EDITORIAL AND BUSINESS ADDRESS: Chemical Engineering Education Department of Chemical Engineering University of Florida • Gainesville, FL 32611 PHONE and FAX : 352-392-0861 e-mail: cee@che.ufl.edu

EDITOR Tim Anderson

ASSOCIATE EDITOR Phillip C. Wankat

MANAGING EDITOR Lynn Heasley

PROBLEM EDITOR James O. Wilkes, U. Michigan

LEARNING IN INDUSTRY EDITOR William J. Koros, Georgia Institute of Technology

- PUBLICATIONS BOARD

• CHAIRMAN • John P. O'Connell University of Virginia

• VICE CHAIRMAN • C. Stewart Slater Rowan University

• MEMBERS •

Kristi Anseth University of Colorado Jennifer Curtis University of Florida Rob Davis University of Colorado Pablo Debenedetti Princeton University Dianne Dorland Rowan Thomas F. Edgar University of Texas at Austin Stephanie Farrell Rowan University Richard M. Felder North Carolina State University H. Scott Fogler University of Michigan Jim Henry University of Tennessee, Chattanooga Jason Keith Michigan Technological University Steve LeBlanc University of Toledo **Ron** Miller Colorado School of Mines Susan Montgomery University of Michigan Lorenzo Saliceti University of Puerto Rico Stan Sandler University of Delaware Donald R. Woods

McMaster University

Chemical Engineering
Volume 43Education
Winter 2009

► EDUCATOR

2 C. Stewart Slater of Rowan University Robert P. Hesketh, Helen C. Hollein, and James H. Tracey

► RANDOM THOUGHTS

15 The 10 Worst Teaching Mistakes II. Mistakes 1–4 Richard M. Felder and Rebecca Brent

► CLASSROOM

10 An Innovative Method for Integrating a Diversity Workshop in a Chemical Engineering Course Ayumu Yokoyama

- Multiple Comparisons of Observation Means—Are the Means Significantly Different?
 T.Z. Fahidy
- 29 Taylor-Aris Dispersion: An Explicit Example for Understanding Multiscale Analysis Via Volume Averaging Brian D. Wood
- 51 Using Simulation Module PCLAB for Steady State Disturbance Sensitivity Analysis in Process Control Emad Ali and Arimiyawo Idriss
- 58 Process Systems Engineering Education: Learning By Research A. Abbas, H.Y. Alhammadi, And J.A. Romagnoli

► CURRICULUM

70 Teaching Chemical Engineering Thermodynamics at Three Levels— Experience from the Technical University of Denmark Georgios M. Kontogeorgis, Michael L. Michelsen, and Karsten H. Clement

► LABORATORY

23 A Process Dynamics and Control Experiment for the Undergraduate Laboratory

Jordan L. Spencer

► UNIT OPERATIONS

39 Combined Steady-State and Dynamic Heat Exchanger Experiment *William Luyben, Kemal Tuzla, and Paul Bader*

► CLASS AND HOME PROBLEMS

65 First Principles Modeling of the Performance of a Hydrogen-Peroxide-Driven Chem-E-Car

Maryam Farhadi, Pooya Azadi, and Nima Zarinpanjeh

CHEMICAL ENGINEERING EDUCATION (ISSN 0009-2479) is published quarterly by the Chemical Engineering Division, American Society for Engineering Education, and is edited at the University of Florida. Correspondence regarding editorial matter, circulation, and changes of address should be sent to CEE, Chemical Engineering Department, University of Florida, Gainesville, FL 32611-6005, Copyright © 2008 by the Chemical Engineering Division, American Society for Engineering Education. The statements and opinions expressed in this periodical are those of the writers and not necessarily those of the ChE Division, ASEE, which body assumes no responsibility for them. Defective copies replaced if notified within 120 days of publication. Write for information on subscription costs and for back copy costs and availability. POST MASTER: Send address changes to Chemical Engineering Education, Chemical Engineering Department, University of Florida, Gainesville, FL 32611-6005. Periodicals Postage Paid at Gainesville, Florida, and additional post offices (USPS 101900).