

Résumé

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Rahul Jain

PROFILE

- Research Professional with Interests in Carbon Nanotubes, Polymer Based Composites, Nanocomposites, Elastomers, High Temperature Polymers, and Other Synthetic Materials.
- Experience and Familiarity with Various Processing, Testing, and Characterization Techniques for Aforementioned Materials.
- Experience with Designing Experiments and Managing Subordinates (Undergraduate Students and Lab Technicians).
- Good Understanding of the Market Trends, Research Trends, and Customer Needs for Selected Materials.
- Good Communication and Inter-Personal Skills.
- Creative and Entrepreneurial Mindset.

EDUCATION

- ♦ **Georgia Institute of Technology (GIT), Atlanta, GA 30332, USA**
Ph.D. in Polymer, Textile and Fiber Engineering (PTFE) **2005 – 05/2009**
Thesis: Carbon Nanotube Reinforced Polyacrylonitrile And Poly(etherketone) Fibers
GPA: 3.85/4.0
- ♦ **University of Alabama at Birmingham (UAB), Birmingham, AL 35294, USA**
M.S. in Materials Engineering **2003 – 2005**
Thesis: Modification of Carbon-Carbon Composites with Carbon Nanofibers
GPA: 3.90/4.0
- ♦ **Delhi College of Engineering (DCE), New Delhi 110042, INDIA**
B.E. (Bachelor of Engineering) in Polymer Science and Chemical Technology **1999 – 2003**
Honors: Degree Passed "First Class with Distinction"

RESEARCH/INDUSTRIAL EXPERIENCE

- ♦ **Benger Laboratory, Spandex/LYCRA® R&D, INVISTA, Waynesboro, VA 22980, USA**
Polymer Materials Scientist (4 month internship) **2008**
Project I: Development of Spandex with Improved Performance Properties
Works Involved: Polymer Synthesis and Yarn Processing, Polymer and Yarn Characterization and Testing
Project II: Development of Novel Elastomeric Materials
Works involved: Chemical Selection and Synthesis; Characterization and Testing of Synthesized Product
- ♦ **Carbon Nanotube Enabled Materials Group (Dr. Satish Kumar), PTFE, GIT, Atlanta, GA 30332, USA**
Graduate Research Assistant **2005 – 2009**
Project I: CNT Reinforced PAN Fibers for Fire Barrier and Fire Protection Applications (NIST)
 - **Processing:** Polymer/CNT Solution Preparation; Dry-Jet Wet Spinning of Fibers
 - **Testing:** Structural and Microstructural Characterization (SEM, WAXD, FTIR), Thermal, Chemical, Electrical, Mechanical, Thermo-Mechanical and Dynamic Mechanical Analyses (Tensile, DMA, TGA, DSC, TMA), Rheology
 - **Work Highlight:** First to Make a Continuous Composite Fiber Containing 20% (or more) MWNTs and CNFs using Conventional Spinning Technology; Fibers Possess Unique Combination of Thermal, Mechanical, and Electrical Properties**Project II:** Polyetherketone (PEK) Grafted SWNT, FWNT, MWNT, and CNF Composite Fibers
Project III: Cellulose/CNT Composite Fibers
- ♦ **Engineered Plastics and Composites Lab (Dr. Uday Vaidya), MSE, UAB, Birmingham, AL 35294, USA**
Graduate Research Fellow/Assistant **2003 – 2005**
Project I: Carbon-Carbon Composites with Carbon Nanofibers (US Space Missile Command)
 - **Processing:** Vacuum Bag Molding, Hand-Layup, Vacuum Assisted Resin Transfer Molding (VARTM)
 - **Testing:** Structural and Microstructural Characterization using Imaging and Physical Testing**Project II:** Emission of Styrene from Vinyl Ester Resin Systems (Army Research Lab)
Works Involved: Physical and Mathematical Modeling of the Emission Phenomenon
Visited U.S. Army Research Labs (Dr. James Sands, Aberdeen Proving Ground, MD 21005) for one week.

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- ◆ **Shriram Institute for Industrial Research, 19 University Road, New Delhi 110007, INDIA**
Winter Internship (8 weeks) 2002 – 2003
Project: Electron Beam Radiation Curing of Epoxy Based Composites
Works Involved:
 - **Processing:** Hand-Layup, Compression Molding, γ Radiation Curing
 - **Testing:** Mechanical and Physical Testing of Textiles and Composites

- ◆ **Product Applications and Research Centre, Gas Authority of India Ltd., Noida 201301, INDIA**
Summer Internship (8 weeks) 2002
Project: Material and Product Testing of Polyethylene (PE) Grades for Blow Molding and Monolayer Film
Works Involved:
 - **Processing:** Injection Molding, Blown Film Extrusion, Blow Molding, Compression Molding
 - **Testing:** Mechanical, Thermal, Thermo-mechanical Characterization of Raw Polymer and Processed Material

PUBLICATIONS AND PAPERS

- **R Jain**, U Vaidya, A Haque. Processing and Characterization of Carbon-Carbon Nanofiber Composites. *Advanced Composite Materials*, 15(2), 2006, 211-241
- **R Jain**, U Vaidya, A Haque. Processing and Characterization of Carbon-Carbon Nanofiber Composites-II. (*In preparation*)
- **R Jain**, U Vaidya, A Haque. Processing and Characterization of Carbon-Carbon Nanofiber Composites. *11th US-Japan Conference on Composite Materials, Sept. 9-11 (2004), Yamagata University, Yonezawa, Yamagata, Japan*
- **R Jain**, C Ulven, U Vaidya, J Sands, J Scala, J Orlicki, G Palmese. Effect of Temperature, Styrene Content, Resin Depth, and Molecular Weight of Resin on the Emission Behavior of Styrene from Vinyl Ester Resins. *Global Plastics Environmental Conference, GPEC 2005, Feb. 24-25 (2005) Atlanta, GA (Won 2nd Place Award for Poster Presentation)*
- **R Jain**, A Rasheed, H Chae, S Kumar, S Rahatekar, J Gilman, D Fox, P Trulove, H Long. PAN/MWNT and Cellulose/MWNT Composite Fibers for Fire Barrier Applications. *NIST 2007 Annual Fire Conference, Apr. 4-5 (2007), Gaithersburg, MD*
- **R Jain**, S Kumar. Polyacrylonitrile/Carbon Nanotube Composite Fibers. *NIST 2008 Annual Fire Conference, Mar. 31- Apr. 2 (2008), Gaithersburg, MD*
- **R Jain**, H Chae, Y Choi, M minus, S Kumar. Effect of Carbon Nanotube (CNT) Diameter and Concentration on Fiber Spinnability and Electrical Conductivity of the Polymer/CNT Composite Fiber. *5th Annual Georgia Tech Graduate Research Symposium, Feb. 26 (2009), Atlanta, GA (Won 1st Place Award for Poster Presentation from the College of Engineering)*
- **R Jain**, H Chae, S Jagannathan, M minus, Y Choi, Y Liu, S Kumar. Carbon Nanotube and Nanofiber Reinforced Films and Fibers. *237th ACS National Meeting & Exposition, Mar. 22-26 (2009), Salt Lake City, UT*
- **R Jain**, H Chae, S Kumar. Carbon Nanofiber (CNF) Reinforced Polyacrylonitrile (PAN) Fibers. *237th ACS National Meeting & Exposition, Mar. 22-26 (2009), Salt Lake City, UT*
- **R Jain** et al. Carbon Nanotube Reinforced Electrically Conducting Polymer Fibers. (*In preparation*)
- **R Jain** et al. Effect of CNT Diameter and Concentration on the Composite Fiber Spinnability. (*In preparation*)
- U Vaidya, **R Jain**, A Haque. Carbon Nanofiber Modified Carbon-Carbon Composites. *ASC/ASTM 19th Technical Conference, Oct. 17-20 (2004), Atlanta, GA*
- S Jagannathan, H Chae, **R Jain**, S Kumar. Structure and Electrochemical Properties of Activated Polyacrylonitrile Based Carbon Fibers Containing Carbon Nanotubes. *Journal of Power Sources*, 185, 2008, 676-684
- S Rahatekar, A Rasheed, **R Jain**, M Zammarano, K Koziol, A Windle, J Gilman, S Kumar. Solution Spinning of Cellulose Carbon Nanotube Composites using Room Temperature Ionic Liquids. (*In preparation*)
- H Chae, B Yoon, **R Jain**, T Uchida, S Kumar. Solutions for Chapter 12 (Carbon Nanofiber and Carbon Nanotube/Polymer Composite Fibers and Films). *Solutions Manual for Nanoengineering of Structural, Functional, and Smart Materials (ed. Schulz et al.)*, CRC Press, 2007, 54-70
- J Scala, J Orlicki, **R Jain**, C Ulven, G Palmese, U Vaidya, J Sands. Emission Modeling of Styrene from Vinyl Ester Resins with Low Hazardous Air Pollutant Contents. *Clean Technologies and Environmental Policy*, 2008, DOI 10.1007/s10098-008-0181-4
- S Rahatekar, A Rasheed, **R Jain**, K Koziol, A Windle, S Kumar, J Gilman. Processing of Natural Polymer-nanocomposites using Ionic Liquids as Green Solvents". *APS Meeting, Mar. 16-20 (2009), Pittsburgh, PA*
- J Scala, C Ulven, J Orlicki, **R Jain**, G Palmese, U Vaidya, J Sands. Emission Modeling of Styrene from Vinyl Ester Resins. *Clean Technologies and Environmental Policy*, 9(4), 2007, 265-279
- S Rahatekar, J Plog, A Rasheed, **R Jain**, S Kumar, J Gilman. Rheological Characterization and Fiber Spinning of Cellulose Ionic Liquids Solutions. *79th Annual Meeting of The Society of Rheology, Oct. 7-11 (2007), Salt Lake City, UT*
- S Rahatekar, K Koziol, A Windle, **R Jain**, S Kumar, E Hobbie, J Gilman. Effect of Aggregate Structure and Length of Carbon Nanotubes on the Rheological Properties of Nanotube/Epoxy Suspension. *79th Annual Meeting of The Society of Rheology,*

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Oct. 7-11 (2007), Salt Lake City, UT

- M Minus, H Chae, S Jagannathan, Y Choi, **R Jain**, Y Liu, E Ford, S Kumar. High-Performance Polymer/Carbon Nanotube Composite Fibers. *237th ACS National Meeting & Exposition, Mar. 22-26 (2009), Salt Lake City, UT*

MEMBERSHIPS/HONORS

- Sigma Xi (The Scientific Research Society)
- Sigma Pi Epsilon (Plastics Engineers Honor Society)
- Alpha Sigma Mu (Materials Science and Engineering Honor Society)
- Tau Beta Pi (The Engineering Honor Society)
- Society of Plastics Engineers (SPE)
- American Chemical Society (ACS)

POSITIONS/ACHIEVEMENTS IN TECHNICAL AND SOCIAL ACTIVITIES

- Participated in LeaderShape® organized by Georgia Tech **2008**
- President: SPE Student Chapter at UAB **2004**
- Vice President: SPE Student Chapter at Georgia Tech **2007**
- Social Chair: Association of Indian Students at UAB **2004**
- Certificate of Completion for the UAB Diversity Awareness Education **2004**
- Certificate of Completion for the Georgia Tech Student Development, Learning, and Diversity **2008**
- Volunteer for "American Cancer Society" (Relay for Life) **2004**
- Volunteer for "Help-Age India" for the Service of Elderly People **1998**
- Nomination: the Outstanding International Student at UAB by Dean of School of Engineering in the Master's category **2005**

TEACHING EXPERIENCE/OUTREACH

♦ **University of Alabama at Birmingham**

EGR 100, Saturday Academy, Engineering Open House, Model Rocket Competition

2003 – 2005

- Introduced Engineering Freshman and High School Students with the Design, Processing, Testing, Properties, and Applications of Plastics and Composites
- With Special Emphasis on Airplane Wing, Skateboard, and Baseball Bat type of Products and Impact Testing with a Gas-Gun
- Guided Undergraduate Students Working in Engineered Plastics and Composites Lab to Facilitate their Research

♦ **Georgia Institute of Technology, Atlanta, GA 30332**

PTFE 1100

2006

- Teaching Assistant for Professor Satish Kumar