Name ATEF F. SALEEB

Position Title Distinguished Professor

Education

- Cairo University, Egypt, B.S.C.E., 1974, Civil Engineering
- Purdue University, Indiana, M.S.C.E, 1979, Civil Engineering
- Purdue University, Indiana, Ph.D., 1981, Civil Engineering

Experience

- 1981 - 1982 Visiting Assistant Professor, Dept. of Civil Engineering, Purdue University, IN.
- 1983 - 1984 Assistant Professor, Dept. of Civil Engineering, Cairo University, Egypt.
- 1984 - 1991 Assistant and Associate Professor, Dept. of Civil Engineering, The University of Akron, OH.
- 1992 – present Professor of Civil Engineering, The University of Akron, OH.

Consulting, Patents

- Battele, Columbus, OH
- Ford Motor Company, MI
- PCSG/STL, Massillon, OH
- Swanson Analysis Systems, Inc., PA
- General Tire, Akron, OH

Services

- Reviewer for Papers in National/International Journals such as:
  - Structural Division, ASCE
  - J. of Engineering Mechanics, ASCE
  - J. of Aerospace Engineering, ASCE
  - Int. J. Of Numerical Methods and Engineering
  - Computer Methods of Applied Mechanics and Engineering
  - J. of Meccanica
  - J. of Biomechanical Engg., ASME
  - Int. J. of Solids and Structures,
  - Int. J of Plasticity
  - J. of Computers and Structures
  - J. of Sound and Vibration

- Member of the inelastic behavior committee, J. of Engineering Mechanics, ASCE, 1985-1988

- Serving on Several Departmental, College and University Committees, Examples of these are:
  - Civil Eng. Department Tenure and Promotion Committees (Committee Member), 2002-2015
  - Civil engineering graduate Committee chair, 1992-1995
  - Civil engineering Graduate Committee, 1995-2000
  - Department Chair Search Committee (Committee Chair), 1998-2001
  - Civil Engineering Faculty Search Committees (Committee Chair for many), 1997-2001,2005-2009
  - Civil Eng. Department Tenure and Promotion Committees: as a Committee Chair in the periods of 1998-2000, 2002, 2007, 2014; and also as a Committee member from 1986-2016.
  - PhD committee member for numerous PhD candidates in Engineering departments such as Mechanical, Civil, Polymer, and Electrical engineering from 1987-2016
  - College of Engineering Awards Committee, 1998-2011
  - College of Engineering Promotion Committee, 1997-2013
  - University –wide committee for faculty research service 1986-1991

- Invitations (National and international)
  - Guest lecturer, Hong Kong university of Science and Technology, Fall 1995
  - Vising scholar, Institut für Statik und Dynamik der Luft- und Raumfahrtkonstruktionen, University of Stuttgart, West Germany, Fall 1989
  - Visiting professor, Yarmouk University, Jordan, Fall 1983
  - Visiting Assistant Professor, Dept. of Civil Eng., Purdue University, IN Purdue, Spring and Summer, 1982

SELECTED PUBLICATIONS

Books and Chapters in Books:

- **Saleeb, A.F.**, S. M. Arnold, and N.R. Al-Zoubi: 'A Study of Time-Dependent and Anisotropic Effects on the deformation Response of Two Flywheel Designs' chapter in Section I of 'Composite Materials: Testing and Design', Charles E. Bakis (Ed.) The 14th ASTM International Symposium on Composite Materials: Testing and Design, 2003.

- Chen, W.F., and **Saleeb, A.F.**, 'Constitutive Equations for Engineering Materials: Elasticity and Modeling', Volume 1, Elsevier Science Publ. Co. Inc., New York, 1994.

- Duffy S.F., and **Saleeb, A.F.**, 'Design Practices for Whisker-Toughened Ceramic Components', chapter in Part 10 of ASM" Engineering Materials Handbook – Vol. 4: Ceramics and Glasses", S.J. Schneider, Jr. (Ed.), Published by ASM International, USA, First/Second editions, 1991/1994.

- **Saleeb, A.F.**, Chang, T.Y.P., and Yingyeunyong, S., 'Analysis of Finitely-Deformed Shells Using Low-Order Mixed Elements', chapter in Part 3 of 'Computational Mechanics of Nonlinear Response of Shells', W.B. Kratzig and E. Onate (Eds.) Springer-Series on Computational Mechanics, Springer-Verlag, NY, 1990.

- Meyers V.J. and **Saleeb, A.F.**, 'Matrix Analysis of Structures: Solution Manual', Harper and Row Publishers, Inc., New York, 1983.

- Chen W.F., and **Saleeb, A.F.**, 'Constitutive Equations for Engineering Materials', John Wiley & Sons, New York, 1982.

- Editing and Review of Chapter 2, 'Constitutive Modeling for Concrete', prepared by an ASCE Sub_Committee (W.F. Chen, Chairman), in "A State-of-the-Art Report on Finite Element Analysis of R.C. Structures", ASCE Committee on Concrete and Masonry Structures, ASCE Special Publication, 1982.

Scientific Journals:

1. **A.F. Saleeb**, M.A. Soudah, J.S. Owusu-Danquah (2018).Stabilization of the Cyclic Response of the Ni49.9 Ti50.1 Shape Memory Actuators under Thermomechanical Loads, Shape Memory and Superelasticity, in review.
2. J.S. Owusu-Danquah, **A.F. Saleeb** & S.H. Natsheh (2018). On the performance of a two-way shape memory micro-gripper actuator, Journal of aerospace engineering, ASCE, 31(4): 04018040
3. **Saleeb, A.F.,** Natsheh, S. H., & Owusu-Danquah, J. S.(2017). A multi-mechanism model for large-strain thermomechanical behavior of polyurethane shape memory polymer, Polymer Journal, Elsevier, 130, 230-241
4. **Saleeb, A. F.**, Natsheh, S. H., & Owusu-Danquah, J. S.(2017).Efficiency of Finite Element Analyses of 55NiTi SMA Actuators: Solid versus Beam and Shell Modeling, FiniteElements in Analysis and Design, Elsevier, 136, 58-69
5. Owusu-Danquah, J. S., & **Saleeb, A. F.** (2017). On the modeling of the effect of processing and heat treatment on actuation behaviors of high temperature ternary and quaternary shape memory alloys. Journal of Alloys and Compounds, 714, 493-501.
6. **Saleeb, A. F.**, Natsheh, S. H., Owusu-Danquah, J. S., & Dhakal, B. (2017). Modeling and Characterization of Cyclic Shape Memory Behaviors of the Binary Ni49. 9Ti50. 1 Material System. Journal of Materials Engineering and Performance, 1-13
7. **Saleeb, A. F.**, & Owusu-Danquah, J. S. (2017). The role of residual stress states in modeling the cyclic two-way shape memory behavior of high-temperature NiTiPd alloys and actuation components. Mechanics of Materials, 110, 29-43.
8. Owusu-Danquah, J. S., & **Saleeb, A. F.** (2017). Detwinning of preloaded martensite in shape memory alloys and its effect on the cyclic behavior of NiTi cylindrical actuators. Journal of Intelligent Material Systems and Structures, 1045389X17704062
9. Owusu-Danquah, J. S., & **Saleeb, A. F.** (2017). On the cyclic stability of the thermomechanical behavior of NiTi shape memory cylindrical actuators. European Journal of Mechanics-A/Solids, 64, 143-159.
10. Owusu-Danquah, J. S., and **Saleeb, A. F**., 2017. On the modeling of the effect of processing and heat treatment of high-temperature ternary and quaternary shape memory alloys, submitted, Journal of Aerospace Engineering, ASCE.
11. Dhakal, B., Nicholson, D. E., **Saleeb, A. F**., Padula II, S. A., and Vaidyanathan, R., 2016. Three-dimensional deformation response of a NiTi shape memory helical-coil actuator during thermomechanical cycling: experimentally validated numerical model. *Smart Materials and Structures*, *25*(9), 095056.

12. **Saleeb A.F.**, and Owusu-Danquah J.S, 2016, The role of residual stress states in modeling the cyclic two-way shape memory behavior of high-temperature NiTiPd alloys and actuation components, Mechanics of materials, in review.
13. **Saleeb A.F.**, Natsheh S.H., Owusu-Danquah J.S., and Dhakal B., 2016. Modeling and Characterization of Cyclic Shape Memory Behaviors of the Binary $Ni_{49.9}Ti_{50.1}$ Material System, Journal of Materials Engineering and Performance, in review.
14. Owusu-Danquah, J. S., **Saleeb, A. F**., 2016. Detwinning of preloaded martensite in shape memory alloys and its effect on the the cyclic behavior of NiTi cylindrical actuators, Journal of Intelligent Material Systems and Structures, in review.
15. Owusu-Danquah, J. S., and **Saleeb, A. F**., 2016. On the cyclic stability of the thermomechanical behavior of NiTi shape memory cylindrical actuators, European Journal of Mechanics-A/Solids, in review.
16. **Saleeb, A. F**., Dhakal, B., Dilibal, S., Owusu-Danquah, J. S., and Padula, S. A., 2015. 'On the modeling of the thermo-mechanical responses of four different classes of NiTi-based shape memory materials using a general multi-mechanism framework'. Mechanics of Materials, 80, 67-86.
17. **Saleeb, A. F**., Dhakal, B., & Owusu-Danquah, J. S., 2015. 'Assessing the performance characteristics and clinical forces in simulated shape memory bone staple surgical procedure: The significance of SMA material model'. Computers in biology and medicine, 62, 185-195.
18. **Saleeb, A. F**., Dhakal, B., & Owusu-Danquah, J. S., 2015. 'On the role of SMA modeling in simulating NiTinol self-expanding stenting surgeries to assess the performance characteristics of mechanical and thermal activation schemes'. Journal of the mechanical behavior of biomedical materials, 49, 43-60.
19. Owusu-Danquah, J. S., **Saleeb, A. F**., Dhakal, B., & Padula II, S. A., 2015. 'A Comparative Study of $_{Ni49.\,9}Ti_{50.1}$ and $Ni_{50.3}Ti_{29.7}Hf_{20}$ Tube Actuators'. Journal of Materials Engineering and Performance, 24(4), 1726-1740.
20. Padula II, S. A., Gaydosh, D., **Saleeb, A.F**, & Dhakal, B., 2014. 'Transients and Evolution in NiTi'. Experimental Mechanics, 54(5), 709-715.
21. **Saleeb, A.F**., Dhakal, B., Padula II, S.A., and Gaydosh, D.J., 2013. 'Calibration of SMA material model for the prediction of the "evolutionary" load-bias behavior under conditions of extended thermal cycling' Smart Mater. Struct, 22(9), 094017.
22. **Saleeb, A.F**., Dhakal, B., Hosseini, M.S., and Padula II, S.A., 2013. 'Large Scale Simulation of NiTi Helical Spring Actuators under Repeated Thermomechanical Cycles' Smart Mater. Struct, 22(9), 094006.
23. **Saleeb, A.F**., Dhakal, B., Padula II, S.A., and Gaydosh, D.J., 2013. "Calibration of a three-dimensional multimechanism shape memory alloy material model for the prediction of the cyclic "attraction" character in binary NiTi alloys" Journal of Intelligent Material Systems and Structures, Vol. 24, n.1, pp-70-88.
24. **Saleeb, A.F.**, Kumar, A., Padula II, S. A. and Dhakal B., 2013. "The cyclic and evolutionary response to approach the attraction loops under stress controlled isothermal conditions for a multi-mechanism based multi-axial SMA model" Mechanics of Materials 63, pp21–47.
25. **Saleeb, A.F.**, Kumar, A., Thomas, V.S., 2013, 'The important roles of tissue anisotropy and tissue-to-tissue contact on the dynamical behavior of a symmetric tri-leaflet valve during multiple cardiac pressure cycle', Med. Eng. Phy., 35 ,pp 23–35.
26. Yun, G.J, **Saleeb, A.F.**, Binienda, W., Menzemer, C., Shang, S., 2012, 'Improved SelfSim for Inverse Extraction of Non-uniform, Nonlinear and Inelastic Constitutive Behavior under Cyclic Loadings', J. Aerosp. Eng., J. Aerosp. Eng, 25, pp256-272
27. **Saleeb, A.F.,** Kumar, A., 2011, 'Automated Finite Element Analysis of Complex Dynamics of Primary System Traversed by Oscillatory Subsystem', Int. J. Comput. Methods Eng. Sci. Mech., Vol. 12, n. 4, pp 184-202.
28. **Saleeb, A.F.**, Padula II, S.A., Kumar A., 2011, 'A Multi – axial, Multi – mechanism based Constitutive Model for the Comprehensive Representation of the Evolutionary Response of SMAs under General Thermomechanical Loading Conditions', Int. J. Plast., Vol. 27, n. 5, pp 655-687.
29. Kumar Abhimanyu, **Saleeb, A.F.**, 2009, 'Computer Modeling for the Complex Response Analysis of Nonstandard Structural Dynamics Problems', J. of Aerospace Engg, Vol. 22, n. 3, pp 324-330.
30. **Saleeb, A.F.**, Kumar Abhimanyu, 2009, 'Comprehensive Modeling of Shape Memory Alloy Material Response Using a Multimechanism-Based Inelastic Model', J. of Aerospace Engg, Vol 22, n. 4, 438-444.
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32. **Saleeb, A.F.**, Liang, R.Y., Al-Qablan, H., and Powers, D., 2005, 'Numerical Simulation Techniques for HMA rutting under loaded wheel tester', Int. J. of Pavement Engg., Vol. 6, n. 1, pp. 57-66.
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generalized potential-based viscoelastoplasticity model', Int. J. of Plasticity, 20, pp. 2111-2142.
35. **Saleeb, A.F.**, Marks, J.R., Wilt, T.E. and Arnold, S.M., 2004, 'Interactive software for material parameter characterization of advanced engineering constitutive models', Advances Engng. Software, 35, pp. 383-398.
36. **Saleeb, A.F.**, Wilt, T.E., Al-Zoubi, N.R. and Gendy, A.S., 2003, 'An anisotropic viscoelastoplastic model for composites—sensitivity analysis and parameter estimation', Composites B, 34, pp. 21-39.
37. S.S Tseng and **Saleeb A. F.**, December 2003, "A Numerical Study of the Dynamic Defect Energy for Global Nondestructive Evaluation", Asia Pacific Review of Engineering Science and Technology, Vol. 2, No. 1, pp. 349-367, ISSN-1727-1266., Project No. : NSC 91-2211-E-151-006
38. Marzouk, S. S., Gendy, A. S., Mikhaiel, S. N. and **Saleeb, A. F.**, 2002 'Modeling with Increased Efficiency and Versatility for Flexural-Torsional Buckling of Unsymmetrical Thin-Walled Structures', International Journal of Structures Stability and Dynamics, Vol. 2, No. 4., pp 431-456.
39. **Saleeb, A.F.**, Gendy, A.S., and Wilt, T.E., 2002, 'Parameter-estimation algorithms for characterizing a class of isotropic and anisotropic viscoplastic material models', Mechanics of Time-Dependent Materials, 6, pp. 323-362.
40. Arnold, S.M., **Saleeb, A.F.**, Al-Zoubi, N.R., 2002, 'Deformation and life analysis of composite flywheel disk systems', Composites Part B: Engineering Volume: 33, Issue: 6, September, pp. 433-459.
41. **Saleeb, A.F.**, Wilt, T.E., Trowbridge, D.A., and Gendy, A.S., 2002, 'Effective strategy for the automated characterization in complex viscoelastoplastic modeling for isotropic/anisotropic aerospace materials', ASCE, J. of Aerospace Engineering, Vol 15, No 3, pp. 84-96.
42. **Saleeb, A.F.**, Gendy, A.S., 2001, 'Mixed Finite Element Modeling for the Dynamics of Beam Assemblages Undergoing Large Overall Motions in Space', Int. J. of Computational Engg. Science 2, no. 2, pp. 309-338.
43. Arnold, S.M., **Saleeb, A.F.**, and Castelli, M.G., 2001, 'A General time dependent constitutive model-Part II: Application to a titanium alloy', Journal of Engineering Materials and Technology, Vol. 123, 65-73.
44. **Saleeb, A.F.**, and Arnold, S.M., 2001, 'A General time dependent constitutive model: Part I-Theoretical developments', J. of Eng. Materials and Tech., Vol. 123, pp.51-64.
45. **Saleeb, A.F.**, Arnold, S.M., Castelli, M.G., Wilt, T.E., and W. Graf, 2001, 'A General Hereditary Multimechanism-Based Deformation Model With Application to The Viscoelastoplastic Response of Titanium Alloys', International Journal of Plasticity, Vol. 17, pp. 1305-1350.
46. Lissenden, C.J., Arnold, S.M., and **Saleeb, A.F.**, 2001, 'Plastic Coupling and Stress Relaxation During Nonproportional Axial-Shear Strain-Controlled Loading', J. of Pressure Vessel technology, Vol. 23, pp. 81-87.
47. Yuan, J.Z., **Saleeb, A.F.**, and Gendy, A.S., 2000, 'Stress Projection, Layerwise-Equivalent, Formulation For Accurate Predictions of Transverse Stresses in Laminated Plates and Shells', International Journal of Computational Engineering and Science,Vol. 1, No. 1, pp. 91-138.
48. Gendy, A.S., and **Saleeb, A.F.**, 2000, 'Nonlinear material parameter estimation for characterizing hyperelastic large strain models', Computational Mechanics, Vol. 25, pp. 66-77.
49. **Saleeb, A.F.**, Wilt, T.E., and W. Li, W., 2000, 'Robust Integration Schemes for Generalized Viscoplasticity with Internal-State Variables', Computers and Structures, Vol. 74, pp. 601-628.
50. Gendy, A.S. and **Saleeb, A.F.**, 2000, 'Nonlinear Dynamics for Mixed Shells With Large Rotation and Elastoplasticity', Int. J. of Comput. Engrng. Science, Vol. 1, No. 1, pp. 1-31.
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52. **Saleeb, A.F.**, Wilt, T.E., and W. Li, W., 1999, 'An Implicit Integration Scheme For Generalized Viscoplasticity with Dynamic Recovery', Computational Mechanics, Vol. 21, No. 6, pp. 429-440.
53. Shih-Shong Tseng and **A.F. Saleeb**, June 1998, "Defect Energy Method for Global Nondestructive Evaluation", Journal of the Chinese Institute of Civil and Hydraulic Engineering, Vol. 10, No. 2, pp. 389-396, Project No. : NSC 84-2211-E-151-001
54. **Saleeb, A. F.**, Wilt, T. E., Li, W., 1998, 'An Implicit integration scheme for generalized viscoplasticity with dynamic recovery' Computational Mechanics, Volume: 21, Issue: 6, June 24, pp. 429 - 440.
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59. Binienda, WK, **Saleeb, A. F.**, 1994, 'Contact-stress phenomena in numerical simulation of unidirectionally-reinforced composite beams', Computers and Structures, vol. 51, no. 3, pp. 277-288.
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61. Gendy, A. S., **Saleeb, A. F.**, 1994. 'Vibration Analysis of Coupled Extensional/Flexural/Torsional Modes of Curved Beams With Arbitrary Thin-Walled Sections', Journal of Sound and Vibration Volume: 174, Issue: 2, July 7, pp. 261 - 274.
62. Kim Y, **Saleeb A. F.**, Chang TYP, 1994, 'Implementation Of Material Stiffness Coefficients In Finite Element Applications To Rubber', Tire Science and Technology; 22, No.4, Oct-Dec. p.223-41.
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65. **Saleeb, A.F.** and Chang, T.Y.P., 1994, 'An Effective Two-Dimensional Frictional Contact Model For Arbitrary Curved Geometry', Int. J for Numerical Methods in Engineering, Vol. 37, pp. 1297-1321.
66. Arnold, S.M., **Saleeb, A. F.**, Tan, H. Q., Zang, Y., 1994, 'Explicit robust schemes for implementation of a class of principal value-based constitutive models: symbolic and numerical implementation', Int. J. Num. Meth. Engng., Vol. 37, pp. 1931-1944.
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83. Chang, T.Y., **Saleeb, A.F.**, and Graf, W., 1989, 'On the Mixed Formulation of a 9 Node Lagrange Shell Element', Computer Methods in Applied Mechanics and Engineering, Vol. 73, pp. 259-282.
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on A Consistent Mixed Formulation', Computers and Structures, Vol. 27, No. 4, pp. 455-466.

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95. Wang, P.S., H. Tan, H., **Saleeb A.F.,** and Chang, T.Y. 1986, 'Code Generation for Hybrid Mixed Mode Formulation in Finite Element Analysis', Association for Computing Machinery, Vol. 2, pp. 45-52.
96. Chen, W.F. and **Saleeb A.F**., 1984, 'Plasticity Modeling for Engineering Materials-Developments and Applications', Special Anniversary Vol. for Honor of Prof. Massonet, Liege, Belgium, pp. 117-132.
97. **Saleeb, A.F.** and Chen, W.F., 1981, 'Elastic-Plastic Large Displacement Analysis of Pipes', Journal of the Structural Division, ASCE, Vol. 107, No. ST4, pp. 605-626.
98. **Saleeb, A.F.** and Chen, W.F., 1981, 'Nonlinear Hyperelastic Constitutive Models for Soils, Part I: Theory and Calibration', in "Limit Equilibrium, Plasticity, and Generalized Stress-Strain in Geotechnical Engineering", R.N. Yong and H.Y. Ko (Eds.), ASCE Publication, pp. 265-285.
99. **Saleeb, A.F.** and Chen, W.F., 1981, 'Nonlinear Hyperelastic Constitutive Models for Soils, Part II: Predictions and Comparisons, in Limit Equilibrium, Plasticity, and Generalized Stress-Strain in Geotechnical Engineering', R.N. Yong and H.Y. Ko (Eds.), ASCE Publication, pp. 492-538.

Refereed Publications:

- **Saleeb, A. F.,** Arnold, S. M., and Al-Zoubi, N. R., 'A Study of Time-Dependent and Anisotropic Effects on the Deformation Response of Two Flywheel Designs', ASTM STP 1436, Composite Materials: Testing and Design Fourteenth Volume, C.E. Bakis, Ed., ASTM International, West Conshohocken, PA, 2003.
- Arnold, S.M., **Saleeb, A.F.,** and Al-Zoubi, N. R. 'Deformation and life analysis of composite flywheel disk and multi-disk systems', NASA/TM-210578, 2001
- Arnold, SM; **Saleeb, A.F.**, Castelli, MG, 'A general reversible hereditary constitutive model. II. Application to a titanium alloy' NASA/TM (USA), vol. 107494, pp. 27, Dec, 1997
- **Saleeb, A.F.**, Arnold, SM, 'A general reversible hereditary constitutive model. I. Theoretical developments NASA.', TM (USA), vol. 107493, pp. 45, Dec, 1997
- Wilt, T.E., Arnold, S.M., and **Saleeb, A.F.**, 'A Coupled/Uncoupled Computational Scheme for Deformation and Fatigue Damage Analysis of Unidirectional Metal-Matrix Composites', ASTM STP 1315, D.L. McDowell, Ed., pp. 65-82, 1997
- Wei Li, **Saleeb, A.F**, 'Robust integration schemes for generalized viscoplasticity with internal-state variables. Part II, Algorithmic developments and implementation', National Aeronautics and Space Administration; Springfield, Va.: National Technical Information Service, distributor. , 1995
- Arnold, S.M., **Saleeb, A.F.**, and Castelli, M.G., 'A fully associative, non-isothermal, non-linear kinematic, unified viscoplastic model for titanium-based matrices', in: Verrilli, M.J., Castelli, M.G. (eds.), Thermomechanical Fatigue Behavior of Materials, ASTM STP Philadelphia, or NASA/TM-106926, pp. 1263., 1994
- Arnold, S.M., **Saleeb, A.F.**, and Castelli, M.G., 'A fully associative non-linear kinematic, unified viscoplastic model for titanium-based matrices', in: Johonson, W.S., Larsen, J.M., Cox, B.N. (eds.), Life Prediction Methodology for Titanium Matrix Composite, ASTM STP 1253, ASTM, Philadelphia, 1994.
- **Saleeb, A.F.**,and S.M. Arnold, 'Explicit robust schemes for implementation of a class of principal value-based constitutive models theoretical development',[Washington, DC] : National Aeronautics and Space Administration ; [Springfield, Va.] : For sale by the National Technical Information Service., 1991

Conference Publications:

- D.E. Nicholson, B. Dhakal, **A.F. Saleeb**, S.A. Padula II, R.D. Noebe and R. Vaidyanathan, "Thermomechanical Behavior of Shape Memory NiTi Springs for Model Validation", ASME 2014 SMASIS, Newport, RI, September 8-10, 2014.
- S. Dilibal, **A. F. Saleeb**, B. Dhakal, A.E. Hurley, J. S. Owusu-Danquah, S. A. Padula II, R. D. Noebe and G. S. Bigelow, 2013. "Characterization Capabilities of a 3D Multi-mechanism Material Model for the Prediction of the Thermo-mechanical Behavior of Different Classes of Shape Memory Materials", ASME 2013 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, September 16-18, 2013 in Snowbird, Utah, USA (Symposium 2 on Mechanics and Behavior of Active Materials).
- B. Dhakal, D.E. Nicholson, **A. F. Saleeb**, S. A. Padula II and R. Vaidyanathan, 2013. "Prediction of the Evolving Multi-dimensional Deformation Response of a Shape Memory NiTi Spring under Thermo-mechanical Cycling", ASME 2013 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, September 16-18, 2013 in Snowbird, Utah, USA (Symposium 2 on Mechanics and Behavior of Active Materials)
- J.S. Owusu-Danquah, **A. F. Saleeb**, B. Dhakal, A.E. Hurley , S. Dilibal, S. A. Padula II, R. D. Noebe, and G. S. Bigelow, 2013. "Large-scale Simulation of a Torque-Tube Actuator Using a 3D Multi-mechanism Material Model: A Comparative Study with $Ni_{49.9}Ti_{50.1}$ and $Ni_{50.3}Ti_{29.7}Hf_{20}$ Shape Memory Alloys", ASME 2013 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, September 16-18, 2013 in Snowbird, Utah, USA (Symposium 2 on Mechanics and Behavior of Active Materials).
- A.E. Hurley, **A. F. Saleeb**, S. Dilibal, B. Dhakal, J.S. Owusu-Danquah, and S. A. Padula II, 2013. "Finite Element Modeling of NiTi Shape Memory Alloy Stents and Bone Staples for Biomedical Applications", ASME 2013 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, September 16-18, 2013 in Snowbird, Utah, USA (Symposium 2 on Mechanics and Behavior of Active Materials).
- **A. F. Saleeb**, B. Dhakal and S. A. Padula II , 2012. "Theoretical Development, Characterization, and Application of a 3D Multi-mechanism SMA Material Model for the Analysis of SMA based Actuators", ASME 2012 Conference on Smart Materials, Adaptive Structures and Intelligent System, September 19-21, 2012 in Stone Mountain, Georgia (Symposium 2 on Mechanics and Behavior of Active Materials).
- S. A. Padula II, D.J. Gaydosh, **A. F. Saleeb**, and B. Dhakal, 2012. "Transients and Evolutions in 55NiTi", ASME 2012 Conference on Smart Materials, Adaptive Structures and Intelligent System, September 19-21, 2012 in Stone Mountain, Georgia (Symposium 2 on Mechanics and Behavior of Active Materials).
- **A. F. Saleeb**, A. Kumar, 'On The Comprehensive Modeling of Response of Shape Memory (SMA) Materials', presented at the ASCE Earth & Space 2008, Long Beach, CA, March 3-5, 2008.
- A. Kumar, **A. F. Saleeb**, 'On the dynamics of non-linear, coupled structures with primary and moving secondary oscillating systems', presented at the ASCE Earth & Space 2008, Long Beach, CA, March 3-5, 2008.
- Doehring, T., Einstein, D., Freed, A., Pindera, M.-J., **Saleeb, A.F.** & Vesely, I., '463-030: New Approaches to Computational Modeling of the Cardiac Valves', International conference on biomechanics, 2nd -- 2004 Aug : Honolulu, HI, 2004, pp.134-137.
- **A.F. Saleeb**, S.M. Arnold, T.E. Wilt, 'General hereditary material deformation modeling with special emphasis on characterization and numerical simulations within the context of ABAQUS', ABAQUS World User Conference, Boston, MA, May 2004.
- **A. F. Saleeb**, A.S. Gendy, N.R. Al-Zoubi, T.E. Wilt, 'Advanced soft tissue modeling for telemedicine and surgical simulations', New Orleans, LA, July 2003.
- **A.F. Saleeb**, S.M. Arnold, T.E. Wilt, 'UMAT implementation of coupled, multilevel, structural deformation and damage analysis of general hereditary materials', ABAQUS USERS CONFERENCE PROCEEDINGS, 2000, May : Newport, RI, pp 67-84.
- **A.F. Saleeb**, A.S. Gendy, T.E. Wilt, 'Parameter estimation for viscoplastic material modeling', NASA Center for Aerospace Information (USA), pp. 14.1-14.15., 1997.
- **A.F. Saleeb.** ; Li, W; Wilt, TE, 'Robust integration schemes for generalized viscoplasticity with internal-state variables', NASA Center for Aerospace Information (USA), pp. 13.1-13.13., 1997
- Shih-Shong Tseng; Ming-Chao Lin and **A.F. Saleeb**, "A Static Approach for Structural Damage Assessment", the 8th International Conference on Computational Methods and Experimental Measurements, Rhodes, Greece, May 21-23, 1997. Project No. : NSC 87-2211-E-151-003
- **A.F. Saleeb**, T.Y. Chang and J. Yuan, 'On Finite Element Modeling of Sheet Metal Forming Processes', presented at the ASM-1990 Conference on Near Net Shape Manufacturing for the Automotive Industry, Detroit, Oct. 8-10, 1990
- T.Y. Chang, **A.F. Saleeb**, and G. Li, 'Large Strain Analysis of Rubbers by a Perturbed Lagrangian Formulation', presented at the 2nd World Congress on Computational Mechanics, University of Stuttgart, W. Germany, Aug. 27-31, 1990
- **A.F. Saleeb**, T.Y. Chang, J. Wang, 'A Simple Shell Model for the Analysis of Sheet Metal Forming Problems', presented at the 2nd World Congress on Computational Mechanics", Univ. of Stuttgart, W. Germany, Aug. 27-31, 1990

- **A.F. Saleeb**, A. Gendy, and T.Y. Chang, 'Buckling and Nonlinear Dynamics of Spatially-Curved Beams', presented at the 3rd Joint ASCE-ASME Mechanics Conference, Session 2: Stability Problems in Steel Structures", Univ. of California, San Diego, July 9-12, 1989.
- **A.F. Saleeb**, T.Y. Chang and W. Graf, 'Nonlinear Applications of Low Order C^o-Elements for Plates and Shells', presented in the International Conference on Computational Engineering Science, April 10-14, 1988, Atlanta, GA.
- M. Sobhani, D.H. Timmerman and **A.F. Saleeb**, 'A Comparative Numerical Study for Three Different Soil Materials', Proc., 2nd International Conference on "Constitutive Laws for Engineering Materials: Theory and Applications", University of Arizona, Tucson, Jan. 1987.
- T.Y. Chang and **A.F. Saleeb**, 'On Selection of Stress Parameters for Hybrid/Mixed Finite Elements', an invited paper, presented at the International Conference on Computational Mechanics, Tokyo, Japan, May 25-29, 1986.
- **A.F. Saleeb**, T.Y. Chang and S. Yingyeunyong, 'A Class of C^o-Triangular Elements for Analysis of Plates and Shells', presented in the Computational Mechanics Session, ASCE-EMD Specialty Conference, State University of New York at Buffalo, May 25-27, 1987.
- T.Y. Chang, **A.F. Saleeb** and W. Graf, 'Reformulation of Degenerated Shell Elements Using a Mixed Method', presented at 1st World Congress on Computational Mechanics, University of Austin, Texas, Sept. 22-26, 1986 .
- **A.F. Saleeb** and K. Lou, 'Prediction Evaluation of Elasticity and Plasticity Models for Sands', presented in the International Workshop on "Constitutive Equations for Granular Soils", Case Western Reserve University, Cleveland, July 1987.
- S.C. Shyu, T.Y. Chang and **A.F. Saleeb**, 'Solution Algorithm for Contact Analysis with Friction Using A Mixed Finite Element Method', presented at the 20th Midwestern Mechanics Conference, Purdue University, W. Lafayette, IN, Sept. 1987.
- M. Sobhani, D.H. Timmerman and **A.F. Saleeb**, 'A Comparative Numerical Study for Determination of Pore Pressure Under Undrained Conditions', Proc., Session on Water Resources, 3rd International Conference on Computational Methods and Experimental Measurements, Porto Carras, Greece Sept. 2-5, 1986.
- **A.F. Saleeb**, T.Y. Chang and J.Y. Chen, 'Local/Global Numerical Integration Techniques for Viscoplastic Analysis', presented at the 3rd Symposium on "Nonlinear Constitutive Modeling for High Temperature Applications", NASA/University of Akron, June 11-13, 1986.
- T.Y. Chang, **A.F. Saleeb** and S.C. Shyu, 'Finite Element Analysis of Two Dimensional Contact Problems with Friction', presented at the Tire Society Fifth Annual Meeting on Tire Science and Technology, University of Akron, March 25-27, 1986.
- **A.F. Saleeb** and T.Y. Chang 'On Finite element Implementation and Computational Techniques for Modeling of High-Temp. Composites', A Four-Hour Seminar, presented at NASA Lewis, Jan. 9, 1989
- W.F. Chen and **A.F. Saleeb**, 'Constitutive Models for Engineering Materials', presented at ASCE Annual Convention in Florida, Oct. 27-31, 1980 .
- **A.F. Saleeb** and W.F. Chen, 'Constitutive Modeling for Soils-An Overview', presented at the ASCE Annual Convention in Las Vegas, April 26-30, 1980.

Technical Reports:

- **A.F. Saleeb** and A. Kumar, 'Life Cycle Evolutionary Modeling of Shape Memory Alloys', Boeing Research & Technology, Boeing Co., December 2010.
- **A.F. Saleeb** and A. Kumar, 'FEA Implementation of the SMA – GVIPS Material Model for Predicting Evolutionary Response of Shape Memory Alloys', Boeing Research & Technology, Boeing Co., December 2009.
- **A.F. Saleeb** and G. K. Ponnaluru, 'Enhancement of the Feature Extraction Capability in Global Damage Detection Using Wavelet Theory', NASA Contractor Report No. 214225, May 2006.
- **A.F. Saleeb** and M. Prabhu, 'Defect Localization capabilities of a Global Detection Scheme: Spatial Pattern Recognition Using Full-Field Vibration Test Data in Plates', NASA Contractor Report No. 211685, Aug 2002.
- **A.F. Saleeb**, A.S. Gendy, T.E. Wilt and D.A., Trowbridge, 1998, 'COMPARE-Constitutive Material Parameter Estimation, User's Guide-Version 1.0', Technical Report, Dept. of Civil Engineering, University of Akron, Akron, Ohio.
- **A.F. Saleeb**, T.Y. Chang, T. Wilt, and I. Iskovitz, 'Finite Element Computational Techniques for Constitutive Modeling of High-Temperature Composite', NASA Contractor Report No. 185120, July 1989.
- S.N. Mikhail and **A.F. Saleeb**, 'Stability of Plates with Holes and Lateral Stiffness Using Finite Elements', Report in Structural Eng., Faculty of Engineering, Cairo Univ., Egypt, 1984.
- **A.F. Saleeb**, 'Computer Analysis of Multi-Shell Concrete Structures', Report No. CE-STR-81-11-2, Civil Eng., Yarmouk Univ., Irbid, Jordan, 1981.
- **A.F. Saleeb** and W.F. Chen, 'Near-Bottom Bend of Flow Lines', Report No. CE-STR-80-4, Structural Engineering Dept., Purdue University, 1980.

TEACHING

Classes Taught

Undergraduate

- Statics
- Mechanics of Solids
- Theory of Structures
- Advanced Structural Analysis
- Steel Design
- Metallic Bridges
- Computer Methods in Structural Engineering

Graduate

- Advanced Mechanics of Materials
- Structural Stability
- Limit Analysis in Structural Engineering
- Finite Element Analysis
- Elasticity
- Plasticity
- Energy Methods
- Advanced Structural Dynamics
- Theory of Plates and Shells
- Advanced Engineering Materials
- Computer Methods in Structural Engineering

Supervised PhD Dissertations:

1. Sufian Natsheh, PhD
   THE UNIVERSITY OF AKRON, In progress

2. Modeling and Characterization of a general multimechanism material model for advanced engineering applications of shape memory alloys
   by Josiah Owusu-Danquah, PhD
   THE UNIVERSITY OF AKRON, Nearing graduation

3. Characterization of a 3D multi-mechanism SMA material model for the prediction of the cyclic "evolutionary" response of NiTi for use in actuations
   by Binod Dhakal, PhD
   THE UNIVERSITY OF AKRON, 2013

4. Comprehensive Modeling of Shape Memory Alloys for Actuation of Large-Scale Structures
   By Kumar Abhimanyu, PhD
   THE UNIVERSITY OF AKRON, 2010

5. Mechanistic Evaluation of the Georgia Loaded Wheel Tester For Superpave asphalt mixtures
   by Husam A. Al Qablan, PhD
   THE UNIVERSITY OF AKRON, 2003

6. On the development of life-prediction methodologies for different designs of composite flywheel rotors
   by Al-Zoubi, Nasser R., PhD
   THE UNIVERSITY OF AKRON, 2002

7. Developments for complex inelastic large-scale simulations and parameter estimation, with emphasis on large-strain, softening and localization phenomena
   by Al-Shatnawi, Anis S., PhD
   THE UNIVERSITY OF AKRON, 2001

8. Theoretical studies and computational algorithms for refined shell modeling: Multiple-scale phenomena and shell-intersection problems in composites
   by Yuan, Jay Z., PhD

THE UNIVERSITY OF AKRON, 1997

9. Material characterization and stress analysis for rubber by finite element method
   by Kim, Yong-Hee, PhD
   THE UNIVERSITY OF AKRON, 1994

10. Fracture evaluation and lifetime predictions of viscoplastic components
    by Seif, Youssef Sobhy, PhD
    THE UNIVERSITY OF AKRON, 1994

11. Studies on global methods for localized-damage detection in large-scale structures
    by Tseng, Shih-Shong M., PhD
    THE UNIVERSITY OF AKRON, 1993

12. Effective nonlinear shell modeling for sheet metal forming applications
    by Yuan, Jianqing, PhD
    THE UNIVERSITY OF AKRON, 1993

13. Development of effective models for nonlinear static/dynamic, and stability analyses of thin-walled structures
    by Gendy, Atef Sami, PhD
    THE UNIVERSITY OF AKRON, 1992

14. Linear and nonlinear finite element analysis of laminated composite structures at high temperatures
    by Wilt, Thomas Edmund, PhD
    THE UNIVERSITY OF AKRON, 1992

15. Effective modeling of frictional contact for three-dimensional sheet metal forming applications
    by Chen, Keming, PhD
    THE UNIVERSITY OF AKRON, 1992

16. Global structure damage detection techniques using vibration characteristics
    by Hu, Jialou, PhD
    THE UNIVERSITY OF AKRON, 1992

17. Parallel computation in finite element method
    by Zheng, Dong, PhD
    THE UNIVERSITY OF AKRON, 1992

18. On parallel algorithms for finite element analysis using mimd and simd systems
    by Hu, Yang, PhD
    THE UNIVERSITY OF AKRON, 1992

19. Finite element implementation and numerical techniques in viscoplastic analyses
    by Seiden Iskovitz, Ilana, PhD
    THE UNIVERSITY OF AKRON, 1992

20. Large strain analysis of rubbers by a mixed finite element method
    by Li, Gongfu, PhD
    THE UNIVERSITY OF AKRON, 1991

21. On the development of effective mixed shell models with emphasis on large-rotation/large-elastic strain analyses
    by Yingyeunyong, Surakate, PhD
    THE UNIVERSITY OF AKRON, 1990

22. A hybrid/mixed model for inelastic nonlinear shell analysis and its application to sheet metal forming problems
    by Wang, Jen-Ying Jim, PhD
    THE UNIVERSITY OF AKRON, 1990

23. A geometric nonlinear degenerated shell element using a mixed formulation with independently assumed strain fields

by Graf, Wiley Edward, PhD
THE UNIVERSITY OF AKRON, 1989

24. Finite element solutions of contact problems based on a consistent mixed formulation
by Shyu, Shih-Ching, PhD
THE UNIVERSITY OF AKRON, 1988

25. On the numerical difficulties and their solutions for implementing recent plasticity models for soils
by Lou, Ken-An, PhD
THE UNIVERSITY OF AKRON, 1988

26. On automatic time incrementing schemes and viscoplastic stress analysis with large strains
by Chen, Jean-Yea, PhD
THE UNIVERSITY OF AKRON, 1987

27. Numerical study of three different soil material models
by Mohammad E. Sobhanie, PhD
THE UNIVERSITY OF AKRON, 1986

Supervised MS Theses:

1. A Comparative Study for the Effect of Tissure Anisotropy on the Behavior of a Single Cardiac Pressure Cycle for a Symmetric Tri-Leaflet Valve.
by Vineet Sunny Thomas , MSc
THE UNIVERSITY OF AKRON, 2010.

2. Comparative Experimental Studies for Global Damage Detection in Plates Using the Scanning Laser Vibrometer Techniques.
by Dabit Acharya, MSc
THE UNIVERSITY OF AKRON, 2006

3. Use of Advanced Material Modeling Techniques in Large-Scale simulations for Highly Deformable Structures
by Krishna C, Vakada, MSc
THE UNIVERSITY OF AKRON, 2005

4. Enhancement of the Feature Extraction Capability in Global Damage Detection Using Wavelet Theory
by Gopi Krishna Ponnaluru, MSc
THE UNIVERSITY OF AKRON, 2005

5. Defect localization capabilities of a global detection scheme: Spatial pattern recognition using full-field vibration test data in plates.
by Milind Prabhu**,** MSc
THE UNIVERSITY OF AKRON, 2002

6. Study of a new global damage detection scheme for disk-type structures
by Muhammad S. Shohel**,** MSc
THE UNIVERSITY OF AKRON, 2001

7. Experimental investigation of a new global damage detection scheme
by Seksan Ratanasumritkul**,** MSc
THE UNIVERSITY OF AKRON, 1997

8. Applications of a hybrid/mixed quadrilateral element to plates and shells

by Chao Jiang, MSc.
THE UNIVERSITY OF AKRON, 1986

9. A parametric study on the numeric sensitivity of incompatible displacement and hybrid/mixed elements
by Wiley E. Graf, MSc.
THE UNIVERSITY OF AKRON, 1984

Supervised MS Engineering Reports:

1. Everard, J. 1992
2. Polack, D. 1985
3. Thorson, M. G. 1985

Engineering Mentoring

- Have mentored many students who are currently serving in the various academic and industrial fields:
  - Academia:
    (1) Dr. Michael Shih-Shong Tseng, professor, department of civil engineering, National Kaohsiung University of Applied Sciences, Kaohsiung, Taiwan
    (2) Dr. Atef Sami Gendy, professor, civil engineering department, Cairo university, Egypt
    (3) Dr. Anis S. Shatnawi, associate professor, department of civil/structural engineering, The university of Jordan, Jordan
    (4) Dr. Husam A. Al Qablan, assistant professor, department of civil engineering, Hashemite university, Zarqa, Jordan

  - Governmental Research Agencies:
    (1) Dr. Steve Arnold, Chief of the Mechanics and Life Prediction Branch in the Structures and Materials Division at NASA Glenn Research Center.
    (2) Dr. Illana Iskovitz, Senior scientist, Ohio Aerospace Institute, Cleveland, Ohio, US.

  - Industry:
    (1) Dr. Nasser Al-Zoubi, Senior Bridge Engineer, El Robinson Engineering
    (2) Dr. Kumar, Abhimanyu, Assistant consultant, Oil and gas division, Atkins
    (3) Dr. Binod Dkakal, CAE Structural engineer, InnovationTek consulting company.

Post Graduate training supervision:

- Post-doctoral (1992-2014)
  1. B. Dhakal, PhD
  2. K. Abhimanyu, PhD
  3. H.A. Al Qablan, PhD
  4. A.S. Gendy, PhD
  5. T. E. Wilt, PhD
  6. S. Dilibal

- Post MS (2004-2005):
  1. J. R Marks, MS
  2. D.A. Trowbridge, MS

Scientific and Professional Society Membership:

- American Society of Civil Engineers
- American Society of Mechanical Engineers
- American Academy of Mechanics
- International Association for Computational Mechanics
- American Concrete Institute
- American Institute of Steel Construction
- Member of the Phi Kappa Phi Honor Society
- Sigma Xi Society

Honors and Awards

- NASA Best Technical paper & Team Award, Structures & Acoustics Division, 2002
- NASA Certificate of Recognition, Inventions/Contributions Board, 1998
- The College of Engineering Louis A. Hill Award for Outstanding Achievement, The Univ. of Akron, 1995
- The Outstanding Research Award, College of Engineering, The Univ. of Akron, 1995
- The 1981 Nellie Munsen Award for Teaching, Purdue University
- B.Sc. Distinction with Honors Degree (ranked first), Cairo University
- The Egyptian Ministry of education Special Award for Nations Top Ten Students entering the University (total of about 117,000 students)

RESEARCH SUPPORT:

1. **NASA Glenn Research**, A Computationally-Efficient, Multi-Mechanism based Framework for the Comprehensive Modeling of the Evolutionary Behavior of Shape, PI **Saleeb, A.F.**, 06/30/11 to 06/30/15, $1,081,812.
2. **Boeing Research & Technology, Boeing Co.**, Computationally Efficient Evolutionary Modeling of SMA (Shape memory Alloys), PI **Saleeb, A.F.**, 06/01/10 to 05/31/11, $65,761.
3. **Boeing Research & Technology, Boeing Co.**, Computationally Efficient Evolutionary Modeling of SMA (Shape memory Alloy), PI **Saleeb, A.F.**, 10/01/09 to 05/31/10, $45,000.
4. **NASA Glenn Research**, Defect Detection Schemes and Algorithmic Developments for Large-Scale Simulations of Damaging Visco-Elastoplastic Structures, PI **Saleeb, A.F.**, 3/16/2002 to 3/14/2005, $ 211,000.
5. **NASA Glenn NICC**, Extending the Capabilities of the Program COMPARE, PI **Saleeb, A.F.**, Aug.2002 to July 2003, $ 73,000.
6. **Cleveland Clinic Foundation**, USAMRMC (DOD), Surgical Simulations With Soft Biological Tissues, PI **Saleeb, A.F.,** Dec.2001 to July 2003, $ 190,000.
7. **NICC/OCS**, Increasing the Usability of Program COMPARE, PI **Saleeb, A.F.,** April.2002 to March. 2003, $ 99,000.
8. **Ohio Department Of Transportation**, Mechanistic Evaluation Of The Georgia Loaded Wheel Tester For Superpave Asphalt Mixtures, Co-Pi **Saleeb, A.F.** , June 2000 to June 2003, 259,397.
9. **NASA Glenn Research**, Defect Detection Schemes and Algorithmic Developments for Large-Scale Simulations of Damaging Viscoelastoplastic Structures, PI **Saleeb, A.F.**, 3/15/2001 to 3/14/2002, $ 31,974.
10. **Ohio Board of Regent**, OBR Matching Fund for NCC3-808 (1999-01 Biennial), PI **Saleeb, A.F.**, 3/15/2001 to 3/14/2002, $ 20,000.
11. **NASA Glenn Research**, Defect Detection Schemes and Algorithmic Developments for Large-Scale Simulations of Damaging Viscoelastoplastic Structures, PI **Saleeb, A.F.**, 3/15/2001 to 3/14/2002, $ 175,000.
12. **NASA Glenn Research**, Deformation and Life Prediction of Polymer Matrix Composite Flywheel Rotors, PI **Saleeb, A.F.**, 3/1/2001 to 8/31/2002, $ 65,333.
13. **NASA Glenn Research**, Defect Detection Schemes and Algorithmic Developments for Large-Scale Simulations of Damaging Viscoelastoplastic Structures, PI **Saleeb, A.F.**, 5/23/2000 to 5/22/2001, $ 152,000.
14. **NASA Glenn Research**, Deformation and Life Prediction of Polymer Matrix Composite Flywheel Rotors, PI **Saleeb, A.F.**, 3/23/2000 to 3/22/2001, $ 47,932.
15. **NASA Glenn Research**, Enhancements to NURBS-Based FEA Airfoil Modeler-SABER, PI **Saleeb, A.F.**, 11/6/1999 to 11/5/2000, $ 102,210.
16. **NASA Glenn Research**, Deformation and Life Prediction of Polymer Matrix Composite Flywheel Rotors, PI **Saleeb, A.F.**, 6/1/1999 to 12/1/2000, $ 30,189.

17. **NASA Glenn Research**, Development in Coupled Deformation-Damage and Fracture Modeling for Life Prediction of Structures/Continuation of NAG-3-1747), PI **Saleeb, A.F.**, 3/1/1999 to 3/1/2000, $ 140,998.
18. **NASA Lewis Research**, Computational Tools for the Macro/Micromechanical Analysis of Composite Structures/Continuation of NCC3-441, PI **Saleeb, A.F.**, 3/8/1999 to 3/8/2000, $ 138,809.
19. **NASA Lewis Research**, Enhancements to NURBS-Based FEA Airfoil Modeler-SABER/Continuation of NCC3-578, PI **Saleeb, A.F.**, 11/6/1998 to 11/6/1999, $ 58,264.
20. **NASA Lewis Research**, Development in Coupled Deformation-Damage and Fracture Modeling for Life Predictions of Structures (Continuation of NAG-3-1747), PI **Saleeb, A.F.**, 5/14/1998 to 12/14/1999, $ 101,981.
21. **NASA Lewis Research**, Computational Tools and Techniques for Macro/Micromechanical Analysis of Composite Structures, PI **Saleeb, A.F.**, 3/8/1998 to 3/8/1999, $ 172,000.
22. **NASA Lewis Research**, Enhancements to NURBS-Based FEM Airfoil Modeler-SABER, PI **Saleeb, A.F.**, 10/17/1997 to 10/16/1998, $ 52,602.
23. **NASA Lewis Research**, Developments in Coupled Deformation-Damage and Fracture Modeling for Life Predictions of Structures, NAG 3-1747 Continuation, PI **Saleeb, A.F.**, 3/25/1997 to 3/24/1998, $ 130,066.
24. **NASA Lewis Research**, Computational Tools for the Macro/Micromechanical Analysis of Composite Structures-Continuation of NCC3-441 (Supplement # 4), PI **Saleeb, A.F.**, 1/8/1997 to 1/7/1998, $ 172,000.
25. **NASA Lewis Research**, Developments in Coupled Deformation-Damage and Fracture Studies for life Prediction (SUPPLEMENT # 2), PI **Saleeb, A.F.**, 4/9/1996 to 4/30/1997, $ 79,781.
26. **NASA Lewis Research**, Computational Tools and Techniques for the Macro/Micromechanical analysis of composite structures, PI **Saleeb, A.F.**, 12/14/1995 to 12/13/1996, $ 79,919.
27. **Ohio Board of Regent**, A University of Akron/CWRU Center for Infrastructure Materials and Rehabilitation (OBR/Investment Fund Award), Co-PI **Saleeb, A.F.**, 7/1/1995 to 6/30/1996, $ 885,000.
28. **NASA Lewis Research**, Algorithms for Parameter Estimation in Viscoplastic Material Models, PI **Saleeb, A.F.**, 5/19/1995 to 10/18/1996, $ 70,000.
29. **NASA Lewis Research**, Development in Coupled Deformation-Damage & Fracture Modeling for Life Predictions of Structures, PI **Saleeb, A.F.**, 5/19/1995 to 2/28/1996, $ 74,398.
30. **NASA Lewis Research**, Computational Tools and Techniques for the Macro/Micromechanical Analysis of Composite Structures, PI **Saleeb, A.F.**, 11/1/1994 to 10/31/1995, $ 75,000.
31. **Ford Motor Company**, Ford Motor Company Donation for Unrestricted Research Support, PI **Saleeb, A.F.**, 5/16/1994 to 5/15/1995, $ 20,000.
32. **NASA Lewis Research**, FE Implementation of Computational Techniques for Constitutive Modeling of High Temperature Composites (contin. of NAG3-901), PI **Saleeb, A.F.**, 11/1/1993 to 12/31/1994, $ 69,935.
33. **NASA Lewis Research**, State-Variables Integrator in Computational Viscoplasticity, PI **Saleeb, A.F.**, 5/1/1993 to 12/31/1994, $ 35,000.
34. **NASA Lewis Research**, FE Implementation & Computational Techniques.., PI Saleeb, Atef, 4/19/1993 to 11/18/1994, $ 44,997.
35. **Ford Motor Company**, Nonlinear Shell Modeling in Metal Forming, PI **Saleeb, A.F.**, July.1992 to Aug.1994, $ 35,000.
36. **NASA Lewis Research**, Finite Element Implementation & Computational Techniques for Constitutive Modeling of High Temperature Composites, PI **Saleeb, A.F.**, 4/1/1992 to 3/31/1993, $ 69,966.
37. **Ohio Department of Transportation**, Field Demonstration of Nondestructive Bridge Evaluation Using Thermographic

Stress Analysis, Co-PI **Saleeb, A.F.**, 1991 to 1993, $ 68,963.

38. **NASA Lewis Research**, (02-00-0625) Finite Element Implementations and Computational Techniques for Constitutive Modeling, PI **Saleeb, A.F.**, 6/1/1990 to 4/1/1992, $ 85,877.
39. **National Science Foundation**, Finite Element Application to Sheet Metal Forming, Co-PI **Saleeb, A.F.**, 1/1/1989 to 6/30/1992, $ 218,000.
40. **Cray Research Inc**., Parallel Algorithms for FE Modeling of Sheet Metal Forming, PI **Saleeb, A.F.**, Nov.1989 to Oct.1990, $31,000.
41. **NASA Lewis Research**, R913, Co-PI **Saleeb, A.F.**, 6/1/1988 to 7/31/1989, $ 69,523.
42. **National Science Foundation**, Advanced Computational Techniques in FE Analysis in Engineering Applications, Co-PI **Saleeb, A.F.**, Mar.1988 to Jan.1991, $ 677,000.

43. **NASA Lewis Research**, Developments of Efficient Shell Elements for Nonlinear Analysis of Engines Subjected to Thermomechanical Loadings, PI **Saleeb, A.F.**, Feb.1987 to Mar.1988, $ 51,972.
44. **NASA Lewis Research**, Nonlinear Analysis of Shells with Large Aspect Ratios, Co-PI **Saleeb, A.F.**, Jan. 1985 to Jan.1987, $ 117,100.