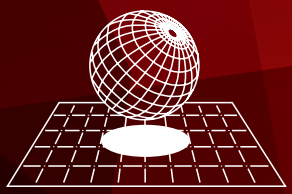

CIMNE

International Center
for Numerical Methods
in Engineering

2012

Centres de recerca
de Catalunya

ACTIVITY REPORT
2012

GOVERNING BODIES

Governing Council

PRESIDENT

Dr. Andreu Mas-Colell
Conseller d'Economia i Coneixement, GC [1]

EXECUTIVE VICE-PRESIDENT

Dr. Eugenio Oñate
Catedràtic, UPC [2]

MEMBERS

Sr. Pere Palacín
Direcció General d'Energia, Mines i Seguretat Industrial, GC

Dr. Antoni Giró
Rector, UPC

Dr. Lluís Ramallo
President Comissió Espanyola de la UNESCO

Sr. Santi Vila
Conseller de Territori i Sostenibilitat, GC

Dr. Benjamín Suárez
Catedràtic, UPC

Executive Council

PRESIDENT

Dr. Eugenio Oñate
UPC

MEMBERS

Sr. Xavier Baulies
Departament de Territori i Sostenibilitat (TES), GC

Dr. Pere Brunet
Reial Acadèmia d'Enginyeria

Dr. Angel Cardama Aznar
UPC

Dr. Pedro Díez Mejía
UPC

Dr. Oriol Alcoba
Centre d'Innovació Empresarial (ACC10), GC

Sra. Francisca García-Sicilia
UNESCO

Dr. Antonio Gens
UPC

Dr. Antonio Huerta
UPC

Dr. Juan Miquel
UPC

Dr. Sebastià Olivella
UPC

Dra. Ana Pérez Neira
UPC

Dr. Lluís Rovira
Institució CERCA [3], GC

[1] GC: Generalitat de Catalunya
[2] UPC: Universitat Politècnica de Catalunya
[3] CERCA: Centres de Recerca de Catalunya

Scientific Advisory Council

Dr. Eduardo Alonso
UPC

Dr. Manuel Casteleiro
Universidad de La Coruña

Dr. Alain Combescure
INSA, Lyon, France

Dr. Manuel Doblaré
Abengoa Research

Dr. Sergio Idelsohn
ICREA Research Professor

Dr. Michael Kleiber
Polish Academy of Sciences, Warsaw, Poland

Dr. Bernd Kröplin
TAO Gmb, Stuttgart, Germany

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Dr. Antonio Marí
UPC

Dr. Xavier Oliver
UPC

Dr. Roger Owen
Chairman of SAC
Swansea University, Swansea, UK

Dr. Manolis Papadrakakis
National Technical University of Athens, Greece

Dr. Bernhard Schrefler
University of Padova, Italy

Dr. Honorio Sierra Cano
Ph.D. in Naval Architecture

Dr. Peter Wriggers
Leibniz Universitaet Hannover, Germany

Scientific Advisory Council Meeting (February 6th, 2013)

CONTENTS

PRESENTATION

The International Center for Numerical Methods in Engineering (CIMNE) is a research organization created in 1987 at the heart of the prestigious Technical University of Catalonia (UPC) as a partnership between the Government of Catalonia and UPC. The aim of CIMNE is the development of numerical methods and computational techniques for advancing knowledge and technology in engineering and applied sciences.

CIMNE's headquarters are located at the heart of the Technical University of Catalonia (UPC) in Barcelona. CIMNE has also premises at different buildings in several campus of UPC. CIMNE has also offices in Spain in Madrid, Terrassa, Castelldefels and Ibiza. In 2005, CIMNE started its international expansion and since then has created the following international branches: CIMNE Latinamerica (Non profit Foundation in Santa Fe, Argentina); CIMNE USA (Non profit Corporation in Washington DC, USA); CIMNE Singapore (Non profit Corporation in Singapore) and Beijing (China).

CIMNE employs some 200 scientists and engineers who work in the different offices of CIMNE around the world (Barcelona, Madrid, Washington DC [USA], Singapore, Santa Fe [Argentina], Beijing [China]). CIMNE has also established a network of 28 Classrooms and Joint Labs in partnership with Universities in Spain and 10 Latin American countries.

The research and technology development (RTD) activities of CIMNE cover a wide spectrum of topics ranging from classical engineering fields such as civil, mechanic, environmental, naval, marine and offshore, food, telecommunication and bio-medical engineering, computer sciences and applied sciences such as material sciences, bio-medicine, computational physics, nature, social and economic sciences and multimedia sciences, among others.

Since 1987, CIMNE has taken part in over 2000 RTD projects in cooperation with some 500 enterprises, universities and research centers worldwide.

The RTD activities of CIMNE are complemented by education and training activities via Master Courses, short courses and seminars and CIMNE Coffee talks. CIMNE scientists supervise doctorate students in cooperation with several universities in Spain and worldwide.

CIMNE publishes books, monographs, research reports and technical reports. CIMNE also organizes international conferences and workshops in the different areas of interest for CIMNE. It has organized 122 conferences since 1987.

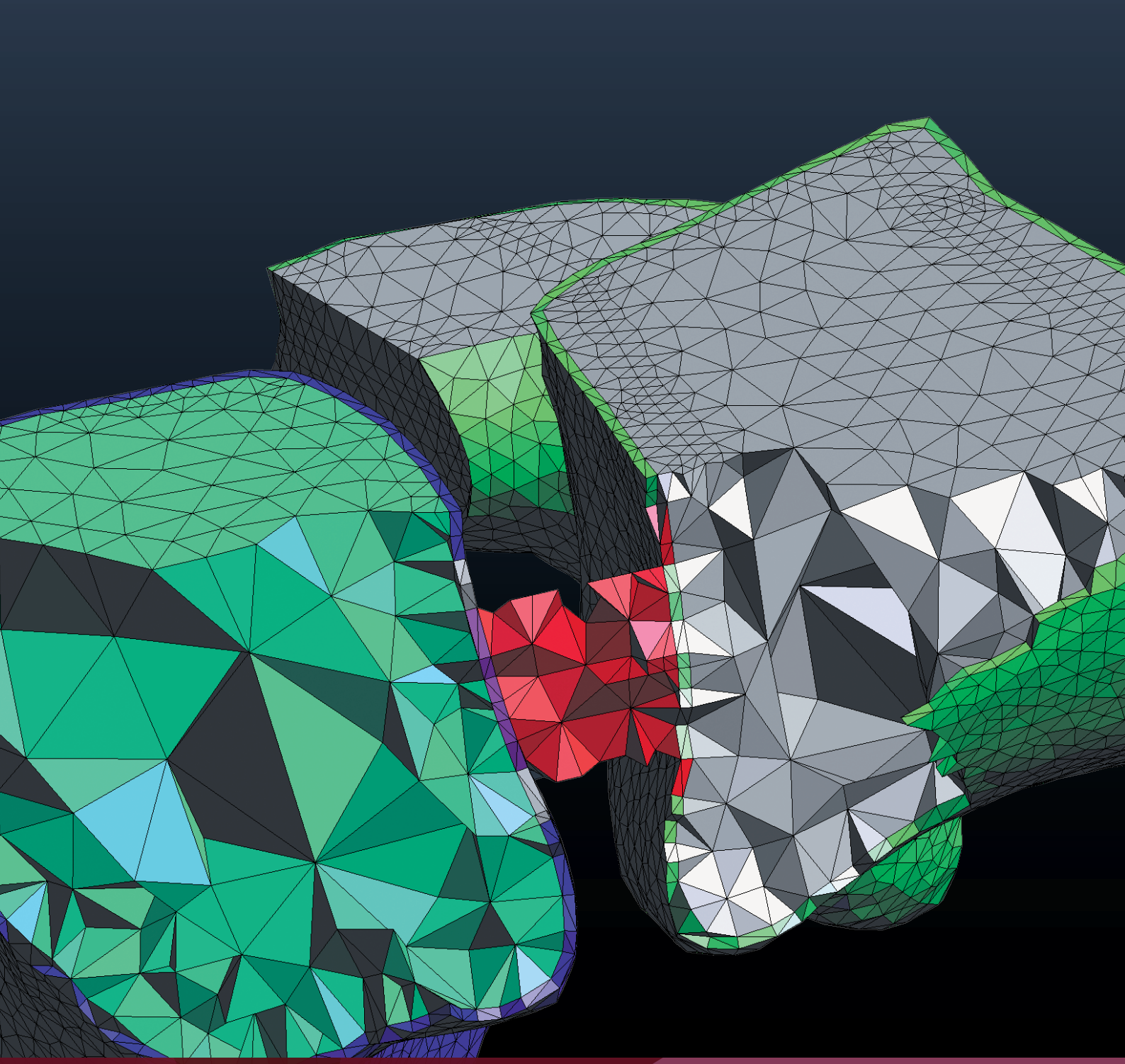
CIMNE has a vocation for transferring the scientific and technical outputs from RTD projects to the industrial sector. This is effectively carried out in cooperation with companies from different sectors that exploit and market CIMNE technology. CIMNE has actively promoted the creation of spin-off companies, some of them totally or partially owned by CIMNE, that play an important role in the industrialization and exploitation of CIMNE technology.

CIMNE maintains close cooperation links with many universities and RTD centers in the field of computational engineering and sciences worldwide. CIMNE has access to the computing facilities of several supercomputer centers in Spain and Europe.

CIMNE has been identified as one of the International Centers of Excellence on Simulation-Based Engineering and Sciences in a recent National Science Foundation (NSF) report [Glotzer et al., WTEC Panel Report on International Assessment of Research and Development in Simulation Based Engineering and Science. World Technology Evaluation Center (wtec.org), 2009].

The following sections briefly explain the activities of CIMNE on education, dissemination, research and technology transfer in 2012. Also the RTD lines of the CIMNE departments and the spin-off companies and products developed at CIMNE are described.

In 2012 CIMNE celebrated its 25th anniversary.



ABOUT CIMNE

A vocation for research and technology tranfer

The Cycle of Ideas

The mission and activity of CIMNE can be clarified if we examine what we call the Cycle of Ideas[1]. Fig. 1 shows a scheme of the transit of an idea, from the instant it originates until it is transformed in an industrial and commercial success. Similarly to what happens in biological and environmental cycles (the water cycle for instance), the cadencies and tempos are very important in the Cycle of Ideas.

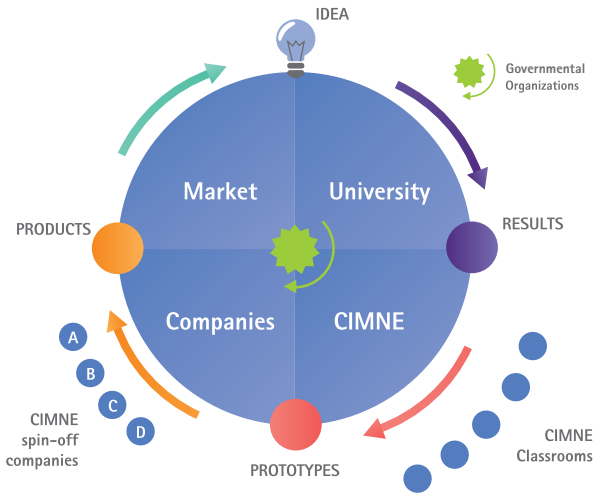


Fig 1. The Cycle of Ideas

Ideas (and here we refer to scientific advances) usually originate in university environments, where many professionals have the mission of studying, investigating and eventually discovering new areas of knowledge. The idea (the new discovery) would be equivalent to a seed, that even being very important it is far from becoming a fruit.

The idea matures in its "tour" by the first quadrant of the Cycle (the University) until it produces tangible results (thesis, papers, computer programs, physical devices, etc.). These "results", if they are not filed and protected, can be easily lost. This leads to undesirable repetitions or duplications.

What to do then with the results of an idea? The best is that they evolve until they reach the level of a prototype; i.e. something (a software code, a system, a device, etc.) that works in a contrastable manner. The transit of a result to a prototype demands an organization, efficient and capable staff and resources. What it is desirable is that the idea follows its route on specialized institutions, adjacent to the university, such as CIMNE, with the mission of transforming knowledge into tangible things (prototypes). The prototype develops into a product within a company. The cycle follows with the marketing of the product and ends up with the reinvestment of part of the profits in the development of new ideas.

1 Oñate, E. The Cycle of Ideas in Research, Development and Technology Transfer, PI 358, CIMNE, 2011

Holistic view of CIMNE RTD activities

The overall research and technological development (RTD) activities of CIMNE has evolved over the years towards providing comprehensive solutions for solving problems that affect human beings. This can be achieved by integrating existing knowledge in a particular field with quantitative information emanating for prediction methods (i.e. computational-based techniques) and experimental measurements. The link between these four concepts: the problem to be solved, computational methods, experimental methods and existing knowledge is well represented by the tetrahedron shown in Fig. 2 below.

Each of the nodes in the tetrahedron is connected to the other three by lines that represent information transfer pipelines (possibly internet). The intensity of the flow along the lines that interconnect two nodes will vary depending on the requirements for solving the problem.

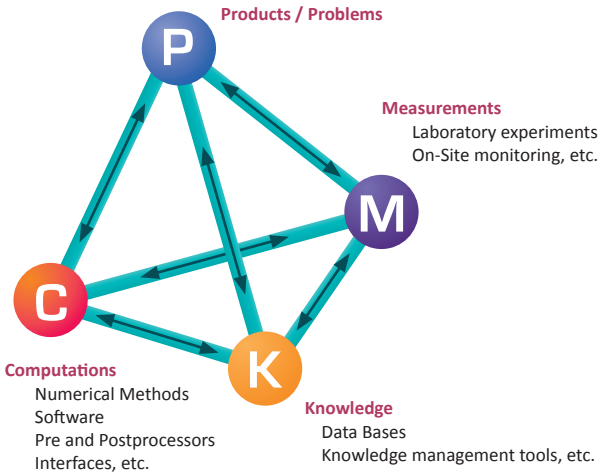


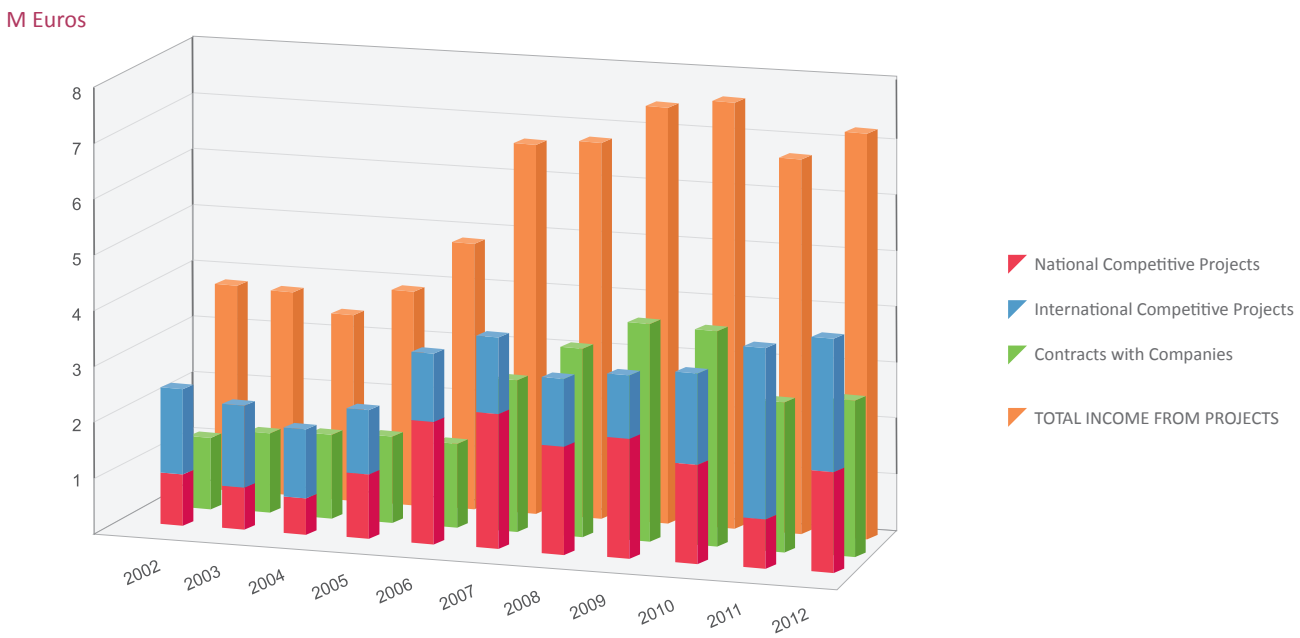
Fig 2. The holistic approach for solving problems at CIMNE

CIMNE in few numbers

	2012	From '87
Courses and Seminars	16	**496**
Congresses	12	**122**
Publications	35	**1368**
Books	1	**131**
Monographs	7	**200**
Research Reports	20	**390**
Techincal Reports	7	**632**
Educational Programs	0	**15**
Contracts with industry	82	**1001**

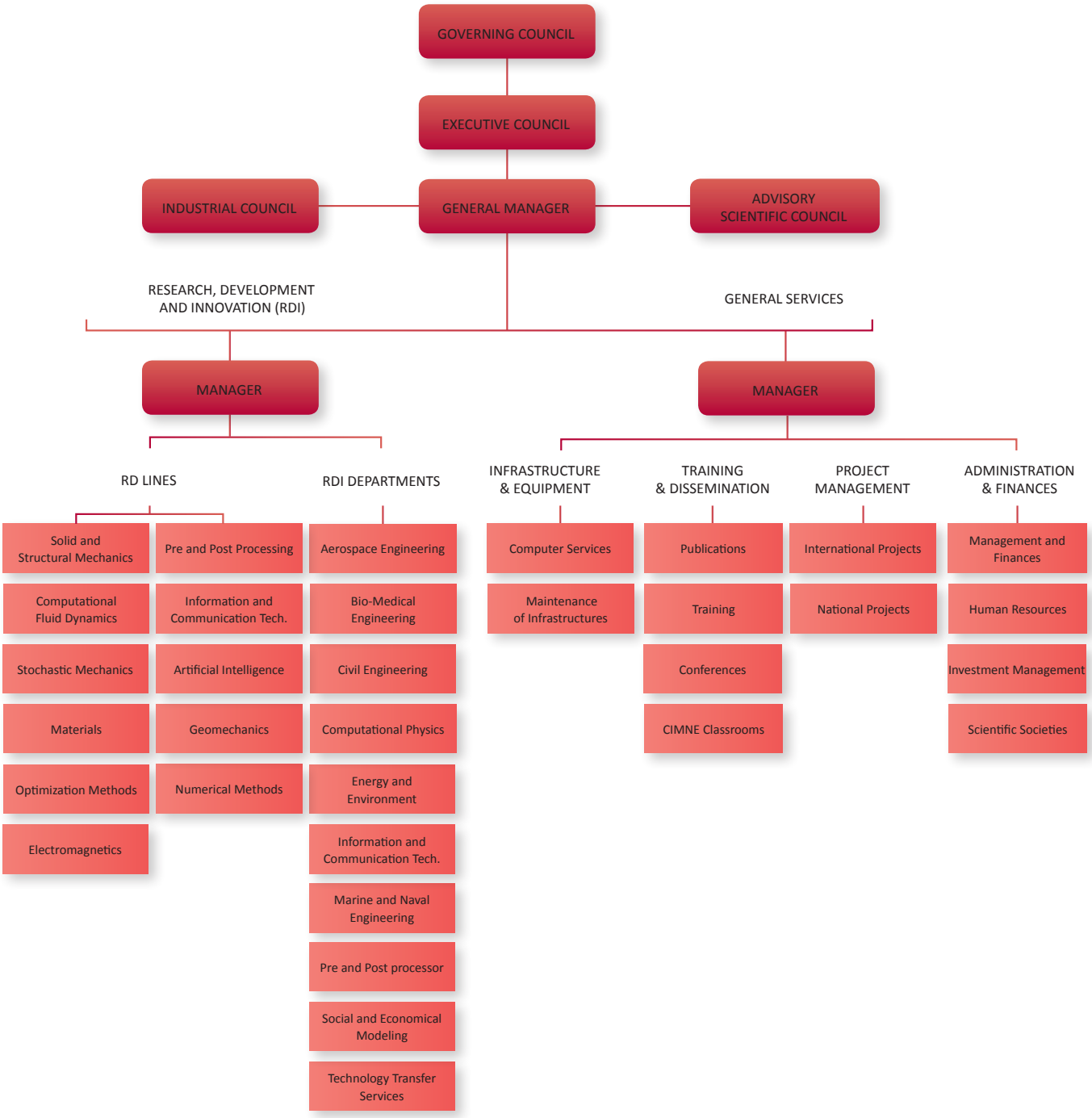
	2012	From '87
Creation of new companies	-	**4**
Competitive Research Projects	71	**642**
European Projects	38	**215**
National Projects	29	**420**
International Projects	2	**5**
Staff	254	
Post Doctoral Researchers	52	
Affiliated Scientists (UPC)	24	
RTD staff	106	
PhD Students	36	
Administration and services staff	36	

Income from projects



Organization chart

The structure of CIMNE evolves in accordance with the following chart:



DIRECTOR

Eugenio OÑATE

VICE-DIRECTOR

Pere-Andreu UBACH

Research Development and Innovation area

RESEARCH STAFF

The number of scientists working at CIMNE during 1987-2012 and in 2012 is listed below, grouped by country of origin.

	2012	87-12
Argentina	9	59
Australia	1	3
Austria		2
Belgium	1	5
Bolivia		3
Brazil	1	8
Bulgaria	1	1
Chile	5	9
China		7
Colombia	11	21
Costa Rica	1	2
Cuba	1	6
Czech Republic	0	6
Dominican Republic	1	2
Ecuador	1	2
Egypt		1
Ethiopia		1

	2012	87-12
France	1	13
Germany	1	28
Greece	1	2
Holland	0	4
Hungary		1
India	1	11
Iran	4	7
Ireland		1
Italy	10	20
Japan		4
Korea		1
Luxembourg	1	1
Mexico	3	16
Morocco	1	2
Panama		1
Peru	1	4
Philippines	0	1

	2012	87-12
Poland		3
Portugal		2
Romania	1	5
Russia	1	1
Serbia		2
Slovenia	1	1
Spain	133	240
Sweden		1
Switzerland		1
Thailandia		1
Tunisia	1	1
Turkey	1	2
United Kingdom		10
United States	1	3
Uruguay	1	2
Venezuela	1	6
Vietnam		1
TOTAL	226	531

SENIOR SCIENTISTS

IDELSOHN Sergio Rodolfo — Icrea Research Professor

PERIAUX Jacques Francis — UNESCO Prof. on Num. Met. Eng.

AFFILIATED SCIENTISTS FROM TECHNICAL UNIVERSITY OF CATALONIA (UPC)

AGELET Carlos
ALONSO Eduardo
ARROYO Marino
BARBAT Alex
BUGEDA Gabriel
CANTE Juan Carlos
CERVERA Miguel
CODINA Ramón
CHIUMENTI Michele
DÍEZ Pedro
GARCÍA Julio
GENS Antonio
HUERTA Antonio
LARESE Antonia
MIQUEL Juan
OLIVELLA Sebastià
OLIVER Xavier
OLLER Sergio H.
OÑATE Eugenio
PRÍNCIPE Ricardo Javier
RODRIGUEZ-FERRAN Antonio
SARRATE José
SUÁREZ Benjamín

POST DOCTORAL RESEARCHERS

ARNAU Pedro A.
BADÍA Santiago I.
BAIGES Joan
BARBIERI Manuela
CANTE Juan Carlos
CARBONELL Josep Ma
CARREÑO Liliana
CERROLAZA Miquel
DADVAND Pooyan
DANOV Stoyan V.
DI CAPUA Daniel
DI MARIANO Alessandra
FLORES Roberto
GAMBOA Gonzalo
GARITTE Benoit
GARRIGA Adan
GONZALEZ Jose M.
HANGANU Alex
HERNANDEZ Joaquin
HOFFMANN Christian A.
JORDANA Francesc De P.
LABRA Carlos
LEE Dong Seop
LÓPEZ Roberto
LUQUOT Linda
MAIDANA Augusto
MARTI Jaime Emilio
MARTI Julio M.
MARTÍN Alberto F.
MARTINEZ Javier
MAVROULI Olga C.
MOKNI Nadia
MORA Francisco Javier
NADUKANDI Prashanth
ORTEGA Enrique
ORTIGOSA Inmaculada
OTIN Rubén
PINEDA Jubert Andrés
PINYOL Nuria
PONS Jordi
RASTELLINI Fernando
ROJEK Jerzy
ROMERO Enrique
ROSSI Riccardo
RUIZ GIRONÉS Eloi
RYZHAKOV Pavel
SALOMÓN Omar
SERVAN Borja
VARGAS Pablo
ZÁRATE Francisco

RTD STAFF

ARASA Jordi
AULEDA Meritxell
AVILA Matias
BELLES Xavier
BEZOS Victor
BORDONE Maurizio
CAMPÀ Francesc
CANDELA Lucía
CARBAJOSA Jesus
CARBONELL Jordi
CARLES Albert
CARRASCO Javier
CASALINUOVO Josefa
CASTAÑO Victor
CASTELLS Aleix
CELADA Ulric
CELIGUETA Miguel Angel
CERVELLÓ Josep
CID Alexis
CIPRIANO Javier
CIPRIANO Jordi
CRIOLLO Rotman Alejandro
COLL Abel
COMA Marti
CORTÉS Fernando
DAVILA Mariolly
DAVIS Meredith France
DE POUPLANA Ignasi
DEU Amadeu
DI FONZO Mario
DIEGO Javier
ESCOLANO Enrique
FABREGAS Gerad
FERNÁNDEZ Luis Jorge
FERRIZ Alberto
FREIXAS Genís
FRUITOS Oscar
GÁLLIGO Juan José
GÁRATE Francisco Javier
GARCÍA Daniel
GARCÍA Mª José
GENS Nuria
GONZÁLEZ Laura
GONZÁLEZ Nubia
GONZÁLEZ Ricardo Adrián
HOSPITAL Raúl
IRAZÁBAL Joaquín
JEREZ Francesc
JIMENEZ Jordi
KAMRAN Kazem
KOUHI Mohammad
KUHNT Andreas
LATORRE J. Salvador
LLACAY Bárbara
LÓPEZ Mª del Pilar
MATÓ Susana
MELENDO Adrià
MENCHERO Oscar
MIRÓ Jaume
MONROS Anna
MONTOYA Jessica
MOR Gerard Jordi
MORATA Miquel
MUÑOZ Christian
NAVARRO Naeria
OLIVARES Gonzalo
OTERO Fermín Enrique
OÑATE José Luis
ORTEGA Enrique
PASENAU Miguel
PEFFER Gilbert
PÉREZ José
PÉREZ Jorge Suit
PÉREZ Daniel
PINTO Andrés E.
PRATS Mònica
PRIEGUE Angel
QUERO Alfredo
RAMÓN Anna
RENDA Fabio
ROCA Javier
RODRIGUEZ Juan Manuel
ROIG Carlos A.
ROSTOVANYI Maria
RUIZ Daniel Felipe
SALAZAR Fernando
SALICHS Sergi
SAN MAURO Javier
SANTASUSANA Miquel
SAU Núria
SERRET Jordi
SCAMUZZI Marco
SOUDAH Eduardo
TARRAGÓ Daniel
TENA Alberto
TOPRAK Erdem
TORRES Ester
TOUS Javier
TRUCO Jordi
UBACH Pere Andreu
VALERO Sergio
VILANOVA Ramon
VILLARRAGA Claudia Juliana
ZAMBRANO Gustavo Eduardo
ZAVALA María Dolores
ZINGGERLING Claudio

PHD STUDENTS

ABADIAS David
ARRUFAT Ferran
BARBOZA Ramón
BECKER Pablo Agustín
BENEDETTI Lorenzo
CABEZA Yoar
CAFIERO Mailhin E.
CAICEDO Manuel Alejandro
COLOMES Josep Oriol
COMELLAS Ester
COTELA Jordi
CRIOLLO Alejandro
DE SIMONE Silvia
DIALAMISHABANKAREH Narges
ESPINOZA Hector Gabriel
FERRÉ Guillem
FERRER Alex
FRANCI Alessandro
GARCIA Maria Del Mar
GAVIDIA Giovana Elizabeth
GÓMEZ Rodrigo Andrés
GRAN Meritxell
HIERRO Alba
JARAUTA Alexandre
LONDOÑO Juan Pablo
MANGADO Nerea
MARULANDA Mabel Cristina
MAS Ricard
NUÑEZ Francisco
PLANAS Ramón
ROJAS Jose Luis
SAMAT Sergio
SCHEIBER Laura
SERRANO Alejandro
SOLER Joaquim
VALHONDO Cristina

General services area

CIMNE's administration staff has specialized to cope with the increasing needs of CIMNE in a wide range of areas.

The following persons form CIMNE's administration team:

GENERAL SERVICES MANAGER

FONT Anna

ADMINISTRATION AND FINANCES

LINARES Mª Carmen
CATALAN Valentín
DE LA ROSA Francisco José
BERNAL Thaydy L.
LUQUE Cristina

PROJECT MANAGEMENT

PÉREZ Sandra
DU PENHOAT Maëlle
CASANOVA Roger
CUADRAT Daniel
HERRERO Elena
MARTÍN Elena
SORIANO Cecilia

CONGRESSES AND WORKSHOPS

FORACE Cristina
ARANDA Laia
BAZZANELLA Alessio
POTOKAR Iztok
SILHANKOVA Marcela

DIRECTOR SECRETARY

ALBERICH Mercè

SECRETARIAT AT CASTELLDEFELS

GARCIA Núria

PUBLICATIONS

SAMPER Mª Jesús
STILMANN Adriana
LÓPEZ Sonia
ESCLUSA Clara

CIMNE CLASSROOMS

GARCÍA-SICILIA Francisca
MORA Javier
SAGRISTÀ Sònia

SYSTEMS

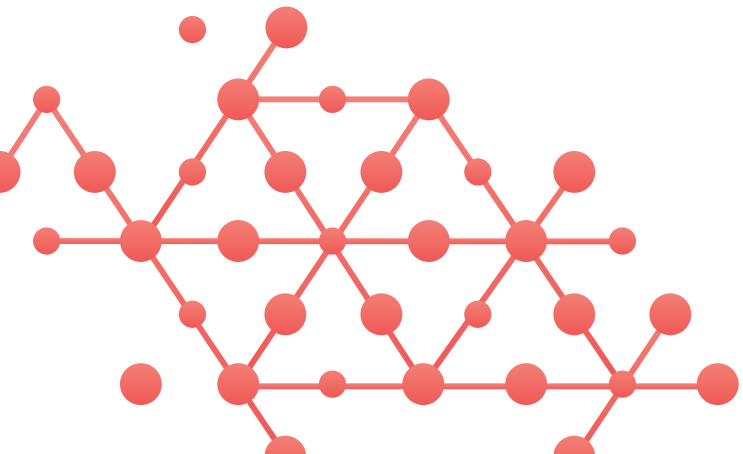
ALONSO Miguel
BURGOS Alberto
GARCÍA Daniel
LOZANO Joaquim
MOLL Felip

MASTER COURSE

ZIELONKA Lelia
OLEA Marga

PERSONNEL

LINARES Merce
LATORRE Irene



Visiting scientists

CIMNE promotes the visits of professors and scientists from around the world working on research and educational projects.

LIST OF VISITING SCIENTISTS IN THE YEAR 2012:

Carlos Máximo Aire
Universidad Nacional Autónoma de México, MÉXICO

Tomasz Bednarek
Kazimirierz Wielki University, POLAND

Facundo Bellomo
Universidad de Salta, ARGENTINA

Antonio Eduardo Bezerra
Universidade Federal do Ceará, BRASIL

Manfred Bischoff
Universität Stuttgart, GERMANY

Salvador Botello
Centro de Investigación en Matemáticas, MEXICO

Miguel Cerrolaza
Universidad Central de Venezuela, VENEZUELA

Adam Dlugosz
Silesian University of Technology, POLAND

Carlos A. Felippa
University of Colorado at Boulder, USA

Mimi Gao
National University of Singapore, SINGAPORE

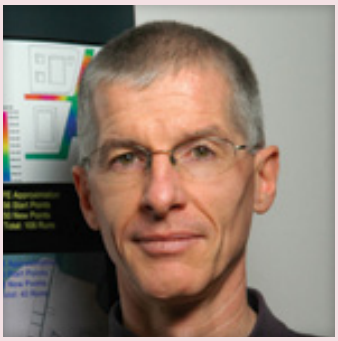
Michael Ghosn
University of New York, USA

Felix Christian Guimaraes Santos
Universidad Federal de Pernambuco, BRASIL

Sergio Idelsohn
Universidad Nacional del Litoral, ARGENTINA

Waclawa Kus
Silesian University of Technology, POLAND

Prof. Carlos A. Felippa



Prof. Rainald Löhner

Prof. Miguel Cerrolaza


España
Washington DC
Cuba
México
Venezuela
El Salvador
Colombia
Brasil
Perú
Argentina
Santa Fe
Chile
Pekin
Singapore

WHERE WE ARE

Branches in Spain

Background and location

The International Center for Numerical Methods in Engineering (CIMNE) was created in 1987 under the auspices of UNESCO by the Generalitat de Catalunya (the autonomous government of Catalonia). CIMNE has its own juridical status as a consortium between the Generalitat de Catalunya and the Universitat Politècnica de Catalunya.

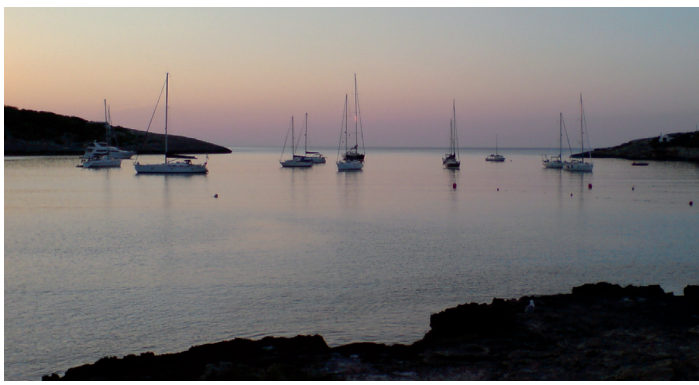
The central offices of CIMNE cover an area of 800m^2 in one of the buildings of the North Campus of the Technical University of Catalonia (UPC) in the heart of the Escola Tècnica Superior d'Enginyers de Camins, Canals i Ports (School of Civil Engineering).

CIMNE also has offices in Terrassa, Madrid, Castelldefels, Ibiza, Washington, Beijing (China), Santa Fe, Singapore and space for RTD and training activities in the 28 CIMNE Classrooms distributed around the world.

CIMNE has a branch in the following Spanish cities:

BARCELONA — *Picture: Port of Barcelona*

MADRID — *Picture: Gardens of El Escorial, Madrid*



IBIZA — *Picture: Creek in Ibiza*

CIMNE - BARCELONA

International Center for Numerical Methods in Engineering
The main branch of CIMNE is in Barcelona, it was created in 1987. CIMNE - BARCELONA covers an area of 800m^2 in the North Campus of the UPC.

Edifici C-1, Campus Nord UPC - Gran Capità, s/n
08034 Barcelona, Espanya
Tel. 34 - 93 205 70 16 - Fax 34 - 93 401 65 17
cimne@cimne.upc.edu - www.cimne.com

View of CIMNE - Barcelona building

Main entrance of CIMNE - Barcelona

Reception

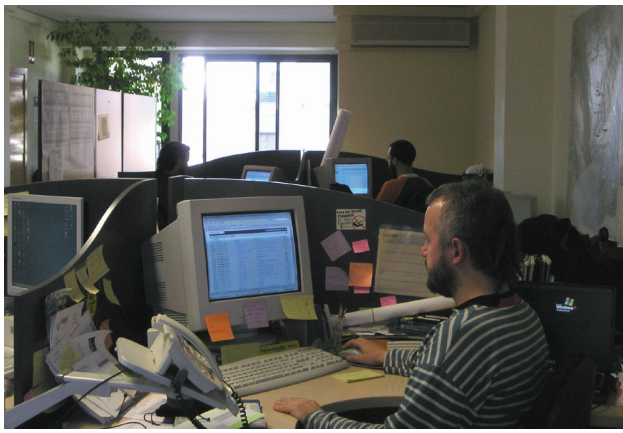
CIMNE - TERRASSA

CIMNE - TERRASSA was created in 2001. CIMNE - TERRASSA covers an area of 150m^2 and houses the department of Building Energy and Environment (BeeGroup).

Dr. Ullés, 2, 3 - 08224 Terrassa, España
Tel. 34 - 93 789 91 69
Fax. 34 - 93 788 31 10

Building housing Bee-Group in Terrassa

Working area



Working area

CIMNE - MADRID

On May 2008 CIMNE inaugurated a new office in Madrid situated in the center of the city. It has 150m^2.

CIMNE - MADRID
Paseo General Martínez Campos nº41
28010 Madrid, España
Tel. 34 - 91 319 13 59

Building

Working area

Reception - Entrance hall

CIMNE - IBIZA

In 2009 CIMNE inaugurated the CIMNE - IBIZA branch. It has 80m^2 and is located in city of Ibiza.

Bisbe Azara, nº4 3º-2ª
07800 Eivissa
Tel. 34 - 971 93 11 94

CIMNE - IBIZA Main entrance

Working area

Ibiza beaches

CIMNE - CASTELLDEFELS

CIMNE-CASTELLDEFELS was inaugurated on October 15th 2008. The facilities are located in the Campus of the UPC in Castelldefels. CIMNE premises represent some 1500m^2 in a new building constructed in collaboration with the UPC.

Campus del Baix Llobregat
Edifici C3, despatx 303, 3ºpl.
Esteve Terradas n. 5 - 08860 Castelldefels, Barcelona
Tel. 34 - 93 413 41 86

Classroom

Meeting room

Lounge

Main entrance of CIMNE Castelldefels

International Branches

During the last years CIMNE has expanded its presence in different geographical areas in the world. The objective is to participate in international RTD projects in cooperation with research centers, universities and companies of different countries.

In the following lines we briefly present the recent experiences in the establishment of CIMNE in Latin America, USA, Singapore and China.

Washington, USA

China

Santa Fe, Argentina

Singapore

CIMNE in Latin America

The presence of CIMNE in Latin America was initially implemented via the CIMNE Classroom Network. This network has 20 Classrooms in different Latin American countries (Argentina (5), Mexico (3), Brasil (2), Colombia (2), Cuba (1), Chile (1), El Salvador (1), Guatemala (1), Perú (1) and Venezuela (3)).

The formal establishment of CIMNE in Latin America was achieved by the creation of a Foundation to foster the activity of CIMNE in that region. The new CIMNE-Latin American Foundation (FCL) is located in the city of Santa Fe (Argentina), the place where the first CIMNE Classroom in the Latin American region was created in cooperation with the National University of Litoral. The activity of CIMNE in the region is coordinated by Mr. Piazzese; Civil Engineer and CIMNE researcher from January 2002 to March 2007.

We list below the main projects carried out by FLC in the period 2010-2012:

RTD PROJECTS

SADMA - Desarrollo de un sistema de apoyo a la decisión para monitorización y gestión sostenible de edificios históricos del patrimonio cultural usando nuevas tecnologías. Agencia Española de Cooperación Int. para el Desarrollo.
01/01/2011 - 31/12/2011

VIS - Estudios de vulnerabilidad por inundaciones en la región hidrográfica Mandinga-Comapala (El Salvador). Agencia Española de Cooperación Int. para el Desarrollo.
01/01/2011 - 31/12/2011

Humedal Cerrón Grande - Monitorización de Variables Físico-Químicas en Humedales RAMSAR de El Salvador. Proyecto financiado por la Universidad Centroamericana "José Simeón Cañas" (UCA).
01/01/2013 – 31/12/2013

EGO - Evaluación de Gasoductos y Oleoductos (Perú)
Convocatoria de presentación: Categoría 2, Proyectos de investigación y desarrollo tecnológico (I+D) 2011, Pontificia Universidad Católica del Perú (PUCP).
01/01/2012 – 28/02/2013

Arenales - Creación de un modelo hidráulico para el estudio de inundaciones del Río Arenales en un área urbana de la ciudad de Salta, Argentina.
01/08/2012 – 31/03/2013

GISG - Desarrollo de una metodología para la Gestión de la Integridad de Sistemas de Gasoductos (Perú)
Convocatoria de presentación: Categoría 2, Proyectos de investigación y desarrollo tecnológico (I+D) 2012, Pontificia Universidad Católica del Perú (PUCP).
01/02/2013 – 31/01/2014

FCL meeting room


Javier Piazzese Director of FCL

CIMNE in the US

CIMNE has developed a number of RTD projects funded by several US organizations such as the Interamerican Development Bank (BID), the World Bank and the Office for Naval Research, among others.

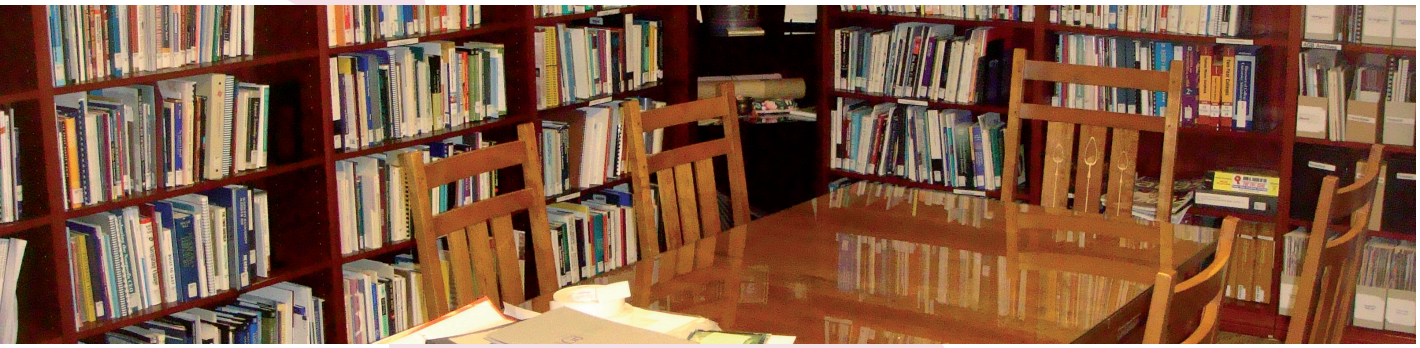
In 2010 CIMNE created a non-profit corporation named CIMNE-USA with the aim of fostering the scientific and technological activities of CIMNE in that country. The new organization is located in the city of Washington DC and is jointly directed by Mrs. Francisca García-Sicilia and Dr. Dave Cranmer. Mrs. García-Sicilia has been a director of international liaison activities in CIMNE for the last five years. Dr. Cranmer is a senior scientist of the National Institute of Standards and Technology (NIST) in the US and advisor of many companies.

In the period 2009-2012 CIMNE-USA has taken part in different RTD projects in the US in cooperation with universities, research centers and enterprises.

RTD PROJECTS

Study of the Drillbit Dynamics and the Dynamics of cuttings transport
Funded by Weatherford
23/11/2011 - 23/11/2012

WAM-V: ADVANCED NUMERICAL SIMULATION AND PERFORMANCE EVALUATION OF WAVE ADAPTIVE MODULAR VESSELS (WAM-V®) IN SPRAY GENERATING CONDITIONS
Funded by Office of Naval Research (ONR)
01/07/2012 - 01/07/2012



Meeting-room in CIMNE-USA

Dave Cranmer, Director of CIMNE-US

CIMNE in Singapore

CIMNE has developed a close relationship with several RTD organizations in Singapore such as the Institute of High Performance Computing (IHPC). Belonging to the A*Start National Agency of the Singapore Government. This relationship has lead to the signing of a cooperation agreement between CIMNE and IHPC aiming to the development of joint RTD projects.

Several visits and interchange have taken place from 2009 between scientists from CIMNE and IHPC. The visits have served for defining a number of RTD projects of interest to both organizations. We note the course on the use of the CIMNE codes GiD and Kratos taught at the IHPC premises on October 2009 by CIMNE scientists Abel Coll, Enrique Escolano and Pooyan Dadvand.

The increasing cooperation between CIMNE and IHPC has motivated CIMNE to create a new organization in Singapore, named CIMNE-Singapore, with the objective of fostering RTD activities and projects in the South East Asia region in cooperation with IHPC. The director of CIMNE-Singapore is Mr. Manuel Lopez a Naval Architect with wide experience in international projects.

We list below the main projects carried out by CIMNE in Singapore in the period 2010-2012:

RTD PROJECTS

NITTO - An integrated Software System for Modelling and Simulating Blood Flow in the Cardiovascular System to Determine the Mechanical Properties of the Vessel Walls.
NITTO DENKO
01/12/2010 - 31/08/2011

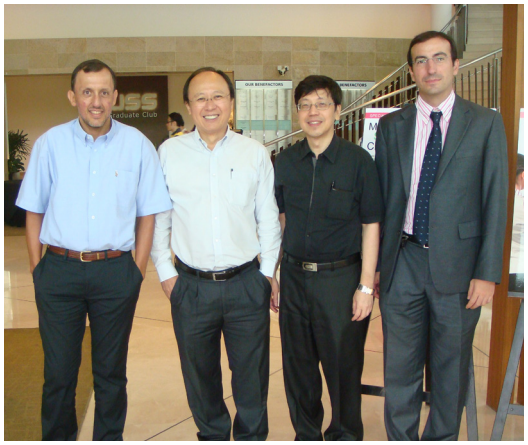
Development of numerical methods for fluid-structure interaction problems CIMNE - IHPC
01/2009-12/2012

ACTIVITIES

Organization of the International Workshop on Advances in Computational Methods for Fluid-Structure interaction
27-29 April 2011, Singapore

Support to the activities of the companies OMNI Ltd and Build Air Asia-Pacific Ltd.

Support to the activities of the company COMPASS Ingeniería y Sistemas SA and Build Air Asia-Pacific Ltd.



Mr. Manuel López (Director of CIMNE-Singapore), Prof. Choo Yoo Sang and Wang Chien Ming, Mr. Pere-Andreu Ubach

Constitution of CIMNE Singapore (May 2010)

CIMNE in China

In 2006 CIMNE started a fruitful cooperation with the People's Republic of China, that has evolved into partnership with some of the most renowned scientific Institutions in China, such as Pekin University, several research centers of the Chinese Academy of Sciences or the Chinese Aeronautics Establishment.

Resulting from these several partnerships, CIMNE has been engaged in number of RTD projects. Supported by the 6th and 7th Frammework Programme of the EU, CIMNE has carried out the coordination on the European side of a series of projects aimed at promoting joint EU-China research on aeronautics. Financed by Chinese organizations, CIMNE has participated in research projects in areas of risk assessment of natural disasters and safety analysis of harbors.

In 2011, CIMNE promoted the creation of the CIMNE Beijing office in cooperation with Professor Mingwu Yuan, of Peking University and President of the International Chinese Association for Computing Mechanics. CIMNE Beijing is directed by Ms Sònia Sagristà.

RTD PROJECTS

GRAIN: GReener Aeronautics International Networking
October 2010 - December 2010

Manipulation of Reynolds Stress for Separation Control and Drag Reduction (MARS)
October 2010 - September 2013

Casting of Large Titanium Structures (COLTS)
October 2010 - September 2013

Research of Prediction Theory and Numerical Analysis Methods for Severe Engineering Geological Disaster
January 2010 - December 2015

On the Development and Applications of Numerical Simulation Software for Ananlyzing Stability of Breakwaters and wave Loading
May 2009 - May 2012

ACTIVITIES:

International Transfer Network Congress 2012
March, 26-27th, 2012

China Access4EU Workshop: "CIMNE: Experiences in Cooperating with China"
June, 28th, 2012

Workshop at the Institute of Mathematics and Systems Science of the Chinese Academy of Science on "Open-Source and modularity in numerical methods: Kratos and GiD, user-friendly tools developed by CIMNE"
November, 22nd, 2012

Workshop on Meshing and Visualization in Scientific Computing: "Kratos Multi-Phusics Framework for Large Unstructurad Mesh Simulation in GiD Pre- and Post-Processor"
December, 27-28th, 2012

Profs. Eugenio Oñate and Ming Wu Yuan

Sònia Sagristà, Director of CIMNE-Beijing

CIMNE Classrooms and Joint Labs

CIMNE Classrooms are physical spaces for cooperation in education, research and technological development (RTD) activities created jointly by CIMNE and one or several universities. CIMNE Classrooms promote educational and training activities for graduate and postgraduate levels and the development of RTD projects in cooperation with companies.

The next page lists the CIMNE Classrooms created since 2000:

Circles denote the countries where CIMNE-Classrooms have been created.

In Spain

FERROL CLASSROOM – CIMNE (SPAIN)

Universidade da Coruña
Directors: Pablo Fariñas y Alfonso García
Created on: 29/January/2001
Activity: Application of numerical methods to problems related to marine engineering.

EUETIB CLASSROOM – CIMNE (SPAIN)

Escuela Técnica de Ingeniería Industrial
Directors: Gabriel Bugeda y Daniel Di Capua
Created on: 18/July/2001
Activity: Simulation of sheet metal stampings, mold filling and structural calculations.

UVA CLASSROOM – CIMNE (SPAIN)

Universidad de Valladolid
Director: Antonio Foces
Created on: 18/April/2002
Activity: Civil engineering projects, ports, marine, industrial, aerospace and architecture.

FNB CLASSROOM – CIMNE (SPAIN)

Facultad de Náutica de Barcelona
Director: Julio García
Created on: 1/March/2002
Activity: Applications of numerical methods to problems related to marine engineering.

UL CLASSROOM – CIMNE (SPAIN)

Universidad de Lleida
Directors: Manuel Ibáñez y Jordi Cipriano
Created on: 24/July/2004
Activity: Numerical methods applied to physics teaching buildings and renewable energy online.

ETSEIAT CLASSROOM – CIMNE (SPAIN)

UPC deTerrassa
Director: Roberto Flores
Created on: 20/April/2007
Activity: Industrial and aeronautical engineering.

CEAV CLASSROOM – CIMNE (SPAIN)

Centro de Estudios Avanzados
Director: Gabriel Molina
Created on: 16/October/2010
Activity: Environment, information and communication technology and tourism.

UPM CLASSROOM - CIMNE (SPAIN)

Universidad Politécnica de Madrid
Director: Rafael Morán
Created on: 25/May/2010
Activity: Applications of numerical methods in civil engineering.

In Latinamerica

INA CLASSROOM – CIMNE (ARGENTINA)

Instituto Aeronáutico Universitario
Director: Carlos Sacco
Created on: 5/September/2002
Activity: Applications of numerical methods to problems related to fluid mechanics, structures, heat transfer, etc.

FICH CLASSROOM – CIMNE (ARGENTINA)

Universidad Nacional del Litoral
Director: Sergio Idelsohn
Created on: 28/October/2002
Activity: Applications of numerical methods to problems related to water resources, mechanical engineering and computer engineering.

UNT CLASSROOM – CIMNE (ARGENTINA)

Universidad Nacional de Tucumán
Director: Guillermo Etse
Created on: 01/November/2002
Activity: Development of computational models of bridges (degradation and repair mechanisms).

UNSA CLASSROOM – CIMNE (ARGENTINA)

Universidad Nacional de Salta
Director: Dr. Liz Nallim
Created on: 10/April/2008
Activity: Development of computer models for application in civil engineering.

UNER CLASSROOM – CIMNE (ARGENTINA)

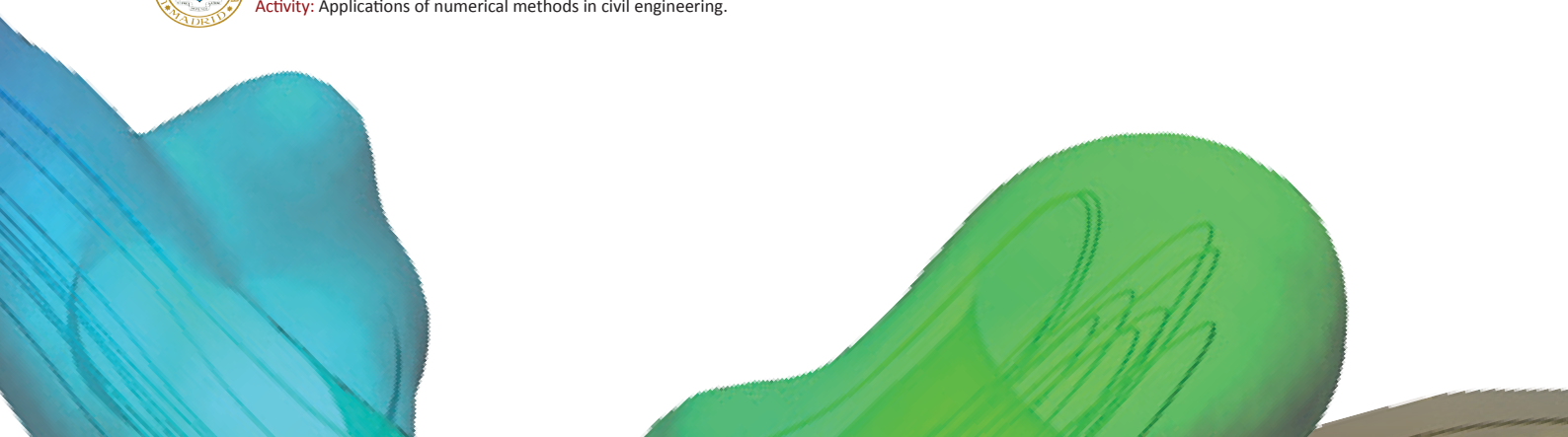
Universidad Nacional de Entre Ríos
Director: José Di Paolo
Created on: 14/March/2013
Activity: Applications of numerical methods to problems related to Bioengineering.

FEMEC CLASSROOM – CIMNE (BRASIL)

Universidad Federal de Uberlândia
Director: Sonia Goulart
Created on: 25/April/2004
Activity: Applications related to the metal stamping process and mold design.

IFSP CLASSROOM – CIMNE (BRASIL)

Instituto Federal de Educaçao, Ciéncia e Tecologia de Sao Paulo
Director: Écio Naves
Created on: 1/July/2009
Activity: Applications of numerical methods for solving engineering problems.



UTFSM CLASSROOM – CIMNE (CHILE)

Universidad Técnica Federico Santa María
Director: Franco Perazzo
Created on: 05/March/2004
Activity: Numerical methods in mechanical engineering. Development of numerical methods.

UNIANDES CLASSROOM – CIMNE (COLOMBIA)

Universidad de los Andes
Director: René Meziat
Created on: 24/January/2003
Activity: Teaching and research in numerical methods, optimization, variational principles and computational mechanics.

UNC CLASSROOM – CIMNE (COLOMBIA)

Universidad Nacional de Colombia
Director: Jorge Hurtado
Created on: June/2005
Activity: Numerical methods applied to civil engineering.

UCLV CLASSROOM – CIMNE (CUBA)

Centro de Investigación de métodos computacionales y numéricos en la ingeniería
Universidad Central de las Villas
Director: Carlos Recarey
Created on: 16/July/2003
Activity: Modeling and analysis of structures and grounds to the application of numerical methods.

UCA CLASSROOM – CIMNE (EL SALVADOR)

Universidad Centroamericana "José Simeón Cañas" UCA
Director: Mauricio Pohl
Created on: 12/February/2010
Activity: Civil engineering applications and multi objective optimization and applications.

UMG CLASSROOM – CIMNE (GUATEMALA)

Universidad Mariano Gálvez
Director: Rolando Torres Salazar
Created on: 01/February/2011
Activity: Development of computer models for application in civil engineering.

UGTO CLASSROOM – CIMNE (MEXICO)

Universidad de Guanajuato
Director: Jesus Gerardo Valdes
Created on: 16/January/2002
Activity: Civil engineering applications and multi objective optimization and applications.

ITESM CLASSROOM – CIMNE (MEXICO)

Instituto Tecnológico de Estudios Superiores de Monterrey
Director: Sergio Gallegos
Created on: 18/May/2009
Activity: Applications of numerical methods in civil engineering.

CIMAT CLASSROOM – CIMNE (MEXICO)

Centro de Investigaciones en Matematicas
Director: Miguel Angel Moreles
Created on: 26/June/2006
Activity: Applied mathematics, numerical methods, engineering and statistical analysis.

PUCP CLASSROOM – CIMNE (PERU)

Universidad Católica de Perú
Directors: Quino Valverde y Salvador Botello
Created on: 16/April/2009
Activity: Modeling and analysis of structures and grounds to the application of numerical methods.

INABIOX CLASSROOM – CIMNE (VENEZUELA)

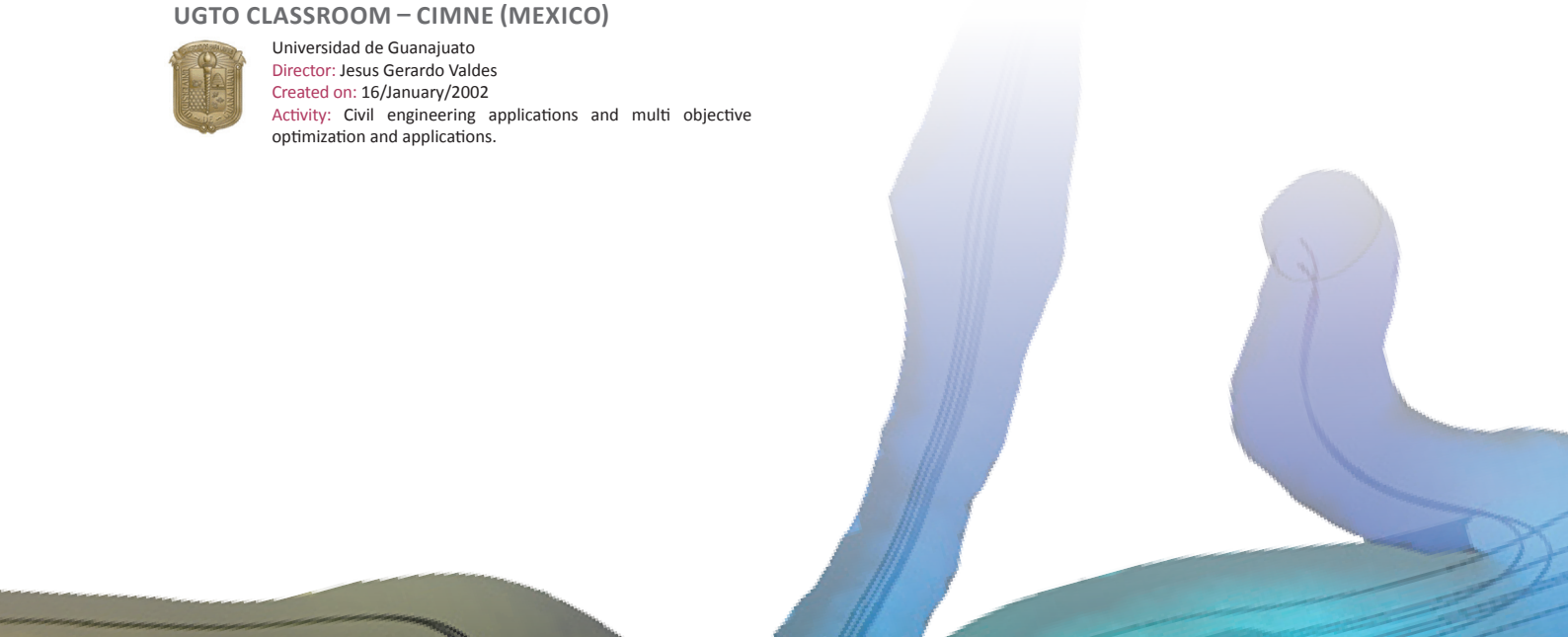
Universidad Central de Venezuela
Director: Miguel Cerrolaza
Created on: 15/February/2004
Activity: Applications of numerical methods to problems related to Bioengineering.

UCLA CLASSROOM – CIMNE (VENEZUELA)

Universidad Centrooccidental "Lisandro Alvaro" (UCLA)
Director: Juan Carlos Vielma Pérez
Created on: 20/October/2008
Activity: Applications of numerical methods to civil engineering problems.

UC CLASSROOM – CIMNE (VENEZUELA)

Universidad de Carabobo
Director: David Ojeda
Created on: 29/April/2009
Activity: Applications of numerical methods in optimization and inverse problems in engineering failure analysis.



CIMNE Classrooms Meetings

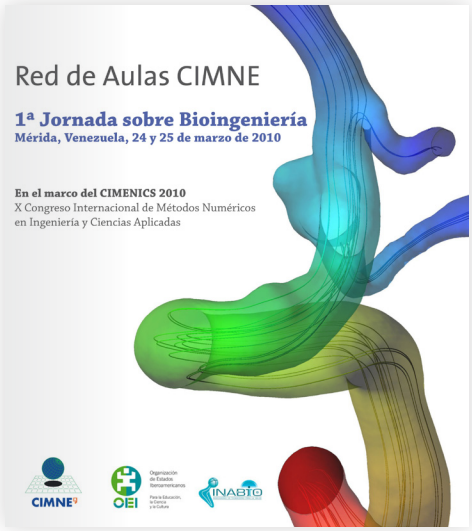
THE IVTH GENERAL MEETING OF THE CIMNE CLASSROOM NETWORK, UPC

Barcelona, July 1st, 2009

Thematic conferences

1ST SEMINAR ON BIOENGINEERING OF THE CIMNE CLASSROOMS

Mérida, Venezuela, March 2010



2ND SEMINAR OF THE CIMNE CLASSROOMS

Salta, Argentina, November 2012

FLUMEN Institute

flumen
Dinàmica fluvial i enginyeria hidrològica

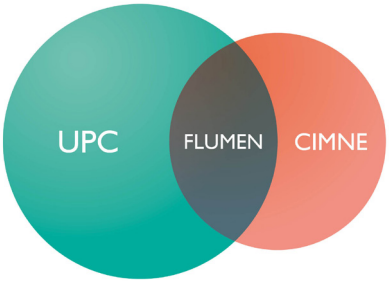
In 2011, CIMNE in participation with UPC created the new FLUMEN Institute for River Dynamics and Hydrologic Engineering.

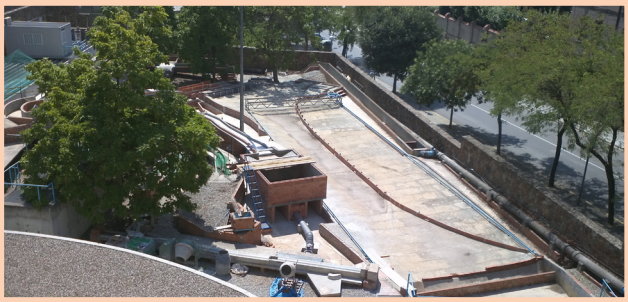
FLUMEN Institute is the outcome of the merging of the prestigious Flumen RTD group existing since 2005 at the School of Civil Engineering of UPC and CIMNE. This partnership brings together the numerical and experimental expertise of the Flumen RTD group in hydraulics with the broad experience of CIMNE in numerical methods, computer simulation and integration of decision-support systems.

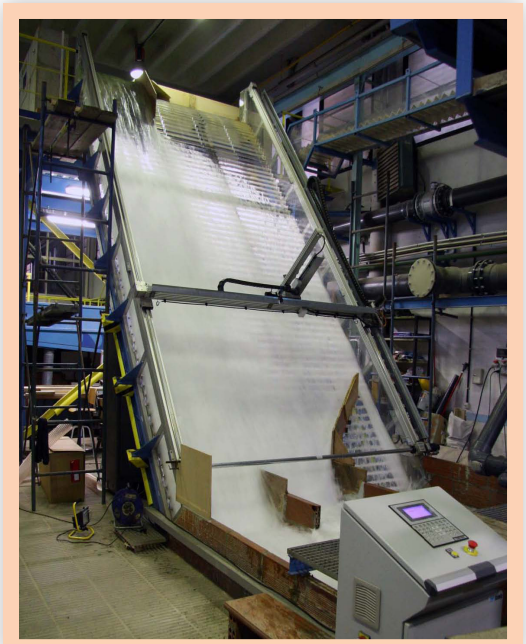
The FLUMEN Institute is located at the Campus North of UPC. Its objectives are the promotion of RTD and technology transfer activities in the field of river dynamic and hydrologic engineering.

The FLUMEN Institute will be equipped with modern experimental facilities for model scale testing of river dynamic and hydraulic problems, as well as with advanced computer simulation codes.

The Flumen Institute is directed by Prof. Josep Dolz from UPC.



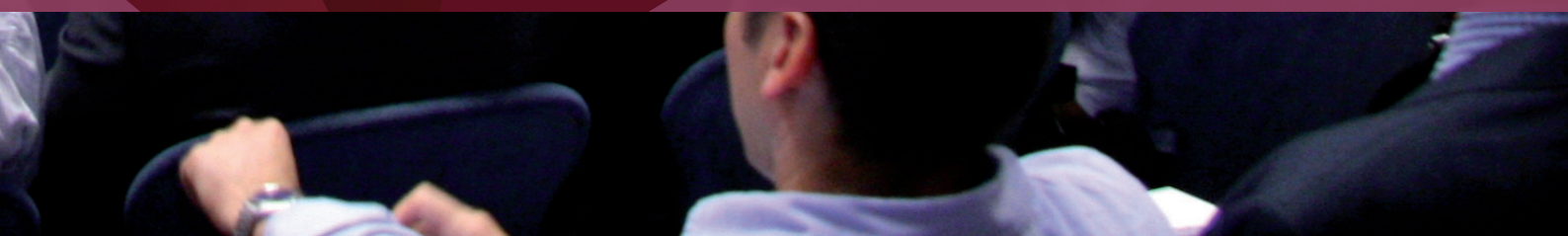




Experimental facilities of FLUMEN Institute

http://www.flumen.upc.edu/

TRAINING AND DISSEMINATION



Courses and Seminars

Courses

CIMNE regularly organises courses and seminars related to the theory and application of numerical methods in engineering. The courses are addressed to recent university graduates and professionals from schools of engineering and applied sciences universities.

In 2012 CIMNE has organised the following courses and seminars:

Master of Science in Computational Mechanics
October 2012

Cálculo de Estructuras por el Método de Elementos Finitos
March 2012

Curso de Máster en Métodos Numéricos Para Cálculo y Diseño en Ingeniería
July 2012

Máster Universitario en Metodos Numéricos en Ingeniería
September 2012

Simulation in Engineering and Entreprenership Doctorate - SEED
October 2012

VIRTUAL LEARNING CENTRE

CIMNE has developed a web environment for distance learning education via Internet. The Virtual Center for continuous Education of CIMNE allows the interaction between students and educators in courses via Internet.

The Virtual Center of CIMNE is useful in gathering information early on in a course to facilitate the registration process. Teachers can also follow the student progress and carry out the different tutorials and exercises.

The Virtual Center operates 24 hours a day to channel all relationships between students, educators, and administrators involved in the course.

Through the Virtual Center of CIMNE students can access the latest information on the various courses and any other academic or administrative matters related to the course.

The Virtual Center of CIMNE hosts the Master Course in Numerical Methods in Engineering and other postgraduate courses of CIMNE.

Seminars

Multiobjective evolutionary algorithms in optimization of selected coupled problems
Dr. Wacław Kuś and Dr. Adam Długosz
6/11/2012
8/11/2012

The Immersed Structural Potential Method for fluid structure interaction
Prof. Antonio J. Gil
20/9/2012

1st. SPAIN - JAPAN WORKSHOP ON COMPUTATIONAL MECHANICS
17/9/2012

ENERGY DISSIPATION CHARACTERISTICS OF REINFORCED CONCRETE COLUMNS
Prof. Haluk Sucuoğlu
7/9/2012

From Biology to Robotic Insects: Super Maneuverable, Flapping Wing Micro-Air-Vehicles Inspired by Biology
Prof. Sergio Preidikman
18/9/2012

ENERGY DISSIPATION CHARACTERISTICS OF REINFORCED CONCRETE COLUMNS
Prof. Haluk Sucuoğlu
7/9/2012

Preserving physical quantities of interest in finite elements with rational bubbles
Johnny Guzman
20/6/2012

Experimental Study and Modeling of the Viscoplastic Response of Polymers and Polymer Composites
Prof. Evagelia Kontou-Drougka
4/5/2012

Discontinuous Galerkin methods for transonic and supersonic flow
Eva Casoni
20/4/2012

A FFT Preconditioning Technique for the Solution of Incompressible Flow on GPU's
Mario Storti
11/4/2012

CIMNE Coffee Talks

The CIMNE Coffee Talks are seminars of one hour organized by CIMNE researches. Each talk opens with a welcome coffee and ends up with an open discussion on the content of the talk.

12 / 12 / 12
SIGPro: Sistema integral de gestión de Proyectos
Sandra Pérez, Maëlle du Penhoat y Claudio Zinggerling

5 / 12 / 12
Líneas de investigación del proyecto RealTime utilizando métodos de partículas
Alex Jarauta

13 / 11 / 2012
Scalable Domain Decomposition Preconditioners Based on Nonoverlapping Domain Decomposition
Santiago Badia

8 / 11 / 12
Results of Shock Capturing Methods for the Transport Equation in 1D
Alba Hierro

24 / 10 / 12
Simplified Femto-satellite Operations for Disaster Management Missions
Joshua Tristancho

18 / 07 / 12
CIMNE celebrates its 25th anniversary
Prof. Benjamín Suarez

2 / 07 / 12
Scaling the comple simulation pipeline for complex FSI problems
Rainald Löhner

20 / 06 / 12
Computational models and challenges in tokamak fusion reactors
Alfredo Portone de Fusion for Energy

6 / 6 / 12
A finite element dynamical and nonlinear subgrid scale approximation for the low Mach number flow equations
Matias Avila

30 / 05 / 12
Datos composicionales. Procesos composicionales. Modelos de curvas de crecimiento desde la prespectiva composicional
Eusebi Jarauta i Juan José Egozque

23 / 05 / 12
KRATOS Multiphysics v3.0

09 / 05 / 12
Computational modeling in mechanized tunneling - from numerical simulation to computational steering
Janosch Stascheit

12 / 04 / 12
Non-invasive upper airway study using Computational Fluid Dynamics and CT-SCAN to improve the treatment of obstructive sleep APNEA syndrom
Mauricio Bordone y Eduardo Soudah

28 / 03 / 12
Lineas de desarrollo en Computacion Grafica y Numérica, Pladema-Tandil-Argentina
Juan Damato

14 / 03 / 12
Experiencia española en el conocimiento y aplicaciones de los materiales reciclados procedentes de escombros de construcción y demolición. Tendencias punteras a nivel mundial. El caso del Puerto de Barcelona
Ignacio Valero

29 / 02 / 12
Modelización Constitutiva Basada en la Teoría de Mezclas - Aplicación a Edificios de Hormigon Armado y Mampostería
Cuauhtémoc Escudero

22/ 02 /12
Robust Design Optimisation of Advanced Hybrid (Fiber-Metal) Composite Structures
Chris Lee junto y Carlos Morillo

7 / 02 / 12
Programa de Cooperación Interuniversitaria e Investigación Científica PCI – AECID: SADMA y VIS, dos proyectos de referencia
Javier Piazzese

1 / 02 / 12
Nueva infraestructura de cálculo en el Cluster de CIMNE
Felip Moll

18 / 01 / 12
Midiendo el reudimiento estructural en bocetos de puentes
Mariano Vázquez Espi

15 / 01 / 12
Fabricación de piezas de caucho: modelado y simulación utilizando OpenFOAM
Pablo Caron de la Universidad Argentina de la Empresa

Conferences and workshops

Since 1987 CIMNE has organised 122 conferences on different topics of computational numerical methods and applied sciences.

Conferences in 2012:

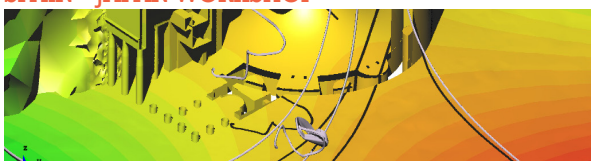
Grain 2012

The GReener Aeronautics International Networking
12-14 November 2012, Barcelona, Spain

Perspectives de futur

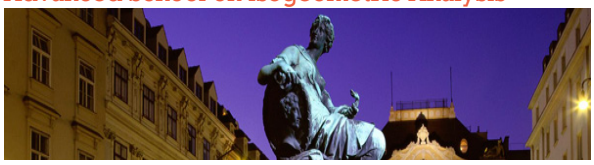
Perspectives de futur i requeriments de la internacionalització territorial de Catalunya
4 October 2012, Barcelona, Spain

SPAIN - JAPAN WORKSHOP



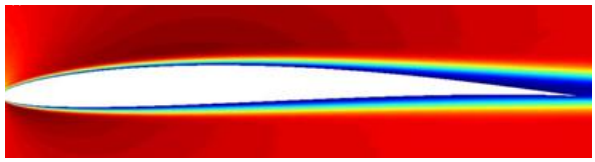
Spain-Japan Workshop on Computational Mechanics
September 17 2012, Barcelona, Spain

Advanced School on Isogeometric Analysis



Advanced School on Isogeometric Analysis: Fundamentals and Applications - IGAschool 2012
7-9 September 2012, Vienna, Austria

DGSchool 2012



Summer School on Discontinuous Galerkin Methods
11-15 June 2012, Barcelona, Spain

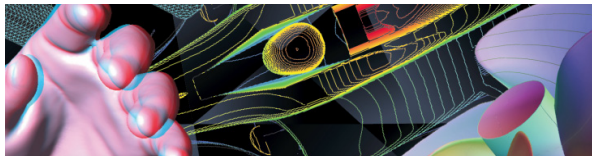
Seminario Leonardo

June 14 2012, Barcelona, Spain

Audio & Music Processing

1st. International Course and Workshop on Audio & Music Processing
6 - 8 June 2012, Ibiza, Spain

6th GiD Convention



6th Convention on Advances and Applications of GiD
10-11 May 2012, Barcelona, Spain

Conferences in 2012

Competitivitat i sostenibilitat territorial

Competitivitat i sostenibilitat territorial. Les infraestructures, el territori i les empreses
10-11 May 2012, Barcelona, Spain

FEM Class of 42 Anniversary

May 8, 2012, Barcelona, Spain

VI Encuentro de Cátedras UNESCO de España

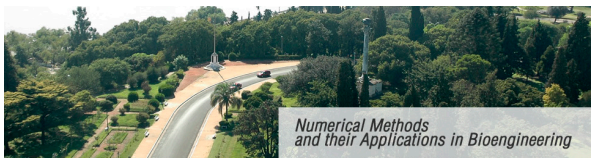
9 - 10 February 2012, Barcelona, Spain

Oportunitat i Reptes Globals de Catalunya

January 26, 2012, Barcelona, Spain

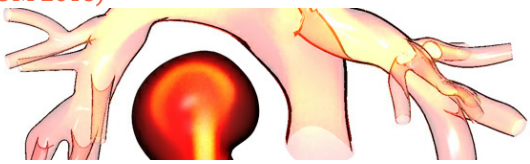
Conferences planned for 2013-2014

PASI 2013



PASI - Numerical Methods and their Applications in Bioengineering
February 18 - March 1, 2013, Paraná, Argentina

Advances in Computational Mechanics (ACM 2013)



A Conference Celebrating the 70th Birthday of Thomas J.R. Hughes
24-27 February, 2013, San Diego, California, USA

FRAMCOS-8

8th. International Conference on Fracture Mechanics of Concrete and Concrete Structures
10 - 14 March, 2013, Toledo, Spain

MARINE 2013

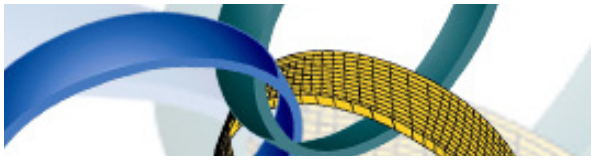
V International Conference on Computational Methods in Marine Engineering
29 - 30 May 2013, Hamburg, Germany

Conferences planned for 2013-2014

ADMOS 2013

International Conference on Adaptive Modeling and Simulation
June 3 - 5, 2013, Lisbon, Portugal

COUPLED PROBLEMS 2013

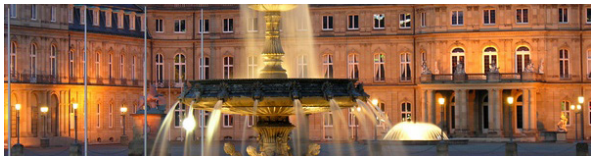


V International Conference on Coupled Problems in Science and Engineering
June 17 - 19, 2013, Ibiza, Spain

COMPLAS XII

XII International Conference on Computational Plasticity
September 3 - 5, 2013, Barcelona, Spain

PARTICLES 2013



III International Conference on Particle-based Methods
18 - 20 September 2013, Stuttgart, Germany

STRUCTURAL MEMBRANES 2013

VI International Conference on Textile Composites and Inflatable Structures
9 - 11 October 2013, Munich, Germany

30 GEF

30 Encuentro del Grupo Español de Fractura
March 13 al 15 2013, Toledo, Spain

T.I.M.E. Conference

T.I.M.E. Conference in “Internet-based tutorials as Complements for Technical Students”
May 30-31, 2013, Barcelona, Spain

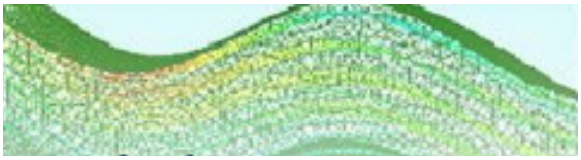
For more information please visit our website:
www.cimne.com

Conferences planned for 2013-2014

TALUDES Y LADERAS INESTABLES

VIII Simposio Nacional sobre Taludes y Laderas Inestables
J11 al 14 de June 2013, Palma de Mallorca, Spain

CMN 2013



Congreso de Métodos Numéricos en Ingeniería
25 - 28 June 2013, Bilbao, España

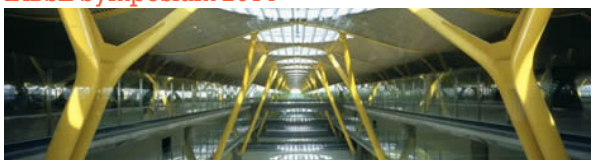
COMPLAS COURSE 2013

COMPLAS Short Course
September 2 - 3, 2013, Barcelona, Spain

EUCASS 2013

5th European Conference for Aerospace Sciences
9 - 11 October 2013, Munich, Germany

IABSE Symposium 2014



International Association for Bridge and Structural Engineering
September 2014, Madrid, Spain

WCCM XI — ECCM V — ECFD VI

Joint Organization of
11th. World Congress on Computational Mechanics
5th. European Conference on Computational Mechanics
6th. European Conference on Computational Fluid Dynamics
20-25 July 2014, Barcelona, Spain

Publications

CIMNE publishes books, journals, monographs, scientific reports and educational software on the theory and applications of numerical methods in engineering.

The publications of CIMNE can be visited and ordered via Internet in www.cimne.com

We list below the publications of CIMNE in 2012:

Books

L131 *G. Zavarise, D. Boso*, Bytes and Science, ISBN: 978-84-940243-2-0, 2012

Journals

Revista internacional de Métodos Numéricos para Cálculo y Diseño en Ingeniería. Editores: E. Oñate y J.C. Heinrich, Vol. 28 nº1, 2, 3, 4, Elsevier, 2012

Archives of Computational Methods in Engineering. Editors: M. Kleiber and E. Onate, Vol. 19 nº1,2,3,4 Springer, 2012

Monographs

M127 *Hernández et al.*, Development of a decisión support system for the design and adjustment of sailboat rigging, 2012

M128 *Pérez et al.*, Evaluación del daño por impacto en laminados de material compuesto mediante la respuesta dinámica, 2012

M129 *Filipich*, Movimiento plano de barras rectas y curvas de sección uniforme no homogénea, 2012

M130 *Nadukandi et al.*, Stabilized finite element methods for convection-diffusion-reaction,Helmholtz and Stokes problems, 2012

M131 *Gavidia et al.*, Clasificadores basados en máquinas de soporte vectorial para el diagnóstico y predicción de la enfermedad del Alzheimer, 2012

M132 *Labra et al.*, Advances in the development of the discrete element method for excavation processes, 2012

M133 *Larese et al.*, A coupled Eulerian-Pfem model for the simulation of overtropping in rockfill dams, 2012

Research reports

PI350, New explicit time integration schemes for the transport equations with increased stability and accuracy, E. Oñate, F. Zárate, S. R. Idelsohn

PI351, Explicit dynamic analysis of thin membranes structures, R. Flores, E. Ortega, E. Oñate

PI352, A stable and accurate finite element formulation for convection-diffusion-absorption problems using finite calculus, E. Oñate, J. M. Canet, P. Nadukandi

PI353, On the use of exponential basis functions in the analysis of shear deformable laminated plates, M. Shahbazi, B. Boroomand, S. Soghrati

PI354, El ciclo de las ideas en la I+D+I, E. Oñate

PI355, Modeling of landslides into reservoir with the particle finite element method, E. Oñate, F. Salazar, R. Morán

PI356, Development of a 6-DoF simulator for analysis and evaluation of autonomous parafoil systems, E. González, C. sacco, E. Ortega, R. Flores

PI357, Possibilities of the particle finite element method for fluid –soil-structure interaction problems, E. Oñate, M. A. Celigueta, S. R. Idelsohn, F. Salazar, B. Suárez

PI358, The cycle of ideas in research, development and technology transfer, E. Oñate

PI359, Reflexiones sobre el tránsito de la idea al producto en el entorno de la Escuela de Caminos de Barcelona, E. Oñate

PI360, Advances on finite element methods and particle-based methods for metal forming processes, E. Oñate

PI361, Simplificación de mallas de triángulos, M. Pasenau, A. Andujar

PI362, Paralelización del código Stampack v7.10, W. Castelló, F. Flores

PI363, Exponential basis functions in solution of incompressible fluid problems with moving free surfaces, S. M. Zandi, B. Boroomand, S. Soghrati

PI364, Analysis of time dependent problems using exponential basis functions, B. Movahedian, B. Boroomand

PI365, Análisis de flujos en lámina libre y su interacción con sólidos y estructuras por el método de partículas y elementos (PFEM), E. Oñate, B. Suárez, F. Salazar, R. Morán, M. Celigueta, S. Latorre

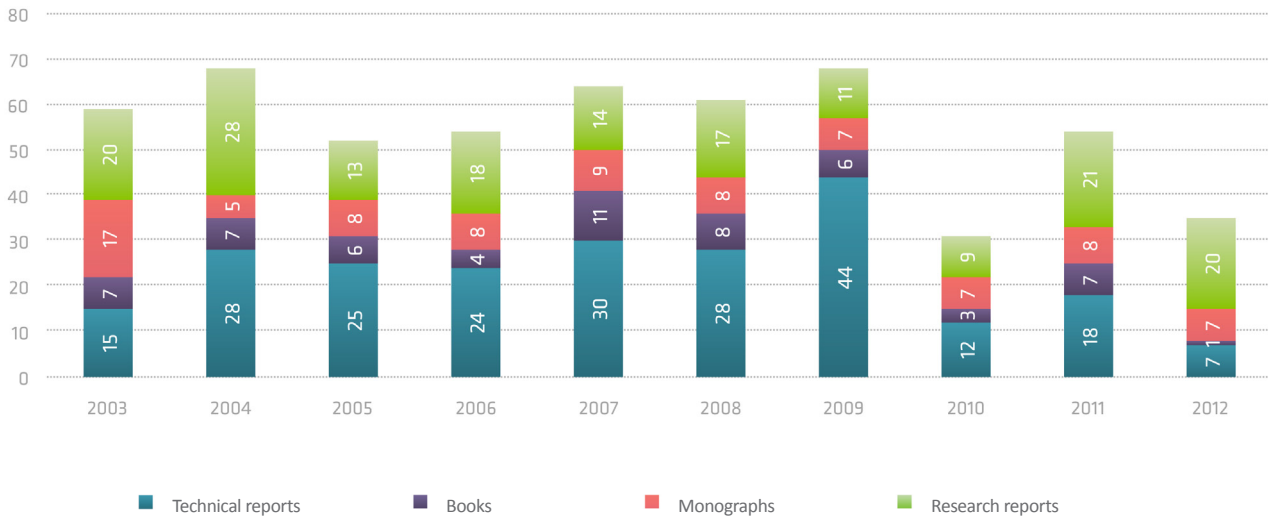
PI366, Modelització del deflectometre d'impacte amb el metode dels elements finits i les partícules, M. Moretó, E. Oñate, J. M. Carbonell

PI367, Modeling of delamination in composite laminated beams using a two-noden beam element based in refined zigzag theory, E. Oñate, A. Eijo, S. Oller

PI368, An adaptive finite point method for aeroelastic analysis, E. Ortega, E. Oñate, S. Idelsohn

PI369, Analysis of the discharge capacity of radial gated spillways using numerical modeling application to Oliana Dam, F. Salazar, R. Morán, R.Rossi, E. Oñate

PI370, Benchmarking on bifurcation and localization in J2 platicity for plane stress and plane strain conditions, M.Cervera, M. Chiumenti, D. Di Capua



Technical reports

IT623 Non-invasive upper airway study using computational fluid dynamics and CT-Scan to improve the treatment of obstructive sleep apnea syndrome, E. Soudah, M. Bordone. J. Irazabal, A. Alvarez, B. Suarez, J. Cobo, F.A. De Carlos

IT624 Simulador de voladura en macizos rocosos. Informe Final

IT625 Interfaces 3DShell y 3DSolid. GiD-Sap 2000, F. Muñoz Salinas, J.M. Meza, F. Peña

IT627 Study of the impact of waves on a breack water with the particle finite element methods, Y. Xhao, M. A. Celigueta, S.Latorre, F. Salazar, E. Oñate

IT628 Project NET-EMC: Numerical simulation, Report (Cimne), X. Roca, M. Coma, R. Otin, J. Mora

IT629 "Evaluating manoeuvering and seakeeping performance of a surface effect ship", E. Oñate

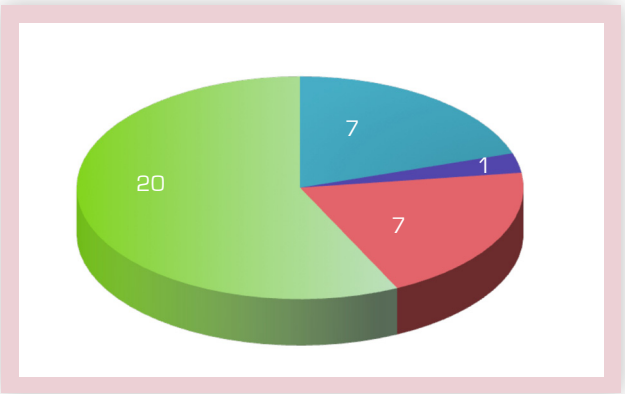
IT630 "Evaluating manoeuvering and seakeeping performance of a surface effect ship", E. Oñate

IT631 Wall shear stress and vorticity estimation using phase-contrast magnetic resonance imaging, J. Pérez, E. Soudah, E. Oñate

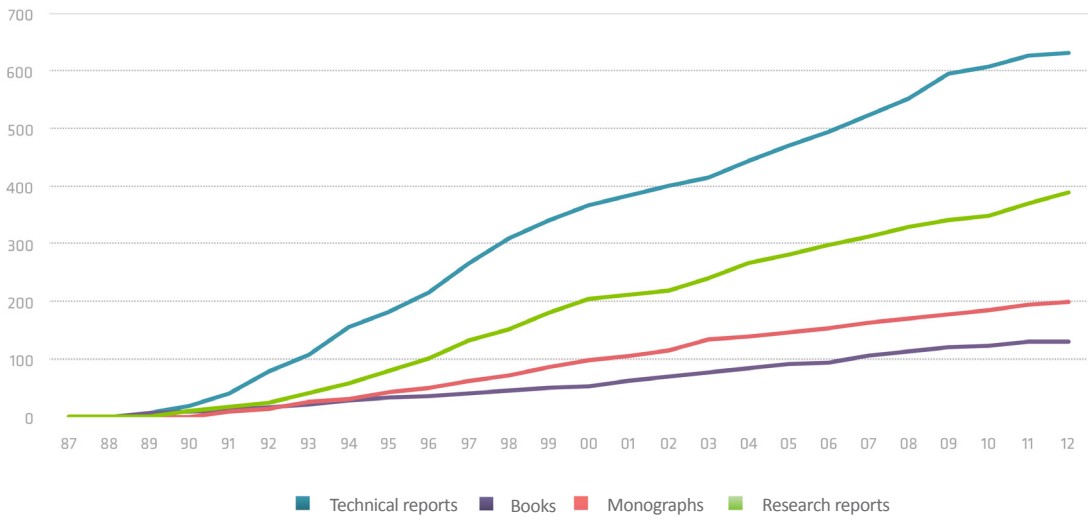
IT632 Desarrollo e integración en Fraktaris de un sistema de gestión de cursos Scorm destinado a la lformación en el mundo marítimo, F. J. Saez Baena

	2012	Total
Books	1	131
Monographs	7	200
Research Reports	7	632
Technical Reports	20	390

Publications. Figures of 2012.

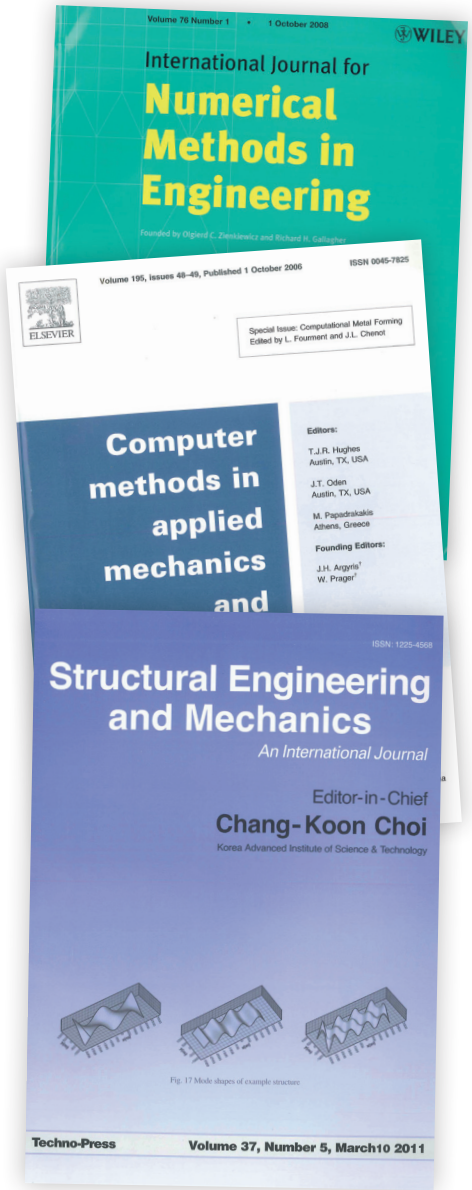


Since 1987 CIMNE has edited 1368 scientific publications.



Publications in scientific journals

This is the list of the 83 papers in scientific journals published by CIMNE researchers in 2012.



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Zhou A.-N., Sheng D., Sloan S.W. and Gens A.,
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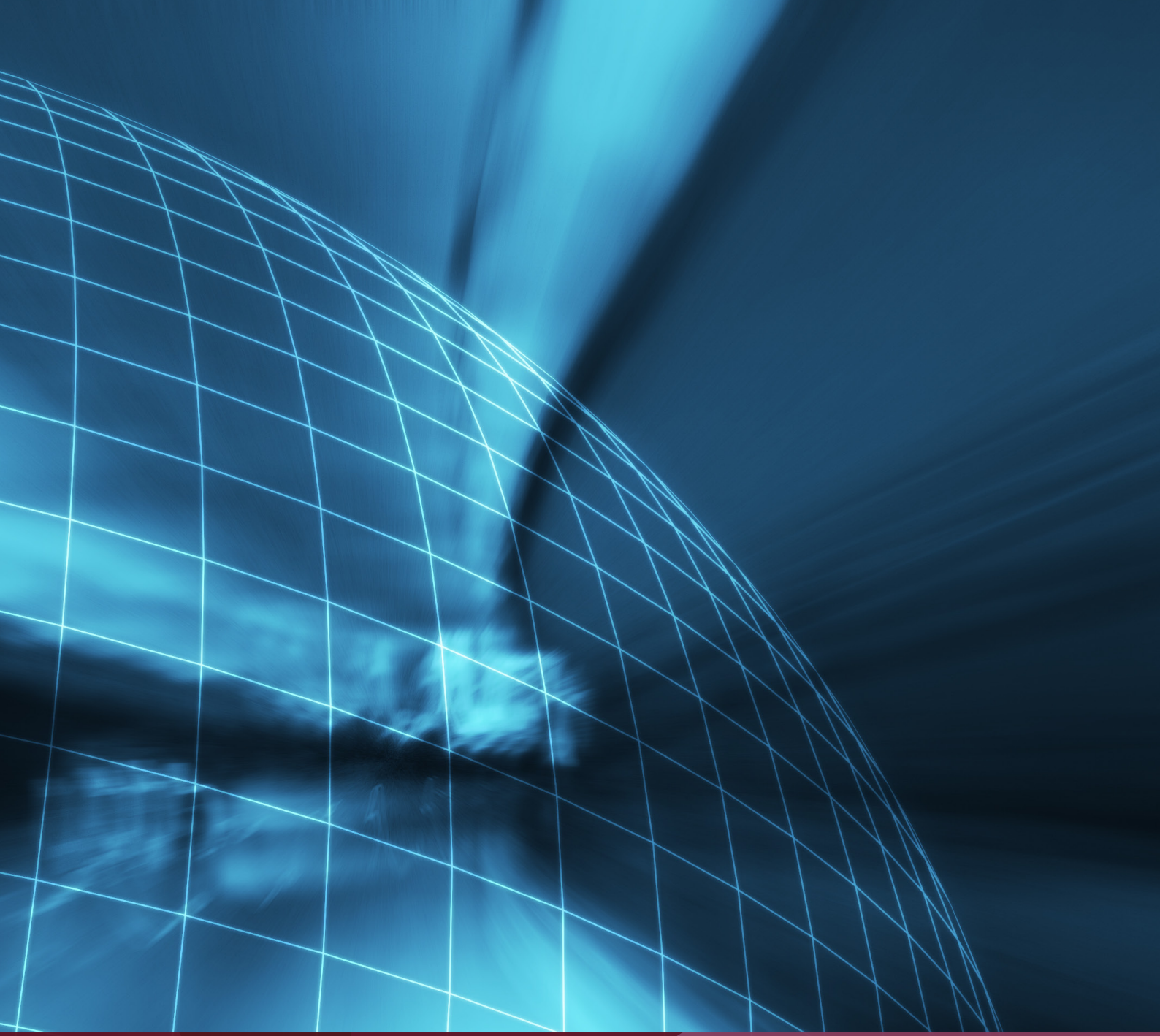

SCIENTIFIC SOCIETIES

SEMNI iacm ECCOMAS ERCOFTAC UNESCO

Sociedad Española de Métodos Numéricos en Ingeniería (SEMNI)

www.semni.org

In 1988, CIMNE contributed to the creation of the Spanish Society for Numerical Methods in Engineering (SEMNI). The basic aims of SEMNI are the organization and coordination of all activities related to numerical methods in engineering in Spain and being the Spanish representative in the International Association for Computational Mechanics (IACM).

SEMNI is linked to similar associations in other countries, for example the European Community on Computational Methods in Applied Sciences (ECCOMAS), the Groupe pour l'Avancement des Méthodes Numériques de l'Ingénieur in France, the United States Association for Computational Mechanics in the United States, and the Asociación Argentina de Mécanica Computacional in Argentina. The headquarters of SEMNI are based in CIMNE.

Currently, SEMNI has over 400 members in Spain and in other countries. Some of the main activities of SEMNI include the organization of technical workshops and the Spanish Conference on Numerical Methods in Engineering.

SEMNI congresses take place in several cities; the first one was in the Canary Islands (1990), the second in La Coruña (1993), the third in Zaragoza (1996), the fourth in Sevilla (1999), the fifth in Madrid (2002), the sixth in Lisbon (2004), the seventh in Granada (2005), the eighth in Porto (2007), the ninth in Barcelona (2009) and the tenth in Coimbra (2011). The next congress will be oganized in Bilbao on 25-28 June 2013.

SEMNI organized the 4th World Congress on Computational Mechanics in Buenos Aires in 1998 and the ECCOMAS congress in Barcelona in September, 2000.

SEMNI also organizes workshops and courses on numerical methods in engineering.

Since 1989 the SEMNI secretariat is located at CIMNE.

The Executive Council of SEMNI is as follows:

PRESIDENT

Xavier Oliver (Univ. Politècnica de Catalunya)

VICE-PRESIDENT

José Mª Goicolea (Univ. Politécnica de Madrid)

SECRETARY

Irene Arias (Univ. Politècnica de Catalunya)

PAST PRESIDENTS

Eugenio Oñate (Univ. Politècnica de Catalunya)
Manuel Casteleiro (Univ. de A Coruña)

EXECUTIVE COUNCIL MEMBERS

Pilar Ariza (Univ. de Sevilla)
Jesús María Blanco (Univ. del Pais Vasco)
Miguel Cervera (Univ. Politècnica de Catalunya)
Ignasi Colominas (Univ. de A Coruña)
Elías Cueto (Univ. de Zaragoza)
Antonio Huerta (Univ. Politècnica de Catalunya)
Fermín Navarrina (Univ. de A Coruña)
José Luis Pérez (Univ. Politécnica de Valencia)
Antonio Rodríguez (Univ. Politècnica de Catalunya)
Riccardo Rossi (CIMNE)
Eugenio Oñate (Univ. Politècnica de Catalunya)

International Association For Computational Mechanics (IACM)

www.iacm.info

The International Association of Computational Mechanics (IACM) was founded in 1981 and promotes advances in computational mechanics.

For the purposes of the IACM, Computational Mechanics is defined as the development and application of numerical methods and digital computers to solve problems in Engineering and Applied Science with the objectives of understanding and harnessing the resources of nature.

Since Computational Solid Mechanics (CSM) and Computational Fluid Dynamics (CFD) are at the core of IACM activity, subjects such as thermodynamics, electromagnetics, rigid body mechanics, control systems and some aspects of particle physics fall naturally within the scope of this definition. Indeed providing of a common forum for discussion, education and research information transfer between the diverse disciplines represented is the main "raison d'être" of IACM.

Since 1994 the IACM Secretariat has been located at CIMNE.

IACM organises the World Congress on Computational Mechanics (WCCM) every four years. Former editions of this congress were held in Austin (1988), Stuttgart (1990), Tokyo (1994), Buenos Aires (1998), Vienna (2002), Beijing (2004), California (2006), Venecia (2008), Sidney (2010) and Sao Paulo (2012). The WCCM 11th will take place in Barcelona on July 20-25, 2014.

IACM publishes a biannual bulletin and supports the organization of special interest conferences, IACM Simposia and courses in various fields of computational mechanics.

The Executive Council of IACM is composed by

PRESIDENT:

G. Yagawa, Japan

PAST PRESIDENTS:

E. Oñate, Spain
T.J.R. Hughes, U.S.A.
T. J. Oden, U.S.A.
A. Samuelson†, Sweden
O.C. Zienkiewicz†, U.K.

VICE PRESIDENT FOR THE AMERICAS:

W.-K. Liu, U.S.A.

VICE PRESIDENT FOR ASIA-AUSTRALIA:

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VICE PRESIDENT FOR EUROPE-MIDDLE EAST-AFRICA:

P. Wriggers, Germany

GENERAL SECRETARY

A. Huerta, Spain

MEMBERS:

T. Belytschko (USA), J. S. Chen (USA), C. Farhat (USA), J. Fish (USA), G. Hulbert (USA), S. Idelsohn (Argentina), P. Ladevèze (France), G.R.Liu (Singapore), H. Mang (Austria), R. Ohayon (France), R. Owen (UK), M. Papadrakakis (Greece), E. Ramm (Germany), B. Schrefler (Italy), T. Tezduyar (USA) and T. Yabe (Japan)

World Congress of the IACM. Barcelona July 20-25, 2014

European Community on Computational Methods in Applied Sciences (ECCOMAS)

www.eccomas.org

ECCOMAS is a scientific organization founded in 1992, grouping together European associations with interests in the development and application of computational methods in applied sciences and technology. The mission of ECCOMAS is to promote joint efforts of European universities, research institutes and industries which are active in the broad field of numerical methods and computer simulation in Engineering and Applied Sciences (i.e. Computational: Solid and Structural Mechanics, Fluid Dynamics, Acoustics, Electromagnetics, Physics, Chemistry, Applied Mathematics, and Scientific Computing), to address critical societal and technological issues with particular emphasis on multidisciplinary applications and disseminate innovative research in the fields of interest of ECCOMAS.

The main event organized by ECCOMAS is a large European congress taking place on a four year cycle attracting scientists and engineers both in and outside Europe. The main objective of these congresses is to provide a forum for presentation and discussion of state-of-the-art advances in scientific computing applied to engineering sciences. Equal emphasis is given to basic methodologies, scientific development and industrial applications.

The previous ECCOMAS Congresses were held in Brussels (1992), Paris (1996), Barcelona (2000), Jyväskylä (2004), Venice-Lido (2008), Vienna (2012).

ECCOMAS also organises large conferences devoted to structures and fluids. European Conferences on Computational Mechanics: Solids, Structures and Coupled Problems (ECCM) were held in Munich (1999), Cracow (2001), Lisbon (2006) and Paris (2012), the next ECCOMAS ECCM congress will take place in Barcelona on July 20-25 2014.

The ECCOMAS Computational Fluid Dynamics Conferences (CFD) were organized in Stuttgart (1994), Athens (1998), Swansea (2001), Egmond aan Zee (2006) and Lisbon (2010), the next ECCOMAS CFD congress will take place in Barcelona on July 20-25 2014.

These series of ECCOMAS global meetings are complemented with more focused thematic conferences on state-of-the-art topics in computational sciences and engineering organised with the support of ECCOMAS.

The secretariat of ECCOMAS is based in CIMNE since 1996.

PRESIDENT

M. Papadrakakis

VICE PRESIDENTS

E. Ramm — P. Neittaanmäki

SECRETARY

P. Díez

TREASURER

M. Bernadou

CO-OPTED MEMBERS TO THE MB

O. Allix — H. Mang — E. Oñate — J. Périaux — E. Stein

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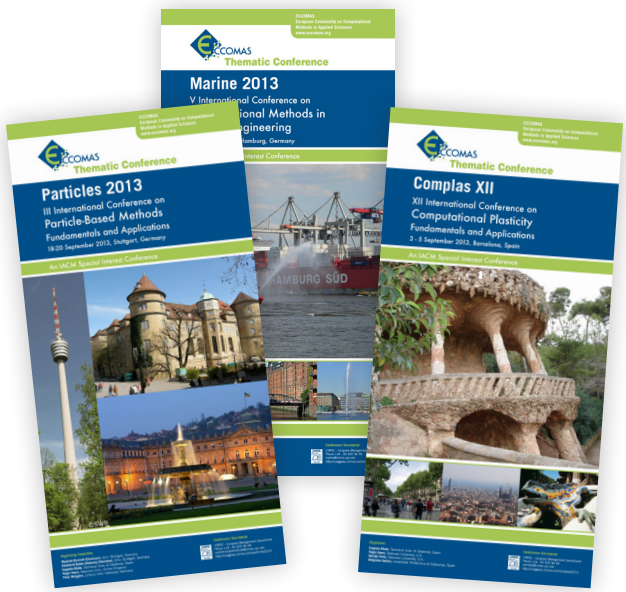
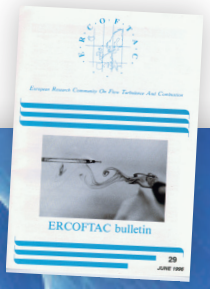
N. Bicanic, ACME (UK) — F. Auricchio, AIMETA (Italy) — C. Mota, APMTAC (Portugal) — D. Vandepitte, BNCM (Belgium) — J. Eberhardsteiner, CEACM (Central Europe) — P. Ladeveze, CSMA (France) — C. Hirsch, ERCOFTAC — P. Neittaanmäki, FMS (finland) — E. Ramm, GACM (Germany) — P. Steinmann, GAMM (Germany) — M. Bernadou, GAMNI/SMAI (France) — M. Papadrakakis, GRACM (Greece) — M. Bercovier, IACMM (Israel) — M. Gilchrist, ISSEC (Ireland) — D. Van Campen, NMC (Nederlands) — T. Kvamsdal, NOACM (Nordic) — A. Maslov, ONIV (Russia) — T. Burczynski, PACM (Poland) — C. Parés, SEMA (Spain) — P. Díez, SEMNI (Spain) — M. Morandi-Cecchi, SIMAI (Italy) — M. Kojic, SSCM (Serbia) — J.F. Molinari, SWICCOMAS — I. Tuncer, TNCTAM (Turkey)





European Research Community On Flow, Turbulence And Combustion (ERCOFTAC)

www.ercoftac.org

The ERCOFTAC network was founded in 1987, composed of more than 60 research centers and companies, promoted by several European aerospace companies with the objective of gathering all European research centers working primarily in the numerical simulation of fluid mechanics problems in engineering. Since 1989, CIMNE is a Pilot Center of ERCOFTAC in Spain.

ERCOFTAC activities in Spain organized by the Pilot Center include 8th European Turbulence Workshop (Barcelona 2000) the Europe-Russia Workshop (Barcelona 2006), the 3rd Workshop on Research in Turbulence (Seville 2008) and the 5th Workshop on Research in Turbulence (Tarragona 2010).

CIMNE coordinates the E-caero project of the EC (2010-2013) aiming to promote joint activities of different scientific associations in the aeronautic field in Europe. ERCOFTAC is a partner in this project.

Prof. O. C. Zienkiewicz,
fisrt Professor in NME

Prof. J. Périaux,
current Professor in NME

Unesco Chair on Numerical Methods in Engineering

www.cimne.com/websasp/unesco/

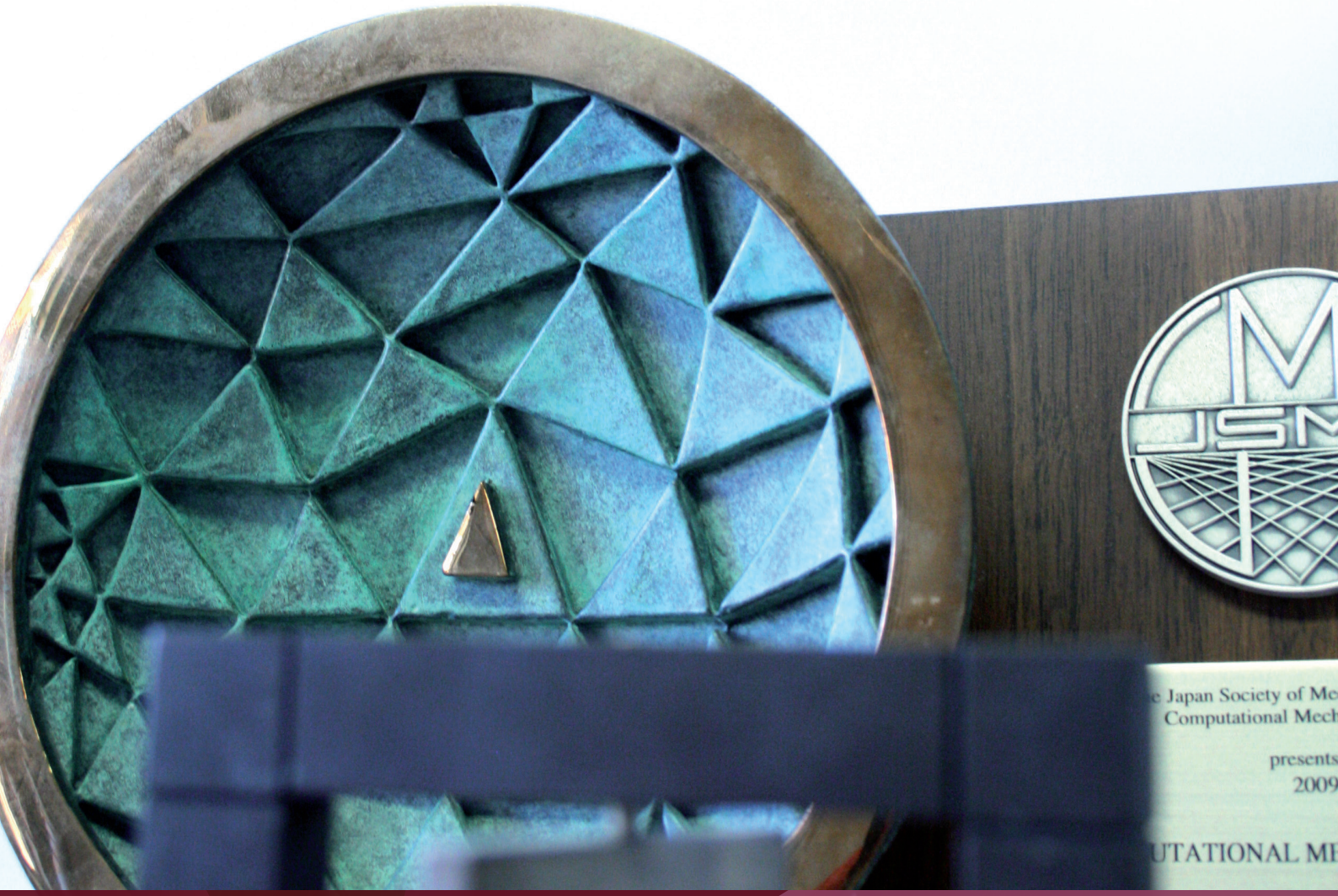
The creation of CIMNE was sponsored by UNESCO, aiming to promote international cooperation and development in the field of the application of numerical methods in science and technology.

As a result of the cooperation between UNESCO and CIMNE, in 1989 the UNESCO Chair on Numerical Methods in Engineering from the Universitat Politècnica de Catalunya (UPC) was created with the support of the Generalitat de Catalunya.

Prof. O. C. Zienkiewicz held the UNESCO Chair since its creation in 1989 until his death on January 2nd, 2009.

In 2009 the Unesco chair of Numerical Methods in Engineering was awarded to, Dr. Jacques Périaux. He is a recognized expert in the field of numerical methods applied to aerospace engineering. Dr Périaux contributions have resulted in a significant increase in the RTD activities of CIMNE in the aerospace sector, the organization of numerous training courses, exchanges with leading scientists worldwide and several RTD projects at international level.

Meeting of the Unesco Chairs located in Spain. Barcelona, December 2011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AWARDS

Awards to CIMNE Scientists (2008-2012)

Eduardo Alonso

GEOTECHNICAL RESEARCH MEDAL. Institution of Civil Engineers (United Kingdom), 2009.

GEOTECHNICAL RESEARCH MEDAL. Inst. of Civil Engineers (United Kingdom), 2010.

Santiago Badia

PREMI EXTRAORDINARI DE DOCTORAT ENGINYERIA CIVIL, Universitat Politècnica de Catalunya, 2008.

STARTING GRANT of the European Research Council (ERC), 2010.

SEMA award to young researchers by the Spanish Society of Applied Mathematics, 2012.

Antonio Gens

Outstanding Contributions Award from International Association for Computer Methods and Advances in Geomechanics (IACMAG), 2011

Miembro de la Royal Academy of Engineering of UK. 2011.

Antonio Huerta

PRANDTL MEDAL of the European Community on Computational Methods in Applied Science, 2008.

Sergio Idelsohn

EMERALD AWARD FOR EXCELLENCE PAPER published in Engineering Computations, 2009.

SEMNI 2009 AWARD in recognition to a professional and international career in the Numerical Methods in Engineering, 2009.

ADVANCED GRANT, of the European Research Council, 2009.

PERSONALITY OF THE YEAR. Newspaper El Litoral, Santa Fe, Argentina, 2010.

PRANDTL MEDAL of the European Community on Computational Fluid Dynamics, 2012.

Xavier Oliver

IACM COMPUTATIONAL MECHANICS AWARD, Venezia, 2008.

PREMIO AMCA INTERNACIONAL A LA TRAYECTORIA CIENTÍFICA, San Luis, Argentina, 2008.

ADVANCED GRANT, of the European Research Council, 2012.

Sergio Oller

DOCTOR HONORIS CAUSA awarded by the Universidad Nacional de Salta, Argentina, 2007.

Eugenio Oñate

O.C. ZIENKIEWICZ MEDAL of the Polish Association for Computational Mechanics (PACM), 2009.

TED BELYTSCHKO APPLIED MECHANICS AWARD (ASME), 2009.

COMPUTATIONAL MECHANICS AWARD from Japan Society of Mechanical Engineers (Jsme), 2009.

LITERATI AWARD FOR EXCELLENCE to the best paper published in Engineering Computations, 2009.

GAUSS-NEWTON MEDAL from International Association For Computational Mechanics (Iacm), 2010.

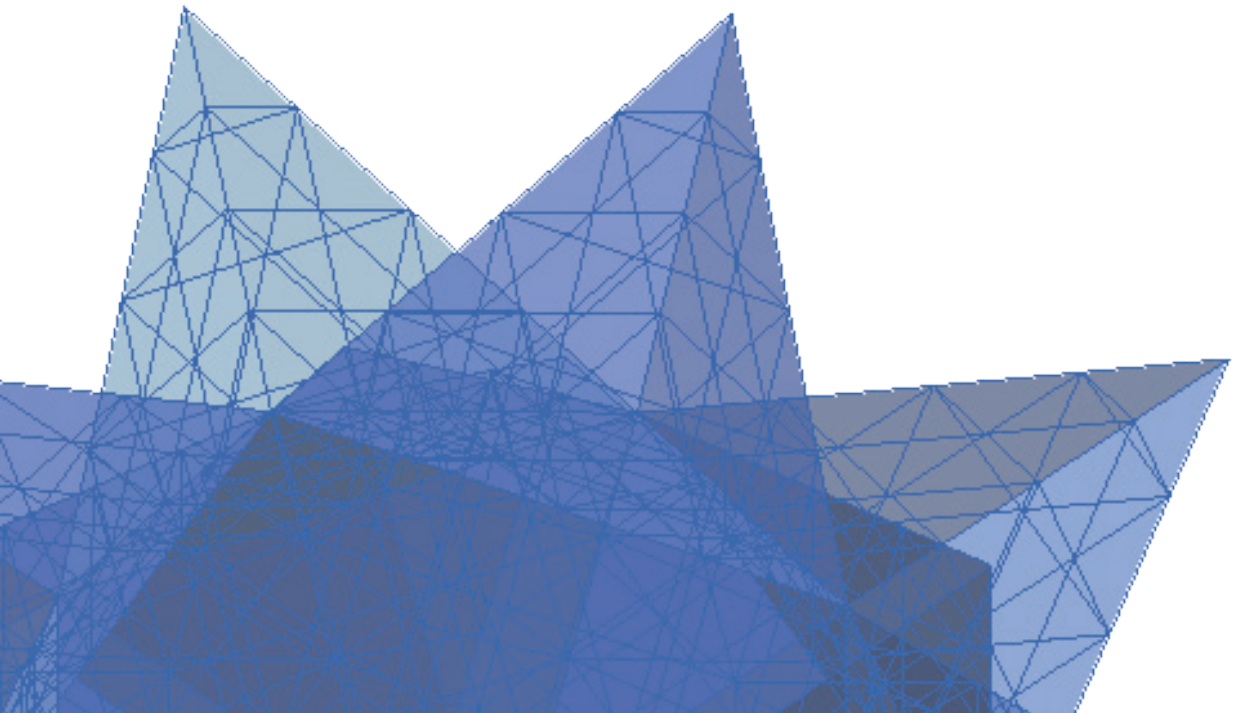
ADVANCED GRANT, of the European Research Council, 2010.

HONORARY DOCTORATE DEGREE by the Institut National des Sciences Appliquées (INSA), Lyon, 2012

DOCTOR HONORIS CAUSA by the University "Marta Abreu" of Las Villas , Santa Clara (Cuba), 2012.

Benjamín Suárez

Medal to the Professional Merit from the Colegio de Ingenieros de Caminos, Canales y Puertos, 2010



Awards to CIMNE

AINE 2010 Award

CIMNE was distinguished with the 2010 Award, as the most innovative organization related to the naval sector for the Asociación de Ingenieros Navales de España (AINE).

Award Duran i Farrell for Research and Technology Univesitat Politècnica de Catalunya, 2004

The Award was delivered to CIMNE scientists Dr. Oñate and Dr. García for their work entitled: "Development of a new finite element code for the hydrodynamic study of vessels. Aplications to the design of sailing ships for the America Cup race".

Ciutat de Barcelona 2002 Award, in Technological Research

On February 11, 2003, the Ciutat de Barcelona award in Technological Research was awarded to the CIMNE research team made up of Eugenio Oñate, Ramon Ribó, Enrique Escolano, Miquel Pasenau and Jorge Suit Pérez, for the development of the GID system, an innovative and user-friendly graphic interface that allows the geometric modeling and visualization of the results of numerical simulations.

Narcís de Monturiol Plate Award to the Scientific and Technological Merit 1999

On November 3, 1999 the Generalitat de Catalunya granted to CIMNE the Narcís de Monturiol Plate Award for Scientific and Technological Merit:

- For its contribution to the development of new methods for analysis and design for products and processes in engineering.
- For the fostering of cooperation between industry and university research groups.
- For many training activities and the promotion of science and technology at the international level.

Special mention to the Ciutat de Barcelona Award 1999

The City of Barcelona awarded CIMNE a Special Mention to the City of Barcelona Award, 1999, in the category of Technological Research for the work carried out by Drs. P. Roca, M. Cervera, and E. Oñate on the modeling and structural analysis of the Barcelona Cathedral.

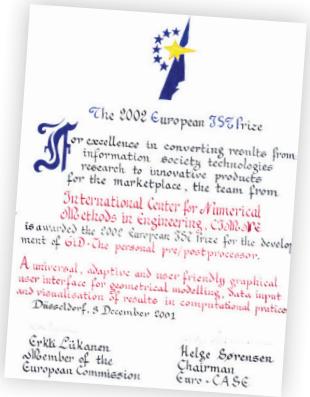
IST Award to the best product of the Information Society Technologies Programme of European Commission (EC).

The EC granted in November 2001 the IST Award to the pre/post processor system GiD developed at CIMNE.

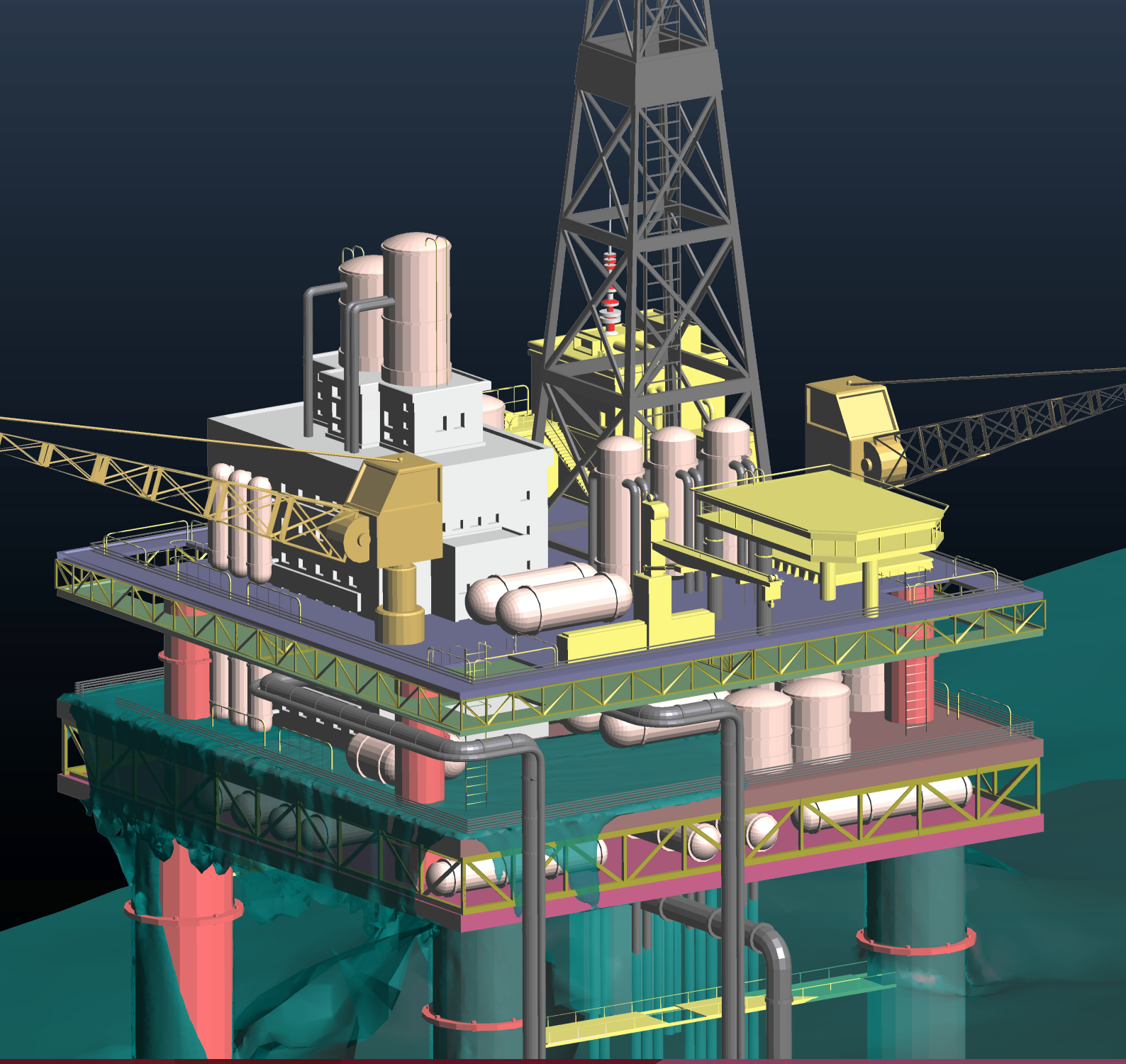
Premi Ciutat de Barcelona, 2002

AINE 2010 Award

Narcís de Monturiol Plate



IST Award



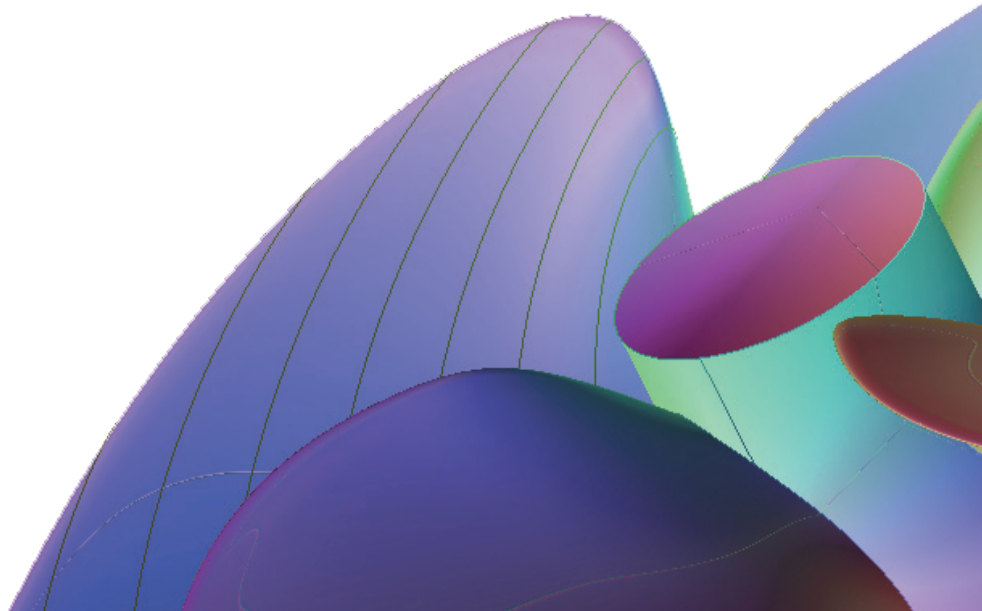
RESEARCH AND DEVELOPMENT ACTIVITIES

Research areas

CIMNE's Research and Development activities are split into the following areas:

- Numerical Methods
- Solid and Structural Mechanics
- Computational Fluid Dynamics
- Stochastic Mechanics
- Materials
- Optimization Methods
- Electromagnetics
- Geomechanics
- Pre and post processing
- Information and Communication Technology
- Artificial Intelligence

In the following pages the main activities of each research area are described.



Numerical Methods

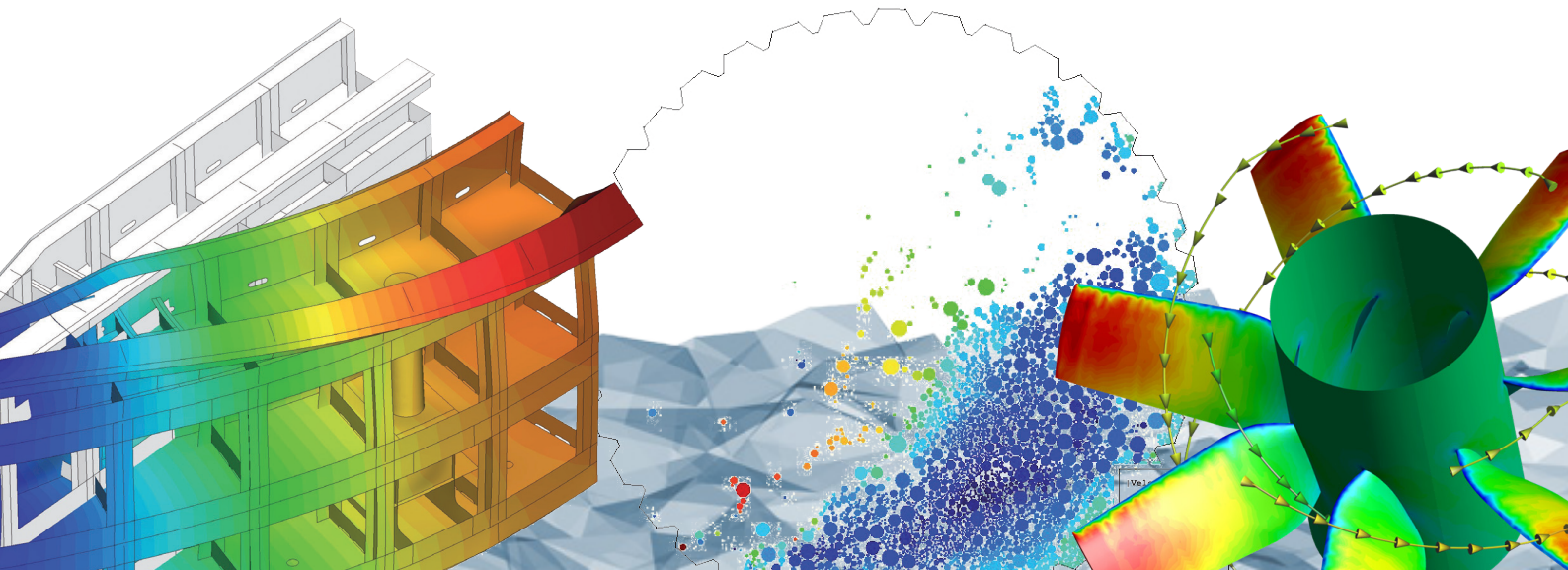
- Advanced numerical methods for solving partial differential equations.
- New meshless methods in computational mechanics
- Innovative solution algorithms for large algebraic systems
- Error estimation and mesh refinement techniques in solid and fluid mechanics
- Methods for certificating the quality of the numerical solution in computational mechanics

Solid and Structural Mechanics

- Finite element methods for linear and non linear analysis of solids and structures.
- Meshless methods in solid mechanics
- Strong discontinuity analysis in solids. Applications to fracture mechanics.
- Rotation-free plate and shell elements
- Coupled problems in solid mechanics (fluid-structure interaction, thermal-mechanical problems, electromagnetics, etc.)
- Combination of finite element and particle methods in solids mechanics.

Computational Fluid Dynamics

- Stabilized finite element and finite volume methods in compressible and incompressible fluid mechanics
- Meshless methods in fluid mechanics
- Finite element and particle methods for free surface flows.
- Numerical methods for multidisciplinary problems in fluid mechanics (fluid-structure interaction, thermal flows, electromagnetics, etc.)



Stochastic Mechanics

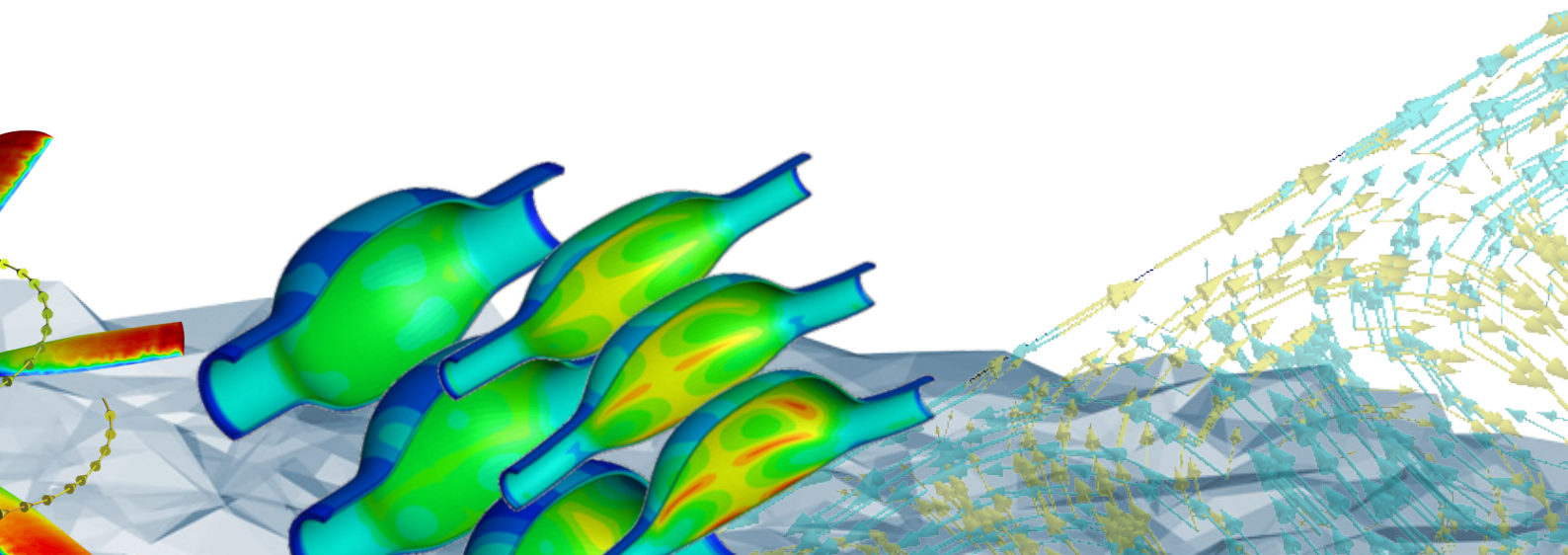
- Monte-Carlo methods for stochastic analysis in computational mechanics
- Game theory for multidisciplinary optimization problems
- Stochastic finite element methods
- Coupling of stochastic methods and finite element methods in solid and fluid mechanics
- Parameter identification via stochastic methods
- Stochastic methods for computer simulation of industrial forming processes.

Materials

- New constitutive models for frictional materials (concrete, rocks, soil) and metallic materials.
- Constitutive models for composite materials
- Nano-material models
- Constitutive models for bio-materials
- Parameter identifications in constitutive models of materials
- Material models for discrete element methods.

Optimization Methods

- Development of electromagnetic solutions using computing tools: ranging from numerical methods for the simulation of the Maxwell's equations in three-dimensional spaces, to codes for processing and analysing electromagnetic phenomena.
- Study of the behaviour of new devices and materials such as: new generations of electrical machines or superconductor-based machines.
- Electromagnetic solutions for food control and processing.
- Sheet stamping processes via electromagnetic fields.



Electromagnetics

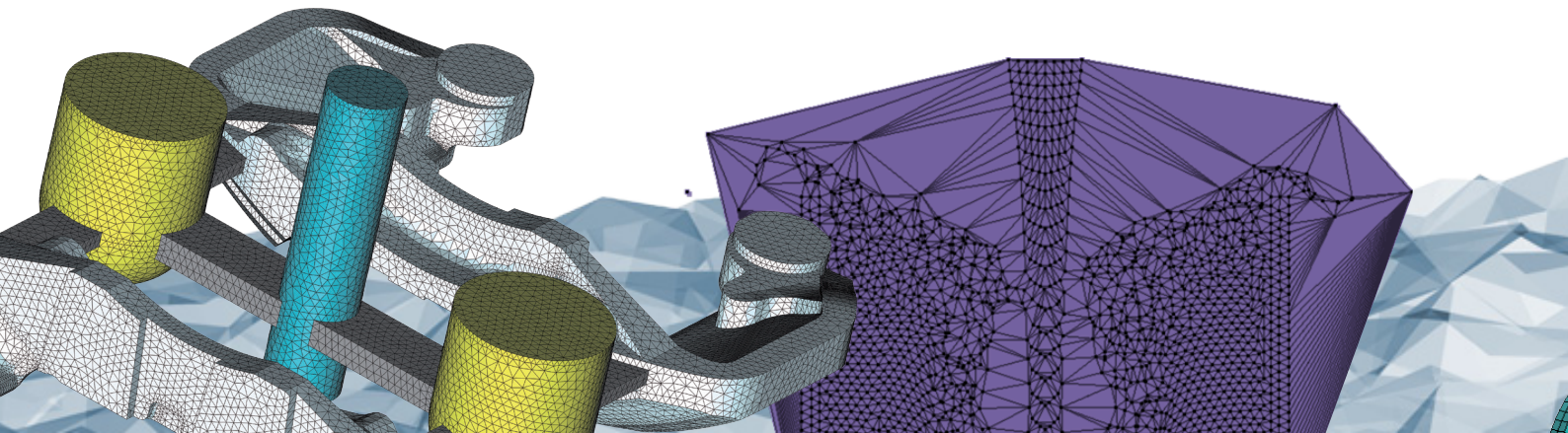
- Development of electromagnetic solutions using computing tools: ranging from numerical methods for the simulation of the Maxwell's equations in three-dimensional spaces, to codes for processing and analysing electromagnetic phenomena.
- Study of the behaviour of new devices and materials such as: new generations of electrical machines or superconductor-based machines.
- Electromagnetic solutions for food control and processing.
- Sheet stamping processes via electromagnetic fields.

Geomechanics

- Development of constitutive models to study the constitutive behaviour of soils and rocks by finite element methods.
- Development of finite element methods for coupled problems in geotechnical engineering.
- Development of finite element and particle methods for modelling and analysis of bed erosion in free surface flows.
- Development of discrete element methods for geomechanical problems.
- Development of particle finite element methods for geomechanical problems.
- Development of numerical methods for underground construction problems.
- Study of tool wear in construction machines.

Pre and post processing

- Development and maintenance of the GiD pre and post processing system (www.gidhome.com).
- Development of methods for generating structured and unstructured meshes.
- Development of input data technology for large scale computational problems.
- Graphical visualization techniques for large scale simulation problems.
- Generation of input data for finite element analysis from medical images.
- Integration of geographical information systems (GIS) with pre and post processing tools and finite element analysis codes.
- Meshless methods for the parametrization of geometries for shape optimization problems.

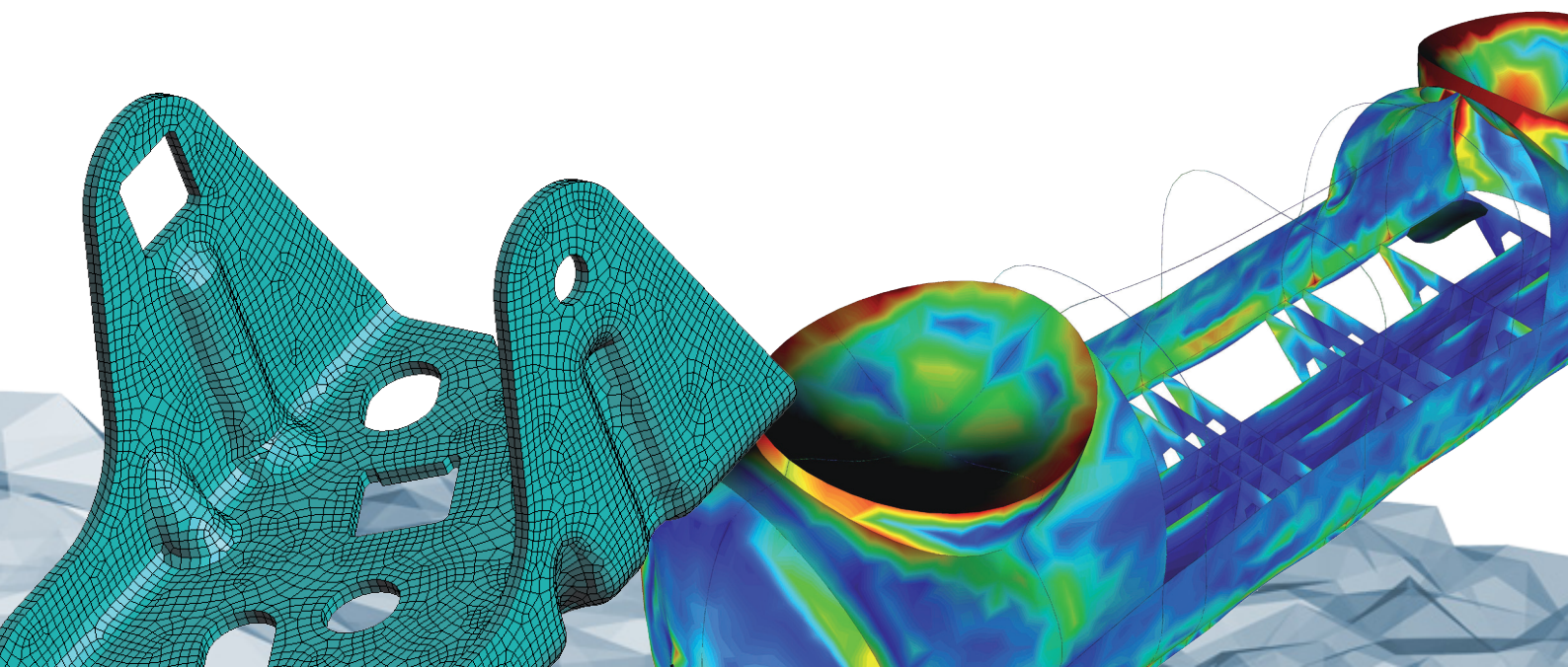


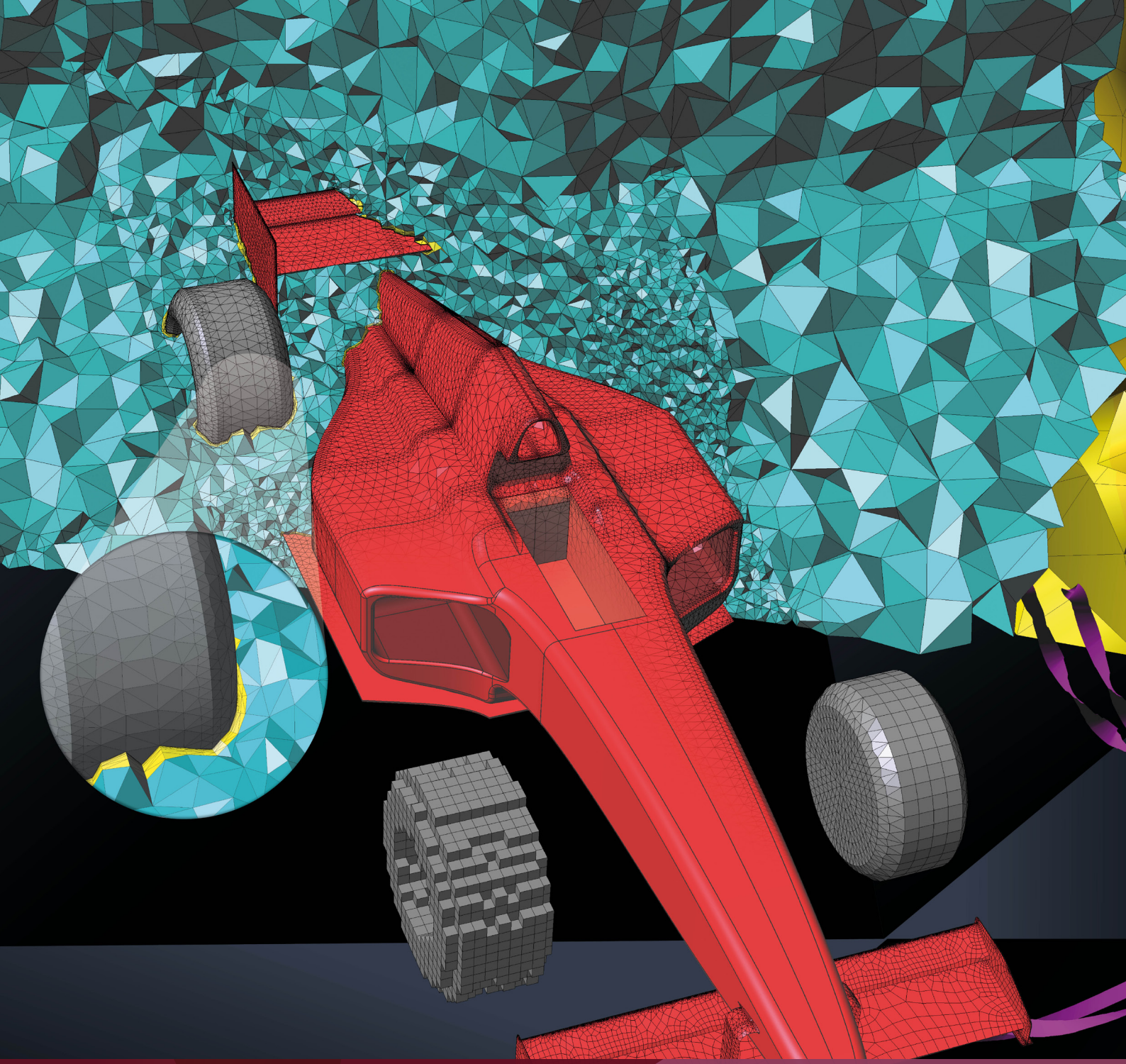
Information and Communication Technology

- Development of Internet tools for supporting management and training activities of individuals and organizations
- Methods for integrating and managing wireless sensors in Internet platforms.
- Development of health monitoring methods for constructions and buildings using wireless sensors and ICT.
- Development and integration of geographic information tools into decision support systems.
- Development of decision support systems integrating wireless sensors, networks, data bases, info-mechanics systems, computer simulation methods and AI technology.
- Application of ICT to manufacturing processes to industry.

Artificial Intelligence

- Development of artificial neural networks (ANN) for optimization, inverse analysis and fast decision making.
- Integration of artificial neural networks (ANN) in decision support systems combining wireless sensors, computer simulations methods and artificial intelligence technology.
- Development of artificial intelligence techniques based in agent simulations.
- Applications of artificial neural networks (ANN) technology for parameter identification in constitutive laws
- Development of intelligent finite element methods via AI technology.





RESEARCH, DEVELOPMENT AND INNOVATION DEPARTMENTS

RDI Departments

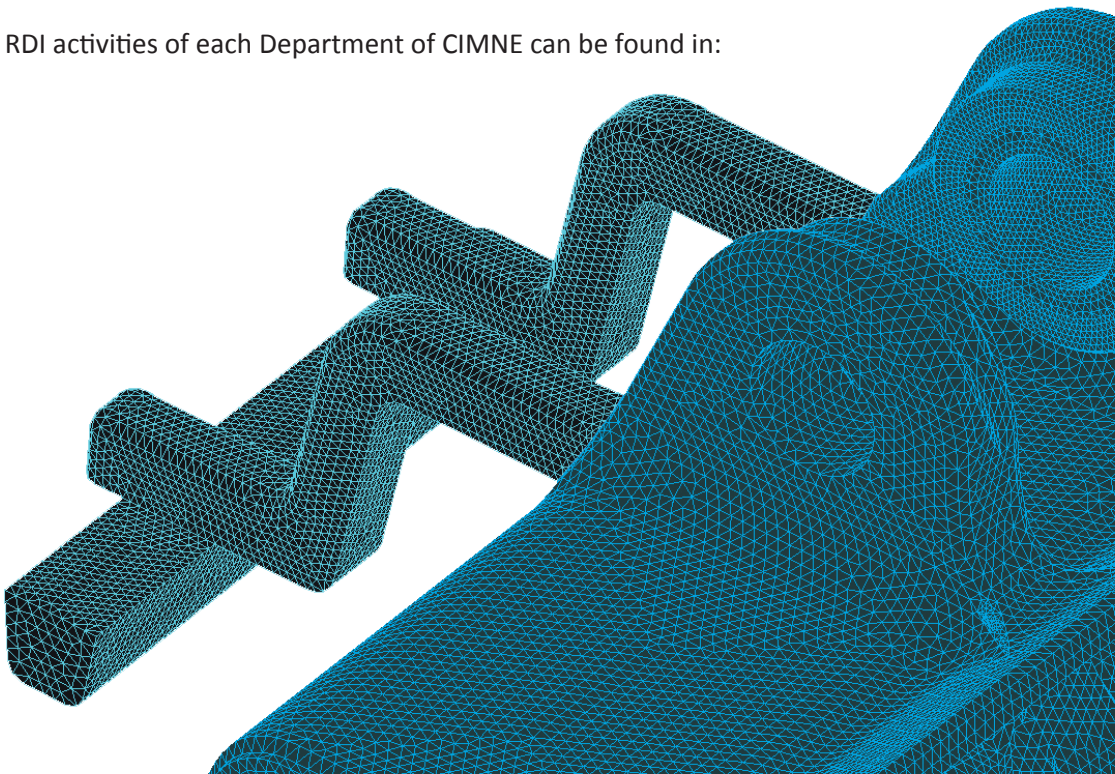
The research, development and innovation (RDI) activities at CIMNE are carried out by the following RDI Departments:

- Aerospace Engineering
- Civil Engineering
- Building, Energy and Environment (BEE GROUP)
- Marine and Naval Engineering
- Technology Tranfer Services (TTS)
- Bio-Medical Engineering
- Socio-Economic Research
- Natura
- Pre and Post processing
- Information and Communication Technologies
- Computational physics and large scale computing

In the following pages we list the key objectives of each RDI Department, its staff and the more relevant on-going projects.

More information on the RDI activities of each Department of CIMNE can be found in:

www.cimne.com



Aerospace Engineering

CIMNE Aeronautics group are in charge of developing new and amazing projects in the aeronautical field, including:

- Development of unstructured grid stabilized finite element and meshless methods for analysis of fluid flows.
- Development of 3D adaptive mesh refinement techniques for compressible/ incompressible flows.
- Optimum shape design in aerodynamics combined with adaptive mesh refinement.
- Structural analysis of composite aerospace structures under static and dynamic load.
- Aeroelastic analysis of parachutes.
- Development of pre/ post processing tools (GiD) for aerospace engineering problems
- 3D unstructured mesh generation
- Analysis data definition
- Visualisation of results
- New algorithms for multidisciplinary problems in aerospace engineering: aeroelasticity, thermal flows, electromagnetics, aeroacoustics, etc

STAFF

Team Manager

Jordi Pons

Team

Pedro Díez
Roberto Flores
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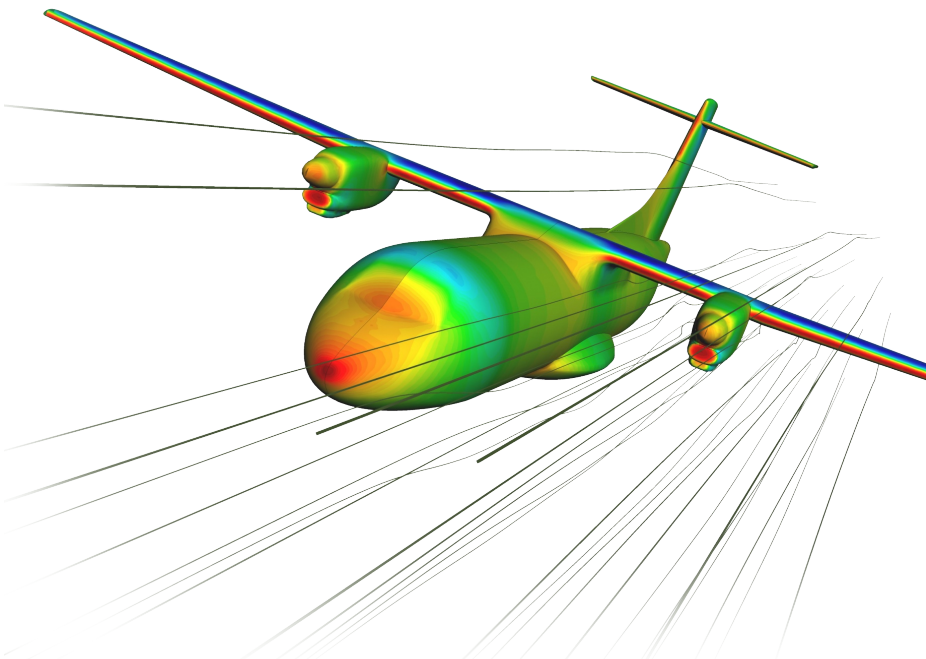

ON-GOING RTD PROJECTS

CRESCENDO: Collaborative and Robust Engineering using Simulation Capability Enabling Next Design Optimisation
FP7, EC-EUROPEAN COMMISSION
Coordinator: AIRBUS SAS
1/05/2009 - 31/10/2012

VALIANT: VALidation and Improvement of Airframe Noise prediction Tools
FP7, EC-EUROPEAN COMMISSION
Coordinator: VKI
1/09/2009 - 31/05/2013

E-CAero: European Collaborative dissemination of AEROnautical research and applications
FP7, EC-EUROPEAN COMMISSION
Coordinator: CIMNE/ECCOMAS
1/09/2009 - 31/10/2013

ALEF: Aerodynamic loads estimation at extremes of the flight envelope
FP7. EC-EUROPEAN COMMISSION
Coordinator: AIRBUS-D
1/05/2009- 30/04/2012

GRAIN: GReener Aeronautics International Networking
FP7 - COOPERATION
EUROPEAN COMMISSION
Coordinator: CIMNE
1/10/2010- 31/12/2012

MARS: Manipulation of Reynolds Stress for Separation Control and Drag Reduction
FP7, EC-EUROPEAN COMMISSION
Coordinator: CIMNE
1/10/2010- 30/09/2013

NEURAL: Neural network computation for fast trajectory prediction
FP7-CLEAN SKY, EC
Coordinator: GTD
01/04/2011 - 31/05/2012

PARAPLANE: Development of a New Steerable Parachute System for Rescue of Small and Medium Size Airplanes
FP7, EC
Coordinator: CIMSA
01/12/2012 - 30/11/2014

M-RECT: Multiscale Reinforcement Of Semi-Crystalline Thermoplastic Sheets And Honeycombs
FP7, EC-EUROPEAN COMMISSION
Coordinator: Victrex Manufacturing Limited
15/04/2010- 14/04/2014

DOTNAC: Development and Optimization of THz NDT on Aeronautics Composite Multi-layered Structure
FP7, EC-EUROPEAN COMMISSION
Coordinator: RMA - Royal Military Academy
1/09/2010- 31/08/2013

HIRF SE: High Intensity Radiated Field Synthetic Environment
FP7 - COOPERATION
EUROPEAN COMMISSION
Coordinator: ALENIA
01/12/2008 - 30/05/2013

AEROROBUST: Diseño robusto de componentes aeronáuticos basado en análisis estocástico aplicado a la resolución de problemas aerodinámicos, de aeroelasticidad, materiales compuestos y planificación de trayectorias.
PLAN NAC. I+D (2008-2011), LIA2. Proy.I+D: Investigación Fundamental, MICINN
Coordinator: CIMNE
1/1/2012 - 31/12/2012

Civil Engineering

These are the main research lines that are being developed at the Civil Engineering Dept.

- Structural analysis of civil constructions under static and dynamic loads: bridges, dams, buildings, harbour structures, hydraulic structures, etc.
- Numerical methods for studying the safety and durability of structures in building and civil constructions.
- Development of decision support systems integrating wireless sensor networks, data bases, calculation methods and AI technology.
- Optimization methods in structural engineering.
- Finite element methods for analysis of textile membranes and inflatable structures.
- Computational methods for analysis of structures with new materials.
- Numerical methods for multidisciplinary problems in civil engineering.
- Integration of wireless sensors with analysis methods for structures and constructions.

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The Civil Engineering Dept. is organized into the following groups:

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Ferran Arrufat
Matias Avila
Joan Baiges
Alex Barbat
Pablo Agustín Becker
Lorenzo Benedetti
Gabriel Bugeda
Manuel Alejandro Caicedo
Juan Carlos Cante
Josep Maria Carbonell
Martha Liliana Carreño
Victor Castaño
Miguel Angel Celigueta
Miguel Cerrolaza
Miguel Cervera
Ramón Codina
Ester Comellas
Jordi Cotela
Michele Chiumenti
Pooyan Dadvand
Daniel Di Capua
Narges Dialamishabankareh
Javier Diego
Alex Ferrer
Alessandro Franci
Juan José Gálido
Jose Manuel Gonzalez
Sergio Rodolfo Idelsohn
Joaquín Irazábal
Kazem Kamran
Mohammad Kouhi
Carlos Andres Labra
Antonia Larese De Tetto
J. Salvador Latorre
Juan Pablo Londoño
Julio M. Marti
Javier Martinez
Javier San Mauro
Juan Miquel
Rafael Moran
Christian Muñoz
Xavier Oliver
Sergio H. Oller
Fermin Enrique Otero
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Sergi Salichs
Omar Salomón
Benjamín Suárez
Jordi Truco
Pablo Enrique Vargas
Ramon Vilanova
Rafael Weyler
Francisco Zárate

APPLIED MATHEMATICS

Coordinator

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Members

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Antonio Rodríguez Ferran
José Sarrate

GEOMECHANICS

Coordinator

Eduardo Alonso

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Meritxell Auleda
Manuela Barbieri
Ramón Barboza
Alejandro Blanco
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Silvia De Simone
Amadeu Deu
Alessandra Di Mariano
Gerad Fabregas
Maria Del Mar García
Benoit Garitte
Antonio Gens
Rodrigo Andrés Gómez
Nubia Gonzalez
Meritxell Gran
Christian Hoffmann
Anna Jurado
Ana Martínez
Ricard Mas
Nadia Mokni
Sebastià Olivella
Marta Pérez
Andrés E. Pinto
Nuria Mercè Pinyol
Anna Ramón
Tobias Roetting
Enrique Edgar Romero
Sergio Samat
Núria Sau
Laura Scheiber
Alejandro Serrano
Daniel Tarragó
Erdem Toprak
María Dolores Zavala
Zhifeng Zhan

OTHERS

Ulric Celada
Francesc De Paula Jordana
Álvaro Meseguer
Francisco Nuñez
Hans Paul Sánchez

RTD PROJECTS

SEDUREC: Gestor de Valorización Tecnológica SEDUREC

iNGENiO 2010
15/09/2006 - 14/03/2012

HIRF SE:High Intensity Radiated Field Synthetic Environment

FP7
Coordinator: ALENIA
01/12/2008 - 31/05/2013

VALIANT: VALidation and Improvement of Airframe Noise prediction Tools

FP7
Coordinator: VKI-EUROTURBO
01/09/2009 - 31/05/2013

REALTIME: Real Time Computational Mechanics Techniques for Multi-Fluid Problems

FP7, Advanced Grant, ERC
Coordinator: CIMNE
01/12/2009 - 31/11/2014

TECNO_FUS: Fusion Technology PROGRAMME-TECNO_FUS

LIA2. Proy.I+D: Investigación Fundamental
Coordinator: CIEMAT
01/02/2009 - 15/12/2013

E-CAERO: European Collaborative Dissemination of Aeronautical research and applications

FP7
Coordinator: ECCOMAS
01/09/2009 - 31/10/2013

ALEF: Aerodynamic loads estimation at extremes of the flight envelope

FP7
Coordinator: AIRBUS FRANCE
01/05/2009 - 30/04/2012

CARE4ME (ITEA2): Cooperative Advanced REsearch for Medical Efficiency

EUREKA
Coordinator: PHILIPS
01/06/2009 - 30/09/2012

SADMA: Tecnologías de avanzada para el diagnóstico y estudio sistémico e integrador de obras de alto valor patrimonial, basado en sistemas de apoyo a la decisión

Ayudas PCI: Programa de Cooperación Interuniversitaria e Investigación Científica
Coordinator: UPC
26/01/2011 - 29/02/2012

BESST: Breakthrough in European Ship and Shipbuilding Technologies
FP7
Coordinator: FINCANTIERI CANTIERI NAVALI IT., S.
01/09/2009 - 28/02/2013

COLTS: Casting of Large Ti Structures
FP7
Coordinator: UNIV. OF BIRMINGHAM
01/10/2010 - 30/09/2013

VIS: Estudios de Vulnerabilidad por Inundaciones en la región hidrográfica Mandinga-Comapala (El Salvador) para la planificación territorial estratégica
Ayudas PCI: Programa de Cooperación Interuniversitaria e Investigación Científica
Coordinator: UPC
26/01/2011 - 29/02/2012

DYNASPHALT: Modelado y tratamiento dinámico de ensayos auscultación de firmes de carreteras
LIA6. Articulación e Internacionalización: Coop.Público-Privada
Coordinator: GEOTECNIA Y CIMIENTOS, S.A.
01/10/2010 - 28/02/2013

ALCON (INNPACTO): Desarrollo de criterios de diseño para el incremento de la capacidad de desagüe en presas de fábrica mediante aliviaderos con cajeros altamente convergentes
LIA6. Articulación e Internacionalización: Coop.Público-Privada
Coordinator: ALATEC
01/10/2010 - 30/06/2013

DOTNAC: Development and optimization of THz NDI on aeronautics composite multi-layered structures
FP7
Coordinator: RMA
01/09/2010 - 31/08/2013

GRAIN: Greener Aeronautics International Networking
FP7
Coordinator: CIMNE
01/10/2010 - 31/12/2012

MARS (FLOW CONTROL): Manipulation of Reynolds stresses for drag reduction and separation control
FP7
Coordinator: CIMNE
01/10/2010 - 30/09/2013

HFLUIDS: Nuevos métodos de partículas y elementos finitos para problemas de interacción fluido-estructura en fluidos heterogéneos con superficie libre. Real Time Computational Mechanics Techniques for Multi-Fluid Problems.
LIA2. Proy.I+D: Investigación Fundamental
Coordinator: CIMNE
21/03/2011 - 31/05/2012

GREENSOLAR: Aumento de eficiencia energética en Sistemas de generación de Energía Solar
Acciones Estratégicas
Coordinator: QUANTECH
10/06/2010 - 31/05/2012

T-CRAFT: SES Maneuvering and Skirt Seal Performance in Waves
ONR BAA
Coordinator: CIMNE
01/04/2010 - 31/03/2012

ULCF: Ultra low cycle fatigue of steel structures under high strain transient loading conditions
RFCS-Research Fund for Coal and Steel
Coordinator: FLUP
01/07/2011 - 30/06/2014

HYPERMEMBRANE: Development of an adaptable structure for architecture application
FP7
Coordinator: CIMNE
01/09/2011 - 31/08/2013

DESURBS: Planning, (re)design and re(engineering) of urban areas to make them less vulnerable and more resilient to security threats
FP7
Coordinator: Resman
01/01/2011 - 31/12/2014

SAFECON: New Computational Methods for Predicting the security of constructions to Water Hazards accounting for fluid-soil-structure interactions
FP7, Advanced Grant, ERC
Coordinator: CIMNE
01/01/2011 - 31/02/2015

NEURAL: Neural network computation for fast trajectory prediction
FP7-CLEAN SKY
Coordinator: GTD
01/04/2011 - 31/05/2012

e-DAMS: Métodos numéricos y experimentales para la evaluación de la seguridad y protección de las presas de materiales sueltos en situación de sobrevertido. Numerical and experimental techniques for safety assessment and protection of embankment dams in overtopping scenarios
LIA2. Proy.I+D: Investigación Fundamental
Coordinator: CIMNE
01/01/2011 - 31/12/2013

Catedras UNESCO: Proyecto de cooperación de las cátedras Unesco para la movilización hacia el desarrollo sostenible del conocimiento y las políticas científicas en países de América Latina y África.Reunión de expertos
CAP: Convocatoria Abierta y Permanente para Actividades de Cooperación y Ayuda al Desarrollo
Coordinator: CIMNE
01/09/2011 - 29/02/2012

TENSABRIDGE: Nuevos Puentes de despliegue rápido ultraligeros LIA6. Articulación e Internacionalización: Coop. Público-Privada
Coordinator: BUILDAIR
01/09/2011 - 31/12/2013

CHANGES: Changing Hydro-Meteorological Risks- As Analyzed by A New Generation of European Scientists
FP7
Coordinator: UTWENTE
01/01/2011 - 31/12/2014

CIMNE-INTAL++: Dinamización de las sedes Internacionales de CIMNE en Latinoamérica, EEUU, China y Singapur
LIA6. Articulación e Internacionalización: Internacionalización
Coordinator: CIMNE
01/10/2011 - 30/09/2013

AACC PROMETHEUS: PROMETHEUS: NUEVOS ENFOQUES PARA EL MODELADO DE LA EVACUACION Y EL INCENDIO
LIA2. Proy.I+D: Investigación Fundamental
Coordinator: UNIV. DE CANTABRIA
01/10/2011 - 30/09/2012

AACC MUMOLADE: Multiscale Modelling of Landslides and Debris Flow
LIA2. Proy.I+D: Investigación Fundamental
Coordinator: CIMNE
25/01/2015 - 31/01/2013

MUMOLADE: Multiscale Modelling of Landslides and Debris Flows
FP7
Coordinator: BOKU
01/01/2012 - 31/12/2015

AEROROBUST: Diseño robusto de componentes aeronáuticos basado en análisis estocástico aplicado a la resolución de problemas aerodinámicos, de aeroelasticidad, materiales compuestos y planificación de trayectorias.
LIA2. Proy.I+D: Investigación Fundamental
Coordinator: CIMNE
01/01/2012 - 31/12/2012

COPASRE: Enfoque integral y probabilista para la evaluación del riesgo sísmico en España
LIA2. Proy.I+D: Investigación Fundamental
Coordinator: CIMNE
01/01/2012 - 31/12/2014

E-SCAFFOLD: e-Scaffold: Simulador para el diseño y desarrollo de andamios para la ingeniería de tejidos.
LIA2. Proy.I+D: Investigación Fundamental
Coordinator: IBEC
01/01/2012 - 31/12/2012

ROMSCALE: Modelado multiescala del comportamiento mecánico y de fallo estructural en materiales, utilizando técnicas de reducción de modelos

LIA2. Proy.I+D: Investigación Fundamental
Coordinator: CIMNE
01/01/2012 - 31/12/2014

TOTAL.KNEE: Development of a new generation of knee prostheses with enhanced lifespan features using advanced computational biomechanics

FP7
Coordinator: CIMNE
01/04/2012 - 31/03/2016

AIR-BRIDGE: Development, validation and transfer to market of a prototype of AIR-BRIDGE for surface transport vehicles

PROVAT
Coordinator: CIMNE
01/01/2012 - 31/12/2013

CHAR-BIAX: Methods and techniques to characterize material strength, via Bi-axial Testing Devices coupled to Artificial Vision Measuring Systems.

CTP
Coordinator: CIMNE
01/01/2012 - 31/12/2013

FLEXICAST: Robust, and FLEXible CAST iron manufacturing

FP7
Coordinator: UPC
01/11/2012 - 31/10/2016

PARAPLANE: Development of a New Steerable Parachute System for Rescue of Small and Medium Size Airplanes

FP7
Coordinator: CIMSA
01/12/2012 - 30/11/2014

WAM-V: ADVANCED NUMERICAL SIMULATION AND PERFORMANCE EVALUATION OF WAVE ADAPTIVE MODULAR VESSELS (WAM-V®) IN SPRAY GENERATING CONDITIONS

Coordinator: CIMNE
01/07/2012 - 30/06/2015

EHEA: Estructura Hinchable Energéticamente Autosuficiente

LIA6. Articulación e Internacionalización: Coop.Público-Privada
Coordinator: BUILDAIR
01/10/2012 - 30/09/2014

iCOMPLEX: Desarrollo del Software iCOMPLEX para el control y evaluación de la seguridad de infraestructuras críticas.

LIA6. Articulación e Internacionalización: Coop.Público-Privada
Coordinator: DACARTEC
01/09/2012 - 31/12/2015

PEBS: Long-Term Performance of Engineered barrier Systems (EBS)

FP7, EC-EUROPEAN COMMISSION
Coordinator: BGR
01/03/2010- 28/02/2014

FORGE: Fate of Repository Gases

FP7, EC-EUROPEAN COMMISSION
Coordinator: BGS
01/02/2009 - 31/03/2013

ACUÑA: Desarrollo de un prototipo de bloque en forma de cuña y de la metodología para su uso como protección frente a la erosión en presas o balsas de materiales sueltos

PLAN NAC. I+D (2008-2011), LIA6. Articulación e Internacionalización: Coop.Público-Privada, MICINN
Coordinator: PREHORQUI
09/01/2011 - 31/12/2013

XLIDE: Desarrollo de Herramientas para el Análisis de Estabilidad en Laderas con Riesgo Potencial sobre Infraestructuras

PLAN NAC. I+D (2008-2011), LIA6. Articulación e Internacionalización: Coop.Público-Privada, MICINN
Coordinator: OFITECO S.A.
01/07/2011 - 30/06/2014

Building, Energy and Environment (BEE GROUP)

The Building, Energy and Environment Group (BEE) was founded in 2001. Its R&D activities are focused on the field of renewable energies and energy efficeincy. Their main research lines are:

- Numerical methods for analysis and design of energy sustainable buildings and constructions.
- Numerical methods for acoustic analysis and design of structures with enhanced materials.
- Methods for analysis of recycling processes of natural and artificial wastes for energy saving and environmental applications.
- Development of decision support systems in the energetic and environment sectors integrating wireless sensors, networks, databases, info-mechanical systems, computer simulation methods and AI technology.
- Development of computational methods for analysis and design of wave power plants.

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RTD PROJECTS

eSESH: Saving Energy in Social Housing with ICT
CIP-Competitiveness and Innovation Framework Programme
EMPIRICA
01/03/2010 - 28/02/2013

BECA: Balanced European Conservation Approach – ICT services for resource saving in social housing
CIP-Competitiveness and Innovation Framework Programme
EMPIRICA
01/01/2011 - 31/12/2013

SEMANCO: Semantic Tools for Carbon Reduction in Urban Planning
FP7
FUNITEC
01/09/2011 - 31/08/2014

AACC BIPV/PCM-Slurry: Developing a novel BIPV façade module enabling enhanced solar thermal/electrical efficiency by using PCM-slurry
LIA2. Proy.I+D: Investigación Fundamental
CIMNE
01/01/2010 - 31/01/2013

SMART SPACES: Saving Energy in Europe's Public Buildings using ICT
CIP-Competitiveness and Innovation Framework Programme
EMPIRICA
01/01/2012 - 31/12/2014

PARANAT: Análisis paramétrico de sistemas de ventilación natural en edificios.
LIA2. Proy.I+D: Investigación Fundamental
CIMNE
01/01/12 - 31/12/2014

AIDA: Affirmative Integrated Energy Design Action
CIP-Competitiveness and Innovation Framework Programme
TU WIEN
01/04/2012 - 31/03/2015

Marine and Naval Engineering

The main RTD lines of the group are:

- Numerical methods for hydrodynamic analysis of vessels.
- Finite element methods for analysis of composite materials and structures in ships accounting for fluid-structure interaction effects.
- Numerical methods for analysis of off-shore constructions accounting for fluid-structure interaction effects.
- Numerical methods for environmental problems in naval and marine engineering.
- Optimum shape design methods for ships
- Numerical methods for multidisciplinary problems in naval and marine engineering.
- Development of decision support system in naval and marine engineering, integrating wireless sensor networks, data bases, computer simulation methods and AI technology (neuronal networks).

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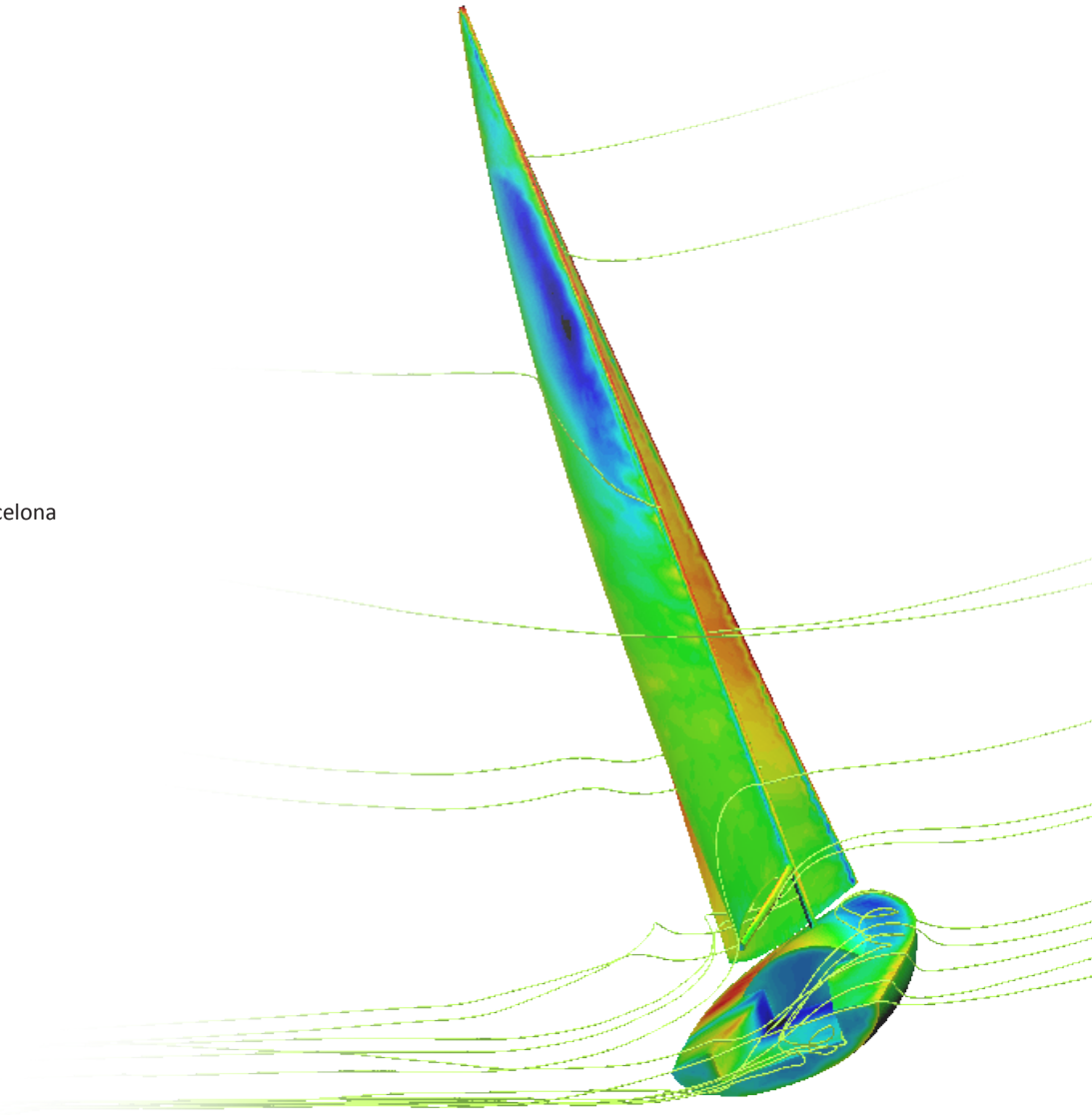


RTD PROJECTS

BESST: Breakthrough in European Ship and Shipbuilding Technologies
FP7
FINCANTIERI CANTIERI NAVALI IT., S.
01/09/2009 - 28/02/2013

GRAIN: Greener Aeronautics International Networking
FP7
CIMNE
01/10/2010 - 31/01/2012

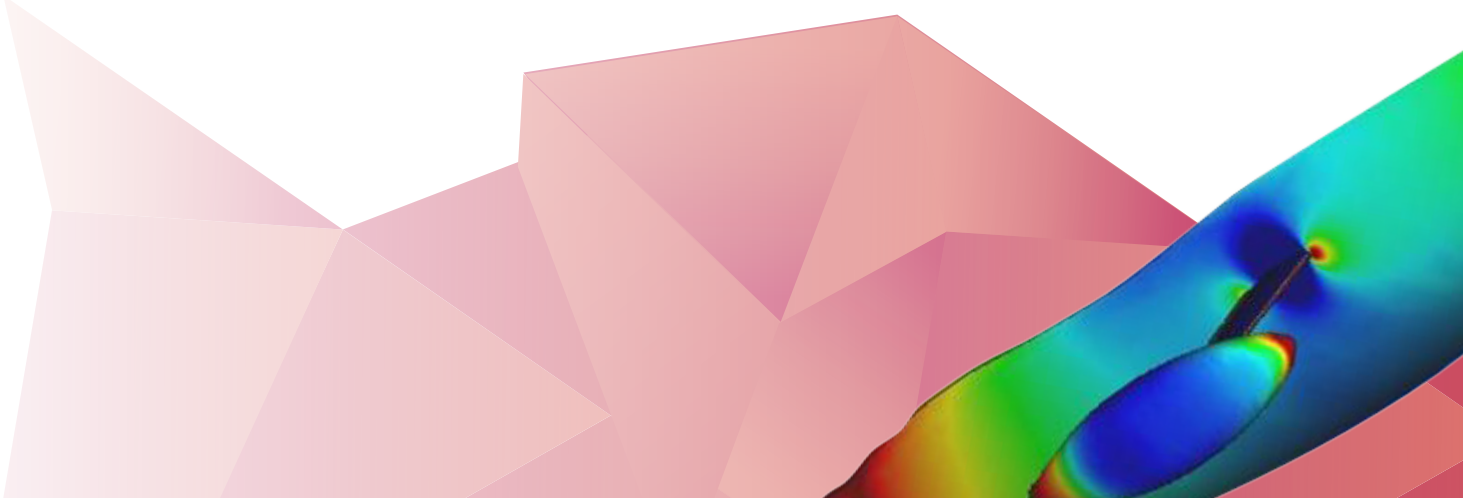
MIELE: Mediterranean Interoperability E-services for Logistics and Environment sustainability
TEN-T (Trans-European Transport Network)
RINA
01/09/2010 - 31/12/2013

T-CRAFT: SES Maneuvering and Skirt Seal Performance in Waves
ONR BAA
CIMNE
01/04/2010 - 31/03/2012

MOS4MOS: Monitoring and Operation Services for Motorways of the Sea.
TEN-T (Trans-European Transport Network)
VALENCIAPORT
21/03/2011 - 31/05/2012

AACC RESURGE: Retrofitting existing ships using reduced emissions green equipment
LIA2. Proy.I+D: Investigación Fundamental
CIMNE
01/01/2010 - 31/01/2013

TrainMoS: Training Motorways of the Sea
TEN-T (Trans-European Transport Network)
UPM
15/01/2012 - 15/10/2013



Technology Tranfer Services (TTS)

CIMNE TTS Group works on:

- Finite element method for analysis of sheet stamping processes.
- Finite element methods for analysis of mould filling, solidification and cooling in casting processes.
- Numerical methods for life predictions of manufactured parts.
- Optimum design methods for manufacturing processes in metal and plastic industry.
- Finite element methods for simulation of welding and riveting processes.
- Decision support systems in forming and manufacturing industries integrating wireless sensor networks, databases, computer simulation methods and AI technology (neuronal networks).
- Numerical methods for multidisciplinary problems in the manufacturing industry.

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Oscar Fruitós

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Mario Di Fonzo
Hector Gabriel Espinoza
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Alberto Férriz
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Jaume Miró
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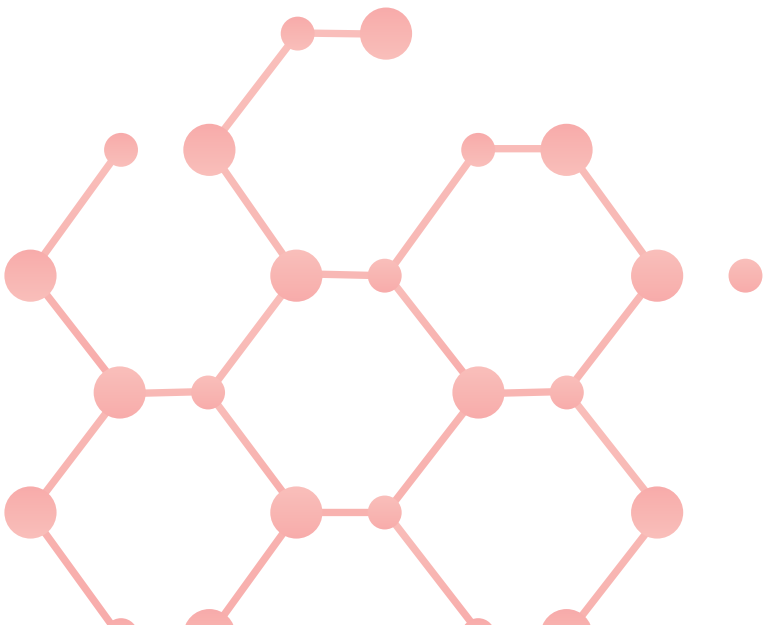
RTD PROJECTS

FER: Fabricació a Europa i regions d'interés

CONES
CIMNE
12/04/2011 - 11/10/2013

HYPERMEMBRANE: Development of an adaptable structure for architecture applications

FP7
CIMNE
01/09/2011 - 31/08/2013



Bio-Medical Engineering

The mission of the BioMedical Department of CIMNE is to create a fusion of engineering and the medicine that promotes scientific discovery and the development of new technologies and therapies through research and education. BioMedical Departament of CIMNE works in the areas listed below:

- Development of numerical methods for modelling and simulation of biomechanical and bio-medical engineering problems.
- Simulation of the mechanics of the cardiovascular system.
- Study of the mechanics of the urology system.
- Fluid-dynamic analysis of the blood flow in vessels.
- Decision support system in bio-medical engineering.
- Study of the heart mechanics.
- Biomedical signal
- Image processing

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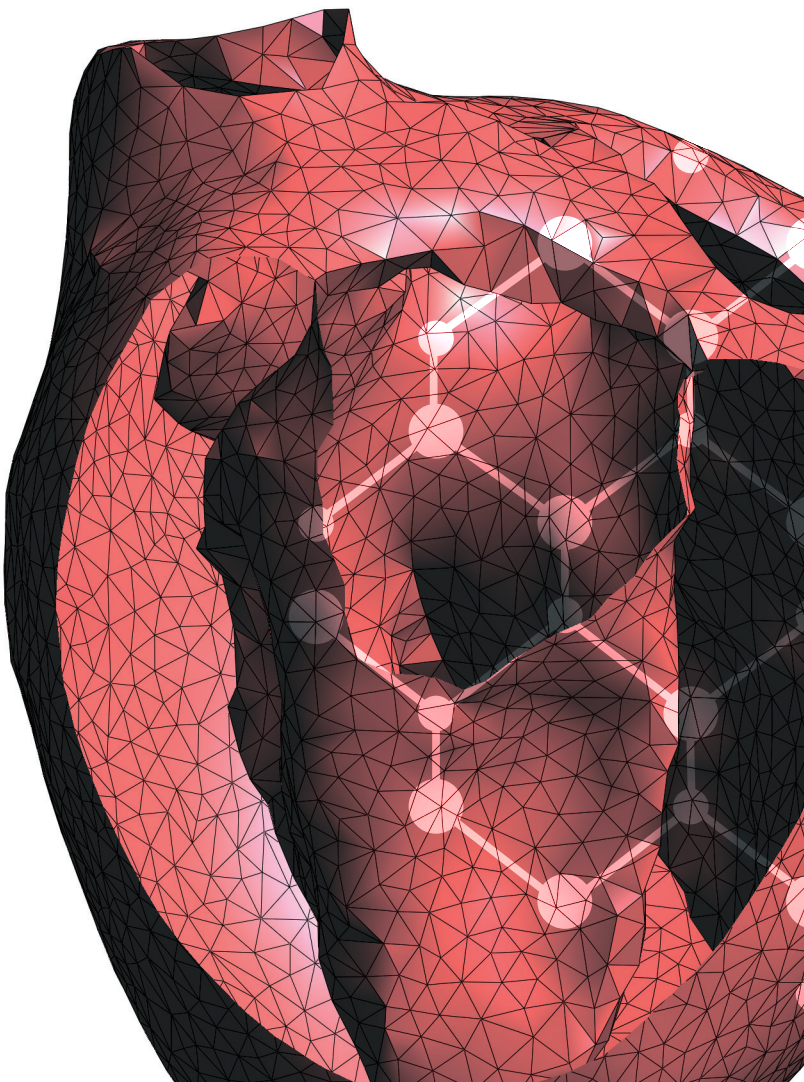
RTD PROJECTS

CHIRON: Cyclic and person-centric Health management: Integrated appRoach for hOme, mobile and clinical eNvironments
FP7-ARTEMIS-JU
FIMI
01/03/2010 - 30/11/2013

E-SCAFFOLD: e-Scaffold: Simulador para el diseño y desarrollo de andamios para la ingeniería de tejidos.
LIA2. Proy.I+D: Investigación Fundamental
IBEC
01/01/2012 - 31/12/2010



Socio-Economic Research

The Socio Economic Research group works in a range of scientific disciplines from information technology and finance to human behaviour, the social sciences, and humanities. The interest and focus is on financial capability, learning technologies, agent-based modelling, and systemic financial risk.

- *Financial capability:* We collaborate with our partners on conceptual work, lab and survey studies, and game development around financial education and financial behaviour. And we work on reaching key public decision makers with the results of our research and development activities.
- *Agent-based modelling of financial systems:* We conceptualise and develop network and agent-based models of financial systems. Our work focuses on methodology primarily, and we use model building and simulation of financial crisis episodes as a vehicle for that work.
- *Games, psychology, and finance:* We develop games for measuring psychological traits, and for learning cognitive and emotion skills. We collaborate with our partners to evaluate these games in lab experiments and in survey studies. Our exploratory work in this area aims to strengthen the link between psychology, pedagogy, and game design.
- *Systemic risk:* A practical aspect of our work in this area is to explore how systemic risk indicators affect market dynamics through mixed network and agent-based simulations, and hence links into our methodological work on agent-based models.

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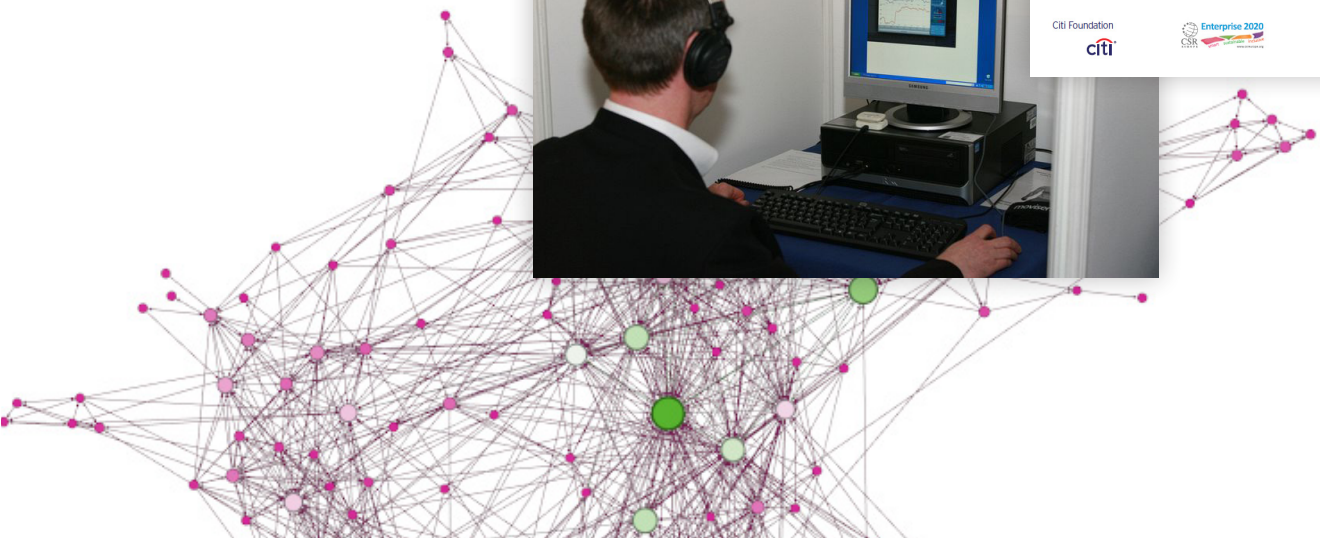


RTD PROJECTS

MATURE: Continuous Social Learning in Knowledge Networks

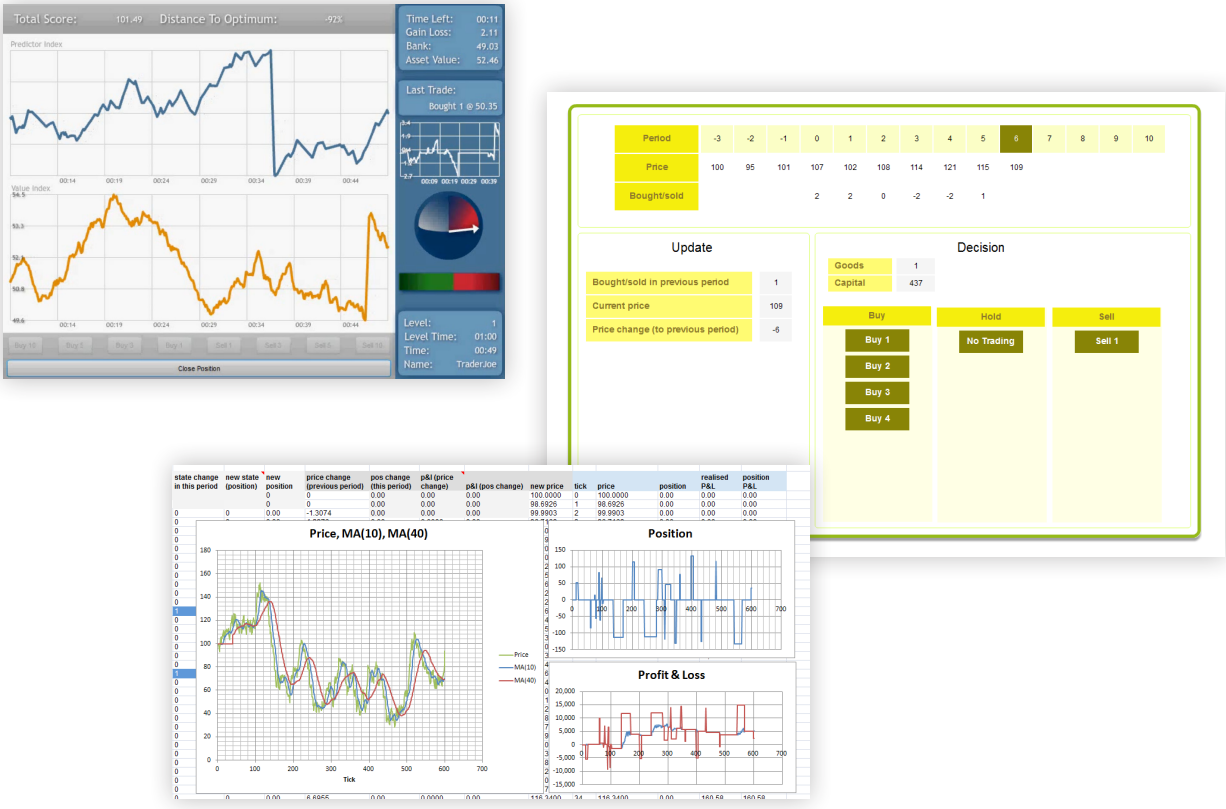
FP7
CIMNE
01/04/2008 - 31/05/2012

LAYERS: Learning Layers - Scaling up Technologies for Informal Learning in SME Clusters

FP7
CIMNE
01/11/2012 - 31/10/2016

xDELIA: Excellence in Public and Professional Decision Making: Boosting Deliberate Practice and Handling biases through inmersive cognitive and emotional reinforcement strategies & tools

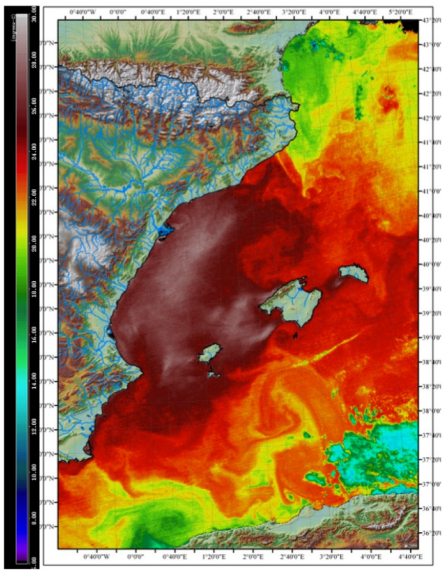
FP7
CIMNE
01/03/2009 - 31/05/2012



Natura

The main activity of CIMNE-Natura is to advance knowledge and technology in global environmental research by bringing together and managing skilled scientists and engineers to develop strategic and applied environmental solutions. The main RTD lines of the group are:

- Water desalination and purification
- Chemical methods for energy storage
- Climate adaptation
- Risk events studies



STAFF

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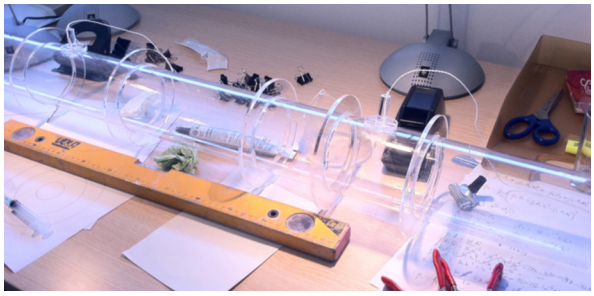
RTD PROJECTS

COLD STEAM: Desalination technology development.

Strategic project of CIMNE.
2011-2012.

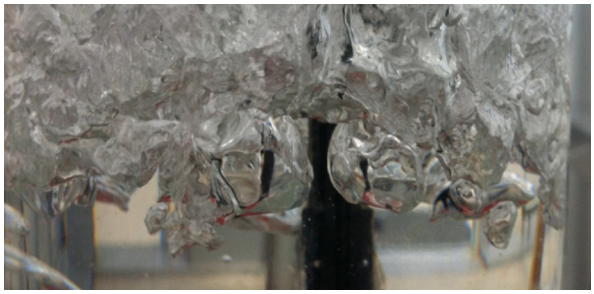


MCM-D3. Multipurpose compact multistage desalination device development.

Strategic project of CIMNE.
2012-2013.

JUST4ME: Just-in-time and just-for-me: hacia la autogestión del aprendizaje en un entorno personal ubicuo

Subprograma INNPACTO.
Ministerio de Ciencia e Innovación
2011-2013.



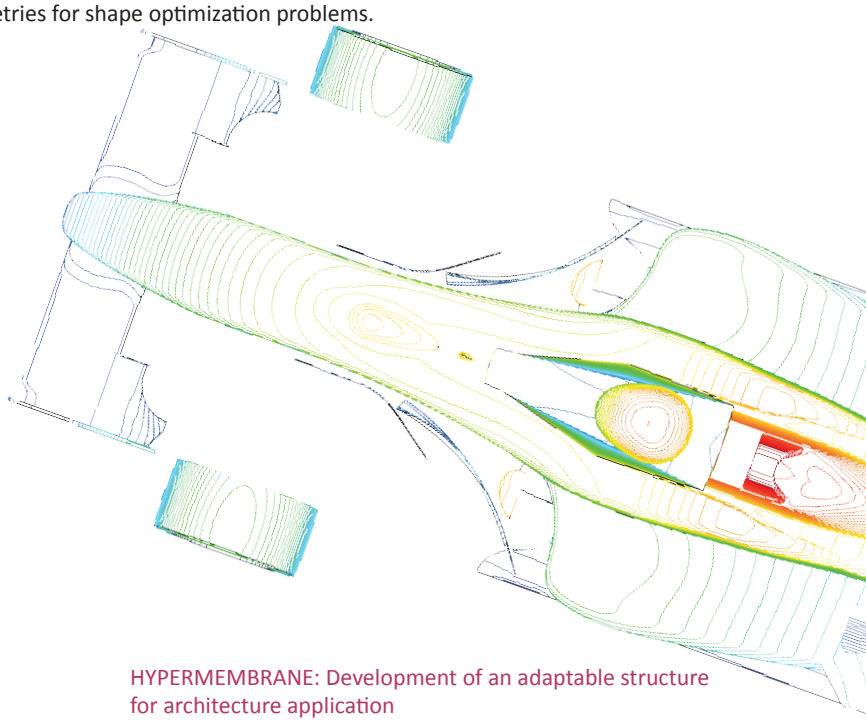
AIDMAR. Support System for the Investigation of Illegal Spills into the Marine Environment.

Ministerio de Ciencia e Innovación
2008-2012.

Pre and Post processing

The Pre and Postprocessing GiD department works on the develop advanced methods for efficient generation of data for numerical simulations and visualization of computational results. These are the main research lines:

- Development and maintenance of the GiD pre and post processing system (www.gidhome.com).
- Development of methods for generating structured and unstructured meshes.
- Development of input data technology for large scale computational problems.
- Graphical visualization techniques for large scale simulation problems.
- Generation of input data for finite element analysis from medical images.
- Integrations of geographical information systems (GIS) with pre and post processing tools and finite element analysis codes.
- Meshless methods for the parametrization of geometries for shape optimization problems.



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RTD PROJECTS

HIRF SE: High Intensity Radiated Field Synthetic Environment

FP7
ALENIA
01/12/2008 - 31/05/2013

CRESCENDO: Collaborative and Robust Engineering using Simulation Capability Enabling Next Design Optimisation

FP7
AIRBUS FRANCE
01/05/2009 - 31/10/2012

HYPERMEMBRANE: Development of an adaptable structure for architecture application

FP7
CIMNE
01/09/2011 - 31/08/2013

Information and Communication Technologies

This group is currently working on:

- Development of Internet tools for supporting management and training activities of individuals and organizations
- Methods for integrating and managing wireless sensors in Internet platforms.
- Development of health monitoring methods for constructions and buildings using wireless sensors and ICT.
- Development and integration of geographic informations tools into decision support systems.
- Development of decision support systems integrating wireless sensors, networks, data bases, info-mechanics systems, computer simulation methods and AI technology.
- Application of ICT to manufacturing processes in industry.

STAFF

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Francesc Jerez
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Ángel Diego Priegue
Alberto Tena
Sergio Valero
Claudio Zinggerling

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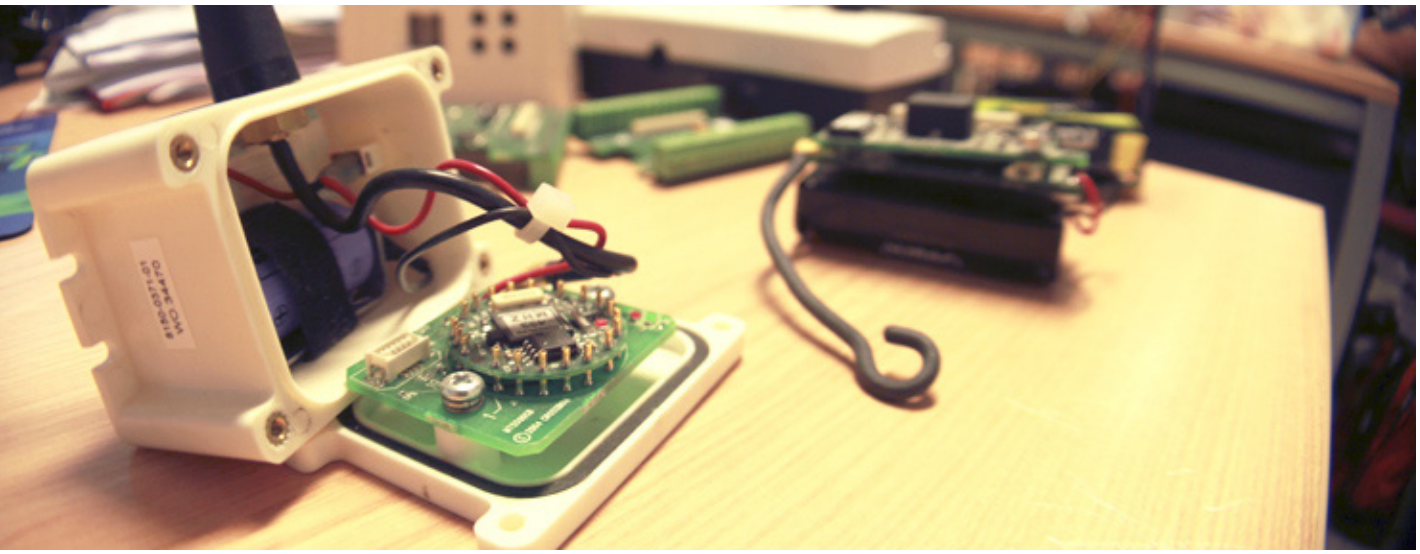


RTD PROJECTS

MATURE: Continuous Social Learning in Knowledge Networks
FP7
CIMNE
01/04/2008 - 31/05/2012

E-CAERO: European Collaborative Dissemination of Aeronautical research and applications
FP7
ECCOMAS
01/09/2009 - 31/10/2013

BESST: Breakthrough in European Ship and Shipbuilding Technologies
FP7
FINCANTIERI CANTIERI NAVALI IT., S.
01/09/2009 - 28/02/2013

CHIRON: Cyclic and person-centric Health management: Integrated appRoach for hOme, mobile and clinical eNvironments
FP7-ARTEMIS-JU
FIMI
01/03/2010 - 30/11/2013

DOTNAC: Development and optimization of THz NDI on aeronautics composite multi-layered structures
FP7
RMA
01/09/2010 - 31/08/2013

MIELE: Mediterranean Interoperability E-services for Logistics and Environment sustainability
TEN-T (Trans-European Transport Network)
RINA
01/09/2010 - 31/12/2013

DESURBS: Planning, (re)design and re(engineering) of urban areas to make them less vulnerable and more resilient to security threats
FP7
Resman
01/01/2011 - 30/12/2014

MOS4MOS: Monitoring and Operation Services for Motorways of the Sea.
TEN-T (Trans-European Transport Network)
VALENCIAPORT
21/03/2011 - 31/05/2012

NEUROLINGUA: Plataforma de estimulación y rehabilitación de las alteraciones del lenguaje basada en fundamentos de neurociencia cognitiva.
LIA6. Articulación e Internacionalización: Coop.Público-Privada
ICA
01/06/2011 - 31/12/2013

DYNACAR: Técnicas para el diseño dinámico de infraestructuras de carreteras
LIA6. Articulación e Internacionalización: Coop.Público-Privada
COPASA
01/10/2011 - 31/12/2013

CLOUD: Optimización de procesos de fabricación mediante aplicaciones cloud computing
LIA6. Articulación e Internacionalización: Coop.Público-Privada
QUANTECH
01/09/2011 - 01/08/2013

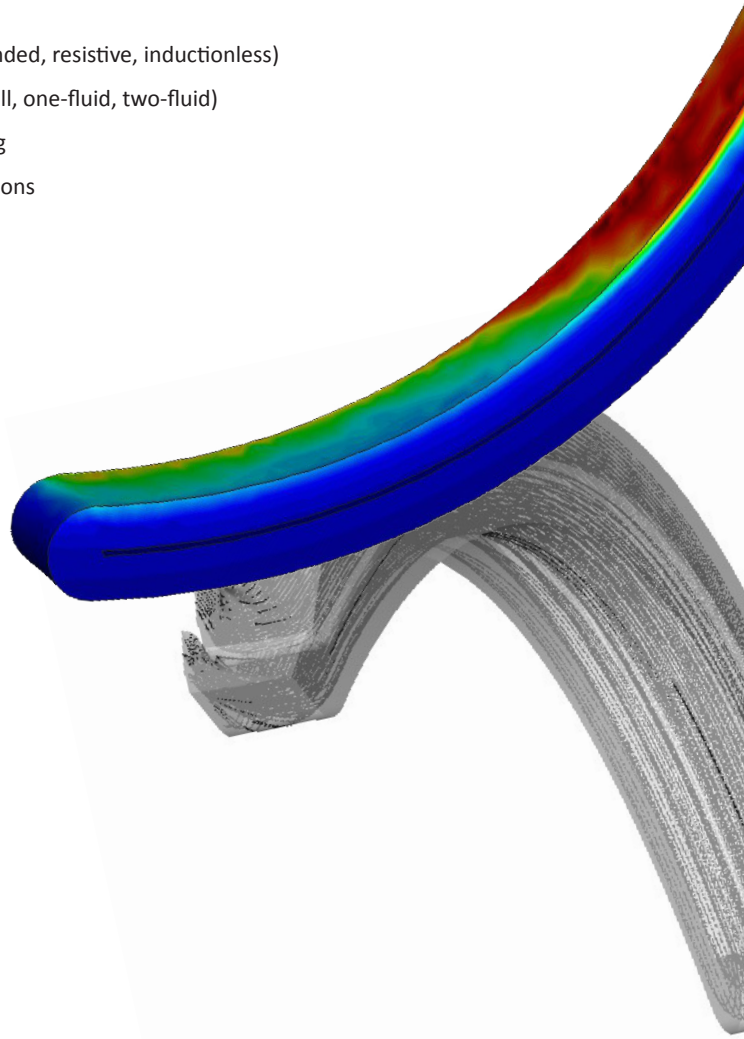
JUST4ME: Just-in-time and just-for-me: hacia la autogestión del aprendizaje en un entorno personal ubicuo
LIA6. Articulación e Internacionalización: Coop.Público-Privada
ICA
01/06/2011 - 31/12/2013

TrainMoS: Training Motorways of the Sea
TEN-T (Trans-European Transport Network)
UPM
15/01/2012 - 15/10/2013

Computational physics and large scale computing

These are the main research lines:

- New finite element formulations for magnetohydrodynamics (extended, resistive, inductionless)
- New finite element formulations for plasma physics (Vlasov-Maxwell, one-fluid, two-fluid)
- Scalable domain decomposition algorithms based on substructuring
- Physics-based preconditioning techniques for multiphysics applications
- High performance scientific computing



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Alba Hierro
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Ramón Planas
Ricardo Javier Principe

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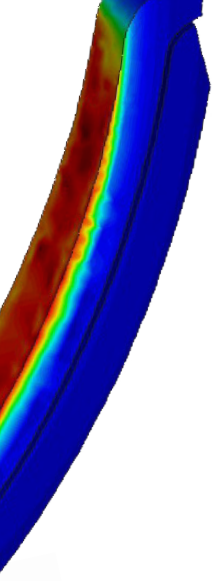
Tel: 93 4134108

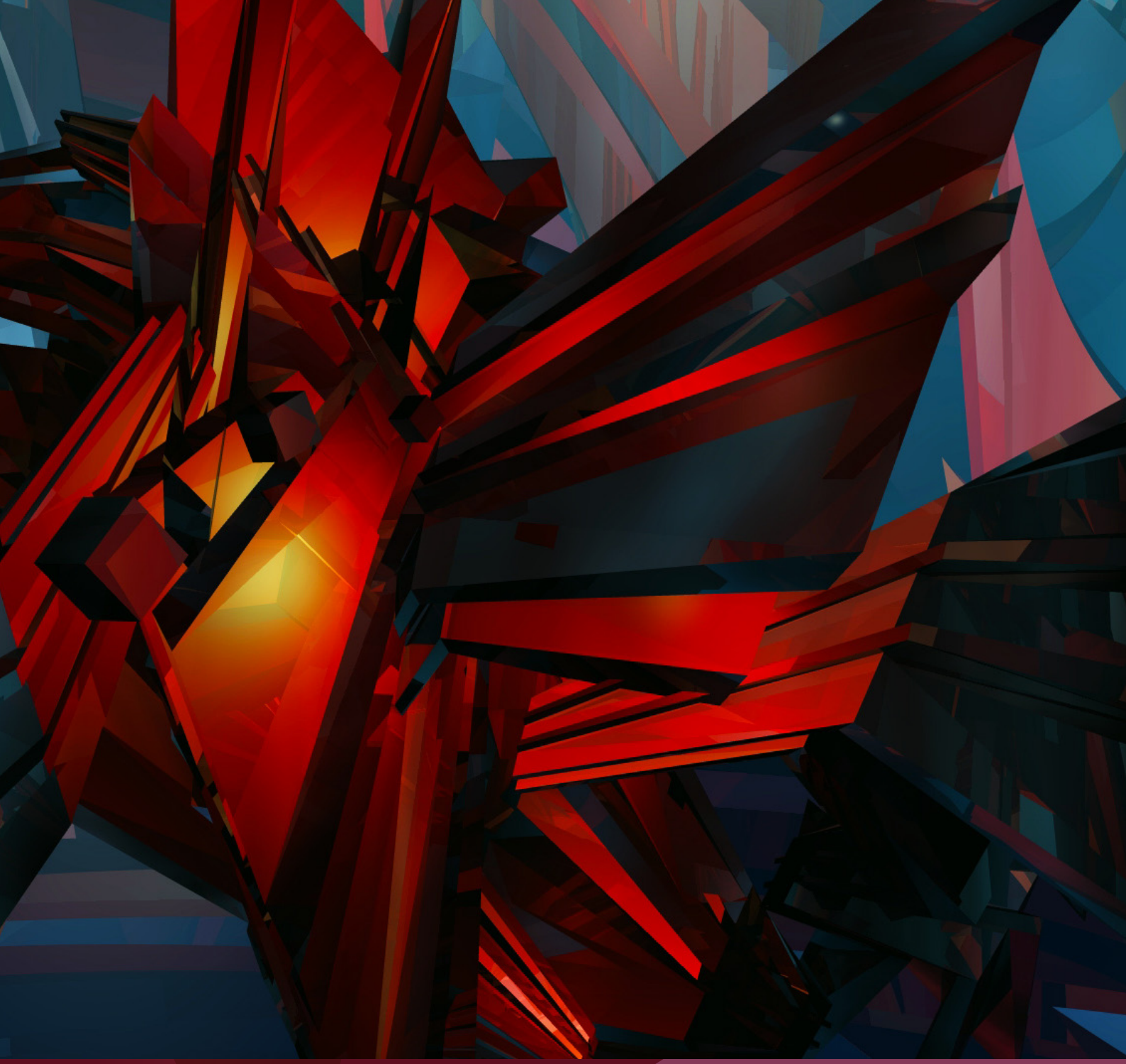
e-mail: sbadia@cimne.upc.edu

RTD PROJECTS

COMFUS Computational Methdos for Fusion Technology
FP7, Advanced Grant, ERC
CIMNE
01/01/2011 - 31/12/2015

FUSIM Herramientas computacionales para interacción solidometal líquido. Aplicación al diseño de módulos de ensayo de envoltura líquida
LIA2. Proy.I+D: Investigación Fundamental
CIMNE
01/01/2012 - 31/12/2014





INNOVATION AND TECHNOLOGY TRANSFER

CIMNE products

We describe below the products developed and marketed entirely by CIMNE or in collaboration with companies.

DECISION SUPPORT SYSTEMS

BEACHING

Information system for management of tourism activities in beach areas.

Developed by CIMNE and marketed by TAOC SA since 2011

www.beaching.com/

SIE

Information system for management of energy consumption in public buildings and municipalities.

Developed by CIMNE

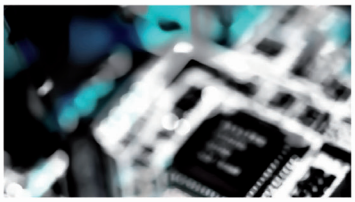
Marketed by Gassó Auditors SL and CIMNE since 2005

FLOOD

Artificial neuronal network package.

Developed by CIMNE

ROBOCOPT



Interpolated platform for robust optimization in engineering.

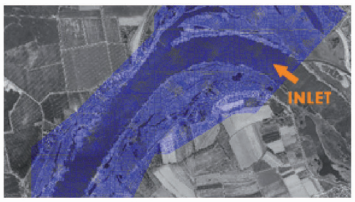
Developed by CIMNE

ROEM

Information system for assessment of the environmental quality in reservoirs and lakes.

Developed by CIMNE

RAMFLOOD

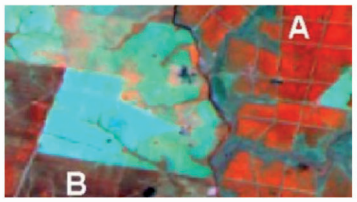


Decision support system (DSS) for risk assessment and managing of floods.

Developed by CIMNE and FLUMEN

www2.cimne.com/ramflood/

GIS+



Web-based interactive Geographic Information System.

Developed by CIMNE

ETESTING

Web-based platform for e-management of experimental tests.

Developed by CIMNE and Applus

WSNP

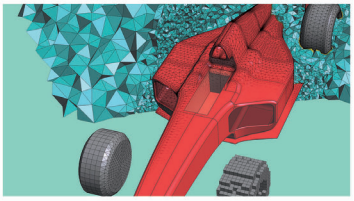
An integrated platform for e-monitoring using wireless sensor network technology.

Developed by CIMNE

www2.cimne.com/wsnp/

PRE AND POST PROCESSING SOFTWARE

GID

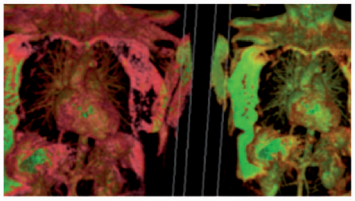


A universal and adaptive pre and postprocessor for computer simulation in engineering and applied science.

Developed and marketed by CIMNE since 1998

www.gidhome.com/

DIPPO

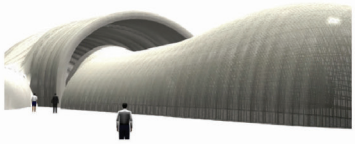


Digital image processing platform.

Developed and marketed by CIMNE since 2011

ENGINEERING SYSTEMS AND HARDWARE

Inflatable structures



Inflatable pavilions, shelters and bridges for applications in engineering and architecture.

Developed in cooperation with Building Ingenieria y Arquitectura SL and Tensairity Structures SL.

Marketed by BuildAir since 2002 (www.builair.com)

COLLABORATIVE WORK PLATFORMS

FRAKTALIS

Fully customizable Web application that creates virtual communities where users can communicate, share information and work collaboratively.

Developed and marketed by CIMNE since 2009

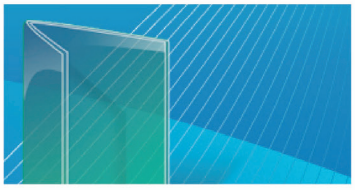
www.fraktalis.com/

Mi colegio en red (MCR)

Integrated communications and services management system for schools via the Internet.

Since 2000

SIGPRO



Integrated software platform for the management of the research and finantial activities and reports in RTD projects.

Developed by CIMNE

LHINGS

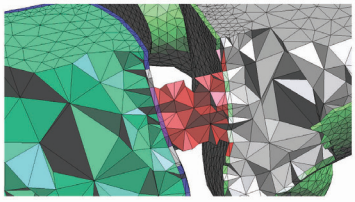
Lhings is a cloud platform designed to provide access and links to all kind of things and let users management, share and interact with those things anywhere and when they like.

Developed and marketed by Lyncos SL in cooperation with CIMNE

www.lhings.com

EDUCATIONAL SOFTWARE

SoftEducatiu



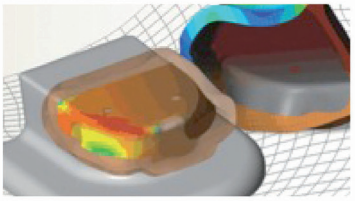
Educational software for interactive learning about structural design and finite element method

Developed and marketed by CIMNE

SIMULATION SOFTWARE

MANUFACTURING PROCESSES

STAMPACK

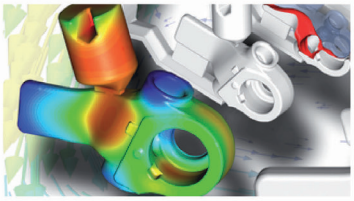


Sheet metal forming processes.
Developed by Quantech ATZ, SA. in cooperation with CIMNE.

Marketed by Quantech ATZ, SA since 1999

www.quantech.es

VULCAN



Casting and foundry processes.

Developed by Quantech ATZ, SA. in cooperation with CIMNE.

Marketed by Quantech ATZ, SA since 2001

www.quantech.es

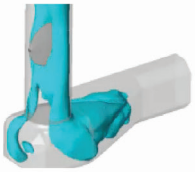
WELDPACK

Welding processes.

Developed by CIMNE

FLUID DYNAMICS

TDYN



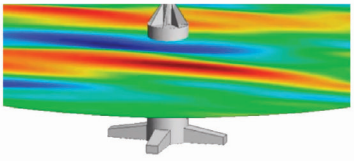
Finite element code for analysis of a wide range of multi-physics problems in engineering and applied science (fluid dynamics, heat transfer, fluid-structure interaction, etc.)

Developed by Compass Ingeniería y Sistemas, SA. in cooperation with CIMNE.

Marketed by Compass since 2003

www.compassis.com

SEAFEM



Hydrodynamics and seakeeping analysis of ships and marine structures.

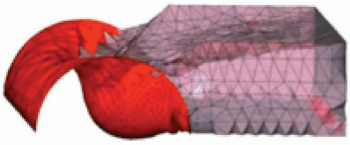
Application for wind tower generators in the sea.

Developed by Compass Ingeniería y Sistemas, SA. in cooperation with CIMNE.
Marketed by Compass since 2011

www.compassis.com

MULTI-PHYSICS

KRATOS



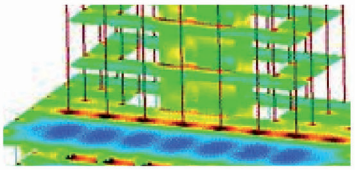
Kratos is an open object-oriented software platform for the development and application of finite element codes for multidisciplinary applications in engineering and applied science.

Developed by CIMNE

www.cimne.com/kratos

STRUCTURAL ENGINEERING

RAMSERIES



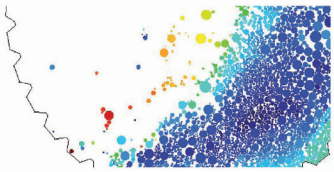
Finite element code for analysis of structures in engineering and architecture.

Developed by Compass Ingeniería y Sistemas, SA. in cooperation with CIMNE.

Marketed by Compass Ingeniería y Sistemas, SA. since 2003

www.compassis.com

DEMPACK

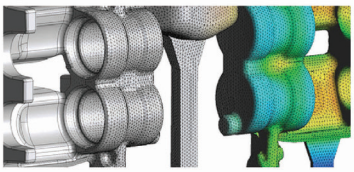


Analysis of granular systems and multifracturing problems in geomechanics and industrial processes using discrete and finite element methods.

Developed by CIMNE

www.cimne.com/dem

COMET



Finite element code for none linear analisys of thermomechanical problems in solid and structural mechanics acounting for frictional contact situations.

Developed at CIMNE

www.cimne.com/comet

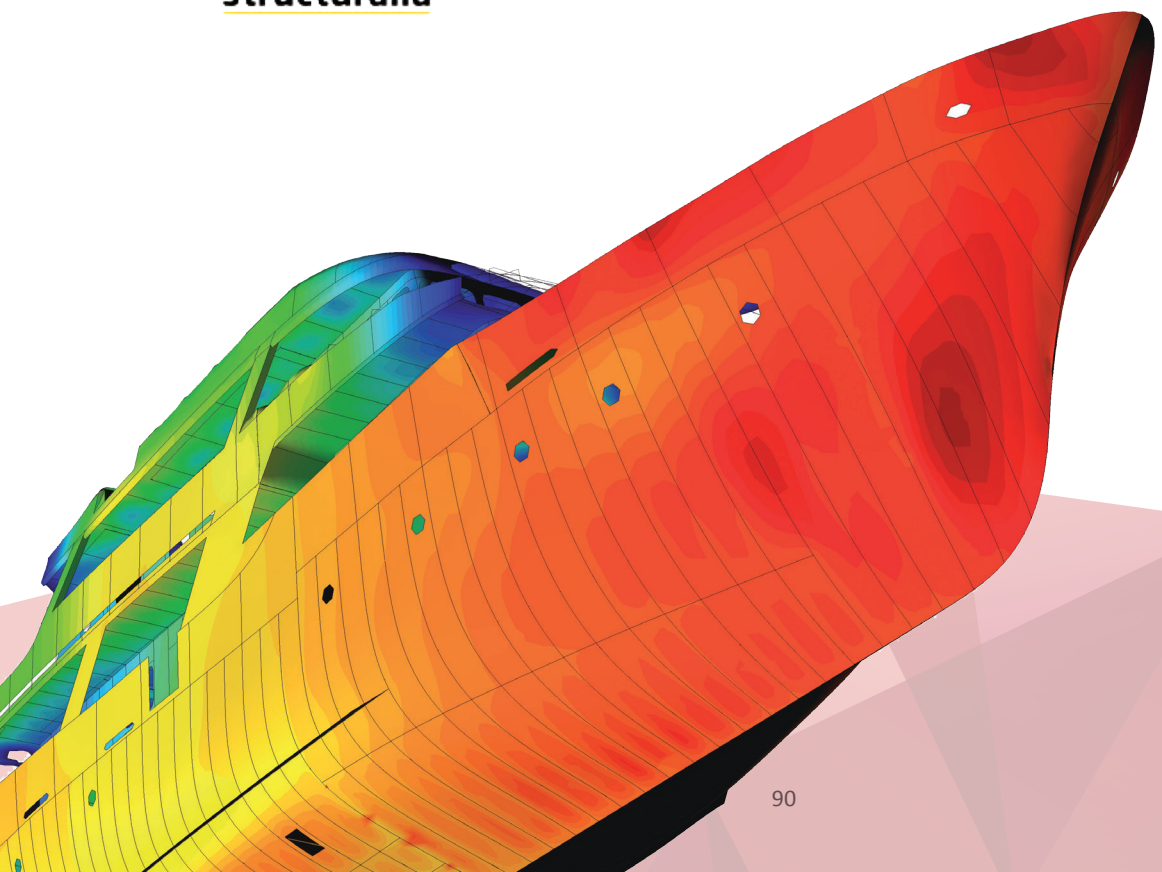
Spin-off companies

Companies promoted by CIMNE

INGENIA AIE *(Created in 2004) is a Group of Economic Interest formed by 8 companies and CIMNE. The objective of INGENIA is to promote the participation of its members in projects of industrial size in the aeronautics and space field in cooperation with the main international manufacturers in the sector. The partners in INGENIA are: Applus, Cimsa, Compass, CT Ingenieros, Prae Trade, Quantech ATZ, Rücker Lypsa, Solid Enginyeria and CIMNE. (www.ingenia.aero). CIMNE owns 12% of INGENIA AIE.*

COMPASS INGENIERÍA Y SISTEMA S.A. *(Created in 2002) The objective of COMPASS is to develop commercial activities in the application of numerical methods in engineering, with emphasis on civil, naval and maritime engineering. COMPASS offers design and analysis services in engineering, project management, specialized software systems for engineering design, innovative developments in engineering and advanced training courses. (www.compassis.com). CIMNE owns 24% of COMPASS.*

STRUCTURALIA S.A. *The objective of STRUCTURALIA is to develop training and consulting activities in civil engineering and construction sector via Internet. The company was sold in 2011 to the US company KAPLAN (The Washington Post Group).*



CIMNE TECNOLOGIA SA *is a company 100% owned by CIMNE aiming to industrialize and market the products and technology developed at CIMNE. CIMNE Tecnología SA is also an incubator and promoter of new companies. http://www.cimnetecnologia.com/ Created in 2011.*

TECNOLOGÍAS AVANZADAS PARA EL OCIO SL (TAOC) *is a company 100% owned by CIMNE Tecnologia SA. It specializes in the development and market of information systems for leisure sectors such as tourism and music. Created in 2012. (www.beaching.com)*

SERVICIOS ENERGÉTICOS AVANZADOS SA *is a company 100% owned by CIMNE Tecnología SA. It specializes in the development and marketing of services of software products for energy management of public and private buildings in urban areas. Created in 2012.*

BUILDAIR INGENIERIA Y ARQUITECTURA SA *is a company created in 2002 specialized in the development and marketing of inflatable structures for a wide range of applications in engineering and architecture. CIMNE Tecnología SA owns 5% of BUILDAIR (www.buildair.com).*

COMPUTATIONAL AND INFORMATION TECHNOLOGIES SA *is a company 100% owned by CIMNE Tecnología SA specialized in the development and application of computational methods and information technology systems in engineering and applied sciences. Created in 2012.*

LYNCOS SL *is a company specialized in the development, application and marketing of information and communication technologies and devices for a wide range of application in the Internet of Things sector. CIMNE TECNOLOGÍA SA owns 15% of LYNCOS SL. Created in 2012. (www.lhings.com)*

BUILDAIR APAC *is a subsidiary of Build AIR operating in the Asia-Pacific region from Singapore. CIMNE owns 20% of BUILDAIR APAC. Created in 2012. (www.buildair.com)*

INERGY (CIMNE-RMS GASSÓ SL) *was created in 2012. This company specializes in the marketing of services and products for energy management of buildings and urban areas. The company is 50% owned by CIMNE Tecnología SA. (www.inergybcn.com)*

CIMNE IN THE MEDIA

ENTREVISTA A JORDI CIPRIANO, DIRECTOR DE BEE-GROUP

"Si queremos que un edificio sea eficiente debemos hacer partícipe al usuario en sus sistemas de control y gestión energética"

Creado en 2001 por dos investigadores del Centro Internacional de Métodos Numéricos en Ingeniería (CIMNE), el *Building Energy and Environment* (BEE-Group) es un grupo de investigación especializado en desarrollar metodologías de análisis y optimización de consumos energéticos en edificios y entornos urbanos. En la actualidad cuenta con 16 investigadores, participa en 7 proyectos europeos y tiene una gran actividad de transferencia tecnológica hacia el sector público y privado.

-¿Qué les distingue como centro de investigación?
Por un lado nuestro método de trabajo, que combina datos reales con simulaciones, nuestra orientación hacia el mercado y nuestra autonomía. Nos caracterizamos por intentar estar un paso por delante en el análisis avanzado de todos los aspectos relacionados con la eficiencia energética de edificios. Aplicamos metodologías para la creación continuada de tecnologías de control y software de gestión de gran aplicabilidad en casos reales. Nuestra internacionalización también es un factor de distinción, tenemos presencia en Bolivia, con proyectos de Biodigestores y en Chile, con proyectos de formación en eficiencia energética.

-Ustedes tienen bases de datos e información sobre miles de edificios; ¿se están aplicando bien las medidas de ahorro energético?
Por lo general allí donde se aplican medidas bien diseñadas se están consiguiendo ahorros importantes. En los últimos años, se han gastado muchos recursos en instalaciones innovadoras y sofisticadas, pero no tanto en los sistemas de control y gestión de estas instalaciones. Muchas veces se ha confiado en la automatización completa de los sistemas sin tener en cuenta a los usuarios del edificio y eso a la larga ha generado rechazo, ineficiencias y la paradoja de que edificios muy nuevos consuman más que los antiguos. En la era de las redes sociales, existen muchas tecnologías TIC que permiten una interacción completa entre ocupantes y edificios. Estamos participando en diferentes proyectos Europeos (*Smart Spaces, eSESH, BECA, AIDA*), que tiene que ver con ello.

-¿En qué consisten?
Formamos parte de diferentes consorcios que están analizando alrededor de 600 edificios públicos y unas 10.000 vivien-

potenciales son menores, por lo que es necesario utilizar los medidores de las compañías.

-¿Y qué

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News

Advanced Grant Award for Prof. Xavier Oliver

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erc European Research Council

Advanced Grant Award
Prof. Xavier Oliver

Professor Xavier Oliver has been awarded this year an Advanced Grant of the European Research Council (ERC). This initiative of the IDEAS Programme of the European Commission funds distinguished researchers in Europe for developing an innovative and challenging project that can lead to results of high impact in any field of science and technology.

The Advanced Grants Programme of the ERC evaluates projects presented by individuals on the basis of three criteria: The project idea, the curriculum vitae of the proposer and the research environment where the project will be developed. The project of Prof. Oliver has been awarded with 2,4 million euro for a 5 year period. The project will be carried out at the International Center for Numerical Methods in Engineering (CIMNE) of the Technical University of Catalonia (UPC).

player.vimeo.com/video/52997980

Presentation of CIMNE Tecnogía by Eugenio Oñate
from CIMNE

http://player.vimeo.com/video/52997980 — E. Oñate talks about the creation of CIMNE Tecnología SA

ENTREVISTA CON DAVID PON, GERENTE DE INERGY

"Aplicando buenas prácticas en el consumo, podemos llegar a ahorros energéticos de hasta un 20% en edificios privados y públicos"

El equipo de INERGY (RSM GASSÓ CIMNE ENERGY S.L.), inicia su actividad en 2004, y ofrece servicios avanzados de consultoría energética, así como un software propio de gestión energética (SIE) pionero en el mercado desde el año 2005. INERGY controla el gasto energético de más de 23.000 puntos de consumo de edificios, cuadros de alumbrado e instalaciones de más de 200 organizaciones –públicas y privadas- con el SIE implantado. Entre éstas, más de 150 ayuntamientos españoles, que suponen alrededor de 2.000.000 de habitantes. David Pon es su gerente.

-¿Qué tipos de servicios ofrece INERGY?
Fundamentalmente, contabilidad y gestión de suministros energéticos de organizaciones, auditoria y optimización energética de edificios y de alumbrado público, gestión y control de contratos de servicios energéticos (ESE), y formación de gestores energéticos.

-¿Qué debe hacer una empresa o una administración que quiere reducir su gasto energético? ¿Cómo les ayudan?
Un primer paso es controlar que las facturas emitidas sean siempre correctas, mejorar las tarifas contratadas, y conocer cuánto y cómo consume la organización. Para ello, en nuestro caso, implantamos el SIE (Sistema de Información Energética), diseñado específicamente para la contabilidad, gestión y monitorización de suministros energéticos. También realizamos una diagnosis energética del edificio o instalación, que va desde una primera comparación con edificios similares de nuestra base de datos, hasta un análisis detallado de las instalaciones y sistemas.

-Y una vez conocido nuestro consumo ¿Qué debemos hacer?
El SIE nos da una visión general del consumo y la eficiencia energética. El siguiente paso es actuar mediante herramientas de gestión energética en aquellos edificios previamente priorizados, que nos permitirán obtener un mayor margen de mejora en poco tiempo.

-¿Como se realiza esa gestión energética?¿Cómo son esos mecanismos?
De forma integrada, combinando tecnología, gestión y comunicación con las personas vinculadas al edificio. Es lo que denominamos Gestión Integral Energética (GIE). Primero auditando la gestión energética del edificio y formulando protocolos de ahorro en el uso, regulación y mantenimiento, sin coste o de muy bajo coste. Segundo, mediante una formación y sensibilización de todos los agentes implicados (dirección, mantenimiento, trabajadores, usuarios, etc.). Por último, mediante la monitorización continua del consumo del edificio, que permite evaluar los resultados obtenidos y hacer seguimiento y definición de nuevas actuaciones. En algunos casos, esta monitorización se puede ampliar a una teleactuación sobre las instalaciones.

-¿Cuál es el margen de mejora?
Mayor del que nos imaginamos. A los pocos meses de la aplicación del SIE ya tenemos resultados que permiten ahorrar entre el 3% y el 10% de la factura. Al aplicar la solución integrada GIE, podemos hablar de ahorros de alrededor del 20% en el consumo energético en edificios públicos y privados. En definitiva, con los protocolos de actuación, ayudamos al cliente no haciendo cosas nuevas sino haciendo bien las de siempre, y por otro, orientamos en las inversiones más rentables a realizar.

-Hablaba usted de la monitorización del consumo y teleactuación…
No sólo es monitorización, es analizar la información y utilizarla para generar ahorro. Por otro lado, es incorporar la conducción energética de las instalaciones mediante la actuación remota.

Le pongo un ejemplo, según un estudio realizado recientemente, se han obtenido ahorros promedio de la factura energética de alrededor del 30% anual en las escuelas públicas de la ciudad de Girona, alcanzando hasta un 50% en alguno de los centros. Todo ello mediante la gestión de facturas con SIE, buenas prácticas en horarios de uso y la telegestión centralizada de los sistemas de calefacción por parte del ayuntamiento de la ciudad.

-¿Cuáles son los planes de futuro de INERGY?
Innovar e internacionalizarnos. En materia energética queda mucho camino por recorrer y surgen nuevos desafíos y oportunidades (la contratación ESE, la nueva Directiva europea relativa a Eficiencia energética, las Smart Cities,...). Nuestro reto es aportar nuevos servicios y herramientas TIC de gestión energética orientadas al ahorro y adaptadas a este escenario cambiante. Ahora lo hacemos en España y Chile, y en un futuro contamos poderlo hacer en otros puntos de Latinoamérica, Asia y Europa.

El nuevo software SIErGy

Próximamente, Inergy lanzará una nueva versión de la herramienta de información y gestión energética SIE, que integra en una sola plataforma datos de facturación y monitorización. Junto a las funciones de tratamiento y visualización de información habituales, el SIErGy aporta funciones avanzadas de análisis y gestión. Destacan el control de facturación, la simulación y optimización de tarifa, benchmarking avanzado, verificación de ahorros, facturación y seguimiento de actuaciones en contratos ESE, y la gestión de alarmas dinámicas y protocolos con el 'energy coach'. El software tiene un enfoque colaborativo y de integración con otras plataformas de telegestión, monitorización y mantenimiento existentes, adaptándose a aquello que ya disponga el cliente. La aplicación se dirige a gestores energéticos públicos y privados, así como a empresas de mantenimiento y ESE.

www.inergybcn.com

Víctor Castaño es el responsable de proyectos tecnológicos de la Unidad de Innovación del Hospital Clínico de Madrid. DL

INNOVACIÓN. SALUD EN EL MÓVIL

UN INGENIERO CREA EL PRIMER LABORATORIO DE APLICACIONES SANITARIAS PARA MÓVILES

Víctor Castaño ha creado el primer laboratorio de desarrollo de aplicaciones sanitarias para teléfonos móviles de última generación (sHealth Lab). Es el responsable de proyectos tecnológicos promovidos por la Unidad de Innovación del Hospital Clínico de Madrid.

NURIA GONZÁLEZ | LEÓN

■ Víctor Castaño Labajo es ingeniero de software, investigador y emprendedor especializado en aplicaciones para la salud. Tras terminar su carrera en la UL comenzó su actividad profesional ligado a la aeronáutica pero se ha decantado por la rama de la ingeniería de la salud. En la actualidad es el responsable de los proyectos tecnológicos nacionales y europeos promovi-

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