

## Theodore P. Philippidis\*

Associate Professor

(Birth date: September 9, 1958 – Birthplace: Athens, Greece – Marital Status: Married, 2 children – Language: Greek, English, French)

*Education:* (1989) Doctorate in Applied Mechanics, The National Technical University of Athens (NTUA) – (1986) Diploma in Mechanical Engineering, NTUA

*Academic Positions:* (1990-1993) Lecturer, Dept. of Mech. Eng., Uni. Patras, Greece. (1993-1998) Assistant Professor, Dept. of Mech. Eng., Uni. Patras, Greece. (1998-2000) Assistant Professor (Tenure), Dept. of Mech. Eng., Uni. Patras, Greece. (2000-present) Associate Professor, Dept. of Mech. Eng. & Aeronautics, Uni. Patras, Greece.



### Research and Academic Activity

*Teaching Activities:* Statics, Mechanics of Composite Materials, Non Destructive Inspection of materials and structures, Design of Composite Structures, Experimental Mechanics of Composites, Energy Theorems in the Theory of Elasticity (graduate), Mechanics of Laminated Plates (graduate)

*Research Interests:* Mechanics of composite materials, Anisotropic elasticity, Failure mechanics, Non-Destructive Testing and Evaluation techniques, Wave propagation in multilayer structures, Experimental mechanics, Numerical and analytical methods in structural analysis, Wind Engineering, Design of composite rotor blades and manufacturing technologies, Progressive damage mechanics, life prediction under spectrum loading, probabilistic methods in the design of composite structures, residual strength and fatigue damage characterization of composite materials using wave propagation techniques

#### Research Advisor/Completed PhD

1. A. A. Anastassopoulos, Non Destructive Characterisation of Damage in Composite Materials by Means of Pattern Recognition Techniques (1995)
2. V. N. Nikolaidis, NDT techniques in composite materials using non-conventional pattern recognition methods (1998)
3. A. P. Vassilopoulos, Determination of fatigue life of fibre reinforced composite materials under plane stress states (2000)
4. D. G. Aggelis, Non Destructive Testing and Composition Characterization of Concrete through analysis of wave propagation parameters (2004)
5. V. A. Passipoularidis, Residual strength & life prediction in composite materials after fatigue (2008)
6. T. T. Assimakopoulou, Damage assessment in laminated composite structures using acoustic methods (2009)
7. A. E. Antoniou, Progressive damage in multi-directional laminates made of composite materials; its effects on guided wave propagation (2009)
8. D. J. Lekou, Reliability estimation in the design of composite material structures (2010)
9. E. N. Eliopoulos, Numerical simulation of damage progression in GFRP composites under cycling loading (2013)
10. K. C. Bacharoudis, Stochastic analysis of structures made of composite materials (2014)

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URL: <http://www.core.mech.upatras.gr>

11. I. T. Masmanidis, Validated design rules for adhesive bonding in wind turbine rotor blade repairs (2018)

12. Florian Sayer, Sub-Component testing for structural adhesive joint assessment in wind turbine rotor blades, Leibniz Universität Hannover (2019)

Professional Affiliations: Technical Chamber of Greece, Greek Association of Mechanical Engineers, Hellenic Society of Composite Materials (founding member), Hellenic Society of Nondestructive Testing (Secretary 1992-1994), Hellenic Society for Wind Energy

Scientific responsible/Research Associate in over 40 international (STRIDE, BRITE-EURAM, JOULE, FP6, FP7, AGARD, COMETT), national (EPAnEK, Synergasia, EPET-II, PAVE, National Academy of Athens) and consultancies (Public Power Corporation, CRES, Geobiologiki SA, HELM Hellas, Compblades Ltd., SmartBlade GmbH, B&T Composites S.A.)

Publications: 80 refereed journal papers, 4 book chapters, Co-Editor of 3 books, Guest-Editor of NDT&E, 60 papers in national & international conference proceedings

Journal Reviewer:

International Journal of Fracture, NDT&E International, Ultrasonics, Journal of Non Destructive Evaluation, Journal of Dynamic Systems Measurement and Control (ASME), Advanced Composites Letters, Neural Computing & Applications, Composites Science & Technology, International Journal of Solids & Structures, Journal of Solar Energy Engng (ASME), International Journal of Fatigue, Engineering Structures, Probabilistic Engineering Mechanics, Energies, Sustainable Energy Technologies & Assessments, Wind Energy, Polymer Composites, Journal of Composite Materials, Journal of Reinforced Plastics & Composites, Composites Part A: Applied Science & Manufacturing, Composites Part B: Engineering, Composite Structures, Construction & Building Materials, International Journal of Damage Mechanics, International Journal of Structural Integrity, Journal of Materials & Design,

Conferences

- Member of International Scientific Committee at COMP '90, Advanced Composites in Emerging Technologies, Patras 20-24 August 1990.
- Member of Scientific Committee at 1<sup>st</sup> Joint Belgian-Hellenic Conference on Non Destructive Testing, Patras 22-23 May 1995.
- Member of Scientific Committee of National conference: Applications of Renewable Energy Sources, Athens, Eugenides Foundation, 30.11 to 02.12.1998.
- (Co)-Organizer of 2<sup>nd</sup> International Conference: Emerging Technologies in Non Destructive Testing, Athens 24-26 May 1999.
- Member of Scientific Committee of 3<sup>rd</sup> International Conference: Emerging Technologies in Non Destructive Testing, Thessalonica 26-28 May 2003
- Member of Scientific Committee of EWEA's Special Topic Conference: The Science of making torque from the wind, Delft University of Technology 19-21 April 2004
- Member of the International Advisory Committee of the 27<sup>th</sup> RISOE International Symposium on Materials Science "Polymer Composite Materials for Wind Power Turbines", RISOE Roskilde 4-7 September 2006
- Member of Conference Organizing Committee of 4<sup>th</sup> International Conference: Emerging Technologies in Non Destructive Testing (ETNDT4), Stuttgart 2-4 April 2007
- Member of Scientific Committee of EAWE 3<sup>rd</sup> Conference: The Science of making torque from the wind, FORTH Heraklion Crete 28-30 June 2010
- Member of International Scientific Committee of DURACOSYS 10<sup>th</sup> Conference: Durability of Composite Systems, VUB Brussels 17-19 September 2012
- Member of the Scientific Committee of RUZGEM 2013 Conference on Wind Energy Science and Technology, METU Ankara Campus 3-4 October 2013
- Member of Conference Organizing Committee of 6<sup>th</sup> International Conference: Emerging Technologies in Non Destructive Testing (ETNDT6), Brussels 27-29 May 2015

### Books

- Advanced Composites in Emerging Technologies, Eds. S. A. Paipetis, T. P. Philippidis, AMATEC Publications, 1991.
- Emerging Technologies in Non Destructive Testing IV, Eds. D. Van Hemelrijck, A. A. Anastassopoulos, T. P. Philippidis, A. A. BALKEMA Publishers, Rotterdam 1999.
- Emerging Technologies in Non Destructive Testing VI, Eds. D. G. Aggelis, D. Van Hemelrijck, S. Vanlanduit, A. A. Anastassopoulos, T. P. Philippidis, CRC Press 2015.

### Book Chapters

1. *Fatigue of Glass-Fiber-Reinforced Plastics Under Complex Stress States*, T. P. Philippidis & A. P. Vassilopoulos, in **Handbook of Advanced Materials**, Ed. J. K. Wessel, Ch.1 pp.16-63, John Wiley & sons (2004)
2. *Fatigue strength of composites under variable plane stress*, T. P. Phillipidis & A. P. Vassilopoulos, in **Fatigue in Composites**, Ed. B. Harris, Ch.18 pp.504-525, WoodHead Publishing Ltd. (2004)
3. *A progressive damage mechanics algorithm for life prediction of composite materials under cyclic complex stress*, T. P. Phillipidis & E. N. Eliopoulos, in **Fatigue Life Prediction of Composites and Composite Structures**, Ed. A. P. Vassilopoulos, Ch.11 pp. 390-436, WoodHead Publishing Ltd. (2010)
4. *Health monitoring of composite structures based on acoustic emission measurements*, T. T. Assimakopoulou & T. P. Phillipidis, in **Fatigue Life Prediction of Composites and Composite Structures**, Ed. A. P. Vassilopoulos, Ch.13 pp. 466-504, WoodHead Publishing Ltd. (2010)

### Major Research Projects (Scientific responsible for UP unless otherwise stated)

1. Study of plastic singular stress fields by the optical method of reflected caustics, Aluminum Greek Co. (1983-1984) (researcher NTUA)
2. Ductile fracture microscopic criteria, Aluminum Greek Co. (1986-1987) (research NTUA)
3. Macroscopic failure criteria for FRP composites, NTUA, Research com. (1988-1989) (researcher)
4. Lightweight reflectors of CFRP materials, EEC, BRITE/EURAM (1989-1993)
5. Processing strategy for filament winding of thermoset components based on a mathematical process description, BRITE/EURAM (1992-1994)
6. Design, modelling and control of a new process for glassfiber preform manufacture with minimization of scraps, improvement of working conditions and without environmental impact, EEC, BRITE/EURAM (1993-1995)
7. Full-scale testing of wind turbine rotor blades, EEC, VALOREN (CRES) (1990-1992)
8. Development of a new generation of design tools for horizontal axis wind turbines, EEC, JOULE (researcher CRES) (1993-1995)
9. Assessment of fatigue life of A/C components and materials by means of AE inspections: Rotor blades of C-130 A/C, PAVE-89 GSRT (1992-1993)
10. Composite basic design and repair technologies, AGARD/SMP (1991-1993)
11. Life prediction of a propeller blade in operational conditions by Acoustic emission, AGARD/SMP (1991-1993)
12. Development of a hybrid numerical-experimental (NDT) tool for damage tolerant design, AGARD/SMP (1993-1994)
13. Numerical analysis and control techniques applied in composite materials testing and design AGARD/SMP (1991-1993)
14. Infrastructure installation for the local development, installation and maintenance of wind energy production systems in combination with sea water desalination systems (WinD), STRIDE-HELLAS (1992-1995)
15. Advanced composite materials in aerospace applications (NDT and NDI), COMETT ATMASTA

- (UETP THRACE) (1993)
16. Stability of Laminated Cylindrical Tubes Under Uniaxial and Multiaxial Stresses, AGARD/SMP (1993-1997)
  17. Damage assessment and Characterization of Fibre Composites, AGARD/SMP (1993-1997)
  18. Numerical simulation of dynamic full-scale testing of wind turbine rotor blades, CRES (1995-1996)
  19. Selecting new rotor blades for Euboia and Crete wind farms of 5 MW, Public Power Corporation (PPC) (1995-1997)
  20. Development of National certification system for wind turbine rotor blades, CRES (1997)
  21. Numerical simulation (FEA) of full-scale tests of wind turbine rotor blades, CRES (1997)
  22. Development of Greek Wind Turbine Technology in the range of 400-500 kW and simultaneous development of rotor blade technology, EPET#573 (1995-2000)
  23. Development of a numerical simulation tool for optimal structural design of a prototype wind turbine rotor blade, GEOBIOLOGIKH S.A. (1999)
  24. European Wind Turbine Testing Procedures & development. Task 2: Blade Test Methods and Techniques (SMT/CRES) (1998-1999)
  25. Non- Destructive Material Testing and Composition Control (MHKKYNES), EPET#M7 (1998-2001) (researcher)
  26. Adaptation of existing wind turbines for operation on high wind speed complex terrain sites; kWh cost reduction (ADAPTURB) (1999-2002) JOR3-CT98-0251.
  27. Probability Distribution of Fatigue Strength of Rotor Blades (PROFAR) (1999-2001) JOR3-CT98-02 (researcher)
  28. Acoustic Emission Proof Testing and Damage Assessment of Wind Turbine Blades (AEGIS) (1999-2002) JOR3-CT98-0283
  29. Development of a MW scale wind turbine for high wind complex terrain sites (MEGAWIND) (2001-2004) ENK5-CT2000-00328
  30. Wind Turbine rotor blades for enhanced aeroelastic stability and fatigue life using passively damped composites (DAMPBLADE) (2001-2004) ENK6-CT2000-00320 (researcher)
  31. Reliable Optimal Use of Materials for Wind Turbine Rotor Blades (OPTIMAT BLADES) (2002-2006) ENK6-CT2001-00552
  32. Integrated Wind Turbine Design (UPWIND) (2006-2011) FP6 EU Contract #019945
  33. Development of inspection and repair methods in wind turbine rotor blades (REPAIR-1, D.357), COMPBLADES S.A. (2011-2012)
  34. Design and manufacturing optimization of filament wound structural components made of FRP composites (Filament Winding-1, D.383) (2011-2012)
  35. Blade structural research and development in the field of composite materials structural simulations (SMARTBLADE-1, D.574) (2012)
  36. Development of structural design methods for rotor blades of small wind turbines (SMARTBLADES, D.575) (2012-2013)
  37. Design and manufacturing optimization of filament wound structural components made of FRP composites (Filament Winding-2, D.640) (2012-2013)
  38. Validated design rules for REpair of damaged WIND turbine rotor blades (REWIND, D.674) SYNERGASIA: REWIND 11SYN\_7\_1000 (2012-2014)
  39. Selection of materials, manufacturing process and structural design of a prototype rotor blade for a 30 kW wind turbine (METUWIND, D.720) (2012-2014)
  40. Vortex generators effect on structural integrity of wind turbine rotor blades (VORTEX, D.727) (2013)
  41. Innovative Wind Conversion Systems (10-20 MW) for Offshore Applications, FP7 COLLABORATIVE (308974) (INNWIND.EU, D.642.002) (2012-2017)
  42. Near-Shore Wind Turbine with Integrated Holistic Control (PARALOS^2), (MIS 5074541/T2EDK-01386, K. 81437) (2020-2023)

Membership in Academic Organizations

European Academy of Wind Energy (EAWE), Country Node member ([www.eawe.org](http://www.eawe.org))