

## **Manjusri MISRA, Ph.D, FRSC(UK), FAIChE, FSPE**

Professor, *School of Engineering*

*Cross-appointed to the Department of Plant Agriculture*

Canada Research Chair (CRC) Tier 1 – Sustainable Biocomposites,  
*Natural Sciences and Engineering Research Council of Canada (NSERC)*

Research Program Director, Bioeconomy Panel,  
*Ontario Agri-Food Innovation Alliance*

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### **EDUCATION AND DEGREES**

Ph.D.	Utkal University	Chemistry Area: Polymers & Natural Fibers	1988
M. Phil	Utkal University	Chemistry	1986
M. Sc.	Utkal University	Chemistry; Specialization: Polymer Chemistry	1980
B. Sc	Utkal University	Chemistry Honours with Distinction	1978

### **POSITIONS HELD**

2020 – Present	<b>Canada Research Chair (CRC) Tier 1 – Sustainable Biocomposites</b> , Natural Science and Engineering Research Council of Canada (NSERC)
2018 – Present	<b>Research Program Director:</b> Ontario Agri-Food Innovation Alliance, OMAFRA, Canada.
2015 – Present	<b>Professor:</b> School of Engineering and Department of Plant Agriculture (Cross-appointed), University of Guelph, Canada.
2008 – 2015	<b>Associate Professor:</b> University of Guelph, Canada.
2008 – 2013	<b>Adjunct Professor:</b> Michigan State University, USA.
2002 – 2007	<b>Visiting Associate Professor:</b> Michigan State University, USA.
2001 – 2002	<b>Research Specialist:</b> Michigan State University, USA.
2000 – 2001	<b>Visiting Research Associate:</b> Michigan State University, USA.
2000 – 2000	<b>Adjunct Visiting Research Associate:</b> Michigan State University, USA.
1999 – 1999	<b>Visiting Scientist:</b> Technical University of Berlin, Germany.
1999 – 1999	<b>Visiting Scientist:</b> Iowa State University, USA.
1998 – 1998	<b>Visiting Scientist:</b> Fritz-Haber Max-Planck Institute & Hahn Meitner Institute, Germany.
1986 – 1998	<b>Senior Lecturer (Chemistry):</b> Utkal University, India.
1981 – 1986	<b>Lecturer (Chemistry):</b> Utkal University, India.

### **RESEARCH IMPACT**

**Google Scholar** Citations: 44, 975; h-index: 94; i10-index: 436 (February 3, 2023).

- 400+ peer-reviewed journal papers (including accepted/in press papers)
- 25 Inventions: 21 Patents Awarded, 34 Patent Applications
- 6 edited books and 25 book chapters
- 85+ Plenary/Keynote/Invited research presentations
- 300+ Conference Presentations (Presented by HQP)
- 5 commercial products in the market
- Over \$20M in research cash funding & over \$12M in-kind support

## AWARDS, HONOURS AND DISTINCTIONS

- 2022 **IAAM Award**, International Association of Advanced Materials, Sweden
- 2021 **Fellow**, Society of Plastic Engineers (SPE), USA
- 2021 **Lifetime Achievement Award**, BioEnvironmental Polymer Society (BEPS)
- 2020 **Canada Research Chair (CRC) Tier 1 – Sustainable Biocomposites**, Natural Science and Engineering Research Council of Canada (NSERC)
- 2020 **Canada’s Most Powerful Women: Top 100 Awards – Manulife Science and Technology Category**, Women’s Executive Networks (WXN), Canada
- 2020 **Fellow**, Society of Plastic Engineers (SPE), USA
- 2020 **CEPS Undergraduate Supervision Award**, College of Engineering and Physical Sciences (CEPS), University of Guelph, Canada
- 2020 **Fellow**, American Institute of Chemical Engineers (AIChE), USA
- 2019 **Fellow**, Royal Society of Chemistry, UK
- 2019 **Woman of Distinction on Science, Technology, Engineering & Math (STEM)**: Guelph YMCA-YWCA Women of Distinction, Canada
- 2018 **NSERC Synergy Award for Innovation**, Natural Sciences and Engineering Research Council, Canada  
This award honours the most outstanding achievements of the collaboration between academia and industry in the natural sciences and engineering.
- 2017 **Andrew Chase Forest Products Division Award**, American Institute of Chemical Engineers (AIChE), USA
- 2017 **Featured Canadian Author**,  
Two publications chosen for ACS Publications Open Access Virtual Issue “[Hot Materials in a Cool Country](#)” featuring articles authored by Canadians to celebrate the 100<sup>th</sup> meeting of the Canadian Chemistry Conference
- 2016 **University of Guelph’s Innovation of the Year Award**, Canada  
The award is for the creation of the 100% Compostable Bio-composite Resin using coffee chaff (waste stream of coffee roasting industry) for single-serve coffee pods. More awards for this innovation found here: <http://purpod100.com/awards/>
- 2014 **Composites Part A Most Highly Cited Paper Award**,  
"Characterization of natural fiber surfaces and natural fiber composites", selected for the award which highlights that the paper has truly generated interest and awareness within the composites community
- 2012 **Jim Hammar Memorial Service Award**, BioEnvironmental Polymer Society (BEPS), USA

## CURRENT RESEARCH AREAS

Bio-based new materials, green nanotechnology, polymer nanotechnology, nanostructured materials & devices, nano particles & applications, pyrolysis of biomass and characterization of biocarbon for composite applications, surface treatment of micro and nanofibers and fiber-matrix adhesion, nanobiocomposites from carbon nanotubes, alumina nanowhisker, silver nanoparticles and cellulose nanofibers self-cleaning/ultrahydrophobic nanocoatings, adhesives, paints, electrospinning processing,

3D printing of biobased materials, bio-based polymer blends, composites and nanocomposites, natural fibre and biomass biocomposites, functionalized plant oils, biobased polyesters and their composites, biobased epoxies and their composites, reactive extrusion processing, extrusion and injection molding of biocomposites, multilayer injection molding, biocomposite sheet molding compounds biocomposite powder processing (BioSMC), microwave processing of biocomposites vacuum assisted resin transfer molding (VARTM) of biocomposites, novel materials derived from starch and chitosan, and Circular Economy.

### Highly Qualified Personnel (HQP)

Trainee	Previous	Current	Lifetime Total
Undergraduate	57	1	58
Master's	40	3	43
PhD	22	6	28
Postdoc/Research Associate	46	7	53
Visiting Students and Scholars	27	0	27
Staff and Technicians	9	5	14
<b>TOTAL</b>	<b>194</b>	<b>28</b>	<b>223</b>

### Top 15 Most Cited Publications (ref. Google Scholar Citations, February 7, 2023)

1. Mohanty, A.K., **Misra, M.**, & Hinrichsen, G. (2000). "Biofibres, biodegradable polymers and biocomposites: an overview". *Macromolecular Materials and Engineering*, 276(1), 1-24. **Cited by 3706.**
2. Mohanty, A.K., **Misra, M.**, & Drzal, L.T. (2002). "Sustainable bio-composites from renewable resources: opportunities and challenges in the green materials world". *Journal of Polymers and the Environment*, 10(1-2), 19-26. **Cited by 2621.**
3. Mohanty, A.K., **Misra, M.**, & Drzal, L.T. (2005). "Natural Fibers, Biopolymers and Biocomposites". *CRC Press*. **Cited by 2363.**
4. Mohanty, A.K., **Misra, M.**, & Drzal, L.T. (2001). "Surface modifications of natural fibers and performance of the resulting biocomposites: an overview". *Composite Interfaces*, 8(5), 313-343. **Cited by 1222.**
5. Reddy, M.M., Vivekanandhan, S., **Misra, M.**, Bhatia, S. K., & Mohanty, A.K. (2013). "Biobased plastics and bionanocomposites: Current status and future opportunities". *Progress in Polymer Science*, 38(10), 1653-1689. **Cited by 1042.**
6. Mishra, S., Mohanty, A.K., Drzal, L.T., **Misra, M.**, Parija, S., Nayak, S. K., & Tripathy, S.S. (2003). "Studies on mechanical performance of biofibre/glass reinforced

- polyester hybrid composites”. *Composites Science and Technology*, 63(10), 1377-1385. **Cited by 1017.**
7. Sgriccia, N., Hawley, M. C., & **Misra, M.** (2008). “Characterization of natural fiber surfaces and natural fiber composites”. *Composites Part A: Applied Science and Manufacturing*, 39(10), 1632-1637. **Cited by 950.**
  8. Huda, M.S., Drzal, L.T., Mohanty, A.K., & **Misra, M.** (2008). “Effect of fiber surface-treatments on the properties of laminated biocomposites from poly (lactic acid) (PLA) and kenaf fibers”. *Composites Science and Technology*, 68(2), 424-432. **Cited by 802.**
  9. Nagarajan, V., Mohanty, A.K., & **Misra, M.** (2016). “Perspective on polylactic acid (PLA) based sustainable materials for durable applications: Focus on toughness and heat resistance”, *ACS Sustainable Chemistry & Engineering*, 4(6), 2899-2916. **Cited by 646.**
  10. Rout, J., **Misra, M.**, Tripathy, S.S., Nayak, S.K., & Mohanty, A.K. (2001). “The influence of fibre treatment on the performance of coir-polyester composites”. *Composites Science and Technology*, 61(9), 1303-1310. **Cited by 623.**
  11. Zampaloni, M., Pourboghrat, F., Yankovich, S.A., Rodgers, B.N., Moore, J., Drzal, L.T., Mohanty, A.K., & **Misra, M.** (2007). “Kenaf natural fiber reinforced polypropylene composites: a discussion on manufacturing problems and solutions”. *Composites Part A: Applied Science and Manufacturing*, 38(6), 1569-1580. **Cited by 568.**
  12. Huda, M.S., Drzal, L.T., Mohanty, A.K., & **Misra, M.** (2006). “Chopped glass and recycled newspaper as reinforcement fibers in injection molded poly (lactic acid) (PLA) composites: a comparative study”. *Composites Science and Technology*, 66(11), 1813-1824. **Cited by 559.**
  13. Mohanty, A.K., Vivekanandhan, S., Pin, J.M., **Misra, M.** (2018). “Composites from renewable and sustainable resources: Challenges and innovations”. *Science* 362 (6414), 536-542. **Cited by 527.**
  14. Jonoobi, M., Harun, J., **Misra, M.**, & Oksman, K. (2009). “Chemical composition, crystallinity and thermal degradation of bleached and unbleached kenaf bast (*Hibiscus cannabinus*) pulp and nanofiber”. *BioResources*, 4(2), 626-639. **Cited by 513.**
  15. Mishra, S., Mohanty, A.K., Drzal, L.T., **Misra, M.**, & Hinrichsen, G. (2004). “A review on pineapple leaf fibers, sisal fibers and their biocomposites”. *Macromolecular Materials and Engineering*, 289(11), 955-974. **Cited by 447.**

#### LIST OF GRANTED PATENTS

1. Mohanty, A.K., Drzal, L.T., Rook, B.P., & **Misra, M.** “Environmentally Friendly PolyLactide-Based Composite Formulations”. Publication Number: US6869985B2.
2. Mohanty, A.K., Drzal, L.T., Rook, B.P., & **Misra, M.** “Environmentally Friendly PolyLactide-Based Composite Formulations”. Publication Number: EP1361039B1.
3. Dwan’Isa, J.P.L., Drzal, L.T., Mohanty, A.K., & **Misra, M.** “Polyol Fatty Acid Polyesters Process and Polyurethanes Therefrom”. Publication Number: US7125950B2.
4. Mohanty, A.K., Drzal, L.T., Rook, B.P., & **Misra, M.** “Environmentally Friendly PolyLactide-Based Composite Formulations”. Publication Number: DK1361039T3.

5. Drzal, L.T., Mehta, G., **Misra, M.**, Mohanty, A.K., & Thayer, K. "Biocomposites Sheet Molding and Methods of Making Those". Publication Number: US7208221B2.
6. Mohanty, A.K., Drzal, L.T., Park, H., **Misra, M.**, & Wibowo, A.C. "Compositions of Cellulose Esters and Layered Silicates and Process for the Preparation Thereof". Publication Number: US7253221B2.
7. Mohanty, A.K., Drzal, L.T., Rook, B.P., & **Misra, M.** "Environmentally Friendly PolyLactide-Based Composite Formulations". Publication Number: DE60307536T2.
8. Mohanty, A.K., Drzal, L.T., Rook, B.P., & **Misra, M.** "Environmentally Friendly PolyLactide-Based Composite Formulations". Publication Number: US7256223B2.
9. Mohanty, A.K., Drzal, L.T., Rook, B.P., & **Misra, M.** "Floor Covering Made from an Environmentally Friendly Polylactide-Based Composite Formulation". Publication Number: US7354656B2.
10. Drzal, L.T., Mohanty, A.K., Liu, W., Thayer, K., & **Misra, M.** "Cellulosic Biomass Soy Flour Based Biocomposites and Process for Manufacturing Thereof". Publication Number: US7576147B2.
11. Mohanty, A.K., Tummala, P., **Misra, M.**, & Drzal, L.T. "Filler Reinforced Thermoplastic Compositions and Process for Manufacture". Publication Number: US7582241B2.
12. Mohanty, A.K., Drzal, L.T., Rook, B.P., & **Misra, M.** "Environmentally Friendly PolyLactide-Based Composite Formulations". Publication Number: CA2427012C.
13. Mohanty, A.K., **Misra, M.**, & Sahoo, S. "Lignin Based Materials and Methods of Making Those". Publication Number: US9309401B2.
14. **Misra, M.**, Vadori, R. & Mohanty, A.K. "Bio-Based Acrylonitrile Butadiene Styrene (ABS) Polymer Compositions and Methods of Making and Using Thereof". Publication Number: US9562156B2.
15. Mohanty, A.K., **Misra, M.**, Rodriguez-Uribe, A., & Vivekanadhan, S. "Hybrid Sustainable Composites and Methods of Making and Using Thereof". Publication Number: US9809702B2.
16. Mohanty, A.K., Yuryev, Y., & **Misra, M.** "Durable high performance heat resistant polycarbonate (PC) and polylactide (PLA) blends and compositions and methods of making those". Publication Number: US9920198B2.
17. Mohanty, A.K., **Misra, M.**, Bali, A., & Rodriguez-Uribe, A. "Renewable Replacements for Carbon Black in Composites and Methods of Making and Using Thereof". Publication Number: US10414880B2.
18. Mohanty, A.K., **Misra, M.**, Behazin, E., & Rodriguez-Uribe, A. "Toughened polyolefin and biocarbon based light weight biocomposites and method of making the same". Publication Number: US10472440B2.
19. Mohanty, A.K., **Misra, M.**, Ogunsona, E., Anstey, A., Torres, S., Codou, A., & Jubinville, D. "Biocarbon and nylon based hybrid carbonaceous biocomposites and methods of Making those and using thereof". Publication Number: US 10,669,420

20. Mohanty, A.K., **Misra, M.**, Behazin, E., Rodriguez-Urbe, A. "Toughened polyolefin and biocarbon based light weight biocomposites and method of making the same". Publication Number: US 10,472,440
21. Mohanty, A.K., **Misra, M.**, Vivekanandhan, S., Gonugunta, P., Wang, T., Rodriguez, A., Tiessen, M., Bali, A. "Novel methods for creation of sub-micron biocarbon materials from biomass and their fields of application". Publication Number: US 11,332,371