FIRST INTERNATIONAL NONLINEAR DYNAMICS CONFERENCE

NODYCON 2019 PROGRAM

Edited by

The NODYCON 2019 Program Committee

Department of Structural and Geotechnical Engineering

Sapienza University of Rome

First International Nonlinear Dynamics Conference Program, Rome, Italy, February 17-20, 2019

INSTITUTIONAL SPONSORS

Under the Auspices of
the City of Rome Council

SPONSORS

INFORMATION FOR CONFERENCE PARTICIPANTS

PRESENTATION GUIDELINES

Authors who present their work at technical sessions are expected to use the Conference laptops for their presentation. Each session room will be equipped with a projector with VGA or HDMI cables and a wireless presenter with laser pointer. Authors will be invited to upload their presentations through the dedicated web portal at www.nodycon2019.org. Prior to the session begins, authors are expected to check that their presentation is properly projected. Contributed presentations are 13-minute presentations plus 2 minutes for Q&A (15 mins). Please make sure that all presentations do not exceed these time limits. Plenary talks are 40-minute presentations plus 5 minutes for Q&A (45 mins).

POSTER GUIDELINES

For the Poster session, standard A0 posters in a free template are expected to be on display on the day of the Poster session. The presenting author is supposed to be available during the Poster session for Q&A.

NODYCON 2019 APP

An APP developed for iOS/Android ready for free download through Apple/Google stores will display the stream of conference news, the conference program with real-time updates, a tool to customize your conference agenda, maps for the conference rooms, likes on the talks/sessions, and the participants list. A few sample screenshots are shown below.
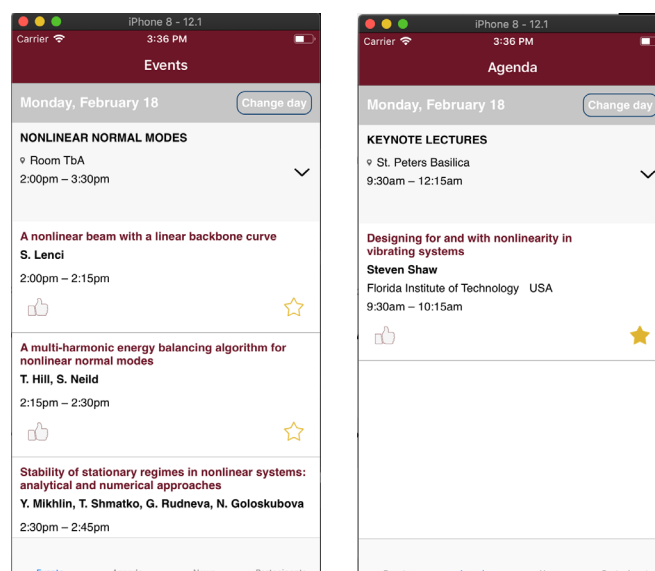
ALI H. NAYFEH PRIZES

Springer sponsored prizes, named the ALI H. NAYFEH Prizes, in honor of Nonlinear Dynamics's founding editor, the late Professor Ali H. Nayfeh, will be awarded for the best papers presented by graduate students and postdocs at the conference.

The Award ceremony is held during the Conference banquet at Brancaccio Palace, February 19, 2019. The prize for the first place is $500, for the second place $400, and for the third place $300. The Award Committee members decided on the awards based on the quality of the written paper using the criteria of novelty, achievement, and potential impact. Some of the papers were submitted to the NODYCON 2019 Special Issue of Nonlinear Dynamics and others to the NODYCON2019 Springer Proceedings.

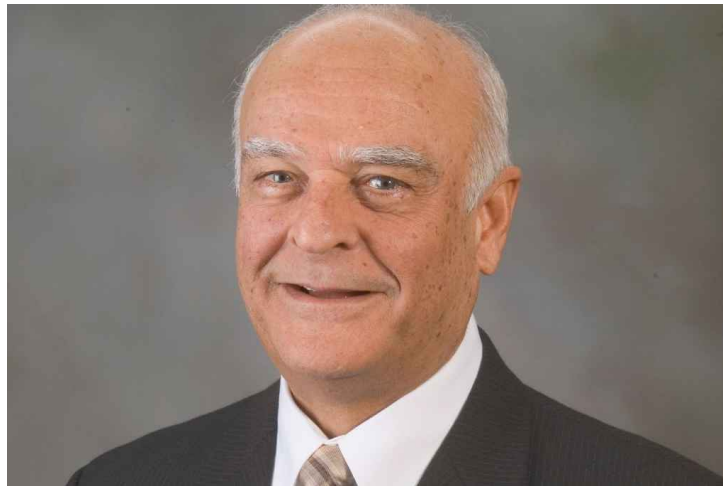For the 2019 Prizes, the Award Committee members are:

Prof. Muhammad Hajj (Stevens Institute of Technology, NJ, USA)

Prof. Stefano Lenci (Polytechnic University of Marche, Italy)

Prof. Hiroshi Yabuno (University of Tsukuba, Japan).

Professor Ali H. Nayfeh

Professor Emeritus of Nonlinear Dynamics

21 December 1933 – 27 March 2017

CONFERENCE SITES

ST. PETER IN CHAINS BASILICA – FEBRUARY 18, 2019

OPENING CEREMONY. The opening ceremony with a tribute to Prof. Nayfeh and the keynote lectures are held at St. Peter in Chains Basilica. The opening ceremony ends with a concert of the **Sapienza MuSa String Quartet.**

FACULTY OF ENGINEERING – FEBRUARY 17 - 20, 2019

WELCOME RECEPTION & TECHNICAL SESSIONS. The technical sessions of the Conference are held at the Faculty of Engineering in a historical building downtown Rome, a few steps away from the Colosseum and the Forum sites.

Social Program

The social activities offered to all NODYCON 2019 attendees are the Welcome reception of February 17 and the Capitoline Museums tour of February 18.

SUNDAY – February 17, 2019	
5:00pm - 7:30pm	**Welcome Reception**

MONDAY – February 18, 2019	
11:00am - 2:00pm	Interactive cooking show/lunch
6:00pm - 7:30pm	**Capitoline Museums Tour**

TUESDAY – February 19, 2019	
9:00am - 12:30pm	Vatican Tour
7:00pm - 10:00pm	**Banquet at Palazzo Brancaccio**

WEDNESDAY – February 20, 2019	
9:30am - 11:00am	Domus Romane, Palazzo Valentini

CAPITOLINE MUSEUMS TOUR – FEBRUARY 18, 2019

The conference attendees in groups of 30 are guided by the NODYCON staff members to the Capitoline Hill (the estimated walking time is 20 minutes). The guided tour with English speaking guides lasts about 90 minutes and feature the masterpieces of Roman art. Whisper radio tour systems are provided to each attendee.

Located at the Capitoline Hill, the Capitoline Museums are the world's oldest public museums. The collection of classical sculpture is one of the finest of Italy, boasting works such as the iconic *Lupa Capitolina* (Capitoline Wolf), and the *Galata morente* (Dying Gaul) as well as a formidable gallery with masterpieces by the likes of Titian, Tintoretto, Rubens and Caravaggio.

BANQUET AT BRANCACCIO PALACE– FEBRUARY 19, 2019

The Banquet consists of a welcome cocktail followed by a four-course dinner. During the dinner the Ali H. Nayfeh Prizes ceremony is held. An open bar is available until 10:00 pm. Entertainment is offered during the banquet by the Sapienza MuSa Jazz Band.

Brancaccio Palace is the last Palace of the Roman Patrician built in 1880 in the heart of the eternal city by the will of Prince Salvatore Brancaccio, descendant of one of the most ancient and illustrious families of the Neapolitan patriciate, and of his wife Mary Elisabeth Field, rich American heiress. The building today is one of the most beautiful luxury locations in Rome.

INTERACTIVE COOKING SHOW – FEBRUARY 18, 2019

The gastronomy of Italy is one of the best in the world. Some of the key secrets of Italian regional cooking are taught by Chefs Blancs from Rome's famous cooking school. At the end of the demonstration participants can enjoy a sit-down lunch of the 3 dishes they have learned to cook. Dessert is on the house. Each participant will receive a handout and apron with the logo of the school.

Approximate duration: 3 h
The place: Via dei Monti Della Farnesina, 77

VATICAN TOUR – FEBRUARY 19, 2019

A complete Vatican Museums tour including the Sistine Chapel visit and guided St. Peter's Basilica tour is available for attendees and accompanying persons. The tour ensures that everyone gets inside the Basilica (not to mention skip the lines!) with an expert guide to enjoy all the treasures the Vatican City has to offer.

Approximate duration: 3 h
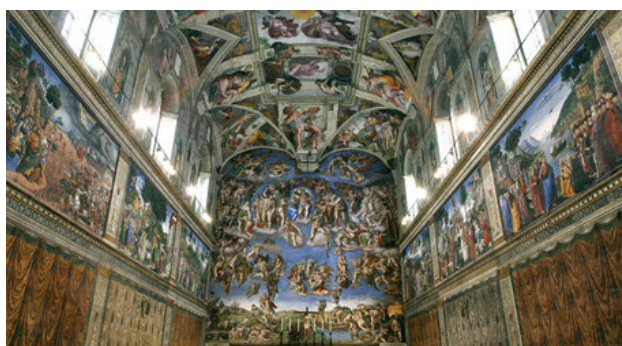
DOMUS ROMANE - PALAZZO VALENTINI – FEBRUARY 20, 2019

With the special Augmented Reality tour of the magnificent Domus Romane, a travel through thousands of years of history is designed to discover what it was really like in the third century. Incredible visuals and live projections bring the remains of these Roman buildings to life.

Approximate duration: 1.5 h
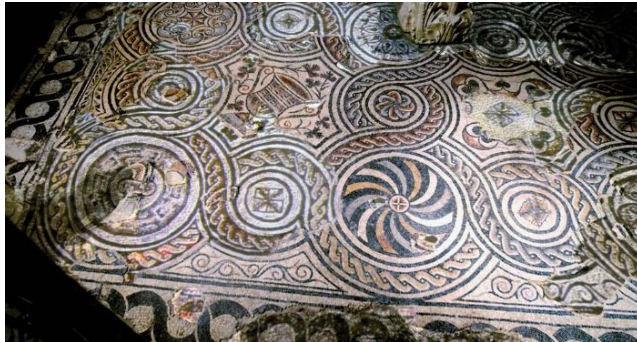
PROGRAM AT A GLANCE

REGISTRATION SITE: MAIN ENTRANCE AT FACULTY OF ENGINEERING

OPENING DAY – Sunday, February 17, 2019	
Conference Registration	2:00pm – 7:00pm
Welcome Reception	5:00pm – 7:30pm

DAY1 – Monday, February 18, 2019, Morning program	
Conference Registration	8:00am – 12:00pm

SITE FOR OPENING CEREMONY AND PLENARY SESSION:
ST. PETER IN CHAINS BASILICA
(NEXT TO THE FACULTY OF ENGINEERING)

DAY1 – Monday, February 18, 2019, Morning program, St. Peter in Chains Basilica	
OPENING CEREMONY	8:30am – 9:40am
Opening remarks by NODYCON2019 Chair, Prof. W. Lacarbonara	8:30am – 8:35am
A rapid fire lecture on *Michelangelo's Mose*	8:35am – 8:40am
Address by Magnificus Rector of Sapienza, Prof. E. Gaudio	8:40am – 8:50am
Address by City of Rome Council, President M. De Vito	8:50am – 8:55am
Address by Rector Delegate for Research and Innovation. Prof. T. Valente	8:55am – 9:00am
Past Engineering Dean and Chair of DISG Department, Prof. F. Vestroni	9:00am – 9:05am
Sapienza MuSa CONCERT	9:05am – 9:20am
Adagio e Allegro by *Wolfgang Amadeus Mozart* from Quartetto in Sol maggiore K80 "Quartetto di Lodi"	
Finale by *Antonin Dvorak* from Quartetto n. 12 in Fa maggiore op. 96 "Americano"	

MuSa String Quartet: Daniele Gorla e Giulia Liberatoscioli (Violins)
Alessandro Mancuso   (Viola)
Antonello Rubini   (Violoncello)

TRIBUTE to Prof. Ali H. Nayfeh, chaired by Prof. G. Rega	9:20am – 9:40am
CLOSURE OF OPENING CEREMONY	9:40am

DAY 1 – Monday, February 18, 2019, Morning program, St. Peter in Chains Basilica

KEYNOTE LECTURE 1
Prof. **Steven Shaw**, Florida Institute of Technology, USA   9:40am – 10:25am
Designing for and with Nonlinearity in Vibrating Systems

COFFEE BREAK   10:25am – 10:55am

KEYNOTE LECTURE 2   10:55am – 11:40am
Prof. **Friedrich Pfeiffer**, Technical University of Munich, Germany
Motion Spaces of Machine Process Combinations

KEYNOTE LECTURE 3   11:40am – 12:25pm
Prof. **Haiyan Hu**, Beijing Institute of Technology, China
Understanding and Utilizing Time Delays in Nonlinear Dynamics

CONFERENCE SITE FOR TECHNICAL SESSIONS:
FACULTY OF ENGINEERING

DAY 1 – Monday, February 18, 2019, Afternoon program, Faculty of Engineering

Lunch break	12:30pm – 2:00pm
Parallel sessions	2:00pm – 3:30pm
Coffee break	3:30pm – 4:00pm
Parallel sessions	4:00pm – 5:00pm
Capitoline Museums visit	6:00pm – 7:30pm

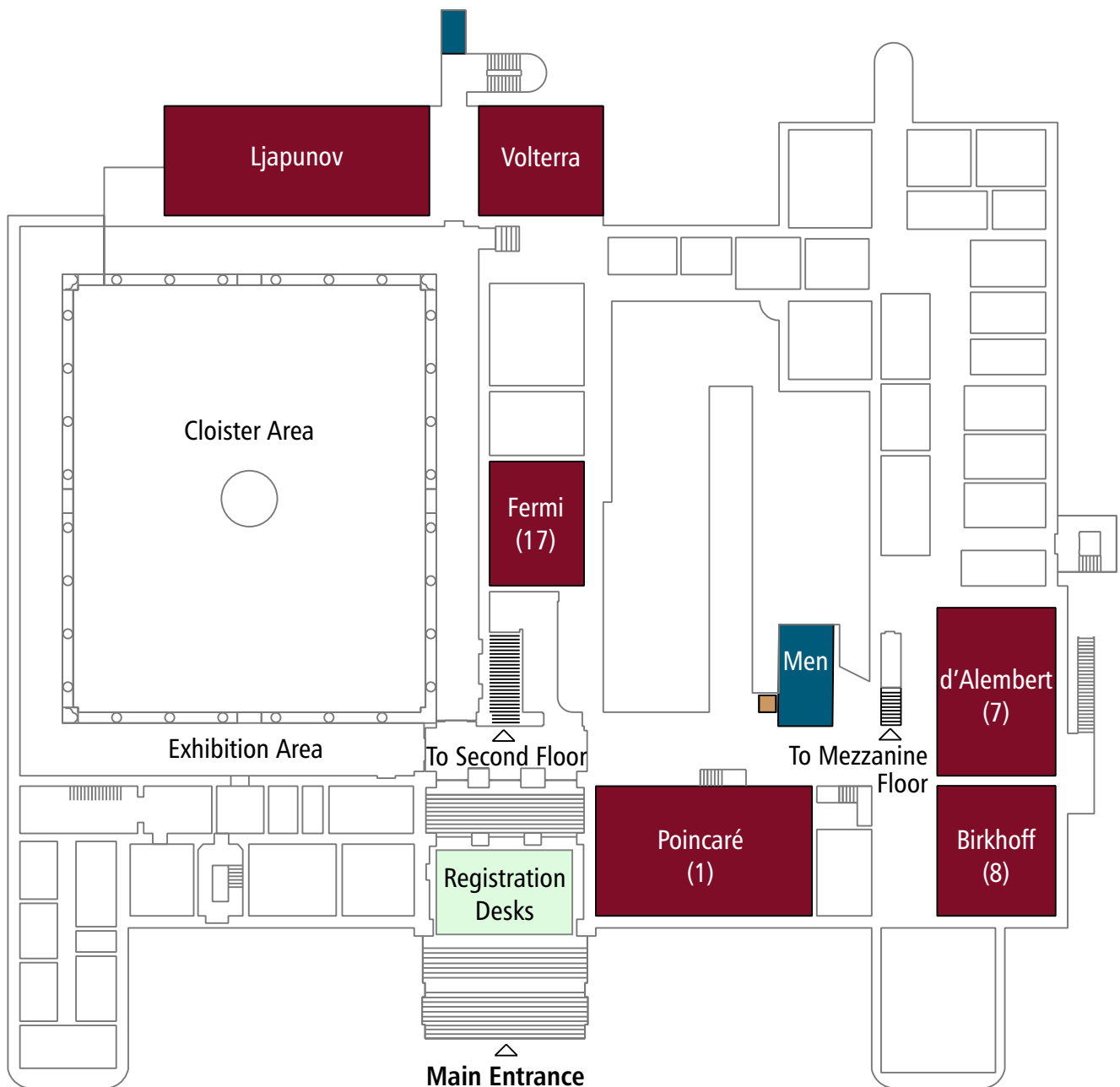## DAY 2 – Tuesday, February 19, 2019, Faculty of Engineering

Parallel sessions	8:30am – 10:00am
Coffee break	10:00am – 10:30am
Parallel sessions	10:30am – 12:30pm
Lunch break	12:30pm – 2:00pm
Parallel sessions	2:00pm – 3:30pm
Coffee break	3:30pm – 4:00pm
Poster session	3:30pm – 4:30pm
Parallel sessions	4:30pm – 5:30pm
Conference Banquet, Brancaccio Palace	7:00pm – 10:00pm

DAY 3 – Wednesday, February 20, 2019, Faculty of Engineering

Parallel sessions	8:30am – 10:00am
Coffee break	10:00am – 10:30am
Parallel sessions	10:30am – 12:30pm
Lunch break	12:30pm – 2:00pm
Parallel sessions	2:00pm – 3:30pm
Coffee break	3:30pm – 4:00pm
Parallel sessions	4:00pm – 5:00pm
Closing ceremony	5:00pm – 5:30pm

First Floor

Ljapunov

Volterra

Cloister Area

Fermi
(17)

Exhibition Area

To Second Floor

Men

d'Alembert
(7)

To Mezzanine
Floor

Poincaré
(1)

Birkhoff
(8)

Registration
Desks

Main Entrance

Legend:

Registration Desks

Restrooms

Conference Rooms

Elevator

Mezzanine Floor

Legend:

Conference Rooms

Restrooms

Women

Lagrange
(12)

To First Floor

Poincaré
(1)

Second Floor

To First Floor

Women & Men

Main Library
(Coffee & Lunch Breaks)
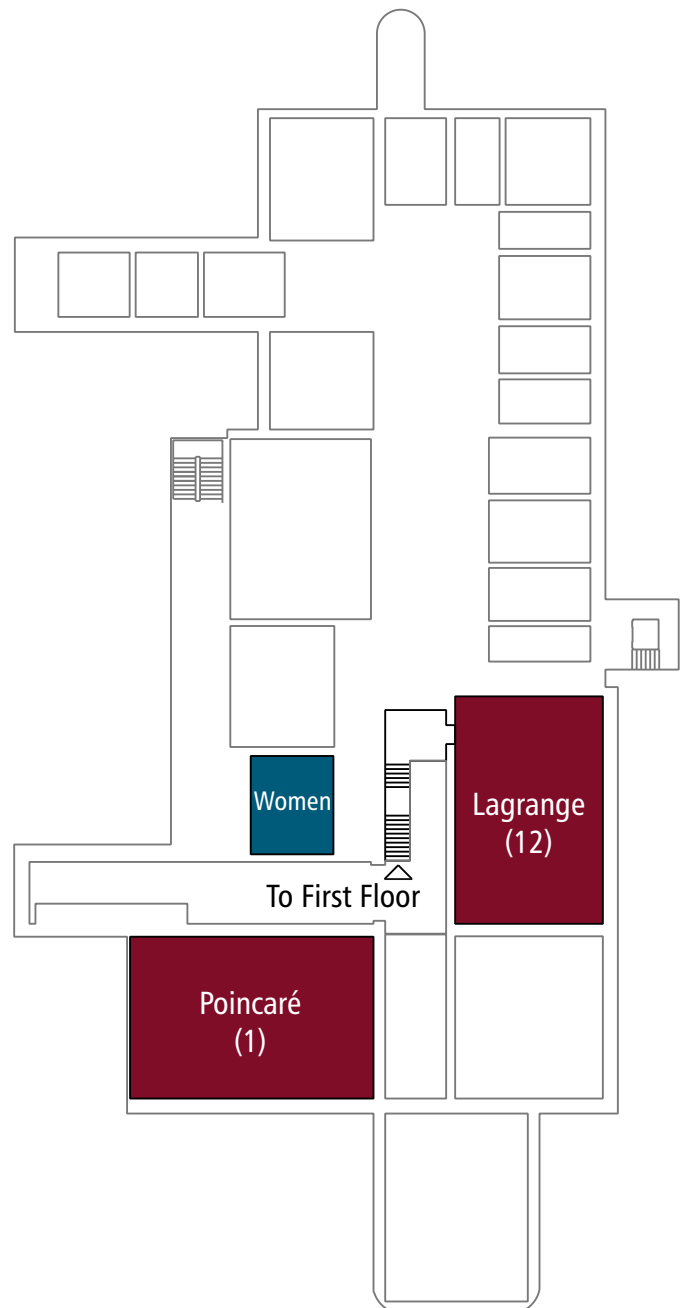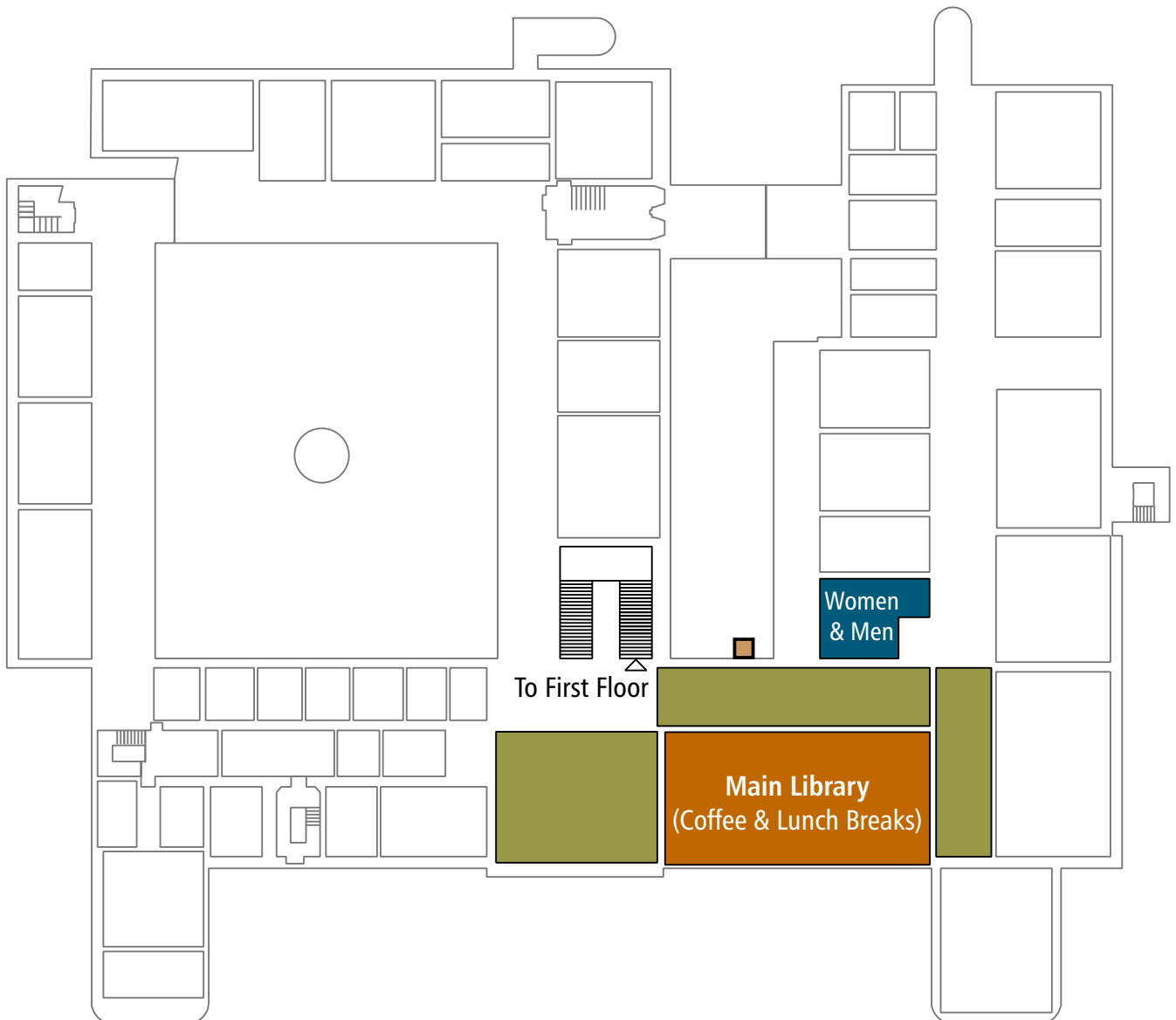
Legend:

Food/Beverages Stations

Coffee & Lunch Breaks

Restrooms

Elevator

SESSIONS ACRONYMS

A - Concepts and methods in nonlinear dynamics

Acronym	Session
NNM	Nonlinear Normal Modes
TD	Transient Dynamics
NSS	Nonsmooth Systems I – II - III
BDI	Bifurcation and Dynamics Instability I – II - III
CND	Computational Nonlinear Dynamics I - II
FSI	Fluid-Structure Interaction
CSU	Chaotic Systems and Uncertainty I - II
ROM	Reduced-Order Models
MTS	Monitoring and Testing Structures
AT	Analytical Techniques I – II - III
NWP	Nonlinear Wave Propagation I - II
MBS	Multi-Body Systems

B - Nonlinear dynamics of mechanical and structural systems

Acronym	Session
MSS	Mechanical Systems and Structures I – II – III – IV
MSO	Multistable Oscillators
MIET	Modal Interactions and Energy Transfer I – II – III
CS	Curved Structures
SI	System Identification I – II
CPM	Constitutive and Phenomenological Models
ED	Experimental Dynamics I – II
PED	Passive Energy Damping I – II
AS	Aerospace Structures
RS	Rotating Systems I – II – III
TPSTD	Turning Process and Systems with Time Delay I – II
SS	Space Structures
CMS	Composites and Multifunctional Structures

C - Nonlinear dynamics and control

Acronym	Session
NVC	Nonlinear Vibration Control I - II
CNS	Control of Nonlinear Systems I – II – III
SA	Sensor and Actuators I - II
NS	Network Synchronization

D - Recent trends in nonlinear dynamics

Acronym	Session
MM	Metamaterials I – II
EH	Energy Harvesting I – II – III
MNS	MEMS and NEMS I – II
BCR	Biomechanics and Capsule Robots
BSD	Biological Systems Dynamics I – II
FOS	Fractional Order System I – II
TFVD	Traffic Flow and Vehicle Dynamics
NPBED	Nonlinear Phenomena in Bio- and Ecosystems Dynamics

DAY 1 – Monday, February 18, 2019

	Ljapunov (Chiostro)	Volterra (Fresco)	Fermi (17)	Poincaré (1)	D'Alembert (7)	Birkhoff (8)	Lagrange (12)
8:00am – 12:00pm	Registration						
8:30am – 9:40am	Opening Ceremony – St. Peter in Chains Basilica						
9:40am – 10:25am	Keynote Lecture 1						
10:25am – 10:55am	Coffee Break						
10:55am – 11:40am	Keynote Lecture 2						
11:40am – 12:25pm	Keynote Lecture 3						
12:30pm – 2:00pm	Lunch Break						
2:00pm – 3:30pm	NNM	CS	MSO	MSS-I	NVC-I	MIET-I	MM-I
3:30pm – 4:00pm	Coffee Break						
4:00pm – 5:00pm	TD	CPM	CNS-I	SI-I	MIET-II	MSS-II	PED-I

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DAY 2 – Tuesday, February 19, 2019

	Ljapunov (Chiostro)	Volterra (Fresco)	Fermi (17)	Poincaré (1)	D'Alembert (7)	Birkhoff (8)	Lagrange (12)
8:30am – 10:00am	NSS-I	MM-II	ED-I	CND-I	BDI-I	EH-I	MNS-I
10:00am – 10:30am	Coffee Break						
10:30am – 12:30pm	FSI	BSD-I	BCR	ROM	MIET-III	CSU-I	PED-II
12:30pm – 2:00pm	Lunch Break						
2:00pm – 3:30pm	NSS-II	FOS-I	MTS	RS-I	CND-II	AS	NVC-II
3:30pm – 4:00pm	Coffee Break						
3:30pm – 4:30pm	Poster Session - Library						
4:30pm – 5:30pm	AT-I	SS	ED-II	TPSTD-I	BDI-II	SA-I	SI-II

DAY 3 – Wednesday, February 20, 2019

	Ljapunov (Chiostro)	Volterra (Fresco)	Fermi (17)	Poincaré (1)	D'Alembert (7)	Birkhoff (8)	Lagrange (12)
8:30am – 10:00am	NSS-III	TPSTD-II	NWP-I	MSS-III	CNS-II	SA-II	EH-II
10:00am – 10:30am	Coffee Break						
10:30am – 12:30pm	AT-II	BSD-II	NWP-II	CMS	CNS-III	RS-II	MNS-II
12:30pm – 2:00pm	Lunch Break						
2:00pm – 3:30pm	BDI-III	TFVD	FOS-II	NS	MBS	CSU-II	RS-III
3:30pm – 4:00pm	Coffee Break						
4:00pm – 5:00pm	AT-III	NPBED	EH-III	CND-III	MSS-IV		
5:00pm – 5:30pm	Closing Ceremony						

DAY 1 – Monday, February 18, 2019

DAY 1 – Monday, February 18, 2019		9:30am – 12:15pm
KEYNOTE LECTURES		St. Peter in Chains Basilica
Chair: G. Rega		
Steven Shaw, *Florida Institute of Technology, USA*	Designing for and with nonlinearity in vibrating systems	9:30am – 10:15am
Coffee break		10:15am – 10:45am
Chair: B. Balachandran		
Friedrich Pfeiffer, *Technical University of Munich, Germany*	Motion spaces of machine-process combinations	10:45am – 11:30am
Haiyan Hu, *Beijing Institute of Technology, China*	Understanding and utilizing time delays in nonlinear dynamics	11:30am – 12:15pm

DAY 1 – Monday, February 18, 2019		2:00pm – 3:30pm
Concepts and methods in nonlinear dynamics ■ **NONLINEAR NORMAL MODES**		Faculty of Engineering (Room **Ljapunov**)
Chair: S. Shaw, S. Lenci		
S. Lenci	A nonlinear beam with a linear backbone curve	2:00pm – 2:15pm
T. Hill, S. Neild	A multi-harmonic energy balancing algorithm for nonlinear normal modes	2:15pm – 2:30pm
Y. Mikhlin, T. Shmatko, G. Rudneva, N. Goloskubova	Stability of stationary regimes in nonlinear systems: analytical and numerical approaches	2:30pm – 2:45pm
T. Detroux, J.P. Noël, G. Kerschen	Mechanical nonlinearity synthesis for improved dynamical performance	2:45pm – 3:00pm
M. Cenedese, G. Haller	A geometric approach for time-periodic resonant perturbations of energy-parametrized families of periodic orbits	3:00pm – 3:15pm
F. Latini, A. Fregolent, W. D'Ambrogio, J. Brunetti	Coupling of systems with nonlinear joints using nonlinear normal modes	3:15pm – 3:30pm

Nonlinear dynamics of mechanical and structural systems

CURVED STRUCTURES

Faculty of Engineering (Room **Volterra**)

Chair: G. Ruta, H. Kang

F. Pellicano, A. Zippo, M. Barbieri, G. Iarriccio	Nonlinear vibrations of shells under extreme thermal conditions	2:00pm – 2:15pm
I. Breslavsky, M. Amabili	Nonlinear dynamics of a cylindrical shell under multi-harmonic excitation	2:15pm – 2:30pm
U. Eroglu, **G. Ruta**	Vibration of pre-loaded shallow circular arches	2:30pm – 2:45pm
M. Han, W. Wang, H. Li, C. Zhou	Nonlinear natural frequency of single arc bellows diaphragm under combined load	2:45pm – 3:00pm
Y. Zhao, L. Chen, Z. Guo, Y. Zhao	Influences of temperature on vibration characteristics of suspended cable under simultaneous primary and sub-harmonic excitations	3:00pm – 3:15pm
R. Lang, I. Němec, F. Hokeš, M. Trcala	Nonlinear dynamics of membrane construction	3:15pm – 3:30pm

Nonlinear dynamics of mechanical and structural systems

MULTISTABLE OSCILLATORS

Faculty of Engineering (Room **Fermi**)

Chair: I. Kovacic, S. Emam

I. Kovacic, M. Cartmell, M. Zukovic	On the behaviour of bistable oscillators excited by low-frequency harmonic forcing: bursting and relaxation oscillations	2:00pm – 2:15pm
S. Ross, A. Bozorgmagham, S. Naik, J. Zhong, L. Virgin	Experimental validation of phase space conduits of transition between potential wells	2:15pm – 2:30pm
P.-O. Mattei, E. Gourc	Tuning of a nonlinear energy sink using multi-stability	2:30pm – 2:45pm
H. Li, Y. Xu, Q. Liu. J. Kurths	Transition-event duration in one-dimensional systems under correlated noises	2:45pm – 3:00pm
S. Emam	Nonlinear dynamic response of bistable composite laminates	3:00pm – 3:15pm
J. Zhang, S. Chen, L. Chen, **W. Tang**	Dynamic buckling of FGM cylindrical shells under torsional impact loads	3:15pm – 3:30pm

Nonlinear dynamics of mechanical and structural systems
MECHANICAL SYSTEMS AND STRUCTURES I

Faculty of
Engineering
(Room **Poincaré**)

Chair: L. Virgin, A. Luongo

T. Breunung, G. Haller	Existence of the steady state response of (quasi-) periodically forced dissipative nonlinear mechanical systems	2:00pm – 2:15pm
Y. Xu, L. Virgin, S.Ross	On locating saddle-points on a surface using experiment data	2:15pm – 2:30pm
A. Abramian, S. Vakulenko, W. van Horssen	On a simple oscillator problem describing ice-induced vibrations of an offshore structure	2:30pm – 2:45pm
M. Ferretti, **G. Piccardo**, A. Luongo	Perturbation solutions of nonlinear taut strings travelled by a moving force	2:45pm – 3:00pm
A. Faragau, A. Metrikin, K. van Dalen	Hybrid solution of an infinite beam on a locally inhomogeneous and non-linear Winkler foundation excited by a constant moving load	3:00pm – 3:15pm
S. Fatehiboroujeni, A. Gopinath, S. Goyal	Effect of drag and pre-stress on oscillations caused by follower forces in continuum rods	3:15pm – 3:30pm

Nonlinear dynamics and control
NONLINEAR VIBRATIONS CONTROL I

Faculty of
Engineering
(Room **d'Alembert**)

Chair: C. Touzé, A. Arena

Y. Kasai, H. Yabuno	Amplitude control of coupled cantilevers with computational coupling	2:00pm – 2:15pm
H. Li, V. Denis, A. Pelat, F. Gautier, **C. Touzé**	Nonlinear energy transfer to improve the acoustic black hole effect	2:15pm – 2:30pm
A. Salvatore, B. Carboni, L.-Q. Chen, W. Lacarbonara	Experimental dynamic response of a wire rope nonlinear isolator	2:30pm – 2:45pm
A. Latif, N. Chalhoub, V. Pilipchuk	Control of the nonlinear dynamics of a truck and trailer combination	2:45pm – 3:00pm
A. Alshaya, M. Majeed, K. Alhazaa	Time-delay control of cantilever beams	3:00pm – 3:15pm
A. Morock, A. Arena, M. Lanzerotti, W. Lacarbonara	Active sling load stabilization	3:15pm – 3:30pm

Nonlinear dynamics of mechanical and structural systems

MODAL INTERACTIONS AND ENERGY TRANSFERS I

Chair: A. K. Bajaj, I. Georgiou

F. Vestroni, P. Casini, M. Basili, L. Morelli	A hysteretic vibration attachment in internal resonance conditions for vibration mitigation	2:00pm – 2:15pm
A. K. Bajaj, N. Bilal, A. Tripathi	On experiments in harmonically excited cantilever plates with 1:2 internal resonance	2:15pm – 2:30pm
F. Alfosail, M. Younis	Multi-frequency excitation of an inclined marine riser under internal resonance	2:30pm – 2:45pm
F. Silva, W. Vaz, P. Gonçalves	Internal resonances in an imperfect circular cylindrical panel	2:45pm – 3:00pm
M. Kovaleva, L. Manevitch, F. Romeo	Strongly nonlinear oscillations of the parametric pendulum	3:00pm – 3:15pm
I. Georgiou	A physical model-proper orthogonal decompositions approach in exploiting continuum nonlinearities: multiple equilibria and ultra-fast decaying vibrations	3:15pm – 3:30pm

Recent trends in nonlinear dynamics

METAMATERIALS I

Chair: D. Caruntu, M. Lepidi

M. Bukhari, O. Barry	Nonlinear metamaterials with multiple local mechanical resonators: analytical and numerical analyses	2:00pm – 2:15pm
M. Lepidi, A. Bacigalupo	Dispersion properties of a non-dissipative oscillatory chain with nonlinear resonators	2:15pm – 2:30pm
F. Mezzani, **A. Sajjad Rezaei**, F. Coppo, S. Pensalfini, A. Carcaterra	Wave propagation phenomena in nonlinear elastic metamaterials	2:30pm – 2:45pm
F. Coppo, F. Mezzani, S. Pensalfini, A. Carcaterra	Numerical simulations in nonlinear elastic metamaterials with nonlocal interaction	2:45pm – 3:00pm
J. Zhou, K. Wang	A meta-rod with nonlinear local resonators for low-frequency band gap	3:00pm – 3:15pm
G. Ming, W. Zhijie	Broadband effective negative mass nonlinear acoustic metamaterial with negative stiffness Duffing oscillator	3:15pm – 3:30pm

Concepts and methods in nonlinear dynamics
TRANSIENT DYNAMICS

Faculty of Engineering (Room **Ljapunov**)

Chair: O. Gendelman, A. Seyranian

Y. Guan, **L. Virgin**	Transient behavior with three degrees of freedom	4:00pm – 4:15pm
O. Gendelman	Escape of forced classical particle from potential well: transient resonance	4:15pm – 4:30pm
K. Afebu, Y. Liu, E. Papatheou	LSTM-based approach for predicting periodic motions of an impacting system via transient dynamics	4:30pm – 4:45pm
S.-S. Guo, Q. Shi	Transient response of some nonlinear dynamic systems excited by stationary Gaussian white noise	4:45pm – 5:00pm

Nonlinear dynamics of mechanical and structural systems
CONSTITUTIVE AND PHENOMENOLOGICAL MODELS

Faculty of Engineering (Room **Volterra**)

Chair: L. Rosati, M. Talò

N. Vaiana, F. Marmo, S. Sessa, L. Rosati	Modeling of the hysteretic behavior of wire rope isolators using a novel rate-independent model	4:00pm – 4:15pm
J. Perret-Liaudet, N. Ponthus, C. Zouabi, J. Scheibert	A stochastically excited bouncing ball model for describing normal contact vibrations at rough planar surfaces during friction at constant sliding velocity	4:15pm – 4:30pm
S. Arakelian, I. Chestnov, A. Istratov, T. Khudaiberganov	A nonlinear dynamic modeling for high temperature superconductivity in the nanocluster topological structures on solid surface	4:30pm – 4:45pm
S. Gong, **S. Oberst**, X. Wang	A non-linear model of rubber shear springs validated by experiments	4:45pm – 5:00pm

Nonlinear dynamics and control
CONTROL OF NONLINEAR SYSTEMS I

Faculty of Engineering (Room **Fermi**)

Chair: F. Chernousko, F. Pfeiffer

F. Chernousko	Two- and three-dimensional motions of a body controlled by an internal movable mass	4:00pm – 4:15pm
N. Bolotnik, T. Figurina	Optimal control of a two-body limbless crawler along a rough horizontal straight line	4:15pm – 4:30pm
S. Tashakori, G. Vossoughi, H. Zohoor, N. van de Wouw	Suppression of axial-torsional vibrations in drilling system described by neutral-type delay differential equations	4:30pm – 4:45pm
A. Buscarino, **C. Famoso**, L. Fortuna, M. Frasca	Control of imperfect dynamical systems	4:45pm – 5:00pm

Nonlinear dynamics of mechanical and structural systems

SYSTEM IDENTIFICATION I

Faculty of Engineering (Room **Poincaré**)

Chair: J. J. Thomsen, F. Vestroni

R. Wang, **B. Balachandran**	Long-term forecasting of chaotic system responses with deep recurrent neural network	4:00pm – 4:15pm
S. M. Sah, J. J. Thomsen, A. Fidlin	Estimating bolt tightness from measured vibrations: Effective linearity of nonlinear boundary stiffness	4:15pm – 4:30pm
B. Tang, S. Wang	Estimating quadratic and cubic stiffness nonlinearities of an asymmetric Duffing oscillator	4:30pm – 4:45pm
J.-S. Pei, B. Carboni, W. Lacarbonara	Mem-models as building blocks for simulation and identification	4:45pm – 5:00pm

Nonlinear dynamics of mechanical and structural systems

MODAL INTERACTIONS AND ENERGY TRANSFERS II

Faculty of Engineering (Room **d'Alembert**)

Chair: L.-Q. Chen, G. Rega

H. Kang, T. Guo, W. Zhu	Spatial dynamic modeling and multi-modal interaction analysis of a cable-stayed bridge	4:00pm – 4:15pm
A. Mansour, G. Rega	Catenary-based nonlinear multimodal theory of cable free vibrations	4:15pm – 4:30pm
L. Kloda, S. Lenci, J. Warminski	Nonlinear dynamics of a beam with one end spring and a tip mass system: an internal transversal-axial resonance	4:30pm – 4:45pm
D.-B. Zhang, Y-Qi Tang, H. Ding, **L.-Q. Chen**	Parametric and internal resonance of a transporting plate with a varying tension	4:45pm – 5:00pm

Nonlinear dynamics of mechanical and structural systems

MECHANICAL SYSTEMS AND STRUCTURES II

Faculty of Engineering (Room **Birkhoff**)

Chair: M. Hajj, J. P. Meijaard

J. Awrejcewicz, R. Starosta, G. Sypniewska-Kamińska	External and internal resonances in a mass-spring-damper system with 3-DOF	4:00pm – 4:15pm
A. Luongo, **D. Zulli**	In-plane and out-of-plane oscillations of a homogeneous model of tall building	4:15pm – 4:30pm
Y. Mikhlin, A. Onizhuk	Resonance behavior of the non-ideal system which contains a snap-trough truss as absorber	4:30pm – 4:45pm
J. P. Meijaard	Nonlinear vibrations of a parallel leaf spring guidance under pre-stress	4:45pm – 5:00pm

Nonlinear dynamics of mechanical and structural systems

PASSIVE ENERGY DAMPING I

Chair: P. Pilipchuk, C.-H. Lamarque

Faculty of
Engineering
(Room **Lagrange**)

M. Farid, O. Gendelman	Modelling, exploration and mitigation of partially liquid-filled tanks using various passive energy absorbers	4:00pm – 4:15pm
G. Hurel, A. Ture Savadkoohi, C.-H. Lamarque	Passive control of a two degrees-of-freedom pendulum by a non-smooth absorber	4:15pm – 4:30pm
V. Pilipchuk	Stochastic energy absorbers based on analogies with soft wall billiards	4:30pm – 4:45pm
B. D. Bak, T. Kalmár-Nagy	Mechanical turbulence: energy transfer and dissipation in a binary tree structured mechanical oscillator	4:45pm – 5:00pm

DAY 2 – Tuesday, February 19, 2019

DAY 2 – Tuesday, February 19, 2019		8:30am – 10:00am
Concepts and methods in nonlinear dynamics		Faculty of
NONSMOOTH SYSTEMS I		Engineering
Chair: S. Shaw, G. Stepan		(Room **Ljapunov**)
S. Natsiavas, E. Paraskevopoulos	Boundary layer dynamics of multibody systems involving impact and friction	8:30am – 8:45am
M. Antali, G. Stepan	Bifurcations of limit directions at codimension-2 discontinuities of vector fields	8:45am – 9:00am
P. Preiswerk, **R. Leine**	A nonsmooth state observer for vibro-impact systems: experimental validation	9:00am – 9:15am
L. Marino, A. Cicirello, D.A. Hills	Displacement transmissibility of a 1-DoF subject to joined base-wall motion in the presence of Coulomb friction	9:15am – 9:30am
C. Yoong, **M. Legrand**	Nonsmooth modal analysis of a non-internally resonant finite bar subject to a unilateral contact constraint	9:30am – 9:45am
Z. Zhang, Y. Liu, J.P. Chávez, J. Sieber	Delayed feedback control of grazing-induced multistability in an impacting system	9:45am – 10:00am

DAY 2 – Tuesday, February 19, 2019		8:30am – 10:00am
Recent trends in nonlinear dynamics		Faculty of
METAMATERIALS II		Engineering
Chair: M. J. Leamy, F. Fraternali		(Room **Volterra**)
A. Amendola, M. De Piano, F. Fraternali	On the nonlinear wave dynamics of lattice metamaterials	8:30am – 8:45am
P.B. Silva, M. J. Leamy, M. Geers, V. Kouznetsova	On additional attenuation zones in nonlinear locally resonant metamaterials	8:45am – 9:00am
F. Dell'Isola, I. Giorgio, M. Laudato, E. Barchiesi, L. Placidi	Non-linear dynamics in pantographic sheets	9:00am – 9:15am
V. Smirnov, **M. Kovaleva**, L. Manevitch	Carbon nanotubes in a bundle: competition of the elastic and van der Waals forces	9:15am – 9:30am
A. Papangelo, F. Fontanela, A. Grolèt, M. Ciavarella, N. Hoffmann	Spatially localized vibration in weakly coupled mechanical systems	9:30am – 9:45am
S. Zhu, J. Li, J. Zhou, T. Quan	Nonlinear vibration analysis of metamaterial honeycomb sandwich structures with negative Poisson's ratio	9:45am – 10:00am

Nonlinear dynamics of mechanical and structural systems

EXPERIMENTAL DYNAMICS I

Faculty of
Engineering
(Room **Fermi**)

Chair: F. Pellicano, J. Perret-Liaudet

C. Bourquard, N. Noiray	Limit cycles of a nonlinear damper coupled to a hot chamber with an unstable mode	8:30am – 8:45am
E. Rigaud, J. Perret-Liaudet	Experimental analysis of gear rattle threshold and vibro-impact dynamics	8:45am – 9:00am
K.C. Chinnam, A. Casalotti, E. Bemporad, G. Lanzara	Electro-mechanical characterization of an electrospun piezoelectric microfiber	9:00am – 9:15am
V. Vaniushkina, H. Hendrikse, M. Segeren, A. Metrikine	Experimental quantification of local contact forces in the slip-joint connection in offshore wind turbines	9:15am – 9:30am
G. Stefani, M. De Angelis, U. Andreaus	Experimental dynamic response of a SDOF oscillator constrained by two symmetrically arranged deformable and dissipative bumpers under harmonic base excitation	9:30am – 9:45am
I. Tartaruga, D. Barton, D. Rezgui, S. Neild	Experimental identification of unstable LCOs in a wing profile	9:45am – 10:00am

Concepts and methods in nonlinear dynamics

COMPUTATIONAL NONLINEAR DYNAMICS I

Faculty of
Engineering
(Room **Poincaré**)

Chair: G. Kerschen, D. Wagg

L. Renson, D. Barton, **V. Ruffini**, S. Neild	Improving the robustness of control-based continuation	8:30am – 8:45am
L. Guillot, B. Cochelin, **C. Vergez**	A Taylor series based continuation method for solutions of ordinary differential equations	8:45am – 9:00am
L. Guillot, B. Cochelin, C. Vergez	A Taylor series based continuation method for the periodic solutions of a wide range of dynamical systems	9:00am – 9:15am
J. Zhong, Y. Xu, L. Virgin, S. Ross	Geometry of escaping dynamics in the presence of dissipative and gyroscopic forces	9:15am – 9:30am
S. Ponsioen, T. Pedergnana, G. Haller	Analytic prediction of isolated forced response curves from spectral submanifolds	9:30am – 9:45am
A. Belyakov, A. Seyranian	Stability boundary approximation of periodic dynamics	9:45am – 10:00am

DAY 2 – Tuesday, February 19, 2019   **8:30am – 10:00am**

Concepts and methods in nonlinear dynamics

BIFURCATION AND DYNAMIC INSTABILITY I

Chair: H. Hetzler, A. Luongo

Faculty of
Engineering
(Room **d'Alembert**)

G. Bonciolini, N. Noiray	Bifurcation dodge: avoidance of a thermoacoustic Instability in transient operation	8:30am – 8:45am
F. D'Annibale, M. Ferretti, A. Luongo	On the effects of damping on nonlinear Ziegler's column	8:45am – 9:00am
M.B. Vizi, G. Stépán	Bifurcation diagram of Furuta pendulum in the presence of dry friction	9:00am – 9:15am
R. Fiedler, H. Hetzler	Stability of quasiperiodic motions	9:15am – 9:30am
A. Lazarus, B. Bentvelsen, S. Protière	Extreme periodic modulation of elastic states: enhanced parametric instabilities for functionality	9:30am – 9:45am
V. Meesala, **M. Hajj**, E. Abdel-Rahman	A qualitative approach for mass sensing based on bifurcation response	9:45am – 10:00am

DAY 2 – Tuesday, February 19, 2019   **8:30am – 10:00am**

Recent trends in nonlinear dynamics

ENERGY HARVESTING I

Chair: G. Quaranta, A. Cammarano

Faculty of
Engineering
(Room **Birkhoff**)

P. Alevras, S. Theodossiades	Experimental investigation of a passively tuned vibration energy harvester for rotating applications	8:30am – 8:45am
R. Mohamed, A. El-Badawy, A. Kirolos, M. Soliman, E. Abdel-Rahman	On modeling of springless electromagnetic energy harvesters	8:45am – 9:00am
M. Varanis, J.P.C.V. Norenberg, R.T. Rocha, J.M. Balthazar, C. Oliveira, A.M. Tusset	Nonlinear dynamics and chaos of the portal frame model as an energy harvester: a time-frequency analysis approach	9:00am – 9:15am
W.M. Kuhnert, A. Cammarano, P.J.P. Gonçalves	On the nonlinear characteristics of power electronics and their effect on electromechanical systems	9:15am – 9:30am
B. Santhosh, K. Devarajan, B. Balaram	Nonlinear dynamics and energy harvesting capabilities of an adaptive snap through oscillator	9:30am – 9:45am
C. Maruccio, **G. Quaranta**, W. Lacarbonara	Nonlinear multiscale dynamics of flexible piezoelectric structures: the role of micromechanics and electrical variables	9:45am – 10:00am

Recent trends in nonlinear dynamics
MEMS AND NEMS I

Faculty of Engineering
(Room **Lagrange**)

Chair: M. Younis, A. Frangi

Authors	Title	Time
D. Czaplewski, D. Lopez, **O. Shoshani**, S. Shaw	SNIC bifurcations and mechanical frequency comb generation due to resonant mode coupling in a MEMS resonator	8:30am – 8:45am
A. Alneamy, **E. Abdel-Rahman**, G. Heppler, A. Abdelaziz, M. Khater	Chaos in an electrostatically actuated arch beam	8:45am – 9:00am
A. Hajjaj, F. Alfosail, N. Jaber, S. Ilyas, M. Younis	Theoretical and experimental investigations of one-to-one internal resonance of MEMS arch resonator	9:00am – 9:15am
D. Caruntu, E. Juarez	Voltage effect on frequency response of parametric resonance electrostatically actuated DWCNT resonators	9:15am – 9:30am
M. Ghommem, A. Abdelkefi	Design and nonlinear analysis of a vibrating beam microgyroscope	9:30am – 9:45am
A. Guerrieri, **A. Frangi**	Modelling geometrical nonlinearities in MEMS resonators	9:45am – 10:00am

H. Alhussein, M. Daqaq	Estimating the flow speed necessary to activate the inter-well dynamics of a twin-well galloping oscillator	10:30am – 10:45am
V. Kurushina, E. Pavlovskaia, A. Postnikov, G.R. Franzini, M. Wiercigroch	Modelling VIV of transversally oscillating rigid structures using nonlinear fluid oscillators	10:45am – 11:00am
S. Brusco, A. Bagnara, S. Cammelli, G. Piccardo	Vortex-shedding phenomenon of a highly tapered circular cylinder	11:00am – 11:15am
Z. Terze, **V. Pandža**, D. Zlatar	Lie group dynamics of multibody system in vortical fluid flow	11:15am – 11:30am
C. Demartino, G. Matteoni, C.T. Georgakis	A quasi-steady 3-DoFs sectional aerodynamic model	11:30am – 11:45am
C. Mannini	Asymptotic analysis of a dynamical system for vortex-induced vibration and galloping	11:45am – 12:00pm
L. Tao, C. Hu, Y. Xie, W. Yi, NBI Team	Nonlinear dynamics analysis and design optimization of pipe conveying fluid in NBI system by absolute nodal coordinate formulation	12:00pm – 12:15pm

J.T. Machado	Entropy analysis of the human DNA Information	10:30am – 10:45am
H. Zhao, J. Yu, J. Cao, R. Wang, W.H. Liao	Refined weighted-permutation entropy: A complexity measure for human gait and physiologic signals with outliers and noise	10:45am – 11:00am
H. Si, X. Sun	Information propagation in recurrent neuronal populations with excitatory and inhibitory synaptic connections	11:00am – 11:15am
E. Kaslik, **E.A. Kokovics**, A. Radulescu	Wilson-Cowan neuronal interaction models with distributed delays	11:15am – 11:30am
O. Brandibur, E. Kaslik, D. Mozyrska, M. Wyrwas	Stability of systems of fractional-order difference equations and applications to a Rulkov-type neuronal model	11:30am – 11:45am
P. Feng, R. Wang, Y. Wu	Critical behaviors of regular pattern selection in neuronal networks with chemical synapses	11:45am – 12:00pm
E. Kaslik, **R. Mureşan**	Dynamics of a homeostatically regulated neural system with delayed connectivity	12:00pm – 12:15pm
T. Helie, **F. Silva**, V. Wetzel	Port-Hamiltonian approach to self-sustained oscillations in the vocal apparatus	12:15pm – 12:30pm

Recent trends in nonlinear dynamics

BIOMECHANICS AND CAPSULE ROBOTS

Faculty of Engineering (Room **Fermi**)

Chair: Y. Liu, N. Bolotnik

R. Rusinek, M. Szymanski	Nonlinear effects in middle ear with active implant	10:30am – 10:45am
J. Simonovic	Simultaneous multi-parametric analysis of bone cell population model	10:45am – 11:00am
I. Breslavsky, M. Amabili	Nonlinear vibrations of a human aortic segment model with residual stresses	11:00am – 11:15am
D. Parshin, A. Lipovka, A. Yunoshev, A. Dubovoy, K. Ovsyannikov, A. Khe, A. Chupakhin	Nonlinear effects for the experimental results of human cerebral aneurysm tissue	11:15am – 11:30am
A. Nunuparov, F. Becker, N. Bolotnik, I. Zeidis, K. Zimmermann	Dynamics and control of a vibration-driven capsule robot with an opposing spring	11:30am – 11:45am
H. Fang, X. Zhan, J. Xu	Improving performance: recent progresses on vibration-driven locomotion systems	11:45am – 12:00pm
B. Guo, Y. Liu	Three-dimensional map for a vibro-impact capsule system	12:00pm – 12:15pm
B. Guo, J. Tian, **Y. Liu**, S. Prasad	Modelling of capsule-intestine pressure for a self-propelled capsule robot via experimental investigation	12:15pm – 12:30pm

Concepts and methods in nonlinear dynamics

REDUCED-ORDER MODELS

Faculty of Engineering (Room **Poincaré**)

Chair: S. Neild, P. Tiso

S. Jain, **P. Tiso**	A multiple scales approach for model reduction of temperature-dependent nonlinear mechanical systems	10:30am – 10:45am
V. Settimi, G. Rega, E. Saetta	Nonlinear dynamic effects of different thermal sources in a thermomechanically coupled plate via a third-order model	10:45am – 11:00am
S. Jain	Exact model reduction and analysis of nonlinear thermo-mechanical systems	11:00am – 11:15am
V. Rishindra Melanathuru, T. Hill, S. Neild	Accounting for static coupling effects in dynamic nonlinear reduced order models	11:15am – 11:30am
I. Nazzari, M. Kapitaniak, V. Vaziri, M. Wiercigroch, E. Pavlovskaia	Dynamics of jarring action	11:30am – 11:45am
W. Wedig	Turbulent travel speeds in nonlinear vehicle dynamics	11:45am – 12:00pm
E. Babilio	On the Duffing-Mathieu equation as one-dimensional reduced-order model for post-buckled beams under harmonic axial excitation	12:00pm – 12:15pm
A. Alazmi, A. Alshaya, K. Alhazza	Natural frequencies and mode shapes of mechanically-connected beams	12:15pm – 12:30pm

Nonlinear dynamics of mechanical and structural systems

MODAL INTERACTIONS AND ENERGY TRANSFERS III

Chair: M. Shitikova, C. Touzé

Faculty of
Engineering
(Room **d'Alembert**)

J.M.P. Raimundo, P.B. Gonçalves, **D. Orlando**	Flexural and sway interaction in the nonlinear vibrations of a phenomenological model of a laterally braced column	10:30am – 10:45am
K. Yamashita, T. Yagyu, H. Yabuno	Nonlinear interactions between unstable oscillatory modes in a cantilevered pipe conveying fluid	10:45am – 11:00am
G. Yacobi, V. Kislovsky, M. Kovaleva, Y. Starosvetsky	Resonant energy transport in coupled nonlinear systems	11:00am – 11:15am
G. Liu, W. Zhang, A. Xi	Nonlinear vibration responses of laminated composite cantilever plate in subsonic air flow	11:15am – 11:30am
M. Shitikova, B. Ajarmah	Nonlinear vibrations of fractionally damped cylindrical shells under the additive combinational internal resonance	11:30am – 11:45am
Y.Q. Tang, Z.G. Ma, S. Liu, L.Y. Zhang	Nonlinear vibration of axially moving beams with internal resonance, speed dependent tension and tension dependent speed	11:45am – 12:00pm
A. Adegoke, T. Fashanu, A. Oyediran	Nonlinear coupled axial and transverse vibrations of a cantilevered pipe conveying pulsating two phase flow	12:00pm – 12:15pm

Concepts and methods in nonlinear dynamics

CHAOTIC SYSTEMS AND UNCERTAINTY I

Chair: A. Buscarino, G. Radons

Faculty of
Engineering
(Room **Birkhoff**)

M. Bucolo, A. Buscarino, L. Fortuna, M. Frasca	Multijump resonance with Chua's circuit	10:30am – 10:45am
D. Müller, A. Otto, **G. Radons**	Nonlinear dynamics with dissipative delays	10:45am – 11:00am
P. Zech, **G. Radons**	Harmonic oscillator interacting with random Ising spins: a hybrid model for dynamical systems with complex hysteresis	11:00am – 11:15am
M. Messias, A. de Carvalho Reinol	On the formation of invariant tori and chaotic dynamics in certain families of quadratic nonequilibrium three-dimensional differential systems	11:15am – 11:30am
J. Pena Ramirez, J. Alvarez	Mixed synchronization in unidirectionally coupled chaotic oscillators	11:30am – 11:45am
Z. Yao, J. Ma, Y. Yao, C. Wang	Synchronization consensus between nonlinear circuits via induction coil coupling	11:45am – 12:00pm
J. Giné	Weierstrass and Painlevé non-integrability for polynomial differential systems in C^2	12:00pm – 12:15pm
M. Krishnamurthy, S. Sinha, W. Ditto	Logic from coupled chaotic systems	12:15pm – 12:30pm

Nonlinear dynamics of mechanical and structural systems

PASSIVE ENERGY DAMPING II

Faculty of
Engineering
(Room **Lagrange**)

Chair: C.-H. Lamarque, B. Carboni

T. Lebrun, M. Wijnand, T. Hélie, D. Roze, B. d'Andréa-Novel	Electroacoustic absorbers based on finite-time control of loudspeakers: a numerical investigation	10:30am – 10:45am
A. Elías-Zúñiga, L.M. Palacios-Pineda, D. Olvera-Trejo, Ó. Martínez-Romero	Nonlinear dynamics of a finite extensibility absorber system examined from its Lyapunov representation form: broaden the frequency bandwidth by exploiting the system internal resonances	10:45am – 11:00am
A. Boccamazzo, B. Carboni, W. Lacarbonara	Optimization strategies of hysteretic tuned mass damper for seismic control	11:00am – 11:15am
D. Li, H. Fang	Adaptation of energy dissipation in a laminated module with tuneable twin wells	11:15am – 11:30am
K. Xu, X. Hua	Influence of nonlinearity on vibration control of H-section hanger by pendulum damper in large displacement	11:30am – 11:45am
Z.Q. Lu, Y.W. Zhang, H. Ding, W. Lacarbonara, L.Q. Chen	Comparison of linear and nonlinear damping effects on a circular ring vibration isolator	11:45am – 12:00pm
H. Sefa Kizilay, E. Cigeroglu	Frequency domain non-linear modelling and analysis of liquid filled column dampers	12:00pm – 12:15pm
E. Cigeroglu, **M. Emin Dogan**	Vibration reduction by using two tuned mass dampers with dry friction damping	12:15pm – 12:30pm

DAY 2 – Tuesday, February 19, 2019		2:00pm – 3:30pm
Concepts and methods in nonlinear dynamics ▮▮		Faculty of
NONSMOOTH SYSTEMS II		Engineering
Chair: R. Leine, A. Pirrotta		(Room **Ljapunov**)
C. Budai, L.L. Kovács, J. Kövecses, G. Stépán	Combined effect of sampling and dry friction on positioning	2:00pm – 2:15pm
I. Atanasovska, K. Stevanović Hedrih, D. Momcilovic	A theoretical model for vibro-impact dynamics of spur gears with tooth flanks wear	2:15pm – 2:30pm
D. Li, C. Xu, M. Gola, D. Botto	Reduced-order modelling friction contact for cylinder-flat contact and experimental validation in an under-platform damper	2:30pm – 2:45pm
H. Tao, J. Gibert	Mechanical logic gates based on strictly biased responses of impact oscillators	2:45pm – 3:00pm
P.D. Spanos, **A. Di Matteo**, A. Pirrotta	Harmonic and random rocking of blocks on nonlinear flexible foundation	3:00pm – 3:15pm
H.Z. Horvath, D. Takacs	Analogue models of rocking suitcases and snaking trailers	3:15pm – 3:30pm

| DAY 2 – Tuesday, February 19, 2019		2:00pm – 3:30pm
Recent trends in nonlinear dynamics ▮▮		Faculty of
FRACTIONAL ORDER SYSTEMS I		Engineering
Chair: K. Stevanović Hedrih, C. Pinto		(Room **Volterra**)
K. Stevanović Hedrih	Independent fractional type modes of free and forced vibrations of discrete continuum hybrid systems of fractional type with multi-deformable bodies	2:00pm – 2:15pm
C. Ding, J. Cao, Y. Chen	Fractional-order model and experimental verification for broadband hysteresis in piezoelectric actuators	2:15pm – 2:30pm
C. Pinto, A. Carvalho	Analysis of a non-integer order model for the coinfection of HIV and HSV-2	2:30pm – 2:45pm
K. Liu, **Y. Chen**, P. Domanski	Control performance assessment of the disturbance with fractional order dynamics	2:45pm – 3:00pm
O. Brandibur, E. Kaslik, **D. Mozyrska**, M. Wyrwas	Stability and numerical solutions to the variable-order Caputo fractional difference equations with order values from (1; 2]	3:00pm – 3:15pm
T. He, J. Ma	The generalized electromagnetic-thermoelastic coupling problem of hollow cylindrical conductor based on the memory-dependent derivative	3:15pm – 3:30pm

DAY 2 – Tuesday, February 19, 2019		2:00pm – 3:30pm
Concepts and methods in nonlinear dynamics **MONITORING AND TESTING OF STRUCTURES** Chair: V. Gattulli, D. Bernardini		Faculty of Engineering (Room **Fermi**)
R. Sanchez Crespo, M.F. Daqaq	Influence of high-frequency excitations on the measurements of a quasi-static load cell	2:00pm – 2:15pm
F. Potenza, V. Gattulli, S. Nagarajaiah	Seismic response prediction of multiple base-isolated structures for monitoring	2:15pm – 2:30pm
K. Ringgaard, O. Balling	Operational modal analysis on a six degree of freedom parallel manipulator: reproducibility, excitation & pose dependency	2:30pm – 2:45pm
N. Barbieri, M. Mannala, R. Barbieri, G. Barbieri	Torsional analysis of transmission line cables	2:45pm – 3:00pm
M. Antonelli, B. Carboni, **D. Bernardini**, T. Kalmàr-Nagy, W. Lacarbonara	Quantifying the rate dependence of a nonlinear hysteretic device	3:00pm – 3:15pm
K. Stevanović Hedrih, S. Brčić, **S. Paunović**	Application of photoelasticity to the stress state analysis in dams: a brief review based on the results of professor Vlatko Brčić	3:15pm – 3:30pm

DAY 2 – Tuesday, February 19, 2019		2:00pm – 3:30pm
Nonlinear dynamics of mechanical and structural systems **ROTATING SYSTEMS I** Chair: C. Nataraj, Z. Terze		Faculty of Engineering (Room **Poincaré**)
A. Vizzaccaro, L. Salles	Blade-casing interaction: phenomena underlying rub-induced vibrations in turbomachinery	2:00pm – 2:15pm
S. Beregi, D. Takacs, G. Stepan	Theoretical and experimental study on the nonlinear dynamics of wheel-shimmy	2:15pm – 2:30pm
M. Al-Shudeifat, C. Nataraj	Backward whirl phenomena in cracked rotor systems with a breathing crack	2:30pm – 2:45pm
Z. Szmit, J. Warmiński	Nonlinear dynamics and synchronisation of rotating hub with pendulums – analytical and numerical approach	2:45pm – 3:00pm
O. Drozdetskaya, A. Fidlin	Investigation of the phase space of a self-balancing device during passage through resonance	3:00pm – 3:15pm
J. Warminski, J. Latalski	Vibrations of a rotor with thin-walled composite piezo-blades	3:15pm – 3:30pm

Concepts and methods in nonlinear dynamics

COMPUTATIONAL NONLINEAR DYNAMICS II

Faculty of
Engineering
(Room **d'Alembert**)

Chair: S. Baguet, G. Formica

L. Leonetti, **G. Formica**, D. Magisano, M. Talò, G. Garcea, W. Lacarbonara	Multistability of carbon nanotube nanocomposite shells	2:00pm – 2:15pm
N. Vaiana, **P. De Lima Souza**, L. Rosati	Nonlinear dynamic analyses of hysteretic mechanical systems by combining an explicit time integration method and a novel rate-independent model	2:15pm – 2:30pm
A. Garcia, G. Taylor, L. Valera, S. Ceballes, A. Al Imran, M. Ceberio, A. Abdelkefi	Interval method uncertainty for nonlinear analysis of cantilevered pipes conveying fluid	2:30pm – 2:45pm
R. Alcorta, B. Prabel, S. Baguet, G. Jacquet-Richardet	Period-doubling bifurcation tracking for the harmonic balance method: application to a Duffing oscillator with asymmetric clearances	2:45pm – 3:00pm
N. Potosakis, E. Paraskevopoulos, S. Natsiavas	Nonlinear dynamics of multibody systems using an augmented Lagrangian formulation	3:00pm – 3:15pm
E. Kremer	Vibrational mechanics of systems with amplitude and phase modulation of excitation	3:15pm – 3:30pm

Nonlinear dynamics of mechanical and structural systems

AEROSPACE STRUCTURES

Faculty of
Engineering
(Room **Birkhoff**)

Chair: P. Masarati, A. Carcaterra

M. Eugeni, **F. Mastroddi**, F. Saltari	Damping models in aircraft flutter analyses	2:00pm – 2:15pm
G. Quaranta	Helicopter post-critical ground resonance oscillation amplitude using multiple input describing functions	2:15pm – 2:30pm
P. Masarati, A. Zanoni, V. Muscarello, R. Paolini, G. Quaranta	Helicopter pilot biomechanics by multibody analysis	2:30pm – 2:45pm
K. Ma, X. Guo, W. Zhang	Multibody dynamics analysis within flapping wings flight	2:45pm – 3:00pm
D. Antonelli, G. Pepe, L. Nesi, A. Carcaterra	Feedback local optimality principle applied to rocket vertical landing VTVL	3:00pm – 3:15pm
A. Casalotti, G. Lanzara	Morphing skin based on the buckling of a piezoelectric thin film	3:15pm – 3:30pm

Nonlinear dynamics and control ▉▉
NONLINEAR VIBRATIONS CONTROL II

Faculty of
Engineering
(Room **Lagrange**)

Chair: L.Q. Chen, G. Habib

Authors	Title	Time
G. Habib, F. Kadar, B. Papp	Impulsive vibration mitigation via the nonlinear tuned vibration absorber	2:00pm – 2:15pm
S. Mohanty, S.K. Dwivedy	Active nonlinear vibration absorber for harmonically excited beam system	2:15pm – 2:30pm
X. Shen, J. Liu, C. Wu, Q. Song	Design and experimental study of woodpecker-inspired shock isolation structure	2:30pm – 2:45pm
Z. Zhang, Z.Q Lu, H. Ding, **L.Q. Chen**	Vibration suppression by a new inerter-based nonlinear energy sink	2:45pm – 3:00pm
X. Sun, Y. Sun, J. Xu	Analysis, design and experiment of continuous isolation structure with local quasi-zero-stiffness property by magnetic interaction	3:00pm – 3:15pm
J. Chen, Y. Shen, X. Li, S. Yang, S. Wen	Bifurcation and stability analysis of commensurate fractional-order van der Pol oscillator with time-delayed feedback	3:15pm – 3:30pm

Chair: M. Talò

R. Rocha, R.O. Medrano-Torricos	Stability analysis of the Chua's system using using root locus and frequency response
X. Gu, Z. Deng	Optimal bounded control of stochastically excited strongly nonlinear vibro-impact system
S. Han, Y. Jin, E. Lee, S. Lee	Sampled-parameter dependent Lyapunov function approach for LPV sampled-data control
S. Song, J. Jung, H. Kim, C.W. Kim	Optimization for unidirectional laminated composite structures under dynamic loading using equivalent static loads method
X. Mao, X. Zhou, T. Shi, L. Qiao	Autapse-induced complicated oscillations of a ring FHN neuronal network with multiple delayed couplings
B. Zhang, X. Guo, W. Zhang	Nonlinear dynamic characteristics of different sandwich graphene plates
M. Zhang, W. Pan, G. Tang	Analysis method to soil-structure interaction based on interface dynamic stiffness reduction of damped system
J.M. Olmos, M.Á. Astiz	Response of a high-speed train traveling over a long and high-pier viaduct during moderate earthquakes
T. Trifonova, S. Arakelian, D. Trifonov, S. Abrakhin, V. Koneshov, M. Arakelian	Nonlinear hydrodynamics and numerical analysis for a series of catastrophic floods/debris (2011-2017): the tectonic wave processes possible impact on surface water and groundwater flows
D. Jing, J. Sun, C. Ren, X. Zhang	Multi-objective optimization of active vehicle suspension system control
C. Li	Homogenous multistablity in memristive system
A. Adebusoye, A. Oyediran, T. Fashanu	Nonlinear dynamic analysis of the large deformation of subsea flowlines and jumpers conveying two-phase fluids
Z. Yang, Q. Yan, X. Yu, B. Jia	Parameter sensitivity analysis of lateral vibration stability in flexible footbridges based on maximal Lyapunov exponent
M. Davini, G. Formica, W. Lacarbonara	A nonlinear finite element formulation for the dynamics of beam-like structures
S. George, R. Misra, G. Ambika	Nonlinear dynamics of RRc lyrae stars
S. Seth	Occurrence of robust chaos in a 3D electronic circuit
P. Rosatelli, W. Lacarbonara, D.J. Inman	Dynamic response of a morphing wing

Concepts and methods in nonlinear dynamics
ANALYTICAL TECHNIQUES I

Chair: G. Kerschen, S. Neild

Faculty of
Engineering
(Room **Ljapunov**)

F. Verhulst	Approximating limit cycles in slow-fast systems	4:30pm – 4:45pm
X. Lliu, **D. Wagg**	ε^2-order normal form analysis for a two-degree-of-freedom nonlinear coupled oscillator	4:45pm – 5:00pm
A. Elliott, **A. Cammarano**, S. Neild, T. Hill, D. Wagg	Predicting nonlinear structural dynamics: a comparison of forced response approximation through frequency detuning	5:00pm – 5:15pm
G. Habib, G. Kerschen	Predicting onset and merging of isolas through force-displacement curves	5:15pm – 5:30pm

Nonlinear dynamics of mechanical and structural systems
SPACE STRUCTURES

Chair: M. Eugeni, A. Arena

Faculty of
Engineering
(Room **Volterra**)

C. Wei, W. Zheng, L. Sun, H. Chen	Modelling method for liquid fuel large amplitude slosh of VTVL in posture section	4:30pm – 4:45pm
J.Z. Lin, W.X. Wu, Q.K. Han, Q.Y. Zhu, H. Ma	Analysis of nonlinear vibration characteristics of single bend pipeline-clamps system in aero-engine	4:45pm – 5:00pm
G. Zhu, G. Li	Dynamic analysis of a flexible partial space elevator with deployment/retrieval	5:00pm – 5:15pm
G. Zhu, J. Kang	Energy based control for space tethered system	5:15pm – 5:30pm

Nonlinear dynamics of mechanical and structural systems
EXPERIMENTAL DYNAMICS II

Chair: A. Shokhin, M. Talò

Faculty of
Engineering
(Room **Fermi**)

J. Ma, Z. Qin, F. Liu, J. Wang, M. Nie, J. Peng	Experimental study on the nonlinear dynamic response of laterally loaded pile using beam on Winkler foundation model	4:30pm – 4:45pm
A. Shokhin, G. Panovko, K. Krestnikovskii	On the synchronization of two unbalance vibration exciters, mounted on a resiliently supported rigid body, near resonance	4:45pm – 5:00pm
N. Cavalagli, M. Ciano, G. Fagotti, M. Gioffrè, V. Gusella, C. Pepi	Experimental investigation on the masonry structures nonlinear response to earthquake with strong vertical component using a shaking table	5:00pm – 5:15pm
C. Bebey, **B. Carboni**, A. Arena, W. Lacarbonara	Nonlinear dynamic response of hysteretic wire ropes: experiments and identification	5:15pm – 5:30pm

Nonlinear dynamics of mechanical and structural systems
TURNING PROCESSES AND SYSTEMS WITH TIME DELAY I

Faculty of Engineering
(Room **Poincaré**)

Chair: B. Balachandran, T. Kalmár-Nagy

B. Beri, G. Stepan	Approximated dynamics of chatter in turning processes	4:30pm – 4:45pm
Y. Yan, L. Chen, J. Xu, M. Wiercigroch, Q. Guo	Improving cutting safety by state-dependent intermittent control	4:45pm – 5:00pm
J. Lelkes, T. Kalmár-Nagy	Bifurcation analysis of a forced delay equation for machine tool vibrations	5:00pm – 5:15pm
L. Zhang, G. Stepan	Bifurcations in human force control	5:15pm – 5:30pm

DAY 2 – Tuesday, February 19, 2019	**4:30pm – 5:30pm**

Concepts and methods in nonlinear dynamics
BIFURCATION AND DYNAMIC INSTABILITY II

Faculty of Engineering
(Room **d'Alembert**)

Chair: J. M. Balthazar, F. Dohnal

M. Santana, P. Gonçalves, R. Silveira	Dynamic stability and load capacity of pyramidal trusses	4:30pm – 4:45pm
M. Ramirez, J. Collado, **F. Dohnal**	Stability of coupled and damped Mathieu equations utilizing symplectic properties	4:45pm – 5:00pm
L. Jiang, J. Li, W. Zhang, T. Quan	Bifurcation of multi-periodic solutions for a four-dimensional deployable circular mesh antenna system	5:00pm – 5:15pm
A. Lukin, D. Indeitsev, I. Popov, O. Privalova, L. Shtukin	Dynamics and elastic stability of a microbeam under ultrafast laser pulse	5:15pm – 5:30pm

DAY 2 – Tuesday, February 19, 2019	**4:30pm – 5:30pm**

Nonlinear dynamics and control
SENSORS AND ACTUATORS I

Faculty of Engineering
(Room **Birkhoff**)

Chair: S. Krylov, M. Younis

V.C. Meesala, **M. Hajj**, S. Shahab	Characterization of nonlinear electro-elastic behavior of piezoelectric receiver in ultrasound acoustic energy transfer systems	4:30pm – 4:45pm
A.E. Elhady Ahmed, **E.M. Abdel-Rahman**, M. Basha	Tuning of Bleustein-Gulyaev permittivity sensors	4:45pm – 5:00pm
N. Krakover, R. Maimon, T. Tepper-Faran, Y. Gerson, R. Rand, **S. Krylov**	Mechanical superheterodyne and its use for inertial sensing	5:00pm – 5:15pm
J. Yuan, **Y. Chen**, S. Fei	Compensation strategies for rate limit effect on first-order plus time-delay systems	5:15pm – 5:30pm

DAY 2 – Tuesday, February 19, 2019		4:30pm – 5:30pm
Nonlinear dynamics of mechanical and structural systems **SYSTEM IDENTIFICATION II**		Faculty of Engineering
Chair: J.-S. Pei, M. De Angelis		(Room **Lagrange**)
X. Chen, L. Xi, Y. Zhang, Y. Chen	Fractional techniques to characterize non-solid aluminium electrolyte capacitors for power electronics applications	4:30pm – 4:45pm
L.G.G. Villani, **S. da Silva**, A.B. da Cunha Jr	Application of a stochastic version of the restoring force surface method to identify a Duffing oscillator	4:45pm – 5:00pm
A. Mani, M.D. Narayanan, M. Sen	Mathematical modeling and parametric identification of a magneto rheological elastomer using fractional calculus	5:00pm – 5:15pm
J. Chen, Y. Zhang, Y. Liu, Q. Zhu	Modified multi-step-length gradient iterative algorithm for Hammerstein systems with random missing outputs	5:15pm – 5:30pm

DAY 3 – Wednesday, February 20, 2019

DAY 3 – Wednesday, February 20, 2019		8:30am – 10:00am
Concepts and methods in nonlinear dynamics ▮ **NONSMOOTH SYSTEMS III**		Faculty of Engineering
Chair: J. Awrejcewicz, J.J. Thomsen		(Room **Ljapunov**)
J. van Til, F. Alijani, W. Lacarbonara	Modeling nonsmooth end stop behavior of a tuned mass damper system under multi-harmonic excitations using Harmonic Balancing with alternating frequency/time	8:30am – 8:45am
A. Bhattacharjee, A. Chatterjee	Linear constraints, outward inequalities, and quadratic programming: a new general philosophy for restitution in impacts	8:45am – 9:00am
H. Xu, J. Ji	Creation of Neimark-Sacker bifurcation for a three-degree-of-freedom vibro-impact system with clearances	9:00am – 9:15am
K. R. Stevanovic Hedrih	Vibro-impact dynamics of two rolling heavy thin disks along rotate curvilinear line and energy analysis	9:15am – 9:30am
T. Yona, Y. Or	Theoretical analysis of wheeled three-link snake robot: singularities of nonholonomic constraints and stick-slip hybrid dynamics	9:30am – 9:45am
R. Lima, R. Sampaio	Stick-slip oscillations in an electromechanical system due to dry-friction	9:45am – 10:00am

DAY 3 – Wednesday, February 20, 2019		8:30am – 10:00am
Nonlinear dynamics of mechanical and structural systems ▮ **TURNING PROCESSES AND SYSTEMS WITH TIME DELAY II**		Faculty of Engineering
Chair: T. Kalmár-Nagy, W. Jin		(Room **Volterra**)
A. M. Tusset, J. M. Balthazar, R. T. Rocha, M. Ribeiro, W. B. Lenz, F. C. Janzen	Time delayed feedback control applied in a non-ideal system with chaotic behavior	8:30am – 8:45am
A. Gouskov, G. Panovko, D.T. Dinh	Effect of the compliance of the part on the double-turning process	8:45am – 9:00am
S. Jiang, J. Xu	Slow-fast oscillations in a time-delayed flexible joint system	9:00am – 9:15am
A. Wang, **W. Jin**, Q. Lin	Effect of the regenerative and frictional force on chatter in turning process	9:15am – 9:30am
T. Dong, X. Qiao	Spatiotemporally dynamic of a coupled neutral-type neural network with time delay and diffusion	9:30am – 9:45am
Y. Jin, P. Xu	Noise-induced resonances in a delayed triple-well potential system	9:45am – 10:00am

Concepts and methods in nonlinear dynamics ■■■			Faculty of Engineering
NONLINEAR WAVE PROPAGATION I			
Chair: M. Lepidi, A. Porubov			(Room **Fermi**)

S. Nikolic, N. B. Aleksic, O. A. Ashour, S. A. Chin, M. Belic		Higher-order breathers, solitons and rogue waves of the quintic nonlinear Schrödinger equation	8:30am – 8:45am
M. Fronk, M. J. Leamy		Higher-order multiple scales analysis of two-dimensional nonlinear periodic structures: waveform invariance and stability	8:45am – 9:00am
Y. Kosevich, Y. Doi		Localization and trapping of negative-effective-mass electrons by supersonic kinks in nonlinear chains with realistic interatomic potentials and electron-phonon interactions	9:00am – 9:15am
A. Porubov, I. Antonov, A. Osokina		Localized nonlinear waves in crystalline media	9:15am – 9:30am
P. Packo, M. J. Leamy		Guided wave propagation in nonlinear phononic plates	9:30am – 9:45am
A. Darabi, A. Mojahed, A. Vakakis, M. J. Leamy		Broadband passive non-reciprocity through nonlinearity and asymmetry	9:45am – 10:00am

Nonlinear dynamics of mechanical and structural systems ■■■			Faculty of Engineering
MECHANICAL SYSTEMS AND STRUCTURES III			
Chair: J. Bridge, Y. Mikhlin			(Room **Poincaré**)

R. Masana, M. Daqaq		On the static and dynamic analysis of Kresling pattern origami cylinders	8:30am – 8:45am
A. Dolev, I. Bucher		Levitated and parametrically excited sphere dynamics in a single-axis ultrasonic levitator	8:45am – 9:00am
E. A.R. Ribeiro, B. A.P. Mendes, C.E.N. Mazzilli		Parametric instability of a heavy-chain model with an asynchronous vibration mode	9:00am – 9:15am
M. Ferretti, G. Piccardo, A. Luongo		Nonlinear planar response of massive taut strings travelled by a force-driven point-mass	9:15am – 9:30am
M. Stender, M. Di Bartolomeo, F. Massi, N. Hoffmann		From steady sliding to squeal and stick-slip oscillations: revealing dynamical transitions in experimental friction-excited systems using nonlinear-time series analysis	9:30am – 9:45am
S. Ramnarace, **J. Bridge**		Analysis of a shape memory alloy spring system under harmonic excitation	9:45am – 10:00am

Nonlinear dynamics and control

CONTROL OF NONLINEAR SYSTEMS II

Faculty of
Engineering
(Room **d'Alembert**)

Chair: M. Lawrynczuk , M. Galicki

Authors	Title	Time
P. Domanski, **M. Lawrynczuk**	Control quality assessment of nonlinear model predictive control using fractal and entropy measures	8:30am – 8:45am
L. Nesi, D. Antonelli, G. Pepe, A. Carcaterra	Fast moving of a population of robots through a complex scenario	8:45am – 9:00am
A. Younespour, S. Cheng	Sliding mode control of nonlinear systems using a block pulse function-based equivalent linearization method	9:00am – 9:15am
M. Galicki	Finite-time control of omni-directional wheeled mobile robots	9:15am – 9:30am
M. Gidlewski, L. Jemioł, **D. Żardecki**	Impact of the controller algorithm on the effect of motor vehicle steering during a lane-change manoeuvre	9:30am – 9:45am
M. V. Gorbunkov, **Y. Y. Maslova**, Y. V. Shabalin	Nonlinear dynamics of harmonically mode-locked feedback-controlled solid state laser	9:45am – 10:00am

Nonlinear dynamics and control

SENSORS AND ACTUATORS II

Faculty of
Engineering
(Room **Birkhoff**)

Chair: M. Younis, Y. Chen

Authors	Title	Time
M. Pinto, N. Roveri, G. Pepe, A. Carcaterra	A theory of swarm of sensors for vibration monitoring of large structures	8:30am – 8:45am
S. Ghaffari, **S. Ceballes**, A. Abdelkefi	Nonlinear modeling and dynamic response of forced carbon nanotube-based bio-mass sensors subjected to uniform and nonuniform thermal loadings	8:45am – 9:00am
A. Papirovskiy, A. Lukin, I. Popov	On the Rayleigh surface acoustic waves in rotating piezoelastic media	9:00am – 9:15am
C.-E. Park, N. K. Kwon, P. Park	Reliable output-feedback control for Markovian jump descriptor systems with sensor failure and actuator saturation	9:15am – 9:30am

Recent trends in nonlinear dynamics 　　　　　　　　　　　Faculty of
ENERGY HARVESTING II　　　　　　　　　　　　　　　Engineering

Chair: F. Romeo, A. Cammarano　　　　　　　　　　　　　(Room **Lagrange**)

J. M. Balthazar, R. T. Rocha, A. M. Tusset, F. C. Janzen	Energy harvesting approach: Nonlinear charge and voltage piezoelectric models coupled to a two-degrees-of-freedom structure	8:30am – 8:45am
A. Nabarrete, S. Shahlaei-Far, J. M. Balthazar	Nonlinear piezoelectric vibration energy harvesting of a cantilever beam using homotopy analysis method	8:45am – 9:00am
F.-R. Liu, W.-M. Zhang	Upstream plates for enhancing the dynamic performance of a wind energy harvester	9:00am – 9:15am
X. Nie, T. Tan, Z. Yan, Z. Yan	Theoretical and experimental analyses of broadband L-shaped beam-mass piezoelectric energy harvester using nonlinear resonance	9:15am – 9:30am
Y. Dai, C. Song, S. Zhu	Energy harvesting of a flying-wing aircraft model in the gust response test	9:30am – 9:45am
T. Tan, Z. Yan, H. Lei, Y. Zou, L. Wang, W. Zhang	Nonlinear energy harvesting from hybrid of galloping and electrical resonance	9:45am – 10:00am

Concepts and methods in nonlinear dynamics
ANALYTICAL TECHNIQUES II

Faculty of
Engineering
(Room **Ljapunov**)

Chair: F. Verhulst, A. Bowling

L. Manevitch, **M. Kovaleva**, V. Pilipchuk	Non-conventional attractors in the weakly detuned system of coupled active oscillators and monad concept	10:30am – 10:45am
A. Bowling, V. Joshi	Integration of modeling and experimentation to explore the underdamped motion of beads in optical tweezers	10:45am – 11:00am
A. M. Bersani, A. Borri, A. Milanesi, G. Tomassetti, P. Vellucci	Singular perturbation techniques and asymptotic expansions for some complex enzyme reactions	11:00am – 11:15am
N. Nassiri-Mofakham	Modelling of exciton dynamics in Gaussian confining potential	11:15am – 11:30am
H.-E. Du, G.-K. Er, V. P. Iu	A novel method for the frequency response curve and its unstable region of strongly nonlinear oscillator	11:30am – 11:45am
K. R. Jayaprakash, D. Marom, Y. Starosvetsky	Analytical study of piecewise linear Mathieu equation	11:45am – 12:00pm
C. Á. Hubay, T. Kalmár-Nagy	A linear algebraic method for obtaining Poincaré-Lyapunov quantities in nonlinear dynamical systems	12:00pm – 12:15pm

Recent trends in nonlinear dynamics
BIOLOGICAL SYSTEMS DYNAMICS II

Faculty of
Engineering
(Room **Volterra**)

Chair: M. Neamtu, J. T. Machado

D. Fan, Q. Wang	Synchronization dynamics of the multi-layer thalamocortical modular motifs	10:30am – 10:45am
X.-B. Zhang, X.-D. Wang, H.-F. Huo	A stochastic SIR epidemic model with media coverage	10:45am – 11:00am
E. Kaslik, **M. Neamtu**, A. Radulescu	A time-delay nonlinear model of dopamine-modulated prefrontal-limbic interactions in schizophrenia	11:00am – 11:15am
F. Zhan, S. Liu	A Henon-like mapping inspired by a discrete-time FitzHugh-Nagumo model	11:15am – 11:30am
L. Wang, M. Huang, Y. Zhang, Y. Zhang	The stability analysis for the gene regulatory circuit in Bacillus subtilis by stochastic generalized cell mapping method	11:30am – 11:45am

Concepts and methods in nonlinear dynamics
NONLINEAR WAVE PROPAGATION II

Chair: S. Carillo, H. I. Abdel-Gawad

Faculty of Engineering (Room **Fermi**)

S. Carillo, M. Lo Schiavo, C. Schiebold	Solutions of matrix soliton equations: some results on Korteweg-de Vries (KdV) and modified Korteweg-de Vries (mKdV) equations.	10:30am – 10:45am
A. Adem	Group classification, symmetry reductions and exact solutions of a generalized Korteweg-de Vries-Burgers equation	10:45am – 11:00am
X. Wang, S. Bilige	Abundant exact solutions of coupled Burgers' equations	11:00am – 11:15am
H. I. Abdel-Gawad, M. Tantawy	Multi-waves solutions of Nizhnik-Novikov Veselov equation with variables coefficients as a composition of self-similar and traveling waves	11:15am – 11:30am
H.-Q. Zhao	Optical wave propagation in a reverse space nonlocal coupled nonlinear Schrödinger and Maxwell-Bloch equations	11:30am – 11:45am

Nonlinear dynamics of mechanical and structural systems
COMPOSITE AND MULTIFUNCTIONAL STRUCTURES

Chair: J. Awrejcewicz, F. Pellicano

Faculty of Engineering (Room **Poincaré**)

A. Range, J. Rhoads	The near-resonant thermomechanics of particulate composite energetic materials in response to high frequency excitation	10:30am – 10:45am
L. Kurpa, T. Shmatko, J. Awrejcewicz	Parametric vibrations of the functionally graded sandwich plates with complex form	10:45am – 11:00am
F. Silva, P. Rodrigues, P. Gonçalves	Nonlinear oscillation of a FG cylindrical shell on a discontinuous elastic foundation	11:00am – 11:15am
M. Talò, B. Carboni, G. Formica, G. Lanzara, M. Snyder, W. Lacarbonara	Nonlinear dynamic response and identification of nanocomposite cantilever beams	11:15am – 11:30am
V. Burlayenko, T. Sadowski, S. Dimitrova	Nonlinear fracture dynamics of double cantilever beam sandwich specimens	11:30am – 11:45am
A. Nabarrete, E. F. Rocha De Araujo, J. M. Balthazar, A. M. Tusset	Nonlinear vibration analysis of a sandwich beam and assessment of the dynamic behavior	11:45am – 12:00pm
H. Yan, Y. Dai, X. Zou	Static and dynamic analysis of dielectric elastomer plates with geometric and physical nonlinearities	12:00pm – 12:15pm
B. Wang, D. Cao, **X. Guo**	Vibration analysis of an axially functionally graded cantilever beam	12:15pm – 12:30pm

Nonlinear dynamics and control ▮▮
CONTROL OF NONLINEAR SYSTEMS III

Faculty of
Engineering
(Room **d'Alembert**)

Chair: Y. Chen, J. H. Park

K. Lochan, B. K. Roy, B. Subudhi	Design of a composite control scheme for a two-link flexible manipulator using contraction theory	10:30am – 10:45am
F. Ge, **Y. Chen**	Distributed event-triggered output feedback control for semilinear time fractional diffusion systems	10:45am – 11:00am
Z. Koruba, I. Krzysztofik	Non-linear model of quadcopter dynamics during observation and laser illumination of a ground target	11:00am – 11:15am
I. Krzysztofik, Z. Koruba	Analysis of quadcopter dynamics during programmed motion in the conditions of external disturbances	11:15am – 11:30am
G. Moretti, M. Fontana, L. Zaccarian, F. Blanchini	Steady-state optimisation of periodic systems based on Fourier analysis	11:30am – 11:45am
A. Composto, **N. Chalhoub**	Experimental validation of the robust performance of a fully-integrated controller-observer-guidance system of a marine surface vessel in an uncontrolled environment	11:45am – 12:00pm
Y. Guo, V. T. Huynh, Z. Wang	Two time scales model based robust tracking control of MBTs autoloaders with oscillatory chassis and flexible joint	12:00pm – 12:15pm
G. Ambika, K. Gupta	Multiple time scale dynamics on complex networks	12:15pm – 12:30pm

Nonlinear dynamics of mechanical and structural systems ▮▮
ROTATING SYSTEMS II

Faculty of
Engineering
(Room **Birkhoff**)

Chair: H. Hetzler, C. Nataraj

R. Wildemans, A. Aribowo, E. Detournay, N. van de Wouw	Modelling and analysis of an anti-stall tool in a drilling system including spatial friction	10:30am – 10:45am
S. Baeuerle, H. Hetzler	Analysis of quasi-periodic oscillations of a rotor-system with compliant seal by a multidimensional Fourier-Galerkin method	10:45am – 11:00am
Y. Benaicha, J. Perret-Liaudet, J.-D. Beley, F. Thouverez, E. Rigaud	Some results about multibody modelling for describing gear dynamics including meshing teeth contact	11:00am – 11:15am
F. Georgiades	Chaotic dynamics in spinning shaft with non-constant rotating speed described by variant Lyapunov exponents	11:15am – 11:30am
B. Zhang, H. Ding, L.-Q. Chen	Super-harmonic resonances of a rotating pre-deformed blade subjected to gas pressure	11:30am – 11:45am
K. Becker, W. Seemann	Bifurcation and solution analysis of a rotor dynamic system involving journal bearings with ovally-shaped profile	11:45am – 12:00pm
T. H. Machado, G. C. Storti	Nonlinear model for wear effects in hydrodynamic bearings applied to rotating systems	12:00pm – 12:15pm
T. H. Mohamad, S. Ilbeigi, **C. Nataraj**	Proper and smooth orthogonal decompositions for detection of inner race defects in rolling element bearings under variable rotational speed	12:15pm – 12:30pm

	Recent trends in nonlinear dynamics	Faculty of
MEMS AND NEMS II		Engineering
Chair: S. Krylov, G. Rega		(Room **Lagrange**)

P. Koludarov, A. Lukin, I. Popov	System-level modelling of torsional MEMS gyroscope nonlinear dynamics	10:30am – 10:45am
B. Torteman, Y. Kessler, A. Liberzon, S. Krylov	Parametrically excited electro thermal micro resonator and its use as a flow sensor	10:45am – 11:00am
I. K. Kim, **S. I. Lee**	Numerical prediction of isolated response solution in electrostatically excited carbon nanotube resonator	11:00am – 11:15am
K. Khorkov, D. Kochuev, R. Chkalov, V. Prokoshev, S. Arakelian	Nonlinear dynamic processes in laser-induced transitions to low dimensional carbon nanostructures in bulk graphite unit	11:15am – 11:30am
A. Iuorio, N. Popovic, P. Szmolyan	Singular perturbation analysis of a regularized MEMS model	11:30am – 11:45am
A. Pyatysheva, A. Lukin, I. Popov	Nonlinear dynamics of single-mass MEMS vibratory gyroscope	11:45am – 12:00pm
P. N. Kambali, F. Torres, N. Barniol, O. Gottlieb	Nonlinear multi-element interactions in an elastically coupled micro-cantilever array subject to electrodynamic excitation	12:00pm – 12:15pm

Concepts and methods in nonlinear dynamics

BIFURCATION AND DYNAMIC INSTABILITY III

Chair: Y. Mikhlin, I. Kovacic

Faculty of Engineering (Room **Ljapunov**)

Authors	Title	Time
Z. Si, Y.-J. Qian, X.-D. Yang, W. Zhang	Parametric stability and response analysis for irregular-shaped asteroids based on perturbed particle-linkage model	2:00pm – 2:15pm
S. Yin, S. Deng, G. Wen	Conjugate eigenvalues and Neimark-Sacker bifurcation near degenerate grazing point	2:15pm – 2:30pm
A. K. de Almeida J., J. O. Murcia Piñeros, A. F. B. A. Prado	Searching for bounded trajectories in specific altitudes for Low Earth Orbit small satellites	2:30pm – 2:45pm
T. Quan, J. Li, W. Zhang, M. Sun	Bifurcation and number of subharmonic solutions for a 4-dimensional system and its application	2:45pm – 3:00pm
M. Yadav, **S. S. Chaurasia**, S. Sinha	Asymmetry in the basin stability of the oscillation death states under the variation of environment-oscillator links	3:00pm – 3:15pm
X. Liu, J. Jiang, L. Hong	Wada boundary bifurcation induced by boundary saddle-saddle collision	3:15pm – 3:30pm

Recent trends in nonlinear dynamics

TRAFFIC FLOW AND VEHICLE DYNAMICS

Chair: W. Wedig, K. Zielonka

Faculty of Engineering (Room **Volterra**)

Authors	Title	Time
L. Prochowski, M. Gidlewski, M. Ziubiński, **K. Zielonka**	Comparative analysis of the kinematics of motorcar bodies during front-to-side collision tests carried out to the FMVSS 214 and conventional crash test procedures	2:00pm – 2:15pm
D. Jing, J. Sun, C. Ren, X. Zhang	Multi-objective optimization of active vehicle suspension system control	2:15pm – 2:30pm
M. Gidlewski, L. Prochowski, L. Jemioł, **K. Zielonka**	The process of energy dissipation during a frontal impact of a motorcar against various places on the side of another car	2:30pm – 2:45pm
S. Zhang, J. Xu, K. W. Chung	An investigation on the local stability and Bautin bifurcation of TCP/AQM congestion control model with state-dependent delay	2:45pm – 3:00pm

DAY 3 – Wednesday, February 20, 2019		2:00pm – 3:30pm
Recent trends in nonlinear dynamics		Faculty of Engineering
FRACTIONAL ORDER SYSTEMS II		(Room **Fermi**)
Chair: J. T. Machado, Y. Chen		
Y.-Q. Wang, X.-P. Ni	Bulk dynamics in TASEP networks with Langmuir kinetics and finite resources	2:00pm – 2:15pm
W. Zan, Y. Xu, J. Kurths, A. V. Chechkin	Fractional FPK equation and its solution associated to SDE excited by combined Gaussian and Lévy noise	2:15pm – 2:30pm
Y. Li, T. He	Transient responses of bi-layered structure due to laser pulse heating based on the generalized thermoelastic theory with fractional order and memory-dependent derivative	2:30pm – 2:45pm
G. Chen, S. Guo, B. Hou, J. Wang, X. Wang	Fractional order impedance control	2:45pm – 3:00pm
Y. Yu, **Z. Wang**	Non-smooth bifurcations in two fractional-order memristive circuits	3:00pm – 3:15pm

DAY 3 – Wednesday, February 20, 2019		2:00pm – 3:30pm
Nonlinear dynamics and control		Faculty of Engineering
NETWORKS SYNCHRONIZATION		(Room **Poincaré**)
Chair: J. H. Park, J. P. Ramirez		
S. Habermehl, N. Bajaj, S. Shah, D. D. Quinn, D. Weinstein, J. Rhoads	Synchronization in a network of coupled MEMS-colpitts oscillators	2:00pm – 2:15pm
J. P. Ramirez, H. Nijmeijer	Enforcing synchronization via open-loop excitation	2:15pm – 2:30pm
V. M. Aravind, S. Sinha, K. Murali	Synchronised hopping induced by interplay of coupling and noise	2:30pm – 2:45pm
S. Liu, R. Zhang, K. Li	Outer synchronization for uncertain discrete network with community structure	2:45pm – 3:00pm

DAY 3 – Wednesday, February 20, 2019		2:00pm – 3:30pm
Concepts and methods in nonlinear dynamics		Faculty of Engineering
MULTI BODY SYSTEMS		(Room **d'Alembert**)
Chair: P. Masarati, K.-W. Kim		
K.-W. Kim, J.-W. Lee, J.-S. Jang, J.-H. Kang, W.-S. Yoo	Derivation of non-dimensional equation of motion for thin plate in absolute nodal coordinate formulation	2:00pm – 2:15pm
Z. Li, B. Wen, Z. Peng, W. Yang	Flexible dynamic modeling and analysis of drive train for offshore floating wind turbine	2:15pm – 2:30pm
B. Rong, X. Rui, K. Lu, L. Tao, G. Wang, J. Zhang	Parallel discrete time transfer matrix method for flexible multibody dynamics with geometric nonlinearity and thermal coupling effect	2:30pm – 2:45pm
J. Ding, Y. Li, B. Li	L-stable method for differential-algebraic equations of multibody system dynamics	2:45pm – 3:00pm
Y.-Q. Wang, S. Lin	Chaos dynamics in multibody interacting particle system with trajectory of variable curvature radius	3:00pm – 3:15pm
Y.-Q. Wang, Z.-A. Zhu, J.-W. Wang	Stochastic dynamical mechanisms of multibody interacting particle system: evolvement laws in non-equilibrium phase transitions	3:15pm – 3:30pm

DAY 3 – Wednesday, February 20, 2019		2:00pm – 3:30pm
Concepts and methods in nonlinear dynamics ■		Faculty of Engineering
CHAOTIC SYSTEMS AND UNCERTAINTY II		
Chair: J. Ma, V. Settimi		(Room **Birkhoff**)
M. Patra	Hyperchaos in 3-D piecewise linear maps	2:00pm – 2:15pm
L. Hong, J. Jiang, J.-Q. Sun	Crises in chaotic pendulum with fuzzy uncertainty	2:15pm – 2:30pm
J. P. Singh, B. K. Roy	Two memcapacitor-based new 3-D chaotic system with cascaded period doubling route to chaos	2:30pm – 2:45pm
F. A. Khan, J. Ahmed, J. Ahmad, J. S. Khan, F. Ahmed, V. Stankovic, H. Larijani	A novel choas-based partial image encryption scheme using lifting wavelet transform	2:45pm – 3:00pm
J. Ahmad, H. Larijani, R. Emmanuel, M. Mannion, A.-U.-H. Qureshi	Chaos-based video encryption-compression for real-time secure indoor human occupancy	3:00pm – 3:15pm

DAY 3 – Wednesday, February 20, 2019		2:00pm – 3:30pm
Nonlinear dynamics of mechanical and structural systems ■		Faculty of Engineering
ROTATING SYSTEMS III		
Chair: Z. Terze, F. Georgiades		(Room **Lagrange**)
S. Huilin, J. Wu	Complex dynamics of a nonlinear relative rotation system and its control by delayed feedback	2:00pm – 2:15pm
M. Jiang, J. Wu, Q. Wang, X. Cao	Status estimation for rolling bearing degradation process by time series analysis based nonlinearity measures on vibration responses	2:15pm – 2:30pm
K. Lu, W. Jian, Y. Jin, Y. Yang, L. Hou	Second dimension reduction method for high-dimensional rotor-bearing system model	2:30pm – 2:45pm
C. Baykal, E. Cigeroglu, Y. Yazicioglu	Vibration analysis of washing machines in the drum plane	2:45pm – 3:00pm

		4:00pm – 5:00pm

Concepts and methods in nonlinear dynamics
ANALYTICAL TECHNIQUES III

Faculty of Engineering (Room **Ljapunov**)

Chair: A. Bhattacharjee, D. Zulli

B. Sandor, T. Kalmár-Nagy	Necessary condition for Universal Differential Equations	4:00pm – 4:15pm
Y. Tian, J. Li, T. Quan	An estimation for the number of periodic solutions of a nonlinear dynamic system in six-dimension and its application	4:15pm – 4:30pm
A. Elias-Zúñiga, **L. M. Palacios-Pineda**, D. Olvera-Trejo, O. Martínez-Romero	Lyapunov equivalent representation of nonlinear oscillators by using a power-form elastic term	4:30pm – 4:45pm
A. Bhattacharjee, K. Shah, A. Chatterjee	Universal averaged dynamics of the Fokker-Planck equation for Paul traps, at all forcing amplitudes	4:45pm – 5:00pm

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DAY 3 – Wednesday, February 20, 2019   4:00pm – 5:00pm

Recent trends in nonlinear dynamics
NONLINEAR PHENOMENA IN BIO- AND ECOSYSTEMS DYNAMICS

Faculty of Engineering (Room **Volterra**)

Chair: J. Ma, Z. Ma

S. Lamba, P. Murali	Complexity and regulation of nitrogen biochemical systems	4:00pm – 4:15pm
B. Dubey, A. Kumar	Modelling on the effect of fear in a prey-predator system with prey refuge and gestation delay	4:15pm – 4:30pm
W. Jia, D. Li	The stochastic dynamics of nonlinear ecosystem under combined Gaussian and Poisson white noise via stochastic averaging	4:30pm – 4:45pm
Z. Ma	Hopf bifurcation of a generalized predator-prey system with habitat complexity and time delay	4:45pm – 5:00pm

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DAY 3 – Wednesday, February 20, 2019   4:00pm – 5:00pm

Recent trends in nonlinear dynamics
ENERGY HARVESTING III

Faculty of Engineering (Room **Fermi**)

Chair: J. M. Balthazar, G. Quaranta

T.-C. Yuan, J. Yang, R.-G. Song	Nonparametric identification of nonlinear electromagnetic energy harvesters	4:00pm – 4:15pm
G. Zhang	Secondary resonance energy harvesting	4:15pm – 4:30pm
S. Zhou, X. Mei, Y. Chen, Z. Yang	Numerical and experimental study of nonlinear asymmetric tristable energy harvesters	4:30pm – 4:45pm

Concepts and methods in nonlinear dynamics

COMPUTATIONAL NONLINEAR DYNAMICS III

Faculty of
Engineering
(Room **Poincaré**)

Chair: J. H. Park, S. Lenci

L.R. Tamatam, D. Botto, S. Zucca	Effect of wear on the dynamics of structures with contact interfaces by a coupled static/dynamic multi-harmonic balance method	4:00pm – 4:15pm
X. Jing	Analysis and design of nonlinearity in the frequency domain: a parametric characteristic approach	4:15pm – 4:30pm
Z. Wang, Z. Tang, J. H. Park	A novel two-stage ellipsoid filtering based system modeling algorithm for a Hammerstein nonlinear model with an unknown noise term	4:30pm – 4:45pm
L. Wang, Y. Zhang, X. Yue, Y. Zhang, W. Xu	The capsizing problem of ship roll based on generalized cell mapping method	4:45pm – 5:00pm

Nonlinear dynamics of mechanical and structural systems

MECHANICAL SYSTEMS AND STRUCTURES IV

Faculty of
Engineering
(Room **d'Alembert**)

Chair: K. van Dalen, G. Formica

T. Mazilu, A. Faragau, A. Metrikine, **K. van Dalen**	Response of an infinite beam on a locally inhomogeneous viscoelastic foundation interacting with a moving oscillator – The Green's function approach	4:00pm – 4:15pm
R. Augello, E. Carrera, W. Chen, M. Filippi, A. Pagani, **B. Wu**	Effect of in-plane loadings on the free vibration of plates in nonlinear regime	4:15pm – 4:30pm
H. Lee, M. Cho	C0 finite elements of absolute nodal coordinate formulation for nonlinear dynamic analysis	4:30pm – 4:45pm
M. Cho, H. Lee, H. Kim	Reduced order model for C0 ANCF flexible multi-body simulation	4:45pm – 5:00pm

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