

Alan W. Weimer

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(<http://www.colorado.edu/lab/weimer/>)

PROFESSIONAL EXPERIENCE

The University of Colorado (Boulder, CO)

1996-present: Professor, H.T. Sears Memorial Professor since 2006

The Dow Chemical Company (Midland, MI)

1980-1996: 5 promotions, including promotion to Associate Research Scientist (1995)

Licensed PE (State of Colorado)

The Australian National University (Canberra, Australia ACT)

2013-present: Level E Adjunct Professor; College of Engineering and Computer Science

EDUCATION

Ph.D., Chemical Engineering, University of Colorado, 1980

M.S., Chemical Engineering, University of Colorado, 1978

B.S., Chemical Engineering (Summa cum Laude), University of Cincinnati, 1976

HONORS AND AWARDS

- 2018 National Academy of Inventors (NAI)
- 2017 AIChE Lifetime Achievement Award in Particle Technology
- 2016 Distinguished Alumni Award, Boardman High School (Youngstown, Ohio)
- 2015 AIChE Nanoscale Science and Engineering Forum (NSEF) Forum Award
- 2015 AIChE Research Excellence in Sustainable Engineering Award
- 2014 Department of Chemical Engineering Faculty Advising Award
- 2011 Excellence in Bio-Derived Technology Commercialization Award (CO Cleantech Industry Assoc.)
- 2010 AIChE Excellence in Process Development Research Award
- 2010 Dean's Award for Outstanding Research (College of Engineering and Applied Science)
- 2010 University of Colorado Physical Science Company of the Year Award – Sundrop Fuels
- 2009 AIChE Thomas Baron Award in Fluid-Particle Systems
- 2007 University of Colorado Physical Science Company of the Year Award – ALD NanoSolutions
- 2006 Distinguished Engineering Alumni Award (University of Colorado)
- 2006 Frost & Sullivan Excellence in Technology Award (via ALD NanoSolutions, Inc.)
- 2006 Inducted into University of Colorado "Pinnacles of Inventorship" Group
- 2006 AIChE Particle Technology Forum Service Award
- 2005 University of Colorado Boulder Faculty Assembly Excellence in Research, Scholarly and Creative Work Award
- 2005 University of Colorado College of Engineering and Applied Science Faculty Research Award
- 2005 United States Department of Energy Hydrogen Program R&D Award
- 2004 R & D 100 Award (Particle-ALD)
- 2004 University of Colorado (Boulder) Inventor of the Year Award
- 2004 AIChE Fellow
- 2002 Niwot, Colorado *Left Hand Laurel* Community Service Award
- 2000, 2001 Department of Chemical Engineering *Faculty Mentor* Award (by students)
- 1997 AIChE Particle Technology Forum *Fluidized Processes Recognition* Award
- 1995 Dow Chemical Company *Excellence in Science* Award
- 1994 Dow Chemical Company *Ceramics Technology Leadership* Special Recognition Award

- 1993 Dow Chemical Company Research *Inventor of the Year* Award
- 1993 Dow Chemical Company *Ceramics Milestone* Award
- 1993 Mid-Michigan AIChE *Professional Progress* Award
- 1991 *Distinguished Young Engineering Alumnus* (University of Cincinnati)
- 1990 Dow Chemical Company *Spangenberg Ceramics Founder's Award*
- 1976 University of Cincinnati *Herman Schneider Medal*

PUBLICATIONS & PATENTS

- 200 published or in-press Refereed Publications
- 39 U.S. Patents (issued); 8 U.S. Patents (pending)
- 151 Invited Presentations
- 7 Edited AIChE Symposium Proceedings; 1 Edited Text; 1 Guest Edited AIChE Journal Issue; 1 Guest Edited Powder Technology Issue; 3 Text Chapters

SYNERGISTIC ACTIVITIES (Technical Supervisory Role)

- Founding Executive Director, Colorado Center for Biorefining and Biofuels (C₂B₂) www.c2b2web.org
- Chair (2004-2006), Vice-Chair & Treasurer (2000-2003) AIChE Particle Technology Forum
- Global Project Coordinator (www.iphe.net) “Solar-driven High Temperature Thermal Splitting of Water”
- Associate Editor, Journal of Nanoparticle Research (2006 – present)
- Director, Materials Engineering and Sciences Division (MESD) of the AIChE 1997-1999
- Chair, National AIChE Area 8d (Ceramics) 1995-1996 and National AIChE Area 3b (Fluidization and Fluid-Particle Systems) 1990-1991
- Committee Chair, University of Colorado at Boulder Council on Research & Creative Work (2004/5)
- Co-founded ALD NanoSolutions, Inc. (www.ALDNanoSolutions.com) 2001 and Copernican Energy (co-founded in 2006, merged with Sundrop Fuels (www.SundropFuels.com) in 2008 - served as Chief Technical Officer for Sundrop Fuels from July, 2008 until the \$155M investment by Chesapeake Energy for a 50% stake, July, 2011)

Primary Research Contribution: 29 Ph.D.s graduated since 1996 – 100% placement, including 4 academics; 6 Ph.D.s currently being directed; ~200 peer-reviewed research papers published (Web of Science h-index = 48 (5,874 citations); Google Scholar h-index = 61 (10,503 citations); <http://scholar.google.com/citations?user=KqGtMDIAAAAJ&hl=en&oi=ao>); 39 U.S. Patents issued; 151 invited presentations; ALD NanoSolutions (www.ALDNanoSolutions.com) spun out from lab in 2001 (28 current employees); Copernican Energy spun out of lab in 2006, acquired by Sundrop Fuels (www.SundropFuels.com) in 2008; Co-invention, development and commercialization of the Rapid Carbothermal Reduction Process (1986 – 1996) for the Dow Chemical Company, sold to Sandvik Coromant and commercialized in UK in 1999; >\$23M PI contribution from 74 funded research grants since 1996; 16 major research related awards/honors.

(Most Significant Impactful Peer-Reviewed Publications/Patents of Historical Significance)

- (1) Hoskins, A.L., S.L. Millican, T.A. Gossett, Y. Gao, X.H. Liang, C.B. Musgrave, and A.W. Weimer, “Non-uniform Growth of Ultra-thin ALD films on Lithium Metal Oxide Materials,” (submitted, 2019). First paper to elucidate the true nature of low-cycle number ALD films on Li-ion battery cathode materials; films are shown to not be continuous or uniform.
- (2) Hoskins, A.L., S.L. Millican, C.E. Czernik, J.C. Netter, T.J. Wendelin, C.B. Musgrave, and A.W. Weimer, “Continuous On-sun Solar Thermochemical Hydrogen Production via an Isothermal redox Cycle,” (submitted, 2019). First continuous demonstration of on-sun isothermal redox water splitting to produce renewable H₂, using a 10 kW pilot plant facility.
- (3) O’Toole R.J., C.J. Bartel, M.U. Kudas, A.J. Horrell, S. Ricote, N.P. Sullivan, C.J. Gump, C.B. Musgrave, and A.W. Weimer, “Particle Atomic Layer Deposition of Alumina for Sintering Ytria-stabilized Cubic Zirconia,” *Journal of the American Ceramic Society* (DOI: 10.1111/jace.16091, 2018). First paper to demonstrate that one Particle ALD cycle enhanced ionic conductivity of YSZ by 23% after sintering at 1350°C for 2 hr; hence, dense parts with high O-ionic conductivity can be produced after sintering at reduced temperatures.
- (4) McNeary, W.W., C. Ngo, A.E. Linico, J.W. Zack, A.M. Roman, K.M. Hurst, S.M. Alia, J. W. Medlin, S. Pylypenko, B.S. Pivovar, and A.W. Weimer “Extended Thin Film Electrocatalyst Structures via Pt Atomic Layer Deposition,” *ACS Applied Nano Materials* **1**, 6150-6158 (2018). First paper to demonstrate use of particle ALD for extended surface nanowire fuel cell catalysis.
- (5) Rowe, S.C., M.A. Wallace, A. Lewandowski, R.P. Fisher, W.R. Cravey, D.E. Clough, I. Hischier, and A.W. Weimer, “Experimental Evidence of an Observer Effect in High-Flux Solar Simulators,” *Solar Energy*, **158**, 889-897 (2017). First paper to demonstrate experimentally that an observer effect exists for high flux solar simulators (HFSS), confirmed experimentally through use of a cylindrical calorimeter with interchangeable faceplates.
- (6) Chubukov, B.A., A.W. Palumbo, S.C. Rowe, I. Hischier, A.J. Groehn, and A.W. Weimer “Pressure Dependent Kinetics of Magnesium Oxide Carbothermal Reduction,” *Thermochimica Acta*, **636**, 23-32 (2016). First kinetic study for carbothermal reduction of MgO to account for both temperature and pressure (1350 to 1650 °C and pressure from 0.1 to 100 kPa), included in the development of a reaction mechanism and reaction rate expression for extreme experimental conditions.
- (7) C. L. Muhich, B. W. Evanko, K. C. Weston, P. Lichty, X. H. Liang, J. Martinek, and A. W. Weimer, “Efficient Generation of H₂ by Splitting Water with an Isothermal Redox Cycle,” *Science*, **341**, 540-542 (2013); “a ground-breaking study of fundamental significance because it experimentally demonstrates the

feasibility of operating thermochemical redox cycles under isothermal conditions” – C&EN (August 5, 2013; page 9).

(8) A. W. Palumbo, E. L. Jorgenson, J. C. Sorli, and A. W. Weimer, “Co-processing Methane in High Temperature Steam Gasification of Biomass,” Bioresource Technology, **128**, 553-559 (2013); demonstrated theoretically (validated experimentally) that additive methane can be reacted at high temperatures with biomass/steam to produce a tar free syngas having a molar $H_2/CO = 2$ ratio suitable for liquid fuel synthesis - without requiring downstream water gas shift (hence, no CO_2 is formed in the process and all biomass carbon is converted to syngas CO); also U.S. Patent 8,287,610.

(9) V. J. Aston, B. W. Evanko, and A. W. Weimer, “Investigation of Novel Mixed Metal Ferrites for Pure H_2 and CO_2 Production Using Chemical Looping,” International Journal of Hydrogen Energy, **38** (22), 9085-9096 (2013); while typical chemical looping processes involve combustion and generate heat as the primary product, the mixed metal ferrite system experimentally shown here has pure H_2 as the primary product – thus providing for a process in which syngas produces a pure H_2 product stream and a pure CO_2 sequestration stream.

(10) C.L. Muhich, Y. Zhou, A. M. Holder, A. W. Weimer, and C. M. Musgrave, “Effect of Surface Deposited Pt on the Photoactivity of TiO_2 ,” Journal of Physical Chemistry C, **116**, 10138-10149 (2012); fundamental understanding that the initial rise and subsequent fall in TiO_2 ’s photoactivity with Pt loading (see paper 12 below) results from the competition between enhanced electron scavenging due to increased O_2 adsorption and increased electron-hole recombination.

(11) X. H. Liang, N.-H. Li, and A. W. Weimer, “Template-directed Synthesis of Porous Alumina Particles with Precise Wall Thickness Control via Atomic Layer Deposition,” Microporous and Mesoporous Materials, **149**, 106-110 (2012); a new method to simultaneously prepare large pore size, high pore volume mesoporous ceramic structures having nanothick wall thickness that can be controlled to within angstroms. Also, U.S. Patent 10,138,169 (2018), “Highly porous ceramic material and method of using and forming same.”

(12) Liang, X.H., J. Li, M.Yu, C.H. McMurray, J.L. Falconer, and A.W. Weimer, “Stabilization of Supported Metal Nanoparticles Using an Ultrathin Porous Shell,” ACS Catalysis, **1**, 1162-1165 (2011); first paper to demonstrate that a porous film prepared by ALD/MLD can inhibit sintering of nano-metal catalyst particles, thus reducing/preventing catalyst deactivation.

(13) Y. Zhou, D. M. King, X. H. Liang, J. Li and A. W. Weimer, “Optimal Preparation of Pt/TiO_2 Photocatalysts Using Atomic Layer Deposition,” Applied Catalysis B – Environmental, **101**, 54-60 (2010); demonstrated that only one ALD cycle for Pt deposition increased catalytic photoactivity of crystalline TiO_2 by 3 times; the highest activity Pt/TiO_2 photocatalyst ever reported.

(14) J. R. Scheffe, J. Li, and A. W. Weimer, “A Spinel Ferrite/Hercynite Water-Splitting Redox Cycle,” International Journal of Hydrogen Energy, **35**, 3333-3340 (2010); a new two-step water splitting “hercynite” cycle for solarthermal conversion providing for significant H_2 production at reduction temperatures $\sim 150^\circ C$ below conventional ferrite/ceria-based methods; enabled discoveries published in Science paper (see paper (6) above).

(15) X. H. Liang, M. Yu, J. Li, Y.-B. Jiang, and A. W. Weimer, “Ultra-thin Microporous/Mesoporous Metal Oxide Films Prepared by Molecular Layer Deposition (MLD),” Chemical Communications 7140-7142 (2009); a $> 1000\text{ m}^2/\text{g}$ nanothick film of an oxide placed conformally on the surface of primary fine particles where both the film thickness and the pore diameter can be controlled to within angstroms. Enabling technology for preventing the sintering of nano-catalytic metal particles deposited

on high surface area supports, and potentially for controlling reaction selectivity via pore size control. Also, U.S. Patent 9,090,971 (2015), “Ultra-thin metal oxide and carbon-metal oxide films prepared by atomic layer deposition (ALD).

(16) D. M. King, S. I. Johnson, J. Li, X. Du, X. H. Liang, and A. W. Weimer, “Atomic Layer Deposition of Quantum-confined ZnO Nanostructures,” Nanotechnology, 20 (19), 195401 (2009); cover article; first demonstration of 3D quantum confinement on particles, used for surface band gap modification.

(17) X. H. Liang, D. M. King, P. Li, S. M. George, and A. W. Weimer, “Nanocoating Hybrid Polymer Films on Large Quantities of Cohesive Nanoparticles by Molecular Layer Deposition,” AIChE Journal, 55 (4), 1030-1038 (2009); demonstrated placing nanothick hybrid organic/inorganic films on primary particles using easily scaled-up process equipment.

(18) M. A. Weimer, M. D. Groner, X. H. Liang, D. M. King, L. F. Hakim, P. Li, S. M. George, and A. W. Weimer, “Ultrafast Metal-Insulator Varistors Based on Tunable Al₂O₃ Tunnel Junctions,” Applied Physics Letters, 92, 164101 (2008); quantum tunneling signature electrical surge protection devices with response times measured of <300 picoseconds; also U.S. Patent 7,132,697, “Nanomaterials for Quantum Tunneling Varistors”.

(19) L. F. Hakim, C. L. Vaughn, H. J. Dunsheath, C. S. Carney, X. H. Liang, and A. W. Weimer, “Synthesis of Oxidation-resistant Metal Nanoparticles via Atomic Layer Deposition,” Nanotechnology, 18, 345603 (2007); method to functionalize the surface of metallic nanoparticles in-situ with nm thick films prior to atmosphere exposure.

(20) L. F. Hakim, D. M. King, Y. Zhou, C. J. Gump, S. M. George, and A. W. Weimer, “Nanoparticle Coating for Advanced Optical, Mechanical and Rheological Properties,” Advanced Functional Materials, 17, 3175-3181 (2007); near-perfect nanofilms to modify optical, mechanical and rheological properties of nanoparticles for unique applications including phosphor additives to LEDs; also U.S. Patent 8,163,336, “Methods for Producing Coated Phosphors and Host Material Particles Using Atomic Layer Deposition Methods,”.

(21) D. M. King, J. A. Spencer II, X. H. Liang, L. F. Hakim, and A. W. Weimer, “Atomic Layer Deposition on Particles Using a Fluidized Bed Reactor with In-situ Mass Spectrometry,” Surface & Coatings Technology 201, 9163-9171 (2007); methodology for controlling fluidized bed reactors operating under reduced pressure for the surface ALD functionalization of ultrafine particles at large scale.

(22) L. F. Hakim, S. M. George, and A. W. Weimer, “Nanocoating Individual Silica Nanoparticles by Atomic Layer Deposition in a Fluidized Bed Reactor,” Chemical Vapor Deposition, 11,420-425 (2005); and Hakim, L.F., S.M. George, and A.W. Weimer, “Conformal Nanocoating of Zirconia Nanoparticles by ALD in a Fluidized Bed Reactor,” Nanotechnology, 16, S375-385 (2005). First demonstration of the coating of nanothick films on primary nanoparticles for large engineering scale methods; these papers provided the basis for Dr. Luis Hakim receiving the Best PhD Award in Particle Technology (AIChE) worldwide in 2009.

(23) Hakim, L.F., J.L. Portman, M.D. Casper, and A.W. Weimer, “Aggregation Behavior of Nanoparticles in Fluidized Beds,” Powder Technology, 160 (3), 149-160 (2005). Introduces concept of “dynamic aggregation”, explaining how fluidized aggregates of nanoparticles dynamically shed particles to one another and in the process exposing all surfaces to gases – thus helping to explain how primary nanoparticles can be coated individually and conformally by atomic layer deposition without agglomeration.

(24) J. D. Ferguson, A. W. Weimer, and S. M. George, “Atomic Layer Deposition of Al₂O₃ Films on Polyethylene Particles,” Chemistry of Materials, 16 (26), 5602-5609 (2004); Also, U.S. Patent 9,376,750

(2016), “Method of depositing an inorganic film on an organic polymer,” first demonstration of the ALD coating of primary polymer particles with uniform nanothick ceramic films; also, first demonstration of an ALD coating on a polymer film not having reactive functional groups.

(25) Wank, J.R., George, S.M., and A.W. Weimer, “Nanocoating Individual Cohesive Boron Nitride Particles in a Fluidized Bed by ALD,” Powder Technology, 142 (1), 59-69 (2004). First demonstration of Particle ALD using a scalable agitated fluidized bed reactor – commercially significant.

(26) U.S. Patent 6,613,383 (2003), “Atomic Layer Controlled Deposition on Particle Surfaces;” also U.S. Patent 6,713,177 (2004) and U.S. Patent 6,913,827 (2005). A suite of broad-based patents licensed to ALD NanoSolutions forming IP platform for Particle ALD technology. (Basis for 2004 R&D 100 Award and founding of ALD NanoSolutions, Inc. www.aldnanosolutions.com).

(27) J. D. Ferguson, A. W. Weimer, and S. M. George, “Atomic Layer Deposition of Ultrathin and Conformal Al_2O_3 Films on BN Particles,” Thin Solid Films, 371, 95-104 (2000); first reported Particle ALD demonstration, i.e. placing a nanothick ALD film on a primary fine particle.

(28) A. W. Weimer, W. G. Moore, R. P. Roach, C. N. Haney, and W. Rafaniello, “Rapid Carbothermal Reduction of Boron Oxide in a Graphite Transport Reactor,” AIChE Journal, 37, 759 (1991); first reported demonstration that rapid carbothermal reduction (RCR) could synthesize submicron carbide particles that approached the size and quality of much more expensive laser-produced particles, but with a substantial cost/performance benefit. See (28, 29).

(29) U.S. Patent 5,380,688 (1995), “Method for Making Submicrometer Carbides, Submicrometer Solid Solution Carbides, and the Materials Resulting Therefrom,” commercialized at Sandvik Coromant, <http://www.coromant.sandvik.com/>, for a captive market to baseload production of the highest quality cutting tools in the world (~ \$500M/yr business); powders are not sold outside of Sandvik, but instead the RCR process is used internally to produce the fine tungsten carbide powders that are then used to fabricate the majority of microdrills sold/used throughout the world today for printed circuit-board drilling.

(30) U.S. Patent 5,110,565 (1992). “Apparatus for Producing Uniform, Fine Ceramic Powders.” Ultra-high temperature graphite transport tube reactor and reaction process for directly synthesizing submicron non-oxide ceramic powders such as WC, B_4C , and SiC . This process was commercialized by Dow Chemical and later by Sandvik Coromant for the manufacture of ultrafine WC powders for producing high-end cutting tools

(31) Weimer, A.W. and G.J. Quaderer, “On Dense Phase Voidage and Bubble Size in High Pressure Fluidized Beds of Fine Powders,” AIChE Journal, 31, 1019 (1985). First demonstration that combined fluidized bed reactor operating pressure and catalyst particle size could be adjusted to control the maximum stable bubble size, or, could even make bubbles disappear within the chemical reactor.

Alan W. Weimer
(Peer Reviewed Publications).

- 1) Weimer, A.W., “Particle Atomic Layer Deposition,” Journal of Nanoparticle Research (submitted, 2019).
- 2) Hamidi, M, A.Bayon, V.M. Wheeler, P. Kreider, M.A. Wallace, T.Tsuzuki, K.Catchpole, and A.W. Weimer, “Reduction kinetics for large spherical 2:1 iron–manganese oxide redox materials for thermochemical energy storage,” Chemical Engineering Science (submitted; 2019).

- 3) Al-Shankiti, I.A., B.D. Ehrhart, B.J. Ward, R. Bader, P. Kreider, and A.W. Weimer, "Design of Manganese Oxide-Based Particles for High-Temperature Thermochemical Energy Storage," Solar Energy (submitted, 2019).
- 4) Hoskins, A.L., S.L. Millican, T.A. Gossett, Y. Gao, X.H. Liang, C.B. Musgrave, and A.W. Weimer, "Non-uniform Growth of Ultra-thin ALD films on Lithium Metal Oxide Materials," (submitted, 2019).
- 5) Hoskins, A.L., S.L. Millican, C.E. Czernik, J.C. Netter, T.J. Wendelin, C.B. Musgrave, and A.W. Weimer, "Continuous on-sun solar thermochemical hydrogen production via an isothermal redox cycle," (submitted, 2019).
- 6) Bartel, C.J., A.W. Weimer, S. Lany, C.B. Musgrave, and A. M. Holder, "The role of decomposition reactions in assessing first-principles predictions of solid stability," npj Computational Materials (in press, 2019)
- 7) Hafford, L.M., B.J. Ward, A.W. Weimer, and K. Linden, "Fecal Sludge as a Fuel: Characterization, cofire limits, and evaluation of quality improvement measures, (in press, Water Science and Technology, WST-EM18881R1, 2019)
- 8) Palumbo, A.W., C.J. Bartel, J.C. Sorli, and A.W. Weimer, "Characterization of products derived from the high-temperature flash pyrolysis of microalgae and rice hulls," Chemical Engineering Science, (in press, 2019); doi.org/10.1016/j.ces.2018.11.029
- 9) McNeary, W.W., C. Ngo, A.E. Linico, J.W. Zack, A.M. Roman, K.M. Hurst, S.M. Alia, J. W. Medlin, S. Pylypenko, B.S. Pivovar, and A.W. Weimer "Extended Thin Film Electrocatalyst Structures via Pt Atomic Layer Deposition," ACS Applied Nano Materials **1**, 6150-6158 (2018).
- 10) Hoskins, A.L., T.A. Gossett, C.B. Musgrave, and A.W. Weimer, "The effect of ultrathin ALD films on the oxidation kinetics of SiC in high-temperature steam," Chemical Engineering Science (submitted, 2018).
- 11) Bartel, C.J., S.L. Millican, A.M. Deml, J.R. Rumptz, W. Tumas, A.W. Weimer, S. Lany, V. Stevanovic, C.B. Musgrave, and A.M. Holder, "Physical descriptor for the Gibbs energy of inorganic crystalline solids and temperature-dependent materials chemistry," Nature Communications, **9**, Article 4168 (2018).
- 12) O'Toole R.J., C.J. Bartel, M.U. Kudas, A.J. Horrell, S. Ricote, N.P. Sullivan, C.J. Gump, C.B. Musgrave, and A.W. Weimer, "Particle atomic layer deposition of alumina for sintering yttria-stabilized cubic zirconia," Journal of the American Ceramic Society (DOI: 10.1111/jace.16091, 2018).
- 13) Chubukov, B.A., S.C. Rowe, A.W. Palumbo, M.A. Wallace, and A.W. Weimer, "Investigation of continuous carbothermal reduction of magnesia by magnesium vapor condensation onto a moving bed of solid particles," Powder Technology (submitted).
- 14) Rowe, S.C., I. Hischer, A.W. Palumbo, B.A. Chubukov, M. A. Wallace, R. Viger, A. Lewandowski, D.E. Clough and A.W. Weimer., "Nowcasting, Predictive Control, and Feedback Control for Temperature Regulation in a Novel Hybrid Solar-Electric Reactor for Continuous Solar-Thermal Chemical Processing," Solar Energy, **174**, 474-488 (2018).
- 15) Ehrhart, B.D., B J. Ward, B.M. Richardson, K.S. Anseth, and A.W. Weimer, "Partial Flocculation for Spray Drying of Spherical Mixed Metal Oxide Particles," Journal of the American Ceramic Society, **101** (10), 4452-4457 (2018).
- 16) McNeary, W.W., A.E. Linico, C. Ngo, S. vanRooij, S. Haussener, M.E. Maguire, S. Pylypenko, and A.W. Weimer, "Atomic Layer Deposition of TiO₂ for Stabilization of Pt Nanoparticle Oxygen Reduction Reaction Catalysts," Journal of Applied Electrochemistry, **48**, 973-984 (2018).
- 17) Yacob, T.W., R. Fisher, K.G. Linden, and A.W. Weimer, "Pyrolysis of human feces: gas yield analysis and kinetic modeling," Waste Management , **79**, 214-222 (2018).
- 18) Chubukov, B.A., A.W. Palumbo, S.C. Rowe, M.A. Wallace, and A.W. Weimer, "Design and fabrication of pellets for magnesium production by carbothermal reduction," Metallurgical and Materials Transactions B (<https://doi.org/10.1007/s11663-018-1309-5>), **49**(5), 2209-2218 (2018).

- 19) Hoskins, A.L., A.H. Coffey, C.B. Musgrave, and A.W. Weimer, “ Nanostructured Mullite Steam Oxidation Resistant Coatings for Silicon Carbide Deposited via Atomic Layer Deposition, Journal of the American Ceramic Society, **101**, 2493-2505 (2018).
- 20) Arifin, D. and A.W. Weimer, “Kinetics and Mechanism of Solar-thermochemical H₂ and CO Production by Oxidation of Reduced CeO₂,” Solar Energy, **160**, 178-185 (2018).
- 21) Zhang, S., E. Yu, S. Gates, W. Cassata, J. Makel, A.M. Thron, C. Bartel, A.W. Weimer, R. Faller, P. Strieve, and J.W. Tringe, “Helium Interactions with Alumina formed by Atomic Layer Deposition show Potential for Mitigating Problems with Excess Helium in Spent Nuclear fuel,” J of Nuclear Materials, **499**, 301-311 (2018).
- 22) Rowe, S.C., M.A. Wallace, A. Lewandowski, R.P. Fisher, W.R. Cravey, D.E. Clough, I. Hischier, and A.W. Weimer, “Experimental Evidence of an Observer Effect in High-Flux Solar Simulators,” Solar Energy, **158**, 889-897 (2017).
- 23) Chubukov, B.A., A.W. Palumbo, S.C. Rowe, M.A. Wallace, and A.W. Weimer, “Enhancing the Rate of Magnesium Oxide Carbothermal Reduction by Catalysis, Milling, and Vacuum Operation,” Industrial & Engineering Chemistry Research, **56** (46), 13602-13609 (2017).
- 24) Al-Shankiti, I., B.D. Ehrhart, and A.W. Weimer, “Isothermal Redox for H₂O and CO₂ Splitting – A Review and Perspective,” Solar Energy, **156**, 21-29 (2017).
- 25) Yang, L., L. Jiang, W. Fu, A.W. Weimer, X. Hu, and Y. Zhou, “TiO₂ Quantum Dots Grown on Graphene by Atomic Layer Deposition as Advanced Photocatalytic Hybrid Materials,” Applied Physics A, **123**, 416 (2017).
- 26) Lubers, A.M., W.W. McNeary, D.J. Ludlow, A.W. Drake, M. Faust, M.E. Maguire, M.U. Kudas, M. Seipenbusch, and A.W. Weimer, “Proton Exchange Membrane Fuel Cell Flooding Caused by Residual Functional Groups after Platinum Atomic Layer Deposition,” Electrochimica Acta, **237**, 192-198 (2017).
- 27) Hischier, I., B.A. Chubukov, M.A. Wallace, R.P. Fisher, A.W. Palumbo, S.C. Rowe, A.J. Groehn, and A.W. Weimer “A Novel Experimental Method to Study Vapor Metal Condensation/Oxidation: Mg in CO and CO₂ at Reduced Pressures,” Solar Energy, **139**, 389-397 (2016).
- 28) Groehn, A.J., A. Lewandowski, R. Yang, and A.W. Weimer, “Hybrid Radiation Modeling for Multi-phase Solar-thermal Reactor Systems Operated at High-temperature,” **140**, 130-140 Solar Energy (2016).
- 29) Ehrhart, B.D., C.L. Muhich, I. Al-Shankiti, and A.W. Weimer “System Efficiency for Two-step Metal Oxide Solar Thermochemical Hydrogen Production – Part 1: Thermodynamic Model and Impact of Oxidation Kinetics,” International Journal of Hydrogen Energy, **41** (44), 19881-19893 (2016) 10.1016/j.ijhydene.2106.07.109.
- 30) Ehrhart, B.D., C.L. Muhich, I. Al-Shankiti, and A.W. Weimer “System Efficiency for Two-step Metal Oxide Solar Thermochemical Hydrogen Production – Part 2: Impact of Gas Heat Recuperation and Separation Temperatures,” International Journal of Hydrogen Energy, **41** (44), 19894-19903 (2016) 10.1016/j.ijhydene.2106.07.110.
- 31) Ehrhart, B.D., C.L. Muhich, I. Al-Shankiti, and A.W. Weimer “System Efficiency for Two-step Metal Oxide Solar Thermochemical Hydrogen Production – Part 3: Various Methods for Achieving Low Oxygen Partial Pressures in the Reduction Reaction,” International Journal of Hydrogen Energy, **41** (44), 19904-19914 (2016) 10.1016/j.ijhydene.2106.07.106.
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ALAN W. WEIMER (Inventor)
(UNITED STATES PATENTS)
Issued US Patents

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- [2] "Catalyst support structure, catalyst including the structure, reactor including a catalyst and method of forming same," U.S. Patent 9,643,159 (2017)
- [3] "Vapor deposition process for the manufacture of coated particles," U.S. Patent 9,546,424 (2017)

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- [6] "Semi-continuous vapor deposition process for the manufacture of coated particles," U.S. Patent 9,284,643 (2016)
- [7] "Implantable devices having ceramic coating applied via an atomic layer deposition method," U.S. Patent 9,279,120 (2016)
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- [9] "Solar-thermal Reaction Processing," U.S. Patent 8,673,035 (2014)
- [10] "Methods for Producing Coated Phosphors and Host Material Particles Using Atomic Layer Deposition Methods," U.S. Patent 8,637,156 (2014)
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- [13] "Metal Ferrite Spinel Energy Storage Devices and Methods for Making and Using Same," U.S. Patent 8,187,731 (2012)
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- [19] "Nanocoated Primary Particles and Method for Their Manufacture," U.S. Patent 6,913,827 (2005)
- [20] "Solar Thermal Aerosol Flow Reaction Process," U.S. Patent 6,872,378 (2005).
- [21] "Insulating and Functionalizing Fine Metal-containing Particles with Conformal Ultra-thin Films," U.S. Patent 6,713,177 (2004).
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- [23] "Atomic Layer Controlled Deposition on Particle Surfaces," U.S. Patent 6,613,383 (2003).

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- [27] "Silicon Nitride/Silicon Carbide Composite Densified Materials Prepared Using Composite Powders," U.S. Patent 5,643,843 (1997)
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Alan W. Weimer
(Honors & Awards)

2018 National Academy of Inventors (NAI) Fellow
2017 AIChE Lifetime Achievement Award in Particle Technology (to be presented Oct, 2017)
2016 Distinguished Alumni Award, Boardman High School (Youngstown, Ohio)
2015 AIChE Nanoscale Science and Engineering Forum (NSEF) Forum Award
2015 AIChE Research Excellence in Sustainable Engineering Award
2014 Department of Chemical Engineering Faculty Advising Award 2011 Excellence in Bio-Derived Technology Commercialization Award (Colorado Cleantech Industry Assoc.)
2011 Excellence in Bio-Derived Technology Commercialization Award (CO Cleantech Industry Assoc.) 2010 AIChE Excellence in Process Development Research Award
2010 Dean's Award for Outstanding Research (College of Engineering and Applied Science)
2010 University of Colorado Physical Sciences Company of the Year Award (Sundrop Fuels)
2009 AIChE Thomas Baron Award in Fluid-Particle Systems
2007 University of Colorado Physical Sciences Company of the Year Award (ALD NanoSolutions, Inc.)
2006 University of Colorado Distinguished Engineering Alumni (DEA) Award
2006 Inducted into University of Colorado at Boulder "Pinnacles of Inventorship" Group
2006 Frost & Sullivan Excellence in Technology Award (ALD NanoSolutions, Inc.)
2005 Best Paper Award (U.S. Best Zone Paper, ASEE)
2005 Keynote Address (Chemical Reactor Engineering X, Zacatecas, Mexico)
2005 University of Colorado College of Engineering and Applied Science Faculty Research Award
2005 University of Colorado Boulder Faculty Assembly Research, Scholarly and Creative Work Award
2005 United States Department of Energy Hydrogen Program R&D Award
2004 University of Colorado at Boulder Inventor of the Year Award
2004 R&D 100 Award
2004 Best Paper Award (U.S. Western Region, ASEE)
2004 Best Paper Award (Solar 2004 National Conference, Portland)
2004 Best Paper Award (Rocky Mountain ASEE Meeting)
2004 Fellow of the AIChE
2002 Outstanding AIChE National Student Chapter Award (Advisor)
2002 University of Colorado Faculty Fellowship
2002 Left Hand Laurel Community Service Award (Niwot, CO)
2000 & 2001 Faculty Mentor Award (awarded by graduating seniors)
2001 Special Teaching Recognition Award (awarded by graduating seniors)
1997 AIChE Particle Technology Forum *Fluidized Process Recognition* Award
1996 Mid-Michigan AIChE *Distinguished Service* Award
1995 Dow Chemical Company *Excellence in Science* Award
1994 Dow Chemical Company *Ceramics Technology Leadership* Special Recognition Award
1993 Dow Chemical Company Research *Inventor of the Year* Award
1993 Dow Chemical Company *Ceramics Milestone* Award
1993 Mid-Michigan AIChE *Professional Progress* Award

1992 Mid-Michigan Sigma Xi “*Best Published Scientific Paper of the Year Award*”
1991 *Distinguished Young Engineering Alumnus* (University of Cincinnati)
1990 Dow Chemical Company *Spangenberg Ceramics Founder's Award*
1989 Dow Chemical Company *Ceramics Milestone Award*
1976 Herman Schneider Medal (University of Cincinnati College of Engineering)

Alan W. Weimer
(152 Invited Presentations)

“Particle Functionalization by ALD: Fundamentals, Applications, and Path Forward,” Plenary Address, to be delivered at PARTEC 2019, Nuremberg, Germany (April 9, 2019)

“Two-step Solar Thermochemical Water Splitting – The Path Forward,” invited graduate seminar presented at Texas Tech University, Lubbock, TX (Sept 17, 2018)

“Team Weimer Research Laboratory,” invited presentation to Shell Oil Company, Houston, TX (September 19, 2018).

“Particle Functionalization by ALD,” invited graduate seminar presented at Montana State University, Bozeman, MT (October 8, 2018)

“An Industrial/Academic Career of Learning, Challenge, Opportunity & Fun,” Lifetime Achievement Award in Particle Technology Keynote Address, 2017 Annual AIChE Meeting, Minneapolis, MN (Nov 2, 2017).

“Two-step Solarthermal Water Splitting – The Path Forward,” Keynote Address, Symposium in Honor of Professor E.A. Fletcher, 2017 Annual AIChE Meeting, Minneapolis, MN (Oct 31, 2017).

“Solarthermal Chemistry – The Path Forward,” University Distinguished Lecture presented at Texas A & M University at Qatar, Doha, Qatar (March 23, 2017)

“Particle Surface Functionalization Using Atomic Layer Deposition,” invited Workshop on Nanomaterials Manufacturing for Energy Applications,” Georgia Tech University, Atlanta, GA (January 17, 2017)

“Solarthermal Chemistry – The Path Forward,” invited Plenary Lecture (Thermochemistry) presented at the Asia Pacific Solar Research Conference, Canberra, Australia, ACT (Nov 29 to Dec 1, 2016)

“Solarthermal Chemistry – The Path Forward,” Keynote Address - presented at the American Society of Mechanical Engineers (ASME) Power and Energy Conference, Charlotte, NC (June 30, 2016)

“What it takes to succeed in the 21st Century,” Invited Commencement-related Address at Boardman High School Honors Assembly, Distinguished Alumni Award, Youngstown, OH (May 25, 2016)

“Solarthermal Chemical Processing” invited graduate seminar presented at Virginia Commonwealth University, Richmond, VA (March 2, 2016)

“Commercializing an Ultra-high Temperature Process – What it Takes, and The Future for Hybrid Solarthermal/Electric or Natural Gas Processing,” invited graduate seminar presented at Georgia Institute of Technology, Atlanta, GA (February 4, 2016)

“An Entrepreneurial Path from Academic Innovations to Commercial Products,” Australian National University Dean’s Colloquium, November 23, 2015 (Canberra, Australia, ACT)

“Functionalization of Fine Particles by Atomic and Molecular Layer Deposition (ALD/MLD),” invited Plenary Award Presentation, AIChE Nanoscale Science and Engineering Forum Award, Salt Lake City, UT (November 9, 2015).

“Hybrid Chemical Looping Hydrogen Process Using Mixed Metal Oxides”, invited presentation, 250th Meeting of the American Chemical Society Meeting, Boston, MA (August 18, 2015).

“Near-isothermal Doped-hercynite redox Cycle for Solar-thermal Water Splitting”, invited presentation, 227th Meeting of the Electrochemical Society, Chicago, IL (May 27, 2015).

“Needed Research Focus for Achieving Cost-effective and Reliable Solar-thermal Water Splitting”, invited presentation, 227th Meeting of the Electrochemical Society, Chicago, IL (May 28, 2015).

“We Need You”, invited Keynote Address, 2015 Rocky Mountain Student Regional AIChE Conference, University of Colorado, Boulder, CO (April 18, 2015).

“Laboratory Curiosity to Commercial Process – What it Takes,” invited graduate seminar presented at Missouri University of Science and Technology, Rolla, MO (March 3, 2015).

“Differences Between Engineering Programs at a Major University in the United States and in Australia,” invited presentation at the Engineering College Educational Retreat, The Australian National University, Canberra, Australia (ACT), November 27, 2014.

“Laboratory Curiosity to Commercial Process – What it Takes,” invited seminar presented at The ANU Energy Change Institute, The Australian National University, Canberra, Australia (ACT) (November 24, 2014).

“Laboratory Curiosity to Commercial Process – What it Takes,” invited graduate seminar presented at South Dakota School of Mines and Technology, Rapid City, SD (October 21, 2014).

“Functionalization and Application of Fine Particles Coated by Atomic/Molecular Layer Deposition (Particle ALD/MLD),” invited graduate seminar presented at the North Carolina State University, Raleigh, NC (November 11, 2013).

“Efficient Generation of H₂ by Splitting Water with an Isothermal Redox Cycle,” invited Distinguished Lecture, ETH Zurich, Swiss Federal Research Institute, Zurich, Switzerland (October 21, 2013).

“Solarthermal Chemical Processing Using Particle Flow Reactors – Challenges and Opportunities,” invited Sheldon Friedlander Plenary Lecture, American Association for Aerosol Research, Portland, OR (October 2, 2013).

“Sustainable Solarthermal Chemical Processing,” invited presentation at the University of Colorado/Kingdom of Saudi Arabia Alumni Event, Riyadh, Saudi Arabia (January 10, 2013).

“Designed Materials for Solar Thermochemical Redox Cycling,” invited presentation at Australian National University, Canberra, Australia, ACT (September 10, 2012).

“Sustainable Chemical Processing Using Concentrated Sunlight,” invited presentation at the 2012 Annual AIChE Meeting, Pittsburgh, PA (October 30, 2012).

“Designed Materials for Solarthermochemical Water Splitting,” invited presentation at the 4th International Conference on Ceramics, Chicago, IL (July 17, 2012).

“Designed Materials for Solarthermochemical Redox Cycling”, invited presentation at the Rocky Mountain Section of the Materials Research Society, Boulder, CO (January 25, 2012).

“Styles of Invention”, invited presentation at the University of Colorado Technology Transfer Office Awards Dinner, Denver, CO (January 17, 2012).

“Renewable Solarthermal Production of Fuels from Biomass and Water”, invited presentation at Ohio State University, Columbus, OH (January 11, 2012).

“Overview of Solar Fuels Technology”, invited presentation at Global Clean Energy Congress & Exhibition, Calgary, Alberta, Canada (October 31, 2011).

“Nanofilms for Solarthermochemical Redox”, invited presentation at Nano-Renewable Energy Summit, Golden, CO (October 25, 2011).

“Rapid Solar-thermal Conversion of Biomass to Syngas”, invited presentation at American Chemical Society National Meeting, Denver, CO (August 29, 2011).

“Functionalization of Fine Particles by Atomic/Molecular Layer Deposition (ALD/MLD)”, invited presentation at Tyco Electronics, Menlo Park, CA (July 14, 2011).

“Rapid Solar-thermal Conversion of Biomass to Syngas”, invited presentation at Danforth Plant Science Center, St. Louis, MO (April 13, 2011).

“Rapid Solar-thermal Conversion of Biomass to Syngas”, invited presentation at Phycal, St. Louis, MO (April 13, 2011).

“The Role of High-temperature Solar in Low Carbon Hydrogen”, invited presentation at Toyota Sustainable Mobility Seminar, La Jolla, CA (April 5, 2011).

“Intellectual Property and Entrepreneurial Opportunities Resulting from Basic Science Research - Creating Real Jobs”, invited presentation at Executive Night Speaker Series, Regis University, March 24 (2011).

“Renewable Solar-thermal Production of Fuels from Biomass and Water”, invited presentation at Transformational Energy Seminar Series, University of Maryland, College Park, MD (February 26, 2011).

“Thin Film Ferrites by ALD for Solar Redox Cycles”, invited presentation at Sun to Petrol Conference, Sandia National Laboratory, Albuquerque, NM (February 23, 2011).

“Renewable Solar-thermal Production of Fuels from Biomass and Water”, invited presentation at Ball Aerospace, Boulder, CO (February 11, 2011).

“Functionalization of Ultrafine Particles with Nanothick Controlled Films,” invited presentation at the 35th International Conference on Advanced Ceramics and Composites (ICACC) Meeting, Daytona Beach, FL (January 27, 2011).

“Commercial Success Through Fundamental Understanding, Persistence and Cost/Performance Benefits,” presented at the 2010 International Conference on Energy, Energy Logistics and the Environment, invited presentation, October 8, 2010 (Denver, CO).

“Functionalization of Ultra-fine Particles with Nano-thick Controlled Films,” NSTI Nanotech 2010, invited Keynote Address, June 22, 2010 (Anaheim, CA).

“Metal Ferrite Spinel for Solar-thermal Water Splitting Redox Cycles,” invited Keynote Address presentation TMS 2010 Annual Meeting, February 17, 2010 (Seattle, WA).

“Solar-thermal Process Intensification,” invited presented at Sandia National Laboratory, February 11, 2010 (Livermore, CA)

“Functionalization of Fine Particles by Atomic/Molecular Layer Deposition (ALD/MLD),” invited presented at Lawrence Livermore National Laboratory, February 10, 2010 (Livermore, CA)

“Functionalization of Fine Particles by Atomic/Molecular Layer Deposition (ALD/MLD),” presented at Lehigh University Graduate Seminar, January 20, 2010 (Bethlehem, PA)

“Functionalization of Fine Particles by Atomic/Molecular Layer Deposition (ALD/MLD) ,” invited presentation to be made at the 2009 Annual Meeting of the American Institute of Chemical Engineers, Particle Technology Forum – Awards Lecture, November 11, 2009 (Nashville, TN)

“Particle ALD – Academic Invention to Commercial Development ,” invited presentation at the 2009 Annual Meeting of the American Institute of Chemical Engineers, Chemical Engineering Principles for Nanotechnology - Plenary Session, November 11, 2009 (Nashville, TN)

“Particle ALD/MLD Functionalization of Fine Particles,” invited presentation at the 216th Meeting of the Electrochemical Society, October 6, 2009 (Vienna, Austria)

“Solar-thermal Production of Renewable Fuels,” presented at ETH Zurich (Swiss Federal Research Institute), Zurich, Switzerland (May 24, 2009).

“The Future of Biofuels and Chemical Engineering Opportunities,” presented at the 10th International Chemical Engineering Student Conference, Monterrey, Mexico (February 19, 2009).

“Solar-thermal Production of Renewable Fuels from Water and Biomass,” presented at Oregon State University Graduate Seminar, Corvallis, OR (January 26, 2009).

“The Future of Biofuels,” presented at the 2008 International Food Service Distribution Conference, Pittsburgh, PA (October 13, 2008).

“Solar-thermal Production of Renewable Fuels from Water and Biomass,” presented at University of Minnesota Graduate Seminar, University of Minnesota, Minneapolis, MN (October 1, 2008).

“Solar-thermal Production of Renewable Fuels from Water and Biomass,” presented at University of Michigan Graduate Seminar, University of Michigan, Ann Arbor, MI (September 23, 2008).

“Renewable Biofuels Using Rapid Solar-thermal Processing,” Featured presentation at the Second Generation Biofuels (Innovation in BioFuels 2008) Conference, Baltimore, MD (May 14, 2008).

“Functionalization of Ultrafine Particles by Atomic Layer Deposition,” invited presentation made to the Ceradyne Corp. Technology Review, Cost Mesa, CA (March 13, 2008).

“Renewable Fuels via Solar-thermal Processing,” Keynote Address presented at the 2008 Solar PACES Biennial Meeting, Las Vegas, NV (March 7, 2008).

“Solar-thermal Production of Renewable Fuels from Water and Biomass,” presented at University of California at Santa Barbara Graduate Seminar, Santa Barbara, CA (February 7, 2008).

“Functionalization of Ultrafine Particle by Atomic Layer Deposition,” presented at the Particle Technology Center Graduate Seminar, University of Florida, Gainesville, FL (January 22, 2008).

“Commercial Success through Fundamental Understanding and Persistence,” Plenary Address presented at CHEMECA 2007 in Melbourne, Australia (September 25, 2007).

“Functionalization of Fine Particles using Atomic Layer Deposition,” Keynote Address presented at CHEMECA 2007 in Melbourne, Australia (September 24, 2007).

“Particle Coating in Fluidized Bed Reactors”, Invited Keynote Address presented at EuroCVD 16, The Hague (Netherlands), (September 17, 2007).

“Functionalization of Ultrafine Particles by Atomic Layer Deposition,” presented at Procter and Gamble Corporation, Cincinnati, OH (February 27, 2007).

“Functionalization of Ultrafine Particles by Atomic Layer Deposition,” presented at University of Cincinnati Graduate Seminar, Cincinnati, OH (February 27, 2007).

“Functionalization of Ultrafine Particle by Atomic Layer Deposition, “presented at Millennium Chemical Company, Baltimore, MD (April 30, 2007).

“Solar-thermal Processing to Split Water,” presented at the Department of Chemical and Biological Engineering, Colorado State University, Fort Collins, CO (April 20, 2007).

“Solar-thermal Water Splitting Using a Zn/ZnO Thermochemical Cycle,” 2007 Inaugural Energy symposium UNLV, Las Vegas, NV (August 16, 2007)

“Solar-thermal Splitting of Water Using a Rapid ZnO Thermochemical Cycle: Fundamentals and Experimental Results”, presented at the Department of Chemical Engineering, Illinois Institute of Technology, Chicago, IL, Graduate Seminar (November 29, 2006).

“Functionalization of Ultrafine Particles Using Atomic Layer Deposition (Particle ALD™)”, presented at the 2nd Engineered Particle Applications Conference, presented in Las Vegas, NV (October 19, 2006).

“Solar-thermal Water Splitting for the Production of Hydrogen”, presented at the Renewables to Hydrogen Forum, National Hydrogen Association, Albuquerque, NM (October 5, 2006).

“Functionalization of Ultrafine Particles by Atomic Layer Deposition”, presented at the Department of Chemical Engineering, West Virginia University, Morgantown, WV, Graduate Seminar, (September 15, 2006).

“Solar-thermal Production of Hydrogen from Water”, presented at the Solar 2006 Meeting, Denver, CO (July, 13, 2006).

“Functionalization of Ultrafine Particles by ALD,” A.W. Weimer, paper presented at the Int’l Fine Particle Research Institute, Santa Barbara, CA (June 26, 2006).

“Solar-thermal Processing to Produce Hydrogen from Water,” presented to Xcel Energy, Boulder, CO (April 28, 2006).

“Functionalized Nanoparticles – a Tutorial,” (web cast) A.W. Weimer, tutorial presented at the 5th World Congress on Particle Technology, Orlando, FL (April 25, 2006).

“Micron and Nanoparticle Coating Using Atomic Layer Deposition”, presented at the E.V. Murphree Awards Session in Honor of L.S. Fan, American Chemical Society 231st Annual Meeting, Atlanta, GA (March 28, 2006).

“Particle ALDTM Technology,” A.W. Weimer, paper presented at the Nanomaterials Project seminar series, Air Products and Chemicals Corp., Allentown, PA (March 7, 2006)

“Particle ALDTM Technology,” A.W. Weimer, paper presented at Osram Sylvania Corporation, Towanda, PA (March 8, 2006).

“Solar Thermochemical Splitting of Water: Theory, Application, and Materials Research Opportunities”, presented at Stanford University – Global Climate and Energy Project Seminar, Palo Alto, CA (February, 2006).

“Novel Polymer Particle ALDTM Extrusion Method for Producing Polymer/Ceramic Nanocomposites”, presented at Lyondell Chemical Company, Cincinnati, OH (November, 2005).

“Functionalizing Ultrafine Particles by Atomic layer Deposition (ALD)”, presented at the Department of Chemistry and Biochemistry, University of Denver, Denver, CO (October, 2005).

“Solar-thermal Reactors: Fundamentals and Applications,” presented at the Department of Chemical Engineering, University of New Mexico, Albuquerque, NM, Graduate Seminar, (October, 2005).

“Synthesis of Boron – rich Boron Carbide Powders for Improved Ceramic Armor,” presented at Ceradyne Corporation and the U.S. Army, Costa Mesa, CA (September, 2005).

“Solar-thermal Reactors: Fundamentals and Applications,” Keynote Lecture, Chemical Reactor Engineering X International Conference, Zacatecas, Mexico (August, 2005).

“Solar-thermal Processing to Decarbonize Natural Gas,” presented at the Department of Mechanical and Process Engineering, ETH-Zurich (Swiss Federal Research Institute), Graduate Seminar, (June, 2005).

“Functionalizing Ultrafine Particles by Atomic Layer Deposition,” presented at Cabot Corporation, Albuquerque, NM, (June, 2005).

“Atomic Layer Deposition to Control Particle Surface Functionality,” presented at the Department of Chemical Engineering, University of Missouri, Rolla, MO, Graduate Seminar, (September, 2004).

“Solar-thermal Production of Hydrogen,” presented at General Electric Global Research laboratory, Niskayuna, NY (September, 2004).

“Solar-thermal Production of Hydrogen,” presented at the Arizona Public Service Company, Phoenix, AZ (July, 2004).

“Solar Thermochemical Production of Hydrogen,” invited tutorial presented at the 2004 International Solar Energy Conference, Portland, OR (July, 2004)

“Commercial Success Through Fundamental Understanding and Persistence,” Keynote Lecture, International World PARTEC2004 Conference, Nuremberg, Germany (March, 2004).

“Conformal Encapsulation of Fine Particles with Ceramic Nanolayers, presented at the Department of Chemical Engineering, University of Pittsburgh, Graduate Seminar, Pittsburgh, PA (February, 2003).

“Passivating Ultrafine iron Powders by Atomic layer Deposition Surface Modification.”presented at the Swiss Federal Research Institute (ETH-Zurich, Switzerland)(May, 2003).

“Solar-thermal Processing to Produce Hydrogen”, presented at the Paul Scherrer Institute, Villigen, Switzerland (May, 2003).

“Fundamentals, Development, and Commercialization of the Rapid Carbothermal Reduction Process,” presented at the Sandvik Tungsten Carbide Production Facilities,” Coromant, United Kingdom (England) (May, 2003).

“Atomic Layer Deposition Processing to Control the Surface Chemistry of Ultrafine Powders, presented at the Swiss Federal Laboratories for Materials Testing and Research (EMPA), Thun, Switzerland (July, 2003).

“The Rapid Carbothermal Reduction Synthesis of Boron Carbide Powders,” presented at the Wacker-Chemie GmbH Chemical Company, Kempten, Germany (August, 2003).

“Rapid Solar-thermal Decarbonization of Methane,” presented at General Electric Global Research laboratory, Niskayuna, NY (August, 2003).

“Atomic Layer Deposition to Control Surface Chemistry of Fine Particles,” presented at General Electric Global Research laboratory, Niskayuna, NY (August, 2003).

“Boron Content Modification of Boron Carbide,” presented at the Army Research Laboratories, Aberdeen, MD (March, 2003).

“Solar-thermal Processing for Thermochemical Cycles to Split Water,” presented at the University of Nevada at Las Vegas (UNLV), Las Vegas, NV (November, 2003).

“Solar-thermal Production of Hydrogen,” presented at Arizona Public Service Company, Phoenix, AZ (November, 2003).

“Producing Boron-rich Boron Carbide Powders by Rapid Carbothermal Reduction,” presented at Ceradyne, Inc., Costa mesa, CA (January, 2002).

“Conformal Encapsulation of Fine Particles with Ceramic Nanolayers,” presented at NIST Magnetic Technology Division Seminar, Boulder, CO (January, 2002).

“Designing for Benign Hydrogen Synthesis in the Sunny Desert SW United States,” Environmental Design Architecture Guest Lecture, Boulder, CO (February, 2002).

“Fine Nickel Powder Synthesis from Nickel Oxalate Precursors,” presented at OMG Americas, Research Triangle park, NC (April, 2002).

“Solar-thermal Processing to Produce Hydrogen,” presented at Chevron-Texaco, Richmond, CA (September, 2002).

“Solar-thermal Processing to Produce Hydrogen,” presented at the Electric Power Research Institute (EPRI), Palo Alto, CA (September, 2002).

“Solar-thermal Processing to Produce Hydrogen,” presented at General Motors Corporation, Warren, MI (October, 2002).

“ALD on Particles,” presented at The Dow Chemical Company, Corporate Seminar Series, Midland, MI (October, 2002).

“Atomic Layer Deposition on Particles – Chemistry and Engineering,” presented to the Department of Chemical Engineering - Graduate Seminar, University of California at Santa Barbara (October, 2002)

“Solar-thermal Processing to Produce Hydrogen,” presented at BP, Houston, TX (October, 2002).

“Solar-thermal Processing to Produce Hydrogen,” presented at the Arizona Public Service Company – Pinnacle West, Phoenix, AZ (November, 2002).

“Atomic layer Deposition – Chemistry and Engineering,” presented to the Department of Process Engineering, Graduate Seminar, Swiss Federal Institute of Technology (ETH-Zurich, Switzerland) (December, 2002).

“Solar-thermal Dissociation of Natural Gas in an Aerosol Flow Reactor,” presented at the Paul Scherer Institute, Villigen, Switzerland (December, 2002).

“Commercializing Novel Particle Technologies,” presented to the Department of Process Engineering, Graduate Seminar, Swiss Federal Institute of Technology (ETH-Zurich, Switzerland) (December, 2002).

“Rapid Process for the Benign Synthesis of Hydrogen,” presented to the Department of Chemical Engineering - Graduate Seminar, Colorado School of Mines and Technology (November, 2001)

“Rapid Solar-thermal Dissociation of Natural Gas,” presented to the Department of Chemical Engineering - Graduate Seminar, University of Maryland, (October, 2001).

“Rapid Solar-thermal Dissociation of Natural Gas,” presented at BP, Anchorage, AK (October, 2001).

“Rapid Solar-thermal Dissociation of Natural Gas,” presented to the Department of Chemical Engineering - Graduate Seminar, University of Colorado, (September, 2001).

“Rapid Carbothermal Reduction Processing using Aerosol Flow Reactors,” presented to the Department of Materials Science and Engineering – Graduate Seminar, University of Washington (June, 2000)

“Rapid Carbothermal Reduction Processing using Aerosol Flow Reactors,” presented to the Department of Chemical Engineering – Graduate Seminar, University of Arizona, Tucson, AZ (October, 1998)

Processing and Properties of NanoPhase SiC/Si₃N₄ Composites, invited presentation at the 5th Annual International Conference on Composites Engineering, Las Vegas, NV (July, 1998).

"Rapid Carbothermal Reduction Processing using Aerosol Flow Reactors," presented to the Department of Chemical Engineering – Graduate Seminar, University of California at Los Angeles (UCLA) (April, 1998)

"Rapid Carbothermal Reduction Processing using Aerosol Flow Reactors," presented to the Department of Chemical Engineering – Graduate Seminar, University of New Mexico (December, 1997)

"Tutorial – Advanced Ceramic Materials Synthesis," presented at the 16th Annual Conference of the American Association for Aerosol Research, invited Tutorial Lecture (October, 1997)

"Plenary Paper: High Temperature Aerosol Processing to Synthesize Advanced Ceramic Powders," invited Plenary presentation at the 1996 Annual Conference of The American Association for Aerosol Research, Orlando, FL, October, 1996.

"High Temperature Formation Processes for Producing Fine Advanced Ceramic Powders – invited Tutorial," presented at the 1995 Annual AIChE Meeting, Miami Beach, FL, November 1995.

"Rapid Carbothermal Reduction Processing & Kinetics for Synthesizing Fine Silicon Carbide Powders," presented to the Department of Chemical Engineering – Graduate Seminar, University of Colorado, Boulder, CO, August, 1995.

"Rapid Carbothermal Reduction Processing & Kinetics for Synthesizing Fine Silicon Carbide Powders," presented at the University of Cincinnati, Graduate Seminar, Cincinnati, OH, June, 1995.

"Flow Reaction Processing for the Manufacture of Fine Ceramic Powders," Dow Chemical Company Excellence in Science Award Presentation, Midland, MI, March, 1995.

"Synthesis of Nitride Ceramic Powders," invited Plenary Presentation, 96th Annual American Ceramics Society Meeting, Indianapolis, IN, April, 1994.

"Non-Oxide Ceramic Powder Synthesis," mid-Michigan Inorganic Science Group 1st Quarter Tutorial Presentation, Midland, MI, March, 1994.

"Synthesis of Nitride Ceramic Powders," presented at Oregon State University, Graduate Seminar, Corvallis, OR, February, 1994.

"Synthesis and Processing of Non-Oxide Ceramics," Tutorial Lecture, 1993 Annual AIChE Meeting, St. Louis, MO, November, 1993.

"Synthesis and Processing of Non-oxide Ceramics," presented at the University of Cincinnati, Cincinnati, OH, October, 1993.

"Rapid Carbothermal Reduction of Boron Oxide in a Graphite Transport Reactor," Sigma Xi "Best Paper of the Year Award Presentation," Midland, MI, January, 1993.

"Nonoxide Powders from Solid Reactants via a Rapid Carbothermal Reduction Aerosol Process," invited lecture presented at the Engineering Foundation Vapor Phase Manufacture of Ceramics Conference, Kona, Hawaii, January, 1992.

"A Rapid Carbothermal Reduction Process for the Manufacture of Boron Carbide," presented at The Ohio State University, Columbus, OH, October, 1991.

"The Reasons to Pursue a Ph.D. in Chemical Engineering," presented to the University of Cincinnati AIChE Student Chapter, Cincinnati, OH, March 1991.

"Rapid Carbothermal Reduction of Boron Oxide in a 2000°C Graphite Transport Reactor," presented at Oregon State University, Corvallis, OR October, 1990.

"Rapid Carbothermal Reduction of Boron Oxide in a 2000°C Graphite Transport Reactor," presented at the University of Colorado, Boulder, CO, October, 1990.

"The General Phenomena of High Pressure Gas-Solid Fluidization," presented at The Ohio State University, Columbus, OH, October, 1988.

"Fundamentals and Applications of High Pressure Fluidized Beds of Fine Carbon Powders," presented at the University of Cincinnati, Cincinnati, OH, February, 1988.

"High Pressure Fluidization Studies," presented at the University of Colorado, Boulder, CO, February, 1987.

"High Pressure Fluidization Fundamentals," presented at the University of Colorado, Boulder, CO, March, 1984.

Alan W. Weimer
(Service Activities)

Primary Service Contributions: CU Campus - Founding Executive Director of the Colorado Center for Biorefining and BioProducts (C2B2) 2006-present, 2013 member of the OCG Director Search Committee, 2008-2011 CU Energy Initiative Leadership Team (leading to RASEI), CU CRCW (Council on Research and Creative Work) member 2002-2006, Chair of CU CRCW 2005-2006, CU CRCW Awards Committee 2007; CEAS - 1st Level Review Committee 2012-present, Vice Chair 2014/2015, Chair 2015/2016, Scholarship Committee 2012 – present, PI for NSF/NERC Group Proposal 2011, Energy and Sustainability College Initiative 2008-2011; ChBE – U/G Program Committee 2010-present, Shop Committee Chair 2014-present, GAANN Renewable and Sustainable Energy Program Chair 2006-2009, 2012-present, Move to JSCBB Building Chair 2010-2012, Tenure and Promotion Committee 2010-2012, Graduate Seminar Committee 2007-2009 (Chair, 2009), Faculty Search Committee Chair 2009, founder of the ChBE Co-operative Education Program in 2000 (Chair 2000-2004); ChBE ABET Chairman 2000-2007; ChBE AIChE Undergraduate Student Chapter Advisor (1996-2001; 2003-2007), including hosting the 12 university Rocky Mountain U/G AIChE Meeting in Boulder in 2007; taught U/G seminar class, U/G Sr Advisor, U/G Materials Option Advisor; External Professional – Area Chair WCPT 8 (to be held April, 2018), Associate Editor, Journal of Nanoparticle Research 2006-present, External Advisory Committee University of Cincinnati 2012-2014, Global Project Coordinator International Partnership for a Hydrogen Economy – U.S.A., Japan, Israel, Switzerland, Spain, Germany, France 2005-2011, AIChE Particle Technology Forum Executive Committee 1999-2006, Treasurer 200-2002, Vice Chair 2002-2004, Chair 2004-2006 (received AIChE Service Award in 2006), Treasurer 5th World Congress on Particle Technology held in Orlando, FL 2006, Planning Committee 4th World Congress on Particle Technology held in Sydney, Australia 2002, Director AIChE Materials and Engineering Sciences Division 1997-1999, Chair International Topical Ceramics Conference held in San Diego 1996, AIChE Area 8d Ceramics Vice Chair 1993-1995, Chair 1995-1997, AIChE Area 3b Fluidization and Fluid-Particle Systems Vice Chair 1988-1990, Chair 1990-1991; Community – 2002 received the Niwot Left Hand Laurel Service Award for the two year negotiation with Qwest (now Century Link) to build a Communications Service Facility at the corner of Niwot Rd and 79th Street which aesthetically fits with the Niwot Community – this building received an award for being the most aesthetically appearing such structure in the SW United States.

Professional Activities

Founding Executive Director – Colorado Center for Biorefining and Biofuels – 2007 to present (CU, CSU, CSM, NREL, State of Colorado Collaboratory for Renewable Energy)
Associate Editor – Journal of Nanoparticle Research, 2006-present
Global Project Coordinator – International Partnership for the Hydrogen Economy (www.IPHE.net) – “Solar-driven High Temperature Thermochemical Production of Hydrogen” 2005-present
Editorial Board – Powder Technology (Elsevier) (2005-present)
Advisory Board – Journal of Nanomaterials (Hindawi) (2006-present)
External Advisory Committee, University of Cincinnati College of Engineering, 2012-present
Chair, AIChE Particle Technology Forum, 2004- 2006
Vice Chair, AIChE Particle Technology Forum, 2002-2004
Treasurer, AIChE Particle Technology Forum, 2000-2002
Executive Committee, AIChE Particle Technology Forum, 1999-present
Treasurer, Fifth World Congress on Particle Technology (held April, 2006 in Orlando, FL)
Planning Committee Fourth World Congress on Particle Technology (Sydney, Australia, July, 2002)
Director, AIChE Materials and Engineering Sciences Division (MESD), 1997-1999
Editor, AIChE Journal Special Issue, “Ceramics Processing”, 43 (11A) 1997
Chair, 1996 International Topical Ceramics Conference (San Diego, CA)
Chair, AIChE Area 8d (Ceramics), 1995-1997
Vice Chair, AIChE Area 8d (Ceramics), 1993-1995

Chair, AIChE Area 3b (Fluidization and Fluid-Particle Systems), 1990-1991
 Vice Chair, AIChE Area 3b (Fluidization and Fluid-Particle Systems), 1988-1990
 Director, Mid-Michigan AIChE Local Chapter, 1994-1996.
 Chair, Mid-Michigan AIChE Continuing Education Committee, 1994-1996.
 Chair, Mid-Michigan AIChE National Engineer's Week Outreach Activities
 Reviewer for Powder Technology, Chemical Engineering Science, Journal of the American Ceramic Society, Industrial and Engineering Chemistry Research & Development, Journal of Solar Energy Engineering, Energy, Journal of Materials Science, AIChE Journal, Journal of Nanoparticle Research, Advanced Materials, Chemistry of Materials, Advanced Functional Materials, Surface and Coating Technology.
 AIChE Session Chair – Annual Meeting of AIChE (1989-present, yearly)

University Activities

ChBE ARPAC Reporting Chair (2017/18)
 CU College of Engineering & Applied Science 1st Level Review Committee; Vice Chair, 2014, 2013-
 ChBE Shop Committee Chair; 2014-present
 CU College of Engineering & Applied Science Scholarship Committee; 2013-
 ChBE GAANN Renewable & Sustainable Energy Program Chair; 2012 -
 ChBE Department Chair Search Committee; 2011-2012
 ChBE Promotion/Tenure Committee; 2011-2012
 ChBE Move Committee Chair; 2010-2012
 PI for Engineering College group NSF NERC proposal submitted 9/2011
 PI for ChBE group GAANN proposal submitted 1/2012
 RASEI (Renewable and Sustainable Energy Institute) Fellow, 2010 - 2011
 ChBE Graduate Seminar Committee, 2008-present; Chair Spring, 2009
 ChBE Faculty Seminar Committee, 2008-present; Chair
 CU Energy and Sustainability Engineering College Initiative, 2008-present
 CU Energy Initiative Leadership Team Faculty Affiliate, 2008-present
 CU CRCW Awards Committee (Boulder Campus), 2007
 ChBE Awards Committee, ChBE (2007 - present)
 ChBE Undergraduate Program Committee (2006-present)
 Chair, Council on Research and Creative Work (CRCW), Boulder Campus, 2004-2006
 CU CRCW, Boulder Campus (2003-2004)
 ChBE AIChE Undergraduate Student Chapter Advisor (1996-2001; 2003-2007)
 ChBE ABET (Engineering Accreditation) Chairman (2000-2007); 2012-
 ChBE Undergraduate Senior Advisor (2007 - present)
 ChBE Undergraduate Sophomore and Materials Option Advisor 1997-2003; 2005-2006)
 Chair, First Level Review Committee, ChBE (2006-present)
 ChBE Faculty Search Committee, (1997-1998; 2005-2006)
 ChBE Shop Committee Chairman, (1997-1999; 2011-2012)
 ChBE Industrial Advisory Committee (1996-1998)
 ChBE Undergraduate Seminar (1997-1998)
 ChBE Safety Committee Chairman, (1997-2000)
 ChBE Co-operative Education Chairman (2000-2004; co-founder of co-op program in 2000)

Alan W. Weimer
(Industrial Experience)

PROFESSIONAL LICENSING

Licensed PE - State of Colorado (# 20279)

ENTREPRENEURIAL ACTIVITIES

Copernican Energy (Boulder, CO)

Co-founded in November, 2006 (Univ. of Colorado spinoff); merged with Sundrop Fuels in July, 2008; served as CTO of Sundrop Fuels from July, 2008 until July, 2011

ALD NanoSolutions, Inc. (Broomfield, CO)

Co-founded in June, 2001 (Univ. of Colorado spinoff)

Industrial Experience

The Dow Chemical Company, Midland, MI (1980 - 1996)

1980-1983: Sr. Research Engineer, Organic Chemicals Research

1983-1987: Project Leader, Chemicals Research/Engineering Research & Development

1987-1991: Research Leader, Ceramics & Advanced Materials Research (C&AMR)

1991-1994: Research Associate, C&AMR

1994-1995: Technical Leader, C&AMR

1995-1996: Associate Scientist, C&AMR

Co-Inventor of Commercial Technology

Invention, Fundamentals, Development, and Commercialization of the "Rapid Carbothermal Reduction"
Process for Producing Super-Ultrafine Ceramic Powders

Additional Industrial (Non-Ceramics) R&D Contributions

Developed a Low Cost Melt Polymerization Process for the Manufacture of Polycarbonate Resin

Developed a Fluidized Bed Agglomeration Process for the Manufacture of Superadsorbent Polymers

Developed a Fluidized Bed Polymeric Coating Process for the Timed Release of Agricultural Chemicals

Developed a Fixed Bed Catalytic Reactor Process for the Manufacture of Methyl Methacrylate Monomer

Developed a High Pressure Fluidized Bed Fischer Tropsch Process for the Manufacture of Mixed Alcohols

Chairman of The Dow Chemical Company Technology Status Analysis Teams for (1) the Manufacture of Hydrogen Peroxide by a Novel Membrane Process (Sarnia, Ontario) and (2) the Catalytic Extraction Process for Recovering and Recycling Compounds from Hazardous Chlorinated Wastes (Freeport, TX)

Dow Chemical Company U.S. Area Dioxin Task Force

Primary Teaching Contributions: Since 1996, has transformed the CHEN capstone design sequence from an academic one-semester course that was in disarray, to a well-organized two-semester industrial based projects course with a well-defined mini-design project in the fall followed by an industrial based open-ended project supported by an industrial liaison in the spring. Over 50 companies have been recruited to support the program - typically arranges for over 35 projects per year (both sections), two course capstone sequence, introduced current events topics into the class to help meet ABET guidelines, typically highest workload and strongest FCQ evaluations in spite of workload - for U/G classes in ChBE for the last few years; presents invited educational papers at Annual AIChE meetings in capstone design sessions (Best Practices in Senior Design); has mentored 93 U/Gs for independent study, Sr. Thesis, Discovery Learning Apprentice Program, and summer REU since joining the faculty in 1996 – 27 have gone on to obtain Ph.D.s.; has mentored 4 M.S. and 34 Ph.D.s since 1996 (four of whom have become academics) – 100% job placement.

(Teaching Evaluations, since 2009)

CHEN-4520 Chemical Process Synthesis (1st semester capstone design)

CHEN-4530 Chemical Engineering Projects (2nd semester capstone design)

Post Spring, 2009 (Ratings 0 to 6)	<u>Ratings (A.W. Weimer/Dept. Average)</u>		
<u>Course & Term</u>	<u>Availability</u>	<u>Course Challenge</u>	<u>Learning Experience</u>
CHEN-4530 (Spring, 2009)	5.4/4.9	5.4/4.8	5.0/4.6
CHEN-4520 (Fall, 2010)	5.7/5.0	5.3/4.8	5.1/4.7
CHEN-4530 (Spring, 2011)	5.7/5.1	5.6/4.8	5.3/4.7
CHEN-4520 (Fall, 2011)	5.6/5.0	5.3/4.8	5.3/4.6
CHEN-4530 (Spring, 2012)	5.2/5.0	5.1/4.7	5.0/4.7
CHEN-4520 (Fall, 2012)	5.7/4.9	5.5/4.7	5.6/4.7
CHEN-4530 (Spring, 2013)	5.6/4.9	5.5/4.7	5.8/4.7
CHEN-4530 (Spring, 2014)	5.7/5.0	5.4/4.7	5.4/4.7
CHEN-4520 (Fall, 2014)	5.3/5.0	5.3/4.7	4.5/4.8
CHEN-4530 (Spring, 2015)	5.3/5.0	5.0/4.8	4.9/4.7
CHEN-4520 (Fall, 2015)	5.2/5.1	5.5/4.9	5.4/4.7
CHEN-4530 (Spring, 2016)	5.3/5.1	5.2/4.9	5.2/4.8
CHEN-4520 (Fall, 2017)	5.1/5.0	5.6/4.8	5.2/4.7
CHEN-4530 (Spring 2018)	5.5/	5.2/	5.2/

Comments from Past Students

Prof. Weimer has received numerous emails from graduating seniors, with comments including:

“Thank you so much for everything this year. I have learned more in this class than many of the other CHEN courses I've taken combined. Plus, it's always fun to design something new.”

“Dear Professor Weimer, I interviewed with a midstream oil and gas company in Denver on Thursday. I brought along both my mini design project as well as my Natural Gas Expansion Facility report. The people I interviewed with were impressed, and I was able to talk intelligently with them about the cryogenic plant, and pipeline projects they have in the works. I felt confident in my knowledge of their company because of my experiences in this class. This company does not generally hire from CU, but still unanimously decided to hire me on as an intern this summer. I know the projects had a lot to do with that. They would also like to participate in the design projects next year. I wanted to say thank you so much for putting together these projects and creating a class with an incredible high learning value. It made all the difference for me.”

“I hope you still remember me, I am ... one of your senior students last year. I’m writing this email from the other side of the Earth (Saudi Arabia). I remember you saying in the class that you like to hear about your students and how they are doing after leaving CU. As you know I’m working in, one of SABIC’s affiliates..... today we are having a shutdown in our bubble bed reactor due to blockage in the plate holes, and I’m assigned to check inside the reactor...when I go over any aspects that I learned in CU, I remember you...I’m writing this email to express my warm thanks to you”

“I just wanted to take a quick second and thank you for everything I learned in Process Design last fall. I thought the course was really interesting and learned a lot. As a result of this, my design team and I chose to partner with ... for our design project in the spring because we were interested in the challenge of working with an actual design company for the project. We had a challenging project, but actually did pretty well with it, which led me to consider process design as a career. I'm happy to report I just got my first job offer from a process design company in and it's really too good to turn down! So I just wanted to thank you again, a significant portion of what I'll be doing at this job directly relates to the material I learned in Process Design, so thank you for your patience and dedication as our instructor!”

“It was a pleasure working with you and the ... liaisons on this project. Thank you for all of your help and support. Having to rework mini design definitely helped our team improve and learn how to more thoroughly design many unit operations. Good luck with your future research endeavors.”

“Thanks for all your help this semester! It was a wonderful experience!”

“Thanks for a great year of designing. The class was demanding but I learned a ton.”

“Thank you for an amazing design semester. I can honestly say I've learned more in this class than in any other class. Thank you. Also, thank you for being an amazing advisor.”

“It was a great experience being in your class this year, despite all the stress! Hope you have a good summer.”

“Professor Weimer has always been extremely accessible for this course and is always willing to help. I feel this course and CHEN4520 with Professor Weimer are where I truly became a chemical engineer. The amount of material covered, the engineering skills learned, and the course load were nowhere near easy but I believe that extra push is truly what separates the ChemE department from other colleges.”

“This was a near perfect class in how it was set up, including the semester before.”

“Alan Weimer is a great professor who definitely cares about his students and the the learning value of his class. This was a very challenging course.”

“Also, thanks for teaching this course. It was one of extreme challenge but also of very high learning value. I am glad I took both semesters of Design with you, and I am sad the current juniors will not be able to have the same experience this coming year. I hope your sabbatical this coming year goes great!”

“I forgot to mention, I used the list you sent out of companies receiving SBIR/STTR grants and landed a paid internship with ... in Cambridge, MA (founded out of MIT)!; They were very impressed with the Mini-Design and Design projects (especially economics). Maybe you can use this as a success story for futures semesters :)”

“Thank you so much for your help this semester. Your class has been very insightful and I appreciate the enthusiasm you have for teaching.”

“Although this course warranted blood, sweat, tears, and more time than I could have imagined....I learned a great amount about design, myself, and working with teams this semester!”

“This course was definitely very challenging, but the challenge has prepared us for the mini design project as well as hopefully the full design project in the spring. Professor Weimer definitely does his best to try and encourage students and has very high expectations, which I appreciate.”

“Dr. Weimer is a fantastic professor. The difficulty and work load of the class was high, but this allows the students to learn more. I am glad I took Design with him.”

“Thank you again for all of your guidance, help, advice, and wisdom over the past year with Mini and Senior Design. I definitely feel like I learned a lot about process engineering, working with an outside liaison was very insightful, and I definitely feel I have received a great education from the Chemical Engineering department at CU.”

“Professor Weimer cares about his student so much, and he makes sure we know that he is always there to help us. I'm not sure if he ever sleeps though because I get emails from him at all hours of the night. That being said, I've never had a professor respond so quickly to emails, especially not ones pertaining specifically to his class.”

“Hi Professor, I just wanted to shoot you an email because I was speaking with {another former student} today about your class ... As I was talking with her, something completely unexpected happened. I realized I missed your class =]. Your class was the first time at CU that I felt like I could be an engineer. Anyway, I just wanted to let you know that even with all the grief I gave you about Mini Design being hard, I think it was that project that made me an engineer.”

“I enjoyed getting to hear some of the real life engineering stories as they helped me to see the application of many of the things we have learned about in previous classes. Although the final mini-design project was a lot of work, I felt that it helped me to learn more about the actual engineering process than I would have if the project had been less in depth. This is not an easy class by any means and the work load is heavy (especially towards the end of the semester), but all in all it has been invaluable in furthering my education. Thank you Professor Weimer.”

“Having the opportunity to work on an actual company project taught me what to expect as a process engineer and has been a great learning experience...”

“The two-semester design course was easily the class I learned the most in during college. Honestly, it is difficult for me to offer an sort of constructive feedback on a course that is structured so well.”

“Dr. Weimer is hands down the best instructor in the ChemE department. He is genuine, kind, and respectful. Yes, the class requires a certain level of sophistication in terms of delivering the tasks, yet Dr. Weimer made it enjoyable.”

Alan W. Weimer

(Directed Research)

Theses Directed

Peter Czerpek, M.S. 1998
David Chacon, M.S. 1999
Patrick Hilbert, M.S. 1999
Andrew Yoder, M.S. 2003
Jeffrey Wank, Ph.D. 2003
Jaimee Dahl, Ph.D., 2004
Casey Carney, Ph.D. 2005
Jennifer Walsh, Ph.D. 2005
Luis Hakim, Ph.D. 2006
Christopher Perkins, Ph.D. 2006
Chad Smith, M.S., 2008
Todd Francis, Ph.D., 2008
David King, Ph.D., 2008
Xinhua Liang, Ph.D., 2008
Jonathan Scheffe, Ph.D., 2010
Yun Zhou, Ph.D., 2011
Paul Lichty, Ph.D. 2011
Janna Martinek, Ph.D., 2012
Bryan Woodruff, Ph.D., 2012
Victoria Aston, Ph.D., 2013
Elizabeth Saade, Ph.D., 2013
Darwin Arifin, Ph.D., 2013
Troy Gould, Ph.D., 2014
Aaron Palumbo, Ph.D., 2014
Christopher Muhich, Ph.D., 2014
Alia Lubers, Ph.D., 2015
Staci van Norman, Ph.D., 2015
Brian Ehrhart, Ph.D., 2017
Scott Rowe, Ph.D., 2018
Boris Chubukov, Ph.D., 2018
Ibraheam Alshankiti, Ph.D., 2018
Amanda Hoskins, Ph.D., 2018
Christopher Bartel, Ph.D., 2018
William McNeary, Ph.D., 2019
Samantha Miller, Ph.D. expected 2019
Jacob Clary, Ph.D., expected 2019
Sarah Bull, Ph.D., expected 2021
Rebecca O'Toole, Ph.D., expected 2021
Julia Hartig, Ph.D., expected 2022
Justin Tran, Ph.D., expected 2023

Postdoctoral Research Associates Directed

Dr. Victoria Aston (2013-2014)
Dr. Karen Buechler (2001-2003)
Dr. Casey Carney (2005-2007)
Dr. Boris Chubukov (2017-present)
Dr. Todd Francis (2009)
Dr. Hans Funke (2005-2009)
Dr. Arto Geohn (2014-2016)
Dr. Christopher Gump (2003-2005)

Dr. Illias Hischier (2013-2015)
Dr. David King (2009-2011)
Dr. Jianhua Li (2007-2010)
Dr. Xinhua Liang (2009-2011)
Dr. Janna Martinek (2012-2013)
Dr. Christopher Muhich (2015-2016)
Dr. Brian Neltner (2010-2011)
Dr. Aaron Palumbo (2014-present)
Dr. Christopher Perkins (2007-2008)
Dr. Scott Rowe (2018)
Dr. Staci Van Norman (2015-2016)
Dr. Guodong Zhan (2005-2006)

Professional Research Assistants Directed

Kathryn Barrett (2009-2010)
Richard Bastar, IV (2013)
Melinda Channel (2008-2011)
Brain Evanko (2012)
Richard “Chip” Fisher (2010-2016)
Oliver Kilbury (2010)
Caitlin Majlinger (2013-2018)
Mark Wallace (2015-2018)
Barbara Ward (2014-2016)
Kimberly Zimmer (2010-2014)

Visiting Foreign Scientists

Sarah von Rooij, 2016 (EPFL, Switzerland)
Matthias Faust, 2013 (Karlsruhe University, Germany)
Carolina Herradon, 2012 (University Rey Juan Carlos, Spain)
Katja Kruit, 2012 (Delft, The Netherlands)
Sandro Hutter, 2012 (ETH Zurich, Switzerland)
Stefan Stroehle, 2011 (ETH Zurich, Switzerland)
Michael Schmidt, 2010 (ETH Zurich, Switzerland)
Aldo Steinfeld, 2010 (ETH Zurich, Switzerland); sabbatical
Teres Felix, 2009 (ETH Zurich, Switzerland)
Michael Wirz, 2009 (ETH Zurich, Switzerland)
Ruud van Ommen, 2009 (Delft, The Netherlands); sabbatical
Kevin Cucho, 2008 (ETH Zurich, Switzerland)
Sophia Haussener, 2007 (ETH Zurich, Switzerland)
David Hirsch, 2006 (ETH Zurich, Switzerland)
Alexander Z’Graggen, 2004 (ETH Zurich, Switzerland)
F. Bruetsch, 2003 (ETH Zurich, Switzerland)

Undergraduate Research Students Supervised (Independent Study and Sr. Thesis)

Audrey Linico, 2017- present
Patrick Burr, 2017-present
Chanel Hill, 2017-present
Theodore Champ, 2017-present
Anna Lai, 2017-present
Alexa Horrell, 2017-present
Iryna Androshchuk, 2017-present

Sean Chapel, 2017-2018
 Laura Nitz, Summer REU (2017); Michigan Technological University
 Katharine Hirl, Summer REU (2016); Benedictine College
 Aiden Coffee, 2015-present
 Benjamin Mousseau, 2015-2016
 Maila Kudas, 2015-present
 Megan Maguire, 2015-present, Sr. Thesis (2015-2016)
 Sophia Barrera Cobos, Summer REU (2015); Monterrey Institute of Technology
 Daniel Vigil, Summer REU (2015); University of Wisconsin
 Mark Wallace, 2014-2015
 Kevin Sun, 2014-present
 Austin Drake, 2014-present; summer REU 2015, Sr. Thesis (2015-2016)
 Vanessa Witte, 2014-2016
 Carla Manzi, 2014
 Elizabeth Kezar, Summer REU (2014) and Summer REU (2015); Kansas State University
 Anthony Anderson, Summer REU (2014); Arizona State University
 Christopher Bartel, Summer REU (2013); Auburn University
 Ryan Hollenbaugh, 2013-2014
 James Baker, 2013-2014
 Jeni Sorli, 2012-present; Sr. Thesis 2014/2015
 Rachel Viger, 2012 – 2014; Sr. Thesis 2013/14
 Kayla Weston, 2011-2014; Sr. Thesis 2013/14
 Amanda Sagastegui, Summer REU (2011); Princeton University
 Jesus Jaime Leal Chapa, Summer REU (2011); Monterrey Inst. of Technol.
 Kathryn Geldart, Summer REU (2011); University of Massachusetts
 Kelly Anderson, 2011-2013, Sr. Thesis 2013/13
 Christopher Wilson, 2011
 Anthony Alli, 2011
 Will Schwab, 2011
 Brittany Jo Michael, 2011
 Chris Bohling, 2010-2011
 Erica Jorgensen, 2010 –present (Sr. Thesis, 2012)
 Benjamin Switzer, 2010
 Lauren Blinn, Summer REU (2010); University of Florida
 Brian Evanko, 2009-present (Sr. Thesis, 2011)
 Amy Oberlin, Summer REU (2009); Univ. of Michigan
 Clay Beavers, Summer REU (2009); New Mexico Tech
 Alan Azar, Summer REU (2009; 2010); Monterrey Inst. of Technol.
 Margarite Parker, 2005, 2008/2009; Sr. Thesis (2009)
 Seth Parker, 2008-2009
 Melissa Rickman, 2008-2009
 Eran Rozewski, 2008-2011
 Samantha Johnson, 2007-2011; Sr. Thesis (2011)
 Andrew Demars, 2008
 Brittany Lancaster, 2007/2008; Sr. Thesis (2008)
 Benjamin Chittick, 2008
 Freya Kugler, 2007/2008
 Ami Patel, 2007/2008
 Peter Kreider, 2007-2010; Sr. Thesis (2010)
 Oliver Kilbury, 2006 – 2008; Sr. Thesis (2008)
 Gevorg Sargsyan, 2006 - 2007
 Andrea Francis, 2007 Summer REU, Monterrey Institute of Technology
 Amanda Scott, 2007 Summer REU, Vanderbilt University
 Henry Diaz, 2006
 Paul Lichty, 2005/2006
 Margarite, Parker, 2005

Lauren Brickner, 2005/2006
 Heather Dunsheath, 2005 Summer REU, Rice University
 Alyssa Roessler, Boulder High School Sr. Student
 Candace Vaughn, 2005 (Sr. Thesis)
 Michael Kerins, 2005
 Janna Martinek, 2005
 Jeffrey Wyss, 2005
 Michele Buzek, 2004
 Michele Casper, 2004 Summer REU, Univ. of South Carolina
 Jason Mooney, 2004
 Eli Paster, 2004
 Candace Vaughn, 2004
 Jeremy Zartman, 2004
 Houston Frost, 2003
 Brian Stephens-Hotopp, 2003 (Sr. Thesis)
 Brandon Hughes, 2003
 Leslie Morgret, 2003 (Sr. Thesis)
 Julie Portman, 2003 Summer REU, Univ. Of Missouri
 Joseph Spencer, 2003 (Sr. Thesis)
 Michele Zeles, 2003
 Houston Frost, 2002 (Sr. Thesis)
 Brandon Hughes, 2002
 Leslie Morgret, 2002
 Joseph Spencer, 2002
 Jeffrey Weisiger, 2002
 Michele Zeles, 2002
 Joseph Spencer, 2001
 Andy Yoder, Summer REU, Michigan State University
 Barr Halevi, 2000
 Jacob Johnson, 2000 (Sr. Thesis)
 Shane Passon, 2000
 David Scott, 2000 (Sr. Thesis)
 Josphe Spencer, 2000
 Joseph Tamburini, 2000 (Sr. Thesis)
 Stephanie Thompson, 2000
 Jacob Johnson, 1999
 David Scott, 1999
 John Lock, 1998 (Sr. Thesis)
 John Lock, 1997
 Charissa Money, 1997
 Brennan Peterson, 1997 (Sr. Thesis)
 David Winks, 1997
 Brennan Peterson, 1996
 Hyun Lee, 1996