

WIESLAW K. BINIENDA, Ph.D., F. ASCE

Professor

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EDUCATION:

- Ph.D.* Mechanical Engineering, Drexel University (1987)
- M.S.* Mechanical Engineering, Drexel University (1985)
- M.S.* Motor Vehicles and Heavy Duty Machines, Warsaw Technical University (1980)

PROFESSIONAL EXPERIENCE:

MANAGERIAL:

Civil Engineering Department, University of Akron

- **Chairman (2003 – present)**
- Interim Chairman (2000 – 2003)

Gas and Turbine Research and Testing Laboratory, University of Akron

- ***Co-Director (2003 – present)***

Aerospace Division, ASCE

- Executive Committee Chairman (2008 -2009)
- General Chair of *2008 Earth & Space International Conference*
- Technical Co-Chair of *2006 Earth & Space International Conference*
- Member of Executive Committee (2005 – present)
- Chairman of the Advanced Composite Materials and Structures Committee (2000 – 2005)
- Deputy Chairman of the Advanced Composite Materials and Structures Committee (1998 – 2000)

Journal of Aerospace Engineering, ASCE

- **Editor-in-Chief (November 2010 – present)**
- Associate Editor for Composite Materials and Advanced Structures (2008 -2011).

Structures, Structural Dynamics, and Materials (SDM) Conference Liaison Committee, ASCE

- Chairman (2008 – present)
- Student paper Competition Chairman – SDM Conference 2010
- Associate Chairman (2005 – 2008)
- Secretary (2000 – 2005)

University of Akron

- Senator (1999 – 2002)

ACADEMIC:

Updated 2/8/2012

University of Akron

- **Professor, Department of Civil Engineering (2000 – present)**
- *Associate Professor*, Department of Civil Engineering (1993 – 2000)
- *Assistant Professor*, Department of Civil Engineering (1988 – 1993)

Drexel University

- *Post Doctoral Fellow*, Mechanical Engineering Department (1987 – 1988)

Temple University

- *Adjunct Professor*, Mechanical Engineering Department (1986 – 1987)

Warsaw Technical University

- *Research Assistant*, Motor Vehicles and Heavy Duty Machines (1980 – 1982)

ACADEMIC SERVICE:

THE UNIVERSITY OF AKRON:

- Supercomputing Committee, Ohio Supercomputer Center (1993 – present)
- Resource Committee, Ohio Supercomputer Center (1993 – present)
- Software Committee, Ohio Supercomputer Center (1993 – present)
- Wellbeing Committee (2000 – 2004)
- Research Committee (2000 – 2004)
- Student Policy Committee (1998 – 1999)
- Advisory Committee for Electronic Delivery System (1994 – 1995)
- Hearing Board Pool (2007 – present)

THE COLLEGE OF ENGINEERING:

- Dean's Advisory Research Committee and Space Committee (2000 – present)
- New Programs in Architecture Engineering Committee (2000 – present)
- Construction Engineering Committee (2000 – present)
- Aerospace Engineering Committee (2000 – 2006)
- Search Committee for the Dean of the College of Engineering (1999 – 2001)
- Graduate Curriculum Committee (1994 – 1995)
- Engineering Computer Policy and Management Committee (1993 – 1999)

THE CIVIL ENGINEERING DEPARTMENT:

- Oversight of all committees of the Civil Engineering Department as Interim Department Chair and Department Chair (2000 – present)
- Undergraduate Curriculum Committee (1996 – 2000)
- Structural Group Planning Committee (1994 – 2000)
- Department Search Committees (1994 – 2000)
- Structural Group Equipment Committee - Materials and Structures Group (1994 – 2000)
- Graduate Committee (1994 – 1998)

EXTERNAL COMMITTEES:

- BUGC Human Resources Task Force, Greater Cleveland Partnership (2003 – present)
- Technical Advisory Committee for FOSBEL, Inc. (1991 – 1994)
- ASCE Aerospace Division Executive Committee member (2004 – 2010)
- Member of the Organizing Committee of International Scientific-Technical Conference, “Advance in Petroleum and Gas Industry and Petrochemistry” – Lviv 2009
- Expert Evaluator for the Foundation of Polish Science, 2008 – present
- SDM Conference Organizing Committee member and Chair of The Best Student Paper Committee – for 2010 SDM Conference, Orlando FL.

LEADERSHIP:

- Led ASCE Aerospace Division, organize Earth and Space Conferences, Sessions for Engineering Mechanics and SDM Conferences, Responsible for Student Paper Competition in 2010 SDM Conference.
- Developed a project for the formation of the Intelligent Gas Turbine Engine Research Center (1\$M equipment funding)– \$2M for New Lab Building for the College, Co-director (2003 – present)
- Created Advisory Council for the Civil Engineering Department (2000 – present)
- Fundraised for undergraduate scholarships via CFCE (distributed scholarships for over \$70k per academic year) (2000 – present)
- Hired faculty members who rank in the College of Engineering as the highest in publication record and research funding at their ranks (2002)
- Initiated a proposal led by the Civil Engineering Department at the University of Akron for the formation of a Transportation Center in cooperation with Ohio University, University of Cincinnati, Central Ohio University, University of Dayton and Case Western Reserve University (2000). Funding at level of \$2M received for 2006-2010.
- Secretary - South Shore Yacht Club (2007-2008).

PROFESSIONAL DEVELOPMENT:

- NSF Workshop for Engineering Materials Laboratory Teaching – NWU 1989
- ExCEED – during CE Head and Chairs meeting 2005, 2010

FELLOWSHIPS, CERTIFICATES, AND AWARDS:

- NASA Lewis Research Center Fellowship (Summer 1989 and 1990)
- The University of Akron Certificate for The Collaborative Performance Review Process Training for Supervisors (June 18, 2001)
- College of Engineering Outstanding Researcher Award – Granted by the peer group in the College of Engineering (April 25, 2002)
- The University of Akron Fifteen Year Award (May 7, 2003)

- NASA “Turning Goals Into Reality Award” for valuable contribution to Jet Engine Containment Concepts and Blade-Out Simulation Team and Exceptional Progress Toward Aviation Safety (September 2, 2004)
- Certificate of Achievement for Faculty Mentor/Learning Assistant Partnership (2004, 2005)
- Akron Public School Certificate – International Baccalaureate Task Force Certificate (July 10, 2005)
- ASCE 2006 Certificate of Appreciation in recognition for outstanding service.
- 2007 Educational Talent Search Certificate for the University of Akron’s “College for a Day” Program.
- ASCE Fellow - awarded November 9, 2007.
- Polonia Technica Certificate of Appreciation September 12, 2007.
- “2008 Gold Award” - American Polish Engineering Association.
- NASA Glenn Patent Award for “Strain Rate Dependent Analysis of Polymer Matrix Composites STRANAL-PMS Version 2” – LEW-17910-1, June 3, 2009.
- NASA Glenn Technical Brief Award for “A Modeling Technique and Representation of Failure in the Analysis of Triaxial Braided Carbon Fiber Composites” – LEW-18435-1 June 10, 2009.
- The Louis A. Hill, Jr. Award, April 15, 2010.
- ASCE Aerospace Division 2010 Outstanding Professional Service Award
- ASCE Aerospace Division 2011 Outstanding Technical Contribution Award

TEACHING ACTIVITIES:

PH.D. DISSERTATIONS DIRECTED

1. "Theory of Crack Initiation from Smooth Surfaces and its Application" by Anping Hong - defended November 21, 1994, co-advisor Prof. Z. Bazant, Civil Engineering Department, Northwestern University, Evanston, IL 60208-3109. Committee members: R. Liang, A. Saleeb, D. Robinson and Y-J Lin.
2. "The Analysis of Multiple Cracks in Non-homogeneous Material" by Ming Zhou – defended May 12, 1995. Committee members: Fertis, Robinson, Kankam, Saleeb, Hariharan
3. "Numerical modeling of breast cancer by detection of the surface deformation perturbation" - by J. Q. Neifert - defended February 10, 1995 (together with biomedical and mechanical engineering departments).
4. "Crack Growth in Functionally Graded Materials” by Nadim Shbeeb defended September 9, 1998. Committee members: Robinson, Menzemer, Zobel, Krieder.
5. "Analytical Modeling of Imperfect Bond Between Coated Fiber and Matrix Material” by Latife Kuguoglu, June 22, 1999. Committee members: Robinson, Menzemer, Kreider, Hajjafar, Hoo Fatt.
6. “Multiple kinked and branched cracks in anisotropic plate” by Khaled Hamad, September 2002. Committee members: HooFatt, Menzemer, Kreider.
7. “Composite/concrete inter-phase performance” by Salim Baraka, May 2002. Committee members: P. Qiao, C. Menzemer and K. Kreider.
8. “Material Modeling of Strain Rate Dependent Polymer and 2D tri-axially Braided Composite”, by Jingyun Cheng, April 15, 2006. P. Qiao, A. Saleeb, R. Goldberg, E. Pan, and K. Kreider.
9. “Nonlinear Strain Rate Dependent Composite Model for Explicit Finite Element Analysis” by Xiahua Zheng, April 22, 2006. Committee members: P. Qiao, A. Saleeb, R. Goldberg, E. Pan, and K. Kreider.

10. "Mechanics of Bi-Material beams and its application to mixed-mode fracture of wood-FRP" by Cole Hamey, July 7, 2007, Committee members: P. Qiao, C. Menzemer, D. Quinn, and K. Kreider.
11. "Low Velocity Impact Analysis of Composite Laminate Plates and sandwich Panels", by Daihua Zheng, Committee members: A. Saleeb, E. Pan, C. Menzemer, X. Gao, and J. Young, December 2007.
12. "The Experimental and Analytical Characterization of the Macromechanical Response for Triaxial Braided Composite Materials", by Justin Littell, Committee members: E. Pan, C. Menzemer, K. Kreider, M. HooFatt, and R. Goldberg, September 2008.
13. "Mesomechanical Model for Failure Study of Triaxial Braided Composite Materials", by Xuetao Li, Committee members: E. Pan, G. Yun, K. Kreider, X. Gao, and R. Goldberg, October 2010.

MASTERS THESES DIRECTED

1. Crack Development in Cross-Ply Laminates under Uniaxial Tension - Andrew L. Gyekenesi, graduated with M.Sc. in CSU Civil Engineering Department, March 1993.
2. Contact Problems for Multilayer Composite Half-plane with HoneyComb substrate - Wang Zhong, April, 1995.
3. High Performance Filament Wound Composite Tubes Analysis - Yong Wang, May, 1996.
4. Retrofitting of Concrete Beam using Graphite Epoxy Layers - Steven Tysl, May, 1999.
5. Vibration Damping in a Composite Shaft using Piezoelectric Patches – Vikram Dhruva, December 2000.
6. Creep-Rupture of Composite Materials - Yanx Cai, July 2002.
7. The preliminary Research on the Composite Material use in Highway Guardrail System – Guozhong Chen, January 2004.
8. Simplified Creep-Rupture material Model for Implicit FEA - Fengxia Ouyang, November 2005.
9. Simulation of Ballistic Impact Behavior of Tri-Axially Braided Composite Half-Cylinders - Marcin Staniszewski, April 2007.
10. Non-Destructive Investigation & FEA Correlation on an Aircraft Sandwich Composite Structure – Justin Bail, December 2007.
11. High Strain Rate Data Acquisition of 2D Braided Composite Substructures – Chuck Ruggeri, September 2009.

SPECIAL PROJECTS DIRECTED

- Interaction of Two Annular Interfacial Cracks - Partial Bound of Fiber - Wanming Lao - Summer 1993.
- Smart Structures in Structural Engineering, M.Sc. Project by Joushua Raymond, Summer 1999.
- Efficiency Estimation for Multibolted GFRP Single Connected Angles, M.Sc. Project by Traian-Ovidiu Gheorghiu, Summer 2000.
- Singularity Index for a Kinked Crack in Anisotropic Material using Finite Element Analysis – M.Sc Project by Khaled A. Hamad, May 2001.

ACADEMIC COURSES TAUGHT

The University of Akron

- 702:801 Plates and Shells
- 710:802 Advanced Composite Mechanics
- 610:803 Introduction to Composite Mechanics
- 682:701 Elasticity
- 694:702 Damage Mechanics in Composites
- 694:703 Design with Advanced Composite Materials
- 694:704 Polymer Composites for Civil and Structural Engineering.
- 101:001 Tools for Engineering Lab
- 201:002 Statics
- Internet Lecture, available at <http://www.ecgf.uakron.edu/~civil/statics>
- 202:003 Introduction to Mechanics of Solids
- 380:001 Engineering Materials Lab

Drexel University

- G606 Solid Mechanics II
- E321 Statics
- E323 Dynamics

Temple University

- E101 Introduction to Fortran 77

WORKSHOPS AND SHORT COURSES:

Department of Polymer Engineering, University of Technology, Malaysia (Summer 1995)

- Micromechanics Approach in Composite Materials
- Macromechanics Approach in Composite Materials
- Fracture and Impact Problems in Composites

CURRICULUM DEVELOPMENT:

- Member of the Mid-West Council of Chairs – ABET accreditation and curriculum development.
- ACBM Undergraduate Faculty Coalition for Engineering Materials Curriculum Development, from 1993 to present.
- Served in Undergraduate Mechanics Focus Group organized by Simon & Schuster Education Group, Chicago Il., May 4 and 5, 1992.
- Served in Ad-hoc UA-CSU Composite Bridge Committee, 1991 - 1999.
- ABET driven modification to Civil Engineering Program.
- Participation in the development of Aerospace Engineering Systems Program
- Development of Architectural Engineering and Construction Engineering Programs.
- Modification of CE program – addition of Senior Design Class 2000, Modification of Tools for Engineering 2006, addition of introduction to Design, 2006.

SCHOLARLY PUBLICATIONS:

**Books (2),
Editorial of Special Issues (5),**

Refereed Papers (53)
NASA Publications (20)
Proceedings Papers and Other Publications (66)
Patent Applications (5)
Citations (310)

BOOKS :

1. "Earth and Space 2006 - Engineering, Construction, and Operations in Challenging Environments", R.B. Malla, W.K. Binienda, and A.K. Maji, ASCE 2006, ISBN 0-7844-0830-0.
2. "Earth and Space 2008 - Engineering, Science, Construction, and Operations in Challenging Environments" W. K. Binienda, ASCE 2008, ISBN 978-0-7844-0988-6.

PATENTS : "METHOD FOR STRAIN RATE DEPENDENCE ANALYSIS" US 2010/0299112 A1

REFEREED JOURNAL EDITORIALS:

1. W.K. Binienda and M.J Pindera, , editorial special issue of Journal of Aerospace Engineering, Vol.15, No.3, p. 73, 2002.
2. W.K. Binienda and P. Qiao, "Advanced Materials and Structures: Analysis methods and Results," editorial special issue of Journal of Aerospace Engineering, Vol. 18, pp. 1-2, 2005.
3. P. Qiao and W.K. Binienda, "Impact Mechanics of Composite Materials for Aerospace Application", editorial special issue of Journal of Aerospace Engineering, Vol. 21, pp.117-118, 2008.
4. R. K. Goldberg and W.K. Binienda, "Ballistic Impact and Crashworthiness Response of Aerospace Structures", editorial special issue of Journal of Aerospace Engineering, V. 22, No. 3, pp. 199-200, 2009.
5. W.K. Binienda, "Mechanics of Advanced Materials and Structures", editorial special issue of Journal of Aerospace Engineering, V.24, No.2, pp. 145-146, 2011

REFEREED JOURNAL PAPERS :

1. L.S. Penn, C.T. Chou, A.S.D. Wang, W.K. Binienda, "The Effects of Matrix Shrinkage on Damage Accumulation in Composites," Journal of Composite Materials, Vol. 23, pp. 570-586, 1989.
2. W.K. Binienda, F. Delale, A.S.D. Wang, "Mixed-Mode Strain Energy Release Rates for a Cracked Unidirectional Composite," ASTM-STP 1059, 1989.
3. W.K. Binienda, A.S.D. Wang, F. Delale, "Analysis of Bent Crack in Unidirectional Fiber Reinforced Composites," International Journal of Fracture, Vol. 47, pp 1-24, 1991.
4. W.K. Binienda, D.N. Robinson, "Creep Model for Metallic Composites Based on Matrix Testing," J. of Engineering Mechanics, ASCE, Vol. 117, pp. 624-639, 1991.
5. W.K. Binienda and E. Reddy, "Mixed-Mode Fracture in Unidirectional Graphite Epoxy Composite Laminates with Central Notch," J. of Reinforced Plastics and Composites, v. 11, pp. 324-338, 1992.
6. W.K. Binienda, G.D. Roberts, and D.S. Papadopoulos, "Effect of Contact Stresses in Four Point Bend Testing of Graphite/Epoxy and Graphite/PMR-15 Composite Beams," SAMPE Quarterly Journal, v. 23, No. 3, pp. 20-28, 1992.

7. D.N. Robinson, W.K. Binienda, and M. Miti-Kavuma, "Creep and Creep Rupture of Metallic Composites," *J. of Engineering Mechanics*, ASCE, Vol. 118, pp. 1646 - 1660, 1992.
8. W.K. Binienda, S.M. Arnold, H.Q. Tan, and M.H. Xu "Stress Intensity Factors in a Fully Interacting, Multicracked, Isotropic Plate," *Computational Mechanics*, v. 13, pp. 1-18, 1993.
9. W.K. Binienda and M.J. Pindera, "Frictionless Contact of Layered Metal Matrix and Polymeric Matrix Composite Half Planes," *Composite Science and Technology Journal*, Vol. 50, No. 1, pp. 119-128, 1994.
10. A. Gyekenesi, J. Hemann and W.K. Binienda, "Crack Development in Carbon/Polyimide Cross-ply Laminates under Uniaxial Tension," *SAMPE Journal*, Vol. 30, No. 3, pp.17-27, 1994.
11. W.K. Binienda, "Stress Intensity Factor for Fully Interacting Cracking in a Multi- Crack Solid," *ASME Journal of Offshore Mechanics and Arctic Engineering*, *Journal of Offshore Mechanics and Arctic Engineering*, Vol. 116, No. 2, pp. 56-63, 1994.
12. E.S. Reddy and W.K. Binienda, "Prediction of Crack Initiation in Unidirectional Composite Beams Subjected to Four Point Bending," *Composite Engineering Journal*, Vol. 4, No. 7, pp. 703-714, 1994.
13. W.K. Binienda and A.F. Saleeb, "Contact Stress Phenomena in Numerical Simulation of Unidirectionally-Reinforced Composite Beams," *J. of Computers and Structures*, Vol.51, No. 3, pp.277-288, 1994.
14. W.K. Binienda, G.D. Roberts and A. Hong, "Influence of Material Parameters on Strain Energy Release Rates for Cross-Ply Laminates with a Preexisting Transverse Crack," *Composites Engineering Journal*, Vol.4, No. 12, pp. 1197-1210, 1994.
15. W.K. Binienda, "Crack Interaction in Brittle Anisotropic Materials," *Archives of Mechanics Journal*, Vol. 47, No. 1, pp. 39-67, 1995.
16. W.K. Binienda, S.M. Arnold, "Driving Force Analysis in an Infinite Anisotropic Plate with Multiple Crack Interactions," *J. of Fracture*, V. 71, pp. 213-245, 1995.
17. M. Zhou and W.K. Binienda, "Analysis of Multiple Cracks Close to Bi-material Interface," *Journal of Aerospace Engineering*, V. 10, no. 1, pp. 16-26, 1997.
18. Y.N. Li, A.P. Hong and W.K. Binienda "Theory of Cohesive Crack Model with Interactive Cracks," *Int. J. Solids and Structures*, Vol. 35, No. 11, pp. 981-994, 1998.
19. W. Zhang, W.K. Binienda and M.J. Pindera, "Frictionless Contact of Multilayered Composite Half Planes Containing Honeycomb Layer," *Composite Science and Technology Journal*, Vol. 59, pp. 331-343, 1999.
20. W. K. Binienda and Y. Wang, "Residual Stresses Reduction in Filament Wound Composite Tubes," *Journal of Reinforced Plastics and Composites*, Vol. 18, No. 8, pp. 684-701, 1999.
21. N.I. Shbeeb, W.K. Binienda and K.L. Kreider, "Analysis of the Driving Forces for Multiple Cracks in Infinite Non-homogeneous Plate, Part I: Analysis," *Journal of Applied Mechanics*, Vol. 66, pp. 492 - 500, 1999.
22. N.I. Shbeeb, W.K. Binienda and K.L. Kreider, "Analysis of the Driving Forces for Multiple Cracks in Infinite Non-homogeneous Plate, Part II: Parametric study," *Journal of Applied Mechanics*, Vol. 66, pp. 501 - 506, 1999.
23. N.I. Shbeeb and W.K. Binienda, "Analysis of an Interface Crack for a Functionally Graded Strip Sandwiched between two homogeneous layers of Finite Thickness," *Engineering Fracture Mechanics*, 64, pp. 693-720, 1999.
24. M. Zhou and W.K. Binienda, "Analysis of Multiple Cracks in a Sandwiched Layer," *Science and Engineering of Composite Materials*, Vol. 8, No. 6, pp. 293-309, 1999.
25. N.I. Shbeeb, W.K. Binienda and K.L. Kreider, "Analysis of a general crack in a functionally graded strip sandwiched between two homogeneous half planes," *International Journal of Fracture*, 104:1, pp. 23-50, 2000.

26. D.N. Robinson and W.K. Binienda, "Optimal Fiber Orientation in Creeping Composite Structures," *Journal of Applied Mechanics*, Vol. 68, pp. 213-217, 2001.
27. D.N. Robinson, and W.K. Binienda, "A Model of Viscoplasticity for Transversely Isotropic In Elastically Compressible Solids," *ASCE Journal of Engineering Mechanics*, Vol.127, No. 6, pp 567-573, 2001.
28. V. B. Birman, W. K. Binienda, and G. Townsend, "2D Maxwell Model," *Journal of Macromolecular Science and Physics*, B41 (2), pp.341-356, 2002.
29. G. Roberts, D.M. Revilock, W.K. Binienda, W.Z., Nie, S.B. Mackenzie, and K.B. Todd, "Impact Testing of Composites for Aircraft Engine Fan Cases," *Journal of Aerospace Engineering*, Vol. 15, No.3, pp. 104-110, 2002.
30. G. Song, P. Qiao, W.K Binienda, and G.P. Zou, "Active vibration damping of a composite beam using smart sensors and actuators," *Journal of Aerospace Engineering*, Vol. 15, No.3, pp. 97-103, 2002.
31. D. N. Robinson, W.K. Binienda, and M. Ruggles, "Creep of Polymer Matrix Composites, Part 1 – A Norton/Bailey Creep Law for Transverse Isotropy," *J. Engineering Mech.*, Vol. 129, No.3, pp.310-317, 2003.
32. W.K. Binienda, D.N. Robinson, and M. Ruggles, "Creep of Polymer Matrix Composites, Part 2 – A Monkman-Grant Failure Relationship for Transverse Isotropy," *J. Engineering Mech.*, Vol 129, No.3, pp.318-323, 2003.
33. L. Kuguoglu, W.K. Binienda, and A. Hajjafar, "Analytical Modeling of Imperfect Bond between Coated Fibers and Matrix Material," *International Journal of Fracture*, Vol. 123, pp. 63-80, 2003.
34. G. Song, X. Zhou, and W.K. Binienda, "Thermal Deformation Compensation of a Composite Beam Using Piezoelectric Actuators," *Smart Mater. Struct.* 13 No 1, pp. 30-37, 2004.
35. D.N. Robinson, and W.K. Binienda, "A Representation of Anisotropic Creep Damage in Fiber Reinforced Composites," *Journal of Applied Mechanics*, Vol. 72, no.4, pp.484-492, 2005
36. G.D. Roberts, J.M. Pereira, D.M. Revilock, W.K. Binienda, M. Xie, and M. Braily, "Ballistic Impact of Braided Composites with Soft Projectiles," *Journal of Aerospace Engineering*, Vol.18, pp. 3-7, 2005.
37. J. Cheng, and W.K. Binienda, "Simulation of Soft Projectiles Impacting Composite Targets using an Arbitrary Lagrangian-Eulerian Formulation" *AIAA Journal of Aircraft*, V.43, No.6, pp 1726-1731, 2006.
38. D. Zheng, and W. K. Binienda, "Effect of Permanent Indentation on the Delamination Treshold for Small Mass Impact on Plates", *IJSS*, V. 44/25-26, pp 8143-8158, 2007.
39. J. D. Littell, Ch. R. Ruggeri, R.K. Goldberg, G.D. Roberts, and W.K. Binienda, "Measurement of Epoxy Resin Tension, Compression, and Shear Stress-Strain Curves over a Wide Range of Strain Rates Using Small Test Specimen", *JAЕ Vol.21*, pp. 162-173, 2008.
40. J. Cheng, and W.K. Binienda, "Simplified Braiding through Integration Points Model for Tri-Axially Braided Composites", *JAЕ Vol.21*, pp. 152-161, 2008.
41. X. Zheng, and W.K. Binienda, "Rate Dependent Shell Element Composite Material Model Implementation in Ls-Dyna", *JAЕ Vol.21*, pp. 140-151, 2008.
42. R.K. Goldberg, G.D. Roberts, J.D. Littell, and W.K. Binienda, "Approximation of Nonlinear Unloading Effect in the Strain Rate Dependent Deformation Analysis of Polymer Matrix Materials Utilizing a State Variable Approach", *JAЕ Vol.21*, pp. 119-131, 2008.
43. J. D. Littell, W. K. Binienda, G.D. Roberts, and R.K. Goldberg, "Characterization of Damage in Triaxial Braided Composites under Tensile Loading", *Journal of Aerospace Engineering*, V. 22, No.3, pp.270-279, 2009.
44. D. Zheng, and W.K. Binienda, "A Semi-Analytical Solution of Wave-controlled Impact on Composite Laminates", *Journal of Aerospace Engineering*, V. 22, No.3, pp.318-323, 2009.

45. X. Li, W.K. Binienda, and J.D. Littell, "Methodology for Impact Modeling of Tri-axial Braided Composites using Shell Elements", *Journal of Aerospace Engineering*, V. 22, No.3, pp.310-317, 2009.
46. J.D. Littell, W.K. Binienda, W.A. Arnold, G.D. Roberts, and R.K. Goldberg, "Effect of Microscopic Damage Events on Static and Ballistic Impact Strength of Triaxial Braid Composites", *Composites: Part A*, Vol. 40, pp. 1846-1862, 2009.
47. X. Li, and W.K. Binienda, "Mesomechanical Model for Numerical Study of Two-Dimensional Triaxially Braided Composite", *Journal of Engineering Mechanics*, Vol. 136, No. 11, pp. 1366-1379, 2010.
48. X. Li, W.K. Binienda, and R.K. Goldberg, "Finite Element Model for Failure Study of Two Dimensional Triaxially Braided Composite", V. 24, No.2, pp.170-180, 2011.
49. R.K. Goldberg, B.J. Blinzler, and W.K. Binienda, "Investigation of a Macromechanical Approach to Analyzing Triaxially-Braided Polymer Composite", *AIAA Journal*, Vol. 49, No. 1, pp. 205-215, 2011.
50. S-B Nam, G.J. Yun, J. Carletta, D-H Kim, and W.K. Binienda, "A Novel Noncontact Electromagnetic Field-Base Sensor for Monitoring of Resonant Fatigue Tests", *Smart Materials and Structures*, Vo. 20, 2011. (doi:10.1088/0964-1726/20/3/035005)
<http://stacks.iop.org/0964-1726/20/035005>
51. G.J. Yun, A.B.M. Abdullah, and W.K. Binienda, Development of Closed-Loop High-Cycle Resonant Fatigue Testing System", *Experimental Mechanics*, pp 1-14, 2011
52. Chao Zhang, Wieslaw K. Binienda, Liming Zeng, Xiaochuan Ye, and Shuwen Chen, "Kinetic study of the novolac resin curing process using model fitting and model-free methods" *Thermochimica Acta*, 523, pp. 63-69, 2011, doi:10.1016/j.tca.2011.04.033
53. L.W. Kohlman, J.L. Bail, G.D Roberts, J.A. Salem, R.E. Martin, W.K. Binienda, "A notched Coupon Approach for Tensile Testing of Braided Composites" *Composites: Part A*, in press, January 2012, doi:10.1016/j.compositesa.2011.12.013.

NASA PUBLICATIONS:

1. W.K. Binienda, D.N. Robinson, S.M. Arnold and P.A. Bartolotta, "A Creep Model for Metallic Composites Based on Matrix Testing: Application to Kanthal Composites," NASA TM 103172, 1989.
2. D.N. Robinson, W.K. Binienda and M. Miti-Kavuma, "Creep and Creep Rupture of Strongly Reinforced Metallic Composites," NASA TR 185286, 1989.
3. W.K. Binienda, S.M. Arnold and H.Q. Tan, "Calculation of Stress Intensity Factors in an Isotropic Multi-C racked Plate: Part I - Theoretical Development," NASA TM 1 05766, 1992.
4. S.M. Arnold, W.K. Binienda, H.Q. Tan and M.H. Xu, "Calculation of Stress Intensity Factors in an Isotropic Multi-Cracked Plate: Part II - Symbolic/Numeric Implementation," NASA TM 105823, 1992.
5. W.K. Binienda and S.M. Arnold, "Driving Force Analysis in an Infinite Anisotropic Plate with Multiple Crack Interactions," NASA TM 106838, January 1995.
6. Wang Zhang, W.K. Binienda and M.J. Pindera, "Frictionless Contact of Mutilayered Composite Half Planes Containing Layers with Complex Eigenvalues," NASA/CR - 97-206309, December 1997.
7. N.I Shbeeb, W.K. Binienda and K.L. Kreider, "Analysis of Multiple Cracks in an Infinite Functionally Graded Plate," NASA CR 208676, 1998.
8. N.I. Shbeeb and W.K. Binienda, "Analysis of an Interface Crack for a Functionally Graded Strip Sandwiched between two homogeneous layers of Finite Thickness," NASA CR 208874, 1999.

9. N. I. Shbeeb, W.K. Binienda and K. L. Kreider, "Analysis of a general crack in a functionally graded strip sandwiched between two homogeneous half planes," NASA CR 209166, 1999.
10. X. Zheng, R. K. Goldberg, W.K. Binienda, and G. Roberts, "Ls-Dyna Implementation of Polymer Matrix Composite Model under High Strain Rate Impact," NASA/TM – 2003-212583.
11. L. H. Kuguoglu, W.K. Binienda and G.D. Roberts, "Fracture Mechanics Analysis of an Annular Crack in a Three-Concentric-Cylinder Composite Model," NASA/TM-2004-212328.
12. G.D Roberts, J.M. Pereira, D.M. Revilock, W.K. Binienda, M, Xie, and M. Braley, "Ballistic Impact of Braided Composites with a Soft Projectile," NASA TM – 2004-212973.
13. Justin D. Littell, Wieslaw K. Binienda, Robert K. Goldberg, and Gary D. Roberts, "A Modeling Technique and Representation of Failure in the Analysis of Triaxial Braided Carbon Fiber Composites", NASA TM 215245, 2008.
14. Justin D. Littell, Wieslaw K. Binienda, Robert K. Goldberg, and Gary D. Roberts, "Full-Field Strain Methods for Investigating Failure Mechanisms in Triaxial Braided Composites" NASA/TM-2008-215197.
15. Justin D. Littell, Wieslaw K. Binienda, Gary D. Roberts, and Robert K. Goldberg, "Characterization of Damage in Triaxial Braid Composites Under Tensile Loading" NASA/TM-2009-215645.
16. Gary D. Roberts, Robert K. Goldberg, Wieslaw K. Binienda, William A. Arnold, Justin D. Littell, and Lee W. Kohlman , "Characterization Triaxial Braided Composites Material Properties for Impact Simulation" NASA/TM-2009-215660.
17. Justin Littell, Wieslaw K. Binienda, William A. Arnold, Gary D. Roberts, and Robert K. Goldberg, "Effect of Microscopic Damage Events on Static and Ballistic Impact Strength of Triaxial Braided Composite", NASA/TM-2010-216095.
18. X. Li, W.K. Binienda, R.K. Goldberg, "Finite Element Model for Failure Study of Two-Dimensional Triaxially Braided Composite", NASA/TM – 2010-216372.
19. R.K. Goldberg, B.J. Blinzler, and W.K. Binienda, "Investigation of a Macromechanical Approach to Analyzing Triaxially-Braided Polymer Composites", NASA/TM – 2010-216371.
20. R.K. Goldberg, B.J. Blinzler, and W.K. Binienda, "Modification of a Macromechanical Finite-Element based Model for Impact Analysis of Triaxially-Braided Composites", NASA/TM – 2010-216922.

PROCEEDINGS PAPERS AND OTHER PUBLICATIONS:

1. F. Delale, A.S.D. Wang, W.K. Binienda, "On the Strain Energy Release Rate for a Crack at the Interface of Two Bonded Materials," Advances in Aerospace Science and Engineering, AD-08, ASME, pp. 113-119, 1984.
2. W.K. Binienda, A.S.D. Wang, F. Delale, "Fracture Due to a Kinked Crack in Unidirectional Fiber Reinforced Composites," Damage Mechanics of Composites AD-12, ASME, pp. 73-81, 1987.
3. A.S.D. Wang, W.K. Binienda, E.S. Reddy and Y. Zhong, "Mixed-Mode Fracture of Uniaxial Fiber Reinforced Composites," Technical Report for Naval Air Development Center, Warminster, PA, 1987.
4. W.K. Binienda, A.S.D. Wang, Y. Zhong and E.S. Reddy, "A Criterion for Mixed- Mode Cracking in Graphite-Epoxy Composites," 1988 ASTM 9th Symposium on Composite Materials, Reno, Nevada.

5. W.K. Binienda, F. Delale and A.S.D. Wang, "Strain Energy Release Rates for Cracked Uniaxial Fiber Reinforced Composites," Fourth Japan-U.S. Conference on Composite Materials Proceedings, 1988.
6. W.K. Binienda and A.P. Hong, "Finite Element Simulation of 0/90 Interface Delamination in Cross-Ply Laminates Initiated by Transverse Cracks," 22nd Annual Pittsburgh Conference on Modeling and Simulation, 2-3 May, 1991.
7. W.K. Binienda, S.M. Arnold and H.Q. Tan, "Application of Symbolic Computations to Damage Growth in Multicracked Brittle Materials," 4th Annual HITEMP Review, October 1991.
8. W.K. Binienda, "Damage and Strength Characterization of BASF Ultrapack-AS4 Interlocked Composite Material under Static Tensile Load Condition," Technical Report for ACROMED Corporation, EPIC, 1991.
9. W.K. Binienda, "Tension Test of Kevlar Cables," Technical Report for LORAL Defense Systems, 1991.
10. W.K. Binienda, "Tension and Fatigue Tests of Kevlar Cables: B29/12 x 15/BLK CT. – CORTLAND," Technical Report for LORAL Defense Systems, 1992.
11. W.K. Binienda, "Influence of Fibers Angle on Contact Stresses and Strain Energy Release Rates in Four-Point Bend Testing of Composite Beams", 7-th Technical Conference on Composite Materials Proceedings, ASC, 1992.
12. W.K. Binienda, "Stress Intensity Factors for Fully Interacting Cracks in a Multicrack Solid", ASME 12-th International conference OMAE proceedings, pp. 831-838, 1993.
13. W.K. Binienda and S.M. Arnold, "Damage Growth in Multi-Cracked Materials", 1993 HITEMP conference, NASA Lewis Research Center.
14. W.K. Binienda, A. Hong, A. Geykenesi and J. Hemann, "Late Stage Damage in G30- 500/PMR-15 Laminates," ASCE Conference Space-94, Albuquerque New Mexico, pp. 316-325, 1994.
15. W.K. Binienda, "Cracks Interaction in Anisotropic Materials," Proceedings of Brittle Matrix Composites 4, edited by A.M. Brandt, V.C. Li and I.H. Marshall, pp. 229-237, Warsaw Poland, 1994.
16. W. K. Binienda, "Workshop Adds Excitement to Undergraduate Materials Course," ACBM - NSF Center for Science and Technology of Advanced Cement-Based Materials, Vol. 6, No. 2, p. 8, 1994.
17. W. K. Binienda and Ming Zhou, "Analysis of Multiple Cracks Close to the Interface in Non-homogeneous Materials," ASCE/2 International Conference on Composites Engineering, New Orleans, August 1995.
18. W.K. Binienda, "Complex Crack Interaction in Composite Plate", Proceedings of Engineering Mechanics, pp. 408-411, 1996.
19. W. K. Binienda and S.M Arnold, "Driving Force Analysis Given Complex Crack Interactions in Monolithic and Composite Materials," 1997 HITEMP Conference, NASA Lewis Research Center.
20. "Probabilistic Residual Strength Model for Uni-Axial Fatigue of Composites," Proceedings of 23rd Annual Conference on Composites, Materials & Structures Conference, Cocoa Beach, FL, January 25-28, 1999.
21. Y. Wang, W.K. Binienda and S. Sulaiman, "Residual Stresses Reduction in Filament Wound Composite Tubes", World Engineering Congress & Exhibition, Kuala Lumpur, Malaysia, 19-22 July, 1999.
22. S. Sulaiman, W.K. Binienda, and Y. Wang, "Internal Pressure Effect on Residual Stresses for Filament Wound Composite Tubes," Mechanical and Manufacturing Engineering World Congress, Perpustakaan Negara Malaysia, 1999.

23. W.K. Binienda and M. Jaroniek, "Photo-elastic Visualization of the Fracture Events in a Model of Functionally Graded Material," ICCE/6 Orlando Florida, 1999.
24. N.I. Shbeeb and W.K. Binienda, "Analysis of Driving Forces for Multiple Cracks in an Infinite non-homogeneous Plate," ICTAM 2000, 20th International Congress of Theoretical and Applied Mechanics, August 27- September 2, 2000, Chicago.
25. G. Song, P. Z. Qiao, and W.K. Binienda, "Active Vibration Damping of a Composite Beam using Smart Sensors and Actuators," SDM Conference, Seattle April 16-19, pp. 3347-3357, 2001.
26. D.W. Stresing, W.K. Binienda, and V. Dhruva, "Analysis of High Energy Impact on Lightweight Composite (Sandwich) Structure," SDM Conference, Seattle, pp. 3319-3324, 2001.
27. G. D. Roberts, D.M. Revilock, W.K. Binienda, W.Z. Nie, S.B. Mekenzie and K.B. Todd, "Impact Testing of Composites for Aircraft Engine Fan Containment," SDM Conference, April 16-19, Seattle, pp. 3325-3335, 2001.
28. W. Z. Nie and W.K. Binienda, „Investigation on Oblique Impact Response of Composite Cylindrical Shells," Poster at 10-th International Conference of Fracture, Honolulu, 2-6 December, 2001.
29. X. Zhou, G. Song, and W.K. Binienda, "Thermal deformation compensation of a composite beam using piezoelectric actuators," proceedings of the Smart Materials Conference, pp. 334-344, 2002.
30. S.A. Baraka, W.K. Binienda, and S. R. Tysl, „Evaluation of the Performance of Concrete Structures Strengthened with FRP Composites," proceedings of EM 2002 Conference, Columbia University, 2002.
31. W.K. Binienda, W. Brostow, J.A. Hinze and R. Simões, "Computer Simulation of Mechanical and Tribological Properties of Materials," Proc. 4-th International Conference on Environment, Development & Engineering, 30-38, 2002.
32. S. Acharya, W.K. Binienda, and D. Robinson, "Numerical Modeling of Creep in Polymer matrix Composites with Transverse Isotropy", proceedings of SDM Conference, Norfolk VA, pp. 2381 – 2385, 2003.
33. G. D. Roberts, J. M. Pereira, D.M. Revilock, E.K. Binienda, M. Xie and M. Brailey, "Ballistic Impact of Composite Plates and Half Rings with Soft Projectiles," proceedings of SDM Conference, Norfolk VA, pp. 3282-3290, 2003.
34. W. Lestari, P. Qiao, G. Song and W.K. Binienda, "Evaluation of Bending and Shear Moduli of Sandwich Structures by Dynamic Response Based Technique," proceedings of SDM Conference, Norfolk VA, pp. 4747-4755, 2003.
35. J. Cheng, G.D. Roberts, and W.K. Binienda, "Finite Element Simulation of Soft Projectiles Impacting Composite Targets," 35-th International SAMPE Conference, Dayton, 2003.
36. X. Zheng, R. K. Goldberg, W.K. Binienda, and G. Roberts, "Ls-Dyna Implementation of Polymer Matrix Composite Model under High Strain Rate Impact," 35-th International SAMPE Conference, Dayton, 2003.
37. X. Zheng, R.K. Goldberg, W.K. Binienda, and G.D. Roberts, "Development and Implementation of Rate Dependent Composite Material Model for Shell Element Application in LSDYNA," pp 633-641 in Earth and Space Engineering Construction, and Operations in Challenging Environments, edited by R.B. Malla and A. Maji, ASCE, pp. 633 – 640, 2004.
38. J. Cheng, G.D. Roberts, and W.K. Binienda, "Finite Element Simulation of Soft Projectile Impacting Braided Composite Structure," SDM Conference Proceedings, Palm Springs, pp. 4319 – 4332, 2004.

39. X. Zheng and W.K. Binienda, "Impact Modeling of Composite Materials with Strain Rate Effect," pp.73-75, Proceedings of Crashworthiness of Light-Weight Automotive Structures, Trondheim Norway, June 17-18, 2004.
40. J. Cheng, M.J. Bennett, W.K. Binienda, and K.S. Carney," Soft Projectiles Impacting Composite Targets – Experiment and Numerical Simulation," pp.75-77, Proceedings of Crashworthiness of Light-Weight Automotive Structures, Trondheim Norway, June 17-18, 2004.
41. Gary Roberts, Cheryl Bowman, Jingyun Cheng, Timothy Schmidt, and Michael Braley, "Deformation Analysis of Triaxial-Braided Carbon/Epoxy Composites," Proceedings of SEM Conference, pp. 229-233, 2005.
42. William Arnold, Wieslaw Binienda, and Gary Roberts "Spring/Hydraulic Accelerated Projectile Experiment (SHAPE)," Proceedings of SEM Conference, pp. 1603- 1607, 2005.
43. William Arnold, Wieslaw Binienda, Gary Roberts, Michael Pereira, Duane Revilock, and Tim Schmidt, "Motion of Wedge-Shape Projectiles during Gas Gun Impact Tests," Proceedings of SEM Conference, pp. 745 – 752, 2005.
44. Xiahua Zheng, Robert K. Goldberg, Wieslaw Binienda, and Gary Roberts, "Rate Dependent Shell Element Composite Material Model Implementation in Ls-Dyna," SDM Conference Proceedings, pp. 5475 – 5488, 2005.
45. Michael Bennett, Charles Ruggeri, Mike Braley, and Wieslaw Binienda, "Application of Braided Composites in Chassis Design of Super Mileage Vehicles," Proceedings of ASC Conference, 2005.
46. Fengxia Ouyang, Sunil Acharya, Wieslaw Binienda, and David Robinson, "Creep Failure in Polymer Composites with Transverse Isotropy: Numerical Approach," Proceedings of ASC Conference 2005.
47. Jingyun Cheng and Wieslaw K. Binienda, "A modified State Variable Polymer Model Implementation in LsDyna", Earth and Space Conference, pp. 143, 2006.
48. Michael Bennett, Charles Ruggeri, Wieslaw Binienda and Timothy Schmidt, "Modeling and Testing of Gelatin with High Strain Rate Loading", SEM Annual Conference and Exhibition, St. Louis MI, 2006.
49. Jingyun Cheng and Wieslaw K. Binienda, "A Numerical Model for Tri-Axially Braided Composites Under High Velocity Soft Projectile Impact", 9-th International LsDyna Users Conference, Detroit MI, 2006.
50. Daihua Zheng, Jingyun Cheng and Wieslaw K. Binienda, "Numerical Modeling of Friction Effects on the Ballistic Impact Response of Single-Ply Tri-Axial Braided Fabric", 9-th International LsDyna Users Conference, Detroit MI, 2006.
51. Daihua Zheng and Wieslaw K. Binienda, "Closed-form Prediction of Delamination Threshold for Small Mass Impacts", EMD2007, 18-th Engineering Division Conference, Blacksburg VA, 2007.
52. Wieslaw K. Binienda, Jingyun Cheng, and Marcin Staniszewski, "Influence of Fiber Architecture of Tri-axially Braided Composite on Threshold Impact Velocity", EMD2007, 18-th Engineering Division Conference, Blacksburg VA, 2007.
53. Wieslaw K. Binienda, and Daihua Zheng, "Finite Element Modeling of Multilayer Fabric for Turbofan Engine Containment Systems", EMD2007, 18-th Engineering Division Conference, Blacksburg VA, 2007.
54. Justin D. Littell, Charles R. Ruggeri, Robert K. Goldberg, and Gary D. Roberts, William A. Arnold, and Wieslaw K. Binienda, "An Optical Technique for Measuring Mechanical Properties of Polymer Resin", SEM Conference, Springfield MA, pp. 294-301, 2007.

55. Justin D. Littell, Wieslaw K. Binienda, Robert K. Goldberg, and Gary D. Roberts, "Full-Field Strain Methods for Investigating Failure Mechanisms in Triaxial Braided Composites", ASCE Earth and Space Conference, Long Beach CA, 2008.
56. Justin D. Littell, Wieslaw K. Binienda, Robert K. Goldberg, and Gary D. Roberts, "A Modeling Technique and Representation of Failure in the Analysis of Triaxial Braided Carbon Composites" FAA/NASA/DoD Aging Aircraft Conference, Phoenix AZ, 2008.
57. Charles R. Ruggeri, Gary D. Roberts, Michael Pereira, Wieslaw K. Binienda, and William A. Arnold, "Composite Panel Impact Testing for Initial Material Screening", ASCE Earth and Space Conference, Long Beach CA, 2008.
58. Wieslaw K. Binienda and Xuetao Li, "A Modified Methodology for Modeling Tri-axial Composite with Trough Thickness Integration Points", ASCE Earth and Space Conference, Long Beach CA, 2008.
59. Gary D. Roberts, Justin D. Littell, Robert K. Goldberg, and Wieslaw K. Binienda, "Characterization of Failure Mechanisms in Triaxial Braided Composites using Optical Measurement Techniques", ASCE Earth and Space Conference, Long Beach CA, 2008.
60. Daihua Zheng, and Wieslaw K. Binienda, "A Semianalytical Solution of Wave-controlled Impact on Composite Laminates", ASCE Earth and Space Conference, Long Beach CA, 2008.
61. Gary D. Roberts, Robert K. Goldberg, Justin D. Littell, Lee Kohlman, and Wieslaw Binienda, "Characterization of Triaxial Braided Composite Material Properties for Impact Simulation" Crash and Safety Session of AHS International 65-th Annual Forum, May 27-29, 2009, Grapevine, TX.
62. Justin D. Littell, Wieslaw K. Binienda, Robert K. Goldberg, and Gary D. Roberts, "A Modeling Technique and Representation of Failure in the Analysis of Triaxial Braided Carbon Fiber Composites" Aging Aircraft Conference, October 22, 2008, Dayton, OH.
63. G-J Yun, S-B Nam, J. Carletta, W.K. Binienda, and D-H Kim, "Vibration Based Crack Detection of Conductive Beam Structures Using A Non-Contact Inductive Vibration Sensor", ANCRiSST The Fifth International Workshop on Advanced Smart Materials and Smart Structures Technology Conference Proceedings, July 29- August 1, 2009.
64. Wieslaw K. Binienda, Xuetao Li, Gary D. Roberts, and Robert K. Goldberg, "A Finite Element Model for Failure Study of Two Dimensional Triaxial Braided Composite (TDTBC)", ASCE Earth and Space Conference Proceedings, Honolulu, March 2010.
65. Robert K. Goldberg, Brina J. Blinzler, and Wieslaw K. Binienda, "Investigation of Macromechanical Approach to Analyzing Triaxially Braided Polymer Composite", AIAA SDM Conference Proceedings, April 2010.
66. Xuetao Li, Wieslaw K. Binienda, W. Lee Kohlman, Robert K. Goldberg, and Gary D. Roberts, "Failure Mechanism Investigation of 2D Triaxially Braided Composite under Different Stress Status in Single Layer tensile Tests", ASC and US-Japan Conference Proceedings, Dayton, September 2010.

PATENTS:

- Spring Accelerated Projectile Impactor – UA 530 Provisional together with William Arnold and Dave Mc.Vaney
- High Velocity Dynamic Friction Tester Device and Procedure – UA 544 Provisional together with William Arnold

- Method for Strain Rate Dependence Analysis V. 2.0 – UA 555 Provisional together with Robert Goldberg, Kelly S. Carney and Aditi Chattopadhyay.
- Rapidly Deployable Construction Unit – UA 598 together with Charles Holsopple
- Method for braid analysis – UA 694.
- Strain Rate Dependent Analysis of Polymer Matrix Composites STRANAL-PMS version 1 and 2 – LEW-17910-1- NCC3-932 together with Robert Goldberg

ACTIVITY IN RESEARCH:

FUNDED RESEARCH - FUNDING TOTAL \$8,531,244

EXTERNAL FUNDING - \$6,558,791 (PI -\$3,265,116, CO-PI -\$3,293,675)

INTERNAL FUNDING - \$2,436,200

1. "Prediction and Measurement of Transverse Cracking in Cross-Ply Laminates," Ohio Aerospace Institute **\$12,805** from Sept. 1990 to June 1991.
2. "3-D FEM Simulations of the Delamination Progress in Cross-Ply Symmetric Graphite-Polyimide Composites," NASA, **\$22,871** from Nov. 1990 to Oct. 1991, **\$33,000** from Nov. 1991 to Oct. 1992 and **\$33,000** from Nov. 1992 to Sept. 1994.
3. "Damage Mechanics Controlled by the Interaction of Microcracks in the Interphase of MMC and BMC," NASA. Lewis Research Center, **\$37,832** from Nov. 1990 to Oct. 1991, **\$48,000** from Nov. 1991 to Oct. 1992, **\$60,000** from Nov. 1992 to Oct. 1993, **\$55,000** from November 1993 to December 1994, and **\$55,000** from January 1995 to December 1995.
4. "Damage and Strength Characterization of BASF Ultrapack – AS4 Interlocked Composite Material under Static Tensile Load Conditions," EPIC **\$1,875** from Jan. 1991 to Sept. 1992.
5. "Tension-Tension Fatigue Behavior of Kevlar Cables – Tests," LORAL Defense Systems, Sept. 1991 - June 1992, **\$ 8,010**.
6. "Durability and Life Prediction Modeling in Polyimide Composites" - NASA Lewis Research Center, from December 1993 to September 1995, **\$20,000**.
7. "Static and dynamic properties of rubber components – tests," LORAL Defense Systems, June - August 1994, **\$ 5,000**.
8. "Prestressed Composite Tubes - Fabrication Process & Design" - Asian Development Bank, **\$ 15,000** from October 15 to Dec 10, 1995.
9. "UA/CWRU Center for Infrastructure Materials and Rehabilitation," Ohio Board of Regents Investment Fund Award, from 7/1/95 to 6/30/96 - group proposal for **\$1,770,000**, (together with Drs. R. Liang, A. Saleeb, J. Padovan, and some CE department members of Case Western Universty).
10. "Mixed-Mode Complex Shape Cracks Propagation in Anisotropic Plates," NASA Lewis Research Center, from 4/11/96 to 4/10/97, **\$ 56,354**.
11. "FE/Analytical Life Prediction of Brittle Materials," NASA Lewis Research Center, from 6/1/97 to 5/31/2000, **\$408,816**.
12. "Design Analysis and Material Modeling for Ceramic Matrix Composite Materials," NASA from 11/3/97 to 11/2/98, **\$ 107,302**.
13. "High Temperature Testing and Modeling of Ceramic Matrix Composites," NASA from May 1, 1998 to April 30, 1999, **\$ 101,544**.

14. "Stress Analysis of Graphite/Epoxy Layered System Adhered to Concrete," Master Builders Technologies, from May 29, 1998 to August 30, 1998, **\$ 8,989**.
15. "General Crack Problems in Functionally Graded Materials," NASA Lewis Research Center, from September 22, 1998 to January 21, 1999, **\$42,000**, together with Dr. J. Padovan.
16. "NDE Methods for Commercial Aircraft Engine," NASA Lewis Research Center, from November 4, 1998 to November 3, 1999, **\$110,507**.
17. "Development of a jet engine containment design methodology," NASA Glenn Research Center, from December 1, 1999 to November 30, 2002, **\$533,275**, together with Dr. E. Sancactar.
18. "Creep rupture model of composite materials", NSF SERG, from June 1, 2000 to May 31, 2001, **\$50,400**, together with Dr. D. Robinson.
19. "FEA Study of Impact-Penetration for Lightweight Jet Engine Containment," NASA Glenn Research Center, from January 1, 2002 to December 31, 2002, **\$115,039**.
20. "FEA Study of Impact-Penetration for Lightweight Jet Engine Containment," NASA Glenn Research Center, from January 1, 2003 to December 31, 2003, **\$148,626**.
21. "Intelligent Propulsion System Foundation Technology – Propulsion 21," NASA Glenn Research Center, from August 1, 2003 to April 30, 2004, **\$29,600**.
22. "Wright Center of Innovation – Spin Test Equipment Grant," OBR, from January 1, 2004 to December 31, 2006, **\$800,000**, together with Drs. P. Qiao, J. Braun.
23. "FEA Study of Impact-Penetration for Lightweight Jet Engine Containment," NASA Glenn Research Center, from January 19, 2004 to January 18, 2005, **\$172,316**.
24. "FEA Study of Impact-Penetration for Lightweight Jet Engine Containment," NASA Glenn Research Center, from January 19, 2005 to January 18, 2006, **\$205,486**.
25. "Intelligent Propulsion Systems Foundation Technology – Phase 2 of Propulsion 21," GEAE **\$39,283**, from Aug 1, 2005 to August 31, 2006.
26. "Development of 3D Braided Zylon Model for Explicit FEA Analysis," NASA, **\$86,749**, from September 1, 2005 to August 31, 2006.
27. "Polymer and Composite Ballistic Impact Testing, Characterization, and Modeling", NASA **\$52,435**, from June 1, 2006 to September 30 2007.
28. "Space Flights Fluid Experiments Analysis and Modeling", ZIN Technologies, **\$67,880**, from October 1, 2006 to June 30, 2008.
29. "Numerical Modeling of Textile Composites" GE Aircraft Engines, **\$20,000**, from May 1, 2007 to December 1, 2007.
30. "Modeling and Testing of Aging Degradation Effects on Dynamic/Impact Performance of Advanced Braided Composites for Jet Engine Fan Cases/Blade Containment Systems", NASA-NRA, **\$879,205**, from September 29, 2007 to September 29, 2011.
31. "An Investigation into Mechanical and Impact Properties of Triaxial Braided Composites for Jet Engine Blade Containment", NASA GSRP - Justin Littell –, **\$30,000**, from September 1, 2007 to August 31, 2008.
32. "Investigation of Test Methods and Damage Mechanisms for Triaxial Braided Composites" Lee Kohlman – NASA GSRP, **\$30,000**, September 1, 2009 to August 31, 2010.
33. "Macro-mechanical Modeling of Tri-axial Braided Composites" Brina Blinzer – NASA GSRP, **\$30,000**, September 1, 2009 to August 31, 2010.
34. "UA support to ZIN for NASA Space Flight Program in 2009", ZIN Technologies, **\$17,592**, October 1, 2009, to September 30, 2010.
35. "Experimental Structural Assessment of Advanced Stirling Convertor Planar Spring Material for Long-Term Durability – Phase I," Sunpower Inc., **\$80,000**, From October 1, 2009 to March 31, 2010, with Dr. Yun Gin Yun.
36. "Experimental Structural Assessment of Advanced Stirling Convertor Planar Spring Material for Long-Term Durability – Phase II," NASA., **\$98,000**, From October 1, 2010 to September 30, 2011, with Dr. Yun Gin Yun.

37. "Investigation of Test Methods and Damage Mechanisms for Triaxial Braided Composites – year 2" Lee Kohlman – NASA GSRP, **\$30,000**, September 1, 2010 to August 31, 2011.
38. "Macro-mechanical Modeling of Tri-axial Braided Composites- year 2" Brina Blinzer – NASA GSRP, **\$30,000**, September 1, 2010 to August 31, 2011.

RESEARCH FUNDED INTERNALLY

1. "Micromechanisms Governing the Deformation and Fracture Behavior of Metal- Matrix Composite Materials," **\$1,200**, Faculty Research Grant, Nov. 1988.
2. "Characterization of Visco-plastic Materials," **\$10,000** - Summer Faculty Fellowship at NASA, 1989.
3. "A Study on Failure and Crack Growth Mechanisms in Ceramics Composites," Research Challenge Grant **\$10,200**, May 1989 to Sept. 1990.
4. "Damage Mechanics in Metal Matrix Composite materials," **\$12,000** - summer faculty Fellowship at NASA, 1990.
5. "Numerical Analysis of Filament Winding Tubes with Pre-stresses Fibers," **\$6,000** - Faculty Research Fellowship, summer 1996.
6. "OBR Individual Research Challenge Match to Design, Progress Modeling, Manufacture, and Testing of Composite Shield for Turbine Engine Blade Containment(1999-01 biennium)," **\$20,000**.
7. "OBR Research Challenge Match to FEA Study of Impact-Penetration for Lightweight Jet Engine Containment", (2001-03 biennium)," **\$20,000**.
8. OBR Incentive Fund, "Polymer-Based Nanotechnologies," **\$7,000** (part of \$70k funding for 10 faculty), 2003.
9. UA cash matching component for "Wright Center of Innovation – Spin Test Equipment Grant," from January 1, 2004 to December 31, 2006, **\$330,000** together with Drs. P. Qiao, J. Braun.
10. UA in-kind matching component for "Wright Center of Innovation – Gas Turbine Engine Research and Testing Laboratory Building, April 2005, **\$2,000,000**.
11. OBR Research Challenge Grant, "Impact Testing and Analysis", **\$20,000**, 2007.
12. Internal cost sharing grant, The University of Akron, **\$10,000**, 2007.

ACTIVITY IN PROFESSION OR DISCIPLINE:

LEADERSHIP IN CONFERENCES

- Session Chairman at ASCE Engineering Construction & Operations in Space IV, Albuquerque, NM (1994)
- Session Chairman at Structural Dynamics and Materials AIAA Conference, Seattle, WA (2001)
- Session Chairman at Structural Dynamics and Materials AIAA Conference, Norfolk, VA (2003)
- Session Chairman at ASCE Robotics, Engineering Construction and Operations in Challenging Environments in Houston, TX (2004)
- Guest editor for Journal of Aeronautic Engineering - special issues (2002 and 2004)
- Organizing Committee Member of the III Scientific-Technical Conference "Advances in Petroleum and Gas Industry and Petrochemistry Conference," Lvov, Ukraine (September 12-18 2004)

- Session Chair at the III Scientific-Technical Conference “Advance in Petroleum and Gas Industry and Petrochemistry Conference, Lvov, Ukraine (September 12-18 2004)
- Technical Co-Chair of the Earth and Space Conference, Houston, TX (March 4-9 2006)
- General Chair of the Earth and Space Conference, Long Beach, CA (March 3-5, 2008)
- Organizing Committee Member of 2010 AIAA SDM conference (2008-2010)

PROFESSIONAL PRESENTATIONS

1. "Fracture Due to a Kinked Crack in Unidirectional Fiber Reinforced Composites," December 1987, ASME-WAM, Boston, MA.
2. "A Criterion for Mixed-Mode Cracking in Graphite-Epoxy Composites," April 1988, ASTM 9th Symposium on Composite Materials, Reno, Nevada.
3. "Mixed-Mode Strain Energy Release Composite," June 1988, ASC, Japan-USA Symposium on Composite Materials, Washington, D.C.
4. "Creep and Relaxation Model for High Temperature Metal Matrix Composites," Fatigue and Fracture Branch at NASA Lewis Research Center, August 1989.
5. "Matrix Cracks in Composite Laminates," Guest Speaker for SAMPE Local Parent's Chapter on October 16, 1990.
6. "Finite Element Simulation of 0/90 Interface Delamination in Cross-Ply Laminates Initiated by Transverse Cracks," 22nd Annual Pittsburgh Conference on Modeling and Simulation, 2-3 May, 1991.
7. "Application of Symbolic Computations to Damage Growth in Multicracked Brittle Materials," 4th Annual HITEMP Review, October 1991.
8. "Influence of Fibers Angle on Contact Stresses and Strain Energy Release Rates in Four-Point Bend Testing of Composite Beams," 7-th Technical Conference on Composite Materials Proceedings, ASC, 1992.
9. "Stress Intensity Factors for Fully Interacting Cracks in a Multicrack Solid," ASME 12-th International conference OMAE proceedings, June 1993.
10. "Damage Growth in Multi-Cracked Materials," HITEMP conference, NASA Lewis Research Center, October 1993.
11. "Late Stage Damage in G30-500/PMR-15 Laminates," ASCE Conference Space-94, Albuquerque New Mexico, 1994.
12. "Influence of Material Parameters on Strain Energy Release Rates for Cross-Ply Laminates with Preexisting Transverse Crack," First International Conference on Composites Engineering, New Orleans, August 28-31, 1994.
13. "Cracks Interaction in Anisotropic Materials," Brittle Matrix Composites 4, Warsaw, Poland, September 13-15, 1994.
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15. "Pre-stressed filament winding process," Centron Corp., Mineral Wells, Texas 76068, February 1995.
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17. "Design Aspects Applied to Components made using Composites in Off-Shore Platform Environment," Petronas Research, Ahah Alam, Selangor Darul Ehsan, Malaysia, July 1995.
18. "Aerospace Applications of Composite Materials," CTRM Kuala Lumpur, Malaysia, July, 1995.
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24. "Analysis of Multiple Cracks in Thick Interphase," ICCE/5 International Conference on Composites Engineering, July 5-11, 1998.
25. "Fracture mechanics problems in materials with thick thermal barrier," NASA Lewis Research Center, August 24, 1998.
26. "Fracture in ceramic thermal barrier coatings," NASA Lewis Research Center, November 12, 1998.
27. "Probabilistic Residual Strength Model for Uni-Axial Fatigue of Composites," 23rd Annual Conference on Composites, Materials & Structures Conference, Cocoa Beach, FL, January 25-28, 1999.
28. "Photo-elastic Visualization of the Fracture Events in a Model of Functionally Graded Material," ICCE/6 Orlando Florida, June 27 - July 3, 1999.
29. "Analysis of Driving Forces for Multiple Cracks in an Infinite non-homogeneous Plate," ICTAM 2000, 20th International Congress of Theoretical and Applied Mechanics, August 27- September 2, 2000, Chicago.
30. "Explicit Finite Element Analysis of Composite Plate," NASA Glenn Research Center, November 17, 2000.
31. "Design and Analysis of Composite Ring under Impact Conditions," GE Cincinnati, OH, December 8, 2000.
32. "Active Vibration Damping of a Composite Beam using Smart Sensors and Actuators," SDM Conference, April 16-19, 2001, Seattle.
33. "Analysis of High Energy Impact on Lightweight Composite (Sandwich) Structure," SDM Conference, April 16-19, 2001, Seattle.
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35. W. Z. Nie and W.K. Binienda, „Investigation on Oblique Impact Response of Composite Cylindrical Shells," Poster at 10-th International Conference of Fracture, 2-6 December, 2001 Honolulu, Hawaii.
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37. S.A. Baraka, W.K. Binienda, and S. R. Tysl, „Evaluation of the Performance of Concrete Structures Strengthened with FRP Composites," EM 2002 Conference, Columbia University, 2002.
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44. W.K. Binienda, "Advances in Braided Composite Material Modeling," NASA workshop at NASA, July 2003.
45. W.K. Binienda, "Ls-Dyna Modeling and Material Model Implementation," NASA/UA workshop at The University of Akron, August 2003.
46. X. Zheng, R.K. Goldberg, W.K. Binienda, and G.D. Roberts, "Development and Implementation of Rate Dependent Composite Material Model for Shell Element Application in LSDYNA," Earth and Space Houston Conference, March 4-11, 2004.
47. W.K. Binienda, "High Energy Impact of Composite Structures – Ballistic Experiments and Explicit FE Analysis," Warsaw Technical University, SiMR, Warsaw Poland, June 9, 2004.
48. X. Zheng and W.K. Binienda, "Impact Modeling of Composite Materials with Strain Rate Effect," Crashworthiness of Light-Weight Automotive Structures, Trondheim Norway, June 17-18, 2004.
49. J. Cheng, M.J. Bennett, W.K. Binienda, and K.S. Carney, "Soft Projectiles Impacting Composite Targets – Experiment and Numerical Simulation," Light-Weight Automotive Structures, Trondheim Norway, June 17-18, 2004.
50. W.K. Binienda, "High Energy Impact of Composite Structures – Ballistic Experiments and Explicit FE Analysis," University of Lulea, Solid Mechanics Department, Lulea, Sweden, June 23, 2004.
51. W.K. Binienda, "Model development for Dynamic Behavior of Composites," Lvov Conference, September 2004.
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59. Michael Bennett, Charles Ruggeri, Mike Braley, and Wieslaw Binienda, "Application of Braided Composites in Chassis Design of Super Mileage Vehicles," ASC Conference, 2005
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66. Wieslaw K. Binienda, "Closed-form Prediction of Delamination Threshold for Small Mass Impacts", EMD2007, 18-th Engineering Division Conference, Blacksburg VA, 2007.
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- Paper Reviewer, Journal of Engineering Materials and Technology
- Paper Reviewer, ASTM – STP
- Paper Review for AIAA journals.
- Paper Reviewer, International Journal of Fracture
- Paper Reviewer, NASA TM Review
- Paper Reviewer, Journal of Engineering Mechanics
- Paper Reviewer, Composites Science and Technology
- Paper Reviewer, Journal of Applied Mechanics
- Paper Reviewer, International Journal of Solids and Structures
- Paper Reviewer, Journal of Aerospace Engineering
- Paper Reviewer, Meccanica, International Journal of Italian Association of Theoretical and Applied Mechanics AIMETA
- Guest Editor, Journal of Aerospace Engineering (2000 – 2008)
- Member, Editorial Board, Journal of Aerospace Engineering (2005 – 2008).
- Associate Editor, Journal of Aerospace Engineering (2008 – 2011)

ORGANIZATION MEMBERSHIP:

- ASME (American Society of Mechanical Engineers)
- ASCE (American Society of Civil Engineers)
- AIAA (American Institute of Aeronautics and Astronautics)
- SAMPE (Society for the Advancement of Material and Process Engineering)
- Member of Lawrence Livermore National Laboratory Collaborator's Program
- Computational Mechanics (The University of Akron)