

EXTENDED CV OF EUGENIO OÑATE

E. Oñate was born in Valencia on March 28, 1953. He is married with Marisa since 1983 and has 3 children (Blanca, 29th; Eugenio, 27th and Guadalupe 22nd).

After completing his degree in Civil Engineering in July 1975 at the University of Valencia (Spain), he joined as a postgraduate student the Civil Engineering Dept. of the University College of Swansea, Wales, UK. There he completed in June 1976 a Master of Science degree and later on a Ph.D. degree under the supervision of Prof. O. C. Zienkiewicz. His Ph.D. studies were funded by an Alcoa Research Grant from USA.

After a short period as Research Assistant at Swansea University, in February 1979 he moved to the Technical University of Catalunya (UPC) in Barcelona, Spain, where he was hired as an Associated Professor on Structural Mechanics at the School of Civil Engineering. He becomes a Full Professor with tenure in the same field in June 1983. From March 1983 to March 1989 he was the Director of the School of Civil Engineering at UPC. During that period and under his personal supervision the new premises of the Civil Engineering School ($\approx 20.000 \text{ m}^2$) were designed and built in the UPC.

On March 1987 he founded CIMNE (International Center for Numerical Methods in Engineering, www.cimne.com), a research center specialized in the development and application of numerical methods in engineering. Since 1987-he is the Executive Vice-President and Director of CIMNE. This center has grown to employ some 250 scientists and engineers from 25 different countries worldwide involved in research activities in different fields of engineering and science (civil, mechanical, aerospace and naval engineering, bio-medical engineering, food engineering, energy, etc.). CIMNE has legal offices in different cities of Spain, Washington DC (USA), Santa Fe (Argentina), Singapore and Beijing. CIMNE has received many prestigious Awards.

In 2002 he created the CIMNE Classroom Network. This network incorporates nowadays 27 centers created by cooperation between CIMNE and several universities in Spain and in several Latin American countries (Argentina, Cuba, Mexico, Chile, Peru, Colombia, Brazil, El Salvador, Venezuela and Guatemala).

In 1989 he was the founder and first President of the Spanish Association for Numerical Methods in Engineering (SEMNI, www.cimne.upc.es/semni). Under his presidency (1989-2004) SEMNI became the largest association in Europe in its field. SEMNI has organized 10 congresses in the field. On June 2004 he was appointed Honorary President of SEMNI. In July 2005 he was appointed Honorary Member of the Portuguese Association of Theoretical, Applied and Computational Mechanics (APMTAC).

He was one of the founders and first Vice-President (1993-95) of the European Community on Computational Methods in Applied Sciences (ECCOMAS, www.eccomas.org). In the period 2000 - 2004 he was the President of ECCOMAS. On September 2000 he organized the ECCOMAS Congress in Barcelona which attracted some 1500 participants. In the period 1994-2002 he was the Secretary General of the International Association for Computational Mechanics (IACM, www.iacm.info). Since September 2002 to July 2010 he has been the President of the IACM. During his term as Secretary General and President of IACM he supervised the organization of the World Congress of Computational Mechanics (WCCM) held in Tokyo (1994), Buenos Aires (1998), Vienna (2002), Peking (2004), Los Angeles (2006), Venice (2008) and Sydney (2010). He is the chairman of the WCCM 2014 to be held in Barcelona on July 2014. Some 4.000 participants are expected to attend this event.

He has received many awards. The more recent Award is the Advanced Grant (2010) of the European Research Council of the European Commission for the project "New computational methods for predicting the security of constructions to water hazards accounting for fluid-soil-structure interactions". This prize, awarded with 2.5 million Euros for 5 years, is the most important that the EC grants to an individual researcher.

Since 1997 he is a Member of the Royal Academy of Doctors of Barcelona. He is a Foreign Member of the Accademia de Science e Lettere of the Istituto Lombardo of Milan (2006), Dr. Honoris Causa by the Universities of Ovidius in Constanza (Rumania, 2000), INSA (Lyon, 2012) and Univ. "Marta Abreu" Las Villas (Cuba, 2013) and Honorary Fellow of the University of Wales (UK) (2007).

His professional activity has combined in a balanced manner an academic career as Professor of Structural Mechanics at the Technical University of Catalonia (UPC), a research career in the field of numerical methods and their applications to engineering and the transfer of the results of his research to the industrial sector.

His research achievement in the field of numerical methods and software for the analysis and design of structures, fluid dynamics and industrial manufacturing processes are internationally recognized. His scientific contributions and software derived from his research activity are of particular relevance to the solution of multidisciplinary problems in the field of civil, industrial, aerospace, marine and naval engineering, among others.

His research activities have focused in the following fields:

- **Development of numerical methods for studying the safety of constructions against water.** Application to the stability of dams in ports under large wave's and to the safety of infrastructures (dams, bridges, buildings, etc.) during flooding and tsunamis. This technology is marketed in Spain by COMPASS Ingeniería y Sistemas S.A. (www.compassis.com).

- **Development of new technologies for design and analysis of inflatable structures** formed by low pressure tubes of new polymer materials. Application to mobile pavilions for exhibitions, hospitals and emergency shelters; airplane hangars and high strength mobile inflatable bridges allowing the pass of traffic. This inflatable structure technology is been exploited worldwide by the Spanish company Buildair Ingeniería y Arquitectura S.A. (www.buildair.com).

- **Development of innovative simulation methods for analysis of solids and structures with standard and composite material.** Applications to the analysis and design of shells, buildings, dams, bridges, tunnels, harbour structures, inflatable structures, geomechanical problems, vehicle structures (cars, airplanes, trains, ships). The outcome of this research is the structural analysis code RamSeries marketed by the Spanish company COMPASS Ingeniería y Sistemas S.A.

- **Development of innovative numerical methods for analysis and design of manufacturing processes.** Applications to sheet metal forming and casting processes, forging, machining and extrusion of metallic products. The outcomes of this research are the software codes STAMPAK (sheet metal forming), VULCAN and Click2Cast (casting) marketed by the Spanish company QUANTECH ATZ S.A. (www.quantech.es).

- **Development of innovative numerical methods for fluid dynamics and fluid-structure interaction problems.** Applications to the study of the safety of constructions in water hazards, aerodynamic and aeroelastic analysis of airplanes and flexible structures (tall buildings, slender bridges, aero generator blades); hydrodynamics and hydro-elastic analysis of ships and sailing boats; fluid-structure interaction problems with application to naval and offshore engineering and coupled thermal-flows in

environmental problems. The outcome of this research work has been collected in the code Tdyn marketed by the Spanish company COMPASS Ingeniería y Sistemas S.A.

- **Development of decision support systems** integrating data-bases, numerical methods, wireless sensor and activators, and artificial intelligence techniques. Applications to the risk prediction and management of floods (Ramflood code, www.cimne.com/ramflood) and sea spills (Spillrec code) and bio-medical engineering and to the management of energy consumption in cities (Energy Information System, SIE). The outcome of this research is marketed by the Spanish companies COMPASS Ingeniería y Sistemas S.A., QUANTECH ATZ S.A. and CIMNE Tecnología SA. (www.cimnetecnologia.com)

- **Development of new web-based technology for e-learning and e-work.** The outcome of this research is collected in the collaborative work platform Fraktalis (www.cimne.com/fraktalis) and the Virtual Training Center marketed by the Spanish company STRUCTURALIA (www.structuralia.com).

The finite element methods he has developed for structural analysis have had a significant impact for the enhanced analysis and design of reinforced concrete and composite structures, large scale inflatable structures (inflatable hangars and bridges, etc.), as well as for the optimum design of industrial sheet forming processes.

PUBLICATIONS

4 books written, 3 edited international journals, 57 edited books, 59 book chapters, 40 monographs with ISBN, 289 papers in international journals, 411 papers in conference proceedings, 3 books translated into English, 230 research publications, 3 book series edited. Total nº of publications: 1087. h factor = 34, Nº of citations: 4.532

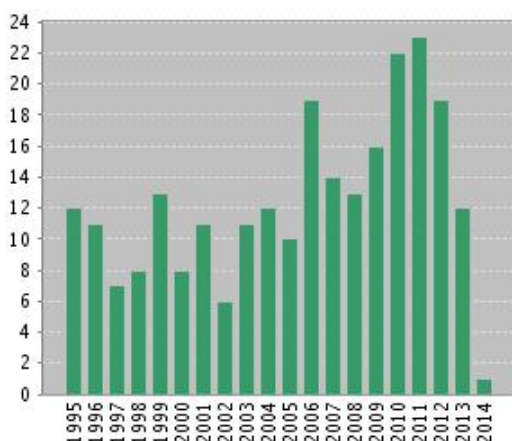
Chief Editor of two JCR journals:

Archives of Computational Method in Engineering. Edited by M. Kleiber and E. Oñate, since 1994. Published by Springer. Impact factor: 3.576

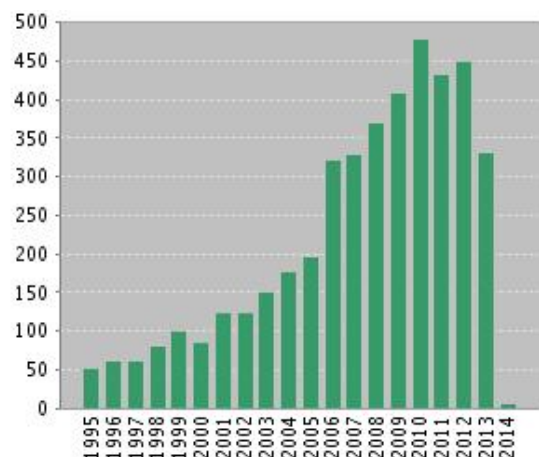
Revista Internacional de Métodos Numéricos para Cálculo y Diseño en Ingeniería. Edited by E. Oñate and S. Idelsohn, since 1985. Published by Elsevier. Recently compiled in JCR (2010). Impact factor: 0.170

NUMBER OF PAPERS IN JCR JOURNALS AND CITATIONS PER YEAR (1999 - 2012) (Source: ISI web of knowledge)

Nº of papers/year



Nº of citations



He has 2 papers with more than 200 citations, 5 papers with more than 100 citations, 16 papers with more than 50 citations and 62 papers with more than 20 citations.

JCR JOURNALS WHERE HE HAS PUBLISHED FIVE OR MORE PAPERS

Int. Journal for Numerical Methods in Engineering (47 papers), Computer Methods in Applied Mechanics and Engineering (37 papers), Int. Journal of Numerical Methods for Analysis and Design in Engineering (in Spanish) (28 papers), Computational Mechanics (20 papers), Engineering Computations (17 papers), Computers and Structures (14 papers), Journal of Solids and Structures (8 papers), Communications in Numerical Methods in Engng. (6 papers), Journal of Materials Processing Technology (5 papers).

INVITED PRESENTATIONS TO PEER-REVIEWED CONFERENCES

He has been invited to deliver 30 Plenary Lectures and 50 Keynote Lectures in the main peer-reviewed international conferences in the field of Computational Engineering.

RTD PROJECTS AND TECHNOLOGY TRANSFER ACTIVITIES

The research lines of Eugenio Oñate have been developed since 1980 in the framework of over 450 RTD projects carried out in cooperation with engineering companies in Spain and worldwide. Many of these projects (around 150 projects) have been developed with support from EC programmes.

In addition, to this RTD activity he has developed an intensive task in the transfer of the outcome of his research to the industrial sector, and in particular to Spanish companies, with the aims of improving their manufacturing processes and products with the help of advanced numerical simulation codes.

We mention his personal involvement in the creation of twelve spin-off companies that operate with success in the international market. Among these we note the following: **QUANTECH ATZ, S.A.** (1996), specialized in the marketing of software and engineering services for the metal forming and aeronautic sectors (www.quantech.es); **STRUCTURALIA, S.A.** (2000), specialized in internet services for the construction sector (www.structuralia.com); **COMPASS, Ingeniería y Sistemas, S.A.** (www.compassis.com) (2002), specialized in the marketing of software and engineering services in the civil and naval sectors; **BUILDAIR, Ingeniería y Arquitectura, S.A.** (www.buildair.com) (2003), specialized in analysis and design of inflatable structures such as airplane hangars, inflatable bridges, emergency and exhibition pavilions, etc; **INGENIA AIE** (www.ingenia.aero) (2003), specialized in engineering services for the aeronautic sector and **NHIT, S. A.** (2003), specialized in transfer of knowledge in computational methods to the industrial sector. **NHIT S.L.** (2009). Transfer and application of computational technology to industry.

In 2011 he created **CIMNE Tecnología, S.A.** specialized in the transfer to industry of the products developed at CIMNE. In 2012 this company has created 6 other spin-off companies such as: **Computational and Information Technologies S.A.**, specialized in the development and market of software and information systems for engineering applications. **LYNCOS S.L.**, specialized in the Internet of Things (www.lthings.com); **Servicios Energéticos Avanzados S.L.** specialized in energy management in buildings (www.inergybcn.com) and **Tecnologías Avanzadas para el Ocio (TAOC S.L.)**, specialized in the application of information technologies in the tourism and leisure sector (www.beaching.com). For more information visit www.cimnetecnologia.com

The mentioned companies market worldwide several products related to the research carried out at CIMNE. These include the Tdyn code for fluid-dynamic analysis, the structural analysis code RamSeries, the metal forming simulation codes Stampack, Vulcan and Click2Cast, the Ramflood code

for risk analysis and management of floods, the SIE code for energy management in buildings, a Collaborative Work Platform and a Virtual Training Center and several designs of inflatable structures for applications in civil engineering and architecture.

The CIMNE spin-off companies employ some 92 workers, including 15 Post-Docs.

OUTSTANDING PUBLICATIONS

We list below E. Oñate ten relevant publications in three technological areas:

1) STRUCTURAL MECHANICS

OÑATE E. AND ZÁRATE F., Rotation-free triangular plate and shell elements, *Int. Journal for Numerical Methods in Engineering*, Vol. 47 (1-3), pp. 557-603, 2000, Citations: 71

OÑATE E., Structural analysis with the finite element method. Linear statics. Volume 1. Basis and solids, 472 pp., Springer, 2009

OÑATE E., Cálculo de Estructuras por el Método de los Elementos Finitos. Análisis Estático Lineal, CIMNE, 850 pp., Barcelona, 1st edition, 1992, 2nd edition 1995

OÑATE E., Structural analysis with the finite element method. Linear statics. Volume 2. Beams, plates and shells, Springer, 2013

2) FLUIDS AND FLUID-SOIL-STRUCTURE INTERACTION

OÑATE E, IDELSOHN S, ZIENKIEWICZ OC, et al. [A finite point method in computational mechanics. Applications to convective transport and fluid flow](#), *Int. Journal for Numerical Methods in Engineering* 39 (22): 3839-3866, 1996, Citations: 365

OÑATE E, [Derivation of stabilized equations for numerical solution of advective diffusive transport and fluid flow problems](#), *Computer Methods in Applied Mechanics and Engineering* 151 (1-2): 233-265, Jan 15 1998, Citations: 109

OÑATE E., IDELSOHN S.R., DEL PIN F. AND AUBRY R., The particle finite element method. An overview, *International Journal of Computational Methods*, Vol. 1 (2), pp. 267-307, 2004, Citations: 82

OÑATE E., IDELSOHN S.R., CELIGUETA M.A., ROSSI R., Advances in the particle finite element method for the analysis of fluid-multibody interaction and bed erosion in free surface flows, *Computer Methods in Applied Mechanics and Engineering*, Vol. 197 (19-20), pp. 1777-1800, 2008, Citations: 32

3) MANUFACTURING PROCESSES

ZIENKIEWICZ OC, JAIN PC, OÑATE E, [Flow of solids during forming and extrusion - some aspects of numerical-solutions](#), *International Journal of Solids and Structures* 14 (1): 15-38, 1978, Citations: 179

OÑATE E, ZIENKIEWICZ OC, [A viscous shell formulation for the analysis of thin sheet metal forming](#), *International Journal of Mechanical Sciences* 25 (5): 305-335, 1983, Citations: 56¹

¹ EO_ExtendedCV_November2013.doc