

**Randy D. Weinstein**

Associate Dean of Academic Affairs, College of Engineering  
Professor, Chemical Engineering  
Villanova University  
215 White Hall or 303 Center for Engineering Education and Research  
800 Lancaster Avenue  
Villanova, PA 19085

Phone: (610) 519-4954      Fax: (610) 519-7354      Email: randy.weinstein@villanova.edu

**EDUCATION:**

1998 **Massachusetts Institute of Technology**, Ph.D., Chemical Engineering  
1993 **University of Virginia**, B.S., Chemical Engineering with High Distinction

**PROFESSIONAL EXPERIENCE:**

2012-present **Villanova University**, Associate Dean of Academic Affairs, College of Engineering  
2007-2012 **Villanova University**, Chair, Chemical Engineering  
2007-present **Villanova University**, Professor of Chemical Engineering  
2009-2012 **Villanova University**, Founding Program Director, Sustainable Engineering  
2007 **Villanova University**, Interim Director, Center for Innovation in Engineering Education  
2004-2007 **Villanova University**, Associate Professor of Chemical Engineering  
2005-2007 **Villanova University**, Associate Research Professor of Chemistry  
1998-2004 **Villanova University**, Assistant Professor of Chemical Engineering

**CONSULTANT EXPERIENCE:**

2007 **ECOR Solutions, Inc.**  
2006-2008 **Ablaze Development Corporation**  
2003 **k Technology Corporation**  
1999-2002 **Lucent Technologies**

**PROFESSIONAL ACTIVITIES:**

Board of Director, Footlighters Theater, 2012-2014  
Foundation Board Member, Alpha Chi Sigma Educational Foundation, 2010-2020  
Grand Master Alchemist (President), Alpha Chi Sigma, 2012-2014  
Grand Collegiate Alchemist (1<sup>st</sup> Vice President), Alpha Chi Sigma, 2010-2012  
Grand Master of Ceremonies (3<sup>rd</sup> Vice President), Alpha Chi Sigma, 2008-2010  
International Advisory Board, SAMPADA: Specialty Advanced Materials and Polymers for Aerospace and Defense Applications, 2008  
Co-Chair, "Thin Films, Coatings, and Interfacial Phenomena Using Compressible or Supercritical Fluids," AIChE Annual Meeting, Philadelphia, PA, 2008.  
Chair, High Pressure Group (1f) of AIChE, 2005-2007.  
Chair, "Thin Films and Coatings Using near and Supercritical Fluids," AIChE Annual Meeting San Francisco, CA, 2006.  
Vice-Chair, High Pressure Group (1f) of AIChE, 2003-2005.  
Co-Chair, "Synthesis and Coating via Supercritical Processing," AIChE Annual Meeting, Austin, TX, 2004.

Chair, "Materials Processing in Supercritical Fluids I," AIChE Annual Meeting, San Francisco, CA, 2003  
Chair of the District Counselors, Alpha Chi Sigma, 2004-2006  
Atlantic Central District Counselor (ACDC), Alpha Chi Sigma, 2002-2008  
Professional Representative, Alpha Chi Sigma, 2002  
Chair, "Materials Processing in Supercritical Fluids II," AIChE Annual Meeting, Indianapolis, IN, 2002  
Advisor Villanova Student Chapter of Tau Beta Pi, 2001-present  
Group 1f (High Pressure) session coordinator for AIChE Annual Meeting, Indianapolis, IN, 2002.  
Co-Chair, "Materials Processing in Supercritical Fluids II" and "Benign Synthesis in Supercritical Fluids," AIChE Annual Meeting, Reno, NV, 2001  
Co-Chair, "Thermodynamics & Processing with Supercritical Fluids," AIChE Annual Meeting, Los Angeles, CA, 2000  
Chair, "Chemistry of Supercritical Fluid Extraction," AIChE Annual Meeting, Dallas, TX, 1999  
National Effectiveness Teaching Institute, 1999  
Advisor Villanova Student Chapter American Institute of Chemical Engineers, 1998-present

#### **HONORS:**

Lindback Award for Teaching Excellence at Villanova University, 2010.  
Innovative Teaching Award, Villanova University, 2008  
Semi finalist for the Lindback Award for Teaching Excellence at Villanova University, 2005, 2007, 2008, and 2009.  
Farrell Award to recognize personal concern for students and exceptional dedication to the Villanova University College of Engineering, 2001  
Society of Graduate Fellows for Sustainability, 1996-1998  
Martin Fellow for Environmental Research, 1997-1998  
MIT Department of Chemical Engineering Special Service Award, 1995  
Alumni/ae Association Student Recruiter Award, 1995  
Alpha Chi Sigma National Leadership Award, 1992 & 1993  
UVA Chemical Engineering Faculty Award, 1993  
Dow Chemical Outstanding Junior Chemical Engineering Award, 1992

#### **PROFESSIONAL SOCIETIES:**

American Society for Engineering Education, 1998  
American Chemical Society, 1998  
Sigma Xi Scientific Research Society, 1996  
Tau Beta Pi Professional Engineering Society, 1992  
Golden Key National Honor Society, 1992  
American Institute of Chemical Engineers, 1991  
Phi Eta Sigma Freshman Honor Society, 1990  
Alpha Chi Sigma, 1990

#### **RESEARCH INTERESTS:**

Current research is focused on environmentally benign chemical processing, nanomaterials, and thermal management of electronic devices. Supercritical carbon dioxide is being used to create self-assembled monolayers (SAMs) and polymeric films on various metal surfaces for corrosion resistance and electrochemical modifications. This environmentally friendly solvent is also

being used to make drug delivery devices by implanting various pharmaceuticals into biocompatible polymeric devices as well as chewing gum. Various reactions and nanomaterial synthesis processes are also being explored in sub- and supercritical carbon dioxide in attempts to better understand these unique fluids. Finally, methods of static and transient thermal management are being studied in portable electronic devices to improve user comfort as well as the electronic reliably.

### TEACHING INTERESTS:

Courses taught include chemical engineering thermodynamics II, modeling and numerical methods I, chemical engineering laboratory II and III, chemical engineering research I and II, engineering interdisciplinary projects II, graduate thermodynamics, introduction to engineering, and nanomaterials and surface science.

### SELECTED PUBLICATIONS (Peer Reviewed):

1. "Selective Decomposition of Isopropanol Using as Prepared and Oxidized Graphite Nanofibers," A.R. Ferens, R.D. Weinstein, R. Guiliano, J.A. Hull, *Carbon*, **2012**, 50, 192.
2. "The Shape Stabilization of Paraffin Phase Change Material to Reduce Graphite Nanofiber Settling during the Phase Change Process," R. Ehid, R.D. Weinstein, A.S. Fleischer, *Energy Conservation and Management*, **2012**, 57, 60.
3. "A Direct Comparison of Three Different Material Enhancement Methods on the Transient Thermal Response of Paraffin Phase Change Material Exposed to High Heat Fluxes," K. Chintakrinda, R.D. Weinstein, A.S. Fleischer, *International Journal of Thermal Sciences*, **2011**, 50, 1639.
4. "Quantification of the Impact of Embedded Graphite Nanofibers on the Transient Thermal Response of Paraffin Phase Change Material Exposed to High Heat Fluxes," K. Chintakrinda, R. Warzoha, R.D. Weinstein, A.S. Fleischer, *J. Heat Transfer*, **2012**, 134, 071901.
5. "Oxidative Dehydrogenation of Ethanol to Acetaldehyde and Ethyl Acetate by Graphite Nanofibers," R.D. Weinstein, A.J. Ferens, R.J. Orange, P. Lamaire, *Carbon*, **2011**, 49, 701.
6. "Liquid and Supercritical Carbon Dioxide Assisted Implantation of Ketoprofen into Biodegradable Sutures," R.D. Weinstein, K.R. Muske, S.A. Martin, D.D. Schaeber, *Ind. Eng. Chem. Res.*, **2010**, 49, 7281.
7. "Project-Based Freshman Engineering: The Core Course," R.H. Caverly, H.M. Fulmer, S. Santhanam, P. Singh, J.C. O'Brien, G.F. Jones, E.S. Char, F.J. Mercede, R.D. Weinstein, J.R. Yost, Proceedings of the 2010 ASEE Conference, Louisville, KY, June 20-23, 2010.
8. "An Investigation into the Solidification of Nano-Enhanced Phase Change Material for Transient Thermal Management of Electronics," O. Sanusi, A.S. Fleischer, R.D. Weinstein, 2010 Itherm Conference, Las Vegas, NV, June 2-5, 2010
9. "Introduction to Engineering: A Freshman Year Multidisciplinary Engineering Course and Competition," J.R. Yost, R.D. Weinstein, Proceedings of the *Mid Atlantic Regional Meeting of ASEE*, **2008**.
10. "Transient Thermal Management Using Phase Change Materials with Embedded Graphite Nanofibers for Systems with High Power Requirements," A.S. Fleischer, K. Chintakrinda, R.D. Weinstein, CA. Bessel, 2008 Itherm Conference, Orlando, FL, May 28-31, 2008.
11. "Transient Thermal Performance of Phase Change Materials with Embedded Graphite Nanofibers," T. Kopec, A.S. Fleischer, R.D. Weinstein, C.A. Bessel, in *Thermes 2007: Thermal Challenges in Next Generation Systems*, Garimella, S.V. and Fleischer, A.S. eds, Millipress, Rotterdam, The Netherlands.

12. "The Removal of Copper with Dialkyldithiocarbamate Ligands in Condensed Carbon Dioxide," R.D. Weinstein, J.G. Richards, C.A. Bessel, W.H. Hanlon, D.W. Skaf, *Chem. Eng. Technol.*, **2008**, 31, 575.
13. "An Experimental Study of Minimum-time Optimal High Pressure Gas Storage System Recharging," A.E. Witmer, K.R. Muske, R.D. Weinstein, M.A. Simeone, Proceedings of the 2007 American Control Conference, **2007**, 1365.
14. "The Experimental Exploration of Embedding Phase Change Materials with Graphite Nanofibers for the Thermal Management of Electronics," R.D. Weinstein, T.C. Kopec, A.S. Fleischer, E. D'Addio, C.A. Bessel, *J. Heat Transfer*, **2008**, 130, 042045.
15. "Characterization of Self-Assembled Monolayers from Lithium Dialkyldithiocarbamate Salts," R.D. Weinstein, J. Richards, S.D. Thai, D.M. Omiatek, C.A. Bessel, C.J. Faulkner, S. Othman, G.K. Jennings, *Langmuir*, **2007**, 23, 2887.
16. "Solubility of Felodipine and Nitrendipine in Liquid and Supercritical Carbon Dioxide by Cloud Point and UV Spectroscopy," R.D. Weinstein, W.H. Hanlon, J.P. Donohue, M. Simeone, A. Rotzich, K.R. Muske, *J. Chem. Engr. Data*, **2007**, 52, 256.
17. "Diffusion of Liquid and Supercritical Carbon Dioxide into a Chitosan Sphere," R.D. Weinstein, J. Papatolis, *Ind. Eng. Chem. Res.*, **2006**, 45, 8651.
18. "Thermal Analysis of Phase Change Materials with Embedded Graphite Nanofibers for Thermal Management of Electronics," T.C. Kopec, R.D. Weinstein, A.S. Fleischer, E. D'Addio, C.A. Bessel, 2006, Proceedings of IMECE2006, **2006**.
19. "PIVOTS: Service Learning at the Science, Theatre & Magic Boundary," M. A. Papalaskari, K. Hess, D. Kossman, S. Metzger, A. Phares, R. Styer, C. Titone, T. Way, R. Weinstein, F. Wunderlich, *36<sup>th</sup> Annual ASEE/IEEE Frontiers in Education Conference*, **2006**, TH2-18.
20. "The Use of Dialkyldithiocarbamate and Bis(acetylaceton)ethylenediimine Ligands for Copper Chelation in Supercritical Carbon Dioxide," A. Dunbar, D. M. Omiatek, S. D. Thai, C. E. Kendrex, L. L. Grotzinger, W. J. Boyko, R.D. Weinstein, D. W. Skaf, C. A. Bessel, G. M. Denison, J. M. DeSimone, *Ind. Eng. Chem. Res.*, **2006**, 45, 8779.
21. "The Kinetics of the Oxidation and Chelation of Cu(0) and Cu<sub>2</sub>O in Hexanes or Condensed Carbon Dioxide by t-Butylperacetate and 1,1,1-Trifluoro-2,4-pentanedione," D.W. Skaf, S. Kandula, L. Harmonay, P. Shodder, C.A. Bessel, R.D. Weinstein, *Ind. Eng. Chem. Res.*, **2006**, 45, 8874.
22. "A Lemon Cell Battery for High-Power Applications," K.R. Muske, C.W. Nigh, R.D. Weinstein, *J. Chemical Education*, **2007**, 84, 637.
23. "Modeling of the Thermal Effects of Heat Generating Devices in Close Proximity on Vertically Oriented Printed Circuit Boards for Thermal Management Applications," J. Harvest, A.S. Fleischer, R.D. Weinstein, *International Journal of Thermal Sciences.*, **2007**, 46, 253.
24. "Analysis of Transient Thermal Management Characteristics of PCM with an Embedded Carbon Fiber Heat Sink," A.S. Fleischer, R.D. Weinstein, T. Kopec, 2006 Itherm Conference, San Diego, CA, May 30 – June 2, 2006.
25. "A Minimum-time Optimal Recharging Controller for High Pressure Gas Storage Systems," K.R. Muske, A.E. Witmer, R.D. Weinstein, in Assessment and Future Directions of Nonlinear Model Predictive Control, Findeisen, R., F. Allgower, and L. T. Biegler, editors, Lecture Notes in Control and Information Science, Springer-Verlag, **2007**, 443-453.

26. "Solubility of Several Short-Chain Lithium Dialkyldithiocarbamates in Liquid and Supercritical Carbon Dioxide," R.D. Weinstein, L.L. Grotzinger, P. Salemo, D.M. Omiatsek, C.A. Bessel, *J. Chem. Eng. Data*, **2005**, 50, 2088.
27. "A Multidisciplinary, Hands-on Freshman Engineering Team Design Project and Competition," R.D. Weinstein, J. O'Brien, E. Char, J. Yost, K.R. Muske, H. Fulmer, J. Wolf, W. Koffke, *International J. Engineering Education*, **2006**, 22, 1023.
28. "Thermal Management of Heat Generating Devices in Close Proximity on Printed Circuit Boards," J. Harvest, A.S. Fleischer, R.D. Weinstein, *ASME-HTD Proc. of the 2005 Summer Heat Transfer Conference* (2005).
29. "Liquid and Supercritical Carbon Dioxide Assisted Blending of Poly(vinyl acetate) and Citric Acid," R.D. Weinstein, J.J. Gribbin, D. Najjar, *Ind. Chem. Eng. Res.*, **2005**, 44, 3480.
30. "The Solubility and Salting Behavior of Several  $\beta$ -Adrenergic Blocking Agents in Liquid and Supercritical Carbon Dioxide," R.D. Weinstein, J.J. Gribbin, K.R. Muske, *J. Chem. Eng. Data*, **2005**, 50, 226.
31. "Effect of Fractional Fluorination on the Properties of ATRP Surface-Initiated Poly(hydroxethyl methacrylate) Films," M.R. Bantz, E.L. Brantley, R.D. Weinstein, J. Moriarty, G.K. Jennings, *J. Phys. Chem. B.*, **2004**, 108, 9787.
32. "The Solubility of Benzocaine, Lidocaine, and Procaine in Liquid and Supercritical Carbon Dioxide," R.D. Weinstein, K.R. Muske, J. Moriarty, E. Schmidt, *J. Chem. Eng. Data*, **2004**, 49, 547.
33. "Forced Convective Cooling of Electro-Optical Components Maintained at Different Temperatures on a Printed Circuit Board," A.S. Fleischer, R.D. Weinstein, S.A. Khobragade, *IEEE Transactions on Components and Packaging Technologies*, **2004**, 27, 296.
34. "Liquid and Supercritical Carbon Dioxide Loading into Chewing Gum Base," R.D. Weinstein, E. Cushnie, T. Kopec, *Ind. Chem. Eng. Res.*, **2003**, 42, 5554.
35. "Structure, Wettability, and Electrochemical Barrier Properties of Self-Assembled Monolayers Prepared from Partially Fluorinated Hexadecanethiols," R.D. Weinstein, J. Moriarty, E. Cushnie, R. Colorado, T.R. Lee, M. Patel, W.R. Alesi, G.K. Jennings, *J. Phys. Chem. B.*, **2003**, 107, 11626.
36. "An Experimental Investigation of the Thermal Interaction of Electro-Optical Components on a Printed Circuit Board in Natural and Forced Convection," A.S. Fleischer, R.D. Weinstein, *ASME-HTD Proc. of the 2003 Summer Heat Transfer Conference* (2003).
37. "End Point Prediction Modeling for Semi-Batch Hydroxide Precipitation," R.D. Weinstein; K.R. Muske, J.P. Dawson, *Ind. Chem. Eng. Res.*, **2003**, 42, 5429.
38. "Natural Convection and Passive Heat Rejection from Two Heat Sources Maintained at Different Temperatures on a Printed Circuit Board," R.D. Weinstein, A.S. Fleischer, K.A. Krug, *J. Elect. Packag.*, **2004**, 126, 14.
39. "Controlling the Properties of n-Alkanethiolate Self-Assembled Monolayers on Gold Using Supercritical Carbon Dioxide-Ethanol Mixtures as Solvents," D. Yan, G.K. Jennings, R.D. Weinstein, *Ind. Chem. Eng. Res.*, **2002**, 41, 4528.
40. "Transient Thermal Management of a Handset Using Phase Change Materials (PCM)," M. Hodes, R.D. Weinstein, S.J. Pence, J.M. Piccini, L. Manzione, C. Chen, *J. Elect. Packag.*, **2002**, 124, 419.
41. "Improved Static and Transient Thermal Management of Handsets Using Heat Spreaders Coupled with Phase Change Materials (PCMs)," R.D. Weinstein, M. Hodes, J.M. Piccini, *ASME-HTD Proc. of the 35<sup>th</sup> National Heat Transfer Conference* (2001).

42. "Self-Assembled Monolayer Films from Liquid and Supercritical Carbon Dioxide," R.D. Weinstein, D. Yan, G.K. Jennings, *Ind. Chem. Eng. Res.*, **2001**, 40, 2046.
43. "Transient Thermal Management of Handsets Using Phase Change Materials (PCMs)," M. Hodes, R.D. Weinstein, S.J. Pence, J.A. Talieri, L. Manzione, C. Chen, *ASME-HTD Proc. of the 34<sup>th</sup> National Heat Transfer Conference* (2000).
44. "Supercritical Fluids as Solvent Replacements in Chemical Synthesis," J.W. Tester, R.L. Danheiser, R.D. Weinstein, A.R. Renslo, J.D. Taylor, and J.I. Steinfeld, *ACS Sym. Ser.*, **2000**, 767, 271.
45. "Silica Promoted Diels-Alder Reactions in Carbon Dioxide from Gaseous to Supercritical Conditions," R.D. Weinstein, A.R. Renslo, R.L. Danheiser, and J.W. Tester, *J. Phys. Chem. B*, **1999**, 103, 2878.
46. "Reassignment of the Vibrational Spectra of CH<sub>3</sub>CHF<sub>2</sub> (HFC 152a), CH<sub>3</sub>CF<sub>3</sub> (HFC 143a), CHF<sub>2</sub>CF<sub>3</sub> (HFC 125), and CHCl<sub>2</sub>CF<sub>3</sub> (HCFC 123)," S. Tai, S. Papasavva, K.H. Illinger, J.E. Kenny, B.D. Gilbert, J.A. Janni, J.I. Steinfeld, J.D. Taylor, and R.D. Weinstein, *Spectrochimica Acta A*, **1999**, 55, 9.
47. "Concerning the Regiochemical Course of the Diels-Alder Reaction in Supercritical Carbon Dioxide," A.R. Renslo, R.D. Weinstein, J.W. Tester, and R.L. Danheiser, *J. Org. Chem.* **1997**, 62, 4530.
48. "Kinetic Correlation of the Diels-Alder Reaction in Supercritical Carbon Dioxide," R.D. Weinstein, A.R. Renslo, R.L. Danheiser, J.G. Harris, and J.W. Tester, *J. Phys. Chem.*, **1996**, 100, 12337.

#### **RECENT GRADUATE STUDENTS:**

D. Sokolik (2003), S. Khobragade (2004), J. Moriarty (2004), T. Kopec (2005), S. Kandula (2005), J. Richards (2007); A. Ferens (2011)

#### **Ph.D. ADVISOR:**

Jefferson W. Tester, Professor of Chemical Engineering, Massachusetts Institute of Technology

#### **COMMUNITY INVOLVEMENT:**

Reader of names, Names Project, AIDS Memorial Quilt, 2005

Board of Directors, King of Prussia Players, Community Theater Group, 2002-2003 season

Advisor, Habitat for Humanity Trip to Danville, VA in Fall of 2001

Actor in community theaters, Celebration Theater (2005-2007: 4 shows), Footlighters (2002-2012: 18 shows), North Light Players (2001: 1 show), King of Prussia Players (2002: 1 show), Hatboro Village Players (2001-2003: 3 shows), Playcrafters of Skippack (2003: 1 show), Colonial Theater (2007: 1 show).