CURRICULUM Prof. FEDERICO CHELI

Federico CHELI was born in Parma on 29th September 1956, graduating in Mechanical Engineering in 1981 at the Politecnico di Milano (Italy).

In 1983 he was appointed Assistant Professor at the Mechanical Department of the Politecnico di Milano and became Associate Professor at the same University in 1992. In September 2000 he was appointed Full Professor at the Faculty of Engineering, Politecnico di Milano.

His scientific work was developed mainly in the field of the dynamics and the stability of mechanical systems applied to vehicles, to the dynamics of large structures, to the dynamics of rotors and to vibration problems of the machines. In greater detail, his research activities are concentrated on:

- research on the dynamic behaviour of large span suspension bridges due to the excitation of wind and passage of road and rail traffic;
- theoretical-experimental analysis on the dynamic performance of structures and tensioned cable;
- identification of the parameters of mechanical systems and their control;
- theoretical-experimental studies on the dynamic behaviour of rail vehicles (problems of stability and behaviour in curve);
- modelling and experimentation of the tyre and its interaction with the road vehicle;
- theoretical-experimental studies on the dynamic behaviour of road car in relation to the problems of performance, handling and comfort;
- applications of active control applied with (active suspension, differential active), to heavy vehicles (roll-over), to rail vehicles (intelligent tramway);
- studies on active and passive safety in rail and road vehicles;
- studies on aerodynamics of rail vehicles and on rubber;
- studies and design of hybrid/electrical vehicles (with the realization of prototypes).

His scientific work has resulted in more than 280 scientific publications, mostly published in international journals or presented in international congresses.

He is a member of the Editorial Board of the:

- Rivista Ingegneria Ferroviaria (CIFI, IT);
- International Journal of Vehicle performance, Interscience Publishers, (UK);
- International Journal of Vehicle systems modelling and testing, Interscience Publishers, (UK).

He is a reviewer of Journal of Mechanical Engineering Science, SAE International, Recent patent and engineering, Vehicle systems modelling and testing, International Journal of vehicle design, International Journal of vehicle structure and systems, Computer methods in applied mechanics and engineering, Journal of process mechanical engineering, Vehicle system dynamics, Journal of wind engineering and industrial aerodynamics, Journal of rail and rapid transit. He is the leader of the Road Vehicle Dynamics Research Group (RVD) of the Mechanical Department of the Politecnico di Milano.

He has been and continues to be responsible for a series of research contracts between Politecnico di Milano and companies such as Pirelli Tyres, Bridgestone, Centro Ricerche FIAT, Ferrari, Maserati, Fiat Auto for road vehicles and FIREMA transport, Lucchini, Ansaldo Breda, Alstom and Trenitalia, Italian railway network, ATM as regards rail vehicles.

He is member of:

- the Cirtras (Interdepartmental Centre of research on transport) of the Politecnico di Milano;
- the team appointed to the design of the new National Osmannoro Centre for the creation of an experimental centre of national railways;
- the Inter-University Centre for Research on Road Safety;
- the Council of Governors of L.I.R.A., Italian Laboratory of Research on equipment for passive safety under road traffic.

He has been an active participant in:

- the National Transportation Project 2 - sub-project Rail vehicles rolling stock for high-speed;
- the definition of the instructions for the Overload for the testing of rail bridges: instructions for the planning, implementation and the testing in the Joint Committee Fs, Italferr, Aicap, and Italian Universities;

- the UNI Commission for Vibrations on the definition of the legislation on the measure of dynamics of road and rail bridges: the GL1 Vibration of bridges and viaducts, technical Committee SC 2 - Vibrations transmitted to fixed structures" of the Vibration Committee;
- research activities developed within Italcertiferr.

He was/is the coordinator in National Research (PRIN) and Europeans Projects:

- national Coordinator of the National Project Co-financing MURST: The damage to the rail wheel contact Caused by the dynamic loads;
- coordinator for the University, the European Project Trows: Tyre and Road Wear Assessment;
- project coordinator for the University of the Vibramag Project;
- coordinator for the University of the European project Weather: Wind Alarm System for Early Evaluation of Terrestrial Transports Handling Risk ;
- responsible for the Spurt European Project: Seamless Public Urban Rail Transport.

He was invited to participate in the CEN of WG6 for the preparation of the European Standard on Evaluating crosswind effects on trains, where they were introduced some calculation methods developed by the research group (RVD).
He has been also involved in the European Research Project Aerodynamics in Open Air Research Project, part of the European Project DEUFRAKO.
On numerous occasions he has been selected by Universita' degli Studi di Padova, Politecnico di Milano Foundation and Cariparo Foundation to offer his expert valuation analysis on research funding.
He is a Professor of Vehicle Dynamics and Control and Dynamics of Mechanical Systems in the Mechanical Engineering Master of Science Course. He is also the coordinator and professor of teaching Dynamics of Multibody Systems in the Engineering Mechanics and Aerospace Engineering PhD Courses.
He is author of following textbooks:

- F. Cheli, G. Diana: Dynamics of Mechanical Systems, vol. 1 and 2, Polipress Milan, 2010
- F. Cheli, E. Pennestrì: Kinematics and dynamics of multi body systems, vol. 1 and 2, Casa Editrice Ambrosiana, 2009;
- F. Cheli, A. Manenti: Notes of hydrodynamic lubrication, Spiegel Edition, 1991

He is currently the Chairman of the Mechanical Engineering Course of the Faculty of Industrial Engineering at the Politecnico di Milano, and he is also a member of the Coordination Educational Committee of the University (OCD). He is a member of the

- board for the GMA (Group of Applied Mechanics);
- Kinematics and dynamics of multi-body systems research group of the Italian Association of Theoretical and Applied Mechanics (AIMETA).

Scientific Awards:

- Best Presentation Award, Symposium XIX IAVSD, "DYNAMICS OF VEHICLES on roads and tracks ":" A new methodology for vehicle sideslip angle identification: comparison with experimental data
- Best Paper That Addresses a Problem for Railway Vehicles, "Aerodynamic Forces Cross-Wind On Rail Vehicles: Wind Tunnel Experimental Tests and Numerical Dynamic Analysis", presented at the World Congress of Rail Research WCRR'03

On July 14th, 2010 he was appointed member of the Scientific Committee of the Fondazione Silvio Tronchetti Provera.
It is part of the Technical Committee of I-MEC (Enti Confindustriali Lombardi per l'Education).
On June 23th 2011 he was appointed correspondent member of the Institute Lombardo della Accademia di Scienze e Lettere (Italian Academy of Arts and Sciences, class of Mathematics and Natural Sciences, Engineering and Architecture)
He is member of the Education Commission of the Italian Coordination of Mechanical Engineering and member (November 2011) of the Board of Directors of the Foundation of the Polytechnic of Milan.

Milan, 31th October 2012

Federico Cheli

(prof. Federico Cheli)