

Curriculum Vitae

SUROJIT GUPTA

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Summary

- ❖ Assistant Professor in the Department of Mechanical Engineering in University of North Dakota.
- ❖ Faculty Researcher in Department of Materials Science and Engineering in Rutgers, the State University of New Jersey.
- ❖ Technical Advisor/Consultant and lead inventor of technology patent of Solidia Technologies (Kliner Perkins Caulfield Byers funded Startup Company from Rutgers University).
- ❖ 2 years of post doctoral experience in The Pennsylvania State University (Joint program between PSU and Corning Incorporated).
- ❖ Successfully collaborated with esteemed companies like Aerospace Division of Honeywell International, Environmental Materials Division of Corning Incorporated, Electronic Materials Division of EPCOS, and 3one2 (a startup company).
- ❖ Successfully lead research initiatives sponsored by various funding agencies like NSF, ONR, and industries like Corning Incorporated, and EPCOS.
- ❖ Thirty one publications in highly reputed journals like Physical Review Letters, Physical Review, Journal of the American Ceramic Society, Journal of Applied Physics, Wear, Journal of the Electrochemical Society, and Tribology Letters.
- ❖ Total citations are 1300 and an h index of 21 (source - Google Scholar).
- ❖ Ph.D. in Material Science and Engineering from Drexel University.
- ❖ Primary research areas are: CO₂ Sequestration and Green Materials, Nanomaterials, Advanced Materials Processing, Structural and High Temperature Materials, Solid Mechanics and Sintering, Environmental and Green Materials, Automobile and Aerospace Materials, Tribology, and Oxidation and Surface Studies.
- ❖ Additional Research Interests: Biomaterials, Electronic Materials and Advanced Microscopy and Spectroscopy.

Education

2006-2008

Postdoctoral Fellow

Advisors: Drs. David J. Green and Gary L. Messing

The Pennsylvania State University

2001 -2006

PhD in Materials Science and Engineering

Advisor: Dr. Michel W. Barsoum

Drexel University

1997-2001

B. Tech (First Class with High Honors) in Ceramic Science and Technology.

University of Calcutta

Academic Positions

- ❖ **2012-Present:** Assistant Professor in the Department of Mechanical Engineering, University of North Dakota.
- ❖ **2014:** Adjunct Professor in the Henan Polytechnic Institute, China
- ❖ **2008-2012:** Faculty Research Assistant in the Department of Materials Science and Engineering in Rutgers, the State University of New Jersey.

	<ul style="list-style-type: none"> ❖ <u>2006-2008:</u> Postdoctoral Scholar in the Department of Materials Science and Engineering, the Pennsylvania State University, PA. ❖ <u>2006 (July-Aug):</u> Visiting postdoctoral researcher in the Department of Mechanical Engineering, Villanova University, PA. ❖ <u>2001-2006:</u> Research Fellow in the Department of Materials Science and Engineering, Drexel University, PA.
Industrial Collaboration	<ul style="list-style-type: none"> ❖ <u>2008-2012:</u> Founder Engineer, Technical advisor/consultant, and member of the core team of scientists of Solidia Technologies (a startup company from Rutgers University). ❖ <u>2006-2008:</u> Lead joint research program with Environmental Materials Division, Corning Incorporated. ❖ <u>2007-2008:</u> Consultant for EPCOS, Austria. ❖ <u>2003-2006:</u> Visiting scientist in Aerospace Division of Honeywell International. ❖ <u>2003-2006:</u> Partnered with 3one2, NJ (a startup company).
Courses Taught	<p>ME 301 (Fall 2012 – Team teaching with Prof. M. N. Cavalli) ME 420 (Fall 2012 – Team teaching with Prof. M. N. Cavalli) ME 313 (Spring 2012, 2014, 2016) ME 490 (Summer 2013 – Independent Study Course on Tribology) ME 420 (Fall 2013, 2014, 2015) ME 490 (Fall 2013 – Independent Study Course on Sintering) ME 490 (Spring 2014, 2016 – High Temperature Materials) ME 590 (Spring 2015 – Advanced Materials) ENGR 201 (Summer 2015 – Statics) ME 428 (Fall 2015 - Advanced Manufacturing Processes)</p>
Senior Design Thesis Advisor	<ol style="list-style-type: none"> 1. “Intelligent Design of Ceramic Green Bodies for Smart Manufacturing”, Students (R. Johnson, T. Hammann, M. Sauka, and H. Feilen) (2012-13) (Outstanding Senior Process Design, 2013 College of Engineering and Mines Design Expositions). 2. “On the Development of Next Generation Advanced Green Manufacturing Technologies”, E. Chejade, R. Dumm, J. Chmielewski, M. Bugliosi (2013-14) (Second Best Senior Process Design, 2013 College of Engineering and Mines Design Expositions). 3. “Mathematical Models for Understanding Manufacturing of Advanced Materials”, R. Johnson, J. Resig, J. Carroll, S. Akkoc, and A. Ali (2013-14) (Completely Online Project – The work was presented in a Research Conference). 4. “Silicone Creep Failure Test Fixture for Marvin Windows”, M. Jakubiec and Jake Klostermeier (2013-14) (Industrial Project). 5. “Smart multifunctional materials by microstructure design”, S. Swanson, T. Colling, K. Lindblad, A. Eastman (2014-15). 6. “Green Manufacturing”, Rick Lofthus, Abshir Nur, Matt Fuka, David Hennessey (2014-15). (Outstanding Senior Process Design, 2015 College of Engineering and Mines Design Expositions). 7. Acting as a co-advisor of Lunarbotics team.

- UG Advising**
- ❖ Fall (2012) -Spring (2013) (58 Freshmen Students with Last Name P-Z)
 - ❖ Fall (2013) - Spring (2014) (49 Freshmen Students with Last Name P-Z)
 - ❖ Fall (2014) -Spring (2015) (50 Freshmen Students with Last Name P-Z)
 - ❖ Fall (2015) - Spring (2016) (50 Freshmen Students with Last Name P-Z)
- MS and ME Thesis Chair**
- ❖ Johnny Nelson (2016-present)
 - ❖ S. Ghosh (2015-present)
 - ❖ F. AlAnazi (ME student: 2015-present)
 - ❖ R. Dunnigan (2014-present)
 - ❖ M. F. Riyadh (2012-2014)
 - ❖ T. Hammann (2013-2014)
 - ❖ R. Johnson (2013-2014)
- MS Thesis Committee Member**
- ❖ D. Berg (MS)
 - ❖ J. Burns (MS)
 - ❖ C. J. Sitter (MS)
 - ❖ Emmanuel Hitimana (MS, 2015)
 - ❖ M. Rasheduzzaman (MS, 2015)
- Service**
- ME Department**
- ❖ Guest presenter for ME 301 and ME 101.
 - ❖ Actively involved during the Selection of Tenure Track Faculty Member (2013-15).
 - ❖ Actively involved during the Selection of Non-Tenure Faculty Member (2012-13).
 - ❖ Research Presentation during ASME Meetings in the Department (2012-14).
 - ❖ Resume and Career Guidance for ME Students (2012-2014).
 - ❖ Member of Department Mission Statement Committee (2013).
 - ❖ Periodic Student Tours.
 - ❖ Advised different senior design student groups (averaged 2-3 senior design teams each other).
 - ❖ Health Ambassador (2014-present).
 - ❖ Petitioned for membership of the American Ceramics Society for 10 students.
- College**
- ❖ “Fun in Materials Science”, for the High School Summer Camp as a part of Outreach Program (July 23, 2014).
 - ❖ Recruiting students for Materials Club (2013).
 - ❖ Elected Associate Member of the Graduate Faculty.
 - ❖ Member of the awards committee of the college.
 - ❖ Founder Advisor of Materials Club.
- University**
- ❖ Invited Judge for the 3rd Biennial Technology Symposium on “Design Thinking” Sponsored by the Department of Technology, CoBPA (Spring, 2013).
 - ❖ Elected Member of Senate Intellectual Property Committee, University of North of Dakota (Term 2013 – 2016).
 - ❖ Nominated Member of USAT Committee, University of North of Dakota (Term 2014 – 2015).
 - ❖ Elected Member of University Assessment Committee, University of North of Dakota (Term 2014 – 2017).
 - ❖ Invited Panel member of Alice Clark Program (2014).
 - ❖ Faculty Advisor for Pi Kappa Phi Fraternity House.

Scientific Community

- ❖ Member of MRS (Materials Research Society), ACeRS (American Ceramics Society), ASME (American Society of Mechanical Engineers), TMS, ASM (American Society of Metals), ACS (American Chemical Society).
- ❖ Adjunct Professor, Henan Polytechnic University, China.
- ❖ Session Chair, 5th International Congress on Ceramics, Beijing, Aug 17-21, 2014.
- ❖ Session Chair, Green Technologies for Materials Manufacturing and Processing VI – Green Materials Processing III, MS&T 14, David L. Lawrence Convention Center, October 12-16, 2014, Pittsburgh, PA.
- ❖ Session Chair, 9th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT9), 39th International Conference and Exposition on Advanced Ceramics and Composites, Jan 25-30, 2015.
- ❖ Session Chair, 2nd European Union - USA Engineering Ceramics Summit, 39th International Conference and Exposition on Advanced Ceramics and Composites, Jan 25-30, 2015.
- ❖ Co-organized: 9th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT9), 39th International Conference and Exposition on Advanced Ceramics and Composites, Jan 25-30, 2015.
- ❖ Organized: T2S7: Ceramics in Conventional Energy, Oil, and Gas Exploration, 11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications, Vancouver, June 14-19, 2015.
- ❖ Co-organized: T4S3: Novel, Green, and Strategic Processing and Manufacturing Technologies, 11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications, Vancouver, June 14-19, 2015.
- ❖ Session Chair, Ceramics in Conventional Energy, Oil, and Gas, 11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications, Vancouver, June 14-19, 2015.
- ❖ Session Chair, Novel, Green, and Strategic Processing, 11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications, Vancouver, June 14-19, 2015.
- ❖ Best paper award selection committee of ICACC 2015.
- ❖ Member of the committee on the society awards of the American Ceramics Society (Appointment from 2015-2020)
- ❖ Co-organized 7th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing, MS&T 2015, Columbus, Ohio.
- ❖ Session Chair, Green Materials Processing I, 7th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing MS&T 2015, Columbus, Ohio.
- ❖ Secretary Elect for ECD American Ceramics Society (2015).
- ❖ Lead Organizer, Young Professional Forum, 9th International Conference on High Temperature Ceramic Matrix Composites and Global Forum on Advanced Materials and Technologies for Sustainable Development, Toronto (2016).
- ❖ Co-organizer, Novel, green, and strategic processing and manufacturing technologies, 9th International Conference on High Temperature Ceramic Matrix Composites and Global Forum on Advanced Materials and Technologies for Sustainable Development, Toronto (2016).

Peer Reviewer

- ❖ **2012-2013:** Corrosion Science (1 manuscript), Tribology International (3 manuscripts),

Journal of International Tribology (1 manuscript), and International Journal of Materials Research (1 manuscript).

❖ **2013 (Spring, Summer, and Fall):** Applied Surface Science (1), Tribology Letters (3), Tribology International (3), Journal of Materials Research (1), Journal of Engineering Tribology (1), Journal of Alloys and Compounds (2), The Electrochemical Society (1), International Journal of Materials Research (1), Journal of Physics and Chemistry of Solids (1), Ceramics International (2), Thin Film Solids (1), Surface and Coatings Technology (1), Material Letters (1).

❖ **2014 (Spring, Summer, and Fall):** International Journal of Applied Ceramics Technology (1), American Chemical Society (1), Journal of Materials Science (1), Materials Research Letters (1), Journal of Materials Engineering and Performance (1), Journal of Physics and Chemistry of Solids (1), International Journal of Refractory Metals and Hard Materials (1), Coatings (1), Journal of Alloys and Compounds (1), and Tribology Letters (1).

Research Experience

DEVELOPING MULTIPLE AREAS OF HIGH IMPACT RESEARCH IN MATERIALS SCIENCE AND ENGINEERING AT THE UNIVERSITY OF NORTH DAKOTA

2012-present

University of North Dakota

Developing multiple areas, namely, (a) sustainable materials, (b) advanced engineered composites, and (c) advanced manufacturing technologies of materials research.

MULTIFUNCTIONAL MATERIALS BY CO₂ SEQUESTRATION

2010-2012

Rutgers, the State University of New Jersey

Developing novel multifunctional materials (for example, different aspects of infrastructure applications) by using a novel Low Temperature Solidification (LTS) process, which consumes CO₂ during solidification process.

NOVEL MICROSTRUCTURES AND COMPOSITES FORMED BY CO₂ SEQUESTRATION

2008-2010

Rutgers, the State University of New Jersey

Discovered a novel type of microstructure by which solids can bond during CO₂ sequestration. Thereafter, fabricated and characterized novel composites by using the same microstructure as a base.

ASTM CERTIFICATION OF COMPOSITES

2008-2010

Rutgers, the State University of New Jersey

Lead ASTM certification program for characterizing novel composites formed by CO₂ sequestration for different applications (Solidia Technologies is commercializing it). These achievements helped Solidia Technologies to clear different financing rounds.

DEVELOPMENT OF HYDROXYAPATITE-COLLAGEN SCAFFOLDS

2008-2010

Rutgers, the State University of New Jersey

By using biomimetic (RT synthesis and neutral pH) paradigm different types of HAP-Collagen scaffolds developed by hydrothermal synthesis.

MULTISCALE MODELS FOR UNDERSTANDING MIXING OF STRUCTURAL MATERIALS

2008-2010

Rutgers, the State University of New Jersey

Fundamental theories about the effect of the mixing process on mechanical behavior of structural materials by using different mathematical models.

SINTERING BEHAVIOR OF LOW TEMPERATURE CO-FIRED CERAMICS

2006 - 2007

The Pennsylvania State University and EPCOS

Successfully developed mathematical models for understanding the thermomechanical properties like viscosity and anisotropy during sintering of commercial LTCC materials developed by EPCOS, Austria. These studies will help in designing complicated 3D architectures in LTCC.

CHARACTERIZATION OF THERMOMECHANICAL PROPERTIES OF HONEYCOMB CERAMICS DURING MANUFACTURING

2006 - 2008

The Pennsylvania State University

Mathematical models for predicting thermomechanical properties of ceramic green ware during manufacturing of diesel particulate filters. In addition, novel in-situ measurement techniques for mechanical properties measurements were also developed.

SYNTHESIS AND CHARACTERIZATION OF NOVEL NATURAL NANOLAMINATES

2001 - 2006

Drexel University

Following solids were synthesized for the first time in single phase form by using innovative materials processing:

- ❖ Al-based: V_2AlC , Cr_2AlC , $TiVAIC$, Ta_4AlC_3 and Ta_2AlC
- ❖ Ge-based: V_2GeC and Cr_2GeC
- ❖ In-based: $TiZrInC$, Ti_2InC , Hf_2InC and Zr_2InC
- ❖ Ga-Based: Cr_2GaC , Ti_2GaN and Nb_2GaC

These solids have a unique layered structure which bestows them with unique physical properties. Briefly, these solids are as conductive as metal and refractory as ceramics.

FABRICATION AND PILOT TESTING OF PROTOTYPE SHAFT FOR OIL FREE ENGINES

2004 -2006

Drexel University, Honeywell International and O.N.R.

Foil bearings are vital components in advanced oil free engines developed by NASA. These revolutionary engines operate between RT and 500°C, and completely eliminate oil as coolants during operation. Successful commercialization will not only eliminate usage of oil (Green Technology), but will also save \$400,000/year in each Boeing aircraft. The critical roadblock in commercialization of this technology is lack of solid lubricants which can function between RT and 500°C.

Successfully lead a team of scientists to scale up patented lab formulations and design pilot scale engine shafts. Subsequently, these shafts were successfully rig tested in generation-V foil bearing rig in Phoenix, Arizona facility of Honeywell International at 50,000 rpm. These shafts performed better than PS-304 materials developed by NASA.

VIBRATION MODES OF NANOLAMINATES

2004 - 2005

Drexel University

The vibration modes of ternary carbides were studied by Raman spectroscopy.

FUNDAMENTAL GROWTH MECHANISMS OF NANO-STRUCTURES

2002 - 2005

Drexel University

Finite Elements Model was developed to understand the growth of nano-whiskers and nano-wires. Successful in solving 50 year old problem of unwanted metal whisker growth in space shuttles and electronic devices.

DEVELOPMENT OF CHAMALEON TYPE SELF LUBRICATING SOLIDS

2003 - 2004

Drexel University and Honeywell International

Developed novel triboactive materials which can slide continuously between RT and 500°C against super alloys, and have <0.5 static and dynamic friction coefficient and low wear loss over the entire temperature range. There are very few materials which can successfully overcome these obstacles. During screening more than 50 different types of compositions were synthesized by hot pressing, hot isostatic pressing and liquid phase sintering. Their tribological and surface properties were characterized by advanced microscopy techniques like FESEM with EDS, AFM and SIMS.

SYNTHESIS AND APPLICATION OF SOLS FOR CASTABLES INDUSTRY

2000 (Aug) - 2001 (Apr)

University of Calcutta

Synthesize sols from inorganic precursors and use them as bonding agent in castables for steel industry.

MAGNETOTRANSPORT AND SUPERCONDUCTIVITY

2000 (June) - 2000 (Aug)

Tata Institute of Fundamental Research (TIFR).

25 % improvement in magnetoresistance was observed in CMR/glass composites.

Honors and Activities

- ❖ Nominated for Outstanding Undergraduate Teaching Award (2015).
- ❖ Nominated for Outstanding Research and Service Award (Faculty Scholar) (2015).
- ❖ Nominated for Outstanding Faculty Award (2015).
- ❖ Member of the Robert L. Coble Award for Young Scholars Committee of the American Ceramics Society.
- ❖ Global Young Investigator Award (GYIA) from Engineering Ceramics Division of the American Ceramics Society (2015).
- ❖ Secretary Elect Engineering Ceramics Division (ECD) of American Ceramics Society (ACeRs).
- ❖ Panel reviewer for NSF Materials Engineering and Processing (MEP) Program, May 22, 2014.
- ❖ Selected for inclusion in the Academic Keys Who's Who in Engineering Higher Education (WWEHE).
- ❖ "Nominated as a Future Leader in Materials Science and Engineering by the American Ceramic Society", Ceramic Leadership Summit and the Future Leader's Program, April 7-9, Baltimore, MD (2014).
- ❖ Senior Design Team won the Outstanding Senior Process Design Award for the Poster Titled, Intelligent Design of Ceramic Green Bodies for Smart Manufacturing" (2013, 2015).
- ❖ Nominated member of Sigma Xi, The Scientific Research Society, 2011.
- ❖ The best rating awarded for successful completion of project titled, "Thermomechanical Behavior of Honeycombs during Manufacturing", funded by Corning Incorporated (2008).
- ❖ Awarded Pennsylvania State University-Corning Inc. postdoctoral fellowship from 2006 2008 (\$40,000 per year).
- ❖ Research work on nanowires featured in the "Physics Update" section of the February 2005 issue of *Physics Today*. These research results were published in *Phys. Rev. Letts.*, **93**

[2] (2004).

❖ Technical award by Honeywell International, Morristown, NJ (2005).

❖ Member of DAT (Disaster Action Team) for *American Red Cross* (2006-2007).

❖ Honorary Graduate Fellowship from Drexel University (over \$20,000.00 per year) from 2001-2006.

Patents

1. "Porous Ceramic and Method of Making", S. Gupta (patent pending). (2013)
2. "Low Alkali Fly Ash Cement and Method of Making", S. Gupta and M. F. Faisal (patent pending) (2013).
3. "Aerated Composite Materials, Methods of Production and Uses Thereof" (2013)
4. "Bonding Element, Bonding Matrix, and Composite Materials having the Bonding Element, and Method of Manufacturing Thereof", R. R. Riman, S. Gupta, V. Atakan, and Q. Li. (International Patent Submitted in several countries) (Publication Number - US20130122267 A1 - Filing Date, Mar 2, 2012)
5. "Ternary carbide and nitride materials having tribological applications and methods of making same", S. Gupta, T. Palanisamy, M.W. Barsoum and C.W. Li, (U.S Patent 755,3564 B2, June 30, 2009).
6. "Ternary carbide and nitride composites having tribological applications and methods of making same", T. Palanisamy, S. Gupta, C. W. Li and M. W. Barsoum, (US Patent 757,2313 B2, Aug. 11, 2009).

Invited Presentations

1. On the Development of Novel Structural Materials for Multifunctional Applications, Army Research Lab (ARL) (2015).
2. Characterizing Tribofilms for Understanding Tribological Behavior of MAX Phases: Surojit Gupta, University of North Dakota, MS&T 2015, Columbus, Ohio.
3. Design Paradigm for Creating Novel Multifunctional Materials, NASA Glenn Research Center, Jun, 2015.
4. Current Progress in the Development of Next Generation Green Manufacturing Technologies (Invited), 39th International Conference and Exposition on Advanced Ceramics and Composites, Jan 25-30, 2015.
5. M. F. Riyad; S. Gupta "On the development of next generation green manufacturing technologies" S. Gupta, M. F. Riyad, T. Hammann, and R. Johnson, Green Technologies for Materials Manufacturing and Processing VI – Green Materials Processing III, MS&T 14, David L. Lawrence Convention Center, October 12-16, 2014, Pittsburgh, PA.
6. "On the development of green functional materials", Henan Polytechnic University, China, Aug, 2014.
7. "Tribology of Novel MAXMET Composites", S. Gupta, 5th International Congress on Ceramics, Beijing (Aug 17-21) (*Keynote Talk*), 2014.
8. "Current Progress in the "Greening" of Ceramic Manufacturing", Surojit Gupta, M. F. Riyad, T. Hammann, and R. Johnson, 5th International Congress on Ceramics, Beijing (Aug 17-21), 2014.
9. "Current progress in the greening of ceramics manufacturing", Surojit Gupta, M. F. Riyad, T. Hammann, and R. Johnson, UND-NDSU-SDSU Joint Symposium on Materials Science and Engineering (Sep, 2014).
10. "Current understanding about the Tribology of MAX Phases and Their Composites, Gordon Research Seminar (GRS), Bentley University, Waltham, MA, July 19-20, 2014.
11. "A Review of the Tribology of MAX Phases and Their Composites", 13th Ceramics Congress, Monte Catini Terme, Italy, CIMTEC, June 8-13, 2014.
12. "On the Development of Novel Advanced Multifunctional Structural Materials, Tata Institute of Fundamental Research, Colaba, Mumbai, India, Jan 4, 2014.
13. "Hydrothermal Processing for High Performance Building and Infrastructure Materials", R. E. Riman, S. Gupta, Q. Li, V. Atakan, C. Vakifahmeoglou, J. Krishnan, M. A.

Wassel, L. Tang, L. McCandlish, N. Decristofaro, ICMAT 2013, Suntec, Singapore (2013) (Key Note Talk).

14. "Development of Novel Structural Materials", S. Gupta, Physics Department, University of North Dakota, Feb 22, 2013.
15. "Novel Structural Materials developed by CO₂ Sequestration of Mineral Silicates", S. Gupta, Q. Li, L. Tang, V. Atakan, and R. E. Riman, 3rd International Solvothermal and Hydrothermal Association Conference (ISHA 2013), Jan 13-17, Texas, Austin.
16. "Carbonate Concrete: A Hydrothermal Technology for CO₂ Utilization and Construction", S. Gupta, Q. Li, L. Tang, V. Atakan, and R. E. Riman, 3rd International Solvothermal and Hydrothermal Association Conference (ISHA 2013), Jan 13-17, Texas, Austin.
17. "Novel Structural Materials", S. Gupta, Sep 20, 2012, Great River Energy.
18. "Applications of Hydroxyapatite Thermochemistry to Biomaterials Synthesis", R. E. Riman, C. Mossad, A. Petersson, and S. Gupta, MS&T 2010, Houston.
19. "Thermomechanical Properties of Honeycombs during Manufacturing" S. Gupta, D J. Green, and G L. Messing, Corning Inc., June, 2006.

Confidential Reports

1. "Thermomechanical behavior of honeycombs during manufacturing", Annual Reports submitted to Corning Incorporated (2007 and 2008).
2. "Progress report on development of triboactive materials for foil bearings", Annual Report submitted to ONR (Contract # N00421-03-C-0085, 2005).

Book Chapter

1. "A Perspective on the Green Body Fabrication and Design for Sustainable Manufacturing", S. Gupta, Book Chapter in Green and Sustainable Manufacturing of Advanced Materials, Elsevier (Invited) (2015).

Publications (Reverse Chronological Order)

An h-index of 21 with a total citations of 1300

2016

42. "On the synthesis and tribological behavior of PEEK-Ti₃SiC₂ composites during self-mating", Applied Composite Materials (pending).
41. "Synthesis and Tribological Behavior of Novel UHMWPE-Ti₃SiC₂ Composites", S. Gupta*, and M. F. Riyad, Polymer Composites (Accepted for Publication).
40. "Reactive Hydrothermal Liquid Phase Densification (rHLPD) - A New Densification Process for Ceramic Composites", C. Vakifahmetoglu et al. submitted to Acta Materialia (Collaboration with Rutgers, State University of New Jersey during the tenure of Dr. Gupta as a Faculty Researcher).
39. "Carbonate Ceramics by CO₂ Utilization" S. Gupta, Q. Li, C. Vakifahmetoglu, V. Atakan, L. Tang, A. Krugler and R.E. Riman, Submitted to Royal Society of Chemistry (Pending) (Collaboration with Rutgers, State University of New Jersey during the tenure of Dr. Gupta as a Faculty Researcher).
38. "A Novel Strategy of Carbon Capture and Sequestration by r-HLPD Processing", Q. Li, S. Gupta, L. Tang, V. Atakan, and R. E. Riman, Frontiers of Energy (Accepted with Minor Revisions) (Collaboration with Rutgers, State University of New Jersey during the tenure of Dr. Gupta as a Faculty Researcher).

2015

37. **"Synthesis and Characterization of Ti_3SiC_2 Particulate-Reinforced Novel Zn Matrix Composites"**, Journal of Materials Engineering and Performance, **24**, 4071-4076 (2015).
36. **"On the Usage of Class C Fly Ash as a Sole Reactive Precursor for Cementitious Phase"**, M. F. Riyad and S. Gupta, J. Bio. Chem. Inter. **2**, 55-60 (2014).
35. **"Novel Al matrix Composites Reinforced with Ti_3SiC_2 (nanolaminates) Particulates"**, S. Gupta, T. Hammann, R. Johnson, and M.F.Riyad, J. Mat. Eng. Perf. **24**, 1011-1017 (2015).
34. **"Novel Self Lubricating Ti_3SiC_2 (Natural Nanolaminates) Reinforced Epoxy Composites"**, S. Gupta, S. Gupta, T. Hammann, R. Johnson, and M.F.Riyad, Tribology Transactions, **58** (2015).

(2012-2014)

33. **"Oxidation-induced Sintering: An Innovative Method for Manufacturing Porous Ceramics"**, S. Gupta and M. F. Riyad, International Journal of Applied Ceramic Technology, Article first published online: 3 Jul 2014, DOI: 10.1111/ijac.12282.
32. **"Synthesis and Characterization of Novel Ti_3SiC_2 -BN Composites"**, Z. Li, A. Zhou, L. Li, L. Wang, S. Li, and S. Gupta, Diamond & Related Materials **43**, 29-33 (2014).

2010 and 2011

31. **"On the Tribology of MAX Phases and Their Composites - A Review"**, S. Gupta and M. W. Barsoum, Wear **271** (2011) 1878- 1894.
30. **"Thermomechanical Behavior of Ceramic Green Bodies during Pre-sintering"**, S. Gupta, D J. Green, G L. Messing and I. Peterson, J. Am. Cer. Soc., **93** [9] 2611-2616 (2010).

2009

29. **"On the compression behavior of Ti_2InC , $(\text{Ti}_{0.5}, \text{Zr}_{0.5})_2\text{InC}$, and M_2SnC (Nb, Hf) at quasi-hydrostatic pressures above 50 GPa"**, Bouchaib Manoun, O. Leaffer, S. Gupta, E.N. Hoffman, S.K. Saxena and M.W. Barsoum, Solid State Communications, **149** [43-44] 1978-1983 (2009).
28. **"Study of tribofilms formed during dry sliding of $\text{Ta}_2\text{AlC}/\text{Ag}$ or $\text{Cr}_2\text{AlC}/\text{Ag}$ composites against Ni-base superalloys and Al_2O_3 "**, S. Gupta, D. Filimonov, V. Zaitsev, T. Palanisamy, T. El-Raghy, M.W. Barsoum, Wear **267**, 1490-1500 (2009).
27. **"Effect of applied load and surface roughness on the tribological properties of Ni-based superalloys versus $\text{Ta}_2\text{AlC}/\text{Ag}$ or $\text{Cr}_2\text{AlC}/\text{Ag}$ composites"**, D. Filimonov, S. Gupta, T. Palanisamy and M.W. Barsoum, Tribol. Lett. **33**, 9-20 (2009).
26. **"Thermal expansion of select $\text{M}_{n+1}\text{AX}_n$ (M=early transition metal, A=A group element, X=C or N) phases measured by high temperature x-ray diffraction and dilatometry"**, T.H. Scabarozi, S. Amini, O. Leaffer, A Ganguly, S. Gupta, W. Tambussi, S. Clipper, J.E. Spanier, M.W. Barsoum, J.D.Hettinger and S.E. Lofland, J. App. Phys. **105**, 013543 (2009).

2008

25. **"Synthesis and elastic mechanical properties of Cr₂GeC"**, S. Amini, A. Zhou, S. Gupta, A. DeVillier, P. Finkel and M. W. Barsoum, J. Mater. Res. **23**, 2157-2165 (2008).
24. **"Tribological behavior of select MAX phases against Al₂O₃ at elevated temperatures"**, S. Gupta, D. Filimonov, T. Palanisamy and M. W. Barsoum, Wear **265**, 560-565 (2008).
23. **"Ambient and 550 °C tribological behavior of select MAX phases against Ni-based superalloys"**, S. Gupta, D. Filimonov, V. Zaitsev, T. Palanisamy and M. W. Barsoum, Wear **264**, 270-278 (2008).

2007

22. **"On the Raman scattering from selected M₂AlC compounds"**, O. D. Leaffer, S. Gupta, M. W. Barsoum and J. E. Spanier, J. Mater. Res., **22** [10] 2651-2654 (2007).
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1. **"Effect of Ti_3SiC_2 particulates on the mechanical and tribological behavior of Sn matrix composites on the mechanical and tribological behavior of Sn matrix composites"**, T. Hammann, R. Johnson, M. F. Riyad, and S. Gupta, 39th International Conference and Exposition on Advanced Ceramics and Composites, Jan 25-30, 2015.
2. **Novel Engineered Cementitious Materials by Using Class C Fly Ash as a cementitious phase"** M. F. Riyad, M. Fuka, R. Lofthus, Q. Li, N. M. Patel, and S. Gupta, Ceramics Transaction, MS&T 2015, Columbus, Ohio.

**Contributed
Presentations**

1. **"Novel Metal Matrix Multifunctional Materials by Ti_3SiC_2 Reinforcements"**, Md. Ahsan Habib, R. Dunnigan, S. Ghosh, S. Gupta, MS&T 2015, Columbus, Ohio.
2. **"Design of Novel Green Manufacturing Technologies"**, S. Gupta, M. F. Riyad, R. Dunnigan, MS&T 2015, Columbus, Ohio.
3. **"Novel MAX Phase Reinforced Soft Metal Composites"**, S. Ghosh, R. Dunnigan, Md. Ahsan Habib, S. Gupta, MS&T 2015, Columbus, Ohio.
4. **"Manufacturing of Novel MAX-Polymer (MAXPOL) Multifunctional Composites"**, R. Dunnigan, M. F. Riyad, Surojit Gupta, MS&T 2015, Columbus, Ohio.
5. **"On the Development of Novel MRM (MAX Reinforced Metal) Multifunctional Materials"**, S. Gupta, D. Ross, 11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications, Vancouver, June 14-19, 2015.
6. **"Novel Engineered Cementitious Materials by Class C Fly Ash"**, S. Gupta, M. F. Riyad, Q. Li, 11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications, Vancouver, June 14-19, 2015.
7. **"Novel Solid Lubricant for Multifunctional Applications"**, S. Gupta, 11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications, Vancouver, June 14-19, 2015.
8. **"Potential of Ceramics based Materials to Ameliorate Corrosion Issues in Petrochemical Refinery Components: A Review"**, M. Hassan, S. Gupta, 11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications, Vancouver, June 14-19, 2015.
9. **"A Perspective on the Green Body Fabrication and Design for Sustainable Manufacturing"**, S. Gupta, 11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications, Vancouver, June 14-19, 2015.
10. **"Tribology of Multifunctional Self Lubricating MAX-Polymer (MAXPOL) Composites"**, S. Gupta, STLE 70th Annual Meeting & Exhibition, Dallas Texas - Omni Hotel - May 17 - 21, 2015.
11. **"Tribology of MAX Phase Reinforced Novel Soft Metal Composites"**, R. Dunnigan, S. Gupta, T. Hammann, STLE 70th Annual Meeting & Exhibition, Dallas Texas - Omni Hotel - May 17 - 21, 2015.

12. **"Effect of Nanolaminate (Ti₃SiC₂) additives on the "Soft" Metals"**, T. Hammann; R. Johnson, S. Gupta, 39th International Conference and Exposition on Advanced Ceramics and Composites, Jan 25-30, 2015.
13. **"Novel Ti₃SiC₂ Reinforced Metal Matrix Multifunctional Materials"**, R. Johnson, T. Hammann, S. Gupta, 39th International Conference and Exposition on Advanced Ceramics and Composites, Jan 25-30, 2015.
14. **"Developing novel strategies for enhancing materials education"**, S. Gupta, D. Bose, M. Cavalli, 39th International Conference and Exposition on Advanced Ceramics and Composites, Jan 25-30, 2015.
15. **"Recent Studies to Understand the Tribology of MAX Phases and Their Composites"**, S. Gupta, 39th International Conference and Exposition on Advanced Ceramics and Composites, Jan 25-30, 2015.
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21. **"Development of Novel MAX-Al Composites"** T. Hammann*, R. Johnson*, M. F. Riyadh, S. Gupta, University of North Dakota, USA. 2014 Scholarly Forum, University of North Dakota (2014).
22. **"The Importance of Tribofilms on the Tribological Behavior of Layered Nanolaminates (MAX Phases)"**, S. Gupta, 38th International Conference and Expo on Advanced Ceramics and Composites. Daytona Beach, Fl. (2014) **(ICACC-GYIF-014-2014)**.
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26. **"Novel Processing Methods for Developing Porous Oxides and Carbide Ceramics"** M. F. Riyad*, R. Johnson, T. Hammann, S. Gupta, 38th International Conference and Expo on Advanced Ceramics and Composites. Daytona Beach, Fl. (2014).
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28. **"A perspective on the tribology of MAX Phases"**, S. Gupta, 40th Biennial Great Lakes Regional Meeting, June 5-8, 2013.
29. **"Novel Methods for Understanding the Manufacturing of Inorganic Materials"**, S. Gupta, 40th Biennial Great Lakes Regional Meeting, June 5-8, 2013.
30. **"On the Development of Novel Cementitious Materials"**, S. Gupta, M. F. Riyad, R. Johnson, T. Hammann, 4th Advances in Cement-based Materials, Urbana, IL, July 8, 2013.
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41. **"Characterization and Isothermal Oxidation of Ta_2AlC in Air."** S. Gupta, D. Filimonov, T. El-Raghy; M. W. Barsoum, MS&T 2006, Cincinnati, Ohio Synthesis.
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46. **"Tribology of Ti_3SiC_2 and its derivatives"**, S. Gupta, Z. M. Sun, M.W. Barsoum, E. Passman, T. Palanisamy and C. W. Li, World Tribology Congress, Sep 12-16 (2005).
47. **"The effect of M (M=Ti,Cr,V,Nb) on the transport and elastic properties of nanolayered ternary carbides M_2AlC ,"** J. Hettinger, P. Finkel, T. Meehan, S. Lofland, K. Harrell, M. W. Barsoum, A. Ganguly, and S. Gupta, American Physical Society, March 2005.
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50. **"Tribological and Wear Studies of MAX Phases and Its Composites"**, S. Gupta, Z. M. Sun, M. W. Barsoum, T. Palanisamy, E. Passman and C. W. Li, MRS Meeting Fall 2004.
51. **"Synthesis and Oxidation of Cr_2AlC and V_2AlC in Air"**, S. Gupta and M. W. Barsoum ECS, 203rd Meeting, Paris, France.
52. **"Synthesis and Oxidation Kinetics of Cr_2AlC in Air"**, S. Gupta and M. W. Barsoum American Ceramic Society, 105th Annual Meeting, Nashville, TN.

53. **"Synthesis and Oxidation kinetics of V_2AlC and $(Ti,V)_2AlC$ in Air"**, S. Gupta and M. W. Barsoum, American Ceramic Society, 105th Annual Meeting, Nashville, TN,.
54. **"Grain Boundary De-Wetting and Real Time Ostwald Ripening of Indium from Zirconium Indium Carbide"**, E N. Hoffman, S Gupta and Michel W. Barsoum 16th Fall Meeting of The Ceramic Society of Japan & The 5th International Meeting of Pacific Rim Ceramic Societies(PacRim5).
55. **"Low Temperature Electrical and Thermal Transport Properties of the Natural Nanolaminate V_2AlC "**, J. D. Hettinger, P. Finkel, S. E. Lofland, M. W. Barsoum and S. Gupta, APS March Meeting, Texas, 2003.

Poster Presentations

1. **"Smart Practices for Enhancing Materials Education"**, 6th North American Materials Education Symposium, Ohio State University, March 26-27, 2014.
2. **"Novel Structural Ceramics by Microstructure Design"**, R. Lofthus, M. Fuka, A. Nur, D. Hennessey, S. Gupta, 11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications, Vancouver, June 14-19, 2015.
3. **"Novel Multifunctional Composites for Energy Harvesting Applications"**, S. Swanson, T. Colling, K. Lindblad, A. Eastman, S. Banerjee, M. N. Cavalli, S. Gupta, 11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications, Vancouver, June 14-19, 2015.
4. **"A Case Study on the Formation of Tribofilms during Dry Sliding of MAX Phases"**, Gordon Research Conference, Bentley Univeristy, Waltham, MA, July 20-25, 2014.
5. **"Novel Senior Design Projects for Developing Better Understanding of Sustainable Materials Manufacturing"**, S. Gupta, D. Bose, and M.N. Cavalli, 5th North American Materials Education Symposium, University of Illinois at Urbana-Champaign, March 20-21, 2014.
6. **"On the Development of Next Generation Advanced Green Manufacturing Technologies"**, E. Chejade, R. Dumm, J. Chmielewski, M. Bugliosi, ND EPSCoR/IDeA 2014 State Conference - Innovations & Expressions - April 29th, 2014.
7. **"Mathematical Models for Understanding Manufacturing of Advanced Materials"**, R. Johnson, J. Resig, J. Carroll, S. Akkoc, and A. Ali (2013-14), ND EPSCoR/IDeA 2014 State Conference - Innovations & Expressions - April 29th, 2014.
8. **"Novel Low Alkali Activated Fly Ash Cement (LAFAC) based Composites"**, M. F. Riyad, T. Hammann, R. Johnson, and S. Gupta, 4th Advances in Cement-based Materials, Urbana, IL, July 8, 2013.