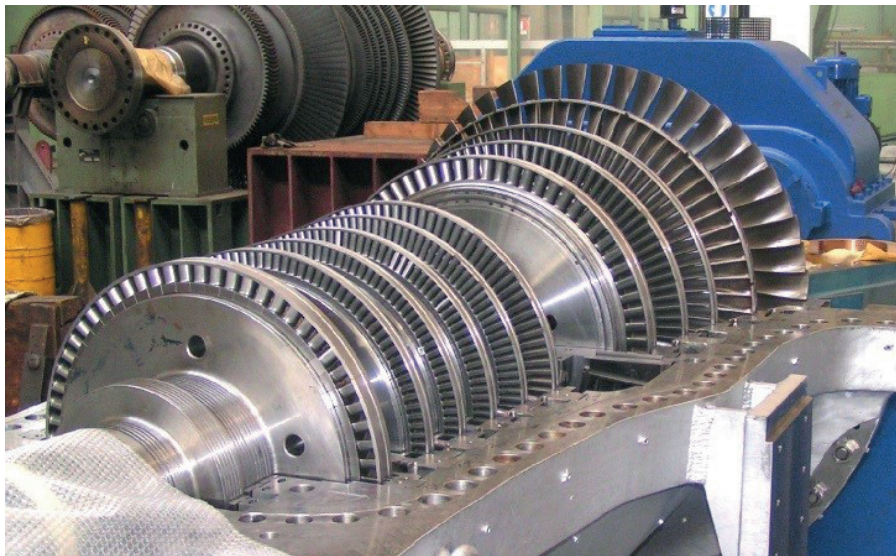


**COUPLING AND NONLINEAR INTERACTIONS  
IN ROTATING MACHINERY**

25 August – 27 August 2015  
Cité Internationale, Lyon, France

<http://573.euromech.org/>



Dear Colleagues,

It is our great pleasure to welcome you in Lyon for the **EUROMECH-Colloquium 573**, organized jointly with the **Congrès Français de Mécanique, CFM 2015**.

The development of more economical and safer societies requires to improve the means of transport and of energy production. Among these means, rotating machines hold a central place. To address these societal issues, it is then essential that the rotating machines technology be innovative and make progress on the following topics: performance, costs and noise reduction while continuing to maintain the components' reliability, durability and safety.

Thus, the purpose of this colloquium is to promote exchange in the rotor dynamic community around their most advanced research in coupling and nonlinear dynamics. The main objective is to have a state of the art in nonlinear numerical (or analytical) simulation (or analysis) tools applied in the field of rotating machinery associated or not with experiment. Concerning multi-physics coupling phenomena, it is mainly the aspects of stability and nonlinear behavior which will be developed.

We wish you a fruitful EUROMECH-Colloquium

*Prof. Fabrice Thouverez (Chair)*

*Prof. Paolo Pennacchi, Prof. Régis Dufour (Co-chairs)*

# Social Program

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## MONDAY 24TH, 2015

### ► 19:00 ► Cocktail

Welcome cocktail at the reception room of the City Hall, shared with the Congrès Français de Mécanique attendees.

City Hall: Historic monument situated between the two squares 'Place des Terreaux' and 'Place de la Comédie' in front of the Opera.

Address: 1 Place de la Comédie, 1<sup>er</sup> arrondissement (69001).

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## TUESDAY 25TH, 2015

### ► 20:00 ► Dinner banquet

Restaurant La Tassée 20 rue de la Charité 69002 LYON [www.latassee.fr](http://www.latassee.fr)

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# Scientific Program

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## TUESDAY AUGUST 25, 2015

### ► 08:30-09:15 ► Auditorium Pasteur - **Keynote 1**

08:30 - 09:15 › *G. Kerschen. University of Liège, Belgium*  
**Toward optimal design of nonlinear mechanical systems using bifurcation analysis**

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### ► 09:15-09:45 ► Coffee break

### ► 09:45-11:45 ► Room Saint Clair 5- **Session A** - Bearings and squeeze film

09:45 - 10:15 › *C. Baum, T. Leister and W. Seemann. KIT Karlsruhe, Germany.*  
**Foil air bearing rotor interaction - Bifurcation analysis of a Laval rotor**

10:15 - 10:45 › *K. Becker and W. Seemann. KIT Karlsruhe, Germany.*  
**A journal bearing with actively modified geometry for extending the parameter-based stability range of rotor dynamic systems**

10:45 - 11:15 › *J. Rebufa, E. Le Guyadec, D. Mazuyer and F. Thouverez. Ecole Centrale de Lyon and CEA-DTEC, France.*  
**Vibration analysis of rotating shaft on textured hydrodynamic journal bearings**

11:15 - 11:45 › *N. Bachschmid, D. Colombo and A. Monterisi. Politecnico di Milano and Turboden Srl, Italy.*  
**Controlling non-linear axial vibrations of a turbine rotor**

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### ► 11:45-12:15 ► Discussions - CFM posters (Roseraie Level)

### ► 12:15-13:30 ► Lunch

### ► 13:30-15:30 ► Room Saint Clair 5 - **Session B** - Rotor-stator interaction, seals and casing effects

13:30 - 14:00 › *B. Andreev, F. Thouverez, A. M. Gouskov and L. Blanc. Ecole Centrale de Lyon, France and BMSTU, Russia.*  
**Modified single-control volume model for labyrinth seal: application for stability study of a rotor/stator interaction**

14:00 - 14:30 › *K. Du, A. O. Pugachev, Y. Li and Y. Wang. Tsinghua University, China and TU Munchen, Germany.*  
**Coupled analysis of non-contacting profiled finger seals taking into account friction effects**

14:30 - 15:00 › *A. Batailly, M. Legrand and C. Pierre. Université McGill, Canada and University of Illinois at Urbana-Champaign, USA.*  
**Full 3D rotor/stator interaction simulations in aircraft engines with time dependent angular speed**

15:00 - 15:30 › *L. Salles, C. Peng and C. Schwingshackl. Imperial College London and Rolls-Royce plc., UK.*  
**Analysis of blade-tip casing interaction using harmonic balance method**

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▶ 15:30-16:00 ▶ **Coffee break**

▶ 16:00-17:00 ▶ **Room Saint Clair 5 - Session C - FSI**

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16:00 - 16:30 > *A. Cadel, F. Thouverez, G. Ngo Boum, L. Blanc and M-O. Parent. SAFRAN Snecma and Ecole Centrale de Lyon, France.*  
**Computing fluid-structure interaction problem with coupled spectral methods**

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16:30 - 17:00 > *A. Combesure, Z. Li, J. C. Marongiu and J. Nunez-Ramirez. INSA-LYON, Ecole Centrale de Lyon and ANDRITZ-HYDRO, France.*  
**Energy controlled non-intrusive code coupling for dynamic fluid structure failure**

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**WEDNESDAY AUGUST 26, 2015**

▶ 08:30-09:15 ▶ **Auditorium Pasteur - Keynote 2**

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08:30 - 09:15 > *D. Ewins. Imperial College London and University of Bristol, UK.*  
**A brief history of coupling and nonlinearity in the vibration of rotating machines (1965-2015)**

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▶ 09:15-09:45 ▶ **Coffee break**

▶ 09:45-11:45 ▶ **Room Saint Clair 5 - Session D Bladed disks dynamics, mistuning, reduction methods**

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09:45 - 10:15 > *A. Grolet, N. Hoffmann and C. Schwingshackl. Imperial College London, UK.*  
**Solitons in non-linear cyclic system**

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10:15 - 10:45 > *M. Mitra, S. Zucca and B.I. Epureanu. University of Michigan, USA and Politecnico di Torino, Italy.*  
**A novel reduction technique for blisks with contact interfaces in microslip**

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10:45 - 11:15 > *S. Tatzko, L. Panning von Scheidt and J. Wallaschek. Leibniz Universität Hannover, Germany.*  
**Forced response of turbine bladings with alternating mistuning and friction damper coupling**

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11:15 - 11:45 > *E. Capiez-Lernout, C. Soize and M. Mbaye. MSME and SAFRAN Turbomeca, France.*  
**Nonlinear geometric analysis of a mistuned bladed disk**

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▶ 11:45-12:15 ▶ **Discussions - CFM posters (Roseaie Level)**

▶ 12:15-13:30 ▶ **Lunch**

▶ 13:30-15:00 ▶ **Room Saint Clair 5 - Session E Rotor dynamics, transient effects, balancing issues**

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13:30 - 14:00 > *L. Xie, S. Baguet, B. Prabel and R. Dufour. INSA-Lyon, CEA-Saclay and Université Paris Saclay, France.*  
**Parametric analysis of the nonlinear behavior of rotating structures**

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14:00 - 14:30 > *F. Georgiades. University of Lincoln, UK.*  
**Towards the determination of a nonlinear Campbell diagram of a spinning shaft with non constant rotating speed**

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14:30 - 15:00 > *A. C. Jarroux, R. Dufour, J. Mahfoud, B. Defoy and T. Alban. Thermodyn, GE Oil & Gas and INSA-Lyon, France.*  
**Parametric analysis of a rigid rotor drop onto touchdown bearings**

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▶ 15:00-15:30 ▶ **Coffee break**

▶ 15:30-17:00 ▶ **Room Saint Clair 1 - Session F Rotor dynamics, cracks detection, shaft coupling**

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15:30 - 16:00 > *A. A. Cavalini Jr, D. S. Rabelo, D. D. Oliveira, R. M. Finzi Neto and V. Steffen Jr. Federal University of Uberlândia, Brazil.*  
**Improved fault detection in a rotating shaft by using the electromechanical impedance method**

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16:00 - 16:30 > *Z. Racic and M. Racic. ZR Consulting, USA.*  
**Avoiding nonlinear responses of turbine-generator rotors in practice**

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16:30 - 17:00 > *A. Lucas Total E&P, France.*  
**Electric Driven Centrifugal Compressor - Super-Synchronous Vibrations on High Speed Shaft Line**

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