

## **SADHAN C. JANA**

### **CURRICULUM VITAE**

PROFESSOR AND CHAIR  
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Naturalized U.S. Citizen

#### ***Education***

Ph.D., Chemical Engineering, Northwestern University, 1993.  
M.Tech., Chemical Engineering, IIT- Kanpur, India, 1988.  
B.Tech., Chemical Engineering, University of Calcutta, India, 1986.

#### ***Academic Positions***

April 1, 2015-present:	Interim Chair, Department of Polymer Engineering, University of Akron
July 2007-present:	Professor, Department of Polymer Engineering, University of Akron
Nov., 2004 – Aug., 2011:	Chair, Department of Polymer Engineering, University of Akron
July 2004 – June 2007:	Associate Professor, Department of Polymer Engineering, University of Akron
Aug. 1998 – July 2004:	Assistant Professor, Department of Polymer Engineering, University of Akron
Fall 1994:	Visiting Professor, Department of Chemical Engineering, City University of New York
Spring 1993:	Instructor, Department of Chemical Engineering, Northwestern University.

#### ***Research Positions***

May 31-August 05, 2005:	NASA Summer Faculty Fellow, NASA Glenn Research Center, Cleveland.
June 14-August 20, 1999:	NASA/OAI Summer Faculty Fellow, NASA Glenn Research Center, Cleveland
December 1994-July 1998:	Senior Chemical Engineer, GE Corporate Res. & Dev., Schenectady, NY.
August 1993 – Dec. 1994:	Post-doctoral Fellow, Levich Institute, CUNY, New York
June 1991 – July 1993:	Research Assistant, Dept. of Chemical Engineering, Northwestern University.
August 1988- June 1991:	Research Assistant, Dept. of Chemical Engineering, UMass-Amherst.

#### ***Administrative Experience***

Department Chair, Department of Polymer Engineering (2015-now); (2004 – 2011); Chair, New Technology Committee, Society of Plastics Engineers (2011-2013); Chair, Education Award Committee, Society of Plastics Engineers (2011-2012); Chair, Co-operative Research Award Committee, Polymer Materials Science and Engineering Division, American Chemical Society (2011-2013); Chair, Board of Directors, Engineering Properties and Structures Division, Society of Plastics Engineers (2009-2010); Chair, National Polymer Innovation Center Building Committee (2007-2010); Chair and Chair-elect, Board of Directors, Engineering Properties and Structures Division, Society of Plastics Engineers (2008-2009; 2009-2010); Chair of Graduate Admission Committee (2002-2004), Department of Polymer Engineering, University of Akron; Chair, Awards Committee, Engineering Properties and Structures Division, Society of Plastics Engineers (2005-2008). Vice Chair, New Technology Committee, Society of Plastics Engineers (2009-2010).

### ***Editorial Activities***

Editor-in-chief, Springer Materials, Polymer Section, Springer-Verlag, GmbH, Heidelberg, Germany.  
Associate Editor, Polymer Engineering & Science, Society of Plastics Engineers journal, published by Wiley.  
Editorial Board, Polymer Engineering Journal  
Editorial Board, Polymers for Advanced Technology  
Review Board, Materials and Manufacturing Processes  
Editorial Board, Defense Science Journal, DRDO, India (2015-2016)  
Editor (G. Mago, D. Kalyon, and F. Fisher coeditors) Polymer Nanocomposite Processing, Characterization, and Applications, special issue, published by Journal of Nanomaterials, 2010.  
Editor (G. Mago, and D. Kalyon coeditors), Polymer Nanocomposite Processing, Characterization, and Applications, special issue, to be published by Journal of Nanomaterials, 2012.  
Editor (Jie Feng coeditor) Biocomposites: Mechanical Properties and Biomedical Applications to be published by CRC Press, a Taylor and Francis Company  
Editor (R. Gupta and A. Ray coeditors), Polymer Engineering & Science, October 2011 special issue in honor of Santosh K. Gupta.

### ***Current Positions in Professional Societies***

American Chemical Society, Polymer Materials Science and Engineering Division: Member of the Board, Chair of Co-operative Research Award Committee  
Polymer Processing Society: Member of the Executive Committee; International Representative from U.S.A., Editor-in-chief of PPS Conference Proceedings.  
Society of Plastics Engineers: Fellow and Honored Service Member; Chair of Education Award Committee; Member of Engineering Properties and Structure Division and New Technology Committee.

### ***Biographical Listing***

WHO'S WHO in America  
WHO'S WHO in the World  
WHO'S WHO in American Education  
WHO'S WHO in Science and Engineering  
WHO'S WHO in Plastics and Polymers

### ***Awards and Honors***

2017 George Stafford Whitby Award for Distinguished Research and Teaching, Rubber Division, American Chemical Society  
2017 Inaugural S.R. Palit Memorial Lecture, Society of Polymer Science India, MACRO 2017, Trivandrum, India  
2014 Honored Service Member, Society of Plastics Engineers  
2011 William C. Zekan Memorial Award, Akron Section, Society of Plastics Engineers  
2011 Excellence in Education, featured in December 2011 issue of Ohio Magazine.  
Honorary Professor, Department of Chemical Engineering, National University of Colombia, Bogota, September 2010.  
2010 Fred E. Schwab Education Award, Society of Plastics Engineers  
Elected Fellow, Society of Plastics Engineers, May 2008  
Mentor of the Year Award, University of Akron, 2007  
Perkin Elmer Award (with graduate student S. Gunes), Composites Division, Society of Plastics Engineers ANTEC 2006  
CHEMCON Distinguished Speaker Award, Indian Institute of Chemical Engineers, IIT Delhi, India, 2005  
CNR Rao Medal, CHEMCON 2005, Indian Institute of Chemical Engineers, IIT Delhi, India, 2005  
Mentor of the Year Award, University of Akron, 2005  
Best Paper Award, Composites Division, Society of Plastics Engineers ANTEC 2005.  
Board Member, Engineering Properties Division (EPSDIV), Society of Plastics Engineers, 2005 – present.

Member, Committee on New Technology, Society of Plastics Engineers, 2007 – present  
NASA Summer Faculty Fellow, NASA Glenn Research Center, 1999, 2005.  
CAREER Award, National Science Foundation (2002)  
Distinguished Young Alumnus Award, University of Calcutta (2001)  
Gold Medal, University of Calcutta (1986).  
National Merit Scholar-Government of India (1977).

### ***Organizing Activities at National and International Conferences***

Chair of 30<sup>th</sup> Polymer Processing Society Annual Meeting (PPS-30), Cleveland, scheduled in June 2014.  
Session Organizer and Session Chair (with D. Lacks), Rheology of Solids, Glasses and Composites, 83<sup>rd</sup> Society of Rheology Meeting, October 9-13, 2011, Cleveland, Ohio.  
Session Organizer and Session Chair (with A. Ray), In Honor of Santosh K. Gupta, AIChE Annual Meeting, October 16-21, 2011, Minneapolis, MN.  
Member, Technical Program Committee, New Technology Forum, Society of Plastics Engineers, ANTEC 2012.  
Member, Technical Program Committee, New Technology Forum, Society of Plastics Engineers, ANTEC 2011.  
Member, Technical Program Committee, New Technology Forum, Society of Plastics Engineers, ANTEC 2010.  
Session Organizer and Chair, In Memory of James L. White, 26<sup>th</sup> Polymer Processing Society Meeting, Banff, Canada, July 4-8, 2010.  
Session Organizer and Chair, In Honor of James L. White, 25<sup>th</sup> Polymer Processing Society Meeting, Goa, India, March 1-5, 2009.  
Member, Technical Program Committee, New Technology Symposium, Society of Plastics Engineers, Philadelphia, November 4-6, 2008.  
Member, Technical Program Committee, Engineering Properties and Structures Division, Society of Plastics Engineers Annual Technical Conference (SPE ANTEC) 2008, Milwaukee, WI.  
Organizer, NANOCOMPOSITES 2008, San Diego, 2008.  
Member, Technical Program Committee, Engineering Properties and Structures Division, Society of Plastics Engineers Annual Technical Conference (SPE ANTEC) 2007, Cincinnati, OH.  
Co-organizer, Symposium on Mixing and Compounding, PPS-23, Sao Paulo, Brazil, 2007  
Member, Committee on Topical Conferences (TOPCON), Engineering Properties and Structures Division, Society of Plastics Engineers, 2005-present.  
Organizer, NANOCOMPOSITES 2007, Las Vegas, 2007.  
Member, Technical Program Committee, Engineering Properties and Structures Division, ANTEC 2006, Charlotte, NC.  
Organizer, NANOCOMPOSITES 2006, Chicago, 2006.  
Session Chair on Polymer Nanocomposites, SPE ANTEC 2006.  
Chair, Technical Program Committee, Engineering Properties Division (EPSDIV), SPE ANTEC 2005.  
Organizer, Novel Manufacturing Methods, NANOCOMPOSITES 2005, San Francisco, 2005.  
Co-organizer, Symposium on Mixing and Compounding, PPS Regional Meeting, Quebec, August 15-17, 2005.  
Organizer, Novel Manufacturing Methods, NANOCOMPOSITES 2004, San Francisco, 2004.  
Chair, Technical Program Committee, 20<sup>th</sup> Annual Conference of Polymer Processing Society (PPS-20), Akron, OH (June 20-24, 2004).  
Co-organizer, Symposium on Blending and Compounding, PPS-19, 2003  
Chair, session on Polypropylene Nanocomposites, SPE ANTEC 2003.  
Organizer, Novel Manufacturing Methods, NANOCOMPOSITES 2003, San Francisco, 2003.  
Co-organizer and co-session chair, Chaotic Mixing, SPE ANTEC 2002.

### ***Membership in Professional Societies***

American Association for the Advancement of Science, The New York Academy of Sciences, Society of Rheology, Society of Plastics Engineers, Polymer Processing Society, American Chemical Society, American Institute of Chemical Engineers.

***Technical Journal Peer-Review Activities***

Advanced Materials; AIChE Journal; Biomacromolecules; Biomaterials; Chemical Engineering Communications; Chemical Engineering and Science; Chaos; Colloids and Surface Science; Composites Science and Technology; Computers and Chemical Engineering; European Polymer Journal; Fluid Dynamics Research; International Polymer Processing; Journal of Applied Polymer Science; Journal of Polymer Science: Part B: Physics; Journal of Engineering Mathematics; Journal of Fluid Mechanics; Journal of Fluids Engineering; Journal of Heat Transfer; Journal of Materials in Civil Engineering; Journal of Materials Science; Journal of Polymer Engineering; Journal of Rheology; Journal of Thermoplastic Composite Materials; Langmuir; Macromolecular Materials and Engineering; Macromolecular Science and Engineering; Macromolecules; Physics of Fluids; Polymer Engineering and Science; Polymer; Polymers and Polymer Composites; Proceedings of the Royal Society of London, Series A; ZAMP

***Ph.D. Thesis Examiner of Overseas Universities***

Gujarat University, India  
Indian Institute of Technology, Delhi, India  
Indian Institute of Technology, Guwahati, India  
Indian Institute of Technology, Kanpur, India  
Indian Institute of Technology, Kharagpur, India  
Indian Institute of Technology, Mumbai, India  
Indian Institute of Science, Bangalore, India  
Nanyang Technological University, Singapore  
Royal Melbourne Institute of Technology, Melbourne, Australia  
Thapar University, Patiala, India  
University of Calcutta, Calcutta, India  
University of New South Wales, Australia  
University of Potsdam, Germany  
U.P. Technical University, India

***Proposal and Panel Review Activities***

National Science Foundation (Materials Processing and Manufacturing, Nanomanufacturing, Chemical Transport System, Division of Materials Research)  
U.S. Department of Agriculture  
American Chemical Society Petroleum Research Fund  
National Science and Engineering Research Council (Canada)  
NASA  
KACST, Kingdom of Saudi Arabia (performed through AAAS)  
Kuwait Research Foundation

***Plenary and Invited Talks at International Conferences:***

1. Jana, S.C. Changing landscape in polymer research: Challenges and opportunities. Inaugural S.R. Palit Memorial Lecture at MACRO 2017 conference, Society of Polymer Science India, Trivandrum, India, January 8-12, 2017.

2. Jana, S.C. Multifunctional materials: State-of-the art and novelties. Plenary talk at International Conference on Functional Materials, IIT Kharagpur, India, December 12-14, 2016.
3. Jana, S.C. Changing landscape in polymer research: Challenges and opportunities. Plenary talk at 2016 Asian Workshop in Polymer Processing, Melbourne, Australia, November 6-9, 2016.
4. Jana, S.C., Gu, S., Zhai, C., Liu, H., Liu, T. Design of mesoporous solid networks in polymer-derived aerogel monoliths and microparticles. Paper No. PMSE 291. Invited talk presented at the 252<sup>nd</sup> American Chemical Society National Meeting and Exposition, Philadelphia, August 21-25, 2016.
5. Jana, S.C., Kim, S.J., Shinko, A., Gu, S., Zhai, C. *Lightweight aerogel materials: From fundamentals to innovative applications*. Invited keynote talk presented at the 14th International Symposium on Bioplastics, Biocomposites and Biorefining (ISBBB 2016), Guelph, Ontario, Canada, May 31-June 3, 2016.
6. Jana, S.C., Gu, S. *Open cell aerogel foams*. Keynote address in session Polymer Foams and Lightweight Structures at 32<sup>nd</sup> International Conference of the Polymer Processing Society (PPS-32), Lyon, France, July 25-29, 2016.
7. Jana, S.C., Raut, P., Swanson, N., Albehaijan, H., Pugh, C., *Improved dispersion of carbon black in rubber compounds for manufacturing low rolling resistance tires*. Keynote address in session Elastomers and Thermoplastic Elastomers at 32<sup>nd</sup> International Conference of the Polymer Processing Society (PPS-32), Lyon, France, July 25-29, 2016.
8. Jana, S.C., Rajgarhia, S., Kim, S.J., Chase, G. *Design of nanoscale polymeric building blocks for high efficiency separation problems*. Invited talk presented at Fellows Forum, Society of Plastics Engineers Annual Technical Conference, Indianapolis, IN, May 22-25, 2016.
9. Jana, S.C., Gu, S., Zhai, C., Li, H., Liu, T. *Design of mesoporous solid networks in polymer-derived aerogels monoliths and microparticles*. Plenary talk at 11<sup>th</sup> International IUPAC Conference on Polymer-Solvent Complexes & Intercalates (Polysolvat-11), Kolkata, India, January 27-30, 2016.
10. Jana, S.C. *Challenges and opportunities in functional nanomaterials design*. Invited talk presented at Fellows Forum, Society of Plastics Engineers Annual Technical Conference, Orlando, FL, March 22-25, 2015.
11. Bahl, K., Jana, S.C. *Surface engineering of sustainable filler materials for low rolling resistance rubber compounds*. Keynote address at Second Symposium on Advances in Sustainable Polymers (ASP-15), Indian Institute of Technology, Guwahati, India, January 21-22, 2015.
12. Raut, P., Shinko, A., Niknezhad, S., Jana, S.C. *Functional materials for new technologies: Designs at nanoscale*. Invited Special Lecture at International Conference on Polymer Science and Technology, Macro 2015, Calcutta, India, January 23-26, 2015.
13. Gu, S., Shinko, A., Jana, S.C. *Science and technology of gels and associated nanostructures of aerogels*. Plenary talk at First International Conference on Polymer Science and Engineering (PSE-2014), Beijing, China, November 10-13, 2014.
14. Gu, S., Shinko, A., Jana, S.C. *Science and technology of gels and associated nanostructures via thermo-reversible gelation process*. Plenary talk at POLYSOLVAT-10, 10th International IUPAC Conference on Polymer-Solvent Complexes & Intercalates. 22-25 September, 2014, Salerno, Italy.

15. Duan, Y., Wang, X., Benavides, R., Jana S.C. *Functional materials design at nanoscales*. Invited talk at the North American Thermal Analysis Society in the special symposium in honor of Stephen Cheng, Santa Fe, NM, September 14-17, 2014.
16. Zhang, H, Jana, S.C. *Design of mesoporous organic-inorganic hybrid aerogels*. Invited talk at “Porous Polymers” at the 248<sup>th</sup> ACS National Meeting in San Francisco, California, August 10-14, 2014.
17. Bahl, K., Jana, S.C. Surface engineering of sustainable filler materials in preparation of polymer compounds. Keynote talk at 14<sup>th</sup> International Conference on Bioplastics, Biocomposites, and Biorefining, May 19-24, 2014, Guelph, Ontario, Canada.
18. Rajgarhia, S., Jana, S.C., *Fiber diameter selection in production of nanofibers by gas jet method*. Invited talk for presentation in the session “Electrospinning and Nanofibers: Symposium in Honor of the 85th Birthday of Darrell Reneker”, Division of Polymeric Materials Science and Engineering (PMSE) in the 247th American Chemical Society (ACS) National Meeting & Exposition in Dallas from March 16-20, 2014.
19. Jana, S.C., Bahl, K., *Surface engineering of sustainable filler materials in preparation of polymeric compounds*. Invited talk at the memorial session for Donald Witenhafer at 2014 Annual Technical Conference of the Society of Plastics Engineers, Las Vegas, April 28-30, 2014.
20. Duan, Y., Wang, X., Benavides, R., Jana, S.C. *Functional materials design at nanoscale*. POLYCHAR 22 World Forum on Advanced Materials, 7-11 April 2014, Stellenbosch, South Africa.
21. Jana, S.C., Rajgarhia, S., Benavides, R., Reneker, D. Fiber diameter selection in production of nanofibers by gas jet method. Invited talk at “Electrospinning and Nanofibers: Symposium in Honor of the 85th Birthday of Darrell Reneker” at 247th ACS National Meeting & Exposition, Dallas, TX, United States, March 16-20, 2014 (2014), PMSE-26.
22. Jana, S.C., Benavides, R., Reneker, D., *High throughput nanofibers by gas jet method: Unique morphologies and applications*, Invited Lecture at 12th International Polymers for Advanced Technologies Conference held in Berlin, Germany from September 29-October 2, 2013.
23. Benavides, R., Jana, S.C., Reneker, D. *Scalable production of polymer nanofibers using gas jet*. Keynote address at 29<sup>th</sup> Annual Conference of Polymer Processing Society, Nuremberg, Germany, July 15-19, 2013.
24. Benavides, R., Jana, S.C., Reneker, D. *High throughput nanofibers by gas jet method: Unique morphologies and applications*. Invited talk in session Polymer Nanocomposites. 5<sup>th</sup> International Conference on Rubber and Rubber-like Materials (ICRRM 2013), Kharagpur, India, March 6-9, 2013.
25. Roy, S., Duan, Y., Jana, S.C. Engineering at nanoscale. Keynote address in session M36, Polymer Analysis Division, Society of Plastics Engineers Annual Technical Conference, Cincinnati, OH, April 21-24, 2013.
26. Jana, S.C., Duan, Y., Wang, X., Shinko, A. Chemical and engineering issues of functional polymer aerogels (Paper no. 237). Invited talk at session on Polymer Polymers: Gels, Hydrogels, and Aerogels, Polymer Materials Science and Engineering Division, American Chemical Society Spring Meeting, New Orleans, April 7-11, 2013.
27. Jana, S.C., Benavides, R., Reneker, D. Carbon nanomaterials: Basics of mesopitch-derived nanofibers and graphene aerogels (Paper no. 580). Invited talk at session on Polymer Precursor-derived Carbon

Nanostructured Carbon Materials, Polymer Division, American Chemical Society Spring Meeting, New Orleans, April 7-11, 2013.

28. Jana, S.C. *Design of nanoreinforcements by engineering at nanoscale*. Keynote (#KN-07-02) address at 28<sup>th</sup> Polymer Processing Society Conference held during December 11-15, 2012 at Pattaya, Thailand.
29. Jana, S.C., Jung, C.D. Exploiting chaos: Should polymerization reactors be chaotic? Invited talk at Engineering Properties and Structure Division session in memory of Kyonsuku Min Cakmak, SPE Annual Technical Conference, April 2-4, 2012, Orlando, Florida.
30. Jana, S.C., Roy, S., Duan, Y., Benavides, R., Wang, X. *Design of nanoreinforcements by engineering at nanoscale*. Keynote address at International Conference on Nanoscience and Technology (CONSAT-2012) held during January 20-23, 2012 at Hyderabad, India.
31. Gunes, S., Jimenez, G., Cao, F., Jana, S.C. *Shape memory polymer nanocomposites research and applications*. Invited talk, Session: A-15.6, CIMTEC 2012 - 4th International Conference on Smart Materials, Structures, and Systems held in Montecatini Terme, Italy, on June 10-14, 2012.
32. Jana, S.C., Gunes, S., Cao, F., Bahl, K., Nanocomposites of rubbery polymers: An engineer's views. International Rubber Conference 2012(IRC 2012) held on May 21-24, 2012 in Jeju, Korea.
33. Roy, S., Jana, S.C. *Challenges and opportunities in design of nanocomposites of polyolefins*. Keynote address. The 27<sup>th</sup> Annual Meeting of The Polymer Processing Society, May 10-14, 2011, Marrakech, Morocco.
34. Wang, X., Jana, S.C. Structure and surface modifications of syndiotactic polystyrene aerogels by incorporation of nanoparticles, nanotubes, and immiscible polymers. Invited talk at session Advances in Polymer Composites, Division of Polymer Chemistry, 242nd ACS National Meeting, Denver, Colorado, August 28 – September 1, 2011.
35. Jans, S.C. *Challenges and opportunities in design of nanocomposites of polyolefins*. Plenary talk. RubberPLAS 2010: The Challenges of Leadership Towards 2015. September 9-11, 2010, Impact Exhibition & Convention Center, Bangkok, Thailand.
36. Jans, S.C. *Shape memory polymers: A review of recent progress*. Plenary talk. RubberPLAS 2010: The Challenges of Leadership Towards 2015. September 9-11, 2010, Impact Exhibition & Convention Center, Bangkok, Thailand.
37. Jana, S.C., Lee, B.J., Roy, S. *Nucleating agent assisted dispersion of POSS in PP: Properties of nanocomposite fibers and films*. Keynote address, Session G03-Polymer Nanocomposites, Polymer Processing Society, PPS-26, Banff, Canada, July 4-8, 2010.
38. Jana, S.C., Gunes, I.S., Lee, B.J., Roy, S. *Non-covalent interactions: Effects on shape memory properties and properties of spun fibers*. Invited talk at PP'2010, International Symposium on Polymer Physics, Ji'nan, Shan Dong, Peoples Republic of China, June 6-10, 2010.
39. Jana, S.C., *Recent developments in shape memory polymers and their nanocomposites*. RGJ-Ph.D. Congress XI, Pataya, Thailand, April 1-3, 2010.
40. Jana, S.C., Gunes, S., Lee, B.J., Roy, S. Analysis of non-covalent interactions between the nanoparticulate fillers and the matrix polymer as applied to shape memory performance and spun fiber properties. 177th Spring Meeting of ACS Rubber Division, Akron, OH, April 26-28, 2010.

41. Jana, S.C., *Nanocomposites of rubbery polymers: An engineer's view*. Invited lecture, IRE09, International Conference, Calcutta, January 28-31, 2009.
42. Jana, S.C., Gunes, I.S. Effects of nanofiller dispersion and polymer morphology on shape memory properties of polyurethanes and their shape memory actuation by resistive heating. Invited talk, Paper# 1287698, 238th ACS National Meeting, Washington, DC, August 16-20, 2009.
43. Jana, S.C., Rheology as a tool for elucidation of properties of nanocomposites. Keynote address, ANTEC 2009, Chicago, June 22-24, 2009.
44. Jana, S.C., Gunes, I.S., Cao, F., *Shape memory polymer nanocomposites*. Invited lecture, UKC2008, US-Korea Conference on Science, Technology, and Entrepreneurship, San Diego, August 14-17, 2008.
45. Jana, S.C., *Rheology as a tool for elucidation of properties of polymer nanocomposites*. Invited lecture, RheoProcessing 2008, Guimaraes, Portugal, June 12-14, 2008.
46. Jana, S.C., Fifteen years of nanocomposites research: What is novel about nanoparticles and manufacturing methods. Plenary Talk, Nanocomposites 2008, San Diego, September 15-17, 2008.
47. Jana, S.C., Shape memory polymer nanocomposites. Invited talk at NSTI Nanotech 2008, June 1-5, 2008, Boston.
48. Jana, S.C., Jung C.D., Exploiting chaos: Should polymerization reactors be chaotic? Invited talk on Nonlinear Dynamics in Polymeric Systems, 2008 Spring National Meeting of the American Chemical Society, April 6-10, 2008, New Orleans.
49. Jana, S.C., *Shape memory thermoplastic elastomers and their nanocomposites*. Plenary lecture, Chemtech 2007, International Conference, Institute of Chemistry, Ceylone, Sri Lanka, June 20-23, 2007.
50. Jana, S.C., *Light weight polymers and polymer composites in fuel cell applications: Challenges and state of the art*. International Conference on Polymeric Materials in Power Engineering, ICPMPE, Bangalore, India, October 4-6, 2007.
51. Jana, S.C., Dharaiya, D., Opalko, R., *Studies on the mechanisms of nanoparticle-induced morphology development in immiscible polymer systems*. Invited keynote lecture. 23<sup>rd</sup> Annual Meeting of the Polymer Processing Society (PPS-23), Salvador, Brazil, May 28-31, 2007.
52. Jana, S.C., Shape memory polymer nanocomposites actuated by resistive heating, Materials Science & Technology 2007 Conference and Exhibit (MS&T '07), September 16-20, 2007, Detroit, Michigan.
53. Jana, S.C., Polymer nanocomposites for shape-memory applications. Invited talk. The 171st ACS Rubber Division Technical Meeting, Akron, Ohio, April 30-May 2, 2007.
54. Jana, S.C., Polymer nanocomposites by filler-polymer reactions, 50th Anniversary Symposium of University of Dayton Research Institute (UDRI) held in Dayton, OH, September 13-14, 2006.
55. Jana, S.C., Polymer nanocomposites design by clay-polymer tethering and novel blending. Presented at Gordon Research Conference on Composites (Chair: Prof. Alan Lesser), Ventura, CA, January 15-20, 2006.



56. Jana, S.C., *Chemical and engineering issues in polymer nanocomposites research and product design*. Invited Lecture, 58<sup>th</sup> Annual Congress of Indian Chemical Engineering, CHEMCON-2005 at Indian Institute of Technology Delhi, December 14-17, 2005.
57. Jana, S.C., *Applications of chaos and dynamical systems theory in polymer mixing*, Forefront of Nonlinear Science and Its Application to Materials Science in the 21st Century (Perspectives of Nonlinear Science in Materials Research, MATNON'05, Japan Society of Polymer Science, Kyoto Institute of Technology, Kyoto, September 28-30, 2005).
58. Jana, S.C., *Chemical and engineering issues of polymer nanocomposites synthesis and processing*, 23<sup>rd</sup> Colombian Chemical Engineering Congress, Manizales, Colombia, August 24-26, 2005.
59. Jana, S.C., *Doing things right with chaotic mixing*, Keynote lecture, Polymer Processing Society (PPS) Regional Meeting, Quebec, August 15-17, 2005.
60. Jana, S.C., *Evaluation of synthesis methods of nanocomposites of epoxies, polyimides, and polyurethanes with layered silicate clay*, International Workshop on Polymer Nanocomposites-Recent Developments and Applications, May 23-25, 2005, Melbourne, Australia.
61. Jana, S.C., Mechanism of exfoliation of nanoclays in thermosetting polymer systems. 27th Asilomar Conference on Polymeric Materials (Chair: Prof. Eric Baer), February 8-11, 2004, Asilomar State Park, Pacific Grove, CA.
62. Jana, S.C. *Chaotic mixing: A new technology for polymer blending*. Presented at MACRO-2002 of Indian Society of Polymer Science, Kharagpur (India), December 9-11, 2002.
63. Jana, S.C., *Issues of dispersion of nanofillers in thermoplastic and thermosetting polymer systems*. Presented at *Nanocomposites 2001: The Path to Commercialization* (Chair: Prof. G. Beal), Baltimore, June 4-5, 2001.
64. Jana, S.C., Prieto, A. *Natural fiber reinforcement of polymeric composites by reaction-induced phase separation*. Presented at 222<sup>nd</sup> ACS National Meeting, Chicago, August 26-30, 2001.
65. Jana, S.C., Patel, N. *Reactive Compatibilization of PBT-PPO Systems Using Low Molecular Weight Epoxies*. Presented at PACIFICHEM 2000 at Honolulu, Hawaii, December 16, 2000.

***Invited talks at Institutes and Universities:***

3M Center, Minneapolis, MN  
 Advanced Elastomer Systems  
 Akron Physics Club  
 Bayer MaterialScience, Leverkusen, Germany  
 Bayer MaterialScience, Pittsburgh  
 Department of Chemical Engineering, Texas Tech University, Lubbock, TX  
 Department of Mechanical Engineering, Texas A&M University, College Station, TX  
 Department of Chemical Engineering, University of Dayton  
 Department of Chemical Engineering, University of Oklahoma,  
 Department of Chemical Engineering, Wayne State University  
 Department of Chemical Engineering, West Virginia University  
 Department of Macromolecular Science and Engineering, Case Western Reserve University  
 Department of Chemical Engineering, University of South Carolina  
 Dow Chemical Company, Freeport, TX  
 GE Corporate Research & Development, Schenectady, New York

GE Plastics, Mt. Vernon, Indiana  
 GE Global Research Center, Bangalore, India  
 Lubrizol, Brecksville, OH  
 PolyOne Corporation, Avon Lake, OH  
 Reliance Industries Limited, Mumbai, India  
 Levich Institute of Physico-chemical Hydrodynamics, CUNY  
 NASA Glenn Research Center, Cleveland

### ***Books and Book Chapter***

- Jana, S.C., Du, L. “Highly-filled graphite-polymer composites: Synthesis, processing, and characterization.” Ch. 17. In *Graphite, Graphene and Their Polymer Nanocomposites*, Prithu Mukhopadhyay and Rakesh Gupta (Ed.), ISBN 978-1-4398-2779-6. Taylor and Francis. 2013.
- Jimenez, G.A., Lee, B.J., Jana, S.C., “Nanoparticles and Polymer Nanocomposites” Chapter 4 in *Nanoscale Multifunctional Materials: Science and Applications*, Sharmila Mukhopadhyay (Ed.), Wiley, ISBN: 978-0-470-50891-6, October 2011.
- Gunes, I.S., Jana, S.C., “Chemical and Engineering Aspects of Morphology Development and Processing of Multiphase Polymer Blend Nanocomposites” Chapter 8 in *Encyclopedia of Polymer Blends*, Volume 2, Avraam Isayev (Ed.), Wiley-VCH Publishers, ISBN: 978-3-527-31930-5, November 2011.
- Gunes, I.S., Jana, S.C., “Biomedical applications of shape memory polymers and their nanocomposites”, in *Polymeric Biomaterials, Vol II: Medicinal and Pharmaceutical Applications of Polymers*, Dumitriu, S., Popa, V. (Ed.), CRC Press, 2013, pp. 287-310.
- Gunes, I.S., Jung, C.D., Jana, S.C., “Evolution of non-linear rheology and network formation during thermoplastic polyurethane polymerization and its relationship to reaction kinetics, phase separation, and mixing”, Ch. 3 in “Non-linear Dynamics with Polymers”, Pojman, J., Miyata, Q.T. (Ed.), Wiley-VCH, Weinheim, ISBN-10: 3-527-32529-8, October 2010.
- Gunes, I. S., Jana, S.C., “Permeability and Water Uptake Actuation of Shape Memory Polyurethane Nanocomposites: Materials, Processing, Modeling, and Applications”, pp. 41-72, Chapter 3 in *Barrier Properties of Polymer Clay Nanocomposites*, ISBN: 978-1-60876-021-3, V. Mittal (Ed), Nova Science Publishers, 2010.
- Gunes, I.S., Jana, S.C., “Shape Memory Polymers and Their Nanocomposites” In: Kar KK, editor. *Advanced Composites*, Singapore: Pan Stanford Publishing, 2012 (Chapter 1) (in press).
- Jana, S.C., “Clay Nanocomposites Of Polyurethanes And Epoxies: Preparation Methods And Properties”, Chapter 9 in *Processing and Properties of Nanocomposites*, ISBN 978-981-270-390-3, Advani, S.G. (Ed), World Scientific, Published December 2006.

### ***Current research focus of the group***

- Polymer nanofibers from novel, high volume production methods exploiting fluid mechanical manipulations. These nanofibers will find novel usage in filtration media, flexible batteries as reinforcement and conduction pathway, and will assist in studies of several phenomena (such as droplet breakup, ion conduction, chemical reactions) under nanoconfinements.

- Science and technology of production, reinforcement, and characterization of netshape silica and polymer aerogels with applications in air purification, sensing, deformable solids separation, thermal insulation, acoustic barriers, and hybrid separator-electrolytes for lithium ion batteries.
- Investigation of hybrid filler packages involving lignin, lignin sulfonate, and carbon black for development of rubber compounds with significantly reduced viscoelastic dissipation and rolling resistance.
- Shape memory polymers for applications as cartilage, artificial knee, and hip joints.
- Templated surfaces from polymer nanocomposite fibers and films for cell culture and cell growth.
- Modeling and experiments on surface-decorated graphenes and graphene-polymer composites.

### ***Publications in Refereed Journals***

***ISI citations~3000, h-index: 30, Average citations per article: 32.***

#### **Top 10 cited articles:**

Park, J.H., Jana, S.C., 2003 Mechanism of exfoliation of nanoclay particles in epoxy-clay nanocomposites. *Macromolecules*, **36**(8), 2758-2768. **(209 citations)**

Ottino, J.M., Muzzio, F.J., Tjahjadi, M., Franjione, J., Jana, S.C., Kusch, H.A. 1992 Chaos, symmetry, and self-similarity: exploiting order and disorder in mixing processes. *Science*, **257**, 754-760. **(147 citations)**

Park, J.H., Jana, S.C., 2003 The relationship between nano- and micro-structures and mechanical properties in PMMA-epoxy-nanoclay composites. *Polymer*, **44**(7), 2091-2100. **(146 citations)**

Jana, S.C., Metcalfe, G., Ottino, J.M. 1994 Experimental and computational studies of mixing in complex Stokes flows: The vortex mixing flow and multicellular cavity flows. *Journal of Fluid Mechanics*, **269**, 199-246. **(137 citations)**

Jana, S.C., Jain, S. 2001 Dispersion of nanofillers in high performance polymers using reactive solvents as processing aids. *Polymer*, **42**(16), 6897-6905. **(136 citations)**

Pattanayak, A., Jana, S.C., 2005 Synthesis of thermoplastic polyurethane nanocomposites of reactive clay by bulk polymerization methods. *Polymer*, **46**(10), 3275-3288. **(113 citations)**

Gunes, S., Jana, S.C., 2008 Shape memory polymers and their nanocomposites: A review of science and technology of new multifunctional materials. *J. Nanosci. Nanotech.* **8**, 1616-1637. **(109 citations)**

Pattanayak, A., Jana, S.C., 2005 Properties of bulk-polymerized thermoplastic polyurethane nanocomposites. *Polymer*, **46**(10), 3394-3406. **(109 citations)**

Cao, F., Jana, S.C., 2007 Nanoclay-tethered shape memory polyurethane nanocomposites. *Polymer*, **48**(13), 3790-3800. **(110 citations)**

Gunes, I.S., Cao, F., Jimenez, G., Jana, S.C. 2008 Evaluation of nanoparticulate fillers for development of shape memory polymer nanocomposites. *Polymer*, **49**, 2223–2234 **(110 citations)**

#### **Complete list of publications (in print or accepted):**

1. Rajgarhia, S., Jana, S.C., Chase, G. 2016 Separation of water from ultra-low sulphur diesel using novel polymer nanofiber-coated glass fiber media. *ACS Appl. Mater. Interf.* 8, 21683-21690.
2. Rajgarhia, S., Jana, S.C. 2016 Comparison of electrospinning and gas jet fiber processes for fabrication of bi-component polymer nanofibers from single solutions. *Macromol. Symp.*, 369, 8–13.
3. Saengthaveep, S., Jana, S. C., Magaraphan, R. 2015 Flow and structure of compatibilized Nylon12/natural rubber blend with functional copolymer. *Journal of Elastomers and Plastics* 48(7), 614-639.
4. Fu, X., Jana, S.C., Chen, Y-M., Zhu, Y. 2016 Synergetic hybrid aerogels of vanadia and graphene as electrode materials of supercapacitors. *C (Journal of Carbon Research)*, 2, 21; doi:10.3390/c2030021 (pp.1-12).
5. Ghosh, M., Lohrasbi, M., Chuang, S., Jana, S.C. 2016 Mesoporous titanium dioxide nanofibers with significantly enhanced photocatalytic activity. *ChemCatChem*, 8, 2525-2535.
6. Gu, S., Zhai, C., Jana, S.C. 2016 Aerogel microparticles from oil-in-oil emulsion systems. *Langmuir*. 32(22), 5637-5645.
7. Kim, S.J., Chase, G., Jana, S.C. 2016 The role of mesopores in achieving high efficiency airborne nanoparticle filtration using aerogel monoliths. *Separation and Purification Technology*, 166, 48-54.
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9. Saengthaveep, S.; Jana, S.C.; Magaraphan, R., 2016 Correlation of viscosity ratio, morphology, and mechanical properties of polyamide 12/natural rubber blends via reactive compatibilization. *Journal of Polymer Research*, 23(5), 1-13.
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***Recent Publications in Refereed Conference Proceedings***

1. Benavides, R. E.; Jana, S. C.; Reneker, D. 2012 Producing nano and micro fibers by using jets of gas. Annual Technical Conference - Society of Plastics Engineers, 70th(Vol 2), 905-912.
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82. Park, J.H., Jana, S.C. 2004 A study on kinetics of epoxy, amine, and quaternary ammonium ions reactions in the epoxy-nanoclay systems. Paper No. 228, PPS-20, 20<sup>th</sup> Annual Meeting of Polymer Processing Society, June 20-24, Akron, Ohio, USA.
83. Pattanayak, A., Jana, S.C. 2004 Evaluation of bulk polymerization processes for clay-tethered polyurethane nanocomposites. Paper No. 235, PPS-20, 20<sup>th</sup> Annual Meeting of Polymer Processing Society, June 20-24, Akron, Ohio, USA.
84. Perilla, J., Jana, S.C., 2004 Evaluation of transient rheological measurements as a tool to determine the extent of coalescence in immiscible polymer blends. Paper No. 310, PPS-20, 20<sup>th</sup> Annual Meeting of Polymer Processing Society, June 20-24, Akron, Ohio, USA.

85. Perilla, J., Jana, S.C., 2004 Study of shear-induced coalescence in chaotic mixing: Polypropylene/polystyrene blends. Paper No. 424, PPS-20, 20<sup>th</sup> Annual Meeting of Polymer Processing Society, June 20-24, Akron, Ohio, USA.
86. Perilla, J., Jana, S.C., 2004 Study of evolution of cocontinuous morphologies in polypropylene-polystyrene blends in chaotic mixing. Paper No. 425, PPS-20, 20<sup>th</sup> Annual Meeting of Polymer Processing Society, June 20-24, Akron, Ohio, USA.
87. Chandra, A., Jana, S.C., 2004 Effect of morphology on mechanical properties of composites prepared by reaction-induced phase separation, Paper no. 511, Session INT2, SPE ANTEC 2004, Chicago, May 16-20.
88. Pattanayak, A., Jana, S.C., 2004 Polyurethane-clay nanocomposites via bulk polymerization methods. Paper no. 386, Session T20, SPE ANTEC 2004, Chicago, May 16-20.
89. Jung, C.D., Jana, S.C., 2004 Synthesis of thermoplastic polyurethanes by chaotic mixing. Paper no. 384, Session INT1, SPE ANTEC 2004, Chicago, May 16-20.
90. Hong, C.M., Jana, S.C., 2004 Shear-induced migration of glass beads during injection molding in filled polymer compound and its effect on mechanical properties and electrical conductivity. Paper no. 798, Session T20, SPE ANTEC 2004, Chicago, May 16-20.
91. Dharaiya, D., Jana, S.C., 2004 The effects of nanoclay on morphology development in immiscible polymer systems by chaotic mixing. Paper no. 513, Session INT1, SPE ANTEC 2004, Chicago, May 16-20.
92. Perilla, J., Jana, S.C. 2004 Morphology-rheology relationships in coalescence of polypropylene droplets in polyamide 6-polypropylene blends induced by simple shear flows. Paper no. 372, Session W34, SPE ANTEC 2004, Chicago, May 16-20.
93. Perilla, J., Jana, S.C. 2004 Analysis of the effects of flow reorientation in chaotic mixing flows on coalescence in blends of polypropylene and polystyrene. Paper no. 380, Session INT1, SPE ANTEC 2004, Chicago, May 16-20.
94. Perilla, J., Jana, S.C. 2004 Time scales of coalescence in processing flows: Investigation of flow through runners and strip molds. Paper no. 371, Session INT5, SPE ANTEC 2004, Chicago, May 16-20.
95. Park, J.H., Jana, S.C. 2004 Plasticization of epoxy network in epoxy-nanoclay systems due to stoichiometric imbalance. Paper no. 382, Session INT1, SPE ANTEC 2004, Chicago, May 16-20.
96. Pattanayak, A., Jana, S.C., Bulk polymerized polyurethane nanocomposites. The 3<sup>rd</sup> World Congress "Nanocomposites 2003". November 10-12, 2003, San Francisco, CA.
97. Sau, M., Jana, S.C. 2003 A study on the effects of chaotic mixer design and operating conditions on the development of morphology in immiscible polymer systems. SPE ANTEC, Session T23, Paper 360, Nashville, TN, May 4-8.
98. Sau, M., Jana, S.C. 2003 Morphology development in PA6/PP system by chaotic mixing: effect of viscosity ratio and composition. SPE ANTEC, Session T5, Paper 362, Nashville, TN, May 4-8.

99. Pattanayak, A., Jana, S.C. 2003 A study on intercalation and exfoliation of layered silicate nanoparticles in thermoplastic polyurethanes. SPE ANTEC, Session M25, Paper 941, Nashville, TN, May 4-8.
100. Park, J.H., Jana, S.C., 2003 Epoxy-aided dispersion of nanoclay in PMMA. SPE ANTEC, Session M25, Paper 372, Nashville, TN, May 4-8.
101. Chandra, A., Jana, S.C., 2003 Fiber-reinforcement of composites by reaction-induced phase separation. SPE ANTEC, Session W11, Paper 952, Nashville, TN, May 4-8.
102. Park, J.H., Jana, S.C., 2003 Mechanism of nanoclay particles in epoxy-clay nanocomposites. SPE ANTEC, Session M25, Paper 371, Nashville, TN, May 4-8.
103. Hong, C.M., Kim, J., Jana, S.C., 2003 The effects of shear-induced migration of conductive fillers on conductivity of injection molded articles. SPE ANTEC, Session W5, Paper 376, Nashville, TN, May 4-8.
104. Perilla, J., Jana, S.C., 2003 Time-scales of coalescence in polymer processing: Study on polypropylene/polyamide 6 blends. SPE ANTEC, Session T33, Paper 421, Nashville, TN, May 4-8.
105. Sau, M., Jana, S.C. 2002 Morphology development in the blending of polypropylene (PP) and polyamide 6 (PA6) under chaotic mixing conditions. PPS-18, June 16-20, Guimaraes, Portugal.
106. Park, J.H., Jana, S.C. 2002 Issues of dispersion of layered silicate nanoparticles in thermosetting epoxies. PPS-18, June 16-20, Guimaraes, Portugal.
107. Jana, S.C. 2002 Low shear chaotic mixing in single-screw extruders. PPS-18, June 16-20, Guimaraes, Portugal.
108. Pattanayak, A., Jana, S.C. A study on intercalation and exfoliation of layered silicate nanoparticles in thermoplastic polyurethanes. MACRO-2002 of Indian Society of Polymer Science, Kharagpur (India), December 9-11, 2002.
109. Sau, M., Jana, S.C., 2002 Blending of immiscible polymer systems by chaotic mixing. Paper no. 179 Presented at ANTEC 2002, San Francisco, May 5-9.
110. Jana, S.C. 2002 Avenues of introducing chaotic mixing in single-screw extruders. Paper no. 180 presented at ANTEC 2002, San Francisco, May 5-9.
111. Sau, M., Jana, S.C. 2002 Morphology development in immiscible polymer systems by baker's cut. Paper no. 178 presented at ANTEC 2002, San Francisco, May 5-9.
112. Prieto, A., Jana, S.C. 2002 Natural-fiber composites of high performance thermoplastic polymers. Paper no. 182 presented at ANTEC 2002, San Francisco, May 5-9.
113. Dharaiya, D., Jana, S.C. 2002 Ternary blends of phenoxy resins with polyamides and polyesters. Paper no. 181 presented at ANTEC 2002, San Francisco, May 5-9.

114. Hong, C.M., Jana, S.C. 2002 Effects of conductive particles on the strength of adhesion between conductive and non-conductive polymer compounds. Paper no. 175 presented at ANTEC 2002, San Francisco, May 5-9.
115. Jana, S.C., Doni, S. 2001 On the effects of migration of filler particles on conductivity and mechanical properties. Paper no. 120 presented at ANTEC 2001, Dallas, May 6-10.
116. Jana, S.C., Jain, S. 2001 Dispersion of nanoparticles in high performance polymers using thermosetting resins. Paper no. 119 presented at ANTEC 2001, Dallas, May 6-10.
117. Hong, C.M., Jana, S.C. 2001 Effects of filler migration on mechanical properties and surface and volume conductivity of filled polymer compounds. Presented at PPS-17, Montreal, May 21-14.
118. Prieto, A., Jana, S.C., 2001 Natural-Fiber Composites of High Temperature Thermoplastic Polymers by Reactive Processing. Presented at PPS-17, Montreal, May 21-14.
119. Chandra, A., Jana, S.C. 2001 Composites of thermoplastic-thermosetting polymers by reactive processing. Presented at PPS-17, Montreal, May 21-14.
120. Jana, S.C., Doni, S. 2000 Surface conductivity of molded sheets and films: I. Migration of filler particles. Book of Abstracts, *DMI Grantees Conference*, National Science Foundation, January 3-7, Vancouver, Canada.
121. Jana, S.C., Chandra, A. 2000 Rheological studies of reaction-induced phase separation in thermoplastic-thermoset polymeric systems. *PPS-16*, June 18-23, Sanghai, China.
122. Jana, S.C., Patel, N. 2000 Improvements in mechanical and thermal properties of polybutylene terephthalate (PBT) by reactive blending with epoxy. *PPS-16*, June 18-23, Sanghai, China.
123. Jana, S.C., Jain, S. 2000 Investigation of microstructures and properties of polyethersulphone (PES)-cured epoxy system. *PPS-16*, June 18-23, Sanghai, China.
124. Jana, S.C., Doni, S. 2000 Migration of filler particles in molded sheets and films. *PPS-16*, June 18-23, Sanghai, China.
125. Jana, S.C., Chandra, A. 1999 A study on rheology-morphology relationships in reactive processing of SAN and epoxy systems. *AIChE Annual Meeting*, October 31-November 5, Dallas, TX.

***Courses taught at University of Akron***

***Graduate:***

Introduction to Polymer Engineering  
 Numerical Analysis of Polymer Processing Operations  
 Polymer Blends and Alloys  
 Polymer Nanocomposites  
 Polymerization Reactor Engineering,  
 Rheology of Polymeric Fluids  
 Polymer Processing

*Undergraduate (BS Program on Mechanical Polymer Engineering):*

Polymer Fluids

Polymer Morphology

Polymer Processing

Introduction to polymer morphology

***Supervision of graduate students at the University of Akron***

**Graduates:** 25 Ph.D. and 17 M.S. thesis completed at University of Akron.

**Currently supervising :** 6 Ph.D. and 3 M.S. students.

**Ph.D. thesis completed at University of Akron (25 in all):**

1. Monoj Ghosh (**Ph.D.**, December 2016)
2. Senlong Gu (**Ph.D.**, August 2016) Thesis title: Building blocks and their effects on polymer aerogel properties.
3. Stuti Rajgarhia (**Ph.D.**, August 2016) Thesis title: Control of morphology and diameter of bicomponent polymeric nanofibers with applications in filtration.
4. Sung Jun Kim (**Ph.D.**, May 2016) Thesis title: Monolithic aerogels and their applications in airborne nanoparticle filtration.
5. Andrew Shinko (**Ph.D.**, May 2015) Thesis title: Structure and morphology control in polymer aerogels with low crosslink density.
6. Kushal Bahl (**Ph.D.**, May 2014) Thesis title: Towards development of lignin-reinforced elastomeric compounds with reduced energy dissipation.
7. Xiao Wang (**Ph.D.**, August 2013) Thesis title: Tailoring of Pore Structures and Surface Properties of Syndiotactic Polystyrene Aerogels.
8. Rafael Esteban Benavides Gonzalez (**Ph.D.**, May 2013) Thesis title: Gas jet process for production of sub-micron fibers.
9. Yannan Duan (**Ph.D.**, May 2012) Thesis title: Fundamental studies on polymer and organic-inorganic hybrid nanoparticles reinforced silica aerogels.
10. Sayantan Roy (**Ph.D.**, December 2011) Thesis title: Polyhedral oligomeric silsesquioxane-sorbitol non-covalent interactions: Effects on the reinforcement of isotactic polypropylene spun fibers.
11. Jason Randall (**Ph.D.**, August 2010) Thesis title: Tailoring structure-property relationships and elastic phenomenon in native and polymer-reinforced silica aerogels.
12. I. Sedat Gunes (**Ph.D.**, April 2009) Thesis title: Analysis of shape memory properties of polyurethane nanocomposites.



13. Byoung J. Lee (**Ph.D.**, June 2009) *Thesis title*: Nucleating agent-assisted preparation of polypropylene/polyhedral oligomeric silsesquioxane (POSS) nanocomposites and their characterization.
14. Ling Du (**Ph.D.**, January 2008) *Thesis title*: Highly conductive epoxy/graphite polymer composite bipolar plates in proton exchange membrane (PEM) fuel cells.
15. Feina Cao (**Ph.D.**, January 2008) *Thesis title*: Shape memory polyurethane nanocomposites.
16. Ayca Ertekin (**Ph.D.**) *Thesis title*: Analysis of wetting, flow, and end-use properties of resin transfer molded nanoreinforced epoxy-glass fiber hybrid composites. (Jointly with Dr. Lloyd Goettler).
17. Michael J. Gintert (**Ph.D.**, August 2007) *Thesis title*: A novel approach to obtain high performance layered silicate thermoset polyamide matrix nanocomposites.
18. Guillermo Jimenez (**Ph.D.**, December 2006) *Thesis title*: Characterization of PMMA and TPU carbon nanofiber composites produced by chaotic mixing.
19. Chang Do Jung (**Ph.D.**, May 2005) *Thesis title*: Synthesis of thermoplastic polyurethanes and polyurethane nanocomposites under chaotic mixing conditions.
20. Dhawal Dharaiya (**Ph.D.**, November 2005) *Thesis title*: Effects of nanoclay and carbon black on morphology development in mixing of immiscible polymers by chaotic mixing.
21. Jong Hyun Park (**Ph.D.**, March 2004) *Thesis title*: A study on nanocomposites of epoxy-clay and epoxy-clay-thermoplastic polymer systems.
22. Jairo Perilla (**Ph.D.**, July 2004) *Thesis topic*: A study on relationship between morphology and rheology of immiscible polymer blends with temporal changes in the interfacial area.
23. Chang Min Hong (**Ph.D.**, November 2004 ). *Thesis title*: A study on shear-induced migration of conductive and non-conductive filler particles.
24. Asim Pattanayak (**Ph.D.**, December 2004) *Thesis title*: A study on clay-tethered thermoplastic polyurethane nanocomposites.
25. Madhusudan Sau (**Ph.D.**, April 2003) *Thesis title*: Morphology development in chaotic mixing of polymers.

**Ph.D. students supervised at Chulalongkorn University, Bangkok, Thailand**

1. Penwisa Pisitsak, Petroleum and Petrochemical College.
2. Saravalee Saengthaveep, Petroleum and Petrochemical College.

**MS thesis completed at University of Akron (17 in all):**

1. Liang Cai (**M.S.**, August 2016) – Graft copolymer aerogels from sulfonated syndiotactic polystyrene functionalized with quaternary phosphonium-containing RAFT agent. (co-advisor Kevin Cavicchi)
2. Chunhao Zhai (**M.S.**, August 2016) – Polyimide aerogels and their applications in removal of airborne nanoparticles.

3. Xuewei Fu (M.S., May 2015) - Synergetic graphene-V<sub>2</sub>O<sub>5</sub> hybrid aerogels as electrode material for electrochemical capacitors.
4. Huan Zhang (M.S., August 2014) – Properties and structures of sulfonated syndiotactic polystyrene aerogel and syndiotactic polystyrene/silica hybrid aerogel.
5. Romny Garcia (M.S., December 2013) – Evaluation of the role of hydrodynamic shear on breakage of thermally conductive particles during compound preparation.
6. Shenlong Gu (M.S., May 2013) – Effects of polybenzoxazine on properties of shape-memory polyurethanes with glassy and crystalline soft segments.
7. Shujing Zhao (M.S., May 2013) – Core-shell nanofiber assemblies containing ionic salts.
8. Jihui Shang (M.S., May 2013) – Effects of carbon nanotubes on fabrication of single-component and bi-component nanofibers by gas jet method.
9. Angela Beltran Osuna (M.S., December 2011) Antifouling silica aerogels.
10. Kushal Bahl (M.S., 2010) Thesis title: Study of optimum process conditions for production of thermally conductive polymer compounds using boron nitride.
11. Numan Erden (M.S., 2009) Thesis title: Polyurethane/polybenzoxazine-based shape memory polymers.
12. Robert Opalko (M.S., 2008) *Thesis title*: Evaluation of the effects of NanofilR nanoclays in the blending of polypropylene and polystyrene.
13. Alberto Prieto (M.S., 2001) *Thesis title*: Wood flour composites of high temperature polymers by reaction-induced phase separation.
14. Dhawal Dharaiya (M.S., 2001) *Thesis title*: Thermoplastic polyhydroxyethers for compatibilization of blends containing polyesters and polyamides.
15. Nisha Patel (M.S., 2000). *Thesis title*: Reactive compatibilization of PBT-PPO blends using low molecular weight epoxies.
16. Sachin Jain (M.S., 2000). *Thesis title*: Nanocomposites of high performance thermoplastic polymers using epoxy as processing aid.
17. Shashishekhar Doni (M.S., 2000) *Thesis title*: Shear-induced migration of particles in filled polymers: Effects on conductivity and mechanical properties.

**Ph.D. thesis in progress (8 in all):**

1. D. Quade (Ph.D., part-time, Fall 2008 – present) Mechanical characterization of shape memory alloys and polymer composites
2. S. Niknezhad (Ph.D., Spring 2011-present) Bioresorbable polymer nanofibers for drug delivery
3. M. Alrashed (Ph.D., Spring 2011-present) Anti-corrosion polymer nanocomposite coatings
4. Prasad Raut (Ph.D., Fall 2012-present) Ionogel membranes for high temperature electrochemical devices.

5. Kaitlyn Mawhinney (Ph.D., Fall 2015-present) Virus interactions with mesoporous surfaces.
6. Nicholas Teo (Ph.D., Fall 2015-present) Nanoparticle filtration using aerogels.
7. Akshata Kulkarni (Ph.D., Fall 2016-present)
8. Erin Farrell (Ph.D., Fall 2016-present)

**M.S. thesis in progress (6 in all):**

Shuxin Ji (M.S., Fall 2015)  
 Hamad A. Albehaijan (M.S., Fall 2015)  
 Wan-Hua Lin (M.S., Fall 2015)  
 Adam Fonner (M.S., Fall 2016)  
 Zipeng Gu (M.S., Fall 2016)  
 Chi Zhan (M.S., Fall 2016)

**Ph.D. graduates in academia:**

- Dr. Jairo E. Perilla, Associate Professor, Department of Chemical Engineering, National University of Colombia at Bogota, Bogota, Colombia
- Dr. Guillermo Jimenez, Professor, Laboratory of Polymers, School of Chemistry, National University of Costa Rica, Heredia, Costa Rica

**Ph.D. graduates in industry:**

Dr. Madhusudan Sau, Indian Oil Corporation, India  
 Dr. Jong Hyun Park, SABIC IP, South Korea  
 Dr. Chang Min Hong, Samsung Cheil Industries, South Korea  
 Dr. Asim Pattanayak, GE Global Research Center, India  
 Dr. Chang Do Jung, Samsung, South Korea  
 Dr. Dhawal Dharaiya, Hendrikson, Akron, Ohio  
 Dr. Michael Gintert, Goodyear, Luxemburg  
 Dr. Ling Du, Goodyear, Akron, Ohio  
 Dr. Feina Cao, Lubrizol, Brecksville  
 Dr. Ayca Ertekin, Tyco Electronics, CA  
 Dr. Byoung J. Lee, Goodyear, Akron, Ohio  
 Dr. Sedat Gunes, 3M, Minneapolis  
 Dr. Jason Randall, Akzo Nobel  
 Dr. Sayantan Roy, Baker Hughes, Houston  
 Dr. Yannan Duan, PolyOne, Avon Lake, Ohio  
 Dr. Rafael Benavides, Dow Chemical, Freeport, TX  
 Dr. Xiao Wang, Baker Hughes, Houston  
 Dr. Kushal Bahl, Teknor-Apex, Rhode Island  
 Dr. Andrew Shinko, Fomo Products Inc., Canton, Ohio  
 Dr. Sung Jun Kim, Hyundai Motors, Korea  
 Dr. Stuti Rajgarhia, Donaldson, Minneapolis, MN  
 Dr. Senlong Gu, Shenma Electrical Limited, Nantong, PRC

**Post-docs in industry:**

Dr. David Gerrard, Baker Hughes, Houston, TX  
 Dr. Sritama Kar, Aks Chemicals, Dublin, Ohio.  
 Dr. Jie Feng, NETL, DOE, Pittsburgh

***Service to community at University of Akron***

Member, Chemical Engineering Chair Search Committee, College of Engineering (2012)  
 Member, Dean Search Committee, College of Polymer Science and Polymer Engineering.

Chair, National Polymer Innovation Center Building Committee, March 2007 – 2010.  
 Chair, Department of Polymer Engineering, November 1, 2004 – 2011.  
 Chair of graduate admissions committee, Polymer Engineering (2002- 2004)  
 Member of graduate admissions committee, Polymer Engineering (1999-2001)  
 Member, Polymer Engineering Annex Building Committee (1999 – 2001)  
 Member, Polymer Processing Hall of Fame Selection Committee (2000 – present)  
 Member, Provost's Advisory Committee  
 Member, Ohio Board of Regents Fellowship Committee  
 Member, Committee on Evaluation of Graduate Faculty Status  
 Faculty supervisor – Computer Laboratory of Department of Polymer Engineering  
 Member, Dissertation Committees of 60 Ph.D. and 20 M.S. students.

### ***Externally Funded Research Programs***

- Raised more than \$3.5 MM in direct research expenditure in last 15 years.
- Yearly research expenditure in last three years in Jana group ranged between \$300K and \$420K.
- Raised ~\$30 MM in training grant along with M. Foster, R. Quirk, R. Seiple from Kingdom of Saudi Arabia for setting up of High Institute of Elastomer Industries in Yanbu, Kingdom of Saudi Arabia. This is a joint venture between SABIC and ExxonMobil. This initiated connections in Kingdom of Saudi Arabia, especially at King Saud University and King Fahd University of Petroleum and Minerals.

### **Research grants:**

#### **List of funded projects:**

Surface engineering approach for enhanced filler dispersion and hysteresis reduction in rubber compounds. NSF Center for Tire Research.

Netshape aerogel articles reinforced by hybrid molecules and polymers. CMMI, NSF

Small diameter NGJ carbon fibers. Source of Support: Ohio Department of Development, sub award from NGJ LLC to University of Akron.

Community Industrial Assistantship grant from PolyOne Corporation to support Kushal Bahl

Materials solutions for improving rolling resistance without compromising crack resistance and wet skid resistance. Triangle Tires. 5/1/2012-4/30/2013 (PI: S.C. Jana).

Polyimide aerogel composites for lightweight aerospace applications. NASA Earth Sciences Fellowship Program, 9/1/2012-8/31/2013 (Renewable up to 3 years). (PI: SC Jana)

Dispersion of Micro- and Nano-Silicon Particles in Host Polymeric Fluids for Picatinny ARDEC, U.S. Army. 2/15/2012-2/14/2013 (P.I.: S.C. Jana).

Polyimide aerogel composites for lightweight aerospace applications. NASA Earth Sciences Fellowship Program, 9/1/2011-8/31/2012 (Renewable up to 3 years). (PI: SC Jana)

Optimized boron nitride and production efficiency for lower cost polymer composites in LED laminates. Ohio 3<sup>rd</sup> Frontier Program, Subcontract from Momentive Performance Materials, 10/1/2010-9/30/2012. (PI: SC Jana)

Advanced composites: The new generations of materials powered by nanotechnology. PI: S.C. Jana  
Funding agency: Ohio 3<sup>rd</sup> Frontier Program, Subcontract from Zyvex Performance Materials. Period: 5/18/2009 – 8/31/2012 (PI: SC Jana).

Dispersion of nanoscale alumina in carrier fluids for optimum energetics. PI: S.C. Jana Funding agency: US Army. Period: 2/1/2009 – 2/14/2012.

Optimum process conditions for production of thermally conductive compounds. PI: S.C. Jana Funding agency: Momentive. Period: 11/13/2008 – 7/30/2010.

Shape memory silica aerogel composites for light weight thermal insulation. GSRP Fellowship. PI: S.C. Jana, NASA, Period: August 1, 2009 – July 31, 2010.

Shape memory silica aerogel composites for light weight thermal insulation. GSRP Fellowship. PI: S.C. Jana, NASA, Period: August 1, 2008 – July 31, 2009.

OBR RC Match to GOALI: Collaborative Research: Processing of Self-assembled, Bottom-Up Polymeric Nanocomposite Materials. PI S.C. Jana.

GOALI: Collaborative Research: Processing of Self-assembled, Bottom-Up Polymeric Nanocomposite Materials. PI S.C. Jana, NSF, Period: September 1, 2007-August 31, 2010.

REU: GOALI: Collaborative Research: Processing of Self-assembled, Bottom-Up Polymeric Nanocomposite Materials. PI S.C. Jana, NSF, Period: September 1, 2007-August 31, 2010.

Shape memory silica aerogel composites for light weight thermal insulation. GSRP Fellowship. PI: S.C. Jana, NASA, Period: August 1, 2007 – July 31, 2007.

Low permeability materials for LPG hose applications. PI: S.C. Jana, Parker Hannifin, May –September 2007.

Synthesis, characterization, and properties of carbon-fiber reinforced PMR-clay nanocomposites. GSRP Fellowship. PI S.C. Jana, NASA, Period: September 1, 2006-August 31, 2007.

Nanoclay/thermoplastic polyurethane chemistry. PI S.C. Jana, Agency: Bayer MaterialScience, Period: June 15, 2005 – August 15, 2005.

Synthesis, characterization, and properties of carbon-fiber reinforced PMR-clay nanocomposites. GSRP Fellowship. PI S.C. Jana, NASA, Period: September 1, 2005-August 31, 2006.

MRI: Acquisition of a nanoindentation system for nanocomposite and advanced materials research and education, P.I.: S.-C. Wong, Co-PI: E. Sancaktar, S. C. Jana, Y. Qiao. Agency: NSF, Period: August 1, 2005 – July 31, 2006.

Synthesis, characterization, and properties of carbon-fiber reinforced PMR-clay nanocomposites. GSRP Fellowship. NASA, Period: September 1, 2004-August 31, 2005.

REU Supplement: Research and education on multi-scale structure development in chaotic mixing of polymers. P.I.: S.C. Jana, NSF CAREER award, Period: February 15, 2002 – January 31, 2007.

REU Supplement: Research and education on multi-scale structure development in chaotic mixing of polymers. P.I.: S.C. Jana, CAREER proposal, National Science Foundation. Period: February 15, 2002 – January 31, 2007.

Evaluation of three flame retardants and nanoparticulate fillers for PC-ABS blends with emphasis on processing. P.I. S.C. Jana, Agency: Bayer Corporation, Period: December 1, 2003 – November 30, 2004.

Synthesis, characterization, and properties of carbon-fiber reinforced PMR-clay nanocomposites. GSRP Fellowship. NASA, Period: September 1, 2003-August 31, 2004.

CAREER: Research and education on multi-scale structure development in chaotic mixing of polymers. . P.I.: S.C. Jana, Agency: National Science Foundation, DMI-0134106, Period: February 15, 2002 – July 31, 2007.

Research and education on multi-scale structure development in chaotic mixing of polymers. . P.I.: S.C. Jana, Agency: Ohio Board of Regents, Period: February 15, 2002 – February 14, 2003.

A study on the effectiveness of flame retardants in PC-ABS blends. P.I.: S.C. Jana, Agency: Bayer Corporation, Period: September 1, 2002 – February 28, 2003.

Surface conductivity of molded sheets and films of conductive polymer compounds. P.I.: S.C. Jana, Agency: National Science Foundation, DMI-9902054, Period: September 1, 1999 – August 31, 2003.

Studies on stress-strain relationships of polymeric materials used in space applications. P.I.: S.C. Jana. Agency: NASA Glenn Research Center. Period: December 1, 1999 – September 30, 2001.

An investigation on the suitability of polyhydroxy ethers as reactive compatibilizers of immiscible polymer systems. P.I.: S.C. Jana, Dow Chemical Company. October 1, 2000 – September 30, 2001.

Individual Research Challenge Award on NSF Grant, DMI-9902054 from Ohio Board of Regents. P.I.: S.C. Jana. Period: September 1, 1999 – August 31, 2002.

Acquisition of a rheometer for polymer materials research and education. P.I.: C.D. Han Co-PI: Jana, Isayev, Leonov, White. Agency: NSF Equipment Grant.