

# **Arvind Agarwal**

## *Curriculum Vitae*

Chair and Professor, Mechanical and Materials Engineering  
Director, Advanced Materials Engineering Research Institute (AMERI)  
College of Engineering and Computing  
Florida International University

## Executive Summary

Dr. Arvind Agarwal is a Professor and Chair of the Department of Mechanical and Materials Engineering at [Florida International University](#) (FIU), Miami, FL, USA. He also serves as the Director of Advanced Materials Engineering Research Institute (AMERI). He served as Associate Dean of Research, College of Engineering and Computing at FIU from 2015-17. Prof. Agarwal obtained his B.S from Indian Institute of Technology (IIT) Kanpur in Materials and Metallurgical Engineering and Ph.D. in Materials Science and Engineering from the University of Tennessee at Knoxville. After his Ph.D., Prof. Agarwal worked in the industry as a Materials Scientist at [Plasma Processes Inc.](#), Huntsville, AL, USA, for three (3) years, before embarking on an academic career at FIU in 2002.

**Research:** Prof. Agarwal's current research interests include advanced materials processing, surface engineering, ultrahigh temperature ceramics, carbon nanotube (CNT), boron nitride nanotube (BNNT), and graphene reinforced composites and coatings, nanoindentation and nanotribology, and mechanical properties of low dimensional and biological materials. His research has been continuously funded for 16 years by NSF, ONR, AFOSR, ARO, NASA, DOE and industries. Currently, he also serves as Co-PI of NSF funded Engineering Center (ERC) Cell-Met in partnership with Boston University and University of Michigan. Prof. Agarwal has published 274 technical articles, which includes 220 peer-reviewed journal articles, 1 book, and 7 edited books. His research has been cited more than 8100 times (*H-index 47*). He has delivered more than 150 presentations at national and international conferences including 35 keynote/invited lectures. Prof. Agarwal serves as a reviewer for more than 15 funding agencies including NSF, DOE, DOD, NASA and several European and Canadian funding agencies. He also serves as the Editorial Board member of 6 journals in the field of materials science and engineering. He has active research collaboration with more than 12 professors and researchers internationally (Switzerland, Germany, France, UK, India, Australia, China, Czech Republic).

**Teaching and Mentorship:** Prof. Agarwal has mentored 32 doctoral and post-doctoral, 13 masters and 26 undergraduate researchers in his lab. He has also mentored 14 K-12 students and 2 K-12 teachers in his labs. Prof. Agarwal has taught 6 graduate and 3 undergraduate courses. He has also conducted several short-term courses and workshops in the USA and internationally for working professionals and engineers. His students and mentees are employed as faculty members, national lab scientists, and senior engineers in the industry within the USA and other countries (China, India, Turkey). His students and mentees have won several awards within and outside FIU. Prof. Agarwal has also served as a mentor to several assistant professors at FIU, and three of them have won NSF-CAREER award.

**Service:** Prof. Agarwal has served his profession at national, international, and domestic levels. Prof. Agarwal has been active in professional societies (ASM, TMS, ACerS) in multiple roles. He has organized more than 15 symposia in the field of surface engineering, nanomaterials, and biomaterials. He has served on several committees including Advanced Materials Editorial Committee, ASM/IIM Visiting Lecture Award, Journal of Thermal Spray Technology Best Paper Award, and Surface Engineering committee. He is the Founding Faculty Advisor of FIU Materials Advantage (MA) student chapter. FIU MA Chapter was awarded (i) Chapter of

Excellence (7 times), and (ii) *Worlds Materials Day Award* (6 times) in last 12 years worldwide. Prof. Agarwal has advised more than 200 students and helped them transition to leadership role through MA. Several of his advisee have become professors and started new MA chapter in their universities resulting in a ripple effect. Prof. Agarwal serves as a reviewer for more than 50 journals in the area of materials engineering, nanotechnology, biomaterials, and mechanics.

Prof. Agarwal has served on several FIU committee at the University, College, and the department level. A few of these committees are Honorary Award Committee, VP Research Advisory Council, College Curriculum Committee, CEC Faculty Council, CEC T&P Committee, and several faculty search & screen committees.

**Administration:** Prof. Agarwal served as *Graduate Program Director* of MME (2004-2008) and *Associate Dean for Research* for CEC (2015-2017). Since 2012, he serves as *Director of Advanced Materials Engineering Research Institute (AMERI)* at FIU which has more than 25 faculty users and 50 Ph.D. students in the area of nanotechnology, materials characterization and materials processing. Currently, Prof. Agarwal serves as the *Chairperson of Mechanical and Materials Engineering* department since October 2017.

**Honors and Awards:** Prof. Agarwal has received several honors and awards both at the national level and within FIU. Some of his major awards include National Science Foundation's (NSF) prestigious *CAREER award* in 2006 and *Nanomaterials and Energy Prize* (Best Journal Paper) in 2017. He received *FIU President's Council Outstanding Professor* (now renamed as *World's Ahead Professor*) in 2010 for sustained excellence in research, teaching, and service. Prof. Agarwal is also a recipient of FIU Faculty *Excellence in Research Award* (2008) and *Excellence in Mentorship* award (2010). Recently, he was honored by *Provost's Mentorship Award* for Graduate students in March 2018. Prof. Agarwal was honored as elected *Fellow of ASM International* in 2012.

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**EDUCATION**

- Ph.D. Dec 1999, Materials Science and Engineering, University of Tennessee, Knoxville, USA
- M. S. Jan 1995, Materials and Metallurgical Engineering, Indian Institute of Technology (IIT) Kanpur, India.
- B. S. May 1993, Materials and Metallurgical Engineering, IIT Kanpur, India.

**PROFESSIONAL APPOINTMENTS**

- Oct 2017 onward, Chair, Mechanical and Materials Engineering, Florida International University
- Aug 2015- Oct 2017, Associate Dean for Research, College of Engineering and Computing, Florida International University (FIU), Miami, FL, USA
- Aug 2011 onward, Professor, Dept. of Mechanical and Materials Engineering, Florida International University, Miami, FL, USA
- February -July 2014, Professor, Dept. of Applied Mechanics, Indian Institute of Technology (IIT) Delhi, India (*on leave of absence from FIU*)
- July 2012- Jan 2014 and Aug 2014 onward, Director, Advanced Materials Engineering Research Institute (AMERI) and Motorola Nanofabrication Lab, College of Engineering and Computing, Florida International University, Miami, FL, USA
- Aug 2007-July 2011, Associate Professor, Dept. of Mechanical and Materials Engineering, Florida International University, Miami, FL.
- July 2004- June 2008, Graduate Program Director, Dept. of Mechanical and Materials Engineering, Florida International University, Miami, FL.
- Nov 2002 –July 2007, Assistant Professor, Dept. of Mechanical and Materials Engineering, Florida International University, Miami, FL.
- Jan 2001-Nov 2002: Adjunct Professor and Member of Graduate Faculty in the Department of Chemical Engineering and Materials Science at the University of Alabama in Huntsville.

- Dec 1999 – Nov 2002, Materials Scientist, Plasma Processes Inc. Huntsville, AL

## RESEARCH INTERESTS

- Nanocomposites and Coatings
- Thermal Spray and Surface Engineering
- Spark Plasma Sintering
- Nanoindentation and In-situ Nanomechanics
- Graphene, Boron Nitride and Carbon Nanotube Composites
- Ultrahigh Temperature Ceramics
- Nano-scale Properties of Biological Materials
- Nano and Macro-scale Tribology
- Near Net Shape Processing and Rapid Prototyping
- Laser Materials Processing and Pulsed Electrode Surfacing

## HONORS AND AWARDS

- Provost's Award for Mentoring Graduate Students, FIU, March 2018
- Nanomaterials and Energy Prize (**Best paper in the journal**), Institute of Civil Engineers (ICE), UK, October 2017
- *Excellence in Review Award*, Carbon journal, 2013-14.
- *Fellow*, ASM International 2012.
- NSF *CAREER Award* 2006-2011.
- FIU President's Council *Outstanding Professor of the Year 2010* for sustained excellence in teaching, research and service, October 2010. FIU has more than 1000 professors in the University.
- FIU Faculty *Excellence in Mentorship* Award, October 2010.
- FIU President's Council Outstanding Professor of the Year 2009 (**Top 3 Finalist**): FIU has more than 1000 professors in the University, September 2009. The award is given to recognize sustained excellence in the areas of research, teaching, and service.
- *Faculty Advisor of the Year* 2009-2010, Student Organization Council, Florida International University, April 2010.
- FIU Faculty *Excellence in Research* Award, September 2008.
- FIU President's Council Outstanding Professor of the Year 2008 (**Top 3 Finalist**): FIU has more than 1000 professors in the entire University, September 2008. The award is given to recognize sustained excellence in the areas of research, teaching, and service.
- FIU Excellence in Faculty Scholarship Award, April 2008
- Executive *Dean's Research Award*, College of Engineering and Computing, FIU, April 2007.
- Paper Ranked # 1 (most downloaded) in Materials Science and Engineering: R journal published by Elsevier Science, April-June, 2007.

- **Faculty Advisor of the Year** 2006-2007, Student Organization Council, Florida International University, 2007.
- **Faculty Advisor of the Year** 2004-2005, Student Organization Council, Florida International University, 2005.
- The Minerals, Metals and Materials Society (**TMS**) **Young Leader** Internship Award 2004.
- **ASM/IIM Visiting Lectureship Award** 2004.
- Member of the selection board for awarding the best paper in J. Thermal Spray Technology
- Nominated by Vice President of University of Tennessee for Certificate of Merit for Academic Proficiency for 1998 and 1999.
- Honorary Student member of Sigma Xi The Scientific Research Society USA, 1999
- Honorary Student member of Phi-Kappa-Phi, USA, 1998.

## **ADMINISTRATIVE EXPERIENCE**

### **(1) Director, AMERI (Fall 2012 onward)**

AMERI is an open access user facility used by 25 faculty members and more than 50 graduate students and several industries and universities in South Florida. AMERI has a staff of 8 people which include an Assistant Director, 2 doctoral level scientific officers, 2 MS level engineers, 2 BS level engineer, and 1 administrative staff. AMERI is a core-recharge center facility at FIU. Prof. Agarwal has directed this institute successfully and grown its **revenue from \$30K to \$160K in 5 years**. Some of the major achievements and activities under his leadership are as follows:

- Development of a business model as recharge center to generate operational funds
- Work with FIU Office of Research and Economic Development (ORED) to develop a rate tool for internal and external users as per Federal guidelines
- Develop a relationship with local Miami chamber of commerce, Bio-Florida, and other Florida organizations to get more business for AMERI
- Helping local small businesses in South Florida to incubate using AMERI facilities
- Develop protocols for external industrial users to use AMERI
- Strategic investment in buying new equipment and major upgrades for AMERI
- Establishing safety training and equipment access policy for AMERI users which includes more than 50 doctoral students.
- Created online facility management and invoicing system for efficient use of tools
- Created an External Industrial Advisory Board to advise AMERI's operation
- Grant enabler for three (3) active NSF ERCs and current active \$10M grants
- AMERI is a major facility that has enabled faculty recruitment in several departments in CEC and other colleges in FIU.

### **(2) Associate Dean for Research, CEC (August 2015-October 2017)**

As Associate Dean for Research for College of Engineering and Computing at FIU, which has 106 tenured/tenure-track faculty, Prof. Agarwal led the college to grow its research profile and displayed financial understanding, prudent decision making and man management in a large organization. Some of his major activities included following:

- Manage annual research expenditure of \$25M

- Managing his own research with more than \$1M active in grants
- Mentoring ~ 30 junior faculty in all departments of engineering and computer science to be successful in securing external funding
- Organized CAREER proposal workshop and panel discussion
- The patent workshop was conducted for Ph.D. students, postdocs and faculty to increase the culture of innovation.
- Develop a strategy to improve research profile of the college by maintaining an active check on the research trends of federal agencies
- Spending indirect cost returns on strategic areas such as:
  - New faculty travel support
  - Grant writing workshop,
  - Critical equipment repair
  - Cost-share for faculty grants in strategic areas
- Coordinated closely with Office of Economic Research and Development (ORED) for establishing policies for cost share in grant submission and limited opportunity proposal submission
- Coordinated closely with Office of Economic Research and Development (ORED) to hire Post-Docs in CEC to meet State's Pre-emerging Research University metrics
- Co-ordinated efforts for FIU-CEC participate in three (3) NSF- Engineering Research Center (ERC) proposals. Two (2) ERCs proposals have been awarded to FIU as a partner which include several faculty members from MME, BME, Physics, and Diversity.
- Coordinated college-wide initiatives on cybersecurity, virtual reality, and smart infrastructure.
- Interacted regularly with a faculty member from six departments on a daily basis on complex issues related to laboratory space, grants cost share, grants submission, equipment repair, and conflict management.
- Worked with other Associate Deans in the University to coordinate large initiatives.
- Worked with Vice President of Research on a regular basis.

### **(3). Chairperson, Mechanical and Materials Engineering (Oct 2017 onward)**

In a short period of 6 months as the Chair of the MME department, Prof. Agarwal has led several new initiatives. Some of these initiatives and achievements are listed below:

- Redesigned undergraduate curriculum and got it approved effective Fall 2018 to improve the efficiency and graduation rate.
- Efficient and aggressive advising of BS students resulted in the 4-year projected graduation rate of 15% (which is more than the double increase from the previous 4-year graduation rate of 6%).
- PUMA: Placing Undergraduates in Mentored Activities. Every faculty member mentors 8-10 undergraduate students every semester to counsel on career, mechanical engineering as a profession, graduate school and any other concerns.
- Working on creating a sequence of online courses.
- Created a performance matrix to track the progress and graduation of doctoral students.
- Working on active recruitment plan for graduate students.
- Continuing faculty search to hire 1 replacement and 5 new (cluster hire between MME/CEE) faculty members.



- Recruited a student team to assist in improving social media presence of MME department to highlight news and achievements.
- Creating a National Level Industrial Advisory Board to assist in MME profile and fundraising.
- Upgrade of several types of equipment in undergraduate teaching ME labs.

## **MEMBERSHIP IN BOARDS OF REVIEW AND ADVISORY ROLES**

### **(A) National and International Advisory Committees**

- Chair, Advanced Manufacturing Expert Committee, Canada Foundation for Innovation, 2017.
- Member, THERMEC Executive Committee, Las Vegas, NV, December 2-6, 2013.
- Member, Thermal Spray Society Award Committee, ASM International, 2013 onward
- INSTITUTE OF METALS LECTURER & ROBERT FRANKLIN MEHL AWARD Committee, TMS, to recognize an outstanding scientific leader by inviting him/her to present a lecture at the Society's Annual Meeting on a technical subject of particular interest to members in the materials science and application of metals program areas, Sept 2009-2012.
- Functional Surface Coatings, TMS Energy Committee, U.S. Department of Energy (DOE) Industrial Technologies Program (ITP), 2010-11
- International Advisory Committee, High-Tech Aluminas and Unfolding their Business Prospects (Aluminas -2013), Kolkata, March 7-9, 2013
- Advisory Committee, Nano Florida 2011 Conference, Miami, FL, Sept 30-Oct.1, 2011
- Technical Advisory Committee, International Symposium on Hydrogen and Energy Storage, January 14-15, 2010, IIT Kanpur, India.

### **(B) Research Funding Agencies**

- National Science Foundation (NSF) Proposals Reviewer and Panelist-2003 onwards.
- Sandia National Lab (DOE) Proposals Reviewer and Panelist
- Army Research Office (ARO) Proposal Reviewer
- Department of Defense Experimental Program to Stimulate Competitive Research (DEPSCoR) Reviewer
- American Association for the Advancement of Science (AAAS) and King Abdulaziz City for Science and Technology (KACST) Research Proposals
- Natural Sciences and Engineering Research Council of Canada (NSERC)
- DST (India)-UKIERI Thematic Partnerships
- Research Science Council (RSC), Hong Kong
- European Science Foundation
- German Science Foundation
- Swiss National Science Foundation
- Israeli Ministry of Science, Technology, and Space
- Austrian Science Fund Proposals (FWF) Reviewer
- Georgian National Science Foundation Reviewer
- U.S. Civilian Research & Development Foundation (CRDF) Reviewer
- International Copper Association (ICA) Proposal Reviewer

### (C) Editorial Board of Journals

- Editorial Board, *Surface and Coatings Technology* (Elsevier), 2012 onwards.
- Editorial Board, *Advances in Tribology* (Hindawi), 2009 onwards
- Board of Review: *Materials and Metallurgical Transactions A* (Springer), 2002-onwards
- Guest Editor, Nanomaterials Journal (MDPI, Switzerland), Special topic on “Nanomechanical Properties of Biological and Biomaterials”, 2018.
- Guest Editor, *Coatings* Journal (MDPI, Switzerland), Special topic on “Ultrahigh Temperature Coatings and Ceramics,” 2017
- *Advanced Materials & Processes* (ASM International) Editorial Committee, 2009-2015
- *JOM* Advisor, Surface Engineering (TMS), 2009-2015
- Associate Editor, *Journal of Thermal Spray Technology* (Springer), 2010-2015
- Guest Editor, *Journal of Thermal Spray Technology* (Springer), 2010-2013
- International Board of Review, *J. Materials Engineering, and Performance* (ASM International), 2002-04.

## TEACHING ACTIVITIES

### (i) Graduate Courses

- EMA 5106: *Thermodynamics and Kinetics of Materials*: Spring 2003, Spring 2004, Spring 2005, Fall 2005, Fall 2006, Fall 2007, Fall 2008, Fall 2009, Fall 2010, Fall 2011, Fall 2012, and Fall 2013
- EMA 5015: *Introduction to Nanomaterials Engineering*: Spring 2004, Spring 2006, and Spring 2007.
- EMA 5001: *Physical Properties of Materials*: Fall 2004, Spring 2012
- EMA 5507C: *Analytical Methods in Materials Science*: Fall 2007, Fall 2008, Fall 2009, Fall 2010, Fall 2011, Spring 2013, Fall 2013, Spring 2016, Spring 2017, and Fall 2017
- EMA 5295: *Principles of Composite Materials*: Fall 2003 and Spring 2009.
- EMA 5200: *Nanomechanics and Nanotribology*, Spring 2011, Spring 2013, Fall 2014, and Fall 2016
- EML 6935: *MME Department Graduate Seminar*: 2003-2004.

### (ii) Undergraduate Courses

- EMA 4521: *Materials Science I*: Fall 2003, Summer 2004, Spring 2005, Fall 2005, and Spring 2007.
- EGN 3365: *Materials Engineering*: Summer 2005, Spring 2015, Fall 2015, and Spring 2018
- EGN 1033: *Technology, Humans and Society*, Fall 2010, Spring 2011, Fall 2011, Spring 2012, and Summer 2012
- *Special Topics for MME Undergraduate*: Several semesters

### (iii) Short Course Offering

- Short Course on “Introduction to Nanotechnology and Nanomanufacturing” was conducted for professionals (17 attendees included Professors, Head of the Dept., Industrial Research

Scientists, and Government Project Managers) at Charlotte on March 14, 2004, during Annual TMS Meeting.

- Short Course “Introduction to Nanotechnology and Nanomanufacturing” conducted for professionals (14 attendees) at Pittsburgh on September 25, 2005, during MS&T 2005 meeting.
- Short Course “Introduction to Nanotechnology and Nanomanufacturing” conducted for Whirlpool professionals and Lake Michigan College-Benton Harbor, MI, April 26-27, 2006.
- Short Course on “Introduction to Nanotechnology” conducted for professionals in South Florida Region (attended by FAU faculty, professional engineer, and Miami Science Museum Director) on Feb 1-2, 2008.
- A 2-week course titled “Thermal Sprayed Coatings & Composites: Science, Engineering, and Applications,” was conducted at MN National Institute of Technology, Allahabad, India under Global Initiative of Academic Network (GIAN) program of Govt. of India, June 20-July 1, 2016.
- Organized 2-day AMERI workshop on “Micro Fabrication and Materials Analysis,” for last 3 years. It has become an annual event in South Florida highlighted by NPR, social media and professional societies.

## MENTORED STUDENTS AND POST-DOCS

### (a) Doctoral Students

1. **Tapas Laha** (*Ph.D., MSE, Fall 2006*): ***Carbon Nanotube Reinforced Aluminum Based Nanocomposites by Thermal Spray Forming***, working as an Assistant Professor in the Metallurgical and Materials Engineering department at Indian Institute of Technology (IIT), Kharagpur.
2. **Kantesh Balani** (*Ph.D., MSE, Summer 2007*): ***Role of Carbon Nanotube in Fracture Toughening of Plasma Sprayed Aluminum Oxide Nanocomposite***, working as an Associate Professor in the Metallurgical and Materials Engineering department at Indian Institute of Technology (IIT), Kanpur.
3. **Bakshi Srinivasa Rao** (*Ph.D., MSE, Summer 2009*), ***Plasma and Cold Spraying of Aluminum Carbon Nanotube Composites: Quantification of Nanotube Distribution and Multi-scale Mechanical Properties***, working as an Assistant Professor in the Metallurgical and Materials Engineering department at Indian Institute of Technology (IIT), Chennai.
4. **Anup Kumar Keshri**, (*Ph.D., MSE, Summer 2010*), ***Comprehensive Process Maps to Synthesize High-Density Plasma Sprayed Carbon Nanotube Reinforced Aluminum Oxide Coatings for Improved Mechanical and Wear Properties.***, working as an Assistant Professor in the Materials Engineering department at Indian Institute of Technology (IIT), Patna.
5. **Debrupa Lahiri**, (*Ph.D., MSE, Summer 2011*), ***Hydroxyapatite-Nanotube Composites and Coatings for Orthopedic Implants***, working as an Assistant Professor in the Department of Metallurgical and Materials Engineering at Indian Institute of Technology (IIT), Roorkee.

6. **Sadegh Behdad**: *Ph.D. (MSE, Fall 2015), Novel Ternary Magnesium-Tin Alloys by Microalloying*, working as a research engineer with Magic Leap (co-advised with Prof. Benjamin Boesl as Major Professor)
7. **Chris Rudolf**, (*Ph.D., Summer 2016*), *TaC-NbC Reinforced with Graphene Nanoplatelets*, working as a post-doctoral researcher at Naval Research Laboratory (NRL), Washington DC, (co-advised with Prof. Benjamin Boesl as Major Professor)
8. **Cheng Zhang**, (*Ph.D. Fall 2016*), *Oxidation Behavior of HfC-TaC based Ultrahigh Temperature Ceramics*, working as a post-doctoral researcher at Plasma Forming Laboratory, FIU (co-advised with Prof. Benjamin Boesl as Major Professor)
9. Archana Loganathan (*Ph.D. (MSE, expected to graduate in Dec 2018)*),
10. Pranjal Nautiyal, (*Ph.D. MSE, expected to graduate in Spring 2020*)
11. Adeyinka Idowu, (*Ph.D. MSE, expected to graduate in Summer 2019*)
12. Sadhana Bhusal (*Ph.D., ME started in Summer 2017*)
13. Mitchell Hopper (*Ph.D., MSE started in Spring 2018*)
14. Xiaolong Lu (*visiting Ph.D. student for two years from China, started January 2018*)

**(b) Masters Students**

15. **Gabriela Gonzalez** (*MS, MSE, Fall 2004*): *Characterization of Vacuum Plasma Sprayed Tantalum Carbide*, presently working as Materials and Production Engineer at Toyota.
16. **Venkata B. Pasumarthi**, (*MS, MSE, Summer 2007*): *Reaction Synthesis of MAX Phases by Plasma Spraying*, presently working as Software Engineer
17. **Sunil Anand Musali** (*MS, MSE, Fall 2007*), *Plasma Processing Maps for Ceramic Coatings using In-flight Particle Sensor*, presently working as Process Engineer/Thermal spray at F.W Gartner, Thermal Spraying Ltd., Houston, Texas.
18. **Jorge P. Tercero** (*MS, MSE, Summer 2008*), *Effect of Nanosize Reinforcement on Plasma Sprayed Hydroxyapatite's Mechanical Properties and Biocompatibility*, presently working as Technical Service Engineer in Titan America.
19. **Riken Patel**, (*MS, MSE, Summer 2009*), *An Experimental and Computational Algorithm for Near Net Shape Fabrication of Thin-Walled Ceramic Structures by Plasma Spray Forming*, presently working as Vice President of Research in A&A Thermal Spray Company.
20. **Di Wang**, (*MS, MSE, Fall 2009*), *Wear Behavior of Ultra High Molecular Weight Polyethylene-Carbon Nanotube Composite*.
21. **Cheng Zhang**, (*MS, MSE, Spring 2012*), *Photocatalytic Activity of Plasma Sprayed Nano TiO<sub>2</sub> Coatings for Dye-Sensitized Solar Cell*, presently working as Post-Doctoral Research Scientist Plasma Forming Lab, FIU.

22. Andy Nieto, (MS, MSE, Spring 2013), ***Graphene Nanoplatelet Reinforced Tantalum Carbide by Spark Plasma Sintering***, presently working as Post-Doctoral Researcher at Army Research Lab, Aberdeen.
23. Kalty Vazquez, (MS, MSE, Fall 2013), ***Synthesis of Carbon Nanotubes Using High Voltage and High-Frequency Induction Fields***.
24. Sara Rengifo, (MS, MSE, Spring 2015), ***A Comparison of Graphene and Tungsten Disulfide based 2D Solid Lubricant Additives to Aluminum***. Presently working as Research Engineer at NASA Marshall, Huntsville, AL.
25. Leslie Embrey, (MS, MSE, Spring 2017), ***3D Graphene Reinforced Epoxy Composites***. Presently working as Research Engineer at Honeywell, Kansas.
26. Louiza Fontoura, (MS, MSE Spring 2017), ***Metallic Coating on Graphene Platelets***.
27. Ana Exime Tyndle, (MS, MSE, Fall 2017), ***Ultrasonic Processing of Aluminum-based Alloys and Composites***. presently working as a Project Engineer in Miami
28. Jenniffer Bustillos, (MS, MSE, starting May 2018), ***Titanium-Boron Nitride Nanotube Composite***

**(c) Undergraduate Student Researchers**

1. Brandon Potens (*FIU, 2003*): Plasma Engineered Nanospherical Ceramic Powders.
2. Melanie Andara (*FIU, 2004-05*): Plasma Sprayed Hydroxyapatite -Nanotube Coatings.
3. Jorge Tercero (*FIU, 2006-07*): Plasma Sprayed Hydroxyapatite Coatings.
4. Tanisha Richard (*FIU, 2008*): Biodegradable Polymer- Nanotube Composites.
5. Suvrat Bhargava (*Vellore Institute of Technology, India, 2008*): Splat Formation Simulation During Plasma Spraying.
6. David Axel Virzi (*FIU, 2008-10*): Synthesis of Ultrahigh Temperature Tantalum Carbide.
7. Jonathan Solomon (*University of Florida, 2009*): Wear Behavior of Plasma Sprayed Hydroxyapatite Coatings.
8. Akanksha Bhargava (*Vellore Institute of Technology, Vellore, India, January-April 2010*): Object Oriented Finite Element Method for Simulating Mechanical and Thermal Properties of Nanotube Reinforced Composites.
9. Sanat Ghosh (*Indian Institute of Technology, Mumbai, India, May-July 2010*): Tribology of Advanced Materials.
10. Samarth Thomas (*FIU, January 2011 onwards*): Plasma Spraying of Advanced Materials.
11. Jason Jeffrey Usher (*Drexel University, March-September 2011*), Laser Engineered Aluminum Coatings.
12. Lovish Behl (*Indian Institute of Technology, Kharagpur, May-July 2011*), Tribology of Bulk Metallic Glasses.
13. Mikael Thiesse (*INSA de Lyon, Cedex, France, May-July 2011*), Macro-scale Tribological Properties of UHMWPEPE-GNP Composites.
14. Francoise Hec (*INSA de Lyon, Cedex, France, May-July 2011*), Nano-scale Tribological Properties of UHMWPE-GNP Composites.

15. Gianni Jimenez, (*FIU, Summer 2013*), Electrical Properties of Plasma Sprayed Sensors and Coatings.
16. Pranjal Nautiyal, (*IIT Delhi, Summer 2014*), Nanoindentation based Creep of Mg Alloys.
17. Eddy Ones, (Brown University, Summer 2015), Processing-Structure-Property Relationships in 3D Printed Polymers
18. Daniela Montero, (*FIU, Fall 2015 onward*), 3D Printed PLA-Graphene Scaffolds.
19. Melania Antillon, (*FIU, Summer 2016 onward*), TaC-NbC based Ultrahigh Temperature Ceramics.
20. Laura Reyes, (*FIU, Fall 2015 onward*), Green Tribology.
21. Jenniffer Bustillos, (*FIU, Summer 2016 onward*), 3D Graphene Foam Reinforced Silicone Composite.
22. Arturo Toro, (*John Hopkins University, Summer 2016 and 2017*), Crystallography of Advanced Materials
23. Catalina Young, (*FIU, Spring 2017 onward*), Ultrahigh Temperature Ceramics by Spark Plasma Sintering
24. Rodolfo Fernandez, (*FIU, Fall 2017 onward*), Ultrahigh Temperature Ceramics by Spark Plasma Sintering
25. Noemi Denise, (*FIU, Spring 2018 onward*), Graphic Visualization of Graphene Foam Reinforced Composites and Advanced Materials
26. Arturo Toro, (*John Hopkins University, will join in Summer 2018*), PANI-BNNT Composites, supported by Army Research Office's Undergraduate Research Apprenticeship Program (URAP)
27. Briana Canet, (*FIU, will join in Summer 2018*), 3D Printed Biopolymers, supported by Research Experience for Minorities (REM) program of Cell-MET NSF ERC.

**(d) Post-Doctoral/Visiting Scientists**

1. *Dr. Yao Chen*: April 24, 2006- May 30, 2008. Currently as Professor at Soochow University, China.
2. *Dr. Tapas Laha*: January 1-July 30, 2007. Currently an Associate Professor of Materials and Metallurgical Engineering, Indian Institute of Technology (IIT) Kharagpur, India.
3. *Dr. Kantesh Balani*: July 2, 2007-June 30, 2008 and June-July 2010. Currently an Associate Professor of Materials and Metallurgical Engineering, Indian Institute of Technology (IIT) Kanpur, India.
4. *Dr. Ruben Galiano Batista*: April 18-September 30, 2008.
5. *Dr. Srinivasa Rao Bakshi*: August 15, 2009-December 1, 2010. Currently as Associate Professor of Materials and Metallurgical Engineering, Indian Institute of Technology (IIT) Madras, India.
6. *Dr. Anup Kumar Keshri*: August 17, 2010-February 28, 2011. Currently an Assistant Professor of Materials and Metallurgical Engineering, Indian Institute of Technology (IIT) Patna, India.

7. *Dr. Sybille Facca*, Orthopedic Surgeon, University of Strasbourg, France, Nov. 15, 2010-May 15, 2011
8. *Dr. Mingdong Bao*, Assistant Professor, Ningbo University of Technology, China, *May 16, 2011-May 15, 2012.*
9. *Dr. Debrupa Lahiri*, Post-Doctoral Researcher, August 2011-December 2012, Currently an Assistant Professor in Materials and Metallurgical Engineering, Indian Institute of Technology (IIT), Roorkee, India
10. *Dr. Suresh Babu Pitchuka*, Scientist, International Advanced Research Center for Powder Metallurgy and New Materials (ARCI), India, June 2012- May 2013.
11. *Dr. Ugur Cavdar*, Assistant Professor, Dept. of Machine and Metal Technologies, Celal Bayar University, Manisa, Turkey, July-September 2012.
12. *Dr. Mubarak Mujawar*, Post-Doctoral Researcher, October 2016-April 2017, Currently as a Visiting Instructor in ECE, FIU
13. *Dr. Harpreet Sidhar*, Post-Doctoral Researcher, December 2016-September 2017, Currently working as Research Engineer at ExxonMobil Upstream Research Company, Houston, TX.
14. *Dr. Lin Wang*, Post-Doctoral Researcher, January-December 2017, Currently working as Assistant Professor in China
15. *Ms. Francy Mayoli Casallas Caicedo*, Visiting Doctoral Researcher, Sept 2017-Feb 2018, currently a Ph.D. student at Columbia
16. *Dr. Manuel Alberteris*, Post-Doctoral Researcher, February-December 2017, Currently working as a Research Engineer in CEE, FIU.
17. *Dr. Cheng Zhang*, Post-Doctoral Researcher, January 2017 onward, currently Seniormost Research Engineer in Plasma Forming Lab, FIU.
18. *Dr. Tony Thomas*, Post-Doctoral Researcher, January 2017 onward, currently working as Research Engineer in Plasma Forming Lab, FIU.

**(e) High School Teachers**

1. Ms. Carmen L. Garcia, Engineering Magnet Instructor, ***Coral Park Senior High School***, Miami, Summer 2010, as a part of Research Experience for Teachers (RET) program supported by NSF.
- 2.** Ms. Melissa Fernandez, ***MAST Academy***, Miami, Summer 2010, as a part of Research Experience for Teachers (RET) program supported by NSF.

**(f) High School Summer Interns**

1. Dayan Paez- MAST Academy (Summer 2003). *Dayan graduated with a BS and MS in Mechanical Engineering from MIT in 2009.*
2. Luis Vasquez - Coral Park High School (Summer 2003)
3. Raul Galindo-Coral Gables Senior High School (Fall 2005 and Spring 2006). *Currently, Raul is a junior in the Department of Mechanical and Materials Engineering at FIU.* Francisco Vega- Killian Senior High School (Fall 2005 and Spring 2006)

4. Gautham Gopal – Fergusson High School (Summer 2006).
5. Pradeep Gopal – Fergusson High School (Summer 2006).
6. Joseph Randall Mills: Fergusson High School (Summer 2008): *Currently a freshman at the University of Central Florida, Orlando.*
7. Joaquim Ardisson: MAST Academy (Summer 2008): *Currently a freshman at Cornell University.*
8. Juan Puerta: Coral Park High School (Summer 2009): *Admitted to MIT as a freshman from 2010.*
9. Laura Salas: Coral Park High School (Summer 2010)
10. Ignacio de Socarraz-Novoa: Columbus High School (Summer 2011)
11. Ashwin Bhat- Fergusson High School (Summer 2011).
12. Nicholas Vo- Miami Lakes Educational Center, (Summer 2012)
13. Abhinav Reddi- (Summer 2012, 2013)
14. Peter McGoron- (Summer 2017)
15. **TBD**-(Summer 2018), supported by Army Research Office’s High School Apprenticeship Program (HSAP) grant.

## **MEMBERSHIP ON GRADUATE DEGREE CANDIDATES' COMMITTEES**

### **Doctoral Students**

1. *Yazan S. Hijazi*: Ph.D. (Electrical Eng.), Next Generation High-Density Three-Dimensional Magnetic Recording Systems, 2005.
2. *Chenxi Lu*: Ph.D. (Physics), The Correlation of Structure and Electronic Properties Near the Surface of Transition Metal Oxides, 2006.
3. *Hayri Sapmaz*: Ph.D. (Mechanical Eng.), Soot measurements in Steady and Pulsed Ethylene/Air Diffusion Flames using Laser-Induced Incandescence, 2006.
4. *Wenzong Wu*: Ph.D. (Materials Eng.), Low-Temperature Sintering Semiconducting Barium Strontium Titanate, 2007.
5. *Nishad Pathak*: Ph.D. (Materials Eng.), Synthesis, Characterization, and Study of Physical Properties of Novel  $M_{N+1}AX_N$  Compounds, 2008.
6. *Shrinivas Kulkarni*: Ph.D. (Materials Eng.), Synthesis, Characterization and Study of Physical Properties of  $M_2AC$  ( $M = Ti, V, Cr, Nb, Zr$ ) ( $A = Al, S, Sn$ ) MAX Phases, 2008.
7. *Ray Moral*: Ph.D. (Mechanical Eng.), Hybrid Multi-Objective Optimization and Hybridized Self-Organizing Response Surface Method, 2008.
8. *Qiang Wang*: Ph.D. (Biomedical Eng.), In Vivo Biocompatibility Evaluation of Composite Polymeric Materials for Use in a Novel Biocompatibility Artificial Heart Valve, 2008.
9. *Jun Huang*: Ph.D. (Materials Eng.), Controlled Growth of Carbon Nanotubes for High-Performance Nanoelectronics, 2009.
10. *Xiaohua Li*: Ph.D. (Mechanical Eng.), Study of Carbon Nanotube Film and Shape Memory Alloys Treatment for Structural Vibration Control, 2009.



11. *Harindra Vedala*: Ph.D. (Materials Eng.), Functionalized Carbon Nanotube Nanoelectrodes for Biomolecular Recognition, 2009.
12. *Lyci George*: Ph.D. (Materials Eng.), High-Pressure Synthesis and Thermodynamic Properties of Hydrides for Hydrogen Storage, 2010.
13. *Subrahmanyam Garimella*: Ph.D. (Materials Eng.), High-Pressure Raman Study on the Decomposition of Polycrystalline Molybdenum Hexacarbonyl, 2010.
14. *Mohammad S. Siddiqui*: Ph.D. (Materials Eng.), Vacuum Brazing of Alumina Ceramic to Titanium for Biomedical Implants Using Pure Gold as the Filler Metal, 2011.
15. *Indranil Lahiri*: Ph.D. (Materials Eng.), Carbon Nanotube-Based Systems for High Energy Efficient Applications, 2011.
16. *Kaushal Jha*: Ph.D. (Civil Engineering), An Energy-Based Nanomechanical Properties Evaluation Method for Cementitious Materials, 2012.
17. *German "Rick" Vargas*: Ph.D. (Electrical Eng.), Silicon Photonic Device For Wavelength Sensing and Monitoring, 2012.
18. *Ali Karbasi*: Ph.D. (Materials Eng.), Developing a High-Density Pt/Alumina Hermetic Feedthrough, 2012.
19. *Yuehai Yang*: Ph.D. (Physics), Mechanical and Electrical Properties of Single-Walled Carbon Nanotubes Synthesized by Chemical Vapor Deposition, (2013).
20. *Sushant Kumar*: Ph.D. (Materials Eng.), Study of Materials and Processes for Clean Energy Applications (2013).
21. *Sushma Amruthaluri*: Ph.D. (Materials Eng.), An Investigation on Biocompatibility of Bioabsorbable Polymer-Coated Magnesium Alloys (2014).
22. *Yongzhou Sun*: Ph.D. (Materials Eng.), Study of Ammonia Borane and its Derivatives: Influence of Nanoconfinement, Catalyst, and Pressure (2015).
23. *Eric Zhang*: Ph.D. (Civil Engineering), The Performance and Service Life Prediction of High-Performance Concrete in Sulfate and Acidic Environments, **completed, 2015**
24. *Rajesh Jha*: Ph.D. (Materials Eng.), Combined Computational-Experimental Design of High-Temperature, High-Intensity Permanent Magnetic Alloys with Minimal Addition of Rare-Earth Elements, **completed, 2016**
25. *Hari Kishore Adluru*: Ph.D. (Mechanical Eng.), A Novel Hip Implant Using 3D Woven Composite Material – Design and Analysis, **completed, 2016**
26. *Weiwei Lin*: Ph.D. (Materials Eng.), Creation and Evaluation of Polymer/Multiwall Carbon Nanotube Films for Structural Vibration Control and Strain Sensing Properties, **completed, 2016**.
27. *Ata Dolatmoradi*: Ph.D. (Materials Eng.), Thermally-Assisted Acoustofluidic Separation for Bioanalytical Applications, **completed, 2017**.
28. *Shadi Darvish*: Ph.D. (Materials Eng.), Thermodynamic Investigation of  $\text{La}_{0.8}\text{Sr}_{0.2}\text{MnO}_{3\pm\delta}$ , Including the Prediction of Defect Chemistry, Electrical Conductivity, and Thermo-mechanical Properties, **completed 2018**.

29. *Paniz Foroughi*: Ph.D. (Materials Eng.), Synthesis & Fundamental Mechanism Study of Nano-crystalline High Temperature & Ultrahigh Temperature Carbide & Boride Ceramics, **completed 2018**.

30. *Shichen Cheng*: Ph.D. (Materials Eng.), **in progress**.

I am also an external reviewer for Ph.D. dissertations from Universities in other countries (e.g., Australia, India).

### **Masters Students**

1. *Andres Felipe Aguirre*: MS (Biomedical Eng.), Static and Dynamic Mechanical Testing of a Polymer with Potential Use as Heart Valve Material, 2003.
2. *Karthik Trichy*: MS (Mechanical Eng.), Dielectric Properties of Refractory Composites via a Cavity Perturbation, 2004.
3. *S. Kanchibotala*: MS (Mechanical Eng.), Study on Amorphization of Ni-Ti-Ta-System and Production of NiTi-Ta Alloys through Conventional Powder Metallurgy, 2004.
4. *Bangalore Rao*: MS (Materials Eng.), Electrical characteristic of Geometrically Confined Multiwall Carbon Nanotubes Mat, 2005.
5. *Tejas Choksi*: MS (Biomedical Eng.), Modification of a Novel Polymer with Potential Use in Artificial Heart Valves: Effects on Hemocompatibility and Mechanical Properties, 2006.
6. *Bimal Pandey*: MS (Physics), Effect of Catalyst and Carbon Source on the Growth of Carbon Nanotube Y-Junctions, 2006.
7. *Carlos Perez*: MS (Materials Eng.), Development of Silver Inks for Front End Metallization in Screen Printed High-Efficiency Silicon Solar Cells, 2007.
8. *Tao Li*: MS (Physics): Synthesis and Mechanical, Electrical and Thermal Properties of Carbon Nanotube-Alumina Nanocomposite, 2007.
9. *Sushma Amruthaluri*: MS (Materials Eng.), Synthesis of Cu-MWCNT Composite and its Electrical Conductivity Measurement, 2008.
10. *S. Boddepalli*: MS (Materials Eng.), Enhancement of Field Emission from Multistage Structure of Carbon Nanotube Arrays, 2008.
11. *Puneet Gill*: MS (Materials Eng.), Synthesis and Investigation of Highly Conductive Cu-Cr-MWCNT Composite, 2009.
12. *Suvrat Bhargava*: MS (Mechanical Eng.), Multi-Objective Optimization of the Molecular Structure of Refrigerants, 2010.
13. *Sohail Reddy*: MS (Mechanical Eng.), Multi-Objective Analysis and Optimization of Integrated Cooling in Micro-Electronics With Hot Spots, 2015.

### **RESEARCH INFRASTRUCTURE CREATION**

Nine (9) new research laboratories have been established which **include eight (8) research laboratories using external funding**.

1. **Plasma Forming Laboratory (PFL)**: This laboratory makes use of 40 kW DC plasma spray system to synthesize coatings, nanocomposite structures, near net shape structures and

functional materials. Basic equipment was purchased from my start-up funds, but a subsequent augmentation of facilities in PFL has been done through external research funds.

2. **Nanomechanics and Nanotribology Laboratory (NnN Lab):** This lab utilizes state of the art Hysitron Triboindenter along with Scanning Probe Microscope (SPM) and nano DMA to evaluate nanoscale mechanical properties of materials. The support for this lab was provided by Office of Naval Research (ONR) through DURIP.
3. **Bulk Metallic Glass Forming Laboratory (BMG Lab):** A state of the art arc melting furnace with suction casting system for synthesis of bulk metallic glassy materials and alloys (*in collaboration with Prof. G. S. Dulikravich*). The support for this lab was provided by Army Research Office (ARO).
4. **High-Temperature Tribology Laboratory (HTTL):** This lab utilizes Nanovea Pin/Ball on Disk Tribometer to study the tribological properties of coatings and materials at room and high temperature (up to 800<sup>o</sup>C) in dry and lubricated conditions. The support for this lab was provided by Office of Naval Research (ONR).
5. **Optical Profilometry Lab (OPL):** A state of the art non-contact Nanovea optical profilometer to study the surface topography of the coatings to understand wear, mechanical properties, and microstructure. The support for this lab was provided by Office of Naval Research (ONR).
6. **Helium Pycnometry Lab:** This equipment enables measurement of the true density of most solids and slurries, using Helium gas. The support for this lab was provided by National Science Foundation (NSF).
7. **Spark Plasma Sintering Lab:** This lab is established to develop novel nanocomposites, amorphous materials, nanostructured ceramics. The support for this lab was provided by Air Force Office of Scientific Research (AFOSR) through DURIP.
8. **Ultra Low Load Mechanical Properties Estimation and Strain Visualization Lab:** This lab is established to develop study micromechanics and failure of a single fiber, tissue, and soft materials along with non-contact video extensometer and a high-speed camera. The support for this lab was provided by Air Force Office of Scientific Research (AFOSR) through DURIP.
9. **Flash Diffusivity and Dynamic Mechanical-Thermal Properties Lab:** This DURIP award was granted in January 2018. This lab is under installation to study thermal (diffusivity, conductivity) and mechanical properties of materials. The support for this lab was provided by ONR through DURIP.

## **LIST OF PUBLICATIONS**

### **Summary: Total 274**

Book (Authored) -1, Books (Edited) - 7, Book Chapters -4, Peer Reviewed Journal Articles - 220, Conference Proceeding Articles -27, Book Reviews-15, Patents Filed-3.

Citations: 8133, H-index: 47 (April 11, 2018, *Source:* Google Scholar)

### **Books (Authored)**

1. **Carbon Nanotubes Reinforced Metal Matrix Composites:** Arvind Agarwal, Bakshi Srinivasa Rao and Debrupa Lahiri, CRC Press, October 2010, ISBN: 978-1-4398114-9-8. ***This book is highlighted by NanoScienceWorks ([www.nanoscienceworks.org](http://www.nanoscienceworks.org)).***

### **Books (Edited)**

2. ***Biosurfaces: From the perspective of Materials Scientist and Engineer***, Eds. K. Balani, Arvind Agarwal, V. Verma, and R. Narayan, Wiley, January 2015.
3. ***Thermal Spray 2012: Proceedings of International Thermal Spray Conference 2012: Air, Land, water and the Human Body: Thermal Spray Science and Applications***, edited by B.R. Marple, Arvind Agarwal, M.M. Hyland, Y.C. Lau, C.J. Li, R.S. Lima, A. McDonald, F. L. Toma, Houston, Houston, USA, 2013.
4. ***Thermal Spray 2011: Proceedings of International Thermal Spray Conference 2011***, edited by B.R. Marple, Arvind Agarwal, M.M. Hyland, Y.C. Lau, C.J. Li, R.S. Lima, A. McDonald, Hamburg, Germany, 2012.
5. ***Thermal Spray 2010: Global Solutions for Future Applications, Proceedings of International Thermal Spray Conference 2010, Global Solutions for Future Applications***, edited by B.R. Marple, Arvind Agarwal, M.M. Hyland, Y.C. Lau, C.J. Li, R.S. Lima, G. Montavon, Singapore, March 2011.
6. ***Surface Engineering in Materials Science III***, edited by Arvind Agarwal, N. B. Dahotre, S. Seal, J.J. Moore, and C. Blue, TMS, Warrendale, PA, February 2005.
7. ***Fifth Global Innovations Symposium on Materials Processing and Surfaces and Interfaces in Nanostructured Materials***, Eds: Sharmila M. Mukhopadhyay, John Smugeresky, Sudipta Seal, Narendra B. Dahotre, and Arvind Agarwal, TMS, Warrendale, PA, 2004.
8. ***Surface Engineering in Materials Science II***, edited by S. Seal, N. B. Dahotre, J.J. Moore, C. Suryanarayana and Arvind Agarwal, TMS, Warrendale, PA 2003.

### **Book Chapters**

9. "Boron Nitride Nanotubes as Fillers/Reinforcement for Polymer, Ceramic, and Metal Matrix Composites," Debrupa Lahiri and Arvind Agarwal, in ***Application and Functionalization of Nanotubes and Nanosheets***, eds. I. Chen, CRC Press, USA, *March 2015*.
10. "Graphene Reinforced Ceramic and Metal Matrix Composites," Debrupa Lahiri and Arvind Agarwal, in ***Graphene: Synthesis and Applications***, eds. W.B. Choi, CRC Press, USA, October 2011, pp. 184-227.
11. "Thermally Sprayed MAX Phase Coatings," Yao Chen and Arvind Agarwal in ***MAX Phases: Microstructure, Properties and Applications***, eds., I.M. Low and Y.C. Zhou, Nova Science Publishers, New York, USA, pp. 103-12, 2011.
12. "Surface Preparation and Properties for Coating Deposition": Arvind Agarwal and Narendra B. Dahotre in ***Intermetallic and Ceramic Coatings***, eds. Narendra B. Dahotre and T.S. Sudarshan, Marcel Dekker, New York, USA, February 1999, pp. 1-31.

### **Peer Reviewed Journal Publications**

## **2018**

1. A. Idowu, B. Boesl, and Arvind Agarwal, “3D Graphene Foam Reinforced Polymer Composites-A Review”, *Carbon*, (in press), 2018.
2. T. Paul, A. Loganathan, Arvind Agarwal and S. Harimkar, “Kinetics of Isochronal Crystallization in a Fe-based Amorphous Alloy,” *J. Alloy Compounds*, (in press), 2018.
3. M. Antillon, P. Nautiyal, A. Loganathan, B. Boesl and Arvind Agarwal, “Strengthening in Boron Nitride Nanotube Reinforced Aluminum Composites Prepared by Roll Bonding,” *Adv. Eng. Mater.*, (in press), 2018.
4. P. Nautiyal, C. Zhang, B. Boesl, and Arvind Agarwal, “Non-Equilibrium Wetting and Capture of Boron Nitride Nanotubes in Molten Aluminum during Plasma Spray,” *Scr. Mater.*, (in press), 2018.
5. P. Nautiyal, B. Boesl, and Arvind Agarwal, “The Mechanics of Energy Dissipation in a Three-Dimensional Graphene Foam with Macroporous Architecture,” *Carbon*, DOI: 10.1016/j.carbon.2018.02.028, 2018.
6. J. Bustillos, C. Zhang, B. Boesl and Arvind Agarwal, “Three-Dimensional Graphene Foam-Polymer Composite with Superior De-icing Efficiency and Strength,” *ACS Appl. Mater. Interf.*, doi.org/10.1021/acsami.7b18346, 2018.
7. Z. Xu, J. Huang, C. Zhang, S. Daryadel, A. Behroozfar, B. McWilliams, B. Boesl, Arvind Agarwal, and M. M. Jolandan, “Bioinspired Lamellar Ceramic-Metal Composite Fabricated by Electroless Plating and Spark Plasma Sintering,” *Adv. Eng. Mater.*, doi: 10.1002/adem.201700782, 2018.
8. A. Bisht, V. Kumar, L. H. Li, Y. Chen, Arvind Agarwal, and D. Lahiri, “Effect of Warm Rolling and Annealing on the Mechanical Properties of Aluminum Compositated Reinforced with Boron Nitride Nanotubes,” *Mater. Sci. Eng. A*, vol. 710, (5), pp. 366-373, 2018.
9. A. Loganathan, A. Sahoo, S. Rengifo, C. Rudolf, C. Zhang, T. Laha, B. Boesl, and Arvind Agarwal, “Multi-Scale Tribological and Nanomechanical Behavior of Cold Sprayed Ti<sub>2</sub>AlC MAX Phase Coating,” *Surf. Coat. Tech.*, vol. 334, pp.384-393, 2018.

## **2017**

10. J. Bustillos, D. Montero Zambrano, A. Loganathan, B. Boesl, and Arvind Agarwal, “Stereolithography based 3D Printed Photosensitive Polymer-Boron Nitride Nanoplatelet Composites”, *Polymer Composites*, DOI: 10.1002/pc.24662, 2017
11. L. Embrey, P. Nautiyal, B. Boesl, and Arvind Agarwal, “3D Graphene Foam Induces Multifunctionality in Epoxy Nanocomposites by Simultaneous Improvement In Mechanical, Electrical and Thermal Properties”, *ACS Appl. Mater. Inter.*, doi. 10.1021/acsami.7b14078, 2017.
- 12.** A. Loganathan, A. Sharma, C. Rudolf, P. Nautiyal, S. Suwas, B. Boesl and Arvind Agarwal, “In-situ Deformation Mechanism and Orientation Effects in Sintered 2D Boron Nitride Nanosheets” *Mater. Sci. Eng. A*, doi.org/10.1016/j.msea.2017.10.019
13. P. Nautiyal, F. Alam, K. Balani and Arvind Agarwal, “The Role of Nanomechanics in Healthcare,” *Adv. Healthcare Mater.*, doi.org/10.1002/adhm.201700793, 2017.

14. H. Sidhar, B. Boesl, and Arvind Agarwal, “The Role of Materials Science and Engineering in Improving Sea Level Rise Preparedness-Part I,” *Adv. Mater. Processes*, October 2017.
15. H. Sidhar, B. Boesl, and Arvind Agarwal, “The Role of Materials Science and Engineering in Improving Sea Level Rise Preparedness-Part II,” *Adv. Mater. Processes*, Nov./Dec. 2017.
16. Md. M. H. Bhuiyan, J. Wang, L. H. Li, P. Hodgson, Arvind Agarwal, Q. Ma and Ian Chen, “Boron Nitride Nanotube Reinforced Titanium Matrix Composites with Excellent High-Temperature Properties,” *J. Mater. Res.*, DOI: 10.1557/jmr.2017.345, 2017.
17. C. Zhang, B. Boesl, Arvind Agarwal, “Oxidation Resistance of Tantalum Carbide-Hafnium Carbide Solid Solutions under the Extreme Conditions of a Plasma Jet,” *Ceramic International*, DOI:10.1016/j.ceramint.2017.07.227, 2017.
18. A. Loganathan, S. Rengifo, A. F. Hernandez, Y. Emirov, C. Zhang, B. Boesl, J. Karthikeyan and Arvind Agarwal, “Effect of 2D WS<sub>2</sub> Addition on Cold Sprayed Aluminum Coating”, *J. Thermal Spray Tech.*, DOI: 10.1007/s11666-017-0608-8, 2017.
19. C. Zhang, A. Loganathan, B. Boesl, Arvind Agarwal, “Thermal Analysis of Tantalum carbide- Hafnium Carbide Solid Solutions from Room Temperature to 1400 °C, *Coatings*, 7(8), 111; DOI:10.3390/coatings7080111, 2017.
20. P. Nautiyal, L. Embrey, B. Boesl and Arvind Agarwal, “Multi-Scale Mechanics and Electrical Transport in a Free-Standing 3D Architecture of Graphene and Carbon Nanotubes Fabricated by Pressure Assisted Welding”, *Carbon*, vol. 122, pp. 298-306, 2017.
21. P. Foroughi, C. Zhang, Arvind Agarwal, Z. Cheng, “Understanding and Controlling Phase Separation in Synthesis of Nanocrystalline Tantalum Hafnium Carbide Solid Solution (Ta<sub>x</sub>Hf<sub>1-x</sub>C) Powders via Carbothermal Reduction Reaction”, *J. Amer. Ceram. Soc.*, DOI:10:1111/jace.15065, 2017.
22. M. Asadikiya, C. Rudolf, C. Zhang, B. Boesl, Arvind Agarwal, Yu Zhong, “ The Effect of Sintering Parameters on Spark Plasma Sintering of B<sub>4</sub>C”, *Ceram. International.*, vol. 43, Issue 14, 1 pp. 11182–11188, 2017.
23. J. Bustillos, D. Montero, P. Nautiyal, A. Loganathan, B. Boesl and Arvind Agarwal, “Integration of Multi-layer Graphene Flakes in Poly(lactic) Acid by 3D Printing to Develop Creep and Wear-resistant Hierarchical Nanocomposites”, *Polymer Composites*, DOI: 10.1002/pc.24422, 2017.
24. S. Rengifo, C. Zhang, S. Harimkar, B. Boesl and Arvind Agarwal, “Effect of WS<sub>2</sub> Addition on Tribological Behavior of Aluminum at Room and Elevated Temperatures”, *Trib. Letters.*, DOI 10.1007/s11249-017-0856-2, 2017.
25. C. Zhang, A. Gupta, S. Seal, B. Boesl and Arvind Agarwal, “Solid Solution Synthesis of TaC-HfC by Spark Plasma Sintering,” *J. Amer. Ceram Soc.* 00:1–10, 2017.
26. P. Nautiyal, B. Boesl, and Arvind Agarwal, “Harnessing Three Dimensional Anatomy of Graphene Foam to Induce Superior Damping in Hierarchical Polyimide Nanostructures,” *Small*, 1603473, 2017.

27. P. Nautiyal, A. Gupta, S. Seal, B. Boesl and Arvind Agarwal, “Reactive Wetting and Filling of Boron Nitride Nanotubes by Molten Aluminum During Equilibrium Solidification,” *Acta Mater.*, vol. 126, pp.124-131, 2017.
28. S. Rastkar, M. Zahedi, I. Korolev and Arvind Agarwal, “A Mesh-free Approach for Homogenization of Mechanical Properties of Heterogeneous Materials,” *Eng. Analysis with Boundary Elements*, vol. 75, pp.79–88, 2017.
29. S. Rengifo, C. Zhang, S. Harimkar, B. Boesl, and Arvind Agarwal, “Tribological Behavior of Spark Plasma Sintered Aluminum-Graphene Composites at Room and Elevated Temperatures,” *Technologies*, vol. 5, 4, 2017.
30. M. Asadikiya, Y. Zhong, Z. Cheng, C. Rudolf, B. Boesl and Arvind Agarwal, “Thermodynamic Modeling and Investigation of the Oxygen Effect on the Sintering of B<sub>4</sub>C”, *J. Alloys Comp.*, DOI: 10.1016/j.jallcom.2016.12.315, 2017.

## **2016**

31. C. Rudolf, B. Eranezhuth, Arvind Agarwal and B. Boesl, “(Ta, Nb)C Composites formed with Graphene Nanoplatelets by Spark Plasma Sintering,” *J. Euro. Ceramic Soc.*, DOI: 10.1016/j.jeurceramsoc.2016.11.017, 2016.
32. A. Nieto, A. Bisht, C. Zhang, D. Lahiri and Arvind Agarwal, “Graphene Reinforced Metal and Ceramic Composites-A Review,” *Inter. Mater. Review*, DOI: 10.1080/09506608.2016.1219481, 2016.
33. L. Reyes, A. Loganathan, B. Boesl, and Arvind Agarwal, “Effect of 2D Boron Nitride Nanoplate Additive on Tribological Properties of Natural Oils”, *Tribology Lett.*, Vol. 64, pp. 41-48, 2016.
34. C. Zhang, B. Boesl, L. Silvestroni, D. Sciti, and Arvind Agarwal, “Deformation Mechanism in Graphene Nanoplatelet Reinforced Tantalum Carbide using High Load *In situ* Indentation,” *Mater. Sci. Eng. A*, vol. 674, pp. 270-275, 2016.
35. P. Nautiyal, C. Rudolf, A. Loganathan, C. Zhang, B. Boesl and Arvind Agarwal, “Directionally Aligned Ultra-long Boron Nitride Nanotube Induced Strengthening in Aluminum based Sandwich Composite,” *Adv. Eng. Mater.*, DOI: 10.1002/adem.201600212, 2016.
36. P. Nautiyal, A. Loganathan, R. Agrawal, B. Boesl, C. Wang and Arvind Agarwal, “Oxidative Unzipping and Transformation of High Aspect Ratio Boron Nitride Nanotubes into “White Graphene Oxide” Platelets,” *Sci. Reports.*, 6:29498 | DOI: 10.1038/srep29498, 2016.
37. A. K. Keshri, L. Behl, D. Lahiri, G.S. Dulikravich, L. Kecskes and Arvind Agarwal, “Dry Sliding Wear Behavior of Hafnium-based Bulk Metallic Glass at Room and Elevated Temperatures,” *J. Mater. Eng. Perform.*, DOI: 10.1007/s11665-016-2242-x, 2016.
38. D. Ward, A. Gupta, S. Saraf, C. Zhang, T. S. Sakthivel, S. Barkam, Arvind Agarwal, and Sudipta Seal, “Plasma Sprayed NiAl-Graphene Oxide Composite Coating as a Model Coating for Dimensional Restoration” *Carbon*, DOI: 10.1016/j.carbon.2016.04.025, 2016.

39. C. Rudolf, Arvind Agarwal and B. Boesl, "TaC-NbC Formed by Spark Plasma Sintering with the Addition of Sintering Additives," *J. Ceram. Soc. Japan*, vol. 124 (4), 381-387, 2016.
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- AIAA/ASME/SAE/ASEE/Joint Propulsion Conference*, Salt Lake City, Utah, 8-11 July 2001.
238. Tim McKechnie, Robert Hickman and Arvind Agarwal, "Low Cost, Net Shape Fabrication of Rhenium and High-Temperature Materials for Rocket Engine Components," *Nondestructive Evaluation, Rocket Nozzle Technology and Structures and Mechanical Behavior Subcommittees Joint Meeting*, Cocoa Beach, FL, Mar 26-30, 2001.
  239. Arvind Agarwal, Robert Hickman, and Tim McKechnie, "Vacuum Plasma Spray Deposition of Refractory Hafnium Materials" *25<sup>th</sup> Annual Conference on Composites, Materials and Structures*, Ceramic, Metal and Carbon Composite Committee (CMC<sup>3</sup>), Cocoa Beach, January 22-25, 2001.
  240. Arvind Agarwal, Tim McKechnie, and Darell Engelhaupt, "Net Shape Forming of Light Weight Optical Structures for Space Applications," *Optics Manufacturing for Dual-Use*, Huntsville, AL, February 14-15, 2001.
  241. Arvind Agarwal, Tim McKechnie, Stuart Starrett and Mark. M. Opeka, "Near Net Shape Forming of Hafnium-Based Ceramic Components: Synthesis and Characterization," *Elevated Temperature Coatings-4*, TMS 2001 Annual Meeting, New Orleans, February 2001, pp. 301-316 (*peer-reviewed*).
  242. Arvind Agarwal, Robert Hickman, Timothy McKechnie and J. Scott O'Dell, "Advances in Near Net Shape Forming and Coating of Erosion Resistant Ultra High-Temperature Materials" *Tri-Service Sponsored Symposium on Advancements in Heatshield Technology*, Huntsville, May 10-11, 2000.
  243. Lalitha R. Katipelli, Arvind Agarwal, and Narendra B. Dahotre, "Oxidation and Wear Performance of Laser Surface Engineered TiC Coating on 6061 Al", *Surf. Eng. in Mater. Sci. I*, Annual TMS Meeting, Nashville, March 2000, pp. 323-334 (*peer-reviewed*).
  244. S. Shah, L.R. Katipelli, Arvind Agarwal and N. B. Dahotre, "Accelerated Liquid Metal Corrosion of Laser Surface Engineered VC Coating on Structural Steel," *Surf. Eng. in Mater. Sci. I*, Annual TMS Meeting, Nashville, March 2000, pp.311-322 (*peer-reviewed*).
  245. Arvind Agarwal and N. B. Dahotre, "NACE Conference in New Delhi" Nov. 1999.
  246. Arvind Agarwal and N. B. Dahotre, "Characterization and Tribological Behavior of Composite Boride Coating Deposited on Steel using Laser Surface Engineering," *Elevated Temperature Coatings -3*, Annual TMS Meeting, San Diego, 28<sup>th</sup> Feb-3 March 1999 (*peer-reviewed*).
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## **Book Reviews**



249. ***Nanofabrication towards Biomedical Applications***, Ed. Challa S.S. R. Kumar, Josef Hormes, and Carola Leuschner, *Materials and Manufacturing Processes*, 21(7), pp. 719, 2006.
250. ***Handbook of Infrared Spectroscopy of Ultrathin Films***: V.P. Tolstoy, I.V. Chernyshova and V.A. Skryshevsky, *Materials and Manufacturing Processes*, Vol. 19(1), pp. 117-121, 2004.
251. ***Materials and Design: The Art and Science of Materials Selection in Product Design***: M. Ashby and K. Johnson, Elsevier Science Inc., New York, 2002, *Corrosion*, Vol. 60 (6), pp.608, 2004.
252. ***Emerging Applications of Vacuum-Arc Produced Plasma, Ion, and Electron Beams***, edited by Efim Oks and Ian Brown; Kluwer Academic Publishers, *Materials and Manufacturing Processes*, Vol. 19(3), pp. 563 – 572, 2004.
253. ***An Introduction to Surface Analysis by XPS and AES***, by John F. Watts and John Wolstenholme; John Wiley & Sons Ltd., England; *Materials and Manufacturing Processes*, Vol. 19(3), pp. 563 – 572, 2004.
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255. ***NACE Corrosion Engineer's Reference Book, 3<sup>rd</sup> Edition***: R. Baboian and R.S. Treseder, NACE International, Houston, *Corrosion*, Vol. 59 (4), pp. 376, 2003.
256. ***Fundamentals of Materials Science and Engineering-An Interactive E-Text***: W.D. Callister, John Wiley and Sons, Inc., New York, 2001, *Corrosion*, Vol. 58 (11), pp. 984, 2002.
257. ***Peabody's Control of Pipeline Corrosion, 2<sup>nd</sup> edition***: R. L. Bianchetti, NACE International, Houston, *Corrosion*, Vol. 57 (8), pp. 744, 2001.
258. ***Introduction to Surface and Thin Film Processes***: John A. Venebles, *Materials and Manufacturing Processes*, Vol. 16 (6), pp. 879, 2001
259. ***Surface Modification Technologies-XIII***, T. S. Sudarshan, JK. A. Khor and M. Jeandin, Eds.; ASM International, 9639 Kinsman Rd., Materials Park, OH 44073, USA; 1999, *Materials and Manufacturing Processes*, Vol. 16(4), pp. 591-596, 2001.
260. ***Laser Beam Shaping: Theory and Techniques***: F. M. Dickey and S. C. Holswade, *Materials and Manufacturing Processes*, Vol. 16(3), pp. 439-440, 2001.
261. ***Properties of Aluminum and Aluminum Alloys: Tensile, Creep and Fatigue Data at High and Low Temperatures***, Eds. J. G. Kaufman, The Aluminum Association, and ASM International, Materials Park, OH, *Corrosion*, Vol. 57 (3), pp. 288, 2001.
262. ***Microstructural Characterization of Materials***: D. Brandon and W. D. Kaplan, *Materials and Manufacturing Processes*, Vol. 15 (3), pp. 470-472, 2000.
263. ***Thermodynamics:- Processing and Applications***: Earl Logan Jr. *Materials and Manufacturing Processes*, Vol. 15 (3), pp. 465-467, 2000.

### **Technical Reports**

264. G. S. Murty and Arvind Agarwal, "Development of Spray Coating Methods and Materials to Replace Aluminum Cladding of Aging Aircraft for Corrosion Protection," **Accession Number:** ADA470203, Final Technical Report, AFOSR, 2007.
265. Arvind Agarwal, "Multi-walled Carbon Nanotube Reinforced Aluminum Nanocomposites by Cold Kinetic Spraying," Report submitted to NSF, International Research and Education in Engineering (IREE) DMI-0634949, October 2007, <http://globalhub.org/resources/880/download/Bakshi.pdf>
266. Arvind Agarwal, "Plasma Engineered Ceramic Nanosphere," Report submitted to FIU Foundation, December 2003.
267. Arvind Agarwal and Tim McKechnie, "Lightweight Beryllium Free Nanostructured Composites," DASG60-02-P-41, Phase I SBIR Report submitted to Missile Defense Agency, December 2002.
268. Arvind Agarwal and Tim McKechnie, "Low-Cost Fabrication Lightweight Optics, Mirrors and Benches," NAS5-0008, Phase II SBIR Report submitted to NASA Goddard Space Flight Center, November 2001.
269. Arvind Agarwal and Tim McKechnie, "Vacuum Plasma Sprayed W-Re Coating," submitted to GE Corporate Research and Development, May 2001
270. Arvind Agarwal and Tim McKechnie, "Functional Gradient Thermal Barrier Coating on Aluminum," submitted to Aerojet Inc., March 2001.
271. Arvind Agarwal and Tim McKechnie, "Vacuum Plasma Spray formed FeAl structures," submitted to Chrysalis Inc., August 2001.
272. Arvind Agarwal and Tim McKechnie, "Vacuum Plasma Sprayed Hf-based Ceramic Components," SC00000163, submitted to Southern Research Institute, Birmingham, AL, March 2000- March 2001.

### **Patents**

1. US 14/984,331, Novel Age-hardenable Magnesium Alloys, Sadegh Behdad, Arvind Agarwal and Benjamin Boesl, Patent pending
2. US 15/182,042, Aluminum-Boron Nitride Nanotube Composites and Method for Making the Same, Pranjal Nautiyal, Chris Rudolf, Cheng Zhang, Benjamin Boesl and Arvind Agarwal, Patent pending
3. US 15/849,020, Three Dimensional Graphene Foam Reinforced Composite Coating and Deicing Systems There from, Jenniffer Bustillos, Cheng Zhang, Benjamin Boesl and Arvind Agarwal, Patent pending

### **Journal Manuscripts (submitted and under review)**

1. P. Nautiyal, C. Zhang, V. Champagne, B. Boesl and Arvind Agarwal, "In-situ Investigation of Splat Sliding Mechanisms in Cold Sprayed Metallic Coatings," *J. Thermal Spray Tech.*, (under review).
2. T. Thomas, C. Zhang, A. Sahu, P. Nautiyal, A. Loganathan, T. Laha, B. Boesl and Arvind Agarwal, "Effect of Graphene Reinforcement on the Mechanical Properties of Ti<sub>2</sub>AlC

Ceramic Fabricated by Spark Plasma Sintering”, *Mater. Sci. Eng. A*, (accepted with revision).

3. P. Nautiyal, M. Mujawar, B. Boesl, and Arvind Agarwal, “In situ Mechanics of 3D Graphene Foam based Ultra-stiff and Flexible Metamaterial”, *Carbon*, submitted on April 07, 2018 (under review).
4. L. Fontoura, P. Nautiyal, A. Loganathan, B. Boesl and Arvind Agarwal, “Nacre-Inspired Graphene/Metal Hybrid by In-situ Cementation Reaction and Joule Heating,” *ACS Appl. Mater. Inter.*, (under review). submitted on April 14, 2018
5. A. Loganathan, P. Nautiyal, B. Boesl and Arvind Agarwal, “Unraveling the Multiscale Nanomechanical and Damping Behavior of MXene,” *Small*, (under review).
6. A. Idowu, J. Bustillos, B. Boesl and Arvind Agarwal, “Electrically and Thermally Triggered Three-Dimensional Graphene Foam-Reinforced Shape Memory Epoxy Composites,” *ACS Nano*, (under review).

## **PRESENTATIONS AND LECTURES**

### **Keynote and Invited Lectures**

1. In-situ Mechanics of a Super-lightweight and Ultra-stiff 3D Graphene-Metal Metamaterial, Symposium: Small-scale Properties of Materials and Length-scale Phenomena, *MS&T 2018*, Columbus, OH, October 14-18, 2018. (Invited, to be presented)
2. Reactive Wetting and Filling of Nanotubes by Molten Metals to Design Advanced Nanocomposites, Symposium: Joining of Inorganic Materials: From Macro- to Nano-length Scales, *CIMTEC 2018*, Perugia, Italy, June 4-8, 2018. (Invited, to be presented)
3. Graphene Reinforced Ultrahigh Temperature TaC, *Workshop on Graphene/Ceramic Composites, Cuenca, Spain*, September 28-30, 2016 (Invited)
4. Spark Plasma Sintered TaC with Graphene, ARCI Hyderabad, India, July 2015 (Invited).
5. Plasma Sprayed Hydroxyapatite Coating with Carbon Nanotubes for Orthopedic Implants, College of Engineering Seminar, *University of Michigan, Dearborn*, Nov. 7, 2014. (Invited)
6. Plasma Sprayed Hydroxyapatite Coating with Carbon Nanotubes for Orthopedic Implants, College of Engineering Seminar, *University of Michigan, Dearborn*, Nov. 7, 2014. (Invited)
7. Spark Plasma Sintered Tantalum Carbide with Graphene NanoPlatelets Reinforcement, Symposium: Advanced High-Temperature Structural Materials, *The 8th Pacific Rim International Conference on Advanced Materials and Processing, Waikoloa, Hawaii*, Aug 4-9, 2013, (Invited)
8. Plasma Sprayed Hydroxyapatite Coating with Carbon Nanotubes for Orthopedic Implants: Thin Films and Surface Engineering, *The 8th Pacific Rim International Conference on Advanced Materials and Processing, Waikoloa, Hawaii*, Aug 4-9, 2013, (Invited)
9. **Keynote Lecture**: Nanotube and Graphene Platelet Reinforced Coatings and Composites, *Nano-Structured and/or Nano Reinforced Metal/Ceramic Composite Symposium, PM*

*2012, Powder Metallurgy World Congress*, Yokohama, Japan, October 14-18, 2012. (could not attend).

10. Boron Nitride Nanotube Reinforced Metal and Ceramic Composites for Functional Applications, *Functional and Innovative Composites, MS&T 2012 Conference*, October 7-11, Pittsburgh, PA, **(Invited)**
11. Plasma Sprayed Hydroxyapatite-Carbon Nanotube Coating for Orthopedic Applications and Small Scale Mechanical Properties of Low Dimensional Nano and Biological Materials, *Indian Institute of Technology, Chennai*, August 13, 2012 **(Invited)**
12. Nanotube Reinforced Ceramic Composites via Spark Plasma Sintering, *International Workshop on Spark Plasma Sintering*, Penn State University, State College, August 24-25, 2011 **(invited)**
13. Advances in Carbon Nanotube Reinforced Metal Matrix Composites, *National Metallurgical Day-Annual Technical Meeting (NMD-ATM)*, November 14-16, 2010, Bangalore, India **(invited)**.
14. The Roadmap for Carbon Nanotube Reinforced Metal Matrix Composites, *Nanotube Reinforced Metal Matrix Composites II," MS&T 2010 Conference*, October 17-21, Houston, TX, **(Keynote Lecture)**
15. Carbon Nanotube Reinforced Metal Matrix Composites: An Overview, *National Physics Laboratory (NPL)*, New Delhi, India, August 6, 2010 **(invited)**.
16. Plasma Sprayed Ceramic-Carbon Nanotube Coatings with Tailored Mechanical Properties, *3<sup>rd</sup> International Conference on Metallurgical Coatings and Thin Films (ICMCTF)*, April 26-30, 2010, San Diego, CA **(invited)**.
17. Carbon Nanotube Reinforced Ceramic Matrix Composites, Dept. of Mechanical Engineering, *Motilal Nehru National Institute of Technology (MNNIT)*, Allahabad, India, July 20, 2009 **(invited)**.
18. Nano-scale Mechanical Characterization of Manmade and Natural Materials, Dept. of Materials and Metallurgical Engineering, *Indian Institute of Technology (IIT), Kanpur*, India, July 14, 2009 **(invited)**.
19. Carbon Nanotube Reinforced Aluminum Composites via Thermal Spray, *Materials Science and Technology 2008*, Pittsburgh, PA, October 5-9, 2008 **(invited)**.
20. Introduction to Nanotechnology and its Application, New Science under the Stars event, *St. Thomas University*, Miami, October 24, 2007 **(invited)**.
21. Plasma Spraying of Carbon Nanotube Reinforced Nanocomposites, "Nanomaterials: Fabrication, Properties, and Applications," *Annual TMS Meeting, Orlando*, FL, 28 February 2007 **(invited)**.
22. Plasma Sprayed Carbon Nanotube Reinforced Nanocomposites, presented at Materials and Metallurgical Engineering Department, *Indian Institute of Technology, Chennai*, January 8, 2007 **(invited)**.
23. Plasma Sprayed Carbon Nanotube Reinforced Nanocomposites, presented at Materials Engineering Department, *Indian Institute of Science, Bangalore*, January 5, 2007 **(invited)**

24. Plasma Sprayed Carbon Nanotube Reinforced Nanocomposites, presented at Mechanical Engineering Department, **Indian Institute of Technology, Guwahati**, December 13, 2006 (*invited*).
25. “Near Net Shape Processing via Thermal Spray Techniques and Bulk Nanostructured Materials,” Department of Materials and Metallurgical Engineering, **Indian Institute of Technology, Kanpur, India, ASM/IIM Visiting Lectureship**, 5 August 2004 (*invited*)
26. “Bulk Composite Components Fabrication with Retained Nanostructure,” Symp Q: Mechanical Properties of Nanostructured Materials and Nanocomposites, **Fall meeting, MRS, Boston**, 1-5 Dec 2003 (*invited*)
27. “Bulk Nanostructured Components by Plasma Forming?” **American Vacuum Society, Florida Chapter, University of Central Florida, Orlando**, March 18, 2003 (*invited*).
28. “Surface Engineering, Net Shape Components, and Characterization of Advanced Materials,” **Wright State University, Dayton, OH**, April 15, 2002. (*invited*)
29. “Innovative Processing Techniques for Advanced Materials,” **Florida International University, Miami**, May 2, 2002. (*invited*).
30. “Near Net Shape Fabrication by Plasma Spray Forming,” **North Alabama Chapter ASM International, Huntsville, AL**, September 18, 2001 (*invited*).
31. “Laser Surface Engineered Titanium Diboride Coating,” Interdisciplinary Seminary Series on Biology/Biotechnology/Chemistry/Chemical & Materials Engineering/Materials Science, **the University of Alabama in Huntsville**, February 23, 2001 (*invited*)
32. “Laser Surface Engineered Titanium Diboride Coating,” **International Advanced Research Center (ARCI) for Powder Metallurgy and New Materials, Hyderabad, India**, 14 December 2000 (*invited*).
33. “Near Net Shaped Hypereutectic Al-Si Structures by Spray Forming Techniques,” **International Advanced Research Center (ARCI) for Powder Metallurgy and New Materials, Hyderabad, India**, 15 December 2000 (*invited*).

### **Contributed Lectures**

34. Three – Dimensional Graphene Foam – Polymer Composite with Superior Deicing Efficiency and Strength, Symposium: Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry, **MS&T 2018**, Columbus, OH, October 14–18, 2018 (*accepted*).
35. Nanomechanical and Multiscale Damping Properties of 2D Layered MXene Phase, **MS&T 2018**, Columbus, OH, October 14-18, 2018 (*accepted*).
36. Microstructural and Multiscale Tribological Properties of the Cold-sprayed Ti<sub>2</sub>AlC MAX Phase Coating, **MS&T 2018**, Columbus, OH, October 14-18, 2018 (*accepted*).
37. Electrically and Thermally Triggered Three-Dimensional Graphene Foam-Reinforced Shape Memory Epoxy Composites, Symposium: Responsive Functional Nanomaterials, **MS&T 2018**, Columbus, OH, October 14-18, 2018 (*accepted*).

38. In situ Mechanical Investigation of Splat Sliding in Cold Sprayed 6061Al Coatings, Symposium: Characterization and Testing: Mechanical Properties, *ITSC 2018*, Orlando, FL, May 7-10, 2018 (*accepted*).
39. Computational Approach for Designing Plasma Sprayed Coatings: From Splat to Bulk Deposits, Conference and Exposition: International Thermal Spray Conference, *ITSC 2018*, Orlando, FL, May 7-10, 2018 (*accepted*).
40. Pathways for Engineering Boron Nitride Nanotube Based High-Strength Metal Matrix Composites, Symposium: Emerging Materials and Processes II, *AEROMAT 18*, Orlando, FL, May 7-10, 2018 (*accepted*).
41. In Situ Deformation Characteristics of a Free-standing Three-dimensional Graphene Foam-aluminum Nanohybrid, Symposium: Nanocomposites V: Structure-Property Relationships in Nanostructured Materials –Nanostructures and Polymer Nanocomposites, *TMS 2018*, Phoenix, AZ, March 11-15, 2018.
42. Synthesis, Consolidation and In-situ Indentation studies on Bulk Boron Suboxide, *MS&T 2017*, Pittsburgh, PA, October 8-12, 2017.
43. Nanomechanical and Nanotribological Studies of BNNP Reinforced UHMWPE Coating for Biomedical Applications, *MS&T 2017*, Pittsburgh, PA, October 8-12, 2017.
44. Multi-scale Mechanical Properties of Biodegradable Mushroom-based Leather, Symposium: 9th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing, *MS&T 2017*, Pittsburgh, PA, October 8 – 12, 2017.
45. Integration of nanoparticles to 3D printing processes (SLA, and FDM), *MS&T 2017*, Material Advantage Undergraduate competition, Pittsburgh, PA, October 8 – 12, 2017.
46. Reaction Synthesis of 2D Boron Nitride Nanoplatelet and Graphene Nanoplatelet by Spark Plasma Sintering for BCN formation, *SMEC 2017*, Miami-Easter Caribbean, April 1-9, 2017
47. Understanding the Phase Formation and Mechanical Behaviour of Two-Dimensional Hexagonal BCN, *ICACC-2017*, Daytona Beach, Florida, January 22-27, 2017.
48. Integration of graphene in poly(lactic) acid by 3D printing to develop creep and wear-resistant hierarchical nanocomposites, Symposium: Additive Manufacturing for Surface Engineering of Materials, *MS&T 2016*, Salt Lake City, UT, October 23-27, 2016.
49. Structural and Mechanical Properties of Spark Plasma Sintered Boron Nitride Nanoplatelets, *MS&T 2016*, Salt Lake City, UT, October 23-27, 2016.
50. Multi-scale Damping Behavior of Three-Dimensional (3D) Graphene Foam-Reinforced Polyurethane Composites, Symposium: Metal and Polymer Matrix Composites III – Polymer Matrix Composites, *MS&T 2017*, Pittsburgh, PA, October 8-12, 2017.
51. Boron Nitride Nanotube Reinforced Aluminum Composite via Solidification Processing, Symposium: Metal and Polymer Matrix Composites III – Metal Matrix Composites, *MS&T 2017*, Pittsburgh, PA, October 8-12, 2017.
52. Multi-Scale Mechanics and Electrical Transport in a Free-Standing 3D Architecture of Graphene and Carbon Nanotubes Fabricated by Pressure Assisted Welding, Symposium:

- Nanostructured materials and devices, *Study of Matter at Extreme Conditions (SMEC 2017)*, Miami-Eastern Caribbean, April 1-9, 2017.
53. Ceramic Composites with 3D Contiguous Graphene Foam Reinforcement, Symposium: Innovative Processing and Synthesis of Ceramics, Glasses and Composites, *MS&T 2017*, Pittsburgh, PA, October 8-12, 2017.
  54. 3D Graphene Foam Reinforced Epoxy Composites, Symposium: Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials, *MS&T 2016*, Salt Lake City, UT, October 23-27, 2016.
  55. High-Temperature Oxidation Behavior of Hafnium Carbide-tantalum Carbide Solid Solutions Prepared by Spark Plasma Sintering, Symposium: Thermal Protection Materials and Systems, *MS&T 2016*, Salt Lake City, UT, October 23-27, 2016.
  56. Oxidative Unzipping and Transformation of High Aspect Ratio Boron Nitride Nanotubes into White Graphene Oxide Platelets, Symposium: Boron, Boron Coatings, Boron Compounds and Boron Nanomaterials: Structure, Properties, Processing, and Applications, *MS&T 2016*, Salt Lake City, UT, October 23-27, 2016.
  57. Development of 3D Printing Process for Engineering Graphene Reinforced Poly (Lactic Acid) Composite with Superior Surface Wear Resistance, Symposium: Additive Manufacturing for Surface Engineering of Materials, *MS&T 2016*, Salt Lake City, UT, October 23-27, 2016.
  58. Structural and Mechanical Properties of Spark Plasma Sintered Boron Nitride Nanoplatelets, Symposium: Boron, Boron Coatings, Boron Compounds and Boron Nanomaterials: Structure, Properties, Processing, and Applications, *MS&T 2016*, Salt Lake City, UT, October 23-27, 2016.
  59. Solid Solutions Formation of Tantalum Carbide-hafnium Carbide by Spark Plasma Sintering, Symposium: Sintering and Related Powder Processing Science & Technologies, *MS&T 2016*, Salt Lake City, UT, October 23-27, 2016.
  60. Ultrahigh Temperature Ceramics (UHTC) Materials with Nano-Reinforcement, *AFRL Research Collaboration Program Review* in Dayton, Ohio, September 22, 2016.
  61. A Study of the Mechanisms of Deformation in Graphene Nanoplatelet Reinforced Tantalum Carbide using In-situ Indentation, Symposium: Sintering and Related Powder Processing Science and Technologies, *MS&T 2015*, Columbus, OH, October 4-8, 2015.
  62. TaCNbC Formed by Spark Plasma Sintering with the Addition of Sintering Additives, *MS&T 2015*, Columbus, Ohio, Oct. 4-8, 2015.
  63. Ultrahigh Temperature Ceramics (UHTC) Materials with Nano-Reinforcement, *AFRL Research Collaboration Program Review* in Dayton, Ohio, September 17<sup>th</sup>, 2015.
  64. In-situ Indentation Behavior and Orientation Effects in Spark Plasma Sintered Graphene, *MRS Meeting*, Boston, MA, December 2015.
  65. Microstructure evolution in spark plasma sintered hafnium-tantalum carbides; *Electric Field Assisted Sintering and Related Phenomena Far From Equilibrium-An ECI Conference*, March 6-11, Tomar, Portugal
  66. Measurement of Graphene Substrates Adhesion Energy Using Nano-scratch Study, *2013 MRS Fall Meeting*, December 1-6, Boston, MA

67. Cold Sprayed Aluminum based Glassy Coatings for Improved Corrosion Resistance, *Advances in Surface Engineering: Alloyed and Composite Coatings*, 2013 TMS Annual Meeting, San Antonio, TX, March 7-11, 2013.
68. Nano- Scratch Behavior of Cold Sprayed Al-bulk Metallic Glassy Coating, *Advances in Surface Engineering: Alloyed and Composite Coatings*, 2013 TMS Annual Meeting, San Antonio, TX, March 7-11, 2013.
69. Graphene Nano-Platelets Reinforced Tantalum Carbide Consolidated by Spark Plasma Sintering, *Hybrid and Hierarchical Composite Materials Symposium*, 2013 TMS Annual Meeting, San Antonio, TX, March 7-11, 2013.
70. Graphene Nano-Platelets Reinforced Tantalum Carbide, *2013 Air Force Office of Scientific Research (AFOSR) High-Temperature Aerospace Materials Program Review*, Arlington, VA, February 11-15, 2013
71. Nanotube Reinforced Composites by Spark Plasma Sintering, *2013 Air Force Office of Scientific Research (AFOSR) High-Temperature Aerospace Materials Program Review*, Arlington, VA, February 11-15, 2013
72. Oxidation behavior of Graphene NanoPlatelets Reinforced Tantalum Carbide Composites in High Temperature Plasma Flow, *Symposium 12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nano-laminated Ternary Carbides and Nitrides (MAX Phases): Structural stability under extreme environments (irradiation, ultrahigh temperature)*, *37th International Conference & Exposition on Advanced Ceramics & Composites (ICACC)*, Jan 27 - Feb 1, 2013, Daytona Beach, Daytona, FL
73. In-situ Focused Ion Beam Microscopy of Polymer Composites, American Society of Mechanical Engineers (ASME), November 14, 2012
74. Plasma Sprayed Hydroxyapatite-Carbon Nanotube Coating for Orthopedic Applications and Small Scale Mechanical Properties of Low Dimensional Nano and Biological Materials, *Indian Institute of Science, Bangalore*, August 8, 2012
75. Preparation and Characterization of Metallic Coatings by Portable High-Pressure Cold Spray System, *International Thermal Spray Conference (ITSC) 2012*, Houston, TX, May 21-25, 2012.
76. Tribological Properties of Plasma Sprayed AlSi Coatings Reinforced by Nano-diamond Particles, *International Conference on Metallurgical Coatings and Thin Films*, San Diego, CA, April 23, 2012
77. Osseointegration of Carbon Nanotube Reinforced Hydroxyapatite Composite Coating on Titanium Implants: *in vivo* studies, *13<sup>th</sup> EFORT European Federation of National Associations of Orthopedics and Traumatology (EFFORT) Congress 2012*, Berlin, May 23-25, 2012
78. Microstructure and Mechanical Properties of Multi-structured Peacock Feathers, *Surfaces and Heterostructures at Nano- or Micro-Scale and Their Characterization, Properties, and Applications*, 2012 TMS Annual Meeting, Orlando, March 11-15, 2012.



79. Role of Yttria Stabilized Zirconia on Fracture Toughness of Plasma Sprayed Aluminum Oxide Composite Coatings, *Advances in Surface Engineering: Alloyed and Composite Coatings*, 2012 TMS Annual Meeting, Orlando, March 11-15, 2012.
80. Tribological Behavior of Plasma Sprayed Al-Si Composite Coatings Reinforced with Different Carbon Allotropes, *Advances in Surface Engineering: Alloyed and Composite Coatings*, 2012 TMS Annual Meeting, Orlando, March 11-15, 2012.
81. *In-situ* Synthesis of TiC/SiC/Ti<sub>3</sub>SiC<sub>2</sub> Composite Coatings by Spark Plasma Sintering, *Advances in Surface Engineering: Alloyed and Composite Coatings*, 2012 TMS Annual Meeting, Orlando, March 11-15, 2012.
82. Plasma Sprayed Titanium Oxide-Carbon Nanotube Composite Coating for Dye-Sensitized Solar Cells, , *Energy Nanomaterials, 2012 TMS Annual Meeting*, Orlando, March 11-15, 2012.
83. *In Vivo* Osseointegration of Nano-Designed Composite Coatings on Titanium Implants, *Biological Materials Science Symposium, 2012 TMS Annual Meeting*, Orlando, March 11-15, 2012.
84. Boron Nitride Nanotube Reinforced Aluminum Nanocomposites, *Nanocomposites*, 2012 TMS Annual Meeting, Orlando, March 11-15, 2012.
85. Multi-scale Mechanical and Tribological Behavior of Plasma Sprayed Carbon Nanotube Reinforced Aluminum Composites, *TMS 2012 Annual Meeting, and Exposition*, Orlando, Florida, March 11-15, 2012.
86. Multi-scale Mechanical Behavior of Carbon Nanotube Reinforced Aluminum Composites, *International Conference on Advances in Metallic Materials and Manufacturing Processes for Strategic Sectors (ICAMPS 2012)*, Thiruvananthapuram, India, January 19-21, 2012.
87. Spark Plasma Sintered TaC and TaC-CNT Composites for Ultrahigh Temperature Applications, *49th NMD and 65th ATM of IIM 2011*, Hyderabad, India, November 13-16, 2011
88. Mechanical Properties at Different Length Scales and Factors Affecting Strengthening in Carbon Nanotube Reinforced Aluminum Composites, *49th NMD and 65th ATM of IIM 2011*, Hyderabad, India, November 13-16, 2011
89. Carbon Nanotube Reinforced Tantalum Carbide via Spark Plasma Sintering, *2011 Air Force Office of Scientific Research (AFOSR) High-Temperature Aerospace Materials Program Review*, Arlington, VA, November 7-11, 2011
90. *In Vivo* Modification of Elastic Modulus Gradient at Implant-Bone Interface, *Emerging Frontiers in Surface Engineering of Biomaterials, Materials Science and Technology Conference 2011*, Columbus, OH, October 16-19, 2011
91. Melanocytes and melanoma cells present different mechanical properties that can be modulated by Endothelin 3, *XXI International Pigment Cell Conference (IPCC), Skin and Other Pigment Cells: Bridging Clinical Medicine and Science*, European Society for Pigment Cell Research and the Department of Dermatology and Pediatric Dermatology, University of Bordeaux, September 20-24, 2011, Palais des Congrès, Bordeaux, France

92. The Other Ones: Non-Cutaneous Melanocyte, *XXI International Pigment Cell Conference (IPCC), Skin and Other Pigment Cells: Bridging Clinical Medicine and Science*, European Society for Pigment Cell Research and the Department of Dermatology and Pediatric Dermatology, University of Bordeaux, September 20-24, 2011, Palais des Congrès, Bordeaux, France
93. Correlation Between Tribological Properties of Carbon Nanotube Reinforced Aluminum Composites at Nano and Macro length scales, *Workshop on Mechanical Behavior at Small Length Scales*, Trivandrum, India, September 18-21, 2011
94. Precipitation and Crystallization of Hydroxyapatite on Boron Nitride Nanotubes Immersed in Simulated Body Fluid, *Surfaces and Heterostructures at Nano- or Micro-Scale and Their Characterization, Properties, and Applications*, 2011 TMS Annual Meeting, San Diego, February 14-17, 2011.
95. Quantification of Osteoblast Adhesion Strength on Hydroxyapatite-Carbon Nanotube Coated Bioimplant Surface, *Biological Materials Science*, 2011 TMS Annual Meeting, San Diego, February 14-17, 2011.
96. Boron Nitride Nanotube: A Novel Reinforcement for Hydroxyapatite, *Next Generation Biomaterials, Materials Science and Technology 2010*, Houston, TX, October 17-21, 2010.
97. Quantifying Mechanical Properties and Adhesion Strength of a Single Splat – Building Blocks of Thermal Sprayed Coatings, *Mechanical Behavior of Low Dimensional Materials, Materials Science and Technology 2010*, Houston, TX, October 17-21, 2010.
98. Microstructure and Mechanical Properties of Tantalum Carbide Reinforced with Carbon Nanotubes”, *AFOSR Biennial Review Meeting*, Dayton, Ohio, 21-22 Sept. 2010
99. Mechanical Properties and Biocompatibility in-vitro and in-vivo of Plasma Sprayed Carbon Nanotube Reinforced Hydroxyapatite Coatings for Orthopedic Implants, *First TMS-ABM International Materials Congress*, July 26-30, 2010, Rio de Janeiro, Brazil
100. Synthesis and Characterization of Multi-walled Carbon Nanotube Reinforced Tantalum Carbide Composites via Spark Plasma Sintering, *12<sup>th</sup> International Ceramic Congress, CIMITEC 2010*, June 6-11, 2010, Montecatini Terme, Tuscany, Italy.
101. Quantification of Carbon Nanotube Distribution and Property Correlation in Nanocomposites, Polymer Nanocomposite, *2010 TMS Annual Meeting*, Seattle, Washington, Feb 13-17, 2010.
102. Microstructure and Mechanical Properties of Tantalum Carbide Reinforced with Carbon Nanotubes, *2010 Air Force Office of Scientific Research (AFOSR) High-Temperature Aerospace Materials Program Review*, February 1-5, 2010.
103. Investigation on Wear Resistance of Plasma Sprayed Hydroxyapatite-Carbon Nanotube Composite Coating and Cytotoxicity of Wear Debris, *34th International Conference & Exposition on Advanced Ceramics & Composites (ICACC)*, January 24-29, 2010, Daytona Beach, Florida.
104. Chemical Vapor Deposited Carbon Nanotubes Reinforced Aluminum Oxide Coating with Improved Fracture and Wear Resistance, *34th International Conference & Exposition on*

- Advanced Ceramics & Composites (ICACC)*, January 24-29, 2010, Daytona Beach, Florida.
105. Enhanced Ionic Conductivity of YSZ Electrolyte for Solid Oxide Fuel Cell, ***International Symposium on Hydrogen and Energy Storage, January 14-15, 2010, Indian Institute of Technology (IIT) Kanpur***, India.
  106. Poly Lactide-Caprolactone Copolymer-Boron Nitride Nanotube: A Novel Polymer Composite for Biodegradable Scaffold ***Application, Third International Conference on Mechanics of Biomaterials and Tissues (ICMOBT)***, Clearwater Beach, FL, December 13-17, 2009.
  107. High-Temperature Tribological Behavior of Carbon Nanotubes Reinforced Plasma Sprayed Aluminium Oxide Coating, ***23<sup>rd</sup> International Conference on Surface Modification Technologies (SMT 23)***, November 2-5, 2009
  108. Study of Melanocytes Mechanical Properties by Nanoindentation Uncovers Membrane Plasticity Behavior. ***Francois's presentation at Memphis 15th Annual Meeting of the Pan-American Society for Pigment Cell Research (PASPCR)***, September 4-7, 2009, Memphis, TN.
  109. An Experimental and Numerical Algorithm for Near Net Shape Forming of Thin-Walled Ceramic Structures by Plasma Spraying, ***US National Congress on Computational Mechanics-2009***, July 16-19, 2009, Columbus, Ohio.
  110. Plasma Sprayed Aluminum Oxide-Carbon Nanotube Composite Coatings with Improved Fracture Toughness and Wear Resistance, ***Sub-Micron and Nanostructured Ceramics***, June 7-12, 2009, Colorado Springs, Colorado.
  111. Nanomechanical Property Evaluation of Murine Cardiac Tricuspid Heart Valve, ***25<sup>th</sup> Southern Biomedical Engineering Conference***, May 15-17, 2009, Miami, FL.
  112. Superior Wear Resistance of Biocompatible Ultra High Molecular Weight Polyethylene Reinforced with Hydroxyapatite and Carbon Nanotubes, ***25<sup>th</sup> Southern Biomedical Engineering Conference***, May 15-17, 2009, Miami, FL.
  113. Copolymer- Boron Nitride Nanotube Composite for Biodegradable Scaffold Application, ***25<sup>th</sup> Southern Biomedical Engineering Conference***, May 15-17, 2009, Miami, FL.
  114. Neural Crest-Derived Melanocytes Affect the Biomechanical Properties of the Tricuspid Valve Leaflet, ***2009 Weinstein Cardiovascular Development Conference***, May 7-9, 2009, San Francisco, CA.
  115. Wear Behavior of Aluminum/Aluminum-Silicon Composite Coatings Prepared by Cold Spraying, ***2009 International Thermal Spray Conference and Exposition***, May 4-7, 2009, Las Vegas.
  116. Synthesis and Characterization of Multiwalled Carbon Nanotube Reinforced Aluminum Nanocomposite via Plasma Spraying of Spray Dried Powders, ***2009 International Thermal Spray Conference, and Exposition***, May 4-7, 2009, Las Vegas.
  117. Comparative Study of CNT/Plasma Interaction during Various Thermal Spray Processes, ***2009 International Thermal Spray Conference and Exposition***, May 4-7, 2009, Las Vegas.

118. An Experimental and Numerical Algorithm for Near Net Shape Forming of Thin-Walled Ceramic Structures by Plasma Spraying, **2009 International Thermal Spray Conference, and Exposition**, May 4-7, 2009, Las Vegas.
119. Nanotribological Properties of Carbon Nanotube Reinforced Plasma Sprayed Aluminum-Silicon Alloy Composite Coatings, **Surface Structures at Multiple Length Scales, Annual TMS Meeting**, San Francisco, Feb 16-19, 2009.
120. Interfacial Phenomena in Plasma Sprayed Multiwalled Carbon Nanotube Reinforced Aluminum Nanocomposite, **Processing, and Fabrication of Advanced Materials**, New Delhi, India, December 15-17, 2008.
121. Improving the Fracture-Toughness of Plasma Sprayed CNT - Al<sub>2</sub>O<sub>3</sub> Nanocomposite Coating, **Processing, and Fabrication of Advanced Materials**, New Delhi, India, December 15-17, 2008.
122. Nanomechanical Properties of Ultra High Molecular Weight Polyethylene- Hydroxyapatite Composite Reinforced with Carbon Nanotubes, **Processing and Fabrication of Advanced Materials**, New Delhi, India, December 15-17, 2008.
123. Multiwalled Carbon Nanotube Reinforced Aluminum Composite Coating via Cold Kinetic Spraying, **Materials Science and Technology 2008**, Pittsburgh, PA, October 5-9, 2008.
124. Chromium carbide-CNT Nanocomposites with Enhanced Mechanical Properties, **Materials Science, and Technology 2008**, Pittsburgh, PA, October 5-9, 2008
125. Biocompatibility and Tribology of Plasma Sprayed Hydroxyapatite-Carbon Nanotube Coatings, **24th Southern Biomedical Engineering Conference**, El Paso, TX, April 19, 2008
126. Multiscale Tribology of Plasma Sprayed Carbon Nanotube Reinforced Aluminum Oxide Nanocomposite Coating, "Nanomaterials: Fabrication, Properties, and Applications," **Annual TMS Meeting, New Orleans**, March 11, 2008.
127. J. Tercero, T. Laha, and Arvind Agarwal, "Fabrication of a Porous Scaffold via 3D Printing and Plasma Spray Forming", **Proceedings of ASME Early Career Technical Conference**, Miami, FL, October 5, 2007.
128. Plasma Sprayed Nanocrystalline YSZ for Fuel Cells, **University of Central Florida**, Orlando, May 10, 2007
129. Fracture Toughness Enhancement via Plasma Spraying of Insitu Grown CNT- Al<sub>2</sub>O<sub>3</sub> Nano-composite Coating, "Nanomaterials: Fabrication, Properties, and Applications," **Annual TMS Meeting, Orlando**, FL, 28 February 2007.
130. CNT Dispersion in Plasma Sprayed Nano-Al<sub>2</sub>O<sub>3</sub> – CNT Nano-Composite Coating, *presented at "Nanocomposites -Their Science, Technology, and Applications,"* **Materials Science and Technology (MS&T) 2006 Conference**, Cincinnati, OH, October 2006.
131. Biocompatibility of Plasma Sprayed Hydroxyapatite-CNT Nanocomposite Coating, "Advanced Processing of Biomaterials," **Materials Science and Technology (MS&T) 2006 Conference**, Cincinnati, OH, October 2006.
132. Spray Formed HA/CNT Substrates for Osteoblast Growth Analysis, "Tissue Engineering & Biomaterials Session," **Biomedical Engineering Society (BMES) 2006**, October 13, Chicago, 2006.

133. Fracture Toughening of Plasma Sprayed Aluminum Oxide – Carbon Nanotube Nanocomposite Coating”, Poster presented at ***Gordon Research Conference at Andover, NH***, during Aug. 13-18, 2006.
134. “Interfacial Strength Measurement of Cold Sprayed Aluminum Coatings,” ***International Thermal Spray Conference***, Seattle, WA, May 15-18, 2006.
135. “Carbon Nanotube Reinforced Hydroxyapatite Coating Biomedical Application,” ***International Thermal Spray Conference***, Seattle, WA May 15-18, 2006.
136. “Effect of Sintering on Thermally Sprayed Carbon Nanotube Reinforced Aluminum Composite,” ***Surfaced and Interfaces in Nanostructured Materials Symposium-2, Annual TMS Meeting***, San Antonio, TX, March 14-15, 2006.
137. “Plasma Sprayed Carbon Nanotube Reinforced Aluminum Oxide Coating,” ***Surfaced and Interfaces in Nanostructured Materials Symposium-2, Annual TMS Meeting***, San Antonio, TX, March 14-15, 2006.
138. “Comparative Evaluation of Plasma and High-Velocity Oxy-Fuel Spray Formed Carbon Nanotube Reinforced Al-Based Composite,” ***Surface Engineering in Materials Science III, Annual TMS Meeting, San Francisco***, February 2005.
139. “Synthesis and Characterization of Vacuum Plasma Sprayed Tantalum Carbide,” ***Surface Engineering in Materials Science III, Annual TMS Meeting, San Francisco***, February 2005.
140. “Near Net Shape Fabrication via Vacuum Plasma Spray Forming,” ***International Symposium of Research Students (ISRS-2004) on Material Science and Engineering***, December 20-22, 2004, Chennai, India
141. “Introduction to Nanotechnology,” Industrial and Systems Engineering, Florida International University Pines Center, 23 October 2004
142. “Characterization of Vacuum Plasma Sprayed Tantalum Carbide,” ***2<sup>nd</sup> International Surface Engineering Congress, Orlando***, 2-4 August 2004.
143. “Plasma Engineered Ceramic Nanospheres,” ***Surfaces and Interfaces in Nanostructured Materials Symposium, Annual TMS Meeting***, March 2004, Charlotte, NC.
144. “Electrochemical Behavior of CNT-Reinforced Aluminum Nanostructured Coating,” ***2<sup>nd</sup> International Surface Engineering Congress, ASM International, Indianapolis***, September 2003.
145. “Aluminum Based Nanostructured Composite Coatings: Processing, Microstructure and Wear Behavior,” ***Surface Engineering in Materials Science II, Annual TMS Meeting, San Diego***, March 4, 2003.
146. “Iron Aluminide Based Coating Deposited by High Energy Density Processes,” ***15<sup>th</sup> International Conference on Surface Modification Technologies, Indianapolis***, November 5-8, 2001.
147. “Net Shape Forming of Light Weight Optical Structures for Space Applications,” ***Conference Optics Manufacturing for Dual-Use, Huntsville***, AL, February 14-15, 2001.
148. “Near Net Shaped Hypereutectic Al-Si Structures by Spray Forming Techniques,” ***Surface Engineering Symposium, ASM Materials Solution Conference, St. Louis***, October 9-12, 2000.

149. "Characterization and Tribological Behavior of Composite Boride Coating Deposited on Steel using Laser Surface Engineering," *Elevated Temperature Coatings –3, Annual TMS Meeting, San Diego*, 28<sup>th</sup> Feb-3 March 1999.
150. "Characterization of Titanium Diboride Coating Deposited on Metals using Pulse Electrode Surfacing (PES) Technique", *XI International Conference on Surface Modification Technologies, Paris, France*, September 8-10, 1997.
151. "Ultrahard Ceramic Composite Coatings," presented at *University of Tennessee for MAES 595 Graduate Students*, September 1997.
152. "Environmental Embrittlement in High-Temperature Intermetallics," presented at *Intl. Seminar for Protection of Environmental Corrosion in Structural and Aircraft Materials*, November 1994, New Delhi, India.

### **Selected Poster Presentations**

153. *In-situ* Mechanics of Cold Sprayed Coatings, *Cold Spray Action Team (CSAT 2018)*, Boston, MA, June 19-20, 2018.
154. Pathways for Engineering Boron Nitride Nanotube Based High-strength Aluminum Composites, Symposium: Nanocomposites V: Structure-Property Relationships in Nanostructured Materials – Poster Session, *TMS 2018*, Phoenix, AZ, March 11-15, 2018.
155. Multi-Scale Mechanics and Electrical Transport in a Free-Standing 3D Architecture of Graphene and Carbon Nanotubes Fabricated by Pressure Assisted Welding, Symposium: Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials – Poster Session *MS&T 2017*, Pittsburgh, PA, October 8-12, 2017.
156. Splat Sliding in Cold-Sprayed Coatings, *Cold Spray Action Team (CSAT 2017)*, Boston, MA, June 14-15, 2017.
157. Oxidative Unzipping and Transformation of Boron Nitride Nanotubes into 'White Graphene Oxide' Platelets, *Florida Statewide Graduate Research Symposium 2017*, Tampa, FL, April 21, 2017.
158. Synthesis of Boron Nitride Nanotubes Reinforced Aluminum Composites by Roll-Bonding Technique, Symposium: Nanostructured materials and devices, Society for Materials at Extreme Conditions, *SMEC 2017*, Ft. Lauderdale, FL, April 1-9, 2017.
159. Nano-Scale Creep and Scratch-Induced Deformation in Mg Alloys, *Florida Statewide Graduate Research Symposium 2016*, Gainesville, FL, April 22, 2016.
160. Properties of Graphene-Silicone Prosthetic Heart Valves, *BMES 2014 Annual Meeting*, San Antonio, Texas, October 22-25, 2014.
161. Tissue Engineered Cartilage Interaction in Healthy and Diseased Environment Using Hydroxyapatite Nanoparticles, *BMES 2014 Annual Meeting*, San Antonio, Texas, October 22-25, 2014.
162. Nanoindentation reveals differences in the mechanical properties of melanocytes and melanoma cells, *American Society for Cell Biology (ASCB) 2010*, Philadelphia, PA, December 11 - 15, 2010.

163. Vacuum Plasma Sprayed Carbon Nanotube Reinforced Tantalum Carbide, *Materials Science and Technology 2010*, Houston, October 17-20, 2010.
164. Quantifying Mechanical Properties and Adhesion Strength of a Single Splat – Building Blocks of Thermal Sprayed Coatings, *Materials Science, and Technology 2010*, Houston, October 17-20, 2010. *(This poster was judged as the “Best Poster” among Graduate Students category).*
165. Nanohardness and Young’s Modulus of Nano Polycrystalline Diamond, 2010 Annual Meeting of COMPRES, Consortium for Materials Properties Research in Earth Sciences, *June 22-25, 2010, Stevenson, WA.*
166. Biocompatibility of Hydroxyapatite-Carbon Nanotube Composite for Orthopedic Implants with Improved Mechanical Properties, *Third International Conference on Mechanics of Biomaterials and Tissues (ICMOBT)*, Clearwater Beach, FL, December 13-17, 2009.
167. Nanotribology of Plasma Sprayed Hydroxyapatite Reinforced with Aluminum Oxide and Carbon Nanotubes, *International Conference on Advanced Nanomaterials and Nanotechnology*, Indian Institute of Technology, Guwahati, India, Dec. 9-11, 2009..
168. Non-wetting of Lotus Leaf, *National Metallurgist’s Day, Indian Institute of Metals*, Kolkata, India, Nov. 14, 2009.
169. Wear Behavior of Ultra High Molecular Weight Polyethylene-Carbon Nanotube Composite Coatings, *Materials Science, and Technology 2009*, Pittsburgh, PA, October 25-29, 2009.
170. Metal embedded Fiber Brag Grating Sensors, *Physics Education 2009 American Physics Society (APS) Meeting*, Pittsburgh, Pennsylvania, USA, March 16–20, 2009.
171. Effect of Nano Grains on Ionic Conductivity on Samarium Doped Ceria for ITSOFC, *33<sup>rd</sup> International Conference, and Exposition on Advanced Ceramics and Composites*, Daytona Beach, FL, January 2009.
172. Near Net Shape Forming of Carbon Nanotube-reinforced Aluminum Nanocomposites by Plasma Spray Forming, *2008 NSF Engineering Research and Innovation Conference, Knoxville*, Tennessee, Jan 7 -10, 2008.
173. Multi-walled Carbon Nanotube Reinforced Aluminum Nanocomposites by Cold Kinetic Spraying, *2007 NSF Grantee conference on International Research and Education in Engineering (IREE)*, Purdue University, West Lafayette, Indiana, Oct. 30 - Nov. 1, 2007.

## **RESEARCH FUNDING**

- **Awarded since 2003 (US \$ 5M as PI and additional \$20.7M as Co-PI)**
- **Average Award for last 15 years: \$333K/year as PI (excluding Co-PI)**

1. PI: Arvind Agarwal, Co-PI: Benjamin Boesl  
 Title: DURIP: Acquisition of Flash Diffusivity Equipment  
 Funding Agency: Office of Naval Research  
 Amount of Funding: \$145,263  
 Time Period of Grant: Jan 1, 2018 – Dec 31, 2019

2. Co-PI: Arvind Agarwal, PI: David J. Bishop (Boston University)

Title: Nanosystems Engineering Research Center for Directed Multiscale Assembly of Cellular Metamaterials with Nanoscale Precision: CELL-MET

Funding Agency: National Science Foundation

TOTAL AWARD FUNDING: \$19,750,000 (FIU's Funding: \$2.4M, \$465K/year)

Time Period of Grant: May 2017- May 2022

3. PI: Arvind Agarwal, Co-PI: Benjamin Boesl

Title: Mechanical Properties of Origami-Inspired Graphene Foam-Polymer Composites (Supplemental Undergraduate and High School Research Apprenticeship (URAP and HSAP) Program)

Funding Agency: Army Research Office

Amount of Funding: \$7,500

Time Period of Grant: Summer 2018

4. PI: Arvind Agarwal, Co-PI: Benjamin Boesl

Title: Boron Nitride Nanotube Reinforced Titanium Composites

Funding Agency: Office of Naval Research

Amount of Funding: \$450K

Time Period of Grant: May 2017- May 2020

5. PI: Arvind Agarwal, Co-PI: Benjamin Boesl

Title: DURIP: Acquisition of In-situ Nanoindenter for Nanomechanics

Funding Agency: Air Force Office of Scientific Research

Amount of Funding: \$108,310

Time Period of Grant: June 2017-May 2018

6. PI: Arvind Agarwal, Co-PI: Benjamin Boesl

Title: Splat Sliding in Cold Sprayed Materials

Funding Agency: Northeastern University/Army Research Office

Amount of Funding: \$300K

Time Period of Grant: September 2016- September 2019

7. PI: Arvind Agarwal, Co-PI: Benjamin Boesl

Title: 3D Graphene Foam Reinforced Flexible Polymer Composites

Funding Agency: Air Force Office of Scientific Research/Army Research Office

Amount of Funding: \$581K

Time Period of Grant: September 2015- September 2018

8. PI: Arvind Agarwal, Co-PI: Benjamin Boesl

Title: Ultra High-Temperature Ceramic Materials with Nano Reinforcements

Funding Agency: Air Force Office of Scientific Research/Clarkson Aerospace

Amount of Funding: \$372,000

Time Period of Grant: September 2013- September 2018



9. Co-PI: Arvind Agarwal, PI: Benjamin Boesl  
Title: DURIP: Acquisition of In-situ Nanoindenter for Nanomechanics  
Funding Agency: Office of Naval Research  
Amount of Funding: \$184,000  
Time Period of Grant: June 2016-May 2017
10. Co-PI: Arvind Agarwal, PI: Zhe Cheng  
Title: Title Novel High-Temperature Carbide and Boride Ceramics for Direct Power Extraction  
Electrode Application  
Funding Agency: Department of Energy  
Amount of Funding: \$250,000  
Time Period of Grant: October 2015- September 2018
11. PI: Arvind Agarwal  
Title: Graphene Nanoplatelet Reinforced Tantalum Carbide  
Funding Agency: Air Force Office of Scientific Research  
Amount of Funding: \$327,000  
Time Period of Grant: June 2012-May 2015
12. PI: Arvind Agarwal, Co-PI: Kuang Hsi Wu  
Title: Acquisition of Spark Plasma Sintering Furnace for Synthesizing Nanocomposites  
Reinforced with Boron Nitride Nanotubes and Carbon Nanotubes  
Funding Agency: Air Force Office of Scientific Research (Defense University Research  
Instrumentation Program-DURIP)  
Amount of Funding: \$268,000  
Time Period of Grant: October 2011-December 2012
13. PI: Arvind Agarwal, Co-PI: None  
Title: Multi-Scale Microstructure and Mechanical Properties of High Carbon Eutectic Tantalum  
Carbide Reinforced with Carbon Nanotubes  
Funding Agency: Air Force Office of Scientific Research  
Amount of Funding: \$333,640  
Time Period of Grant: April 2009-March 2012
14. PI: Arvind Agarwal, Co-PI: None  
Title: Optical Profilometer to Evaluate Wear Resistance of Carbon Nanotube Reinforced  
Ceramic Nanocomposite Coatings  
Funding Agency: Office of Naval Research  
Amount of Funding: \$36,295  
Time Period of Grant: March 2010- October 2011
15. PI: Arvind Agarwal, Co-PI: None  
Title: Research Experience for Teachers (Supplemental Funding for CAREER award) Funding  
Agency: National Science Foundation  
Amount of Funding: \$14500

Time Period of Grant: May- December 2010

16. PI: Arvind Agarwal, Co-PI: None

Title: Development of Comprehensive Process Maps Development of Comprehensive Process Maps for Carbon Nanotube Reinforced Ceramic Nanocomposite Coatings with Improved Fracture, Fatigue and Wear Properties

Funding Agency: Office of Naval Research

Amount of Funding: \$399,601

Time Period of Grant: April 2008- December 2011

17. PI: Arvind Agarwal, Co-PI: None

Title: CAREER: Near Net Shape Consolidation of Bulk Nanocomposites by Plasma Spray Forming

Funding Agency: National Science Foundation – CAREER Award,

Amount of Funding: \$400,000.

Time Period of Grant: Feb 2006- July 2011

18. PI: Arvind Agarwal, Co-PI: None

Title: Research Experience for Undergraduate (Supplemental Funding for CAREER award)

Funding Agency: National Science Foundation

Amount of Funding: \$12000

Time Period of Grant: April 2009-April 2011

19. PI: Sharan Ramaswamy, Co-PI: Arvind Agarwal

Title: Enhanced Retention and Anchorage of Hydrogels Augments Cartilage Regeneration in Osteochondral Defects (*RESEED Grant*)

Funding Agency: College of Engineering and Computing, FIU

Amount of Funding: \$35000

Time Period of Grant: May 2010- May 2011.

20. PI: Igor Tsukanov, Co-PI: Arvind Agarwal

Title: Computational and Experimental Tools for Prediction of Thermal Strains in Plasma Sprayed Coatings (*RESEED Grant*)

Funding Agency: College of Engineering and Computing, FIU

Amount of Funding: \$35000

Time Period of Grant: May 2010- May 2011.

21. PI: George S. Dulikravich, Co-PI: Arvind Agarwal

Title: Multi-objective Optimization of Corrosion Resistant Aluminum Alloys

Funding Agency: Office of Naval Research (ONR) and Touchstone Research Laboratory

Amount of Funding: \$33,000

Time Period of Grant: September- December 2009

22. PI: Arvind Agarwal, Co-PI: None  
Title: Carbon Nanotube Reinforced Ceramic Coatings and Free Standing Structures by Plasma Spraying for Improved Toughness  
Funding Agency: Office of Naval Research  
Amount of Funding: \$328,956  
Time Period of Grant: March 2005- June 2008.

23. PI: Arvind Agarwal, Co-PI: Yiding Cao  
Title: Nanomaterials for Fuel Cells  
Funding Agency: NASA and University of Central Florida  
Amount of Funding: \$89,000  
Time Period of Grant: December 2006- March 2008

24. PI: Jiandi Zhang (Physics), Co-PIs: Arvind Agarwal, Wenzhi Li, Kevin O' Shea and Xiaotang Wang  
Title: Acquisition of an X-ray/UV Photoelectron Spectroscopy Setup for Materials Research & Education  
Funding Agency: Army Research Office  
Amount of Funding: \$316,600  
Time Period of Grant: July 2007-June 2008, (*Role: Co-PI*)

25. PI: George S. Dulikravich, Co-PI: Arvind Agarwal  
Title: Multi-Objective Optimization of Bulk Metallic Glasses  
Funding Agency: Army Research Office  
Amount of Funding: \$300,000  
Time Period of Grant: July 2006-June 2009, \$300K

26. PI: Arvind Agarwal, Co-PI: None  
Title: International Research and Education in Engineering (IREE): Multi-walled Carbon Nanotube Reinforced Aluminum Nanocomposites by Cold Kinetic Spraying  
Funding Agency: National Science Foundation  
Amount of Funding: \$22075  
Time Period of Grant: September 2006-December 2007

27. PI: Arvind Agarwal, Co-PI: None  
Title: Acquisition of Nanoindenter with Atomic Force Microscope Objective for Evaluating Nanomechanical Properties of Bulk Nanocomposites and Coatings  
Funding Agency: Defense University Research Instrumentation Program (DURIP), Office of Naval Research  
Amount of Funding: \$250,000  
Time Period of Grant: April 2006-March 2007

28. PI: Arvind Agarwal, Co-PI: G. S. Murty (Touchstone Research Lab)

Title: STTR: Development of Spray Coating Methods and Materials to replace Aluminum Cladding of Aging Aircraft for Corrosion Protection  
Funding Agency: Air Force Office of Scientific Research  
Amount of Funding: \$100,000 (*FIU's portion \$41,000*)  
Time Period of Grant: August 2006-April 2007

29. PI: Arvind Agarwal, Co-PI: Scott O' Dell (Plasma Processes Inc.)  
Title: STTR: Innovative Molybdenum Alloys for Extreme Operating Conditions  
Funding Agency: NASA  
Amount of Funding: \$100,000 (*FIU's portion \$24,000*)  
Time Period of Grant: March 2006- July 2007

30. PI: C. Levy (MME, FIU), Co-PI: Arvind Agarwal,  
Title: Investigation of Carbon Nanotubes and Shape Memory Alloy Treatment for Vibration Control  
Funding Agency: Army Research Office  
Amount of Funding: \$209,290  
Time Period of Grant: July 2005-June 2008

31. PI: Arvind Agarwal, Co-PI: None  
Title: High Strength Bioceramic Coatings Reinforced with Carbon Nanotubes for Orthopedic Implants  
Funding Agency: FIU Research Foundation  
Amount of Funding: \$24,961.  
Time Period of Grant: June 2005-June 2006

32. PI: Arvind Agarwal, Co-PI: None  
Title: Nanoscale Mechanics, Bio-inspired Hierarchical Structures, and Potential Application  
Funding Agency: NSF and Northwestern University  
Amount of Funding: \$2000 (Travel Award)  
Time Period of Grant: June 2005

33. PI: Arvind Agarwal, Co-PI: None  
Title: Carbon Nanotube Reinforced TaC for Improved Fracture Toughness  
Funding Agency: FIU Research Foundation  
Amount of Funding: \$4,961.  
Time Period of Grant: June- December 2004

34. PI: Arvind Agarwal, Co-PI: None  
Title: Plasma Engineered Ceramic Nanospheres  
Funding Agency: FIU Research Foundation  
Amount of Funding: \$4,997.  
Time Period of Grant: June- December 2003

35. PI: Arvind Agarwal, Co-PI: None

Title: Zero Erosion W-Re Nozzle Inserts  
Funding Agency: Plasma Processes Inc.  
Amount of Funding: \$30,400.  
Time Period of Grant: November 2003- November 2005

31. PI: Arvind Agarwal, Co-PI: None  
Title: Vacuum Plasma Sprayed TaC Structures  
Funding Agency: Plasma Processes Inc.  
Amount of Funding: \$8320.  
Time Period of Grant: November 2003- June 2005
32. PI: Arvind Agarwal, Co-PI: None  
Title: Characterization of Ceramic Powders & Coatings  
Funding Agency: Plasma Processes Inc.  
Amount of Funding: \$2500.  
Time Period of Grant: January 2003- December 2005

### **Funding (Before 2002)**

1. “Spherodized Iron Oxide Powder,” Steward Inc., May 2002, \$20,000.
2. “Lightweight Beryllium Free Nanostructured Composites”: Missile Development Agency, March-October 2002, \$70,000.
3. “Vacuum Plasma Sprayed W-Re coating,” GE Corporate Research and Development March-May 2002, \$16,000
4. “Development of FeAl based intermetallic structures and coatings,” Chrysalis Technologies Inc., July-Dec 2001, \$20,000.

### **RESEARCH COLLABORATORS**

I have established successful research collaborations within my department, college, FIU and other universities at national and international level (Switzerland, Italy, UK, France, Japan, China, Brazil, Australia, and India). Also, I have an active collaboration with the industries. The nature of my research is highly multi-disciplinary which includes topics from Biology (*e.g. mechanical properties of single cell*), Civil Eng. (*e.g. nano-mechanical properties of concrete*), Biomedical Eng. (*e.g. mechanical properties of orthopedic implants, gels and membranes*), Physics (*e.g. carbon nanotubes and surface science*) and Electrical Eng. (*e.g., plasma sprayed fiber grating sensors*). These collaborations have resulted in the publication of journal articles, successfully securing federal grants, and exchange of students at the international level.

### **International Universities**

1. Dr. Jeff Wheeler, EMPA, Switzerland
2. Dr. Hanus Seiner, Academy of Sciences of the Czech Republic
3. Dr. Diletta Scitti, Institute of Science and Technology for Ceramics, Faenza, Italy
4. Prof. Nadia Jessel- University of Strasbourg, France
5. Prof. Ian Chen-Deakin University, Australia

6. Prof. Kantesh Balani-Indian Institute of Technology (IIT), Kanpur, India
7. Prof. Jayant Jain- Indian Institute of Technology (IIT), Delhi, India
8. Prof. D. Graham McCartney -University of Nottingham, United Kingdom
9. Prof. Marcia Gallas- Instituto de Física – UFRGS, Brazil
10. Prof. Yao Chen-Soochow University, China
11. Prof. Chitoshi Masuda-Waseda University, Japan

**US Universities (other than FIU)**

1. Prof. S. Seal -University of Central Florida, Orlando
2. Prof. N. B. Dahotre-University of Tennessee, Knoxville
3. Prof. R. Narayan-University of North Carolina, Charlotte
4. Prof. Juan C. Nino-University of Florida-Gainesville
5. Prof. S. Harimkar- Oklahoma State University, Stillwater
6. Prof. E. Olevsky, San Diego State University, San Diego

**FIU**

1. Prof. Benjamin Boesl- Mechanical and Materials Engineering
2. Prof. Norman Munroe- Mechanical and Materials Engineering
3. Prof. Igor Tsukanov- Mechanical and Materials Engineering
4. Prof. Cesar Levy- Mechanical and Materials Engineering
5. Prof. Yiding Cao- Mechanical and Materials Engineering
6. Prof. George S. Dulikravich- Mechanical and Materials Engineering
7. Prof. Wonbong Choi- Mechanical and Materials Engineering
8. Prof. Jiuhua Chen- Mechanical and Materials Engineering
9. Prof. Nick Tsoukias-Biomedical Engineering
10. Prof. Sharan Ramaswamy- Biomedical Engineering
11. Prof. Nakin Suksawang-Civil and Environmental Engineering
12. Prof. Roberto Panepucci-Electrical and Computer Engineering
13. Prof. Jiandi Zhang- Physics
14. Prof. Wenzhi Li-Physics
15. Prof. Lidia Kos-Biology

**Industry/National Labs**

1. Dr. Meyya Meyappan-NASA Ames Research Center
2. Mr. Tim McKechnie and Mr. Scott O'Dell-Plasma Processes Inc., Huntsville, AL
3. Mr. Robert Hickman-NASA Marshal Space Flight Center, Huntsville, AL
4. Dr. J. S. Karthikeyan-ASB Industries, OH
5. Dr. G. S. Murty- Touchstone Research Laboratory, VA

**AWARDS WON BY MENTORED STUDENTS AND ORGANIZATION**

1. Jenniffer Bustillos, **Worlds Ahead Graduate (Spring 2018)** – Florida International University, May 2018.

2. Pranjali Nautiyal, **First Prize, TMS Graduate Student Poster Contest** (Functional Materials Division), **TMS 2018**, Phoenix, AZ, March 2018.
3. Pranjali Nautiyal, **First position, Engineering Poster Presentation, Florida Statewide Graduate Student Research Symposium**, Univ. of South Florida, Tampa, April 2017
4. Material Advantage at FIU, **Most Creative Recruitment Strategies Award at National Level**, Fall Membership Challenge, Fall 2017
5. Archana Loganathan, **GSAW (Graduate Student Appreciation Week) 2018 Scholarly Forum First Prize Winner**
6. Archana Loganathan, **2<sup>nd</sup> Prize for Ceramographic Competition**, American Ceramic Society (ACerS) Basic Science Division held in the Material Science and Technology 2017 (MS&T 17) conference, Pittsburgh, PA.
7. Archana Loganathan, **Dissertation Evidence Acquisition**, Summer 2018.
8. Jenniffer Bustillos, **Winner of Material Advantage Undergraduate Speaking Contest** at Materials Science & Technology 2017, Pittsburgh, PA, October 2017.
9. Catalina Young, American Ceramic Society (ACerS) Presidential Council **Scientific Creativity Award** for Best Ceramograph, (*MS&T 17*) Conference, Pittsburgh, PA.
10. Catalina Young, American Ceramic Society (ACerS) Presidential Council **Viewers' Choice Award** for Best Ceramograph, (*MS&T 17*) conference, Pittsburgh, PA
11. Ms. Jenniffer Bustillos, BS student, **2<sup>nd</sup> Prize, McNair Scholar**, Fall 2016
12. Mr. Pranjali Nautiyal, Ph.D. student: **Best Technical Presentation**, Graduate Students Organization Council at FIU, Spring 2016.
13. Dr. Chenz Zhang, **Worlds Ahead Graduate, Spring 2016**, Florida International University
14. Dr. Debrupa Lahiri: Zwick Science Award 2013 for Best Mechanical Characterization Technique, Madrid, Spain, April 2014.
15. Dr. Santanu Das: Best Poster Award, Measurement of Graphene Substrates Adhesion Energy Using Nano-scratch Study, 2013 MRS Fall Meeting, December 01 - 06, Boston, USA
16. Mr. Andy Nieto: *Best Graduating MS* student in the College of Engineering and Computing, FIU, Spring 2013.
17. FIU Materials Advantage chapter: was awarded as the "Chapter of Excellence" by TMS and ASM International for 2011-12. FIU has won this award for the 7<sup>th</sup> time in nine years. The award is given to top 5 ASM/TMS chapters worldwide (more than 70 chapters) for their yearly activities to promote the cause of Materials Science and Engineering, October 2012.
18. Dr. Sybille Facca, *Best Paper Award by French Biomechanics Society* for the paper titled "Nanoreinforcement of hydroxyapatite coatings on titanium for osseointegration of orthopedic implants," October 2012
19. *World Materials Day Award*, awarded to FIU Materials Advantage Chapter, October 2011, Columbus, OH

20. Ms. Debrupa Lahiri: *Best Graduating Ph.D.* student in the College of Engineering and Computing, FIU, Summer 2011, August 13, 2011.
21. Ms. Debrupa Lahiri, *Worlds Ahead Graduate*, Honored by FIU President for overall excellence and impact during Summer 2011 Commencement, August 13, 2011.
22. Ms. Debrupa Lahiri, Ph.D. student: awarded *Best Graduate Student Poster Award* for Materials Science and Technology (MS&T) Conference in Houston, October 2010.
23. Ms. Debrupa Lahiri, Ph.D. student: awarded *2<sup>nd</sup> Prize for Best Student Paper "Surfaces and Heterostructures at Nano- or Micro-Scale and their Characterization, Properties, and Applications I" symposium*, Annual TMS Meeting, San Diego, CA, Feb. 27- March 3, 2011.
24. Ms. Debrupa Lahiri, Ph.D. student: awarded *Dissertation Year Fellowship (DYF)* by University Graduate School, Florida International University (Spring 2011- Fall 2011)
25. FIU Materials Advantage chapter: was awarded as the "*Chapter of Excellence*" by TMS and ASM International for 2009-10. FIU has won this award for the 6<sup>th</sup> time in eight years. The award is given to top 5 ASM/TMS chapters worldwide (more than 70 chapters) for their yearly activities to promote the cause of Materials Science and Engineering, October 2010.
26. Mr. David Axel Virzi, B.S. student: awarded *NSF Travel Grant* to attend Materials Science and Technology (MS&T) Conference in Houston, October 2010.
27. Mr. Indranil Lahiri: *Student Member, ASM Board of Trustees*, ASM International, Materials Park, OH, 2010-11.
28. Mr. Riken R. Patel: *Best Graduating MS* student in the College of Engineering and Computing, FIU, Fall 2009.
29. Mr. Srinivasa R. Bakshi: *Best Graduating Ph.D.* student in the Department of Mechanical and Materials Engineering, Fall 2009.
30. Mr. Riken R. Patel: *Best Graduating MS* student in the Department of Mechanical and Materials Engineering, FIU, Fall 2009.
31. Ms. Debrupa Lahiri: Selected by American Ceramic Society to nationwide "*President's Student Council*," Daytona Beach, FL, January 2010.
32. FIU Materials Advantage chapter: was awarded as the "*Chapter of Excellence*" by TMS and ASM International for 2008-09. FIU has won this award for the 5<sup>th</sup> time in seven years. The award is given to top 5 ASM/TMS chapters worldwide (more than 70 chapters) for their yearly activities to promote the cause of Materials Science and Engineering, October 2009.
33. *World Materials Day Award*, awarded to FIU Materials Advantage Chapter, October 2009, Pittsburgh, PA.
34. Ms. Debrupa Lahiri, Ph.D. student: awarded *Dissertation Evidence Acquisition (DEA)* fellowship by University Graduate School, Florida International University (Fall 2009-Summer 2010)
35. Mr. Anup K. Keshri: awarded *Dissertation Year Fellowship (DYF)* by University Graduate School, Florida International University (Fall 2009-Summer 2010)



36. Ms. Debrupa Lahiri, Ph.D. student: awarded *Best Poster Award* by Materials Processing and Manufacturing Division (MPMD) of The Materials Society (TMS) at 2009 Annual Meeting in San Francisco, Feb 15-19, 2009.
37. Mr. Anup K. Keshri: Selected by American Ceramic Society to nationwide "*President's Student Council*," Daytona Beach, FL, January 2009.
38. World Materials Day Award, 2008 awarded to FIU Materials Advantage Chapter, October 2008, Pittsburgh, PA.
39. Mr. Srinivasa Rao Bakshi, Ph.D. student: awarded *Dissertation Year Fellowship* by University Graduate School, Florida International University (Fall 2008-Summer 2009)
40. Mr. Anup K. Keshri: *Arthur E. Focke Leader Shape Award*, as one among six students worldwide, by American Society of Materials (ASM) Education Foundation Board of Trustees, for Summer of 2008.
41. Mr. Kantesh Balani: *Best Graduating Ph.D.* student in the College of Engineering and Computing, FIU, Fall 2007
42. Mr. Jorge Tercero, M.S. student: awarded *NSF Travel Grant* to attend NSF-CMMI Conference, January 7-10, Knoxville, TN
43. FIU Materials Advantage chapter: was awarded as the "*Chapter of Excellence*" by TMS and ASM International for 2006-2007. FIU has won this award for four consecutive years. This honor is even more special as FIU chapter is only four years old. The award is given to top 5 ASM/TMS chapters worldwide (more than 70 chapters) for their yearly activities to promote the cause of Materials Science and Engineering, September 2007.
44. World Materials Day Award, 2007 awarded to FIU Materials Advantage Chapter (formerly ASM/TMS student chapter), September 2007.
45. FIU Materials Advantage chapter: won the first National "**Materials Bowl**" during Annual TMS Meeting in Orlando, 25 February 2007.
46. Mr. Kantesh Balani: David Merchant International Student Award, Phi Beta Delta National Society, Spring 2007.
47. Mr. Kantesh Balani: Dean's award for excellent performance during Ph.D., Spring 2007.
48. Mr. Tapas Laha: *Best Graduating Ph.D.* student in the College of Engineering and Computing, FIU, Fall 2006
49. FIU Materials Advantage chapter: was awarded as the "*Chapter of Excellence*" by TMS and ASM International for 2005-2006. FIU has won this award for 3 consecutive years. This honor is even more special as FIU chapter is only 3 years old. The award is given to top 5 ASM/TMS chapters worldwide (more than 70 chapters) for their yearly activities to promote the cause of Materials Science and Engineering.
50. World Materials Day Award, 2006 awarded to FIU Materials Advantage Chapter (formerly ASM/TMS student chapter), August 2006.
51. Mr. Jorge Tercero, B.S. student: awarded *NSF Travel Grant* to attend NSF-DMI Conference, July 24-27, St. Louis, MO.
52. Mr. Kantesh Balani, Ph.D. student: awarded *NSF Travel Grant* to attend NSF-DMI Conference, July 24-27, St. Louis, MO.

53. Mr. Tapas Laha, Ph.D. student: awarded *NSF Travel Grant* to attend NSF-DMI Conference, July 24-27, St. Louis, MO.
54. Mr. Kantesh Balani, Ph.D. student: awarded *Dissertation Year Fellowship* by University Graduate School, Florida International University (beginning July 2006)
55. Mr. Kantesh Balani, Ph.D. student: *Best Technical Presentation*, Students Organization Council (SOC) at FIU awarded \$400, March 2006.
56. Mr. Tapas Laha, awarded *Dissertation Year Fellowship* by University Graduate School, Florida International University (beginning January 2006)
57. Mr. Tapas Laha, Ph.D. student: *Travel scholarship of \$500* to attend Annual TMS Meeting in San Antonio, March 13-16, 2006
58. Mr. Bakshi S. Rao, Ph.D. student: Best poster award by FIU Materials Advantage, November 2006.
59. FIU ASM/TMS student chapter: was awarded as the "Chapter of Excellence" by TMS and ASM International for 2004-2005. FIU has won this award for 2 consecutive years. This honor is even more special as FIU chapter is only 2 years old. The award is given to top 5 ASM/TMS chapters worldwide (more than 70 chapters) for their yearly activities to promote the cause of Materials Science and Engineering.
60. *World Materials Day Award*, 2005 awarded to FIU Materials Advantage Chapter (formerly ASM/TMS student chapter).
61. FIU Materials Advantage Chapter (formerly ASM/TMS student chapter): was awarded as *BEST organization* by Engineering Student Council, Florida International University, April 2005.
62. FIU Materials Advantage Chapter (formerly ASM/TMS student chapter): was awarded \$800 for submitting *one of the best proposals* for annual chapter activities, February 2005.
63. Mr. Kantesh Balani, *Best Technical Presentation*, Students Organization Council (SOC) at FIU awarded \$400, March 2005.
64. Mr. Tapas Laha, Ph.D. Student: *Travel scholarship of \$500* to attend Annual TMS Meeting in San Francisco, Feb 13-17, 2005.
65. Mr. Kantesh Balani, Ph.D. Student: was awarded "*Best Technical Paper*" in Advanced Materials Processing Category at International Symposium of Research Students (ISRS-2004) on Material Science and Engineering, December 20-22, 2004, Chennai, India
66. FIU ASM/TMS student chapter: was awarded as the "Chapter of Excellence" by TMS and ASM International for 2003-2004. This honor is even more special as FIU chapter is awarded in its first year of existence. The award is given to top 5 ASM/TMS chapters worldwide (more than 70 chapters) for their yearly activities to promote the cause of Materials Science and Engineering.
67. FIU ASM/TMS Chapter: Students Organization Council (SOC) at FIU has awarded ASM/TMS Student Chapter as "*Best New Organization*" award for 2003 for its academic and community service activities. The award also included funds more than \$500, which is being utilized for academic and outreach activities.

68. Mr. Kantesh Balani, Ph.D. Student: *Arthur E. Focke LeaderShape Award*, as one among six students worldwide, by American Society of Materials (ASM) Education Foundation Board of Trustees, for Summer of 2004.
69. Mr. Tapas Laha, Ph.D. Student at Florida International University: *Arthur E. Focke LeaderShape Award*, as one among six students worldwide, by American Society of Materials (ASM) Education Foundation Board of Trustees, for Summer 2004.
70. Ms. Petya Georgieva, Ph.D. Student at the University of Central Florida (with Prof. S. Seal): *2<sup>nd</sup> Prize for Poster Presentation* (Materials Science Category) Awarded by Florida Chapter of American Vacuum Society for “Development of Metal-Ceramic Bulk Nanocomposite with Enhanced Properties and Important Engineering Applications,” March 8-9, 2004.
71. Mr. Tapas Laha, Ph.D. Student: *National Science Foundation (NSF) Fellowship* to attend Summer Institute on Nano Mechanics and Materials at Northwestern University, August 2003.
72. Mr. Keith Rea, B. S. Student at the University of Central Florida (with Prof. S. Seal): *3<sup>rd</sup> Prize awarded by International Metallographic Society (IMS)* for “Fishing in the Hole” Insitu Focused Ion Beam Lift-out for TEM Analysis, 2003.
73. Ms. Melanie Andara, B. S. Student: has been awarded *REU Fellowships* in 2 consecutive years by Univ. of Central Florida, Orlando and Georgia Institute of Technology, Atlanta. Dr. Agarwal was her mentor.

## PROFESSIONAL SERVICE

### (a) Conference/Symposium Organization

1. Co-Organizer, *Surface Engineering for Improved Corrosion Resistance*, TMS-2018, March 11-15, Phoenix, AZ, 2018.
2. Organizer, Taking Pentagon to the People, DOD Conference at FIU, September 25-26, 2017.
3. Co-Organizer, *Nanostructured Surfaces for Improved Functional Properties*, TMS 2017, Feb 26-March 2, San Diego, CA, 2017.
4. Co-Organizer, *Additive manufacturing for Surface Engineering of Materials*, MS&T-2016, Salt Lake City, UT, Oct 23-26, 2016.
5. Lead Organizer, *Advanced Protective Coatings/Surface Engineering*, THERMEC 2013, Las Vegas, NV, Dec. 2-6 2013.
6. Co-Organizer, *Advances in Surface Engineering: Alloyed and Composite Coatings-3*, 2014 Annual TMS Meeting, San Diego, CA, February 16-20, 2014
7. Co-Organizer, *Advances in Surface Engineering: Alloyed and Composite Coatings-2*, 2013 Annual TMS Meeting, San Antonio, TX, March 3-7, 2013
8. Co-Organizer, *Advances in Surface Engineering: Alloyed and Composite Coatings*, 2012 Annual TMS Meeting, Orlando, FL, March 11-15, 2012

9. Co-Organizer, *Surfaces, and Heterostructures at Nano- or Micro-Scale and their Characterization, Properties, and Applications II*, 2012 Annual TMS Meeting, Orlando, FL, March 11-15, 2012
10. Co-Organizer, *Emerging Frontiers in Surface Engineering of Biomaterials*, Materials Science and Technology 2011, Columbus, OH, Oct 16-20, 2011.
11. Co-Organizer, *Surfaces, and Heterostructures at Nano- or Micro-Scale and their Characterization, Properties, and Applications I*, Annual TMS Meeting, San Diego, CA, Feb. 27- March 3, 2011.
12. Co-Organizer, *Surface Engineering for Amorphous-, Nanocrystalline-, and Bio-materials*, Annual TMS Meeting, Seattle, WA, Feb 14-18, 2010.
13. Lead Organizer, *Surface Structures at Multiple Length Scales*, Annual TMS Meeting, San Francisco, CA, Feb 15-19, 2009.
14. Co-Organizer, *Experimental and Computer Modeling of Plasma Spray Processes for Near Net Shape Forming and Coating*, 10<sup>th</sup> US National Congress on Computational Mechanics, Columbus, OH, July 16-19, 2009.
15. Co-organizer and Co-Editor, *Surface and Interfaces in Nanostructured Materials-2*, Annual TMS Meeting, San Antonio, March 2006.
16. Lead Organizer and Chief Editor, *Surface Engineering in Materials Science-III*, Annual TMS Meeting, San Francisco, February 2005.
17. Co-organizer and Co-Editor, *Surface and Interfaces in Nanostructured Materials*, Annual TMS Meeting, Charlotte, February 2004.
18. Co-organizer and Co-Editor, *Surface Engineering in Materials Science-II*, Annual TMS Meeting, San Diego, March 2003.
19. Session Chair at several international conferences organized by ASM, TMS, and AVS.
20. Organizing Committee Member-*International Surface Engineering Congress*, ASM International, 2000-2003.

**(b) Review Activities (for Journals)**

1. ACS Nano (American Chemical Society, ACS)
2. Acta Biomaterialia (Elsevier)
3. Acta Materialia (Elsevier)
4. Advanced Engineering Materials (Wiley)
5. Advanced Healthcare Materials (Wiley)
6. Advanced Materials (Wiley)
7. Advanced Powder Technology (Elsevier)
8. Applied Materials and Interfaces (American Chemical Society, ACS)
9. Applied Physics Letters (American Institute of Physics)
10. Applied Surface Science (Elsevier)
11. Biomedical Materials (Institute of Physics, IOP)
12. Biofabrication (Institute of Physics, IOP)
13. Carbon (Elsevier)
14. Chemical Physics Letters (Elsevier)

15. Colloids and Surfaces B: Biointerfaces (Elsevier)
16. Composite A: Applied Science and Manufacturing (Elsevier)
17. Composite B (Elsevier)
18. Composite Science and Technology (Elsevier)
19. Expert Review of Medical Devices (Future Science Group, London)
20. International Journal of Applied Ceramic Technology (Blackwell Publishing)
21. Journal of Alloys and Compounds (Elsevier)
22. Journal of American Ceramic Society (American Ceramic Society)
23. Journal of Applied Physics (American Institute of Physics)
24. Journal of Biomedical Materials Research: Part A (Wiley)
25. Journal of Colloid and Interface Science (Elsevier)
26. Journal of Composite Materials (SAGE Publishers)
27. Journal of Electrochemical Society (Electro Chemical Society, ECS)
28. Journal of Heat Transfer (American Society of Mechanical Engineers, ASME)
29. Journal of Manufacturing Science & Eng. (American Society of Mechanical Engineers)
30. Journal of Materials Engineering and Performance (Springer)
31. Journal of Materials Processing Technology (Elsevier)
32. Journal of Materials Research (Materials Research Society)
33. Journal of Materials Science (Springer)
34. Journal of Nanoscience and Nanotechnology (American Scientific Publisher)
35. Journal of Physics and Chemistry of Solids (Elsevier)
36. Journal of Physical Chemistry (American Chemical Society, ACS)
37. Journal of Royal Society Interface (The Royal Society)
38. Journal of Thermal Spray Technology (Springer)
39. Langmuir (American Chemical Society, ACS)
40. Materials (Molecular Diversity Preservation International, MDPI)
41. Materials Chemistry and Physics (Elsevier)
42. Materials Science and Engineering A (Elsevier)
43. Materials Science and Engineering B (Elsevier)
44. Metallurgical and Materials Transactions (ASM and TMS International)
45. Nanomedicine (Future Medicine)
46. Nanotechnology (Institute of Physics, IOP)
47. Nature
48. Physica E (Elsevier)
49. Philosophical Magazine (Taylor and Francis)
50. Review of Scientific Instruments (American Institute of Physics)
51. Starch (Wiley)
52. Surface Coatings and Technology (Elsevier)
53. Surface Modification Technologies (ASM International and Institute of Materials, London)
54. Textile Research Journal (SAGE Publishers)
55. Tissue and Cell (Elsevier)
56. Ultrasonics (Elsevier)
57. Wear (Elsevier)

### **(c)Membership in Professional Organization**

- Fellow of ASM International
- Senior Member, The Minerals, Metals and Materials Society (TMS)
- American Ceramic Society
- Materials Research Society (MRS)
- American Society of Mechanical Engineers (ASME)
- Thermal Spray Society (TSS)
- AAAS

### **UNIVERSITY SERVICE**

Apart from my major administrative duties as AMERI Director, Associate Dean for Research, and MME Chair, I have also served on several committees at the department, college, and University levels.

#### **University Level**

- FIU Vice President of Research's Advisory Council, 2008, 2010
- FIU Faculty Mentor Advisory Board, 2011-2014
- Member, FIU Vice President of Research Search Committee, 2006.
- Member, FIU University Graduate School (UGS) Dean Search Committee, 2006.
- University Honorary Degree and Award Committee, 2011

#### **College Level**

- College of Engineering and Computing Tenure and Promotion Committee, 2012
- College of Engineering and Computing Research Advisory Committee, 2010
- Secretary, College of Engineering and Computing Curriculum Committee, 2008-09.
- Executive Dean's Taskforce Committee on Graduate Enrollment, 2006

#### **Department Level**

- Graduate Program Director, Mechanical and Materials Engineering, Florida International University, July 2004-June 2008.
- Chair, MME Strategic Plan Committee, 2011-14
- Chair, MME Non-Tenure Track Faculty Promotion Committee, 2011-12, 2013-14
- Chair, MME Departmental Teaching Load Committee, 2011-12
- Member, Departmental Tenure, and Promotion Committee, 2007-onwards
- Chair, MME Graduate Program Committee, 2012-14
- MME Undergraduate Adhoc Lab Improvement Committee, 2006.
- Member, MME Faculty Screen & Search Committee, 2005, 2006, 2007, 2011, 2012
- Member, MME Instructor Search Committee, August 2004.
- Member, Materials Science and Engineering Ph.D. Curriculum Committee, 2004.

