

VITA

NAME:

Gerald W. Young

PRESENT RANK:

Professor
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PERSONAL DATA:

Birthdate: April 27, 1959
Birthplace: Barberton, Ohio
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EDUCATIONAL DATA:

Ph.D. - Engineering Sciences and Applied Mathematics Northwestern University - Evanston,
IL - June 1985
Dissertation: "Dynamics and Stability of Flows with Moving Contact Lines".

B.S. - Applied Mathematics - The University of Akron, Akron, Ohio - June 1981.

PROFESSIONAL EXPERIENCE:

9-85 - 8-89	Assistant Professor
9-89 - 9-92	Associate Professor
9-92 - Present	Professor
7-94 - 8-07	Applied Mathematics Division Coordinator
9-07 - Present	Graduate Program Coordinator
	Department of Theoretical and Applied Mathematics
	The University of Akron
	Akron, Ohio
1-85 - 8-85	Post-Doctoral Fellow
	Engineering Sciences and Applied Mathematics
	Northwestern University
	Evanston, Illinois

9-79 - 1-80	Summer Intern, Co-op
6-80 - 9-80	The Goodyear Tire and Rubber Company
6-81 - 9-81	Akron, Ohio
6-82 - 9-82	

STUDENT DEVELOPMENT

Directed or co-directed **twenty-five Master's Theses:** Jeffrey Bonfiglio, Ines Busuladzic, Robert Carnahan, Sandra Djurkovic, Mary Gegick, Mikal Gilger, Kimberly Groshong, Kotchanun Jittavanich, Brad Justice, Jinglu Li, Teng Li, Bin Liu, Pei Qing Luo, Toma Marinov, Scott Meech, Kevin Moore, Stephanie Morman, Lance Nelson, Aaron Orians, Michael Perry, Michael Ralich, Brandon Reed, Mark Roberts, Joseph Tucker, Jane Zhang.

Currently directing or co-directing **three doctoral students:** Joshua Johnston-joint with Jack Braun, Mech Eng, Kyle Miller-Integrated Biosciences program, Brandon Reed-joint with Kevin Kreider and Iqbal Husain, and **thirteen Master's students:** Joshua Adams, Sandra Addo, Edrissa Gassama, Matt Hoffman, Erin McGough, Diana Macavei, Robert Moser, David Nassar, Gary Orum, Pam Robison, Sara Rollo, Pat Starvaggi, Mary Zitnik.

Directed or co-directed **twenty-one Senior Honors Projects:** Ines Busuladzic, Kim Christie, James DiLellio, Ryan Evans, Jackie Foust, Jared Hicks, Laurie Humphreys, Walter Keifer, Kevin Kupchella, Brian McDonald, Jason McHood, Kevin Moore, Jennifer Mowrey, Aaron Orians, Jan Spears, Carl Stitz, Robert Streharsky, Gary Traicoff, Joseph Tucker, Jeffrey Umlauf, Mira Vukelic.

Currently directing or co-directing **eleven Honors projects:** Joshua Adams, Matt Hoffman, Adam Martinez, Robert Moser, Denielle Ricciardi, Sara Rollo, Corey Simon, Pat Starvaggi, Andrew Stine, Brian Vanscoy, Mary Zitnik.

REFEREED JOURNAL PUBLICATIONS:

1. "On Asymptotic Solutions and Boundary-Value Problems Defined on Thin Domains," G. W. Young and S. H. Davis, *Quarterly of Applied Mathematics*, Vol. XLII, January 1985, pp. 403-409.
2. "Directional Solidification with Buoyancy in Systems with Small Segregation Coefficient," G. W. Young and S. H. Davis, *Physical Review B.*, Vol. 34, September 1986, pp. 3388-3396.
3. "The Flow Induced by a Plate Oscillating Across a Fluid Interface," G. W. Young and S. H. Davis, *Journal of Fluid Mechanics*, Vol. 174 (1987), pp. 327-356.
4. "Rivulet Instabilities," G. W. Young and S. H. Davis, *Journal of Fluid Mechanics*, Vol. 176 (1987) pp. 1-31.

5. "Anisotropic Interface Kinetics and Tilted Cells in Unidirectional Solidification," G. W. Young, S. H. Davis, and K. Brattkus. *Journal of Crystal Growth*, Vol. 83 (1987), pp. 560-571.
6. "Morphological Instabilities in Directional Solidification of a Binary Alloy: End Effects," G. W. Young and S. H. Davis. *SIAM Journal on Applied Mathematics* Vol. 49 (1989), pp. 152-164.
7. "Steady-State Thermal Solutal Diffusion in a Float Zone," G. W. Young and A. Chait. *Journal of Crystal Growth*, Vol. 96 (1989), pp. 65-95.
8. "Morphological Instability in a Float Zone," L. B. Humphreys, J. A. Heminger, and G. W. Young. *Journal of Crystal Growth*, Vol. 100 (1990), pp. 31-50.
9. "Surface Tension Driven Heat, Mass, and Momentum Transport in a Two-Dimensional Float-Zone", G. W. Young and A. Chait, *Journal of Crystal Growth*, Vol. 106 (1990), pp. 445-466.
10. "Flow Effects in a Vertical CVD Reactor", G. W. Young, S. I. Hariharan, and R. Carnahan, *SIAM Journal on Applied Mathematics*, Vol. 52 (1992), pp. 1509-1532.
11. "Plasma Carburization of an Axisymmetric Steel Sample", M. Gegick and G. W. Young, *SIAM Journal on Applied Mathematics*, Vol. 54 (1994), pp. 877 - 906.
12. "An Asymptotic Model of the Mold Region in a Continuous Steel Caster", J. DiLellio and G. W. Young, *Metallurgical Transactions*, Vol. 26b (December 1995), pp. 1225 - 1241.
13. "Modeling the time-dependent growth of single-crystal fibers", G. W. Young and J. A. Heminger, *Journal of Crystal Growth*, Vol. 178 (1997), pp. 410 - 421.
14. "Modeling of the Edge-Defined Film Fed Growth Process", G. W. Young and J. A. Heminger, *Journal of Engineering Mathematics*, Vol. 38 (2000), pp. 371 - 390.
15. "An Asymptotic Approach to Mathematically Modeling Ohno Continuous Casting of Cored Rods", S. A. Morman and G. W. Young, *Journal of Engineering Mathematics*, Vol. 38 (2000), pp. 51 - 76.
16. "Comparison of Asymptotic Solutions of a Phase-Field Model to a Sharp-Interface Model", S. I. Hariharan and G. W. Young, *SIAM Journal on Applied Mathematics*, Vol. 62 (2001), pp. 244-263.
17. "Asymptotic Solutions of a Phase-Field Model for Alloy Solidification", C. B. Clemons, S. I. Hariharan and G. W. Young, *SIAM Journal on Applied Mathematics*, Vol. 82 (2002), pp. 1952-1972.

18. "Measuring and Modeling Thermal Fluctuations at Nanometer Length Scales", R. M. Ralich, R. D. Ramsier, D. D. Quinn, C. B. Clemons, and G. W. Young, *Phys. Rev E*, Vol. 65 (2002), pp. 057601-1-4.
19. "Development of Experimental Techniques and an Analytical Model for Aluminum Nitriding", R. Evans, A. Salifu, G. Zhang, E. Evans, S. I. Hariharan and G. W. Young, *Surface and Coatings Technology*, Vol. 157 (2002), pp. 59-65.
20. "A Mathematical Model for Photopolymerization from a Stationary Laser Light Source", M. F. Perry and G. W. Young, *Macromolecular Theory and Simulations*, Vol. 14 (2005), pp. 26-39.
21. "Simulation of a One-Dimensional Phase-Field Model For Solidification", L. D. Nelson, J. A. Heminger, C. B. Clemons, G. W. Young, and S. I. Hariharan, *International Journal of Applied Mathematical Sciences*, Vol. 2 (2005), pp. 81-96.
22. "Squeezed-State Eigenfunctions of the Schrödinger Equation due to Geometric Confinement", R. M. Ralich, C. B. Clemons, G. W. Young, and R. D. Ramsier, *International Journal of Applied Mathematical Sciences*, Vol. 2 (2005), pp. 105-120.
23. "Asymptotic Solutions for a Time-Dependent, Axisymmetric Directional Solidification System", J. Bonfiglio, J. McHood, C. B. Clemons, D. Golovaty, and G. W. Young, *Journal of Crystal Growth*, Vol. 285 (2005), pp. 415-426.
24. "Multi-Scale Modeling, Simulations and Experiments of Coating Growth on Nanofibers: Part I - Sputtering", A. Buldum, I. Busuladzic, C. B. Clemons, L. H. Dill, K. L. Kreider, G. W. Young, E. A. Evans, G. Zhang, S. I. Hariharan, and W. Keifer, *J. Applied Physics*, Vol. 98, (2005), pp. 044303-044303-10.
25. "Multi-Scale Modeling, Simulations and Experiments of Coating Growth on Nanofibers: Part II – Deposition", A. Buldum, C. B. Clemons, L. H. Dill, K. L. Kreider, G. W. Young, X. Zheng, E. A. Evans, G. Zhang, and S. I. Hariharan, *J. Applied Physics*, Vol. 98, (2005), pp. 044304-044304-16.
26. "Field Emission from Coated Nanowires", T. Marinov, A. Buldum, C. B. Clemons, K. L. Kreider, G. W. Young, and S. I. Hariharan, *J. Applied Physics*, Vol. 98, (2005), pp. 044314-044314-11.
27. "Asymptotic Solutions for an Axisymmetric, Stagnant Film Model of Directional Solidification", C. B. Clemons, D. Golovaty, and G. W. Young, *Journal of Crystal Growth*, Vol. 289, Issue 2 (2006), pp. 715-726.
28. "An Asymptotic Analysis for Directional Solidification of a Binary System", K. Kupchella, C. B. Clemons, D. Golovaty, and G. W. Young, *Journal of Crystal Growth*, Vol. 292, (2006), pp. 111-124.

29. "One-Dimensional Dynamics of Nano-Scale Oxidation", A. Orians, C. B. Clemons, D. Golovaty, and G. W. Young, *Surface Science*, Vol. 600, (2006), pp. 3297-3312.
30. "Continuum and atomistic modeling of interacting graphene layers", J.P. Wilber, C. B. Clemons, G. W. Young, A. Buldum and D.D Quinn, *Phys. Rev. B*, Vol. 75 (2006), pp. 045418-1 – 045418-10.
31. "Modeling and Simulation of Axisymmetric Coating Growth on Nanofibers", K. Moore, C. B. Clemons, K. L. Kreider, and G. W. Young, *J. Applied Physics*, Vol. 101 (2007), pp. 064305-1 – 064305-12.
32. "Buckling Instabilities in Coupled Nano-Layers", D. D. Quinn, C. B. Clemons, J. P. Wilber, G. W. Young and A. Buldum, *International Journal of Non-Linear Mechanics*, Vol. 42 (2007), pp. 681-689.
33. "Effects of the Electric Field Shape on Nano-Scale Oxidation", S. Djurkovic, C. B. Clemons, D. Golovaty and G. W. Young, *Surface Science*, Vol, 61 (2007), pp. 5340-5358.
34. "Modeling, Simulation and Experiments of Coating Growth on Nanofibers", P. Hamrick, C. B. Clemons, J. Heminger, K. L. Kreider, G. W. Young, A. Buldum, E. Evans and G. Zhang, *J. Applied Physics*, Vol. 103 (2008), pp. 044304 – 044304-14.
This paper was highlighted and selected to appear in the March 10, 2008 issue of Virtual Journal of Nanoscale Science & Technology. The Virtual Journal, which is published by the American Institute of Physics and the American Physical Society in cooperation with numerous other societies and publishers, is an edited compilation of links to articles from participating publishers, covering a focused area of frontier research.
35. "Solutions of Two-Factor Models with Variable Interest Rates", J. Li, C. B. Clemons, G. W. Young, and J. Zhu, *Journal of Computational and Applied Mathematics*, Vol. 222 (2008), pp. 30-41.
36. "Modeling and Simulation of Coating Growth on Nanofibers", J. Wilder, C.B. Clemons, K.L. Kreider, G.W. Young, E. Evans and G. Zhang, *J. Applied Physics*, Vol. 105 (2009), pp. 0543171-0543178.

REFEREED PROCEEDINGS PAPERS AND BOOK CHAPTERS

1. "Coupled Buoyancy/Morphological Instability in Systems with Small Segregation Coefficient," G. W. Young and S. H. Davis, *Proceedings of the Tenth U.S. National Congress of Applied Mechanics*: Austin, 1986, pp. 237-248.

2. "Steady State Thermal-Solutal Convection and Diffusion in a Simulated Float Zone", G. W. Young and A. Chait, *Low-Gravity Fluid Dynamics and Transport Phenomena*, edited by Jean N. Koster and Robert L. Sani, Vol. 130 (1990) Progress in Astronautics and Aeronautics, pp. 119-157.
3. "Float Zone Modelling: Transport Phenomena and Morphological Stability", G. W. Young, Proceedings of the *Eleventh U.S. National Congress of Applied Mechanics*, Tucson, Arizona, May 21-25, 1990, *Appl. Mech. Rev.*, Vol. 43, no. 5, Part 2, May 1990, pp. S63-S69.
4. "Mathematical Description of Viscous Free Surface Flows", G. W. Young, *Free Boundaries in Viscous Flows - IMA Volumes in Mathematics and its Applications - Vol. 61*, edited by Robert A. Brown and Stephen H. Davis
5. "Photo-Polymerization Applied to Stereolithography", G. W. Young, et. al., IMA Preprint Series # 1254 - *Mathematical Modeling for Instructors - Institute for Mathematics and its Applications*, University of Minnesota - September 1994
6. "Water Equilibration in Vapor Diffusion Crystal Growth", G. W. Young, E. Gray, and A. Chait, *Mathematical Modeling: Case Studies from Industry*, edited by Ellis Cumberbatch and Alistair Fitt, Cambridge University Press (2001), pp. 199-228
7. "Coating Growth on Nanofibers: Multi-Scale Modeling, Simulations and Experiments", A. Buldum, C. Clemons, E. A. Evans, K. L. Kreider, and G. W. Young, *Tech. Procs. of Nanotechnology 2004*, Vol. 3 (2004) p. 346.
This paper was selected for the Nanotech Virtual Showcase at the Nanotech 2004 Conference and Tradeshow and for Nanopolis - The Distributed Knowledge Network for Nanoscale Science and Engineering. The Nanotech Virtual Showcase featured the best papers of the conference through multimedia animations representing their central concept.
8. "Buckling Instabilities in Coupled Nanobeams", D. D. Quinn, A. E. Pudloski, C. B. Clemons, J. P. Wilber, G. W. Young, and A. Buldum, *ENOC-2005*, Eindhoven, Netherlands, August (2005), pp. 1-8.
9. "Buckling Instabilities in Coupled Nanoscale Structures", A. E. Pudloski, C. B. Clemons, J. P. Wilber, G. W. Young, A. Buldum, and D. D. Quinn, *2005 ASME International Mechanical Engineering Congress and Exposition*, Orlando, Florida, November (2005), pp. 1-9.
10. "Modeling a Porous Slider Bearing with an External Reservoir", J. Johnson, M.J. Braun and G. W. Young, *Proceedings of the STLE/ASME International Joint Tribology Conference*, San Diego, California, October (2007), pp. 1-2.

11. "An Asymptotic Expansion Approach to Modeling the Heat Transfer in a Reservoir-Extended Porous Slider Bearing", J. Johnson, M.J. Braun and G. W. Young, *Proceedings of the STLE/ASME International Joint Tribology Conference*, Miami, Florida, October (2008), pp. 1-2.

PATENTS:

1. International Application No. PCT/US2008/003499, International Publication No. WO 2008/115473, "Self-Acting, Self-Circulating Fluid System without External Pressure Source and Use in Bearing System", M. J. Braun, A. M. Balasoiu, S. I. Moldovan, G. W. Young and J. D. Johnston, September 25, 2008.

RESEARCH GRANTS:

1. "Mathematical Sciences Research Equipment" - NSF Grant No. DMS-8604047, \$60,740, with S.I. Hariharan and D. Buchthal.
2. NASA-ASEE Case Lewis Summer Faculty Fellowship Program, Materials Division - Metals Science Branch - Microgravity Applications, June 1 to August 21, 1987, \$9,600.
3. NASA Lewis Cooperative Agreement for MMSL Software and Hardware Development - NASA Grant No. NCC 3-104, (1988 - 1995): \$1,555,618, with S. I. Hariharan.
4. "Modeling of Material Processing Systems" - 1989 Presidential Young Investigator Award 1989: NSF Grant No. DMS-89-57534 (PYI), (1989 - 1994): \$260,896
Industrial Partners associated with this award:

A. Schulman Inc.:	\$66,876
Apple Computer, Inc.:	\$795
BP America:	\$10,000
General Electric:	\$10,000
SUN Microsystems:	\$2,601
The Timken Company:	\$30,000
IBM Equipment Grant	\$15,624
5. NASA Lewis Cooperative Agreement for Software and Hardware Development in Computational Materials Science - NASA Grant No. NCC 3-494, (1996 - 1998): \$417,996, with S. I. Hariharan.
6. NSF Division of Mathematical Sciences - "Modelling of Material Processing Systems" NSF Grant No. DMS-95-32021, (1996 - 1998): \$58,948.
7. NSF Division of Mathematical Sciences - "Modeling and Scaling of Material Processing Systems" NSF Grant No. DMS-99-72185, (1999 - 2002): \$122,500, with S. I. Hariharan.

8. NSF Division of Mathematical Sciences - “Homogenization and Materials Science Conference”, NSF Grant No. DMS-00-72259, (2000): \$15,000, with L. Beryland and S. I. Hariharan.
9. NASA Glenn Cooperative Agreement for Modeling, Software and Hardware Development for Analytical and Computational Materials Science - NASA Grant No. NCC 3-716, (1999 - 2003): \$570,292, with S. I. Hariharan and C. B. Clemons.
10. NSF Division of Mathematical Sciences - “Multi-Scale Analysis and Simulation of Nanofiber Coatings: Growth and Applications” NSF Grant No. DMS-03-05580, (2003 - 2004): \$106,250, with C. B. Clemons, K. Kreider, E. Evans, A. Buldum, and S. I. Hariharan.
11. NSF Division of Mathematical Sciences - “Modeling and Analysis of an Electrochemical Nanocell” NSF Grant No. DMS-03-05577, (2003 - 2004): \$100,000, with C. B. Clemons, D. Golovaty, and S. I. Hariharan.
12. NASA Glenn Cooperative Agreement for Theory, Modeling, Software and Hardware Development in Computational Materials Science - NASA Grant No. NCC 3-1094, (2003 - 2004) \$64,000, with C. B. Clemons and S. I. Hariharan.
13. NASA Glenn Cooperative Agreement for Theory, Modeling, Software and Hardware Development in Computational Materials Science - NASA Grant No. NNC04GB27G, (2004 - 2007) \$128,000, with C. B. Clemons and S. I. Hariharan.
14. NSF Division of Mathematical Sciences - “Modeling, Simulation, and Analysis of Bending Nanotubes” NSF Grant No. DMS-04-07361, (2004 - 2008): \$267,935, with P. Wilber, D. Quinn, D. Golovaty, and A. Buldum.
15. NSF DMI - “NIRT: Nanofiber Manufacturing for Energy Conversion and Utilization” NSF Grant No. DMI-0403835, (2004 - 2008): \$1,300,000, with D. Reneker, G. Chase, E. Evans, D. Smith, R. Ramsier, A. Buldum, S. I. Hariharan, K. Kreider, and A. Yarin.
16. NIH ROI GM086895- “Collaborative Research: Polymeric Drug Delivery Systems and Biofilms in the Lung”, Year 1 - August 2008 - June 2009: \$349,340, with Gerald Young, Wiley Youngs, Stephanie Lopina, Curt Clemons, Pat Wilber, Dan Ely, Amy Milsted, Yang Yun, Carolyn Cannon and Jeff Leid.
17. Ohio Board of Regents Research Challenge - June 1996 - June 1997 - \$40,000
Ohio Board of Regents Research Challenge - June 1998 - June 1999 - \$20,000
Ohio Board of Regents Research Challenge - July 1999 - July 2000 - \$20,000
Ohio Board of Regents Research Challenge - July 2003 - July 2004 - \$7,354
Ohio Board of Regents Research Challenge - July 2003 - July 2004 - \$7,652
Ohio Board of Regents Research Challenge - August 2008 - June 2012 - \$20,000

CONSULTING:

Battelle Columbus Division - Contract DAAL03-86-D-0001 Report Issued: "The Physics of High Energy Pulsed Dye Lasers."

MEMBERSHIP IN PROFESSIONAL AND/OR HONORARY SOCIETIES:

American Physical Society - Division of Fluid Dynamics.
 Society of Industrial and Applied Mathematics.
 Sigma Xi, Scientific Research Society.
 ASM International The Materials Information Society.

AWARDS:

1981 - 1984	National Science Foundation Graduate Fellowship.
1989	National Science Foundation Presidential Young Investigator Award - Applied Mathematics.
1989, 1993	University of Akron Faculty Recognition Award
1994	University of Akron Outstanding Teacher of the Year Award
2003	University of Akron Favorite Faculty of the Year Award

REFEREE SERVICES:

Acta Materialia; Applied Microgravity Technology; International Journal of Engineering Science; Journal of Colloid and Interface Science; Journal of Crystal Growth; Journal of Engineering Mathematics; Journal of Fluid Mechanics; Measurement Science and Technology; Nanotechnology; Physics of Fluids; Quarterly Journal of Mechanics and Applied Mathematics; SIAM Journal of Applied Mathematics

Reviewer and Panel Participant - National Science Foundation
 Reviewer and Panel Participant - NASA Microgravity Sciences and Applications Program

Judge, Head Judge and Challenge Master - Northeastern Ohio Science Fair, Destination Imagination