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## International Centre for Computer Methods in Engineering

CIMEC is located in Santa Fe, Argentina, and it is dedicated to the research and development of numerical methods applied to engineering sciences. The centre is part of INTEC, a technological institute at the National University of Litoral (UNL) and the National Council for Scientific and Technological Research of Argentina (CONICET). It began in 1981 and since has accomplished intensive research and development activity in the field of numerical methods in engineering.

***Figure 2.***
*Part of CIMEC staff. Today, 25 people including 8 doctorates*

CIMEC has and is participating in several International Joint Research Projects. For instance the International Centre for Numerical Methods in Engineering (CIMNE) of the Catalan Politechnic University, Barcelona, Spain; with the Laboratoire de Techniques Aeronautiques et Spatiales (LTAS) of the University of Liege, Belgium; with the Universite Pierre et Marie Curie, Paris, France; with the National Science Foundation, USA; with the University of Birmingham, U.K.; with the University of Graz, Austria; and with the Institute National de Recherche en Informatique et Automatique (INRIA), France. In this sense, CIMEC is willing to be partner in future International Joint Research Projects with well known institutions of all over the world.

***Figure 1.***
*Building where CIMEC is located at the Parque Tecnológico del Litoral Centro, Santa Fe, Argentina*

The main research areas are: naval hidrodynamics; surface and subsurface hydrology; nonlinear material modeling; combustion engines; mechanics of mechanisms; biomechanics; numerical methods; advanced programming (parallel computing, object oriented programming). Within current research projects under development, we can mention:

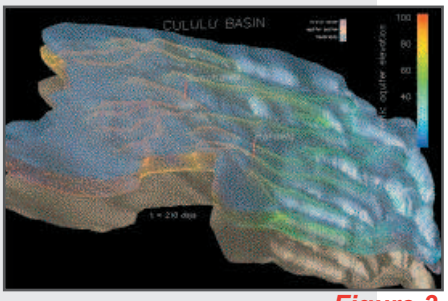


***Figure 3.***
*Model for the surface and subsurface hidrologycal flow in Santa Fe state.*

- **Meshless methods:** involving the development of new methods for computing solutions of partial differential equations on moving domains.
- **Modelling of surface and subsurface water flow:** numerical modelling of aquifer water balance coupled with surface streams (channels and rivers) involving several aquifers and layers per aquifer.
- **Modelling of processes in steel production:** development of methods and algorithms to accurately model: the multiphase flow inside metallurgical ladles, the solidification inside the continuous casting mould and the stress development during thermal cooling. The project involves the participation of Instituto Argentino de Siderurgia, which belongs to a consortium formed by the main argentine steel producers.
- **Methods for synthesis of aeronautical mechanisms:** the objective of this project is to build an integrated general-purpose software for the structural (type) and dimensional syntheses of mech anisms, starting from specification of functional requirements.
- **Parallel computing:** The flow shown around a car-like body has been obtained with a free CFD finite element code named PETSc-FEM that is being developed at CIMEC. This code runs on Beowulf clusters and can be downloaded for free (GPL license) and extended by coding new element routines. (http://www.cimec.org.ar/petscfem, http://www.cimec.org.ar/twiki/bin/view/Cimec/PETScFEMResults).

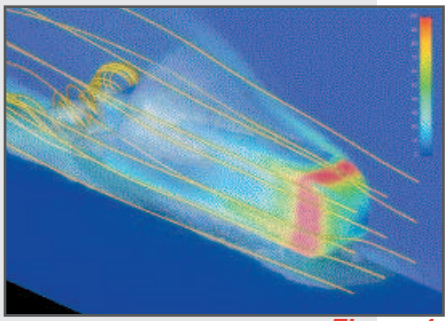

***Figure 4.***
*Flow around a car-like body*

**Web: http://www.cimec.org.ar**

# ENIEF '2003

## XIII Congress on Numerical Methods and their Applications

**Bahía Blanca, Argentina**
**November 4-7, 2003**

DEPARTMENT OF ENGINEERING
UNS

REGIONAL FACULTY OF BHAÍA BLANCA
UTN

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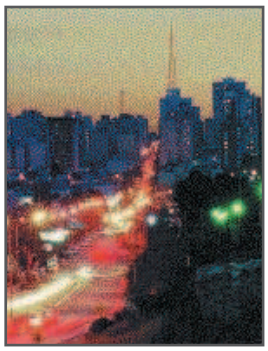

***Organized by:***
Department of Engineering, Universidad Nacional del Sur and Regional Faculty of Bahía Blanca, Universidad Tecnológica Nacional.

The Argentine Association for Computational Mechanics (AMCA) announces the XIII Congress on Numerical Methods and their Applications, ENIEF 2003. The congress is of interest for engineers, mathematicians, physicists, researchers, and other professionals who develop numerical methods or use them as part of their professional practice. The ENIEF meetings started in 1983 as the only national meeting of users and researchers of the Finite Element Method. The success that the meeting had in the computational mechanics community in Argentina and neighbouring countries promoted a sequence of periodic ENIEF events, which alternate with the national MECOM congress.

The topics to be covered in this congress are Fluid Mechanics, Heat Transfer, Solid Mechanics, Structural Analysis, Discrete Mathematics, Mesh Generation, Visualization, Software Development and Algorithms.

### *Invited Speakers:*

Dr. Gregory Kopp from University of Western Ontario, London, Canada. Dr. Rubens Sampaio from Pontificia Universidade Catolica do Rio do Janeiro, Brazil. Dr. Manuel Pastor Pérez from Universidad Politécnica de Madrid, España. Dr. Guillermo Creus from Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil. Dr. Antonio Huerta from Universidad Politécnica de Cataluña, Spain.

### Congress Location

Bahía Blanca is located in the southern part of Argentina. It is, with more than a quarter-million citizens, the second largest southernmost city in the world. It is Argentina's second busiest port. This is due to the proximity to agricultural activity. Bahía Blanca has important oil, gas and chemical industries and its port houses one of Argentina's largest naval bases. The climate is sub-tropical. The cultural and academic activity is remarkable, with two national universities as well as several colleges.

# The Centre for Industrial Research

In 1989 the TECHINT GROUP OF COMPANIES founded the nonprofit organization Fundación para el Desarrollo Tecnológico (FUDETEC), which houses the Center for Industrial Research (CINI) – the R&D center for the TECHINT steel industries. CINI is located in Campana (Argentina), a city 80 km north of Buenos Aires.

The objectives of CINI are to develop scientific and technological research supporting the steel companies of the TECHINT group in the fields of: development of new products and optimization of existing ones; development and optimization of production processes; and to provide research training to young engineers and scientists.

CINI is organized in four Departments and a specialized lab, named as follows: Materials & Corrosion Department, Computational Mechanics Department, Applied Physics Department, Mechanical Technology Department, Full Scale Testing Lab

Besides this departmental organization, CINI has structured three Technological Areas and each one coordinates the research activities that are focused on a given technology: Steelmaking Technology Area, Furnace Technology Area, Mechanics of Tubular Products Area

The CINI staff comprises 62 persons (as of September 2002): 11 with doctoral degrees granted by universities in Argentina and abroad.

To find out more, visit our web site at
**www.fudetec.com**

***Figure 1:*** *CINI Full Scale Testing Lab Premises*

***Figure 2:*** *CINI Office Building in Campana*