DIMITRIS A. SARAVANOS

Professor
Structural Mechanics and Smart Materials Lab
Applied Mechanics, Materials and Biomechanics Section
Department of Mechanical Engineering & Aeronautics,
University of Patras, Patras, GR26500, GREECE
Tel: +30-2610-996191, +30-2610-969437, Fax: +30-2610-992644,
e-mail: saravanos@mech.upatras.gr, http://saam.mech.upatras.gr

Researcher ID
scopus : 006676075
orcid: 0000-0001-9224-2047

EDUCATION:

1988 Ph.D in Mechanical Engineering, The Pennsylvania State University, University Park, PA.
1984 M.E. in Mechanical Engineering, Stevens Institute of Technology, Hoboken, NJ.
1982 Diploma w. Thesis in Mechanical Engineering, National Technical University of Athens.

POSITIONS HELD:

1999-date Professor, Dept. of Mechanical Engineering & Aeronautics, University of Patras.
1989-1999 Senior Research Associate, Ohio Aerospace Institute, Structures Division, NASA Glenn Research Center, Cleveland, Ohio.
1988-1989 NRC Research Associate, Structural Mechanics Branch, Structures Division, NASA Glenn Research Center, Cleveland, Ohio.
1984-1988 Graduate Research Assistant; Applied Research Laboratory; The Pennsylvania State University

CURRENT RESEARCH THRUSTS:

Computational structural mechanics and dynamics, adaptive and morphing structures, multifunctional and intelligent materials, composite materials and structures, structural health monitoring, finite element methods, multi-scale mechanics.

EDITORIAL DUTIES, CONFERENCE COMMITTEES, REVIEWING:

Associate Editor:
Wind Energy, John Wiley (2011-date)
J. of Aerospace Science and Technology, Elsevier (2008-date)
Quest Editor: J. of Intelligent Materials, Systems and Structures (2008, 2012); Journal of Composite Materials(2008)
Editorial Board: INCAS Bulletin, Romania
Organization of international scientific meetings:
Organizer and Chairman, COMP-07: 6th International Symposium on Advanced Composite Technologies, 2007
Organizer and Chairman, ICAST2011 22nd International Conference on Adaptive Structures Technologies, 2011
Member of Leading Conference Committees (2004- date): AIAA Adaptive Structures Conference; Intern. Conference on Adaptive Structures Technologies (ICAST); Member of European Structural Health Monitoring Workshop.
Reviewer: All major journal in the fields of Aeronautics (AIAA J), Applied Mechanics (IJSS, ASME Applied Mechanics), Vibrations and Structural Dynamics (ASME JVA, JSV, JASA); Intelligent Materials and Structures (JIMSS, SMS); Composite Materials and Structures (Composites Part A, B, Composite Structures, Advanced Composites Letters); Computational Mechanics (NME, CMAME, Computational Mechanics), etc.

PROFESSIONAL AFFILIATIONS & SERVICE:

Associate Fellow AIAA, Member ASME.
ERC evaluation panel member.
Member of AIAA Adaptive Structures Committee; Member of Intern. Conference on Adaptive Structures Technologies Organizing Committee, Member of European Structural Health Monitoring Workshop Scientific Committee.

AWARDS:

Thesis Advisor of the best European Ph.D in Wind Energy (2012), European Wind Energy Academy.
Space Act Award (2000), NASA Glenn Research Center.

4 Team Achievement Awards (1990, 1993, 1995, 2001), NASA Glenn Research Center.

PUBLICATION RECORD:

70 Journal Articles, 96 Conference Papers and Presentations, over 104 coauthors.
Citations: 2256 (Scopus), 3214 (Google Scholar); *h-index:* h-21 (WoS), h-25 (Scopus), h-28 (Google Scholar).

RESEARCH SUPPORT:

2015-2017 CROR Blade-Out Impact Simulations and Sample Manufacturing (BLADEOUT), JTI-CS2-2014-CFP01-AIR-01-05, (98,000Eu)

2014-2016 Fast impact cross-analysis methodology for Composite leading edge Structures (FIMAC), JTI-CS-2013-2-SGO-02-073, GRA-632420 (135,180Eu)

2014-2015 Flexible sensor co-operation for structural health diagnosis/prognosis, (Wireless-FLEX_Sense), JTI-CS-2013-2-GRA-01-054, GRA-6325064 (39,924Eu)

2012-2017 Innovative wind conversion systems (10-20MW) for offshore applications (InnWind.Eu), FP7-ENERGY, GRA-308974 (350,000Eu)

2012-2015 Graphene and its Nanocomposites: Production, Properties and Applications, Thalis National Project.

2012-2014 Morphing Skin with a Tailored Non-conventional Laminate (MOSKIN), FP7-Clean Sky SkyJTI-CS-2011-2-SFWA-01-040, GRA-298164 (84,000Eu)

2012-2012 Shape Memory Alloy Trailing Edge (SMyTE) FP7-CleanSky JTI-CS-2011-1-GRA-02-015 (35,000Eu).

2011-2014 Damage Detection and Structural Health monitoring in composite structures based on Lamb wave methods with Active Piezoelectric Sensors (45,000Eu), Herakleitos II National Project.

2011-2012 Wireless Integrated Strain Monitoring and Simulation System (WISMOS), CleanSky JTI-CS-2010-13-ECO-01-005 (40,000Eu).

2010-2013 International Institute of Multifunctional Materials for Energy Conversion (IIMEC), http://iimec.tamu.edu/, NSF-USA, member.

2009-2014 Optimisation for low Environmental Noise impact Aircraft (OPENAIR), FP7 – TRANSPORT, Principal Investigator (200.000Eu).

2008-2009 Preliminary Studies on Damage Tolerant Strategies for Composite Damage Detection and Health Monitoring; EOARD/AFOSR Grant; (Univ. of Shefield, Univ. of Patras); 50,000$.

2005-2009 Integrated Wind Turbine Design; Int. Project; EU Research Framework FP6-Energy; Principal-Investigator (150.000Eu).

2005-2009 Aerospace Nanotube Hybrid Composite Structures with Sensing and Actuating Capabilities; EU Research Framework FP6-Aero; Co-Investigator.

2005-2006 "Smart Mechanical Structures with Stochastic Damage Self-Detection Capabily", Postgraduate Research Program-Pythagoras, Hellenic Ministry of Education, Co-Investigator.

2005-2007 International Collaboration on Predictive Methodologies for the Design of Lamb-Wave Piezoelectric Wafer Active Sensors for Structural Health Monitoring; National Science Foundation (NSF) – (Univ. of South Carolina, Univ. of Shefield, Univ. of Patras).

2003-2006 Modeling of Electromechanical Behavior of Carbon Nanotubes and Nano-Composite Materials; Karatheodoris Research Program, Univ. of Patras; Principal Investigator.

2002-2006 Smart Piezoelectric Composites with Damage Self-Monitoring Capabilities; Graduate Research Program - Heracleitos, Hellenic Ministry of Education; Principal Investigator.

2000-2004 Wind Turbine Rotor Blades For Enhanced Aeroelastic Stability And Fatigue Life Using Passively Damped Composites-DAMPBLADE; 5th EU Research Framework - ENERGIE ENK6-CT2000-00320 (232,000Eu); Principal Investigator.

1999-2001 Design & Development of a Composite Bridge; National Research Program EPET-II, Inst. of Chemical Engineering; Co-investigator.

1999-2001 Mechanics and Finite Element Models for the Nonlinear Analysis of Composite Shells with Embedded Piezoelectric Elements, Karatheodoris Research Program, Univ. of Patras; Principal Investigator

1992-1997 Mechanics for Intelligent Composite Materials-Structures for Propulsion Components; OAI-NASA Cooperative Agreement NCC3-391; Principal Investigator.

1994-1995 Passive-Active Composite Materials and Structures for Vibration and Noise control; Competitive Internal NASA Funding (75,000$); Principal Investigator.

1992-1994 Smart Composite Structures for Active Tip Clearance Control; Competitive Internal NASA Funding (90,000$); Principal Investigator.

1992-1994 Process-Composite Tailoring for Isothermal Fatigue Life Maximization; Internal NASA Funding, (125,000$); Principal Investigator.

1990-1992 Process-Interphase Layer Tailoring for Residual Stress Minimization in MMCs; Internal NASA Funding, (100,000$/yr); Co-Principal Investigator.

1991-1992 Integrated Analysis and Design of Thick Composite Structures for Optimal Passive Damping Characteristics, OAI-NASA Cooperative Agreement NCC3-208/4 (90,000$); Principal Investigator.

1989-1991 Optimal Design of Composite Orthopaedic Implants, NASA Grant NAG 3-1027, Case Western Reserve Univ. (170,000$); Co-Investigator.

1988-1989 Mechanics of Damping for Composite Materials and Structures, NRC-NASA Resident Research Fellowship.

REPRESENTATIVE JOURNAL ARTICLES:

Rekatsinas C.S., Nastos C.V., Theodosiou T.C. and Saravanos D.A. "A Time-Domain High-Order Spectral Finite Element for the Simulation of Symmetric and Anti-symmetric Guided Waves in Laminated Composite Strips", *Wave Motion*, 2015, pp. 1-19, *DOI: 10.1016/j.wavemoti.2014.11.001*.

Chrysochoidis N. A., Assimakopoulou T. T. and Saravanos D. A. "Non-linear Wave SHM Method Using an Active Nonlinear Piezoceramic Sensor for Matrix Cracking Detection in Composites", *J. Intelligent Materials, Structures and Systems*, Sept. 2014; DOI:10.1177/1045389X14549865.

Solomou A.G., Machairas T.T. and Saravanos D. A. "A Coupled Thermomechanical Beam Finite Element for the Time Simulation of Shape Memory Alloy Actuators", *J. Intel. Materials Structures and Systems*, 2014, Vol. 25(7) 890–907; *DOI: 10.1177/1045389X14526462*.

Theodosiou T.C. and Saravanos D.A., "Numerical Simulation of Graphene Fracture Using Molecular Mechanics Based Nonlinear Finite Elements", *Computational Materials Science*, 82C (2014), pp. 56-65; *doi: 10.1016/j.commatsci.2013.09.032.*

Theodosiou T.C. and Saravanos D.A. "Molecular Mechanics Simulations of Graphene using Finite Elements", *European Journal of Computational Mechanics*, Vol. 22, no. 1, 2013; *doi:10.1080/17797179.2013.766016*. (3)

Chortis D. I., Varelis D. S. and Saravanos D. A. "Linearized Frequencies and Damping in Composite Laminated Beams Subject to Buckling", *ASME J. of Vibration and Acoustics*, vol. 135, no. 2, 2013; *doi: 10.1115/1.4023051*

Chortis D. I., Varelis D. S. and Saravanos D. A. "Prediction of Material Coupling Effect on Structural Damping of Composite Beams and Blades", *Composite Structures*, 94 (2012) 1646–1655; *doi:10.1016/j.compstruct.2011.12.004.* (5)

Chrysochoidis N. A., Barouni A. K. and Saravanos D. A. "Delamination Detection in Composites Using Wave Modulation Spectroscopy with a New Active Nonlinear Acousto-Ultrasonic Piezoelectric Sensor", *J. Inteligent Materials, Structures and Systems*, December 2011, vol. 22, no. 18, 2193-2206; *doi: 0.1177/1045389X11428363*. (11)

Chortis D. I., Chrysochoidis N. A., Varelis D. S. and Saravanos D. A. "A Damping Mechanics Model and a Beam Finite Element for the Free-Vibration of Laminated Composite Strips under In-Plane Loading", *J. Sound and Vibration*, Vol. 330, 2011, pp. 5660–5677; *doi:10.1016/j.jsv.2011.06.025*. (3)

Theodosiou T.C. and Saravanos D.A. "Numerical investigation of mechanisms affecting the piezoresistive properties of CNT-doped polymers using multi-scale models," *Composites Science and Technology*, Vol. 70 (9), 2010, pp. 1312-1320; *doi:10.1016/j.compscitech.2010.04.00*. (58)

Chrysochoidis N. A. and Saravanos D. A. "High Frequency Dispersion Characteristics of Smart Delaminated Composite Beams" *J. of Intelligent Material Systems and Structures*, Vol. 20:9, June 2009. (In top 10 cited list for the journal's 2011 Impact Factor); *doi: 10.1177/1045389X09102983.* (4)

Plagianakos T. S. and Saravanos D. A. "Higher-Order Layerwise Laminate Theory for the prediction of Interlaminar Shear Stresses in Thick Composite and Sandwich Composite Plates", *Composite Structures*, 87 (2009) 23–35; *doi:10.1016/j.compstruct.2007.12.002*. (36)

Chrysochoidis N. A. and Saravanos D. A. "Generalized Layerwise Mechanics for the Static and Modal Response of Delaminated Composite Beams with Active Piezoelectric Sensors", *Int. J. of Solids and Structures*, Vol 44, No. 25-26, 2007, pp. 8751-8768; *doi:10.1016/j.ijsolstr.2007.07.004*. (12)

Theodosiou T.C. and Saravanos D.A. "Molecular Mechanics Based Finite Element for Carbon Nanotube Modeling", *Computer Modeling in Engineering & Science*, Vol.19, No.2, 2007, pp. 121-134. (26)

Varelis D. and Saravanos D. A. "Coupled mechanics and finite element for non-linear laminated piezoelectric shallow shells undergoing large displacements and rotations," *Int. J. of Numerical Methods in Engineering*, vol. 66, no. 8, 2006, pp. 1211-1233; *doi: 10.1002/nme.1590*. (12)

Saravanos D. A., Varelis D., Plagianakos T. S. and Chrysochoidis N. "A Shear Beam Finite Element for the Damping Analysis of Tubular Laminated Composite Beams," *Journal of Sound and Vibration*, Vol. 291, No. 3-5, April 2006, pp. 802-823; *doi:10.1016/j.jsv.2005.06.045*. (23)

Chrysohoidis N. A. and Saravanos D. A. "Assessing the Effects of Delamination on the Damped Dynamic Response of Composite Beams with Piezoelectric Actuators and Sensors," *Smart Materials and Structures*, Vol. 13, No. 4, pp. 733-42, May 2004; *doi:10.1088/0964-1726/13/4/01*. (23)

Plagianakos T. S. and Saravanos D. A. "High-Order Layerwise Mechanics and Finite Element for the Damped Dynamic Characteristics of Sandwich Composite Beams," *Intern. Journal of Solids and Structures*, Vol. 41, No. 24-25, pp. 6853-6871, 2004; *doi:10.1016/j.ijsolstr.2004.05*. (43)

Varelis D. and Saravanos D. A., "Coupled Buckling and Postbuckling Analysis of Laminated Piezoelectric Composite Plates with Large Displacement and Stress Nonlinearity," *Int. J. of Solids and Structures*, Vol. 41, pp.1519-38, 2004; *doi:10.1016/j.ijsolstr.2003.09.034*. (40)

Varelis D. and Saravanos D. A. "Nonlinear Coupled Mechanics and Buckling Analysis of Composite Plates with Piezoelectric Actuators and Sensors," *Smart Materials and Structures*, Vol. 11, No. 3, pp. 330-336, Jun. 2002. (33)

Saravanos D.A. and Christoforou A. P. "Low-Energy Impact of Adaptive Cylindrical Laminated Piezoelectric-Composite Shells," *Intern. J. of Solids and Structures*, Vol. 39, No. 8, May 2002, pp. 2257-79. (7)

Lee H. J. and Saravanos D.A. "Mixed Multi-Field Finite Element Formulation for Thermopiezoelectric Composite Shells," *Int. J. of Solids and Structures*, Vol. 37, 2000, pp. 4949-4967. (66)

Saravanos D. A. "Damped Vibration of Composite Plates with Passive Piezoelectric-Resistor Elements," *J. of Sound and Vibration*, Vol. 221, No. 5, Apr. 1999, pp. 867-885. (35)

Saravanos D. A. and Heyliger P. R. "Mechanics and Computational Models for Laminated Piezoelectric Beams, Plates, and Shells," *Applied Mechanics Reviews*, Vol. 52, No. 10, 1999, pp. 305-320. (258)

Lee H. J. and Saravanos D.A., "The effect of Temperature Dependent Material Nonlinearities on the Response of Piezoelectric Composite Plates," *J. of Intelligent Material Systems and Structures*, Vol. 9, No. 7, July 1998; (also NASA TM-97-206216). (26)

Saravanos D. A. "Mixed Laminate Theory and Finite Element for Smart Piezoelectric Composite Shell Structures," *AIAA J.*, Vol. 35, No. 8, pp. 1327-1333, 1997; (also NASA CR 198490, 1996). (125) **171st most cited journal article**

Lee H.J. and Saravanos D.A. "Generalized Finite Element Formulation for Smart Multilayered Thermal Piezoelectric Plates," *Intern. J. of Solids and Structures*, Vol. 34, No. 26, 1997, pp. 3355-3371; (also, *NASA TM-106990*). (80)

Heyliger P. R., Pei K. C. and Saravanos D. A., "Layerwise Mechanics and Finite Element Model for Laminated Piezoelectric Shells," *AIAA Journal*, Vol. 34, No. 11, pp. 2353-2360, 1996. (73)

Saravanos D. A., Heyliger P. R. and Hopkins D.A. "Layerwise Mechanics and Finite Element for the Dynamic Analysis of Piezoelectric Composite Plate Structures," *Int. J. of Solids and Structures*, Vol. 34, No. 3, 1997, pp. 359-378; (also NASA TM-107232, 1996). (229) **52nd most cited journal article**

Birman V., Saravanos D.A. and Hopkins D.A., "Micromechanics of Composites With Shape Memory Alloy Fibers in Uniform Thermal Fields," *AIAA Journal*, Vol. 34, No.9, Aug. 1996, pp. 1905-1912. (31)

Lee H. J. and Saravanos D. A., "Coupled Layerwise Analysis of Thermopiezoelectric Smart Composite Beams," *AIAA Journal*, Vol. 34, No. 6, June 1996, pp. 1231-1237; (Also, *NASA TM 106889*). (62)

Saravanos D. A. and Hopkins D. A., "Effects of Delaminations on the Damped Dynamic Characteristics of Composite Laminates: Mechanics and Experiments," *J. of Sound and Vibration*, Vol. 192, No. 5, May 1996, pp. 997-993; (also, *NASA TM 106862*). (101).

Heyliger P. R. and Saravanos D. A., "Exact Free-Vibration Analysis of Laminated Plates with Embedded Piezoelectric Layers," *J. of Accoustical Society of America*., Vol. 98, No. 3, 1995, pp. 1547-1557. (154)

Saravanos D.A. and Heyliger P.R. "Coupled Layerwise Analysis of Composite Beams with Embedded Piezoelectric Sensors and Actuators," *J. of Intelligent Material Systems and Structures*, Vol. 6, No. 3, 1995, pp. 350-363. (also, NASA CR 195313). (165) **19th most cited journal articles**

Saravanos, D. A. and Pereira J.M., "Dynamic Characteristics of Specialty Composite Structures with Embedded Damping Layers," *J. of Vibration and Acoustics, Transactions of the ASME*, Vol. 117, No. 1, 1995, pp. 62-69. (24)

Saravanos, D. A., ``Integrated Damping Mechanics for Thick Composite Laminates and Plates," *J. of Applied Mechanics, Transactions of the ASME*, Vol. 61, No. 2, pp. 375-383, 1994. (36)

Saravanos, D. A. and Pereira J. M., "Effects of Interply Damping Layers on the Dynamic response of Composite Plates," *AIAA Journal*, Vol. 30, No. 12, Dec. 1992, pp. 2906-2913. (47)

Saravanos, D. A. and Chamis, C. C., "Multi-Objective Shape and Material Optimal Design of Composite Structures Including Damping," *AIAA Journal*, Vol. 30, No. 3, Mar. 1992, pp. 805-813. (30)

Saravanos, D. A. and Chamis, C. C., "Mechanics of Damping for Fiber Composite Laminates Including Hygro-Thermal Effects," *AIAA Journal*, Vol. 28, No. 10, Oct. 1990, pp. 1813-1819. (40)

Saravanos, D. A. and Chamis, C. C., "Unified Micromechanics of Damping for Unidirectional and Off-Axis Fiber Composites," *J. of Composites Technology and Research*, Vol. 12, No. 1, 1990, pp. 31-40. (51)

Saravanos, D. A. and Lamancusa, J. S., "Optimal Structural Design of Robotic Manipulators with Fiber Reinforced

Composite Materials," *Computers and Structures*, Vol. 36, No. 1, 1990, pp. 119-132. (14)