

Editorial

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At the dawn of this century, which many believe would be the most technologically far-reaching in the history of this planet, the discipline of computer modeling, which lies at the intersection of the bio-info-nano technologies, is poised to bring about revolutionary changes in our lives, in our society, and the world we live in.

Computer Modeling will be the core enabling-discipline for all technological & scientific advances that are yet to be made in this century. It involves a diverse set of research thrusts, in several focus areas, as for instance:

CMES “FOCUS DISCIPLINES”:

- a) **Contemporary Engineering, Physical, Chemical & Biological Sciences;**
- b) **Systems Integration through Computations; and**
- c) **Advanced Communications and Information Processing Technologies**

In each of the above disciplines, the following research thrusts can be identified.

Contemporary Engineering, Physical, Chemical & Biological Sciences:

- Aeroacoustic Impact Reduction for Human Factors
- Bionanotechnology
- Biomechanics
- Boundary Element Methods
- Combustion & Reactive Flows
- Composite Materials: Modeling, Fabrication and Processing
- Computational Biology
- Computational Chemistry
- Computational Electromagnetics
- Computational Penetration Mechanics

- Computational Structural Mechanics and High-performance Computing
- Finite Element Methods
- Prediction of Fatigue Life of Structures
- Finite Rotations in Beam, Plate and Shell Structures
- Flexible Multi Body Dynamics , Space Structures
- Fluid Flow & Heat Transfer
- Fluid-Structure Interactions
- Fracture and Damage Mechanics
- Homogenization & Computational Meso/Micro/Damage Mechanics
- Inverse Problems and Optimization
- Mesh Adaptation & Optimization for Engineering Applications
- Meshless Methods in Modeling
- Meshless Local Petrov-Galerkin (MLPG) Methods
- Molecular & Quantum Computing
- Modeling of Fabrics and Membranes
- Multi-scale (quantum-nano-micro-meso-macro) Modeling
- Multiphysics & Multibody Dynamics
- Nanomechanics
- Nanotechnology
- Optimization and Inverse Design Engineering
- Simulation of Fracture and Failure in Solids
- Stability and bifurcation
- Turbulence
- Turbomachinery
- Two-Phase Flows

Systems Integration through Computations:

- Computational Educational Engineering(real-time simulations in class-room instruction)
- Factory of the Future
- Flight Safety & Continued Airworthiness

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- Integrated Product and Process Design; Visualization and Virtual Reality
- Life-Cycle Costs
- Life Extension of Aging Infrastructure(Bridges, Aircraft, Railroads, etc)
- Machine Control
- MEMS & Semiconductor Technology
- Minimally Invasive Surgery Thru Computer Modeling
- Modeling of Smart Structures and Repairs
- Multidisciplinary Design and Optimization
- Navigation, Guidance & Control
- NEMS
- Nonlinear Dynamical Systems & Chaos
- Nonlinear System Control
- Optimal Design of Structures
- Rapid Prototyping & Minimization of Product-to-Market Costs

Advanced Communications and Information Processing Technologies:

- Computational Animation/ Entertainment
- Computational Electronic Packaging
- Computational Finance & Market Indicators
- Computational Intelligence and Advanced Information Technologies in Engineering Science
- Computational Mechanics for Electronic Devices/Components
- Data Mining
- Geographically Distributed Real Time Computing
- Informatics
- Large-scale data management
- Multi-media & entertainment
- Multiscale Simulations: Quantum-Molecular Dynamics-Meso-Macro Mechanics
- Parallel Computation for Visualization and Virtual Reality
- Real-Time Scientific Visualization
- Sensors & Actuators
- Symbolic Computer Programming in Computational Mechanics
- Visualization
- Virtual Reality

The goal of the International Journal, “CMES: Com-

puter Modeling in Engineering & Sciences” is to bring together researchers from the three general areas of: 1. Contemporary Engineering, Physical, Chemical and Biological Sciences, 2. Systems Integration Through Computations, and 3. Advanced Communications and Information Processing Technologies, to foster a stronger multi- & inter-disciplinary research for the advancement of computational modeling capabilities in the coming decades. This will be the unique role of “CMES: Computer Modeling in Engineering & Sciences” in the archival literature.

Also, Computer Modeling is expected to play a dominant role in Information technology, as the later discipline evolves in the coming decades. Information technology will depend not only on the hardware associated with computing, communications, large scale data-management, informatics, etc., but even more strongly on the software, whose core can be characterized as Computational Modeling as enumerated above.

These are the motivations that prompted the creation, in 2000, of “**CMES: Computer Modeling in Engineering & Sciences**”. As it enters its fourth year of publication, with Volume 4 and 6 issues in 2003, it is clear that CMES is well on its way to fulfill its mission.

Also, because of the ever-increasing flow of manuscripts, and a large back-log of papers in spite of very stringent review and acceptance procedures, CMES will be published *monthly, with 2 Volumes and 12 issues*, beginning January 2004.

To further facilitate the rapid review and acceptance procedures in CMES, several regional Associate Editors are being appointed, beginning January 2003. Authors may submit their manuscripts (3 copies) to a Regional Associate Editor in their geographical proximity. These Associate Editors are:

Professor Ferri M.H. Aliabadi, University of London, London (boundary element methods; structural integrity; biomechanics);

Professor Wen-Hwa Chen, National Tsinghua University, Hsinchu (Computational nanoengineering; Electronic packaging; meshless methods);

Professor Lothar Gaul, University of Stuttgart, Stuttgart (Acoustics, Boundary Element Methods, Structural Dynamics)

Professor Masanori Kikuchi, Tokyo Science University, Tokyo (Fracture Mechanics, Elastic-Plastic Frac-

ture, Damage Mechanics, and Numerical Simulation of Fracture.);

Professor Sung-Wan Lee, University of Maryland, College Park (Aerospace structures, Shell modeling, nonlinear structural analysis);

Professor Toshihisa Nishioka, Kobe University, Kobe (Crack and Fracture Problems, Impact Problems, Hybrid Methods);

Professor Padraic O'Donoghue, National University of Ireland, Galway (Boundary element methods);

Dr. A.M. Rajendran, Army Research Office, Research Triangle Park (Physics-based material modeling; high-performance computing; Contact, impact & penetration);

Dr. Ivatury S. Raju, NASA Langley, Hampton (Composite Materials: Modeling, Fabrication, and Processing; Computational Materials; Innovative and Nontraditional Mechanics Methods; Cradle-to-grave Simulations);

Professor Wei Shyy, University of Florida, Gainesville (Computational Fluid Dynamics; Nanotechnology; Heat transfer, Turbo machinery);

Dr. Deepak Srivastava, NASA Ames, Moffett Field (Computational nanoscience & nanotechnology; nanodevice modeling, carbon nanotubes);

Professor Antonio Tadeu, University of Coimbra, Coimbra (Boundary element methods; earthquake engineering; structural dynamics);

Professor Zhenhan Yao, Tsinghua University, Beijing (Boundary Element Method, Meshless Method and Computational Solid Mechanics)

The Associate Editors of CMES have kindly accepted complete responsibilities for handling the reviews on papers that are directly submitted to them, and make recommendations on the acceptability of the paper(s) for publication in CMES.

All the papers accepted for publication in CMES will also be invited for presentation at the annual ICCES Conferences (International Conference on Computational & Experimental Engineering & Sciences).

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