

## CURRICULUM VITAE

Nombre **Jesús Alfredo Güemes Gordo**

### Formación académica

Ingeniero Aeronáutico, Univ. Politécnica de Madrid (1974)  
Licenciado en Ciencias Físicas, Univ. Complutense de Madrid (1978).  
Doctor Ingeniero Aeronáutico, UPM (1983).

### Actividad profesional y cargos académicos

1. Investigador en el INTA (Instituto Nacional de Técnica Aeroespacial) 1976- 1982,
2. Profesor Titular en la ETSI Aeronáuticos, UPM, desde 1983
3. Catedrático de Ciencia de los Materiales, UPM, desde 1989
4. Director del Departamento de Materiales y Producción Aeroespacial, UPM, desde 1996.
5. Profesor visitante en la Universidad de Stanford (USA) curso 1992 / 93, Universidad de Toronto, verano 1994, y University of South Carolina, verano 1996

### Experiencia profesional relevante

Es o ha sido el investigador principal, responsable por la UPM, en los siguientes proyectos europeos:

- **1996-1998** ‘Smart Wind Turbines Blades’. (JOR3-CT96-0104). Contratista principal y responsable desarrollo de sensores en fibra óptica para la medida de deformaciones y vibraciones.
- **1998-2000** : EC Project ‘ Process efficient Regulation for Economical Composites Technologies (PERFECT)’, (BE 4048), como subcontratista de CASA-Airbus para el desarrollo de sensores de monitorización de curado y medida del flujo de resina mediante fibra óptica
- **2001- 2003**: Euclid RTP 3.20 project on ‘Active Health Monitoring System (AHMOS)’, responsable de sensores de daño en fibra óptica y sistemas de análisis de señal.
- **2002-2004** Proyecto para la Agencia Espacial Europea sobre: ‘ Sensores de fibra óptica multifunción para su aplicación a tanques criogénicos reutilizables’
- **2003-2006** Proyecto Growth de la UE: BASSA (Bonded Adhesive Single Step Assembly). Responsable de caracterización de adhesivos y ensayos de estructuras en Composites
- **2004-2007** Proyecto UE. ARTIMA (Aircraft Reliability through Intelligent Materials). Responsable de estructuras con amortiguamiento activo, y de instrumentación con fibra óptica
- **2005-2008** Proyecto UE: ALCAS. Responsable de instrumentación con fibra óptica
- **2006-2009** Proyecto SSA de la UE: “SHM-in-Action.” Coordinador

### Publicaciones y nombramientos

- Es autor de 25 publicaciones científicas referenciadas en la base de datos EI-Compendex, y un alto número (>60) de comunicaciones a Congresos y otras publicaciones nacionales.
- Co-Editor del libro : Structural Health Monitoring, , con D. Balageas, C. Fritzen. Hermes 2005
- Autor del Capítulo: ‘Intelligent Processing of Aerospace Composite Materials’, incluido en ‘Encyclopedia of Smart Materials’, (M. Schwartz, ed). John Wiley & Sons, Inc (2002)
- Miembro del Panel de Estructuras y Materiales AGARD (NATO) durante 1986-1996

- Miembro del Comité europeo sobre ‘Structural Health Monitoring, programa COST (1997-2001)
- Miembro de la Red europea FOSEN (Fibre Optic Sensors European Network) (1998-2002)
- Miembro del Comité Ejecutivo de la Asociación Española de Materiales Compuestos, y de la Asociación de Ingenieros Aeronáuticos de España.
- Miembro del SPIE, Institute of Physics of London, y otras asociaciones científicas internacionales.

### **Publications referenced at El Compendex**

1. *Cusano, A. Consales, M.; Cutolo, A.; Penza, M.; Aversa, P; Giordano, M.; Güemes, A* “Optical probes based on optical fibers and single-walled carbon nanotubes for hydrogen detection at cryogenic temperatures” . Applied Physics Letters, v 89, n 20, 2006
2. *Lopez-Diez, J, Torrealba, M, Guemes, A, et al.* ‘Application of statistical energy analysis for damage detection in spacecraft structures’ KEY ENG MAT 293-294: 525-532, 2005
3. *Rodriguez, R, Yarza, A, Lopez-Diez, J, Guemes A.* ‘Damage detection on typical aeronautical structures’ KEY ENG MAT 293-294: 677-684, 2005
4. *Guemes, A.; Pintado, J.M.; Frovel, M.; Olmo, E.; Obst, A.* . “Comparison of three types of fibre optic hydrogen sensors within the frame of CryoFOS project”. Proceedings of SPIE v 5855 PART II, 2005, p 1000-1003
5. *Menendez, J.M. ; Munoz, P.; Pintado, J.M.; Guemes, J.A.* .”Damage detection in composite materials by FBGs”. Proceedings of SPIE , v 5502, Second European Workshop on Optical Fibre Sensors, EWOFs'04, 2004, p 451-454
6. *Lopez, J. ; Cuerno, C.; Atienza, R.; Guemes, A.* . “Damage detection in boundary conditions. Comparison benchmark”.: Key Engineering Materials, v 245-346, 2003, p 59-68
7. *Suarez, J.C. ,Remartinez, B.; Menendez, J.M.; Guemes, A.; Molleda, F.* “ Optical fibre sensors for monitoring of welding residual stresses” Journal of Materials Processing Technology, v 143-144, n 1, Dec 20, 2003, p 316-320
8. *Casas, Joan R.; Ramos, G.; Diaz-Carrillo, S.; Guemes, J. A.* “Intelligent repair of existing concrete structures” Computer-Aided Civil and Infrastructure Engineering, v 17, n 1, January, 2002, p 43-52
9. *Menendez, Jose M.; Munoz-Esquer, Pedro; Rodriguez-Lence, Fernando; Guemes, Alfredo*” Fiber optic sensors for process monitoring of composite aerospace structures”: Proceedings of SPIE - v 4694, 2002, p 53-64
10. *Fritzen, C.-P.; Mengelkamp, G.; Guemes, A.* “ A CFRP plate with piezo-electric actuators and sensors as self-diagnosing intelligent structure”: Proc.

International Conference on Noise and Vibration Engineering, ISMA, 2002, p 185-191

11. *Guemes, J.A. ; Menendez, J.M* “Response of Bragg grating fiber-optic sensors when embedded in composite laminates”: *Composites Science and Technology*, v 62, n 7-8, June, 2002, p 959-966
12. *Guemes, J.A.; Frovel, M.; Rodriguez-Lence; Menendez, J.M.* “ Embedded fiber Bragg grating as local damage sensors for composite materials”: *Proceedings of SPIE* , v 4694, 2002, p 118-128
13. *Guemes, A, Tanner, P, Bellod, JL* ‘Internal strains monitoring of a brick/concrete vault by Fiber Optics Sensors’ *COMPOSITES IN CONSTRUCTION* : 757-760, 2001
14. *Guemes, J.A.; Menendez, J.M.; Frovel, M.; Fernandez, I.; Pintado, J.M* “Experimental analysis of buckling in aircraft skin panels by fibre optic sensors”: *Smart Materials and Structures*, v 10, n 3, June, 2001, p 490-496
15. *Menendez, J.M.; Guemes, J.A.* “ Bragg grating-based multiaxial strain sensing: its application to residual strain measurement in composite laminates”: *Proceedings of SPIE* , v 3986, 2000, p 271-281
16. *Diaz-Carrillo, S.; Sancho, J.; Torres, E.; Guemes, J.A* “Measurement of strain around holes in CFRP bolted joints by means of Bragg gratings”: *Proceedings of SPIE*, v 4185, 2000, p 704-707
17. *Castillo, D.M. ,Pardo de Vera, C.; Guemes, J.A.* “Structural integrity analysis with piezoelectric patches” *Key Engineering Materials*, v 167-168, 1999, p 91-101
18. *Pardo de Vera, C.; Guemes, J.A.* “Embedded self-sensing piezoelectric for damage detection”. *J. of Intelligent Material Systems and Structures*, v 9, n 11, Nov, 1999, p 876-882
19. *Menendez, J.M. ; Guemes, J.A.* “Strain measurements inside thick CFRP laminates at the vicinity of bolted joints”: *Proceedings of SPIE* - v 3670, 1999, p 184-194
20. *Diaz-Carrillo, Sebastian ; Pardo, Carlos; Guemes, Alfredo* “Online diagnosis of the structural behaviour of windmills by Bragg gratings and piezoelectrics”: *Proceedings of SPIE*, v 3674, 1999, p 445-452
21. *Guemes, Alfredo; Menendez, Jose M.* “Fatigue strength of glass reinforced polyester (GRP) laminates with embedded optical fibers”: *Proceedings of SPIE* , v 2779, 1996, p 217-221
22. *LeBlanc, M.; Huang, S.Y.; Ohn, M.; Measures, R.M.; Guemes, A.; Othonos, A.* “Distributed strain measurement based on a fiber Bragg grating and its reflection spectrum analysis”: *Optics Letters*, v 21, n 17, Sept 1, 1996, p 1405

23. *Guemes, J.A.* “Curing residual stresses and failure analysis in composite cylinders” *Journal of Reinforced Plastics and Composites*, v 13, n 5, May, 1994, p 408-419
24. *Serrano, M.A.; Guemes, A.* “Experimental analysis of mechanical joints in structural elements of GRP”: *Metal Matrix Composites*, v 4, 1993, p 112
25. *Suarez, J.C.; Molleda, F.; Guemes, A.* “Void content in carbon fibre/epoxy resin composites and its effects on compressive properties”: *Metal Matrix Composites*, v 6, 1993, p 589

## Other Conference Proceedings

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M. Frovel, Ignacio Baraibar, J. M. Pintado, Daniel Stelzl, Alfredo Güemes. Performance Evaluation of Fiber Bragg Gratings Over a Large Temperature Range. . *Proceedings of the 5<sup>th</sup> International Conference on Structural Health Monitoring*, pp., Stanford, CA, Sep. 2005, ISBN: 1-932078-51-7.

A. Güemes. Smart sensors for cryogenic reusable launchers (Keynote paper) . ECCOMAS Smart Structures and Materials Conference . Destech Publications Inc ISBN 1-932078-20-7 pages 844 –851 (2005)

G. Kawiecki, J. Peña, J. A. Güemes,. Strain monitoring using FBG optical transducers in a mechanical test of an aeronautical structure *Proceedings of the 2nd European Workshop on Structural Health Monitoring, SHM 2004*, Munich, Germany, 7-9 Jul 2004.

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J: Peña-Macias, A. Güemes,G. Kawiecki. Cure monitoring using Networks of Piezoceramic Transducers. *Proceedings of the 4<sup>th</sup> International Conference on Structural Health Monitoring*, pp. 1223-1230, Stanford, CA, Sep. 2003.

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JL Zapico, P. Gonzalez, JM Lecue, A. Guemes, Processing by Neural Networks of Signals from piezoelectrics bonded to Composite Beams. *Proceedings of the First European Workshop on Structural Health Monitoring, SHM 2002*, Paris-ENS-Cachan, 10-12 Jul 2002.

J. A. Güemes, J. M. Menéndez. Damage Detection in Composite Laminates by Fibre Optics Bragg Grating Sensors, Based on The Peak Splitting Phenomena. *Proceedings of the 3<sup>rd</sup> International Conference on Structural Health Monitoring*, pp.1023-1032, Stanford, CA, Sep. 2001.

P. Muñoz Esquer, F. Rodriguez Lence, J. M. Menéndez. J. A. Güemes. Intelligent processing of advanced composite materials, *1<sup>st</sup> International Conference on Advanced Materials and Processing Technologies*, Leganés, Madrid, Spain, Sep. 2001.

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M. Frövel, I. Fernandez, J. M. Pintado, J. A. Güemes, J. M. Menéndez, Integrated fibre optic sensors for monitoring the buckling behaviour of stiffened CFRP panels, *Proceedings of the Adaptronic Congress 2001*, Berlin, Germany, Apr. 2001.

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A. Güemes. Structural Health Monitoring for Aircraft Structures (Invited paper). *19<sup>th</sup> Conf. On Materials for Aerospace Applications*, Munchen (Germany) Dec 2000

F. Molleda, J. A. Güemes, J. C. Suárez, M. B. Remartínez, J. M. Menéndez. Use of optical fibre sensors for welding residual stresses monitoring. *3<sup>rd</sup> International Conference on Mechanics and Materials in Design*, Orlando, FL, May 2000.

C. Pardo de Vera, F. Rodriguez-Lence, P. Muñoz-Esquer, J. M. Menéndez, S. Díaz-Carrillo, J. A. Güemes. Proyecto PERFECT: Monitorización de los procesos de autoclave y RTM. *Actas del II Congreso de Materiales Compuestos, MATCOMP' 99*, pp. 227-234, Málaga, Spain, Nov. 1999.

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F. Rodríguez-Lence, P. Muñoz-Esquer, J. M. Menéndez, C. Pardo de Vera, S. Díaz-Carrillo, J. A. Güemes. Smart sensors for resin flow and composite cure monitoring. *Proceedings of the 12<sup>th</sup> International Conference on Composite Materials, ICCM-12*, Paris, France, Jul. 1999.

J. A. Güemes, S. Díaz-Carrillo, J. M. Menéndez, C. Pardo de Vera, P. Vionis, R. Scherer, D. Bercebal, A. Cuerva. Strain and damage monitoring of wind turbine blades by piezoelectrics and fiber optic sensors. *Proceedings of the ECCM-8 European Conference on Composite Materials*, vol. 3, pp. 357-364, Naples, Italy, Jun. 1998.

J. M. Menéndez, S. Díaz-Carrillo, J. A. Güemes. Sensores de fibra óptica para el análisis de la tenacidad a fractura interlaminar en materiales compuestos. *XV Encuentro del Grupo Español de Mecánica de Fractura*, Zamora, Spain, Mar. 1998.

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J. M. Menéndez, J. A. Güemes. Fatiga de probetas de carbono epoxy ensayadas a cortadura interlaminar. *Actas del V Congreso Nacional de Propiedades Mecánicas de Sólidos*, Barcelona, Spain, Jul. 1996.

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