**, Orlando, Florida, USA, January 26, 2015
- 2014** **Invited talk**, NANO 2014, CINVESTAV, Mexico City, Mexico, November 6-7, 2014
- Invited Talk**, AVS Texas Chapter meeting, UTD, August 6, 2014.
- Keynote Speaker**, 21st International Symposium on Metastable, Amorphous and Nanostructured Materials (ISMANAM 2014), June 29-July 4, 2014.
- Invited talk**, Nanotechnology Symposium, CINVESTAV, Saltillo, Mexico, June 15, 2014
- Invited Talk**, New Diamond and Nanocarbon Conference, Chicago, May 25-29, 2014.
- Keynote Speaker**, Energy Summit 2014 “Powering the Internet of Things”, UTD, Richardson, TX, January 27, 2014.

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**Invited Speaker at Conferences (Continuation)**

- 2013 Invited Talk**, Symposium Symposium K: Micro- and Nanoscale Processing of Materials for Biomedical Devices, MRS Fall Meeting, December 3, 2013.  
**VIP Plenary Speaker and Panelist in Innovation and Technology Transfer Session**, NANO-Monterrey-Mexico, November 5, 2013,  
**Invited Speaker**, 60<sup>th</sup> American Vacuum Society National Meeting, Long Beach, October 29, 2013.  
**Plenary Speaker**, IEEE NMDC International Conference, Taiwan, October 8, 2013.  
**Tutorial Lecturer**, Symposium on Innovation and Technology Transfer, SBPMat-Brazil, September 30, 2013.  
**Plenary Talk**, IUMRS-ICAM International Conference, Qingdao, China, September 23-28, 2013.  
**Keynote Talk**, PRICM8, Kano, Hawaii, USA, August 2-7, 2013.  
**Tutorial Lecturer**, International Symposium on Integrated Functionalities, Dallas, TX, USA, July 28 – August 3, 2013.
- 2012 Invited Talk**, Workshop of the Society of Hispanic Professional Engineers, University of California-Riverside, CA, November 16-17, 2012.  
**Invited talk**, International Materials Research Congress, Symposium on Diamond and Nanocarbon Materials, Cancun-Mexico, August 12-16, 2012.  
**Invited Talk**, New Diamond and Nanocarbon Conference, San Juan, Puerto Rico, May 20-24, 2012.  
**Invited Talk**, Advanced Research Workshop: Multiferroic and Multifunctional Materials: MMM-2012, Natal, Brazil, April 16-20, 2012.  
**Tutorial Talk**, at Advanced Research Workshop: Multiferroic and Multifunctional Materials: MMM-2012, Natal, Brazil, April 16-20, 2012  
**Invited Talk**, 2nd Workshop in Micro and Nanotechnology, Hermosillo, Mexico, February 2-3, 2012.
- 2011 Keynote Talk**, “Science and Technology of Ultrananocrystalline Diamond Thin Films for Biomedical Implants”, ECI Conference on Carbon-Based Nano-Materials and Devices, Suzhou City, China, October 17-21, 2011.  
**Invited Talk**, “Science and Technology of Ultrananocrystalline Diamond Thin Films for Biomedical Implants”, International Symposium on Integrated Functionalities, Cambridge, United Kingdom, August 31- September 4, 2011.  
**Plenary Talk**, “Science and Technology of Multifunctional Thin Films for Devices for Sustainable Energy”, Workshop on New Materials for Sustainable Energy, Stephenson Institute for Renewable Energy, Liverpool, UK, February 25-26, 2011.

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**Invited Speaker at Conferences (Continuation)**

- 2010 Plenary Talk**, “Science and Technology of Multifunctional Thin Films and Application to Multifunctional Micro and Nano Devices”, 2010 International Workshop on Nanomaterials and Nanodevices, Beijing, China, July 1-3, 2010.
- Plenary Talk**, “Science and Technology of Multifunctional Thin Films and Application to Multifunctional Micro and Nanodevices”, 2010 International Workshop on Nanomaterials and Nanodevices, Guiyang, China, July 4-6, 2010.
- Keynote Talk**, “Science and Technology of Ultrananocrystalline Diamond Films for Application to Multifunctional Micro and Nanodevices “, 4<sup>th</sup> International Conference on New Diamond and Nanocarbons, May 16-20, 2010, Suzho, China.
- Invited Speaker**, Taiwan-Argonne Workshop on Nano-structured Materials, National Cheng Kung University, Tainan, Taiwan, February 1-2, 2010
- Invited Speaker**, SPIE 2010 conference on Micro- and Nanotechnology Sensors, Systems, and Applications Conference at Orlando, FL, April 2010.
- 2009 Plenary Speaker**, 20th Anniversary Conference, Athens, Greece, September 6-10, 2009.
- Lecture**, “Science and Technology of Ultrananocrystalline Diamond Films for Biomedical Devices”, Hospital Austral-Pilar, Buenos Aires, Argentina, August 3-10, 2009.
- Lecture**, “First Argentine School of Nanotechnology and Regenerative Medicine, Universidad Nacional de la Plata, La Plata, Buenos Aires, Argentina, July 14-17, 2009.
- Plenary Speaker**, New Diamond and Nanocarbon Conference, Traverse City, Michigan, June 7-11, 2009.
- 2009 Invited Speaker**, SPIE Defense Security & Sensing 2009, Orlando, FL, April 13, 2009.
- Invited Speaker**, US-Argentina Workshop on Nanomaterials, Bariloche, Argentina, March 15-17, 2009.
- Invited Speaker**, Military Health Support Systems, Vienna, VA, March 11, 2009.
- Invited Speaker**, Lockheed Martin Special Symposia, Nanotech Conf. and Expo 2009, Houston, TX, May 3-7, 2009.
- 2008 Invited Speaker**, Military Health Support Systems Conference: Providing Military Health Through Technology and Advancing Protocols, Washington DC, October 1-3, 2008.
- Invited Lecturer**: International Center for Materials Physics, Shenyang, China, July 10-11, 2008.
- Invited Speaker**: the 20<sup>th</sup> International Symposium on Integrated Ferroelectrics, Singapore, June 9-12, 2008
- Invited Speaker**: New Diamond and Nano Carbon Conference, Taipei, Taiwan, May 26-29, 2008.
- Invited Speaker**: International SPIE Defense + Security, Orlando, Florida, 16-20 March 2008.

## **ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**

### **Invited Speaker at Conferences (Continuation)**



- 2007 Special Lecture:** Receiving ‘Doctor Honoris Causa’ at Universidad Nacional de Córdoba, Córdoba, Argentina, November 5, 2007  
**Invited Speaker:** International Microwave Symposium: Novel Materials for RF MEMS, Honolulu, Hawaii, June 3-8, 2007  
**Invited Speaker:** 19th International Symposium on Integrated Ferroelectrics May 8-11, 2007 in Bordeaux, France
- 2006 Invited Speaker,** “First International Symposium on Transparent Oxides”, Crete Greece, October 23-25, 2006.  
**Invited Speaker,** Workshop on “Telemedicine for the Future Battlefield”, Alexandria, VA.
- 2005 Keynote Speaker,** Medical Device R&D Summit, Jacksonville, Florida, Dec. 4-6, 2005.  
**Invited Speaker,** Novel Applications of Surface Modifications, Chester, United Kingdom, September 18-21, 2005.  
**Invited Speaker,** Diamond 2005, Toulouse, France, September 11-16, 2005.  
**Invited Speaker,** 11<sup>th</sup> International Meeting on Ferroelectricity, Foz do Iguzu, Brazil, September 5-9, 2005.
- 2005 Invited Speaker,** 230<sup>th</sup> American Chemical Society Meeting, DC, Aug.28-Sept. 1, 2005.  
**Invited Speaker,** 8<sup>th</sup> US National Congress on Computational Mechanics: Symposium on Thin Film and Small Mechanical Behavior, Austin, TX, July 24-28, 2005.  
**Invited Speaker,** International Meeting on Materials, Cancun, Mexico, August 21-25, 2005 Symposium on “Thin Films and Small Scale Mechanical Behavior”, Austin, Texas, July 25-29, 2005.  
**Invited Speaker,** West Virginia University Workshop on Multifunctional Material Stoichiometry, Jackson Hole, Wyoming, July 17- 21, 2005  
**Invited Lecture,** Tamkang University, Tamsui, Taiwan, June 29, 2005.
- 2005 Invited Lecture,** Workshop for the Development and Application of  
**Invited Speaker,** Ultrananocrystalline Diamond (UNCD) Tamkang University, Tamsui, Taiwan, June 29, 2005.  
**Invited Speaker,** Army Research Workshop Advanced Active Thin Film Materials for The Next Generation of Micro Scale Army Applications, May 10-12, 2005.  
**Invited Speaker,** 10<sup>th</sup> International Conference on New Diamond Science and Technology, Tsukuba, Japan, May 10-13, 2005.  
**Invited Speaker,** 15<sup>th</sup> International Symposium on Integrated Ferroelectrics Shanghai, China, April 17-20, 2005.  
**Invited Speaker** 15<sup>th</sup> International Symposium on Integrated Ferroelectrics Shanghai, China, April 17-20, 2005.  
**Invited Speaker,** American Ceramic Society Meeting, Baltimore, MD, April 11-15, 2005,  
**Invited Speaker,** Bio-Medical Nanoscience Integrated Research Team Meeting, Feb 9-11, 2005.

## **ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**

### **Invited Speaker at Conferences (Continuation)**

- 2004** **Invited Speaker**, Materials Research Society, Fall Meeting, November 30-December 3.  
**Invited Speaker**; Intern. Confer. on Materials, Cancún, Mexico, August, 20-25, 2004.  
**Invited Lecturer**, Pan American Advanced Study Institute, Bariloche, Argentina, June 22-30, 2004.  
**Invited Speaker**; Internat. Conf. on Atomic Collision with Solids, Italy, July 14-19, 2004.  
**Invited Lecturer**, International Workshop on "Frontiers in Materials Research", Centro InterAmericano de Materiales (CIAM)-CONICYT, Viña del Mar, Chile, April 26-29.  
**Invited Speaker**, MRS Spring Meeting, San Francisco, USA, April 12-16.  
**Invited Speaker**, International Symposium on Integrated Ferroelectrics, Gyeongkiu, Korea, April 5-8, 2004.  
**Invited Speaker**. 9<sup>th</sup> national Conference of New Diamond Science and Technology, Tokyo, Japan, March 26-29, 2004.  
**Invited Speaker**, University of Aarhus, 2<sup>nd</sup> Annual Workshop, of the Nanotechnology Center, Denmark, January 22, 2004.
- 2003** **Invited Speaker**, International Meeting on Nanomaterials, Tokyo Institute of Technology, Tokyo, Japan, November 21, 2003.  
**Invited Speaker**, 5th Motorola Workshop on Computational Materials and Electronics, Motorola University, Austin, TX, USA, November 13-14, 2003.  
**Invited Speaker**, Micoelectromechanical Systems (MEMS) Symposium: International Union of Materials Research Societies-International Conference in Asia, Singapore.  
**Invited Speaker**, Central and LatinAmerican Conference on Surfaces (CLACSA), Valparaiso, Chile.  
**Invited Speaker**, Tokyo Institute Technology, Workshop on Nanotechnology of Advanced Materials, Tokyo, Japan.  
**Invited Speaker**, 10<sup>th</sup> Bio-Medical International Conference, Chicago, IL.  
**Invited Speaker**, 10<sup>th</sup> European Meeting on Ferroelectricity 2003, Cambridge, UK.
- 2003** **Invited Speaker**, Symposium on Synchrotron X-ray Research in Materials Science: XII International Conference on Materials, Cancún, Mexico.  
**Invited Speaker and Panelist**, Nanotechnology Session: NanoEngineering World Forum, Marborough, MS.  
**Invited Speaker and Panelist**, Nano-Biosensors and Nanotechnology Sensors Session, Nanosensors Conference, Chicago, IL.  
**Invited Speaker**, 15<sup>th</sup> International Symposium on Integrated Ferroelectrics, Colorado Springs, CO.

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**  
**Invited Speaker at Conferences (Continuation)**

- 2002 Invited Speaker**, MRS Fall Meeting Symposium on “Surface Engineering”  
**Plenary Speaker**, Annual Meeting of the Argentinian Physical Society, Cordoba, Argentina.  
**Invited Speaker**, International Conference on Materials, Cancun, Mexico.  
**Invited Speaker**, European Materials Research Society Spring Meeting, Symposium on Advanced Materials for Microelectronics Ferroelectrics and Low-K Materials, Strasbourg, France.  
**Invited Speaker**, International Union of Materials Research Societies Meeting, Electronic Materials, Xia, China.  
**Invited Speaker**, International Symposium on the Applications of Ferroelectrics 2002 and 14<sup>th</sup> International Symposium on Integrated Ferroelectrics, Nara, Japan.  
**Invited Speaker**, Society of Tribology and Engineering Symposium, Houston, USA.
- 2001 Invited Speaker**, 1<sup>st</sup> International Workshop of Ferroelectric Memories”, Tokyo, Japan.  
**Invited Speaker**, 3<sup>rd</sup> International Symposium on Tribology, Beijing, China.  
**Invited Speaker**, 2<sup>nd</sup> International MEMS Workshop, Singapore.  
**Invited Speaker**, National Symposium of the Argentinian Physical Society, Rosario, Argentina.
- 2000 Plenary Speaker**, SPIE's 2000 Symposium on Smart Materials and MEMS, Melbourne, Australia.  
13<sup>th</sup> International Vacuum Microelectronics Conference, Guangzhou, China.  
Workshop on Hard Coatings, San Jose, Costa Rica.  
12<sup>th</sup> International Symposium on Integrated Ferroelectrics, Aachen, Germany.  
International Conference on Metallurgical Coatings and Thin Films, San Diego, CA.  
Materials Research Society-Spring Meeting, San Francisco, CA.
- 1999 Plenary Speaker**, 11<sup>th</sup> International Symposium on Integrated Ferroelectrics, Colorado Springs, CO.  
Materials Research Society Spring Meeting, San Francisco, CA.  
International Conference on Coatings and Thin Films, San Diego, CA.  
19<sup>th</sup> Werner Brandt Workshop on “Ion Interaction with Solids”, Bariloche, Argentina.  
American Ceramic Society National Symposium, Indianapolis, IN.  
12<sup>th</sup> International Vacuum Microelectronics Conference, Darmstadt, Germany.
- 1999 Invited Speaker**, 2<sup>nd</sup> International Workshop on Vacuum Microelectronics, Wroclaw, Poland.  
**Invited Speaker**, International Workshop on Ferroelectrics, Guanica, Puerto Rico.  
**Invited Speaker**, International Workshop on “Superlattices and Microstructures”, Cancun, Mexico.  
**Invited Speaker**, International Conference on Ion-Surface Interactions, Moscow, Russia.

## **ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**

### **Invited Speaker at Conferences (Continuation)**

- 1998 Invited Speaker**, Advanced Studies Institute on Exploration of Subsurface Phenomena, by Particle Scattering, Monterey, CA,  
**Invited Speaker**, 10<sup>th</sup> International Symposium on Integrated Ferroelectrics, Monterey, CA.  
**Invited Speaker**, COST 514 “Ferroelectric Thin Films”, Ljubiana, Czechoslovakia.  
**Invited Speaker**, 11<sup>th</sup> International Vacuum Microelectronics Conference, Asheville, NC.  
**Invited Speaker**, International Summer School on “Electron Emission from Diamond Thin Films, Asheville, NC.
- 1997 Invited Speaker**, 9th International Meeting on Ferroelectrics, Seoul, South Korea.  
**Invited Speaker**, Materials Research Society Symposium on "In Situ Process  
**Invited Speaker**, Diagnostics and Intelligent Materials Processing, " Boston, USA.
- 1996 Invited Speaker**, 3rd International Conference on Defect in Insulating Materials, Wake Forest, USA.  
**Invited Speaker**, 8th International Symposium on Integrated Ferroelectrics, Tempe, Arizona, USA.  
**Invited Speaker**, Materials Research Society, North Carolina Chapter, Research Triangle Park, USA.
- 1995 Invited Speaker**, 7th International Symposium on Integrated Ferroelectrics, Colorado Springs, USA.
- 1994 Invited Speaker**, Materials Research Society Fall Symposium "Ferroelectric Thin Films IV," Boston, USA.  
**Invited Speaker**, International Workshop on Ferroelectric Thin Films, Stockholm, Sweden.  
**Invited Speaker**, Materials Research Society Spring Symposium "Synthesis and Characterization of Oxide Thin Films," San Francisco, USA.  
**Invited Speaker**, 6th International Symposium on Integrated Ferroelectrics, Monterey, USA.
- 1993** XI National Conference on Ion Interaction with Surfaces, Moscow, Russia.
- 1992 Key-Note Speaker**, Iberoamerican Congress on Science and Technology, Buenos Aires, Argentina.  
**Invited Speaker**, 7th Latin-American Symposium on Surface Science and 1st Iberoamerican Congress on Surface Science and Applications, Bariloche, Argentina.  
**Invited Speaker**, IEEE International Symposium on the Application of Ferroelectrics, Greenville, South Carolina, USA.  
**Invited Speaker**, Anniversary Symposium of the Royal Academy of Sciences and Letters, Copenhagen, Denmark.

**ACADEMIC AND PROFESSIONAL HONORS AND ACTIVITIES (Continuation)**

**Invited Speaker at Conferences (Continuation)**

- 1991 Invited Speaker**, Materials Research Society Symposium, N.C. Chapter, Current Topics in Materials Science, Research Triangle Park, USA.  
**Invited Speaker**, Gordon Conference on Instrumentation in Physics Research, Howard and Smith  
**Invited Speaker**, Colleges, Geneva, USA.
- 1990 Invited Speaker**, International Conference on Materials and Manufacturing Processes, Paris, France.  
**Invited Speaker**, National Symposium on Coatings and Thin Films, Vilnius, Lithuania, USSR  
**Invited Speaker**, International Workshop on Thin Films, Vienna, Austria.
- 1989 Invited Speaker**, 12th W. Brandt Workshop on Penetration of Charged Particles in Matter, San Sebastian, Spain.  
**Invited Speaker**, SEM International Conference, Salt Lake City, USA.
- 1988 Invited Speaker**, 3rd Symposium on Surface Science, Vienna, Austria.
- 1987 Invited Speaker**, 11th International Workshop on Particle Penetration in Solids, Alicante, Spain.  
**Invited Speaker**, SEM International Conference, Hamilton, Canada.
- 1986 Invited Speaker**, Workshop on "Plasma Modification of Surfaces," Princeton, USA.  
**Invited Speaker**, International Conference on Quantitative Surface Analysis Techniques and Applications, London, England.
- 1985 Invited Speaker**, American Society of Metals Meeting, Toronto, Canada.
- 1984 Invited Speaker**, Workshop on Synergistic Effects in Surface Phenomena Related to Plasma-Wall Interactions, Nagoya, Japan. Canadian Seminar on Surfaces, Montreal, Canada.

## PUBLICATIONS

## **Patents (23 as of 2017)**

“Material for Medical Use Comprising Nanoparticles with Super-Paramagnetic Properties and its Utilization in Surgery”, R. Zysler, A. Berra, P. Gurman, **O. Auciello**, M.J. Saravia, US Patent # 9,427,354 (8/30/2016).

“Material for Medical Use Comprising Nanoparticles with Super-Paramagnetic Properties and its Utilization in Surgery”, R. Zysler, A. Berra, P. Gurman, **O. Auciello**, M.J. Saravia, Japan Patent # 5,954,797 (2016).

“Nanocrystalline-Diamond/Carbon and Nanocrystalline-Diamond/Silicon Composite Electrodes for Li-Based Batteries”, O Auciello, Y. Tzeng, C-P. Liu, C-K. Lin, Y-W Cheng, US Patent # 9,196,905 (2015).

“Electrostatic MEMS Devices with High Reliability”, C.L. Goldsmith, O. Auciello, A.V. Sumant, D.C. Mancini, C. Gudeman, S. Sampath, J.A. Carlisle, R.W. Carpick, J. Hwang, US Patent # 8,963,659 (2/24/2015).

“Method for Making Particle/Polymer Composites and Applications to Biomedical Devices”, **O. Auciello** (ANL), P. Gurman (ANL), and A. Berra (University of Buenos Aires, Argentina) US Patent #8,834,757 B2. (2014)

“RF-MEMS Capacitive Switches with High Reliability” C. L. Goldsmith, **O. Auciello**, J. A. Carlisle, S. Sampath, A.V. Sumant, R. W. Carpick, J. Hwang, D. C. Mancini, and C. Gudeman, United States Patent No. 8,525,185 (2013).

“Ultrananocrystalline Diamond (UNCD) Films with Optimized Dielectric Properties for Advanced RF MEMS Capacitive Switches”, A. Sumant, **O. Auciello**, and D. Mancini, US Patent # 8,354,290 (1/15/2013).

“Multi-Layer Micro/Nanofluid Devices with Bio-Nanovalves”, Li, L. Ocola, M. Firestone, **O. Auciello**, US Patent # 8,343,425 (1/1/2013).

“Integration of Dissimilar Materials for Advanced Multifunctional Devices”, **O. Auciello**, J.A. Carlisle, J. Gerbi, and J. Birrell, US Patent # 7,791,201 (9/7/2010).

“Layered Cu-based Electrode for High-Dielectric Constant Oxide Thin Film-Based Devices”, **O. Auciello**, US Patent # 7,714, 405 (2010).

“Piezoelectrically Actuated Ultrananocrystalline Diamond Tip Array Integrated with Ferroelectric or Phase Change Media for High-Density Memory”, **O. Auciello**, US Patent # 7,602,105 (2009).

“A Method to Grow Pure Nanocrystalline Diamond Films at Low Temperatures and High Deposition Rates”, J.A. Carlisle, D.M. Gruen, **O. Auciello**, and X. Xiao, US Patent # 7,556,982 (2009).

## **PUBLICATIONS (Continuation)**

## **Patents (Continuation)**

“Use of Tungsten Interlayer to Enhance the Initial Nucleation and Conformality of Ultrananocrystalline Diamond (UNCD) Thin Films”, Nevin Naguib, James Birrell, Jeffrey Elam, John Carlisle, Orlando Auciello, US Patent ABANDONED BY ANL AND ADT, Nov 08, 2007.

“A Method to Grow Carbon Thin Films Consisting Entirely of Diamond Grains 3-5 nm in Size and High-Energy Grain Boundaries”, N. Naguib, J. Birrell, J. Elam, J.A. Carlisle, **O. Auciello**, US Patent #7,128,8893 (2006).

“Patterning of Nanocrystalline Diamond Films for Diamond Microstructures Useful in MEMS and Other Devices”, D.M. Gruen, H.G. Busmann, E.M. Meyer, A.R. Krauss, and **O. Auciello**, US patent # 6,811,612 B2 (11/2/2004).

“N-Type Doping of NCD Films with Nitrogen and Electrodes Made There from” D.M. Gruen, A.R. Krauss, O. Auciello, J.A. Carlisle, US patent #6,793,849 B1 (2004).

“High-Dielectric Constant Alloy Oxide for New Generation of Integrated Circuit Gate Oxide and Magnetic Multilayer Memories”, **O. Auciello**, US patent (filed January 27, 2003).

“Field Emission from Bias—Grown Diamond Thin Films in a Microwave Plasma”, D.M. Gruen, A.R. Krauss, M.Q. Ding, and **O. Auciello**, US patent # 6,447,851(2002).

“Ultrananocrystalline Diamond Cantilever Wide Dynamic Range Acceleration /Vibration/Pressure Sensor”, A.R. Krauss, D.E. Gruen, M.J. Pellin, and **O. Auciello**, US patent # 6,422,077 (2002).

"Enhanced Electron Emission from Microtip Structures Displays," **O. Auciello**, A.R. Krauss, D.E. Gruen (Argonne National Laboratory) and G.E. McGuire (MCNC), US patent # 5,886,459 (1998).

"Hybrid Metal / Metal-Oxide Electrodes for Ferroelectric Memories," A.I. Kingon, **O. Auciello**, H.N. Al-Shareef, D.J. Lichtenwalner, and R. Dat, US Patent #5,555,486; (1996).

"A New Flat Panel Display Based on Ferroelectric Cathodes," **O. Auciello** and G.E. McGuire, MCNC, US Patent 5,453,661(1995).

"An Automated Dual Ion or Laser Beam Sputter- or Ablation-Deposition System for Production of Multicomponent and Layered Films," **O. Auciello**, and A. R. Krauss, US Patent 4,923,585 (1990).

## **PUBLICATIONS (Continuation)**

## **Patent Disclosures (22 as of 2017)**

“Novel Ultrananocrystalline Diamond Probes for High-Resolution Low Wear Nanolithography Techniques” A.V. Sumant, R.W. Carpick, J.A. Carlisle, and **O. Auciello**, Application, June 29, 2005.

“Synthesis of a Self Assembled Hybrid of Ultrananocrystalline Diamond and Carbon Nanotubes”, X. Xiao, J.A. Carlisle, **O. Auciello**, J. W. Elam, and D.M. Gruen, Applications Serial # 60/578,532, June 19, 2004.

“Ultrananocrystalline Diamond/Metal or Metal-Oxide Composite electrodes for Multifunctional Devices”, **O. Auciello**, J.A. Carlisle, J. Wang, and X. Xiao, submitted on May 20, 2004.

“Oxygen Diffusion Barrier for Integration of Oxide Thin Films with Copper Layers for Oxide Film-Based Devices”, **O. Auciello**, disclosed on March 2003.

“High-Efficiency Detection of High Mass Particles by Coating Emissive Detectors”, **O. Auciello**, J.A. Carlisle, C.H. Chen, J. Moore, M. Pellin, and X. Xiao, December 4, 2003.

“Microwave Plasma Systems with Automated Process Control for Synthesis of Carbon-Based Coatings on Large Area Substrates for Multiple Applications”, **O. Auciello**, and J.A. Carlisle, disclosure submitted on June 11, 2003.

“Robust Ultrananocrystalline Diamond Electrodes for Fuel Cells”, **O. Auciello**, J.A. Carlisle (ANL-MSD), J.V. Mantese (Delphi), disclosure submitted June 11, 2003.

“Seeding and Growth Process for Production of Diamond Films”, **O. Auciello**, J.A. Carlisle, and J. Birrell, disclosure submitted June 11, 2003.

“A Method to Grow Stress-Free Phase Pure Nanocrystalline Diamond Films at Low Temperature”, J.A. Carlisle, D.M. Gruen, **O. Auciello**, and X. Xiao, August 21, 2002.

“Seeding and/or Growth Process for Production of Diamond Films”, **O. Auciello** and J.A. Carlisle, November 2, 2002.

“Diamond Thin Film Transistor (DTFT) Concept and Fabrication Process”, **O. Auciello** and A. Sumant, August 30, 2002.

“Ultrananocrystalline Diamond (UNCD)-Based Bio-Sensors”, **O. Auciello**, J.A. Carlisle, and D.M. Gruen, May 10, 2002.

“Nanocrystalline Diamond Transistor”, **O. Auciello**, Argonne National Laboratory, patent disclosure submitted August 20, 2000.

"Integration of Low-work Function Alloy Coatings with Novel Edge Emitter Structure for Emissive Flat Panel Displays," **O. Auciello**, A.R. Krauss, and D.M. Gruen, 1997.

## **PUBLICATIONS (Continuation)**



### **Patent Disclosures (Continuation)**

"New Flat Panel Display and Blue Light Emitting Device Technologies Based on Field Emitter-Induced Ultra Violet Radiation Excitation," R. Baragiola (Univ. of Virginia) and **O. Auciello** (MCNC), 1995.

"A Method for Conversion of Pulsating Cold Cathodes into CW Cathodes with Enhanced Emission and Fabrication of Continuous Cathodes with Enhanced Emission," **O. Auciello** (MCNC), 1995.

"Selective Deposition of Diamond Thin Films on Field Emitter Tips and Other Localized Areas for Application to Flat Panel Displays," **O. Auciello** (MCNC, USA), R. Spitzl, and J. Engemann (University of Wuppertal, Wuppertal, Germany), 1994.

"Nanometer-Scale Selective Deposition of Single and Multicomponent Oxide Thin Films by Electric-Induced Field Emission," **O. Auciello** and R. Chapman, MCNC, 1992.

"A Novel Focused Beam Lithograph Technique for Fabricating Josephson Junctions," **O. Auciello**, MCNC, 1992.

"A Novel Ion Beam Source Based on an Integrated Electron Field Emission Array," **O. Auciello**, MCNC, 1992.

"A Plasma-Induced Ion Irradiation Technique for Biodecontamination of Surfaces," **O. Auciello**, G. E. McGuire, and L. F. Stikeleather, MCNC, 1992.

"An Automated Dual Ion Beam Sputter-Deposition Technique for Metallization of Microcircuit Interconnects and Via /Contact Filling Without a Lift-off Process," **O. Auciello** (MCNC), 1991.

### **PUBLICATIONS (Continuation)**

## **Books (30 as of 2017)**

“Proceedings of International Symposium on Integrated Functionalities (ISIF 2013)”  
**O. Auciello**, S. Dey, and D. J. Taylor (Eds.), **vol. 157**, Issue 1, 5-6 (2014).

“Emerging Non-Volatile Memories”, S. Hong, **O. Auciello**, and D. Wouters (Eds), Springer, New York, Heidelberg Dordrecht, London (2014).

“New Functional Materials and Emerging Device Architectures for Nonvolatile Memories”, D. Wouters, E. Tokumitsu, **O. Auciello**, P. Dimitriakis. Y. Fujisaki, Mater. Res. Soc. Symp. Proc. 1337, Warrendale, PA (2011).

“Materials Science and Technology for Nonvolatile Memories”, edited by D. Wouters, **S. Hong**, S. Soss, **O. Auciello**, Mater. Res. Soc. Symp. Proc. 1071, Warrendale, PA, (2008).

“Science and Technology of Nonvolatile Memories”, edited by **O. Auciello**, J. Van Houdt, R. Carter, S. Hong, Mater. Res. Soc. Symp. Proc. **933E**, Warrendale, PA (2006).

"In Situ, Real-Time Characterization of Thin Film Growth Processing and Phenomena, "  
**O. Auciello** and A.R. Krauss (Eds.), John Wiley and Sons, Inc. (2001).

“Science and Technology of Integrated Ferroelectrics: Past Eleven Years of the International Symposium on Integrated Ferroelectrics Proceedings”, C.A. Paz de Araujo, **O. Auciello**, and R. Ramesh (Eds.), Gordon and Breach Publishers, vol. **11** "Ferroelectricity and Related Phenomena" (2000).

“Annual Review of Materials Science: Metal Oxides”, **O. Auciello** and R. Ramesh (Eds.), vol **28** (1998).

"Science and Technology of Electroceramic Thin Films," **O. Auciello** and R. Waser (Eds.), NATO/ASI Series E **vol. 238**, Kluwer Academic Publishers (1995).

**Translation to Chinese** of "Plasma Diagnostics," **vol. 2** "Discharge Parameters and Chemistry," **O. Auciello** and D.L. Flamm (Eds.), Academic Press (1990), Academia Sinica (1994).

**Translation to Chinese** of "Plasma Diagnostics," vol. 1 "Discharge Parameters and Chemistry," **O. Auciello** and D.L. Flamm (Eds.), Academic Press (1990), Academia Sinica (1994).

"Multicomponent and Multilayered Thin Films for Advanced Microtechnologies: Techniques, Fundamentals, and Devices," **O. Auciello** and J. Engemann (Eds.), NATO/ASI Series E **vol. 234**, Kluwer Academic Publishers, 1993.

"Plasma-Surface Interaction and Processing of Materials," **O. Auciello**, A. Gras-Marti, J.A.Valles-Abarca and D.L. Flamm (Eds.), Kluwer Academic Publishers, 1990.

"Plasma Diagnostics," **vol. 2** "Surface Analysis and Interactions," **O. Auciello** and D.L. Flamm (Eds.), Academic Press, 1990.

"Plasma Diagnostics," **vol. 1** "Discharge Parameters and Chemistry," **O. Auciello** and D.L. Flamm (Eds.), Academic Press, 1990.

"Ion Bombardment Modification of Surfaces: Fundamentals and Applications," **O. Auciello** and R. Kelly (Eds.), Elsevier Scientific Publishing Co., 1984.

## **PUBLICATIONS (Continuation)**

## **Books (continuation)**

### **Book Series (2)**

**"Science and Technology of Multifunctional Thin Films", O. Auciello and R. Ramesh (Eds.), Kluwer Academic Publishers, 2003-2010 (new).**

- "Nanoscale Phenomena in Ferroelectric Thin Films", Seungbum Hong (Ed.) (2004)
- "Graded Ferroelectrics, Transcapacitors, and Transponents", J.V. Mantese and S.P. Alpay (Eds.) (2004)
- "Thin Films and Heterostructures for Oxide Electronics", S.B. Ogale (Ed.)

**"Plasma-Materials Interaction", O. Auciello and D.L. Flamm (Eds.), Academic Press, 1988-1996.**

"Plasma-Surface Interaction Processes in Fusion Devices," W.O. Hofer (Guest Ed.), 1996).

"Plasma Deposition of Amorphous Silicon-Based Materials," G. Bruno, P. Capezzuto, A. Madan (Guest Eds.), 1995.

"Plasma Etching: An Introduction," D. Manos and D.L. Flamm (Guest Eds.), 1989.  
**2nd Edition**, 1993.

"Plasma Deposition, Treatment and Etching of Polymers," R. D'Agostino (Guest Ed.), 1991.

Plasma Diagnostics," **vol. 2** "Surface Analysis and Interactions," **O. Auciello** and D.L. Flamm (Eds.), Academic Press, 1990.

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"On the Kinetic Energies of Excited Atoms Sputtered from Li, LiF and NaCl," S. Dzioba, **O. Auciello**, and R. Kelly, Rad. Effects Lett. **vol. 45** (1980) p. 235-246.

"On Surface Normal Energy Distribution of Sputtered Recoils," G. Carter, G. Fischer, R. Webb, S. Dzioba, R. Kelly and **O. Auciello**, Rad. Effects Lett. **vol. 45** (1979) p. 45-48.

"On the Relative Stability of Different Topographical Features Developed on Bombarded Copper Surfaces," **O. Auciello** and R. Kelly, Rad. Effect Lett. **vol. 43** (1979) p. 187-192.

"On the Problem of Stability of Pyramidal Structures Developed on Bombarded Copper Surfaces," by **O. Auciello**, R. Kelly, and R. Iricibar, Rad. Effects Lett. **vol. 43** (1979) p. 37-42.

"A Possible Experiment to Elucidate Whether Long Range Focuson Exist in Single Crystal Sputtering," **O. Auciello**, Phys. Lett. **vol. 68A** (1978) p. 336-338.

"Molecular Effects in Ion-Electron Emission from Clean Metal Surfaces," R.A. Baragiola, E.V. Alonso, **O. Auciello**, J. Ferron, G. Lantschner, and A. Oliva Florio, Phys. Lett. **vol. 67A** (1979) p. 211-213.

"Ion Trapping, Sputtering and Structural Changes In  $O_2^+$  and  $N_2^+$  Bombardment of Polycrystalline Aluminum Films," **O. Auciello**, R.A. Baragiola, E.R. Salvatelli, and J.L. Spino, 5th Int. Conf. on Ion Implantation in Semiconductors and Other Materials, Boulder, Colorado (1976), Plenum Press (1977) p. 231-236.

"A Novel Ultra-High Vacuum Manipulator with Six Degrees of Freedom," **O. Auciello**, C. Lulich, E.V. Alonso, and R.A. Baragiola, Nucl. Instr. Meth. **vol. 147** (1977) p. 349-351.

"Ultra-High Vacuum Rotary Manipulator with Direct Cooling," **O. Auciello**, E.V. Alonso, and R.A. Baragiola, Vacuum **vol. 26** (1976) p. 349-350.

## **PUBLICATIONS (Continuation)**

### **Publications in Journals and Conference Proceedings (Continuation)**

"A Simple Model for Blistering Mechanism," **O. Auciello**, Rad. Effects **vol. 30** (1976) p. 11-16.

"Charge Transfer in  $\text{He}^+ + \text{Li}$  and  $\text{He}^+ + \text{Cd}$  Collisions," **O. Auciello**, E.V. Alonso, and R.A. Baragiola, Phys. Rev. **vol. A13** (1976) p. 985-986.

"Resistors of Intermediate Values and Low TCR Obtained by Oxygen Ion Implantation In Aluminum Films," J. Arancibia, R.A. Baragiola, E.R. Salvatelli, **O. Auciello**, and P. Mendoza, 62nd Meeting of the Argentinian Physical Society, Argentina (1975), Proc. (1976) p.3-7.

"Dose Dependence of Electron Emission from Al by 30 KeV  $\text{O}_2^+$  Bombardment," E.V. Alonso, **O. Auciello**, and R.A. Baragiola, 6th Int. Conf. on Atomic Collision with Solids, Amsterdam, Holland (1975), Proc. (1975) p. 20-25.

### **EXTRACURRICULAR PUBLICATIONS**

"Creator's Signs," by **O. Auciello** (American Poetry Anthology, Vol. VI, 1986).

"Creation," by **O. Auciello** (American Poetry Anthology, Word of Praise, Vol. III, 1987).

### **GRANTS**

New

- ARMY “Thin Film High-K Dielectric Semiconductor Materials for Developmoent of IRFPAs”, Y. Yuanning (PI, Microsol Technologies, Inc.), O. Auciello (Co-PI, UTD); **SBIR Phase I \$150,000 (12 months), 2016-2017.**
- DOE “Development of Low Z Thin Film Stripper Foils for X-Ray Windows”, Subcontract to UHV and Nanorunch Inc., O. Auciello (PI) \$ **107,000 (July 2015- June 2017).**
- Prior**
- Lockheed  
Martin “Exploratory R&D to Develop Transparent UNCD Coatings on Glass”, O. Auciello (PI), **four Months: \$20,000 (2014-15)**
- NSF “Technology Transfer for Commercialization of Industrial, Electronic and Medical Device Products Based on a Patented Ultrananocrystalline Diamond Coating”, O. Auciello (PI), E. Fuentes (Postdoc, Entrpreneurial Leader), J. Shapiro (Industrial Mentor), **Year 1: \$50,000 (2014-15).**
- NSF “Ultrananocrystalline Diamond (UNCD) Coating Technology for Integrated Electrode-Membrane-Inner Wall Coating of Case for Robust/Reliable Commercial Li-Sulfur Batteries” Y. Chabal (PI, UTD), O. Auciello (PI, UTD), J. Wagner (Co-PI, ADT), **Year 1 (2013): \$107,480; Year 2 (2014): \$42,520; Total: \$150,000.**
- NSF “Research and Development of Paramagnetic Centers in Diamond Films and Applications to a Broad Range of Sensors for Chemical Analysis and Medical Diagnostics, Bio-defense, Environmental monitoring, and Food Safety,” C. A. Meriles (PI, City College of New York), O. Auciello (Co-PI, UTD), J. Wagner (Co-PI, ADT), **Year 1 (2013): \$54,584; Year 2 (2014): \$54,583; Year 3 (2015): \$54,583 Total: \$163,750.**
- Samsung “Science and Technology for the Development of a New Generation of Implantable Drug Delivery Devices Based on a Novel Biocompatible Ultrananocrystalline Diamond (UNCD) Film Technology”, **O. Auciello (PI), \$100,000 per year (2013-2014).**
- Samsung “Science and Technology for RRAM Based on Correlated Electron Resistive Access Memories (CeRAM)”, **O. Auciello (PI), \$100,000 per year (2013-2014).**
- Argonne  
Contract  
(DARPA) “Low Power NEMS-Switch Based Logic Technology,” **PI: O. Auciello, UTD/MSD, \$179,000 (2013-2014).**

## **GRANTS (Continuation)**

### **Prior (Continuation)**

- DOE-OBBER “A High Density Microelectronic-Tissue Hybrid Sensor for Imaging”,  
**O. Auciello (PI)** and J.A. Carlisle (Co-PI), DOE Bioengineering, **\$580,000 (ANL subcontract); Total: \$ 3 million per year (5 National Labs, 3 Universities, Second Sight (Company): \$200,000 1<sup>st</sup> year, \$160,000 / year). Funding increased to \$400,000 for FY04 and FY05. \$450,000 for FY05-06. FY07 \$400 K), FY08 \$ 250 K, FY09: \$ 250 K, FY10: \$250 K.**
- DARPA “Low Power NEMS-Switch Based Logic Technology,” **PI: O. Auciello,**  
Co-PIs: D. Mancini, A. Sumant, J. Hiller, (ANL/MSD/ CNM), R. Carpick and  
G. Piazza (U Pennsylvania), **\$650,000; Phase III, 2011-2012.**
- NASA “Electron Field Mission from UNCD Surfaces for Space Exploration Mass  
Spectrometers”, **PI: O. Auciello,** Co-PI:A. V. Sumant, **FY10: \$ 30 K**
- LakeShore** “Development of High-Dielectric Constant Thin Films for Supercapacitors for  
Energy Storage”, **PI: O. Auciello, FY 2012: \$30 K.**
- DARPA “Low Power NEMS-Switch Based Logic Technology,” **PI: O. Auciello,**  
Co-PIs: D. Mancini, A. Sumant, J. Hiller, (ANL/MSD/ CNM), R. Carpick and  
G. Piazza (U Pennsylvania), **\$1,350,000; Phase II, 2010-2011.**
- DARPA “Low Power NEMS-Switch Based Logic Technology,” **PI: O. Auciello,**  
Co-PIs: D. Mancini, A. Sumant, J. Hiller, (ANL/MSD/ CNM), R. Carpick and  
G. Piazza (U Pennsylvania), **\$1,850,000; Phase I, 2009-2010.**
- DARPA “Co-Integration of Multi-functional Diamond MEMS Technology with High-  
Performance CMOS for DC to GHz Frequency Applications” **PI: O. Auciello,**  
Co-PIs: J.A. Carlisle (ANL, M. Heaton (IMT), N, Kane (ADT), R. Carpick  
(UWM), **\$5,200,000; 2004-2010.**
- DARPA “Low Power NEMS-Switch Based Logic Technology,” **PI: O. Auciello,**  
Co-PIs: D. Mancini, A. Sumant, J. Hiller, (ANL/MSD/ CNM), R. Carpick and  
G. Piazza (U Pennsylvania), **\$250,000; Phase 0, 2008-2009.**
- DOE-LDRD “Science and Technology for Development of High-Sensitivity Biosensors ”  
O. Auciello (PI) (CNM/MSS), D. C. Mancini, A. V. Sumant (CNM)  
B. Shi (MSD); **\$263,000, 2007-2010.**
- DOE-BES “Quantum Computation with Electron Spins: Qubit Networks of Endohedral N in  
C60”, F. Y. Fradin (PI), **O. Auciello,** J.A. Carlisle, and J. Schlueter, B. Kay, T.  
Rajh, V. Dravid, **\$225,000 per year, 2004-2007.**
- DOE-NSET Nanostructured Biocomposite Materials for Energy Transduction, M.A. Firestone,  
L.A. Curtiss, D.M. Gruen, J.A. Carlisle, **O. Auciello,** L.E. Iton, P. D. Laible,  
R. E. Gerald, M. R. Wasielewski, **\$ 3,533,000, 2003-2006,**

**GRANTS (Continuation)**

**Prior (Continuation)**

- DOE-OIT “Science and Technology of Ultrananocrystalline Diamond for Mechanical Pump Seals Applications”, J. Hryn and J.A. Carlisle (PIs), **O. Auciello**, M. Pellin (Co-PIs), \$ **400,000 / year; 2002-2008.**
- DOE-LDRD “Biocompatibility of Ultra-nanocrystalline Diamond Thin Film, B. Shi and **O. Auciello (PIs)** and Q. Jin (Co-PI), **\$399,000; ), 2006-2009**
- DOE-LDRD “Fundamental and Applied Science of Ferroelectric/Piezoelectric-Diamond Hybrid Heterostructures for High-Performance MEMS/NEMS Devices”, **O. Auciello (PI)**, G. Bai, J. Wang, and J.A. Carlisle (Co-PI), **\$330,000, 2004-2007.**
- DOE-LDRD "Science and Technology of a New TiAlO Alloy Oxide and its Application to a New Generation of Integrated Circuit Gate Dielectric **O. Auciello (PI)**.,**\$100,000 per year, 2003-2006.**
- NSF “Science and Technology of Ultrananocrystalline Diamond Thin Films for Multifunctional MEMS/NEMS Devices”, Espinosa et al. (Northwestern University), **O. Auciello (PI)**, J.A. Carlisle, **NSF –NIRT 2003-2006, \$1,200,000 total, %65,000 per year for O. Auciello (PI-UIC/ANL), 2003-2006**
- DOE-Strategic LDRD “Surface Functionalization of Ultrananocrystalline Diamond Thin Films J.A. Carlisle, M. Gruen, L. A. Curtiss, **O. Auciello**, G.W. Crabtree, **ANL Strategic LDRD, \$300,000 per year, Total: 900,000, 2002-2004.**
- DOE-Strategic LDRD “Derivatization of Ultrananocrystalline Diamond for Bioassays. J.A. Carlisle (Pi) D.M. Gruen, O. Auciello, A. Firestone, **\$160,000/ year, 2002-2004.**
- DOE (Synthesis & Processing Center) "Tribology and Mechanical Properties of Carbon Films", ANL-PI:: **O. Auciello, \$45,000 per year, 2001-2003.**
- DOE (Synthesis & Processing Center) "Nanoscale Science of Perovskite Thin Films", Center Directors: **O. Auciello (ANL)**, D. Dimos (SNLA); **\$300,000 per year, 2001-2005.**
- DOE-OTT "High-Power Capacitors for Electronic Packaging," Co-PIs: M. Lanagan and **O. Auciello (ANL), \$300,000; 1998-2003.**
- DARPA “Evaluation of Ultrananocrystalline Diamond (UNCD) Thin Films as a Potential High Performance MEMS Material”, **O. Auciello (PI)**, J.A. Carlisle (Co-PI), **\$ 670,000; 2003-2004.**

**GRANS (Continuation)**  
**Prior (Continuation)**

- DARPA "Frequency Agile Thin Film Materials for Integration into High Frequency Devices," Co-PI's: **O. Auciello** and M. Lanagan (ANL) **\$1,200,000; 1998-2003.**
- NSF "Science and Technology of Ultrananocrystalline Diamond Films for Multifunctional MEMS/NEMS Devices", Co-PIs: Z. Chen (Univ. Missouri), H. Espinosa (Northwestern Univ.), **O. Auciello (ANL-UIC), \$ 1,300,000, 2003-2006.**
- DOE-LDRD "Fundamental and Applied Studies of Novel Intermetallic Thin Films for Lithium Ion Battery Anodes", J. Vaughey, A. J. Kahaian, **O. Auciello**, J. A. Carlisle, M. Pellin, J. Elam, (PIs), **\$180,000 per year, 2004-2006.**
- DOE-LDRD "Science and Technology of Nanocrystalline Diamond Thin Films and Applications to Microelectromechanical System (MEMS) and Micromechanical Assemblies (MMA)," Co-PI's: A.R. Krauss, **O. Auciello**, And D.M. Gruen (MSD), D.Mancini (APS), and A. Erdemir (ET), **\$135,000 per year; 1999-2001.**
- DOE-LDRD "Nanoscale Science of Ferroelectric Thin Films," PI: **O. Auciello, \$75,000 per year; 2001-2002.**
- NSF "Ferroelectric Cathodes" PI: **O. Auciello, \$ 10,000, FY2000 (six months).**  
Ionwerks
- NASA  
UHV Tech "Synthesis and Characterization of Nanocrystalline Diamond Thin Films for Microelectromechanical Systems", PI: **O. Auciello, \$ 15,000, FY2001**
- NIH  
UHV Tech "Ferroelectric Cathodes for Plasma-Induced Ozone Purification of Water", PI: **O. Auciello, \$ 10,000, FY2000 (six months).**
- DOE-LDRD "Science and Technology of Low-Work Function Coatings and LIGA-Type Fabrication Methods and Their Integration in Structures for Field Emission Flat Panel Displays," Co-PI's: **O. Auciello**, A.R. Krauss, and D. Mancini, **\$150,000; 1998-2000.**
- DOE-LDRD "Ferroelectric Cathodes," PI: **O. Auciello, \$75,000; 1998-1999.**
- DOE-LDRD "Energy Storage in Ceramic-Based Ultracapacitors ," Co-PI's: **O. Auciello (ANL), \$300,000; 1998-1999.**
- DARPA "Development of Low Voltage Field Emitter Cathodes with Enhanced Electron Emission Coatings for Flat Panel Displays," PI; **O. Auciello**, Co-PI: A.R. Krauss, D.M. Gruen (ANL), **\$340,800; 1996-2000.**

**GRANTS (Continuation)**  
**Prior (Continuation)**

- NSF-ONR "Development and Application of *In Situ*, Real-Time and *Ex Situ* Characterization Techniques to Study the Growth of High Temperature Superconducting Thin Films and Heterostructure Interfaces," PI: E.A. Irene (UNC), **O. Auciello** (ANL), A.R. Krauss (ANL), **\$510,000; 1995-1998.**
- ONR "Integrated Ion Beam Sputter-Deposition/Time-of-Flight Ion Scattering and Direct Recoil Spectroscopy-Ellipsometer System for *In Situ*, *Real-Time* Characterization of Film Growth Processes," PIs: E.A. Irene (UNC), **O. Auciello**, and A.R. Krauss (ANL), **\$310,000; 1996-1998.**
- DARPA "Piezoelectric Films for Integration Into Actuators for Fiber Optic Alignment," PI; **O. Auciello** (ANL), Subcontract from McDonnell Douglas, **\$45,000; 1997.**
- ARPA "Ferroelectric Thin Films: Long Term Properties and Manufacturability Issues," PI: **O. Auciello** and A.I. Kingon, **\$379,371; 1993-1996.**
- ONR "Synthesis of Electro-optic Thin Films on Semiconductors and Demonstration of Devices," PI: A.I. Kingon and **O. Auciello**, **\$550,464; 1991-1995.**
- NATO Organization of NATO Advanced Research Workshop on "Science and Technology of Electroceramic Thin Films," Italy, Director: **O. Auciello**, **\$17,000; 1994.**
- DARPA: "Studies of Microstructures of Electro-Optic and Ferroelectric Thin Films Produced by Ion Beam Sputter-Deposition," PI: A.I. Kingon and **O. Auciello**, **\$528,000; 1990-1993.**
- ARO "Control of Surface Melting and Ablation of Materials Exposed to High Heat Fluxes from Plasmas," Co-PI's: **O. Auciello**, J.G. Gilligan, M. Bourham, and O. E. Hankins, **\$600,000; 1990-1993.**
- NSF: "The Fabrication of Multicomponent Oxide Films by Computer-Controlled Dual Ion Beam Sputter Deposition," Co-PI's: A.I. Kingon, **O. Auciello**, R.F. Davis, **\$441,084; 1989-1992.**
- DARPA: "The Fabrication of High  $T_c$  Oxide Superconducting Thin Films and Devices via Computer-Controlled Dual Ion Beam Sputter Deposition and In Situ Processing," Co-PI's: **O. Auciello**, A.I. Kingon, R.F. Davis, **\$791,739; 1988-1991.**
- NATO NATO Advanced Study Institute on "Multicomponent and Multilayered Thin Films for Advanced Microtechnologies: Techniques, Fundamentals, and Applications," Germany, Director: **O. Auciello**, **\$57,000; 1992.**
- ONR: "The Deposition of Multicomponent Films for Electro-optic Applications via a Computer-Controlled Dual Ion Beam Sputtering System," Co-PI's: A.I. Kingon, **O. Auciello** and K. Backman, **\$486,376; 1988-1991.**

## **GRANTS (Continuation)**

### **Prior (Continuation)**

- DARPA: "Symposium on Ferroelectric Thin Films," Directors: A.I. Kingon and **O. Auciello, \$9,000; 1991.**
- NATO: "Elastic and Inelastic Processes in Low Temperature Plasmas," PI: **O. Auciello, \$5,538; 1988-1989.**
- NSF: "Novel Automated Laser-Ablation Deposition Technique for Manufacturing High Temperature Superconducting Films," PI: **O. Auciello, \$29,824; 1987-1988.**
- NATO Organization and Direction of NATO Advanced Study Institute on Plasma-Surface Interaction and Processing of Materials," Spain, Director: **O. Auciello, \$46,000; 1988.**
- ARO: "Control of Surface Melting and Ablation of Materials Exposed to High Heat Fluxes," Co-PI's: **O. Auciello, J.G. Gilligan, O.E. Hankins and B.W. Wehring, \$300,000; 1986-1989.**
- NCSU Faculty Development Grant (New Initiatives) (High T<sub>c</sub> Superconductor Films) PI: **O.Auciello,\$3,500; 1987.**
- ARO: "Proof-of-Principle of the Vapor Shield Mechanism in Erosion of Materials Under High Heat Fluxes," Co-PI's: **O. Auciello, J.G. Gilligan, O.E. Hankins, B.W. Wehring, \$86,000; 1986.**
- NCSU Initiation Grant "Plasma-Surface Interaction Phenomena", PI: **O. Auciello, \$50,000; 1985-1986.**

### **Industrial Grants Prior**

- Lightmatrix "Development of Photonic MEMS Switches", Co-PIs: **O. Auciello, D.M. Gruen, and J.A. Carlisle (ANL); \$200,000 / year; 2001-2002.**
- INTEL "Development of RF-MEMS Switches", Co-PIs: D.M. Gruen, J.A. Carlisle, and **O. Auciello (ANL); \$150,000; 2002.**

### **SUMMARY OF FUNDING RAISED FROM 1987 TO 2016 FOM DIFFERENT USA AGENCIES AND INDUSTRY IN THE USA AND ABROAD, AS PI OR CoPI IN DIFFERENT R&D PROGRAMS**

DOE-BES FWP (1996-2012):	\$15,000,000
DOE-BER (2004-2010):	\$ 2,730,000



DOE-OTT	(2002-2004):	\$ 300,000
DOE-LDRD	(1996-2010):	\$ 1,900,000
DARPA	(1987-2010):	\$17,000.000
NSF	(1987-2005):	\$ 470,000
INDUSTRY	(1987-2015):	\$ 750,000
ONR	(1987-2000):	\$ 1, 850,000
<b>TOTAL</b>		<b>\$40,000,000</b>

## **MAJOR ACCOMPLISHMENTS**

1. **1986-1996.** O. Auciello (NCSU and MCNC) and colleagues (J. Narayan-NCSU) were one of the first two groups in producing Y-Ba-Cu-O High Temperature Superconductors (HTSC) Films based on the bulk YBCO material al discovered in the late 1980's, which earned the Noble Prize to two

European scientists. This work opened the way for an intensive research on the science and technology of high temperature superconducting thin films from the 90's until today.

"Formation of Thin Superconducting Films by Laser Processing Method," J. Narayan, N. Biunno, R. K. Singh, O.W. Holland, and **O. Auciello**, *Appl. Phys. Lett.* **vol. 51** (1987) p. 1845-1847.

**ISI Citation Information: Times Cited: 350**

**Importance:** this is one of the two first papers simultaneously published in APL ( the other was published by Venkatesan et al-Bellcore) demonstrating the synthesis of HTSC YBCO films, and opening the way for research on HTSC film synthesis, shortly after the announcement of the Nobel Prize for the discoverers of HTSC in bulk materials in the late 1980's. The synthesis was done in the vacuum system designed by O. Auciello and using a laser of J. Narayan.

2. **1986-present.** O. Auciello (NCSU and ANL) and A.I. Kingon (NCSU) pioneered the use of conducting oxide electrodes (RuO<sub>2</sub> was patented as the first oxide electrode for FeRAMS-see Auciello CV) to eliminate the 30-year old problem of polarization fatigue in PbZr<sub>x</sub>Ti<sub>1-x</sub>O<sub>3</sub> (PZT) ferroelectric capacitors for FeRAM, through a careful control of oxygen vacancies at the electrode-ferroelectric interface. This was a critical step in the development of reliable FRAMs based on PZT. Fujitsu and Texas Instruments are currently using the conducting oxide electrode approach for commercialization of FeRAMs based on PZT thin films. The other FeRAMs are based on the novel SrBi<sub>2</sub>Ta<sub>2</sub>O<sub>9</sub> (SBT) ferroelectric material developed by Symetrix Corporation (Colorado Springs, USA) that yields FeRAMs without fatigue with Pt electrodes, because the oxide-rich SBT/PT interface layer controls the oxygen vacancies, thus fatigue. Matsushita-Panasonic, Toshiba, Hynix and others commercialize the SBT-based FeRAMs, with Symetrix license.

"Ferroelectricity in Ultrathin Perovskite Films," D.D. Fong, G.B. Stephenson, S.K. Streiffer, J.A. Eastman, **O. Auciello**, P.H. Fuoss, C. Thompson, *Science* vol. 304 (2004) 1650-1653.

**Importance:** This is the first paper that demonstrated that the limit of ferroelectricity in Perovskite PbTiO Films is three Atomic Units, opening the way for nanoferroelectrics.

"Science and Technology of Ferroelectric Thin Films for Nonvolatile Memories," R. Ramesh, S. Aggarwal and **O. Auciello**. *Annu. Rev. Mater. Sci.* **32**, 191(2001).

**ISI Citation Information Citations: 140**

**Importance:** This was an invited review that summarized the advances and opportunities in ferroelectric thin film materials for nonvolatile memory applications.

"The Physics of Ferroelectric Memories," **O. Auciello**, J.F. Scott, R. Ramesh, July (1998) p. 22.

**ISI Citation Information: Times Cited: 1000**

**Importance:** this paper showed the physics and future of ferroelectric memories for insertion in the market.

"Hybrid Metal / Metal-Oxide Electrodes for Ferroelectric Memories," A.I. Kingon, **O. Auciello**, H.N. Al-Shareef, D.J. Lichtenwalner, and R. Dat, US Patent #5,555,486; Sept 1996.

**Importance:** this is the patent that showed the way to produce hybrid Pt/oxide interface electrodes to yield fatigue-free PZT capacitors for ferroelectric memories.

## **MAJOR ACCOMPLISHMENTS (Continuation)**

"Studies of Multicomponent Oxide Films and Layered Heterostructure Growth Processes via in situ, Time-of-Flight Ion Scattering and Direct Recoil Spectroscopy," **Auciello O.**, Krauss A.R., Im J., Schultz J.A., *ANNUAL REVIEW OF MATERIALS SCIENCE* **Volume: 28**

Pages: 375-396 Published: 1998

**ISI Citation Information: Times Cited: 19**

**Importance:** this paper showed the importance of the *in situ* ion scattering characterization technique to study the growth of oxide and other films in relatively high pressure environments, while before the ion scattering technique could be used only in high vacuum, not allowing to study film growth processes in situ and real time.

2. **1995-present.** O. Auciello and A. Gruverman demonstrated the use of a new technique (Piezoresponse Force Microscopy-PFM) based on Atomic Force Microscopy to study ferroelectric domain configuration and dynamics at the nanoscale in ferroelectric thin films. This technique is based on measuring the atomic scale displacement of the atoms on the surface of the ferroelectric materials upon application of a voltage between the top and bottom surface of the ferroelectric layer which induces the polarization and associated piezoelectric (i.e., physical displacement of ions in the lattice) phenomena. Many groups now use this technique worldwide, and several companies are commercializing AFM-PFM systems for research.

“Imaging and control of domain structures in ferroelectric thin films via scanning force microscopy,” Gruverman A., **Auciello O.**, Tokumoto H., ANNUAL REVIEW OF MATERIALS SCIENCE Volume: 28 Pages: 101-123 Published: 1998

**ISI Citation Information: Times Cited: 229**

**Importance:** this paper showed the importance of the new piezoresponse imaging technique to study ferroelectric domains at the nanoscale and open the new field of PFM imaging of ferroelectric domains and contributed to develop a new market of PFM instrumentation.

3. **1996-present** O. Auciello pioneered the development of a unique multifunctional material in thin film form. The material is based on a novel TiAl alloy layer, for which Auciello’s group have demonstrated several functionalities, namely: 1) oxygen diffusion barrier to integrate oxides (e.g., BaSr<sub>x</sub>Ti<sub>1-x</sub>O<sub>3</sub> (BST)) films (grown at high-temperature in oxygen-rich environments) with copper electrode layers (without oxidation of the electrode) to achieve the highest performance BST based capacitors with the highest electrical conductivity electrodes for high frequency devices demonstrated today; Auciello’s group used more recently the same TiAl barrier to integrate oxide piezoelectric thin films with a novel multifunctional material in thin film form, named ultrananocrystalline diamond (UNCD), to develop a new generation of low voltage piezoelectrically actuated diamond microelectromechanical/ nanoelectromechanical systems (MEMS/NEMS) with the highest performance demonstrated today; the observation that TiAl formed a thin oxide layer (~3 to 4 nm thick) lead to another breakthrough functional use of TiAl alloys, in this case as an amorphous TiAlO<sub>x</sub> layer with relatively high-dielectric constant and bandgap for application as a novel amorphous high-k dielectric to replace SiO<sub>2</sub> in the next generation of nanoscale CMOS devices. The idea came from observing that Al<sub>2</sub>O<sub>3</sub> is the material with the highest bandgap (~ 8 eV) closest to SiO<sub>2</sub> (~ 9 eV), although with relatively low K- 10, while TiO<sub>2</sub> exhibits the highest K among all amorphous oxides being explored for the new generation of high-K CMOS gates, but with relatively low bandgap (3.3 eV). Based on this observation, Auciello postulated that by producing a Ti<sub>x</sub>Al<sub>1-x</sub>O<sub>3</sub> with the appropriate stoichiometry, this material can provide a better alternative to HfO<sub>2</sub> which is currently the leading candidate to replace SiO<sub>2</sub> in every nanoscale

**MAJOR ACCOMPLISHMENTS (Continuation)**

CMOS. The published results show that the Ti<sub>x</sub>Al<sub>1-x</sub>O<sub>3</sub> material exhibits permittivity ~ 30, which the highest demonstrated today among amorphous high-k oxides.

“A New Hybrid  $Ti_xAl_{1-x}O_y$  Gate Dielectric Layer for Next Generation Ultra-High Capacitance Density CMOS Gates,” O. Auciello, W. Fan, B. Kabius, S. Saha, and J.A. Carlisle, C. Lopez and E.A. Irene, R.A. Baragiola, Appl. Phys. Lett **86** (2005).

**Importance:** this paper demonstrated that the new  $TiAlO_x$  dielectric layer exhibits the highest dielectric constant among all known amorphous oxide candidates to replace  $SiO_2$  in the next generation of nanoscale CMOS devices.

**4. 1996-present.** O. Auciello and two colleagues (D. M. Gruen and A. R. Krauss) started a whole new field of research and technological development focused on the science and technology of a novel material in thin film form defined as ultrananocrystalline diamond (UNCD). They developed a unique patented plasma chemistry involving Ar (the lowest cost inert gas) and  $CH_4$  as the source of C atoms to grow diamond films with the smallest grains demonstrated today (2-5 nm). UNCD films exhibit a unique combination of exceptional mechanical, tribological, physical, chemical, electronic, thermal transport, and biocompatible properties. They performed pioneering research to understand the fundamentals underlying the growth and the properties of UNCD, and in the process obtained several key patents to enable the commercialization of the UNCD technology. Auciello led the work to demonstrate that UNCD films can be used in a wide range of technologies, and to do so, he co-founded Advanced Diamond Technologies (ADT) in 2004, jointly with J.A. Carlisle (CTO) and Neil Kane (CEO). The multifunctionalities of UNCD enables a broad range of commercial applications, namely: a) UNCD coatings are now in commercial mechanical pump seals (marketed by ADT), making a major impact in enabling pumps in the chemical, the oil and car industries run with 20% savings in energy usage; b) Atomic Force Microscope UNCD tips now in the market provides wear-free AFM tips for much higher resolution AFM analysis as compared with wear prone Si tips; c) New diamond-based MEMS/NEMS technologies to replace the current Si-based technology that is hindering the development and commercialization of MEMS and NEMS devices, due to the poor mechanical and tribological properties of Si (new RF MEMS switches, using UNCD as a dielectric with controlled charging have been developed and are in the process of being inserted in a new generation of RF communication devices, electronic radars and more); d) New UNCD-based field electron emission cathodes for application to field emission displays, cold cathodes for mass spectrometer for deep space exploration and more ; e) Use of UNCD films as hermetic bioinert/biocompatible coating for encapsulation of Si microchips for implantable biomedical devices (a Si chip coated with UNCD will be implanted inside the eye as an artificial retina to restore sight to people blinded by retina degeneration)-the chip has been implanted on 31 blind people in the USA, England, France, Switzerland, and Mexico, and they are starting to read large letters and recognize objects again, although diffusively, because the current small number of electrodes (62-240) that inject electrical pulses from the chip image processed from a CCD camera on the ganglion cells for transmission to the brain to form images); f) Auciello’s group recently demonstrated that UNCD surfaces support an efficient growth of stem cells, and they are now investigating the feasibility of differentiating those cells into photoreceptors to replace the dead photoreceptors in the retina of people blinded by the death of photoreceptors, and in the future differentiation into spinal cord cells to eventually restore motion to people paralyzed by

#### 4. MAJOR ACCOMPLISHMENTS (Continuation)

trauma of those cells, brain cells, to control or eliminate brain degradation conditions, such as Parkinson disease, and improvements in many other human conditions. This research started a new field of developmental biology based on the UNCD biocompatibility.

“Low Temperature Growth of Ultrananocrystalline Diamond,” X. Xiao, J. Birrell, J.E. Gerbi, **O. Auciello** and J.A. Carlisle, *J. Appl. Phys.* **96** (2004) 2232-2239.

**Importance:** This is the first paper that demonstrated that the UNCD films are the only diamond films that can be synthesized at 400 °C, opening the pathway to using UNCD for fabrication of monolithically integrated diamond MEMS/NEMS with CMOS devices to enable a whole new hybrid diamond MEMS/NEMS /CMOS technology.

“Piezoelectric/Ultrananocrystalline Diamond Heterostructures for High-Performance Multifunctional Micro/Nanoelectromechanical Systems,” S. Sudarsan, J. Hiller, B. Kabius, **O. Auciello**, *Appl. Phys. Lett.* **90** (2007) 134101.

**Importance:** this is the first paper demonstrating the possibility of integrating an oxide based piezoelectric film (PZT) with a carbon based material (UNCD) to produce a new generation of high-performance piezoelectrically actuated diamond MEMS/NEMS, opening the way for a new generation of advanced MEMS/NEMS devices driven by CMOS.

“DNA Modified Nanocrystalline Diamond Thin Films as Stable, Biologically, Active Substrates,” W. Yang, **O. Auciello**, J.E. Butler, W. Cai, J.A. Carlisle, J.E. Gerbi, D.M. Gruen, T. Knickerbocker, T. Lasseter, J.N. Russell, L. M. Smith, R. J. Hamers, *Nature Mater.* **1** (2002) 253-257.

**Importance:** This is the first paper that demonstrated that the surface of UNCD films can be functionalized to express DNA and other biomolecules, opening the field of diamond-based nanobiointerfaces.

“*In Vitro* and *In Vivo* Evaluation of Ultrananocrystalline Diamond for Coating of Implantable Retinal Microchips,” X. Xiao, J. Wang, J. A. Carlisle, B. Mech, R. Greenberg, R. Freda, M. S. Humayun, J. Weiland, and **O. Auciello**, *J. Biomedical Materials* **77B (2)** (2006) 273-281.

**Importance:** This paper demonstrated that UNCD coatings can enable the implantation of a Si microchip in the human eye as the key component of an artificial retina to restore sight to people blinded by retina degeneration.

“Fundamentals of ultrananocrystalline diamond (UNCD) thin films as biomaterials for developmental biology: Embryonic fibroblasts growth on the surface of (UNCD) films,” B. Shi, Q. Jin, L. Chen and **O. Auciello**, *Diamond and Related Materials*, **vol. 18 (2-3)**, (2009) 596-600.

**Importance** this is the first paper that demonstrates that UNCD surfaces are excellent for growing stem cells, thus opening the field for developmental biology based on diamond.

## MAJOR ACCOMPLISHMENTS (Continuation)

**5. 2009-present.** In the quest for new scientific and technological frontiers, O Auciello recently started an effort on research on phenomena in oxide thin films that may lead to a new generation of Thermoelectrics as well as oxide Photovoltaics devices for energy conversion and storage systems.

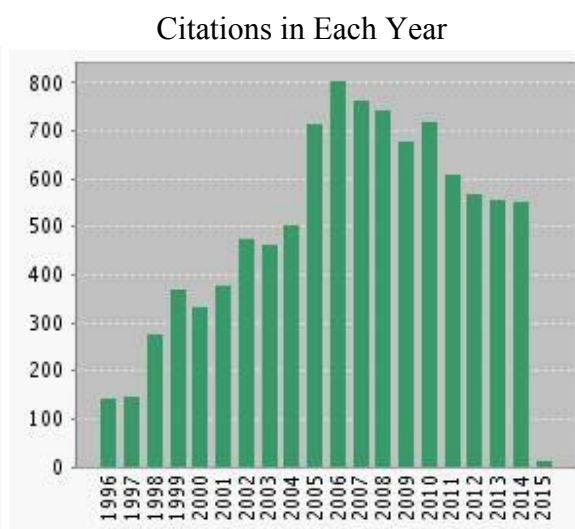
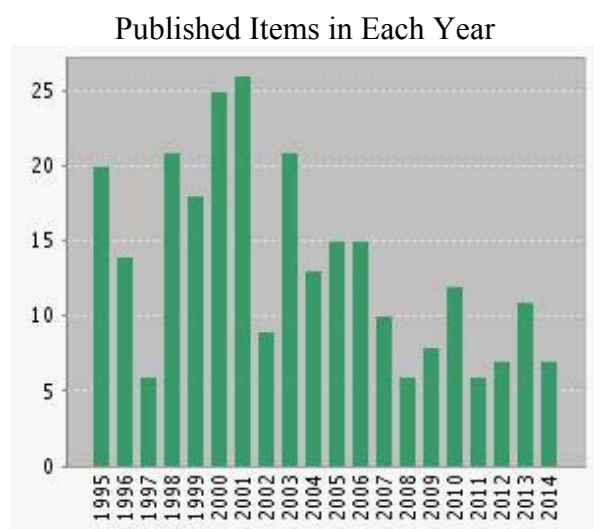
“Growth and Characterization of Transparent Pb(ZrTi)O<sub>3</sub> Capacitor on Glass Substrate,” K.K. Uprety, L.E. Ocola, and **O. Auciello**, J. Appl. Phys. **102** (2007) 084107.

**Importance** this is the first paper showing the feasibility of integrating PZT films with transparent conductive oxide electrodes for potentially high-efficiency solar cells based on the high electric field in a ferroelectric layer to produce a much more efficient sun light-induced electron-hole pair separation than in the state of the art Si solar cells.

**Citation Report** AU=Auciello O AND CI= (Argonne OR Toronto OR Hamilton OR Raleigh OR Princeton) Timespan=All Years. Databases=SCI-EXPANDED, SSCI, A&HCI, IC, CCR-EXPANDED (This report reflects citations to source items indexed within Web of Science. Perform a Cited Reference Search to include citations to items not indexed within Web of Science).

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Citing Articles without self-citations:	6,920
Average Citations per Item:	31.71
<b>h-index:</b>	<b>54 (May 2016)</b>

### Articles Citations

- [Synthesis and characterization of highly-conducting nitrogen-doped ultrananocrystalline diamond films](#), Applied Physics Letters 79(10):1441-1443 · September 2001 (265 Reads, 348 Citations as of March 2017).

- "Formation of Thin Superconducting Films by Laser Processing Method," J. Narayan, N. Biunno, R. K. Singh, O.W. Holland, and **O. Auciello**, *Appl. Phys. Lett.* **vol. 51** (1987) p. 1845-1847.

**ISI Citation Information: Times Cited: 350**

- "Science and Technology of Ferroelectric Thin Films for Nonvolatile Memories," R. Ramesh, S. Aggarwal and **O. Auciello**. *Annu. Rev. Mater. Sci.* **32**, 191(2001).

**ISI Citation Information Citations: 140**

**Importance:** This was an invited review that summarized the advances and opportunities in ferroelectric thin film materials for nonvolatile memory applications.

"The Physics of Ferroelectric Memories," **O. Auciello**, J.F. Scott, R. Ramesh, July (1998) p. 22.

**ISI Citation Information: Times Cited: 1000**

**Importance:** this paper showed the physics and future of ferroelectric memories for insertion in the market.

"Imaging and control of domain structures in ferroelectric thin films via scanning force microscopy," Gruverman A., **Auciello O.**, Tokumoto H., ANNUAL REVIEW OF MATERIALS SCIENCE Volume: 28 Pages: 101-123 Published: 1998

**ISI Citation Information: Times Cited: 229**

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