

## EDUCATION

2012–2015 | **Dual Degree: Doctor of Philosophy (Ph.D.) in Material Science Engineering and Commercialization & Master of Business Administration, Texas State University**

-Research on gas barrier coatings resulted in **one** publication and a startup company: [Nabaco Inc.](#)

-Research on ultrasound-based topography measurement resulted in **one** publication and co-founded: [Akyor L.L.C.](#)

-Research on Colloidal synthesis and self-assembly to create hierarchical structures on surfaces using Industrially scalable Processes resulted in over **three** publications.

-Awarded Doctoral Research Support Fellowship

*Collaborators:* Dr. Gary W. Beall, Texas State University: Polymer and Nanocomposites

Dr. Orlin D Velez, North Carolina State University: Directed Self-assembly of particles

Dr. Javad R. Gatabi, Apple Inc.: Ultrasound-based sensor development

2009–2011 | **Master of Applied Mathematics, University of Texas Rio Grande Valley**

-Research on modeling nanofiber production processes, resulting in **two** publications.

*Collaborators:* Dr. Daniel N. Riahi, University of Illinois Urbana Champaign: Mathematical modeling

Dr. Dambaru Bhatta, University of Texas Rio Grande Valley: Object-Oriented Programming

2005 – 2009 | **Bachelor of Technology in Electrical Engineering, West Bengal University of Technology**

## TECHNICAL SKILLS

**Surface Characterization:** Microscopy: Scanning electron (F.E.I. Helios Nano Lab, JEOL JSM-6010 & F.E.I. Talos™ f200i S/ TEM) *sample preparation via e-beam evaporation and R.F. sputtering for high contrast imaging, focused ion beam [FIB] for site-specific analysis and ablation of materials*);. Optical and fluorescence (Olympus Laser Scanning Confocal, AMG EVOS FL digital LED-based transmission and fluorescence microscope & Olympus BX60M) *analysis of large-scale polymer/ metal film coatings*. Scanning Probe Microscopy (Bruker Dimension ICON AFM, Bruker DektakXT®). Dynamic light scattering (Malvern Zetasizer Nano-ZS, NanoSight Brownian Motion Microscope) Nanoparticle characterization in medium(s). Spectroscopy: X-ray Photoelectron and Energy Dispersive X-ray (*elemental analysis and electronic structure determination of polymer-based thin films and other materials*), UV-VIS, FTIR (Shimadzu UV-2501 and Beckman DU 7400 UV-Vis, Bruker ALPHA II FTIR) *measuring and analyzing absorption and reflection behavior of films and materials*. X-ray Diffractometry (Rigaku Smart Lab and Bruker D8 Focus Powder X-Ray Diffractometer with Sol-X Solid State Detector XRD) *analyzing and measuring the structure of materials, small-angle x-ray scattering [S.A.X.S.] for polymer/ powder*. Ellipsometry and Profilometry (J.A. Woollam Co. M-2000UI Ellipsometry) *determination of polymer film thickness and surface features*. **Macromolecular Characterization/Processing techniques** using Centrifugation, Mocon Gas Permeation Measurement, Rame Hart Model 200-F1 Goniometer, TA Q200 Modulated Differential Scanning Calorimeter(D.S.C.), TA Q50 Thermogravimetric Analyzer(TGA), TA Q800 Dynamic Mechanical Thermal Analyzer (D.M.T.A.), Mass Loss Calorimeter.

**Surface Preparation & Modification Skills:** Ultrasound-aided Condensation-polymerization-based functionalized polymer micro and nanoparticle synthesis & chemical vapor assisted adhesive layer formation. Industrial Rotary Kilns and Furnaces (surface modification/transformation of Silica, Humic acid (graphene oxide). Ball milling (hydrothermal processing of polymers).

**Semiconductor Processes:** Hands-on experience in Class 10000 Clean-room *Physical and Chemical Dry Etching (Oxford ICP-RIE Plaslab 180, PE-50 Plasma Asher)* Annealing or Chemical Vapor Deposition (Lindberg 3-Zone Tube Furnace) Thin film deposition (Angstrom Engineering EvoVac Ebeam Evaporator, A.J.A. International Orion Magnetron), Chemical Processing (Kewaunee fume hood for H<sub>2</sub>SO<sub>4</sub>, NH<sub>4</sub>OH, HCl, H<sub>2</sub>O<sub>2</sub>, H.F. Processing, H.E.M.C.O. fume hood for acid, base, and solvent immersion processing).

**Computational Skills:** Design of Experiment(D.O.E.), R (*Statistical data analysis*), LabVIEW (Electrical Process design and data collection), AUTO-CAD (*2D and 3D mechanical design and modeling*), M.A.T.L.A.B. & Simulink (*numerical simulation and modeling of physical processes*).

**Safety, Environmental Compliance & Quality Control:** Acquainted with Process Safety Management (P.S.M.) and risk assessment tools like H.A.Z.O.P. Knowledge of Six Sigma methodologies and lean principles.

**Other Skills:** Experienced in developing and maintaining laboratory equipment (*thermal, pneumatic, chemical, and electronics-based*).

## PROFESSIONAL ACADEMIC AND INDUSTRY EXPERIENCE

2018-Present | **Assistant Professor and Program Coordinator, Texas A&M University-San Antonio, TX**

- ✓ Led and directed the **Surface Sciences and Engineering Lab**: Capability include nanoparticle synthesis, chemical and thermal processing, mechanical processing, thin film deposition, and material characterization
- ✓ **Program Coordinator**: growth in student enrollment, from an initial count of 5 to 22 within three semesters.
  - Conceptualized and developed laboratories, courses, and curriculum in line with A.B.E.T. Accreditation,
  - **Faculty recruitment** as a committee member and chair.
  - Student outreach, industry outreach, creating internship opportunities, and initiating the IEEE - Texas A&M-SA Student Chapter.
- ✓ **D.E.I.B. Committee Member**
- ✓ **Mentored** over 30 student(s) for research, publication, and career guidance: T.A.M.U.S.A., IEEE, R.S.C.
- ✓ **Teaching**: Physics and Engineering Courses, primarily Project Based/Hands-on Experiential Learning based.

2017-2018| **Senior Process Engineer**, *Siotex Corporation, Austin, TX*

- ✓ -I optimized and designed renewable and eco-friendly/green **synthesis processes** to create **silica nanoparticles from rice husks**.
- ✓ -Processes Development (D.O.E.) optimized to double the weekly production (>100 pounds of Silica)
- ✓ -Quality control (>99% pure amorphous silica Nanoparticle) to maintain customer demands.
- ✓ -Designed and Maintained production plant equipment (Rotary Kiln, Industrial Ball mill(s), electronic equipment(s) related to the characterization of processes)
- ✓ -Supervised and managed a team of 5 Engineers.

2012-2016| **Doctoral & Post-Doctoral Research Associate**, *Texas State University, San Marcos, TX*

- ✓ -I created novel lithographic surface patterns, primarily with nanoparticles as templates.
  - ✓ -Implemented successful method optimization to reduce inherent defects in thin films by 86%.  
-Implemented ultrasound-based Doppler measurement techniques to measure surface topography up to 11 microns.
  - ✓ -Layer-by-layer deposition of clay-polymer composites to create intercalated structures on surfaces for gas barrier application(s).
  - ✓ -Thermodynamics and kinetics-based *computational* modeling of Nanoparticles during self-assembly processes.
- 2010-2011| **Graduate Research Assistant**, *University of Texas Rio Grande Valley, Edinburg, TX*
- ✓ Mathematical modeling and simulations of nanofiber production processes (using M.A.T.L.A.B. and Mathematica)

### SELECTED PUBLICATION AND INVITED TALKS

**10** Total Publications, as **6** first author, **1** as an advisor/mentor. **6** Total Conferences. Citation Records from Google Scholar:

[https://scholar.google.com/citations?hl=en&user=IW\\_KfV8AAAAJ](https://scholar.google.com/citations?hl=en&user=IW_KfV8AAAAJ)

- El Shazly M. Duraia, **Sayantana Das**, and Gary W. Beall: "Single-step synthesis of carbon nanotubes-nickel cobaltite (CNT-NiCo<sub>2</sub>O<sub>4</sub>) by thermal decomposition of cyanide compounds for electrochemical sensing applications" - Currently under Review at Ceramics International
- **Sayantana Das**, *Invited Speaker*: "Creation and Control of Hierarchical Structures using Nanomaterials". Optics Meet 2021, November 21.
- El Shazly M. Duraia, **Sayantana Das** and Gary W. Beall. "Humic Acid Nanosheets Decorated by Tin Oxide Nanoparticles and their Humidity Sensing Behavior". Sensors and Actuators, B. Chemical, 2018.
- **Sayantana Das**, Orlin D. Velez, El Shazly M. Duraia, Javad R. Gatabi, and Gary W. Beall. "Reduction of defects in colloidal monolayers via surface modifiers and periodic vibration". Surface and Coatings, 2017.
- Maedeh Dabaghianamiri, **Sayantana Das**, and Gary W. Beall. "Polymer/Clay Nanocomposite Self-Assembly Approach for Gas Barrier Film Applications". Material Research Society, 2017.
- **Sayantana Das**, El Shazly M. Duraia, and Gary W. Beall. "Formation of Periodic Size Segregated Stripe Pattern via Convective Assembly and its Mechanism" . Applied Surface Science, 2017.
- Javad R. Gatabi, **Sayantana Das**, and Farshid Forouzabakhsh. "The Effect of Amplitude Modulation on the Axial Resolution of Doppler Based Ultrasonic Topography Measurement". IEEE Transactions, 2016.

### SELECTED HONORS AND AWARDS

- Editorial Committee Member, Particle Characterization Interest Group, **Royal Society of Chemistry** | 2023
- Chair of University Relations, **IEEE Region5: Lone Star Section, USA** | 2023
- Senior Member, **IEEE** | 2023
- Faculty Advisor/Counsellor, **IEEE TAMUSA Student Chapter** | 2023
- U.S. Department of Energy, Office of Science, L.E.D.P. Grant, ~\$135K | 2022
- Outstanding Reviewer Award, **IEEE Transactions** | 2022
- M.R.S.C. (Member of Royal Society of Chemistry), **Royal Society of Chemistry** | 2021
- Key Scientific Article Award, [Advances in Engineering](#) | 2018