



Professor Eugenio Oñate Ibáñez de Navarra

See:

<http://www.cimne.com/eo/>

http://en.wikipedia.org/wiki/Eugenio_O%C3%B1ate_Iba%C3%B1ez_de_Navarra

<http://0-www.worldcat.org/novacat.nova.edu/identities/lccn-n88-83065>

<http://www.barnesandnoble.com/c/eugenio-onate>

"images for eugenio onate" - GOOGLE

<http://www.informatik.uni-trier.de/~ley/db/indices/a-tree/o/O=ntilde=ate:Eugenio.html>

Technical University of Catalonia (UPC), Spain

BIOGRAPHY

E. Oñate was born in Valencia on March 28, 1953. He is married with Marisa since 1983 and has 3 children (Blanca, 25th; Eugenio, 23rd and Guadalupe 19th).

After completing a degree in Civil Engineering in July 1975 at the Technical Univ. of Valencia (Spain), he started postgraduate studies at the Civil Engineering Dept. of Swansea University, Wales, UK. There he completed in June 1976 a Master of Science degree (M.Sc. Thesis on *Development of a finite strip method for analysis of bridges and folded plate structures*) and later a Ph.D. degree (Dec. 1978) under the supervision of

Prof. O. C. Zienkiewicz (Ph. D. Thesis on *Plastic flow in metals with special reference to: I) Coupled thermal flow. II) Thin sheet metal forming*). His Ph.D. studies were funded by an Alcoa Research Grant from USA.

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 became a Full Professor with tenure on 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 (^a 20.000 m²) were designed and built in the new campus of 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 180 scientists and engineers from 25 different countries worldwide specialized in research activities in different fields of engineering and science (civil, mechanical, aerospace and naval engineering, bio-medical engineering, food engineering, etc.). CIMNE has received many prestigious Awards in Cataluña and by the European Commission.

In 2002 he created the CIMNE Classroom Network. The CIMNE Classrooms are physical spaces jointly created by CIMNE and a University for the development of training, research and technology transfer activities (see www.cimne.com for further details). The CIMNE Classroom Network incorporates nowadays 24 centers created between CIMNE and universities in Spain and in several Latin American countries (Argentina, Mexico, Chile, Peru, Colombia, Brazil, Cuba and Venezuela). The CIMNE Classrooms are a unique instrument for scientific and technical cooperation between research, academic and industrial organizations in Europe and Latin-America.

He has supervised **48 Ph.D. Thesis** and **57 Master Thesis**. 30 of his former students are now full professors in Universities in Spain (13), USA (4), UK (2) and Latin America (11). He has had a significant impact in the creation of new scientific groups in cooperation with his former students.

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 the field of Numerical Methods in Engineering. SEMNI has organized 8 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) as recognition of his work towards the unification of APMTAC and SEMNI conferences which are jointly held since 1983 and typically attract some 400 scientists and engineers.

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 third 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 he is the *President of the IACM*. On July 2006 he was re-elected as President of the IACM for a new four year period. During his mandate as Secretary General and President of IACM he has supervised the organization of the World Congresses of Computational

Mechanics of the IACM held in Tokyo (1994), Buenos Aires (1998), Vienna (2002), Peking (2004), Los Angeles (2006) and Venice (2008). The next World Congress of the IACM will be take place in Sidney on July 2010.

His research activities have spread over a range of multidisciplinary fields which he has contributed relevant theories and methods of scientific and industrial relevance. His key research lines are the following:

- **Development of innovative finite element methods for analysis and optimal design of structures with standard and composite materials.** Applications to shells, buildings, dams, bridges, tunnels, harbours, geomechanics, inflatable structures and vehicle structures (cars, airplanes, trains, ships).
- **New rotation-free triangular finite elements for analysis of plate and shell structures.**
- **New stabilized finite element methods based on finite calculus** for fluids and incompressible solids.
- **Development of innovative numerical methods for optimal design of manufacturing processes.** Applications to sheet metal forming, casting, forging, rolling and extrusion of metallic products.
- **Development of innovative numerical methods combining particle-based methods, discrete element methods and finite element methods for coupled problems in engineering.** Applications to aeroelastic analysis of airplanes and flexible structures (tall buildings, slender bridges and aero-generator blades); hydrodynamic analysis of ships; fluid-structure interaction problems with application to harbour and marine engineering and to constructions under flooding situations; excavation problems in civil and mining engineering and coupled thermal- flows in industrial and environmental problems.
- **Modelling and simulation of the melting and burning of objects with the particle finite element method.**
- **Development of decision support systems in engineering** integrating data-bases, numerical methods, wireless sensors and artificial intelligence techniques. Applications to the risk prediction and management of floods, sea spills , energy consumption in cities and bio-medical engineering.

The above research lines have been developed in the framework of over **400 RTD projects** carried out in cooperation with the main engineering companies in Spain and worldwide. Some **120** of these projects have been developed in the framework of EC programmes.

In parallel with the RTD activities, Eugenio Oñate has organized as **chair person 29 international congresses** on topics closely related with the above RTD lines. See list of congresses in www.cimne.com.

He has published **223 papers** in scientific journals. He has written 3 **text books** and is the editor of **37 books** in different topics of Computational Engineering Mechanics. He is the **editor of two scientific journals** (one of which is published by Springer) and **3 books series** in Computational Mechanics. He is the author of **51 chapters in books, 22 monographs, 327 papers in conference proceedings** and **147 research reports**.

He has **2180 citations** in the field of Computational Engineering Science. He has an **h index** of **26** and 11 papers with more than 50 citations

He is regularly invited to deliver Keynote (Plenary) Lectures in the main International Conferences in Computational Engineering Science (**25 Plenary Lectures and 30 Keynote lectures** in the last 20 years).

His research work has been recognized in many Prizes and Awards (see Curriculum Vitae).

In addition, to his scientific activity he has developed an intensive task in the transfer of the outcome of his research to the industrial sector. He has been personally involved in the **creation of five spin-off companies** in

Spain. These companies are operating with success in the international market distributing and applying software products and practical outcomes derived from the research at CIMNE. The more successful of these companies are: Structuralia (www.structuralia.com) specialized in e-learning services for the construction sector; COMPASS (www.compassis.com) specialized in software for naval and construction sectors; Quantech ATZ (www.quantech.es) specialized in software for manufacturing and aerospace sectors; BuildAir (www.buildair.com) specialized in design and construction of textile membrane and inflatable structures and INGENIA (www.ingenia.aero) specialized in consulting services in aeronautics.

ACADEMIC DEGREES

1975 Ingeniero de Caminos, Canales y Puertos (Civil Engineering), Technical University of Valencia.

1976 Master in Science, Swansea University, UK.

1978 Doctor in Philosophy (Ph.D.). Swansea University, UK.

1979 Doctor Ingeniero de Caminos, Canales y Puertos (Ph.D. in Civil Engng), Technical Univ. of Catalonia (UPC).

ACADEMIC AND SCIENTIFIC POSITIONS

1979 Associated Professor in Structural and Continuum Mechanics at Technical Univ. of Catalonia (UPC)

1981 Full Professor in Structural and Continuum Mechanics, UPC.

1983 - 89 Director of the School of Civil Engineering, UPC

1987 Director of International Center for Numerical Methods in Engng. (CIMNE).

1989 - 2004 President of the Spanish Association for Numerical Methods in Engng (SEMNI).

1992 - 95 President of the Scientific Council of the Center for Supercomputing of Catalonia

1992 - 95 Director of the Structural Mechanics Department at UPC.

1993 - 96 Vice-president of European Community on Comput. Methods in Applied Sciences (ECCOMAS)

1994 - 2002 General Secretary of the Int. Association for Computational Mechanics (IACM).

2000 - 2004 President of European Community on Comput. Meth. Appl. Sciences (ECCOMAS).

2002 - 2010 President of the International Association for Computational Mechanics (IACM).

2004 Honorary President of Spanish Association for Numerical Methods in Engng. (SEMNI)

MAIN RESEARCH LINES

- Innovative rotation-free triangular elements for analysis of plate and shell structures;
- New finite element (FE) methods for analysis and optimal design of structures with composite materials;
- New numerical techniques combining particle-based methods, discrete element methods and FE methods for multidisciplinary engineering problems;
- Innovative numerical methods for simulation and optimal design of manufacturing processes;
- New stabilized finite element methods for fluid mechanics, convective transport and incompressible solids;
- Modeling and simulation of the melting and burning of objects in fire.
- Integration of decision support systems in engineering

PRIZES AND AWARDS

1990 Catalanian Medal for Research "Narcís Monturiol".

1995 Medal to Professional Merit of Spanish Institution of Civil Engineers.

1996 Eric Reissner Medal in Computational Mechanics.

1998 Fellow of the International Association for Computational Mechanics (IACM).

1998 Computational Mechanics Award (IACM)

1999 Accessit to the City of Barcelona Award in Technological Research

- 1999** Narcis Monturiol Award from the Catalonian Government
- 2000** Award of the Spanish Group for Fracture Mechanics.
- 2000** Award of the Argentinian Association for Computational Mechanics (AMCA)
- 2001** Medal of the School of Civil Engineering of UPC to Professional Achievements
- 2002** City of Barcelona Award in Technological Research
- 2002** Highly Commended Award for Outstanding Paper in Engng. Computations. Emerald Literati Club
- 2003** Award for Excellence for Outstanding Paper in Engng. Computations. Emerald Literari Club
- 2004** University of Jyväskylä Medal (Finland)
- 2004** Duran i Farell Award of UPC for Excellence of Research and Technology Transfer
- 2007** Award from Spanish Association for Numerical Methods in Engng. (SEMNI)
- 2008** Grand Prize of the Japan Society for Computational Engineering and Science (JSCES)
- 2009** O.C. Zienkiewicz Medal of the Polish Association for Computational Mechanics (PACM)
- 2009** Literati Award for Excellence to the best Paper published in Engineering Computations
- 2009** Ted Belytschko Applied Mechanics Award of ASME (USA)
- 2009** Computational Mechanics Award of the Japan Society of Mechanical Engineering (JSME)
- 2010** Gauss-Newton Medal of the International Association for Computational Mechanics (IACM)

HONORARY DOCTORATES AND FELLOWSHIPS

- 2000** Doctor Honoris Causa, Ovidius University, Constanza, Rumania
- 2005** Honorary Member of Portuguese Assoc. for Theoretical, Applied and Computational Mechanics (APMTAC)
- 2007** Honorary Fellow of Swansea University (UK)

TEXT BOOKS

- Oñate, E.**, Análisis de Estructuras por el Método de Elementos Finitos (in Spanish, 900pp), 1992 (1st Edition), 1995 (2nd Edition).
- Oñate, E.**, The Aura of Numbers (in Spanish), Royal Academy of Doctors, 110 pp., Barcelona, 1998
- Oñate, E.**, Structural Analysis by the Finite Element Method, Vol. 1: Basis and Solids, 450 pp., Springer, 2009

EDITED BOOKS He has edited **17 books** in the period 1999-2009. We list below a **selection of four edited books**. - Computational Plasticity, *E. Oñate and R. Owen* (Eds.), Springer 2007.

- Computational Methods for Coupled Problems in Science and Engineering, *E. Oñate, B. Schrefler and M. Papadrakakis* (Eds.), CIMNE, Barcelona, 2007
- Computational Methods in Marine Engineering, *E. Oñate, P. Bergan, J. García, and T. Kvamsdal* (Eds.), CIMNE, Barcelona, 2007
- Textile Composites and Inflatable Structures, *E. Oñate and B. Kröplin* (Eds.), Springer, 2005

MONOGRAPHS He has published **14 monographs** in the period 1999-2009. We list below a **selection of three monographs**.

- Carbonell, J.M., Oñate, E. and Suárez, B.**, A particle finite element method for excavation problems. Monograph M115, 240pp, CIMNE, Barcelona, 2009.
- García J., Oñate E. and Sierra H.**, Finite element methods for hidrodynamic analysis of ships, Monograph M 59, 269 pp., CIMNE, Barcelona, 2000
- Car E., Oller S. and Oñate E.**, Numerical analysis of composite materials, Monograph M 57, 350 pp., CIMNE, Barcelona, 2000

CHAPTERS IN COLLECTIVE VOLUMES

He has published 10 chapters in collective volumes. We list below a selection of three chapters.

Idelsohn, S.R., Oñate, E., Rossi, R., Marti, J. and Del Pin, F., New computational challenges in fluid-structure interaction problems. In *New Computational Challenges in Material, Structures and Fluids*, J. Eberhasrsteiner, C. Hellmich, H. Mang and J. Periaux (Eds.), Chapter 2, pp. 17-33, Springer, 2009.

Oñate E. Stabilization via finite element computations. In *Finite Element methods: 1970 and Beyond* .L. Franca, T.E. Tezduyar and A. Masud (Eds.), Chapter 3, pp.154-171, CIMNE, Barcelona, 2004.

Oñate E., García J. and Idelsohn S.R., Ship hydrodynamics. In *Encyclopedia of Computational Mechanics*, E. Stein, R. de Borst and T.J.R. Hughes (Eds.), Vol. 3, Chapter 18, pp. 579 - 607, Wiley, 2004.

INVITED PRESENTATIONS TO PEER-REVIEWED CONFERENCES In the last 10 years he has been invited to deliver **15 Plenary Lectures** and **20 Keynote Lectures** in the main peer-reviewed international conferences in the field of Computational Engineering .We list below a selection of **six** recent Plenary Lectures (PL).

Oñate, E., Advanced computational method for simulation of coupled problems in engineering. PL at 3rd Polish Conference on Computational Mechanics, Zielona Góra, Poland, 18-20 May 2009.

Oñate, E., Modelling and simulation of excavation problems with the particle finite element method. PL at 2nd Int. Conf. on Computational Methods in Tunnelling Problems, Univ. Bochum, Germany, 9-11 September 2009.

Oñate, E., Overview of finite element method for analysis of inflatable structures. PL at 4th Int. Conference on Textile Composites and Inflatable Structures, Univ. of Stuttgart, Germany, 5-7 October 2009.

Oñate, E., Possibilities of the Particle Finite Element Method in Engineering. PL at the 1st Int. Conference on Particle-based Methods. Fundamentals and Applications, Barcelona, 25-27 November 2009.

Oñate, E., *Possibilities of particle finite element method in computational mechanics*. Plenary Lecture at the 4th Asian Pacific Congress on Computational Mechanics, Kyoto, Japan, December 3-6, 2007.

Oñate, E., *Advances in computational methods for fluid-structure interaction problems*. PL at VII World Congress on Computational Mechanics, Los Angeles, USA, July 16-22, 2006.

PUBLICATIONS IN REFEREED JOURNALS: 223 papers in international journals