

THE KENNETH RUSSELL ENDOWED LECTURE

Kenneth Russell came to Queen's in 1954. He had research experience in polymer chemistry at Cambridge and Princeton, in thermodynamics of rocket fuels at Penn State and in kinetics of atom recombination at Manchester. He was known particularly for his polymer research and first year and polymer lectures (dating back to 1956). He retired officially in 1990.

His interest in polymer chemistry arose through wartime work on butyl rubber. This led to a Ph.D. thesis on isobutene polymerization by Friedel Crafts catalysts, including kinetic studies of the effects of various co-initiators. His research at Queen's led to an understanding of the dual role of a wide range of co-initiators.

Free radical studies at Princeton led to determination of transfer constants for transfer agents and retarders (still quoted in the Polymer Handbook).

His other main research areas, inspired in large measure by parallel work at Du Pont, consisted of structural studies of polyethylene and grafting of vinyl monomers to polyethylene. These carried on for 12 years into his retirement and profited from cooperation with many members of staff. A main factor in the incorporation of this lecture series was Dr. Russell's work with Drs. Whitney and Parent.

RECENT PUBLICATIONS

Kang, N.; Cho, S.; Leonhardt, E. E.; Liu, C.; Verkhoturov, S. V.; Woodward, W. H.; Eller, M. J.; Yuan, T.; Fitzgibbons, T. C.; Borguet, Y.; Jahnke, A. A.; Sokolov, A. N.; McIntire, T.; Reinhardt, C.; Fang, L.; Schweikert, E. A.; Spencer, L. P.; Sun, G.; Trefonas, P.; Wooley, K. L. "Topological Design of Highly Anisotropic Aligned Hole Transporting Molecular Bottlebrushes for Solution-processed OLEDs", *J. Am. Chem. Soc.*, **2022**, *144*(18), 8084-8095, DOI: 10.1021/jacs.2c00420.

Shen, Y.; Yang, X.; Song, Y.; Tran, D. K.; Wang, H.; Wilson, J.; Dong, M.; Vazquez, M.; Sun, G.; Wooley, K. L. "Complexities of Regioselective Ring-Opening vs. Transcarbonylation-Driven Structural Metamorphosis during Organocatalytic Polymerizations of Five-Membered Cyclic Carbonate Glucose Monomers", *JACS Au*, **2022**, *2*(2), 515-521, DOI: 10.1021/jacsau.1c00545.

PREVIOUS RUSSELL LECTURERS

2021 • L. Jiang

2019 • S. Yamaguchi

2018 • M. Winnik

2018 • T. Lodge

2017 • S. Holdcroft

2016 • K. Matyjaszewski



Department of Chemistry Queen's University

is honoured to host the
2022 Russell Lecturer:

Karen Wooley

Texas A&M University

"Natural Product-based Polymers that Address Health-Food-Energy-Water Challenges: Structural, topological and morphological diversities for sustainable, degradable polymers derived from carbohydrates"



Friday, September 30, 2022

11:30 AM

Room 117, Chernoff Hall

DR. KAREN L. WOOLEY



Karen L. Wooley
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Karen L. Wooley holds the W. T. Doherty-Welch Chair in Chemistry and is a University Distinguished Professor at Texas A&M University, with appointments in the Departments of Chemistry, Chemical Engineering and Materials Science & Engineering. She also serves as Director of the Laboratory for Synthetic-Biologic Interactions. Her academic training included undergraduate study at Oregon State University (B.S., 1988) and graduate study under the direction of Professor Jean M. J. Fréchet at Cornell University (Ph.D., 1993). She began an academic career as an Assistant Professor of Chemistry at Washington University in St. Louis, Missouri in 1993, was promoted in 1999 to Full Professor with tenure, was installed in 2006 as a James S. McDonnell Distinguished University Professor in Arts & Sciences, and in 2007 received an appointment in the School of Medicine, Department of Radiology. Karen relocated to Texas A&M University in July 2009. Research interests include the synthesis and characterization of degradable polymers derived from natural products, unique macromolecular architectures and complex polymer assemblies, and the design and development of well-defined nanostructured materials. She has designed synthetic strategies to harness the rich compositional, regiochemical and stereochemical complexity of natural products for the construction of hydrolytically-degradable polymers, which have impact toward sustainability, reduction of reliance on petrochemicals, and production of biologically-beneficial and environmentally-benign natural products upon degradation – these materials are expected to impact the global issue of plastic pollution and address challenges resulting from climate change. The development of novel synthetic strategies, fundamental study of physicochemical and mechanical properties, and investigation of the functional performance of her materials in the diagnosis and treatment of disease, as superabsorbent hydrogels to address global challenges associated with excessive liquid water, as non-toxic anti-biofouling or anti-icing coatings, as safe, sustainable battery materials or materials for microelectronics device applications, and as environmental remediation systems are particular foci of her research activities. Recent awards include the American Chemical Society Award in Polymer Chemistry (2014), the Royal Society of Chemistry Centenary Prize (2014), and election as a Fellow of the American Academy of Arts and Sciences (2015), National Academy of Inventors (2019), American Association for the Advancement of Science (2020), American Institute for Medical and Biological Engineering (2020), and National Academy of Sciences (2020). Most recently, she was named as the 2021 Southeastern Conference (SEC) Professor of the Year. Karen has served on the technical advisory boards and served in consulting capacities for several companies, from Fortune 500 companies to start-ups, and law firms. She is the co-founder and President of Sugar Plastics, LLC, and Chief Technology Officer of Teysha Technologies, LTD.

SELECTED HONOURS & AWARDS

- Eminent Scholar Award, Aggie Women Network, Texas A&M University, 2021
- SEC Professor of the Year, Southeastern Conference on behalf of Texas A&M University, 2021
- Member, National Academy of Sciences (NAS), 2020 - present
- Fellow, American Association for the Advancement of Science (AAAS), 2020 - present
- Fellow, American Institute for Medical and Biological Engineering (AIMBE), 2020 - present
- Fellow, National Academy of Inventors (NAI), 2019 - present
- Fellow, American Academy of Arts & Sciences (AMACAD), 2015-present
- Oesper Award, University of Cincinnati Department of Chemistry, 2015
- Honorary Fellow of the Chinese Chemical Society, 2014-present
- Fellow of the Royal Society of Chemistry, 2014-present
- Royal Society of Chemistry Centenary Prize, 2014
- American Chemical Society Award in Polymer Chemistry, 2014
- Texas A&M University Distinguished Professor, 2011-present