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Opportunities and Challenges for a New Golden Age of Chemical Engineering

ABSTRACT

In my year as AIChE president, I saw amazing things happening in our profession around the world. I propose that we are in the early days of a new "Golden Age" of chemical engineering and cite five reasons. First is new availability of energy supplies worldwide through hydrofracturing and renewable energy. Meanwhile, molecular biology has become a promising tool for production of chemicals and medicines. Computing advances aid our understanding and applications of molecular science, along with product design and process operation. Fourth, manufacturing is more process-oriented than ever, benefiting from chemical-engineering expertise. Finally, the molecular, systems, and process-based approaches of chemical engineering are well suited to addressing society's needs and aspirations.

These changes provide new opportunities and new challenges, as I will show by recent examples. The late John Chen recently examined how academic preparation and industry needs can diverge unless we have common acceptance of what ChE fundamentals are. A key to our potential impact is embracing both the breadth and core of our professional identity as chemical engineers.

BIOGRAPHY

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Phil Westmoreland is a professor at North Carolina State University in the Department of Chemical and Biomolecular Engineering and Executive Director of the NCSU Institute for Computational Science and Engineering. His research focuses on reaction kinetics and reaction engineering by molecular-beam mass spectrometry, computational chemistry, and reactive-flow modeling, and his degrees are in chemical engineering from N.C. State (BS '73), LSU (MS '74), and MIT (PhD '86). Phil was the founding Chair of AIChE's Computational Molecular Science and Engineering Forum and is a past president of CACHE. His teaching, research, and service have been recognized in recent years by Lawrence Berkeley National Lab's David Shirley Award, AIChE's Gary Leach and George Lappin Awards, ASEE's William Corcoran Award, and the National Science Foundation Director's Award for Collaborative Integration.