

# DANIEL ANTHONY GULINO

## Curriculum Vitae

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office: Department of Chemical & Materials  
Engineering  
New Mexico State University  
Las Cruces, NM 88003  
(575) 646-2258 (office)  
(740) 517-2389 (cell/home)  
gulino@nmsu.edu

home: 4284 Canterra Arc  
Las Cruces, NM 88011  
(740) 517-2389  
gulinod@gmail.com

## ACADEMIC RECORD

Ph.D., Chemical Engineering, University of Illinois at Urbana-Champaign, 1983  
M.S., Chemical Engineering, University of Illinois at Urbana-Champaign, 1982  
B.A., Chemistry, Kenyon College, 1979

## PROFESSIONAL EXPERIENCE

January 2013 – present:

New Mexico State University, Las Cruces, New Mexico. Adjunct Professor, Department of Chemical & Materials Engineering, primary responsibility is teaching and development of undergraduate laboratory courses (junior and senior level). Occasional teaching of other chemical engineering and mechanical engineering undergraduate courses as departmental needs dictate.

August 1989 – June 2012:

Ohio University, Athens, Ohio. Faculty member, Department of Chemical & Biomolecular Engineering, Russ College of Engineering and Technology  
– 1989 – 1992, Assistant Professor  
– 1992 – 2012, Associate Professor  
– June 2012 – present, Associate Professor Emeritus

July 1983 – June 1989:

National Aeronautics and Space Administration – Lewis (now Glenn) Research Center, Cleveland, Ohio. Position: Research Scientist – served as a member of the Electro-Physics Branch of the Power Technology Division. Principal areas of responsibility included investigation of environmental durability of spacecraft electrical power system materials and deposition and characterization of thin film coatings for this application.

## PUBLICATIONS

1. S. W. Kirchoefer, N. Holonyak, Jr., K. Hess, D. A. Gulino, H. G. Drickamer, J. J. Coleman, and P. D. Dapkus. "High Pressure Experiments on  $\text{Al}_x\text{Ga}_{1-x}\text{As}$ -GaAs Quantum-Well Heterostructure Lasers." *Solid State Communications* 42 633 (1982).
2. S. W. Kirchoefer, N. Holonyak, Jr., K. Hess, D. A. Gulino, H. G. Drickamer, J. J. Coleman, and P. D. Dapkus. "Absorption Measurements at High Pressure on  $\text{AlAs-Al}_x\text{Ga}_{1-x}\text{As}$ -GaAs Superlattices." *Applied Physics Letters* 40 821 (1982).
3. S. W. Kirchoefer, N. Holonyak, Jr., K. Hess, K. Meehan, D. A. Gulino, H. G. Drickamer, J. J. Coleman, and P. D. Dapkus. "High Pressure Measurements on  $\text{Al}_x\text{Ga}_{1-x}\text{As}$ -GaAs ( $x = 0.5$  and  $1$ ) Superlattices and Quantum-Well Heterostructure Lasers." *Journal of Applied Physics* 53 6037 (1982).
4. S. W. Kirchoefer, K. Meehan, N. Holonyak, Jr., D. A. Gulino, H. G. Drickamer, R. D. Burnham, and D. R. Scifres. "High Pressure Measurements on Visible Spectrum  $\text{Al}_x\text{Ga}_{1-x}\text{As}$  Heterostructure Lasers: 7100-6750Å 300K Operation." *Applied Physics Letters* 41 406 (1982).
5. D. A. Gulino, L. R. Faulkner, and H. G. Drickamer. "High Pressure Photoelectric Studies of Semiconductor-Electrolyte Systems." *Journal of Applied Physics* 54 2483 (1983).
6. D. A. Gulino and H. G. Drickamer. "High Pressure Studies of the Dye-Sensitized Photocurrent Spectrum of Titanium Dioxide." *Journal of Physical Chemistry* 88 1173 (1984).
7. J. A. Woollam, V. Natarajan, J. Lamb, A. A. Khan, G. Bu-Abbud, J. Pouch, D. A. Gulino, S. Domitz, D. C. Liu, and D. Ingram. "Optical and Interfacial Electronic Properties of Diamondlike Carbon Films." *Thin Solid Films* 119 121 (1984).
8. V. Natarajan, J. D. Lamb, J. A. Woollam, D. A. Gulino, and D. C. Liu. "Diamondlike Carbon Films: Optical Absorption, Dielectric Properties, and Hardness Dependence on Deposition Parameters." *Journal of Vacuum Science and Technology* A3(3) 681 (1985).
9. V. J. Kapoor, P. V. Koeppel, D. C. Radulescu, M. J. Mirtich, B. A. Banks, and D. A. Gulino. "Characterization of Ion Beam Deposited Carbon Coatings on Semiconductors." *Journal of Vacuum Science and Technology* A3(6) 2327 (1985).
10. D. A. Gulino. "Ion Beam Sputter Deposited Zinc Telluride Films." *Journal of Vacuum Science and Technology* A4(3) 509 (1986).
11. D. E. Morel, S. R. Ayers, D. A. Gulino, R. C. Tennyson, and R. A. Egger. "Solar Concentrator Materials Development," *Advancing Toward Technology Breakout in Energy Conversion* (21st IECEC), Vol. 3, American Chemical Society, Washington, D.C., 1986, pp. 2032-2038.
12. D. A. Gulino, R. A. Egger, and W. F. Banholzer. "Oxidation-Resistant Reflective Surfaces for Solar Dynamic Power Generation in Near Earth Orbit." *Journal of Vacuum Science and Technology* A5(4) 2737 (1987).
13. D. A. Gulino. "Atomic-Oxygen Durability of Impact-Damaged Solar Reflectors." *Journal of Spacecraft and Rockets* 25(1) 39 (1988).

14. D. A. Gulino. "Space Station Solar Concentrator Materials Research." *Advanced Materials and Manufacturing Processes* 3(2) 261 (1988). (Invited review article.)
15. D. A. Gulino and C. E. Coles. "Oxygen Plasma Effects on Several Liquid Droplet Radiator Fluids." *Journal of Spacecraft and Rockets* 25(2) 99 (1988).
16. D. A. Gulino. "Solar Dynamic Concentrator Durability in Atomic Oxygen and Micrometeoroid Environments." *Journal of Spacecraft and Rockets* 25(3) 244 (1988).
17. D. A. Gulino, R. A. Egger, and W. F. Banholzer. "Oxidation-Resistant Surfaces for Solar Reflectors." *NASA Tech Briefs* 12(10) 54 (1988).
18. D. A. Gulino. "Oxidation of Reflectors Through Pinholes in Coatings." *NASA Tech Briefs* 13(1) 38 (1989).
19. D. A. Gulino. "Thin Film Coatings for Space Electrical Power System Applications," in *Surface Modification Technologies II*, T. S. Sudarshan and D. G. Bhat, eds., TMS, Warrendale, PA (1989). pp. 73-90.
20. *Surface Modification Technologies III*, T. S. Sudarshan, D. G. Bhat and H. Hintermann, eds., D. A. Gulino, M. Jeandin, P. A. Molian, and P. Patnaik, assoc. eds., TMS, Warrendale, PA (1990).
21. B. N. De, K. Memarzadeh, A. Julianto, G. G. Myers, J. A. Woollam, D. A. Gulino, and T. M. Dever. "Ellipsometric Studies of the Diffusion of Atomic Oxygen Through Silicon Dioxide Thin Films." *AIAA Journal* 28(6) 1065 (1990).
22. D. A. Gulino, L. R. Kren, and T. M. Dever. "Isotopic Study of Oxygen Diffusion in Oxide Coatings." *Thin Solid Films* 188 237 (1990).
23. B. R. King, H. C. Patel, D. A. Gulino, and B. J. Tatarchuk. "Kinetic Measurements of Oxygen Dissolution into Niobium Substrates: In Situ XPS Studies." *Thin Solid Films* 192 351 (1990).
24. D. A. Gulino, F. DiFilippo, and T. M. Dever. "A Model for the Calculation of Solar Concentrator Reflectance Loss Due to Particle Impact," in *Surface Modification Technologies IV*, T. S. Sudarshan and D. G. Bhat, eds., TMS, Warrendale, PA, 1991. pp. 635-642.
25. S. Neogi and D. A. Gulino. "Chemical Vapor Deposition of Silicon-based Dielectric Films." *Materials and Manufacturing Processes* 6(3) 433 (1991).
26. S. Neogi, D. C. Ingram, and D. A. Gulino. "Improved Adhesion of Silicon Dioxide to Polyimide Composite by Ion Implantation." *HITEMP Review 1991* (Advanced High Temperature Engine Materials Technology Program) NASA CP-10082, 1991. pp. 11-1 to 11-10.
27. S. Neogi and D. A. Gulino. "High-Temperature Oxidation Resistance of SiO<sub>2</sub>-Coated Polyimide Composite." *AIChE Journal* 38(9) 1379 (1992).
28. L. M. Miller, S. Neogi, and D. A. Gulino. "Al<sub>2</sub>O<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub>/SiO<sub>2</sub> Coatings for High Temperature Thermo-Oxidative Stability of Polyimide Composites." *HITEMP Review 1992* (Advanced High Temperature Engine Materials Technology Program) NASA CP-10104, 1992. pp. 7-1 to 7-8.

29. L. M. Miller and D. A. Gulino. "Multilayer Coatings for Polyimide Composite Thermoxidative Stability." HITEMP Review 1993 (Advanced High Temperature Engine Materials Technology Program). NASA CP-19117, 1993. pp. 16-1 to 16-12.
30. L. M. Miller and D. A. Gulino. "Aluminum Oxide Films for Thermo-Oxidative Protection of Polyimide Composites." Materials Research Society Symposium Proceedings. 305 191 (1993).
31. L. M. Miller and D. A. Gulino. "Dual-Layer Coatings for Polyimide Composite Thermo-Oxidative Protection." Surface and Coatings Technology 68/69 76 (1994).
32. L. M. Miller and D. A. Gulino. "A Model for the Oxidative Degradation of Polyimide-Based Composites at Elevated Temperatures." Proceedings of the Second International Conference on Composites Engineering. David Hui, ed. August 1995, pp. 281-282.
33. L. M. Miller and D. A. Gulino. "Al<sub>2</sub>O<sub>3</sub>/SiO<sub>2</sub> Coatings on Polyimide-Matrix/Carbon-Fiber Composites." NASA Tech Briefs. 20(4) 28 (1996).
34. Y. Gao, D. A. Gulino, and R. Higgins, "Effect of Susceptor Geometry on GaN Growth on Si(111) with a New MOCVD Reactor," in GaN and Related Alloys, Materials Research Society Symposium Proceedings. 537, p. G3.53, (1999). See also: MRS Internet J. Nitride Semicon. Res. 4S1, G3.53 (1999). (<http://nsr.mij.mrs.org/4S1/G3.53/>)
35. Y. Chen, D. A. Gulino, and R. Higgins. "Residual Stress in GaN Films Grown by MOCVD." Journal of Vacuum Science and Technology A. 17(5), 3029, Sept/Oct 1999.
36. Y. Fu, D. A. Gulino, and R. Higgins. "Residual Stress in GaN Epilayers Grown on Silicon Substrates." Journal of Vacuum Science and Technology A. 18(3), 965, May/June 2000.
37. J. A. Himes, J. R. Willis, and D. A. Gulino. "Effect of Externally-Imposed Radial Strain on the Piezoelectric Response of MOCVD-Grown Gallium Nitride." GaN and Related Alloys. MRS Proceedings Volume 639. p. G11.58 (2001).  
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38. W. Ju, D. A. Gulino, and R. Higgins. "Epitaxial Lateral Overgrowth of Gallium Nitride on Silicon Substrate." Journal of Crystal Growth. Vol 263/1-4 pp 30-34 (2004).
39. R. Malka, S. Nesic, and D. A. Gulino. "Erosion Corrosion and Synergistic Effects in Disturbed Liquid-Particle Flow." Wear. Vol 262/7-8, pp. 791-797 (2007).

## CONFERENCE PRESENTATIONS

Presentations of which I was an author or co-author. Underlined name was actual presenter.

1. D. A. Gulino. "Ion Beam Sputter Deposited Zinc Telluride Films." Presented at the 32nd National Symposium of the American Vacuum Society, Houston, TX. November 1985.
2. D. A. Gulino, R. A. Egger, and W. F. Banholzer. "Oxidation-Resistant Reflective Surfaces for Solar Dynamic Power Generation in Near Earth Orbit." Presented at the 33rd National Symposium of the American Vacuum Society, Baltimore, MD. October 1986.

3. D. A. Gulino, and C. E. Coles. "Effect of an Oxygen Plasma on the Physical and Chemical Properties of Several Liquid Droplet Radiator Fluids." Presented at the 25th Aerospace Sciences Meeting of the American Institute of Aeronautics and Astronautics, Reno, NV. January 1987.
4. D. A. Gulino. "Effect of Hard Particle Impacts on the Atomic Oxygen Survivability of Reflector Surfaces with Transparent Protective Overcoats." Presented at the 25th Aerospace Sciences Meeting of the American Institute of Aeronautics and Astronautics, Reno, NV. January 1987.
5. D. A. Gulino. "The Survivability of Large Space-Borne Reflectors Under Atomic Oxygen and Micrometeoroid Impact." Presented at the 25th Aerospace Sciences Meeting of the American Institute of Aeronautics and Astronautics, Reno, NV. January 1987. (Invited paper.)
6. D. A. Gulino, T. M. Dever, and W. F. Banholzer. "Chemical Vapor Deposited Silica Coatings for Solar Mirror Protection." Presented at the 26th Aerospace Sciences Meeting of the American Institute of Aeronautics and Astronautics, Reno, NV. January 1988.
7. R. L. Parsons and D. A. Gulino. "Effect of an Oxygen Plasma on Aluminum Thin Films." Presented at the 17th Annual Symposium on Applied Vacuum Science and Technology, co-sponsored by the Florida chapter of the American Vacuum Society and the U.S. Department of Energy. Clearwater Beach, FL. February 1988.
8. D. A. Gulino. "Thin Film Coatings for Space Electrical Power System Applications". Presented at the Second International Conference on Surface Modification Technologies, sponsored by The Metallurgical Society of the AIME. Chicago, IL. September 1988. (Invited paper.)
9. D. A. Gulino, L. A. Kren, and T. M. Dever. "Isotopic Study of Oxygen Diffusion in Oxide Coatings." Presented at the 16th International Conference on Metallurgical Coatings, San Diego, CA. April 1989.
10. D. A. Gulino, F. DiFilippo, and T. M. Dever. "A Model for the Calculation of Solar Concentrator Reflectance Loss Due to Particle Impact." Presented at the Fourth International Conference on Surface Modification Technologies, sponsored by the Société Française de Métallurgie. Paris, France. November 1990.
11. G. M. Gladysz and D. A. Gulino. "Downstream Microwave-Enhanced Deposition of  $\text{SiN}_x$ ." Presented at the Joint Spring Meeting of the APS Ohio Section/AVS Ohio Section/AAPT Appalachian and Southern Ohio Sections, Athens, Ohio. April 1991.
12. S. Neogi, D. C. Ingram, and D. A. Gulino. "Improved Adhesion of Silicon Dioxide to Polyimide Composite by Ion Implantation." Presented at the 4th Annual HITEMP Review (Advanced High Temperature Engine Materials Technology Program), Westlake (Cleveland), Ohio. October 1991.
13. S. Neogi and D. A. Gulino. "Silicon Dioxide Thin Films Deposited by PECVD onto Polymeric Composites for High Temperature Oxidation Resistance." Presented at the Third Topical Conference on Emerging Technologies in Materials held in conjunction with the 1991 Annual Meeting of the American Institute of Chemical Engineers, Los Angeles, California. November 1991.
14. M. Gopal and D. A. Gulino. "A Study of Silicon Nitride Films Deposited by MECVD from Several Reactant Precursors." Presented at the Third Topical Conference on Emerging Technologies in

Materials held in conjunction with the 1991 Annual Meeting of the American Institute of Chemical Engineers, Los Angeles, California November 1991.

15. L. M. Miller, S. Neogi, and D. A. Gulino. " $\text{Al}_2\text{O}_3$  and  $\text{Al}_2\text{O}_3/\text{SiO}_2$  Coatings for High Temperature Thermo-Oxidative Stability of Polyimide Composites." Presented at the 5th Annual HITEMP Review (Advanced High Temperature Engine Materials Technology Program), Westlake (Cleveland), Ohio. October 1992.
16. S. Neogi and D. A. Gulino. "Diethylsilane as a Precursor for the Low Temperature Deposition of  $\text{SiO}_2$  by LPCVD onto Polyimide Composites." Presented at the 1992 Annual Meeting of the American Institute of Chemical Engineers, Miami Beach, Florida. November 1992.
17. L. M. Miller and D. A. Gulino. "Aluminum Oxide Films for Thermo-oxidative Protection of Polyimide-Based Composites." Presented at the 1993 Spring Meeting of the Materials Research Society, San Francisco, California. April 1993.
18. L. M. Miller and D. A. Gulino. "Multilayer Coatings for Polyimide Composite Thermoxidative Stability." Presented at the 6th Annual HITEMP Review (Advanced High Temperature Engine Materials Technology Program), Westlake (Cleveland), Ohio. October 1993.
19. L. M. Miller and D. A. Gulino. "Dual-Layer Oxide Coatings for Polyimide Composite Thermo-oxidative Protection." Presented at the International Conference on Metallurgical Coatings and Thin Films (ICMCTF-94), San Diego, California. April 1994.
20. L. M. Miller and D. A. Gulino. "A Model for the Oxidative Degradation of Polyimide-Based Composites at Elevated Temperatures." Presented at the Second International Conference on Composites Engineering, New Orleans, Louisiana. August 1995.
21. P. Chakravarthy, L. M. Miller, and D. A. Gulino. "Polymer Durability at High Temperatures." Presented at the Fifth World Congress of Chemical Engineering, San Diego, California. July 1996.
22. Y. Gao, D. A. Gulino, and R. Higgins. "Effects of Susceptor Geometry on GaN Growth on Si(111) with a New MOCVD Reactor." Presented at the 1998 Fall Meeting of the Materials Research Society, Boston, Massachusetts. December 1998.
23. D. A. Gulino, Y. Gao, B. Mehta, and M. Gopal. "Effect of Susceptor Geometry and Growth Pressure on the Fluid Flow and Heat Transfer in a New Vertical MOCVD Reactor." Presented at the MRS Workshop "Advances in Thin Film Simulations and Experimental Verification" held in San Jose, California. June 1999.
24. Y. Gao, D. A. Gulino, M. Gopal, B. Mehta, and R. Higgins. "Simulation and Optimization of a Vertical MOCVD Reactor for the Epitaxial Growth of GaN on Silicon." Presented at the 1999 Annual Meeting of the American Institute of Chemical Engineers, Dallas, Texas. November 1999.
25. Y. Zou, D. A. Gulino, and M. K. Alam. "Carbon Fibers Grown From Hydrocarbon and Coal Precursors." Presented at the Eighth Annual Chemical Engineering Graduate Student Symposium, West Virginia University, Morgantown, West Virginia. September 2000.

26. J. A. Himes, J. R. Willis, and D. A. Gulino. "Effect of Externally-Imposed Radial Strain on the Piezoelectric Response of MOCVD-Grown Gallium Nitride." Presented at the 2000 Fall Meeting of the Materials Research Society, Boston, Massachusetts. November 2000.
27. Y. Zou, D. A. Gulino, and M. K. Alam. "Iron-Catalyzed Growth of Carbon Fibers from Hydrocarbon Precursors." Presented at the 2001 Annual Meeting of the American Institute of Chemical Engineers, Reno, Nevada. November 2001.
28. M. Al-Tamimi and D. A. Gulino. "Growth of Gallium Nitride on Silicon Substrate by MOCVD Using Multiple Buffer Layers." Presented at the 49th International Symposium of the American Vacuum Society, Denver, Colorado. November 2002.
29. W. Sun, K. Chokshi, S. Nesic, and D. A. Gulino. "A Study of Protective Iron Scale Formation in CO<sub>2</sub> Corrosion." Presented at the 2004 Annual Meeting of the AIChE, Austin, Texas, November 2004.