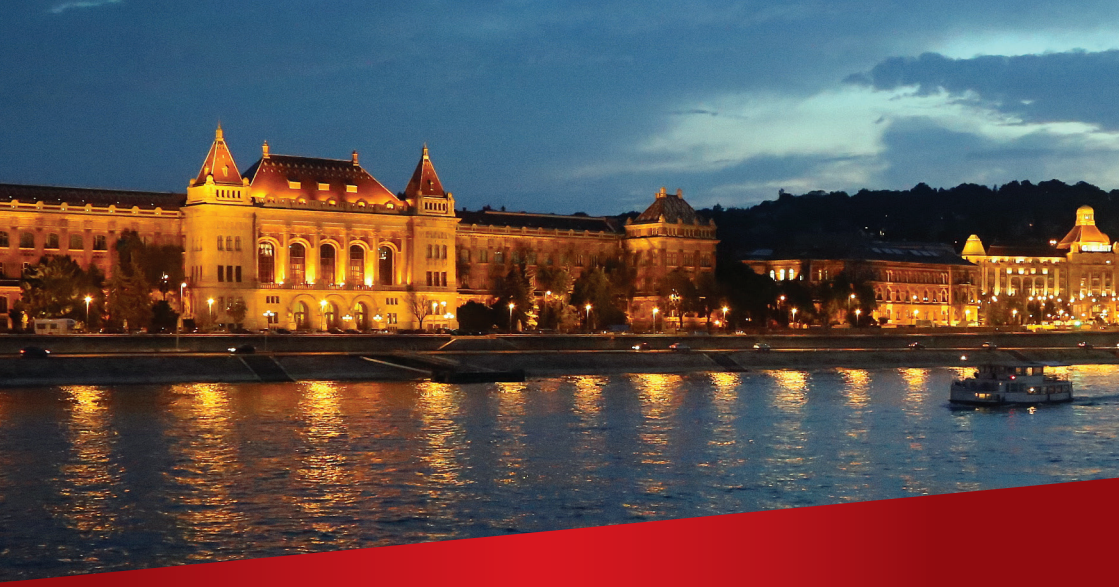

ENOC 2017

9TH EUROPEAN NONLINEAR DYNAMICS CONFERENCE

25-30 June, 2017

Budapest, Hungary

Department of Applied Mechanics
Budapest University of Technology
and Economics

PROGRAMME

www.congressline.hu/enoc2017

ORGANIZERS

Local Organizing Committee (LOC)
Gábor Stépán *(chairman)*
Gábor Csernák *(secretary)*
Péter Beda
Gábor Domokos
Zsolt Gáspár
János Józsa
György Károlyi
Gyula Patkó
Tamás Tél
János Vad

European Nonlinear Oscillations Conference Committee (ENOCC)
Giuseppe Rega, Italy *(Chair ENOCC)*
Vincent Acary, France
Matthew Cartmell, UK
Felix Chernousko, Russia
Oded Gottlieb, Israel
Andrei Metrikine, The Netherlands
Remco Ingmar Leine, Germany
Pedro Leal Ribeiro, Portugal
Alois Steindl, Austria
Gábor Stépán, Hungary

WELCOME

Dear Colleagues,

It is my great pleasure and privilege to welcome you at the 9th European Nonlinear Dynamics Conference (ENOC 2017) in Budapest, Hungary.

I would like to express my gratitude to the European Nonlinear Oscillations Conference Committee and Council for supporting our proposal. My colleagues in the Local Organizing Committee did their best to create a friendly atmosphere for work and rest, encourage new personal contacts and exchange of ideas.

Budapest is an ideal setting to discuss current progress in the research of nonlinear dynamics. Our capital is a city of outstanding geographical location with great traditions, wonderful historical places, as well as plenty of prestigious hotels within walking distance to the venue and to downtown Budapest.
According to the traditions of ENOC conferences, the scientific programme is structured to numerous minisymposia on major and challenging pre-defined topics, organized by well-recognized scientists.

I wish you all a successful meeting, full of exchange and improvement of ideas and knowledge in the diverse fields of nonlinear dynamics.

Gábor Stépán
Chair of ENOC 2017
Department of Applied Mechanics
Budapest University of Technology and Economics

GENERAL INFORMATION

Conference date
25-30 June, 2017

Conference venue
Budapest University of Technology and Economics (BME)
H-1111 Budapest, Műegyetem rkp. 3. / Building K

Please note that the plenary room (KF51, Auditorium Maximum), session rooms, Aula and Gallery areas are on 3 different levels in the building, they are visualized on the floorplans in this programme book.

Access by public transportation
The simplest way to reach the venue of ENOC 2017 - Building K of BME - is by a short walk from the public transport interchange hub called Szent Gellért Tér (St. Gellért Square).

Trams stopping here: 19, 41, 47, 48, 49, 56, 56A
Busses stopping here: 7, 133E
Underground line No. 4 (Metro M4, green line)

Official conference language
The official language of the conference is English.

Internet access
Password secured free WIFI is available at the venue of the conference.
For access codes please contact the registration desk on-site.

Registration and information desk opening hours
25 June, Sunday 15.00- 21.00
26 June, Monday 8.00-18.00
27 June, Tuesday 8.00-18.00
28 June, Wednesday 8.00-14.00
29 June, Thursday 8.00-18.00
30 June, Friday 8.00-12.00

Hotline to registration desk
+36 70/608-6806

Meals
Included in the registration fee, organisers provide coffee breaks and hot lunches for the participants. The meals are served in the Aula and on the Gallery of the conference venue where the registration desk and the poster stands are placed.
The serving points are marked on the floorplan in this program book, the serving times are detailed in the programme overview.

Badges
Identification badges are provided along with other conference materials upon registration. The organisers kindly ask you to wear them all the time during the conference. Please also note that your conference badge assures your entrance to conference premises and catering. Persons without badges may be refused.
The identification badges are also helpful when contacting the secretariat and other participants.

Mobile phones
Please respect the speakers and presenters by ensuring that your mobile phone is switched off during the scientific sessions.

Technical Information for Speakers
The organizers kindly ask you to bring your presentations with you on a USB memory stick. Your presentation must be uploaded to the computers in the posted room with the help of the assisting volunteers responsible for the dedicated room.
The presentation uploading deadline is the last coffee break prior to your scheduled presentation. Please note that double slide projection and personal laptops cannot be used.

Technical Information for Poster Presenters
Poster size: 1189 mm vertically x 841 mm horizontally (A0 portrait size)
Poster set-up: Monday, 26 June from 9.00
Poster removal: Friday, 30 June from 11.00

All supplies needed to hang the posters will be available at the poster stands.

Poster session: **Thursday, 29 June 16.00-18.00**

Programme changes
Due to unforeseen circumstances the organisers cannot assume liability for any changes in the scientific programme. Organisers will do their best to keep ENOC 2017 participants up to date, possible changes in programme will be immediately communicated.

Conference papers of ENOC 2017 Conference
Please find all the papers under the following link:
http://congressline.hu/enoc2017/abstracts.php

ENOC 2017 Young Scientist Award
The Organizing Committee proudly announces the ENOC 2017 Young Scientist Award given for the best two oral presentations during the conference.
The nominated presentations will be evaluated during the sessions and awarded on the Closing Ceremony. Each winner will receive a 300 EUR prize, a special experimental device and a certificate.

ENOC 2017 Best Poster Award
The Organizing Committee proudly announces the ENOC 2017 Best Poster Award given for the best poster presentation during the conference. The best poster will be chosen during the poster session and awarded on the Closing Ceremony.
The winner will receive a special experimental device and a certificate.

REGISTRATION FEES

Registration types	Regular fees after 28 April, 2017	Onsite fees
Participant/Author registration fee EUROMECH member	EUR 550	EUR 570
Participant/Author registration fee non EUROMECH member	EUR 580	EUR 600
Student/Student Author registration fee	EUR 300	EUR 300
Additional paper handling fee	EUR 100	EUR 100
Accompanying Person participation fee	EUR 180	EUR 180

All prices include 27% VAT.

Participant / Author / Student fees include
- Access to all conference sessions
- Conference bag
- Programme booklet
- Attendance at the Ice Breaker
- Attendance at the half day excursion
- Attendance at the Farewell Dinner
- Coffee and tea during coffee breaks
- Lunches

The accompanying person fee includes
- Attendance at the Ice Breaker
- Attendance at the half day excursion
- Attendance at the Farewell Dinner
- Castle tour including visit at the National Gallery
- Budapest Bath Tour – Széchenyi Bath
- Tour bag

SOCIAL PROGRAMMES

Ice Breaker
Sunday, 25 June, 2017, 19.00-21.00
Venue: Budapest University of Technology and Economics, Building K, Aula
Included in registration fee / accompanying fee

By refreshing yourself after travelling with some wine and snacks, you can register and meet your colleagues at the conference venue.

Farewell Dinner
Thursday, 29 June, 2017, 19.00-24.00
Venue: Szekér Csárda / Budapest, Óbuda Island
Included in registration / accompanying fee
Departure: by boat at 19.00 from Gellért Square port Liberty Bridge (Szabadság híd) Buda side.

The organizers of the ENOC 2017 congress are willing to give you a little taste of the Hungarian culture spiced with a memorable boat trip on the river Danube. Make sure not to miss this unique opportunity and attend the farewell dinner! Beyond the pleasant boat ride you will get excellent Hungarian hospitality, traditional food, nice wines, lots of fun with colleagues and a temporary time travel back to the 19th century to see how Csárdás was danced in a Csárda.

Half day excursion (prior registration was needed)
Wednesday, 28 June, 2017, 13.30-18.00

Included in registration fee / accompanying fee
Departure: at 14.00 from Budapest University of Technology and Economics

Please note that for security reasons a photo ID is necessary, make sure to have it with you! During the excursions refreshments are provided.

Sightseeing tour
This half-day sightseeing tour highlights the most attractive features of the beautiful city of Budapest. Participants also visit the impressive House of Parliament.

The Jewish sights of Budapest
During this four-hour long walking tour in the world's second largest Synagogue you can have an inside look into the Jewish quarter's very rich history.

Factory visit AUDI Hungaria
AUDI Hungaria invites you to a stunning factory tour on the path. Please calculate with 1,5 hours bus transportations to the visitor centre and back.

FLOORPLANS

MEZZANINE FLOOR
KF51 (AUD. MAX)
WC
AULA
P
+
MAIN ENTRANCE
GROUND FLOOR
KF81
KF82
KF83
KF87
KF88
+ REGISTRATION
CATERING/COFFEE
P POSTER

FLOORPLANS

FIRST FLOOR
K150
K155
K134
K174
WC
WC
WC
WC
GALLERY
CATERING/COFFEE

Sunday, 25 June, 2017

19.00 - 21.00 **ICE BREAKER – AULA, BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS**

Monday, June 26, 2017

TIME/ ROOM	ROOM 1 (KF51)	ROOM 2 (K174)	ROOM 3 (K155)	ROOM 4 (K134)	ROOM 5 (K150)	ROOM 6 (KF81)	ROOM 7 (KF88)	ROOM 8 (KF82)	ROOM 9 (KF87)
09.30 - 10.30	Opening Ceremony								
10.30 - 11.00	COFFEE BREAK								
11.00 - 12.00	Plenary lecture	**Particles - Simulating Complicated Processes with Meshfree Methods** Peter Eberhard *University of Stuttgart, Germany*							
12.00 - 13.30	LUNCH								
13.30 - 15.30	MS-09 I. Nonlin. Dyn. Eng. Sys.	MS-11 I. Time delay	MS-03 I. Comput. M.	MS-08 I. Nonlin. Mech. & Struct.	MS-18 I. Control	MS-10 I. Non-smooth Dyn.	MS-07 I. Multibody	MS-19 I. Fluid-Structure	MS-06 I. Fractional Deriv.
15.30 - 16.00	COFFEE BREAK								
16.00 - 18.00	MS-09 II. Nonlin. Dyn. Eng. Sys.	MS-11 II. Time delay	MS-03 II. Comput. M.	MS-08 II. Nonlin. Mech. & Struct.	MS-18 II. Control	MS-10 II. Non-smooth Dyn.	MS-07 II. Multibody	MS-19 II. Fluid-Structure	MS-06 II. Fractional Deriv.

Tuesday, June 27, 2017

TIME/ ROOM	ROOM 1 (KF51)	ROOM 2 (K174)	ROOM 3 (K155)	ROOM 4 (K134)	ROOM 5 (K150)	ROOM 6 (KF81)	ROOM 7 (KF88)	ROOM 8 (KF82)	ROOM 9 (KF87)
08.30 - 10.30	MS-09 III. Nonlin. Dyn. Eng. Sys.	MS-11 III. Time delay	MS-03 III. Comput. M.	MS-08 III. Nonlin. Mech. & Struct.	MS-18 III. Control	MS-10 III. Non-smooth Dyn.	MS-07 III. Multibody	MS-02 I. Asymptotic M.	MS-01 I. Reduced-order
10.30 - 11.00	COFFEE BREAK								
11.00 - 12.00	Plenary lecture	**Autonomous assembly of a team of flexible spacecraft** Haiyan Hu *School of Aerospace Engineering, Beijing Institute of Technology, Beijing, China*							
12.00 - 13.30	LUNCH								
13.30 - 15.30	MS-09 IV. Nonlin. Dyn. Eng. Sys.	MS-11 IV. Time delay	MS-03 IV. Comput. M.	MS-08 IV. Nonlin. Mech. & Struct.	MS-18 IV. Control	MS-10 IV. Non-smooth Dyn.	MS-13 I. Nonlin. Dyn. in Biol.	MS-02 II. Asymptotic M.	MS-01 II. Reduced-order
15.30 - 16.00	COFFEE BREAK								
16.00 - 18.00	MS-09 V. Nonlin. Dyn. Eng. Sys.	MS-11 V. Time delay	MS-03 V. Comput. M.	MS-08 V. Nonlin. Mech. & Struct.	MS-18 V. Control	MS-16 I. Random Dyn. Sys.	MS-13 II. Nonlin. Dyn. in Biol.	MS-02 III. Asymptotic M.	MS-01 III. Reduced-order

Wednesday, June 28, 2017

TIME/ ROOM	ROOM 1 (KF51)	ROOM 2 (K174)	ROOM 3 (K155)	ROOM 4 (K134)	ROOM 5 (K150)	ROOM 6 (KF81)	ROOM 7 (KF88)	ROOM 8 (KF82)	ROOM 9 (KF87)
08.30 - 10.30	MS-09 VI. Nonlin. Dyn. Eng. Sys.	MS-11 VI. Time delay	MS-12 I. MEMS-NEMS	MS-08 VI. Nonlin. Mech. & Struct.	MS-04 I. Experiments	MS-16 II. Random Dyn. Sys.	MS-14 I. Nonlin. Dyn. Eng. Design		MS-20 I. Wave Propagation
10.30 - 11.00	COFFEE BREAK								
11.00 - 12.00	Plenary lecture	**Internal resonances in tiny structures: new results and practical applications** Steven Shaw[1,2] *[1]Department of Mechanical and Aerospace Engineering, Florida Institute of Technology, Melbourne, FL, USA* *[2]Departments of Mechanical Engineering and Physics and Astronomy, Michigan State University, East Lansing, MI, USA*							
12.00 - 13.30	LUNCH								
14.00 - 18.00	EXCURSION								

Thursday, June 29, 2017

08.30 - 10.30	MS-05 I. Slow-fast Sys.	MS-21 I. Traffic & Vehicle	MS-12 II. MEMS-NEMS		MS-04 II. Experiments	MS-17 I. Time-periodic Sys.	MS-14 II. Nonlin. Dyn. Eng. Design	MS-15 I. Energy Transfer	MS-20 II. Wave Propagation
10.30 - 11.00	COFFEE BREAK								
11.00 - 12.00	Plenary lecture	**Tailoring nonlinearity for advanced engineering design: linearization, optimization and practical realization** Gaëtan Kerschen *Space Structures and Systems Laboratory, Aerospace and Mechanical Engineering Department, University of Liege, Belgium*							

Thursday, June 29, 2017

TIME/ ROOM	ROOM 1 (KF51)	ROOM 2 (K174)	ROOM 3 (K155)	ROOM 4 (K134)	ROOM 5 (K150)	ROOM 6 (KF81)	ROOM 7 (KF88)	ROOM 8 (KF82)	ROOM 9 (KF87)
12.00 - 13.30	LUNCH								
13.30 - 15.30	MS-05 II. Slow-fast Sys.		MS-12 III. MEMS-NEMS		MS-04 III. Experiments	MS-17 II. Time-periodic Sys.	MS-14 III. Nonlin. Dyn. Eng. Design	MS-15 II. Energy Transfer	MS-21 II. Traffic & Vehicle
15.30 - 16.00	COFFEE BREAK								
16.00 - 18.00	POSTER SESSION								
19.00	FAREWELL DINNER								

Friday, June 30, 2017

08.30 - 10.30	MS-05 III. Slow-fast Sys.		MS-12 IV. MEMS-NEMS			MS-17 III. Time-periodic Sys.	MS-14 IV. Nonlin. Dyn. Eng. Design	MS-15 III. Energy Transfer	
10.30 - 11.00	COFFEE BREAK								
11.00 - 12.00	Plenary lecture								
12.00 - 13.30	Closing ceremony								

Exact model reduction for nonlinear oscillations: from equations to data sets
George Haller
Chair in Nonlinear Dynamics, Institute for Mechanical Systems, ETH Zürich

LIST OF MINI-SYMPOSIA

Nr.	Title	Short name
MS01	Reduced-Order Modeling and System Identification	Reduced-order
MS02	Asymptotic Methods	Asymptotic M.
MS03	Computational Methods	Comput. M.
MS04	Experiments in Nonlinear Dynamics and Control	Experiments
MS05	Slow-Fast Systems and Phenomena	Slow-fast Sys.
MS06	Fractional Derivatives	Fractional Deriv.
MS07	Dynamics and Optimization of Multibody Systems	Multibody
MS08	Nonlinear Phenomena in Mechanical and Structural Systems	Nonlin. Mech. & Struct.
MS09	Nonlinear Dynamics in Engineering Systems	Nonlin. Dyn. Eng. Sys.
MS10	Non-Smooth Dynamics	Non-smooth Dyn.
MS11	Systems with Time Delay	Time delay
MS12	Micro- and Nano-Electro-Mechanical Systems	MEMS-NEMS
MS13	Nonlinear Dynamics in Biological Systems	Nonlin. Dyn. in Biol.
MS14	Nonlinear Dynamics for Engineering Design	Nonlin. Dyn. Eng. Design
MS15	Energy Transfer and Harvesting in Nonlinear Systems	Energy Transfer
MS16	Random Dynamical Systems - Recent Advances and New Directions	Random Dyn. Sys.
MS17	Time-periodic systems	Time-periodic Sys.
MS18	Control and Synchronization in Nonlinear Systems	Control
MS19	Fluid-Structure Interaction	Fluid-Structure
MS20	Wave Propagation in Mechanical Systems	Wave Propagation
MS21	Traffic and Vehicle Dynamics	Traffic&Vehicle

DETAILED PROGRAMME

Sunday, 25 June 2017

15.00-21.00 **Registration**

19.00-21.00 **Ice breaker**
Aula of Building K,
Budapest University of Technology and Economics

Monday, 26 June 2017

Room 1 (KF51)

9:30-10:30 **Opening Ceremony**

10:30-11:00 **Coffee break**

Room 1 (KF51)

11:00-12:00 **Keynote lecture**

Particles - Simulating Complicated Processes with Meshfree Methods
Peter Eberhard
University of Stuttgart, Germany

12:00-13:30 **Lunch break**

Room 1 (KF51)

13:30 - 15:30 **MS 09 / I.**
Nonlinear Dynamics in Engineering Systems

Chair: Yuri Vladimirovich Mikhlin
Co-chair: Alois Steindl

13:30 **ID 33**
Response regimes in equivalent mechanical model of weakly nonlinear liquid sloshing
Maor Farid, Oleg Gendelman
Technion – Israel Institute of Technology, Department of Mechanical Engineering, Haifa, Israel

13.50 **ID 89**
Inertial effects in thermoacoustic subcritical bifurcation
Giacomo Bonciolini, Edouard Boujo, Nicolas Noiray
ETH Zürich, Mechanical Engineering Department, Zürich, Switzerland

14.10 **ID 138**
Bifurcation analysis of non-smooth floating bodies
Dane Sequeira, Brian Mann
Duke University, Mechanical Engineering and Materials Science, Durham, USA

14.30 **ID 272**
Flutter instability of a visco-elastic belt drive
Alois Steindl
Vienna University of Technology, Institute for Mechanics and Mechatronics, Vienna, Austria

14.50 **ID 338**
Motion planning problem for a finite-dimensional approximation of the Navier-Stokes equations
Alexander Zuyev
Max Planck Institute for Dynamics of Complex Technical Systems, Computational Methods in Systems and Control Theory, Magdeburg, Germany

15.10 **ID 456**
Forced vibrations of a string in the presence of a smooth unilateral obstacle
Harkirat Singh, Pankaj Wahi
Indian Institute of Technology Kanpur, Mechanical Engineering, Kanpur, India

Room 2 (K174)

13:30 - 15:30 **MS 11 / I.**
Systems with Time Delay

Chair: Zaihua Wang
Co-chair: Tamas Insperger

13:30 **ID 373**
Control of amplitude chimeras by time delay in dynamical networks
Eckehard Schöll
Technische Universität Berlin, Physics, Berlin, Germany

13.50 **ID 62**
Delay-differential equations applied to queueing theory
Jamol Pender[1], Richard Rand[2], Elizabeth Wesson[2]
[1]Cornell University, Departmnt of Operations Research and Information Engineering, Ithaca, USA
[2]Cornell University, Department of Mathematics, Ithaca, USA

14.10 **ID 366**
Folding tori and Chenciner bubbles in an ENSO model with delayed feedback
Andrew Keane, Bernd Krauskopf, Claire Postlethwaite
University of Auckland, Department of Mathematics, Auckland, New Zealand

14.30 **ID 117**
Period-1 oscillations of a state-dependent delayed TCP model with PIE queue management policy via high-dimensional harmonic balance method
Lijun Pei
Zhengzhou University, School of Mathematics and Statistics, Zhengzhou, China

14.50 **ID 51**
Optimization criterions of a multi-time-delay controlled isolation system with asymmetrical nonlinearity
Xiuting Sun[1], Shu Zhang[2], Jian Xu[2], Huijie Yu[1], Shenlong Wang[1], Yao Yan[3]
[1]University of Shanghai for Science and Technology, Department of Mechanical Engineering, Shanghai, China
[2]Tongji University, School of Aerospace Engineering and Applied Mechanics, Shanghai, China
[3]University of Electronic Science and Technology of China, School of Aeronautics and Astronautics, Chengdu, China

15.10 **ID 447**
Galerkin approximations for the pole placement of time delayed systems
Shanti Swaroop Kandala, C. P. Vyasarayani
Indian institute of Technology Hyderabad, Department of Mechanical and Aerospace Engineering, Hyderabad, India

Room 3 (K155)

13:30 - 15:30 **MS 03 / I.**
Computational Methods

Chair: Harry Dankowicz
Co-chair: András Árpád Sipos

13:30 **ID 166**
Computing solution surfaces of quasilinear PDE's by continuation
Pablo Aguirre
Universidad Técnica Federico Santa María, Departamento de Matemática, Valparaíso, Chile

13.50 **ID 268**
Bifurcation analysis of nonlinear normal modes with the harmonic balance method
Clément Grenat[1], Sébastien Baguet[1], Régis Dufour[1], Claude Henri Lamarque[2]
[1]INSA Lyon (Institut National des Sciences Appliquées), LaMCoS CNRS UMR 5259, Villeurbanne, France
[2]ENTPE (Ecole Nationale des Travaux Publics de l'Etat), LTDS, UMR CNRS 5513, Vaulx-en-Velin, France

14.10 **ID 337**
Control-based continuation of unstable pedestrian flows
Ilias Panagiotopolos, Jen Starke
University of Rostock, Department of Mathematics, Rostock, Germany

14.30 **ID 376**
Embedded construction of adjoint equations for optimization using continuation
Mingwu Li, Cole Anderson, Harry Dankowicz
University of Illinois at Urbana-Champaign, Department of Mechanical Science and Engineering, Illinois, USA

14.50 **ID 434**

Tracking critical points on evolving curves and surfaces

Gábor Domokos[1], Zsolt Lángi[2], András Árpád Sipos[1]

[1]Budapest University of Technology and Economics, Department of Mechanics, Materials and Structures, Budapest, Hungary

[2]Budapest University of Technology and Economics, Department of Geometry, Budapest, Hungary

15.10 **ID 451**

Continuation of periodic orbits in symmetric conservative systems: an application to the planar 2k+1 body problem

Jorge Galan Vioque[1], Abimael Bengochea[2], Ernesto Perez Chavela[3]

[1]Universidad de Sevilla, Departamento de Matemática, Sevilla, Spain

[2]Universidad Autonoma Mexico, Departamento de Matemática, Mexico City, Mexico

[3]Instituto Tecnologico Autonomo de Mexico, Departamento de Matemática, Mexico City, Mexico

Room 4 (K134)

13:30 - 15:30 **MS 08 / I.**

Nonlinear Phenomena in Mechanical and Structural Systems

Chair: Bala Balachandran

Co-chair: Sotirios Natsiavas

13:30 **ID 18**

Irregular dynamics of an elliptic vortex in an oscillatory nonlinear flow

Eugene Ryzhov[1], Konstantin Koshel[1], Dmitry Ovcharenko[2]

[1]Pacific Oceanological Institute of FEB RAS, Geophysical Hydrodynamics, Vladivostok, Russia

[2]Far Eastern Federal University, Applied Mechanics, Vladivostok, Russia

13:50 **ID 106**

Heave-pitch-roll nonlinear dynamics of a spar platform

Elvidio Gavassoni

Federal Universit of Paraná, Department of Civil Construction, Curitiba, Brazil

14.10 **ID 294**

Steady streaming in a vibrating channel with ratchet

Jie Yu

Stony Brook University, Department of Civil Engineering, Stony Brook, United State of America

14.30 **ID 382**
Bifurcations in implicit map - application to surface location error in milling processes
Adam Kiss K, Daniel Bachrathy, Gábor Stépán
Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

14.50 **ID 97**
Nonlinear resonances of a rigid-flexible antenna system
Bensong Yu, Bensong Jin, Xiumin Gao, Ti Chen
Nanjing University of Aeronautics and Astronautics, State Key Lab of Mechanics and Control of Mechanical Structures, Nanjing, China

15.10 **ID 370** **CANCELLED**
Nonlinear vibrations of viscoelastic cylindrical shells with internal flowing fluid
Zenon Del Prado[1], Paulo Gonçalves[2]
[1]Federal University of Goias, School of Civil Engineering, Goiania, Brazil
[2]Pontifícia Universidade Católica do Rio de Janeiro, Department of Civil Engineering, Rio de Janeiro, Brazil

Room 5 (K150)

13:30 - 15:30 **MS 18 / I.**
Control and Synchronization in Nonlinear Systems

Chair: Nathan van de Wouw
Co-chair: Marc Jungers

13:30 **ID 100**
Control of mechanical systems with uncertain set-valued friction
Ruud Beerens, Maurice Heemels, Nathan Van de Wouw, Henk Nijmeijer
Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands

13.50 **ID 111**
Control of multistability in vibro-impact systems
Yang Liu
University of Exeter, College of Engineering, Mathematics and Physical Sciences, Exeter, United Kingdom

14.10 **ID 203**
On the problem of control resonance oscillations of a mechanical system with unbalanced exciters
Sergey Eremeykin, Grigory Panovko, Alexander Shokhin
Mechanical Engineering Research Institute of RAS, Department of Vibrational Bio-Mechanics, Moscow, Russia

14.30 **ID 221**
Sufficient conditions for convergence of discrete-time Lur'e type systems
Marc Jungers[1], Nathan Van de Wouw[2]
[1]*CNRS, Centre de Recherche en Automatique de Nancy (CRAN), Nancy, France*
[2]*Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands*

14.50 **ID 240**
Active vibration control of a nonlinear system using pole placement
Maryam Ghandchi Tehrani[1], Gaetan Kerschen[2], Thibaut Detroux[2]
[1]*University of Southampton, Institute of Sound and Vibration Research, Southampton, United Kingdom*
[2]*University of Liege, Department of Aerospace and Mechanical Engineering, Liege, Belgium*

15.10 **ID 511**
Autoresonant excitation and control of parametric vibration
Vladimir Babitsky[1], Abolfazl Zahedi[2]
[1]*Loughborough University, Wolfson School of Mechanical and Manufacturing Engineering, Loughborough, United Kingdom*
[2]*University of Manchester, School of Mechanical, Aerospace and Civil Engineering, Manchester, United Kingdom*

Room 6 (KF81)

13:30 - 15:30 **MS 10 / I.**
Non-Smooth Dynamics

Chair: Vincent Acary
Co-chair: Remco Ingmar Leine

13:30 **ID 38**
Control of a vertical mode of a cable by a nonsmooth oscillator
Alireza Ture Savadkoohi
ENTPE (Ecole Nationale des Travaux Publics de l'Etat), LTDS UMR CNRS 5513, Vaulx-en-Velin, France

13.50 **ID 58**
Investigation of the dynamics of the wiper blade around the reversal
Motoki Unno[1], Atsushi Shibata[2], Hiroshi Yabuno[1], Dai Yanagisawa[3], Tomonori Nakano[3]
[1]*University of Tsukuba, Graduate School of System and Information Engineering, Tsukuba, Japan*
[2]*Keio University, Faculty of Science and Technology, Yokohama, Japan*
[3]*Mitsuba Corporation, Kiryu, Japan*

14.10 **ID 181**
Dynamic analysis of a cantilever beam subject to a moving mass under unilateral constraint
Lucio Demeio
Università Politecnica delle Marche, Dipartimento di Ingegneria Indistriale e Scienze Matematiche, Ancona, Italy

14.30 **ID 259**
Towards an optimal control framework for non-smooth mechanical systems
Reza Kianifar, Remco Ingmar Leine
University of Stuttgart, Institute for Nonlinear Mechanics, Stuttgart, Germany

14.50 **ID 348**
Nonlinear dynamics of oscillators with shape memory alloy
Sebastian Tatzko, Jonas Böttcher
Institute of Dynamics and Vibration Research, Leibniz Universität Hannover, Department of Mechanical Engineering, Hannover, Germany

15.10 **ID 399**
On the dynamics of dimpled electrostatic MEMS actuators
Ayman Alneamy[1], Majed Al-Ghamdi[1], Mahmoud Khater[2], Sangtak Park[1], Eihab Abdel-Rahman[1], Glenn Heppler[1], Beichen Li[3], Ridha Almikhlafi[1]
[1]University of Waterloo, Systems Design Engineering, Waterloo, Canada
[2]KFUPM, Mechanical Engineering, Dahran, Saudi Arabia
[3]University of Waterloo, Mechanical and Mechatronics Engineering, Waterloo, Canada

Room 7 (KF88)

13:30 - 15:30 **MS 07 / I.**
Dynamics and Optimization of Multibody Systems

Chair: Felix L. Chernousko
Co-chair: Igor Zeidis

13:30 **ID 5**
Rigidity constraints in analytical mechanics
René Souchet
Buxerolles, France

13:50 **ID 60**
Two-dimensional motion of a body carrying movable internal masses
Felix Chernousko
Institute for Problems in Mechanics, Russian Academy of Sciences, Moscow, Russia

14.10 **ID 173**

A three field weak formulation for integration of the equations of motion of multibody systems subject to equality constraints

Elias Paraskevopoulos[1], Nikolaos Potosakis[1], Sotirios Natsiavas[2]

[1]Aristotle University, Thessaloniki, Greece, Department of Mechanical Engineering, Thessaloniki, Greece

[2]Aristotle University, Thessaloniki, Greece, Faculty of Mechanical Engineering, Thessaloniki, Greece

14.30 **ID 362**

The discretized Coulomb friction model in a non-singular complementarity formulation for multibody systems with contacts

Albert Peiret[1], József Kövecses[1], Josep M. Font-Llagunes[2]

[1]McGill University, Mechanical Engineering, Montreal, Canada

[2]Universitat Politècnica de Catalunya, Mechanical Engineering, Barcelona, Spain

14.50 **ID 387**

Locomotion conditions for a two-body system on a rough inclined plane

Nikolay Bolotnik[1], Philipp Schorr[2], Igor Zeidis[2], Klaus Zimmermann[2]

[1]Institute for Problems in Mechanics, Russian Academy of Sciences, Laboratory of Robotics and Mechatronics, Moscow, Russia

[2]Technische Universitaet Ilmenau, Department of Mechanical Engineering, Ilmenau, Germany

15.10 **ID 439**

Non-reverse motion of a two-body system along a straight line on a rough horizontal plane

Nikolay Bolotnik[1], Tatiana Figurina[2], Pavel Gubko[1]

[1]Institute for Problems in Mechanics, Russian Academy of Sciences, Laboratory of Robotics and Mechatronics, Moscow, Russia

[2]Institute for Problems in Mechanics, Russian Academy of Sciences, Laboratory of Control of Mechanical Systems, Moscow, Russia

Room 8 (KF82)

13:30 - 15:30 **MS 19 / I.**
Fluid-Structure Interaction

Chair: Andrei Metrikine

Co-chair: Oded Gottlieb

13:30 **ID 202**

Analysis of stability transitions in a microswimmer with superparamagnetic head

Yuval Harduf, Yizhar Or

Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

13:50 **ID 118**

Cascade of bifurcations in nonlinear transonic panel flutter oscillations

Vasily Vedeneev[1], Anastasia Shishaeva[1], Andrey Aksenov[2]

[1]Lomonosov Moscow State University, Institute of Mechanics, Moscow, Russia

[2]Tesis LTD, Moscow, Russia

14.10 **ID 150**

Slow-invariant-manifold resonance capture in vortex-induced vibration of a circular cylinder with a nonlinear dissipative rotator

Antoine Blanchard[1], Oleg Gendelman[2], Lawrence Bergman[1], Alexander Vakakis[3]

[1]University of Illinois at Urbana-Champaign, Department of Aerospace Engineering, Champaign, USA

[2]Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Tel Aviv, Israel

[3]University of Illinois at Urbana-Champaign, Department of Mechanical Science and Engineering, Champaign, USA

14.30 **ID 204**

Computing the viscous fluid flow between moving cylinders of an arbitrary cross-section

Alexander Petrov[1], Anastasiya Kazakova[2]

[1]Moscow Institute of Physics and Technology (MIPT), Department of Theoretical Mechanics, Moscow, Russia

[2]Chuvash State University, Department of Applied Mathematics, Physics and Information Technologies, Cheboksary, Russia

14.50 **ID 206**

Nonlinear damping types in wake oscillator model for vortex-induced vibrations of 2DoF rigid structure

Victoria Kurushina, Ekaterina Pavlovskaia, Marian Wiercigroch

University of Aberdeen, Centre for Applied Dynamics Research, Aberdeen, United Kingdom

15.10 **ID 261**

Flow-induced vibration of a D-shape cylinder

Jisheng Zhao, Mark C. Thompson, Kerry Hourigan

Monash University, Department of Mechanical and Aerospace Engineering, Melbourne, Australia

Room 9 (KF87)

13:30 - 15:30 **MS 06 / I.**
Fractional Derivatives

Chair: Riccardo Caponetto
Co-chair: Masaharu Kuroda

13:30 **ID 59**
Fractional-order controller design based on the Nyquist diagram for the vibration control of a flexible beam
Naoki Yoshitani, Masaharu Kuroda
University of Hyogo, Department of Mechanical Engineering, Himeji, Japan

13.50 **ID 363**
Chaos control in fractional-order systems using fractional Chebyshev collocation method
Eric Butcher, Morad Nazari, Arman Dabiri
University of Arizona, Aerospace and Mechanical Engineering, Tucson, USA

14.10 **ID 521**
Numerical solving unsteady space-fractional problems
Petr Vabishchevich
Russian Academy of Sciences, Nuclear Safety Institute, Moscow, Russia

14.30 **ID 2**
Calculus on Smith-Volterra-Cantor sets
Alireza Khalili Golmankhaneh
Islamic Azad University, Urmia Branch, Department of Physics, Urmia, Iran

14.50 **ID 432**
Fractional order PI gimbal control
Giuseppe Avon[1], Riccardo Caponetto[1], Gabriella Xibilia[2]
[1]University of Catania, DIEEI, Catania, Italy
[2]Università di Messina, Dipartimento di Ingegneria, Messina, Italy

15.10 **ID 353**
Feedback PDalpha type iterative learning control for fractional-order human arm-support nonlinear system
Mihailo Lazarevic[1], Nikola Djurovic[1], Milan Cajic[2], Boško Cvektovic[1], Petar Mandic[1], Ljubiša Bucanovic[3]
[1]University of Belgrade, Faculty of Mechanical Engineering, Department of Mechanics, Belgrade, Serbia
[2]SASA, Department of Mechanics, Belgrade, Serbia
[3]Messer Tehnogas, Department EEMCS, Belgrade, Serbia

15:30-16:00 **Coffee break**

Room 1 (KF51)

16.00 - 18.00 **MS 09 / II.**
Nonlinear Dynamics in Engineering Systems

Chair: Alois Steindl
Co-chair: Alexander Fidlin

16.00 **ID 87**
On the dynamics of friction based tuned mass dampers
Alexander Fidlin, Nigora Gafur
Karlsruhe Institute of Technology, Institute of Engineering Mechanics, Karlsruhe, Germany

16.20 **ID 465**
On the effect of the deformed state of a tire on the combined wheel's rolling, sliding, and spinning with dry friction
Sergey I. Zhavoronok[1], Alexey A. Kireenkov[2]
[1]Institute of Applied Mechanics, Russian Academy of Sciences, Mechanics of Smart and Composite Materials and Systems, Moscow, Russia
[2]Ishlinsky Institute for Problems in Mechanics RAS - Moscow Institute of Physics and Technology (State University), Laboratory of Mechanics of Systems Department of Higher Mathematics, Moscow - Dolgoprudny, Russia

16.40 **ID 473**
Improved theory of the combined dry friction in problems of pneumatics' dynamics
Alexey A. Kireenkov[1], Sergey I. Zhavoronok[2]
[1]Ishlinsky Institute for Problems in Mechanics RAS - Moscow Institute of Physics and Technology (State University), Laboratory of Mechanics of Systems Department of Higher Mathematics, Moscow - Dolgoprudny, Russia
[2]Institute of Applied Mechanics, Russian Academy of Sciences, Mechanics of Smart and Composite Materials and Systems, Moscow, Russia

17.00 **ID 476**
Vibration decay and positioning time of sampled-data systems with dry friction
Csaba Budai[1], László Kovács[2], József Kövecses[2], Gábor Stépán[3]
[1]Budapest University of Technology and Economics, Department of Mechatronics, Optics and Mechanical Engineering Informatics, Budapest, Hungary
[2]McGill University, Department of Mechanical Engineering, Montreal, Canada
[3]Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

17.20 **ID 513**

Numerical method for nonlinear vibration of contact joint structures

Loic Salles[1], Luca Pesaresi[2], Jason Armand[1]

[1]Vibration University Technology Center, Department of Mechanical Engineering, Imperial College, London, United Kingdom

[2]Vibration University Technology Center, Department of Mechanical Engineering, Imperial College, London, United Kingdom

17.40 **ID 410**

Building a test equipment for measuring chaotic behaviour in a frictional oscillator

Gábor Licskó, Gábor Csernák, Gábor Stépán

Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

Room 2 (K174)

16.00 - 18.00 **MS 11 / II.**

Systems with Time Delay

Chair: Tamás Insperger

Co-chair: Giuseppe Habib

16.00 **ID 50**

An online control strategy for time delayed vibration absorber

Feng Wang, Jian Xu

Tongji University, School of Aerospace Engineering and Applied Mechanics, Shanghai, China

16.20 **ID 80**

A probabilistic approach towards robust stability optimization, with application to vibration control

Luca Fenzi[1], Dan Pilbauer[1], Wim Michiels[1], Tomas Vyhlidal[2]

[1]KU Leuven, Department of Computer Science, Heverlee, Belgium

[2]Czech Technical University in Prague, Department of Instrumentation and Control Engineering, Prague, Czech Republic

16.40 **ID 95**

Experiment and analysis of active vibration suppression via an absorber with a tunable delay

Yixia Sun[1], Jian Xu[2]

[1]Shanghai University of Engineering Science, School of Mechanical Engineering, Shanghai, China

[2]Tongji University, School of Aerospace Engineering and Applied Mechanics, Shanghai, China

17.00 **ID 108**
Cable substructuring with feedback delay
Nandor Terkovics[1], Simon Neild[2], Mark Lowenberg[1], Robert Szalai[3]
[1]University of Bristol, Department of Aerospace Engineering, Bristol, United Kingdom
[2]University of Bristol, Department of Mechanical Engineering, Bristol, United Kingdom
[3]University of Bristol, Department of Engineering Mathematics, Bristol, United Kingdom

17.20 **ID 392**
A nonlinear tuned vibration absorber for chatter mitigation
Giuseppe Habib[1], Gaetan Kerschen[2], Gabor Stepan[1]
[1]Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary
[2]University of Liege, Aerospace and Mechanical Engineering, Liege, Belgium

Room 3 (K155)

16.00 - 18.00 **MS 03 / II.**
Computational Methods

Chair: Jan Sieber
Co-chair: Roberto Barrio

16.00 **ID 63**
Topological changes in slow-fast systems: chaotic neuron models
Roberto Barrio
University of Zaragoza, Department of Applied Mathematics, Zaragoza, Spain

16.20 **ID 134**
Differential equations with state-dependent delays - smooth center manifolds and normal forms
Jan Sieber
University of Exeter, College of Engineering, Mathematics and Physical Sciences, Exeter, United Kingdom

16.40 **ID 279**
Numerical approximation of invariant manifolds for dynamical systems with simultaneous self- and forced excitation
Robert Fiedler, Hartmut Hetzler
University of Kassel, Department of Mechanical Engineering, Kassel, Germany

17.00 **ID 290**

A neutral homoclinic bifurcation in a 3D map

H. G. E. Meijer[1], W. Govaerts[2], Y. A. Kuznetsov[1,3], N. Neirycnk[2]

[1]University of Twente, Department EEMCS, Enschede, The Netherlands

[2]Ghent University, Department of Applied Mathematics and Computer Science, Ghent, The Netherlands

[3]Utrecht University, Department of Mathematics, Utrecht, The Netherlands

17.20 **ID 149**

Homoclinic orbits embedded in one-dimensional invariant manifolds of maps

Niels Neirynck[1], Willy Govaerts[1], Hil Meijer[2]

[1]Ghent University, Department of Applied Mathematics, Computer Science and Statistics, Ghent, Belgium

[2]University of Twente, Department of Applied Mathematics, Enschede, The Netherlands

17.40 **ID 379**

Global manifolds parametrised by isochrons

James Hannam, Bernd Krauskopf, Hinke Osinga

University of Auckland, Department of Mathematics, Auckland, New Zealand

Room 4 (K134)

16.00 - 18.00 **MS 08 / II.**

Nonlinear Phenomena in Mechanical and Structural Systems

Chair: Sotirios Natsiavas

Co-chair: Jerzy Warmiński

16.00 **ID 238**

Inherent control error in a multi-PD controlled double inverted pendulum

Gergely Gyebrószki[1], Gábor Csernák[2]

[1]Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

[2]MTA-BME Research Group on Dynamics of Machines and Vehicles, Budapest, Hungary

16.20 **ID 252**

Modes of vibration of nanobeams vibrating with large displacements and actuated by DC electric tensions

Marco Alves[1], Pedro Ribeiro[2]

[1]Faculty of Engineering, University of Porto, DEMec, Porto, Portugal

[2]Faculty of Engineering, University of Porto, DEMec/INEGI, Porto, Portugal

16.40 **ID 345**
Experimental investigation of the friction-induced instabilities at the origin of wet belt squeal
Simon Gatignol[1], Thierry Demassougne[2], Alain Le Bot[1]
[1]Laboratoire de Tribologie et de Dynamique des Systèmes, TPCDI, Lyon, France
[2]HUTCHINSON, HUTCHINSON SNC, Joué-lès-Tours, France

17.00 **ID 402**
Experimental nonlinear phenomena in structures with multiple equilibria controlled by boundary displacements: ultra-fast decay of coupled vibrations
Ioannis Georgiou[1], Anil Bajaj[2]
[1]National Technical University of Athens, School of Naval Architecture and Marine Engineering, Athens, Greece
[2]Purdue University, School of Mechanical Engineering, West Lafayette, USA

17.20 **ID 499**
Frequency response of P-mode intrinsic localized mode
Edmon Perkins
Auburn University, Department of Mechanical Engineering, Auburn, USA

17.40 **ID 507**
Analysis of dry galloping on inclined cables under stationary wind
Daniele Zulli[1], Giuseppe Piccardo[2], Angelo Luongo[1]
[1]University of L'Aquila, Department of Civil, Architectural and Environmental Engineering, L'Aquila, Italy
[2]University of Genoa, Department of Civil, Chemical and Environmental Engineering, Genoa, Italy

Room 5 (K150)

16.00 - 18.00 **MS 18 / II.**
Control and Synchronization in Nonlinear Systems

Chair: Bernard Brogliato
Co-chair: Nathan van de Wouw

16.00 **ID 37**
A real-time gesture classification using surface EMG to control a robotics hand
Yannick Aoustin
University of Nantes, Department of Mechanical Engineering, Nantes, France

16.20 **ID 75**
Reference spreading trajectory tracking control: experimental analysis on a one-degree-of-freedom setup
Mark Rijnen, Alessandro Saccon, Henk Nijmeijer
Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands

16.40 **ID 229**
Dynamic control of 3D directional drilling systems with state estimation
Octavio Antonio Villarreal Magaña[1], Emmanuel Detournay[2], Nathan Van de Wouw[3]
[1]Delft University of Technology, Delft Center for Systems and Control, Delft, The Netherlands
[2]University of Minnesota, Department of Civil, Environmental and Geo-Engineering, Minneapolis, USA
[3]Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands

17.00 **ID 316**
Position control of an electro-pneumatic clutch using Takagi-Sugeno techniques
Robert Prabel, Harald Aschemann
University of Rostock, Faculty of Mechanical Engineering, Rostock, Germany

17.20 **ID 20**
Decentralized guaranteed cost control for synchronization in networks of linear singularly perturbed systems
Jihene Ben Rejeb[1], Irinel-Constantin Morarescu[2], Jamal Daafouz[2]
[1]University of Lorraine, Nancy, France
[2]University of Lorraine, School of Mechanical and Electrical Engineering, Nancy, France

Room 6 (KF81)

16.00- 18.00 **MS 10 / II.**
Non-Smooth Dynamics

Chair: Claude-Henri Lamarque
Co-chair: Vincent Acary

16.00 **ID 73**
Anisotropic dry friction with non-convex force reservoirs: modeling and experiments
Simon Walker, Remco Ingmar Leine
University of Stuttgart, Institute for Nonlinear Mechanics, Stuttgart, Germany

16.20 **ID 248**
An augmented Lagrangian frictional contact formulation for nonsmooth multibody systems
Javier Galvez Buezo[1], Alberto Cardona[2], Federico Cavalieri[2], Olivier Brüls[1]
[1]University of Liege, Department of Aerospace and Mechanical Engineering, Liege, Belgium
[2]Centro de Investigación de Métodos Computacionales (CIMEC), Santa Fe, Argentina

16.40 **ID 282**
Lyapunov stability of a planar rigid body with two frictional point contacts
Péter L. Várkonyi[1], Yizhar Or[2]
[1]Budapest University of Technology and Economics, Department of Mechanics, Materials and Structures, Budapest, Hungary
[2]Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

17.00 **ID 368**
Frictional passive damping in a beam on foundation under moving loads
Rita Corrêa, Fernando Simões, António Pinto da Costa
Departamento de Engenharia Civil, Instituto Superior Técnico, Lisboa, Portugal

17.20 **ID 440**
Discontinuous dynamics of wheels with a towed axis
Mate Antali, Gabor Stepan
Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

Room 7 (KF88)

16.00- 18.00 **MS 07 / II.**
Dynamics and Optimization of Multibody Systems

Chair: József Kövecses
Co-chair: Stefan Chwastek

16.00 **ID 15**
Selected aspects involved in dynamics and optimization of cranes with a pivoting boom
Stefan Chwastek
Cracow University of Technology, Mechanical Department, Cracow, Poland

16.20 **ID 16**
Model of person balancing on the seesaw
Alexander Formalskii, Pavel Kruchinin
Lomonosov Moscow State University, Deapartment of Applied Mechanics and Control, Moscow, Russia

16.40 **ID 167**
Dynamically balanced optimal gait generations for the biped walking on stairs using GA and GA-NN
Lulu Gong, Yunpeng Li, Ruowei Zhao, Zhenghai Zhang, Weikang Zeng
Tongji University, School of Life Sciences and Technology, Shanghai, China

17.00 **ID 196**
Chain fountain dynamics
Friedrich Pfeiffer[1], Johannes Mayet[2]
[1]Technical University of Munich, Institute for Applied Mechanics, Muenchen, Germany
[2]Technical University of Munich, Institute for Applied Mechanics, Muenchen, Georgia

17.20 **ID 217**
Analysis of passive wearable spring-clutch device for energy saving during walking
Roee Keren, Yizhar Or
Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

17.40 **ID 235**
Analysis of underactuated dynamic locomotion systems using perturbation expansion - the twistcar toy example
Ofir Chakon, Yizhar Or
Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

Room 8 (KF82)

16.00- 18.00 **MS 19 / II.**
Fluid-Structure Interaction

Chair: Oded Gottlieb
Co-chair: Kerry Hourigan

16.00 **ID 135**
Robust maneuver load alleviation via LPV aeroservoelastic model
Hongkun Li, Huang Rui, Yonghui Zhao, Haiyan Hu
Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering, Nanjing, China

16.20 **ID 179**

Modular approach for the modeling and dynamic analysis of a pipe conveying fluid

Renato Maia Matarazzo Orsino, Celso Pupo Pesce

Universidade de São Paulo, Departamento de Engenharia Mecânica, São Paulo, Brazil

16.40 **ID 109**

Periodic regimes caused by ice-fluid-simple oscillator interaction

Andrei Abramian[1], Dmitry Indeitsev[2]

[1]Institute of Problems of Mechanical Engineering Russian Academy of Sciences, Department of Applied Mathematics, Saint Petersburg, Russia

[2]Institute of Problems of Mechanical Engineering Russian Academy of Sciences, Applied Mechanics, Saint Petersburg, Russia

17.00 **ID 274**

Stabilization of a multi-tethered lighter-than-air rigid-body sphere undergoing vortex-induced vibrations in uniform flow

La Mi[1], Oded Gottlieb[2]

[1]Technion – Israel Institute of Technology, Autonomous Systems and Robotics Program, Haifa, Israel

[2]Technion – Israel Institute of Technology, Mechanical Engineering, Haifa, Israel

17.20 **ID 515**

Intermittent oscillations of elastic structure in fluctuating axial fluid flow

S. Krishna Kumar[1], Sayan Gupta[2], Sunetra Sarkar[3]

[1]Department of Applied Mechanics, Indian Institute of Technology Madras, Chennai, India

[2]Department of Applied Mechanics, Indian Institute of Technology Madras, Applied Mechanics, Chennai, India

[3]Department of Aerospace Engineering, Indian Institute of Technology Madras, Aerospace Engineering, Chennai, India

17.40 **ID 284**

Flutter of plate in one side flow

Lifeng Wang

Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering, Nanjing, China

Room 9 (KF87)

16.00- 18.00 **MS 06 / II.**
Fractional Derivatives

Chair: Dana Copot
Co-chair: Péter Béda

16.00 **ID 9**
Contributions of the pool of long-lived chronically infected CD4+ T cells in HIV dynamics: a fractional-order approach
Ana Carvalho[1], Carla Pinto[2]
[1]Faculty of Sciences, University of Porto, Department of Mathematics, Porto, Portugal
[2]School of Engineering, Polytechnic of Porto, Porto, Portugal

16.20 **ID 116**
Generic bifurcations at nonlocal continua described by fractional calculus
Peter Béda
Budapest University of Technology and Economics, Department of Vehicle Elements and Vehicle-structure Analysis, Budapest, Hungary

16.40 **ID 160**
Stability of fractional positive continuous-time and discrete-time nonlinear systems
Tadeusz Kaczorek
Bialystok University of Technology, Faculty of Electrical Engineering, Bialystok, Poland

17.00 **ID 180**
Combined resonance of a nonlocal nanobeam on fractional Pasternak-type viscoelastic foundation
Milan Cajić[1], Danilo Karličić[1], Mihailo Lazarević[2], Wen Chen[3]
[1]Mathematical Institute of Serbian Academy of Sciences and Arts, Department of Mechanics, Belgrade, Serbia
[2]University of Belgrade - Faculty of Mechanical Engineering, Department of Mechanics, Belgrade, Serbia
[3]Hohai University, Institute of Soft Matter Mechanics, Department of Engineering Mechanics, Nanjing, China

17.20 **ID 242**
Generalized fractional order reset element (GFrORE)
Niranjan Saikumar, Hassan HosseinNia
Technische Universiteit Delft, Precision and Microsystem Engineering, Delft, The Netherlands

Tuesday, 27 June, 2017

Room 1 (KF51)

08.30 - 10.30 **MS 09 / III.**
Nonlinear Dynamics in Engineering Systems

Chair:
Livija Cveticanin

Co-chair:
Yuri Vladimirovich Mikhlin

08.30 **ID 110**
Forced and damped solitons in cyclic and symmetric structures
Filipe Fontanela[1], Aurelien Grolet[2], Loic Salles[1], Amin Chabchoub[3], Norbert Hoffmann[1]
[1]Imperial College London, Department of Mechanical Engineering, London, United Kingdom
[2]Arts et Metiers ParisTech, Department of Mechanical Engineering, Lille, France
[3]Aalto University, Department of Mechanical Engineering, Aalto, Finland

08.50 **ID 283**
On a family of gradient-free control functions for extremum seeking problems
Victoria Grushkovskaya, Christian Ebenbauer
University of Stuttgart, Institute for Systems Theory and Automatic Control, Stuttgart, Germany

09.10 **ID 305**
Non-classical nonlinear normal vibration modes in mechanical systems
Yuri Vladimirovich Mikhlin
National Technical University "KhPI", Applied Mathematics, Kharkov, Ukraine

09.30 **ID 377**
Preloading in nonlinear oscillator
Zvonko Rakaric, Livija Cveticanin, Miodrag Zukovic
University of Novi Sad, Faculty of Technical Sciences, Novi Sad, Serbia

08.30 - 10.30 **MS 11 / III.**
Systems with Time Delay

Chair:
Eric Butcher

Co-chair:
Zaihua Wang

08.30 **ID 105**
Stability analysis of machining processes with parameter uncertainty
Dominik Hamann, Nico-Philipp Walz, Achim Fischer, Michael Hanss, Peter Eberhard
University of Stuttgart, Institute of Engineering and Computational Mechanics, Stuttgart, Germany

08.50 **ID 245**
Influence of frictional mechanism on chatter vibrations in cutting process
Andrzej Weremczuk, Rafał Rusinek, Jerzy Warmiński
Lublin University of Technology, Department of Applied Mechanics, Lublin, Poland

09.10 **ID 384**
Runout in milling: Tiny cause with significant effects
Andreas Otto, Günter Radons
Chemnitz University of Technology, Institute of Physics, Chemnitz, Germany

09.30 **ID 416**
Dynamics in milling pocket structures
Song Ren, Xinhua Long
Shanghai Jiao Tong University, Department of Mechanical Engineering, Shanghai, China

09.50 **ID 431**
Fast and accurate estimation of the unconditional stability threshold in milling by including the effects of tooling system bending
Giovanni Totis, Marco Sortino
University of Udine, Polytechnic Department of Engineering and Architecture, Udine, Italy

10.10 **ID 466**
A mechanistic ploughing model for chatter magnitude limitation in thin-walled parts turning
Mikhail Guskov
Arts et Metiers ParisTech, PIMM Laboratory, Paris, France

Room 3 (K155)

08.30 - 10.30 **MS 03 / III.**
Computational Methods

Chair:
Themistoklis Sapsis

Co-chair:
Robert Szalai

08.30 **ID 69**
Capturing similarity solutions in multidimensional Burgers' equation
Jens Rottmann-Matthes
Karlsruhe Institue of Technology, Department of Mathematics, Karlsruhe, Germany

08.50 **ID 374**
Differential positivity for nonlinear consensus
Fulvio Forni
University of Cambridge, Department of Engineering, Cambridge, United Kingdom

09.10 **ID 420**
Nonlinear model identification and spectral submanifolds for multi-degree-of-freedom mechanical vibrations
Robert Szalai[1], George Haller[2]
[1]University of Bristol, Department of Engineering Mathematics, Bristol, United Kingdom
[2]ETH Zürich, Mechanical Engineering, Zürich, Switzerland

09.30 **ID 469**
Harmonic balance method with iterative frequency technique for nonlinear oscillators
Tien Hoang, Denis Duhamel, Gilles Foret
Ecole des Ponts ParisTech, Laboratoire NAVIER, Champs sur Marne, France

09.50 **ID 493**
Robustness of coherent sets computations
Kathrin Padberg-Gehle, Anna Kluenker
Leuphana University of Lueneburg, Applied Mathematics, Lueneburg, Germany

08.30 - 10.30 **MS 08 / III.**
Nonlinear Phenomena in Mechanical and Structural Systems

Chair: Jerzy Warmiński
Co-chair: Bala Balachandran

08.30 **ID 227**
Experimental validation of vibro-impact force models using numeric simulation and perturbation methods
Geraldo Rebouças, Ilmar Santos, Jon Juel Thomsen
Technical University of Denmark, Department of Mechanical Engineering, Kgs. Lyngby, Denmark

08.50 **ID 234**
Parametric vibrations of a rotating thin-walled composite blade subjected to base excitation
Jaroslaw Latalski, Jerzy Warminski
Lublin University of Technology, Applied Mechanics, Lublin, Poland

09.10 **ID 323**
Modeling of the dynamics of an autoparametric system with the spherical pendulum
Danuta Sado, Jan Freundlich, Anna Bobrowska
Warsaw University of Technology, Institute of Machine Design Fundamentals, Warsaw, Poland

09.30 **ID 327**
Dynamics of a strongly nonlinear mechanical system: a case of dissipation-induced instability
Márcio José Horta Dantas
Universidade Federal de Uberlândia, Faculdade de Matemática, UFU, Uberlândia, Brazil

09.50 **ID 381**
Parametrically excited inertial sensors
S. Amir Mousavi Lajimi, Eihab Abdel-Rahman
University of Waterloo, Systems Design Engineering, Waterloo, Canada

10.10 **ID 223**
Homoclinic Chaos near resonances in coupled SQUID
Vassilios Rothos
Aristotle University, Thessaloniki, Greece, Department of Mechanical Engineering, Thessaloniki, Greece

Room 5 (K150)

08.30 - 10.30 **MS 18 / III.**
Control and Synchronization in Nonlinear Systems

Chair: Olivier Brüls
Co-chair: Bob Rink

08.30 **ID 332**
Implicit finite element formulation of the inverse dynamics of vibrating robots
Olivier Brüls[1], Arthur Lismonde[1], Valentin Sonneville[2]
[1]University of Liege, Department of Aerospace and Mechanical Engineering, Liege, Belgium
[2]University of Maryland, Department of Aerospace Engineering, Maryland, USA

08.50 **ID 286**
Nonlinear normal modes of coupled van der Pol oscillators exhibiting synchronisation
Jithin Velayudhan, Bipin Balaram
Amrita Vishwa Vidyapeetham, Department of Mechanical Engineering, Coimbatore, India

09.10 **ID 328**
Mixed synchronization in a triplet of coupled mechanical oscillators
Jasper Borreman[1], Henk Nijmeijer[1], Joaquin Alvarez[2], Jonatan Pena Ramirez[2]
[1]Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands
[2]CICESE, Department of Electronics, Ensenada, Mexico

09.30 **ID 380**
Synchronisation of beams attached to a rotating hub
Zofia Szmit, Jerzy Warminski, Jaroslaw Latalski
Lublin University of Technology, Applied Mechanics, Lublin, Poland

09.50 **ID 386**
The emergence and breaking of synchrony in networks of dynamical systems
Bob Rink
Vrije Universiteit Amsterdam, Department of Mathematics, Amsterdam, The Netherlands

10.10 **ID 524** **CANCELLED**
Role of phase synchronisation in turbulence
Sara Moradi[1], Bogdan Teaca[2], Johan Anderson[3]
[1]Royal Military Academy, Laboratory for Plasma Physics -LPP-ERM/KMS, Brussels, Belgium
[2]Coventry University, Applied Mathematics Research Centre, Coventry, United Kingdom
[3]Chalmers University of Technology, Department of Earth and Space Sciences, Göteborg, Sweden

08.30 - 10.30 **MS 10 / III.**
Non-Smooth Dynamics

Chair: Claude-Henri Lamarque

Co-chair: Remco Ingmar Leine

08.30 **ID 42**
Analysis of pivoting algorithms for LCPs in redundant contact dynamics
Andreas Enzenhöfer[1], Marek Teichmann[2], József Kövecses[1]
[1]McGill University, Department of Mechanical Engineering, Montreal, Canada
[2]CM Labs Simulations, Montreal, Canada

08.50 **ID 83**
Comparison of Moreau-type integrators based on the time finite element discretization of the virtual action
Giuseppe Capobianco, Tom Winandy, Simon R. Eugster, Remco Ingmar Leine
University of Stuttgart, Insitute for Nonlinear Mechanics, Stuttgart, Germany

09.10 **ID 85**
Worst-case analysis of approximate straight-line motion mechanism with link tolerances and joint clearances
Narendra Akhadkar[1], Vincent Acary[2], Bernard Brogliato[2]
[1]Schneider Electric, Grenoble, France
[2]INRIA, Grenoble, France

09.30 **ID 205**
Time-stepping scheme for mechanical systems with unilateral constraints and time-delays
Benjamin Biemond[1], Wim Michiels[2]
[1]Netherlands Organization for Applied Scientific Research, Deparment of Optomechatronics, Delft, The Netherlands
[2]KU Leuven, Department of Computer Science, Heverlee, Belgium

09.50 **ID 253**
Modification of Moreau-Jean's scheme for energy conservation in inelastic impact dynamics
Carlos Yoong[1], Mathias Legrand[1], Vincent Acary[2]
[1]McGill University, Department of Mechanical Engineering, Montreal, Canada
[2]INRIA, Project - Team Bipop, Grenoble, France

10.10 **ID 301**

Impact dynamics near unilaterally constrained grazing orbits

Stéphane Junca[1], Huong Le Thi[1], Mathias Legrand[2], Anders Thorin[2]

[1]Université Côte d'Azur, Laboratoire de Mathématiques J.A. Dieudonné, Nice, France

[2]McGill University, Department of Mechanical Engineering, Montreal, Canada

Room 7 (KF88)

08.30 - 10.30 **MS 07 / III.**

Dynamics and Optimization of Multibody Systems

Chair: Werner Schiehlen

Co-chair: Laszlo Kovacs

08.30 **ID 45**

Torsional vibration damper design using augmented Lagrangian particle swarm optimization

Philipp Mall[1], Alexander Fidlin[2], Arne Krüger[1]

[1]Dr. Ing. h.c. F. Porsche AG, Transmission Development, Weissach, Germany

[2]Karlsruhe Institue of Technology, Institute of Engineering Mechanics, Karlsruhe, Germany

08.50 **ID 94** **CANCELLED**

Dynamic topology optimization of a flexible multibody system described by ALE-ANCF with time-varying length

Jialiang Sun[1], Qiang Tian[2], Haiyan Hu[2]

[1]Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering, Nanjing, China

[2]Beijing Institute of Technology, School of Aerospace Engineering, Beijing, China

09.10 **ID 107**

Distributed adaptive synchronization control for networked Lagrange system with dynamic friction compensation

Naijing Jiang, Shu Zhang, Jian Xu

Tongji University, School of Aerospace Engineering and Applied Mechanics, Shanghai, China

09.30 **ID 333**

Control of a cart with oscillators under uncertainty

Igor Ananevskii[1], Tigran Ishkhanyan[2]

[1]Institute for Problems in Mechanics, Russian Academy of Sciences, Laboratory of Control of Mechanical Systems, Moscow, Russia

[2]Moscow Institute of Physics and Technology (MIPT), Department of Aerophysics and Space Research, Moscow, Russia

09.50 **ID 460**
Predictive control of robot manipulators with flexible joint
Laszlo Bencsik[1], Balint Bodor[2]
[1]MTA-BME Research Group on Dynamics of Machines and Vehicles, Budapest, Hungary
[2]Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

10.10 **ID480**
Inertia properties and their role in haptic rendering
László Gőgh, Bálint Mohácsi, László Kovács, József Kövecses
McGill University, Department of Mechanical Engineering, Montreal, Canada

Room 8 (KF82)

08.30 - 10.30 **MS 02 / I.**
Asymptotic Methods

Chair: Leonid Manevitch
Co-chair: Roman Starosta

08.30 **ID 133**
Non-stationary attractors in forced and damped weakly coupled pendulums
Leonid Manevitch
Semenov Institute of Chemical Physics, Russian Academy of Sciences, Department of Polymers and Composite Materials, Moscow, Russia

08.50 **ID 174**
Vibrational analogue of coherent quantum Rabi oscillations in a three-body nonlinear mechanical system
Yuriy Kosevich, Valeri Smirnov, Margarita Kovaleva, Leonid Manevitch
Semenov Institute of Chemical Physics, Russian Academy of Sciences, Department of Polymers and Composite Materials, Moscow, Russia

09.10 **ID 298**
On periodic trajectories of a near-Hamiltonian autonomous dynamical system
Liubov Klimina, Boris Lokshin, Yury Selyutskiy
Lomonosov Moscow State University, Institute of Mechanics, Moscow, Russia

09.30 **ID 304**
Plane motion of the rigid body with the spring-damper suspension
Roman Starosta[1], Grażyna Sypniewska-Kamińska[1], Jan Awrejcewicz[2]
[1]Poznan University of Technology, Institute for Applied Mechanics, Poznan, Poland
[2]Lodz University of Technology, Department of Automatics, Biomechanics and Mechatronics, Lodz, Poland

09.50 **ID 470**
Stationary and non-stationary dynamics of the parametric pendulum
Francesco Romeo[1], Leonid Manevitch[2], M. Kovaleva[2]
[1]Sapienza University of Rome, Department of Structural and Geotechnical Engineering, Rome, Italy
[2]Semenov Institute of Chemical Physics, Russian Academy of Sciences, Department of Polymers and Composite Materials, Moscow, Russia

10.10 **ID 514**
Analytical studies of a two degree-of-freedom vibro-impact system
Pawel Fritzkowski[1], Roman Starosta[1], Jan Awrejcewicz[2]
[1]Poznan University of Technology, Institute of Applied Mechanics, Poznan, Poland
[2]Technical University of Lodz, Department of Automatics and Biomechanics, Lodz, Poland

Room 9 (KF87)

08.30 - 10.30 **MS 01 / I.**
Reduced-Order Modeling and System Identification

Chair: Michael McFarland
Co-chair: Huang Rui

08.30 **ID 123**
Nonlinear reduced-order modeling for controlled aeroelastic systems
Huang Rui
Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering, Nanjing, China

08.50 **ID 529**
Prediction of transonic Aerodynamic Forces via nonlinear reduced-order models
Zhijun Yang, Huang Rui, Yonghui Zhao, Haiyan Hu
Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering, Nanjing, China

09.10 **ID 354**
Particle filters with nudging in multiscale chaotic systems: with application to the Lorenz-96 atmospheric model
Hoong Yeong, Ryne Beeson, Navaratnam Sri Namachchivaya
University of Illinois at Urbana-Champaign, Aerospace Engineering, Urbana, USA

09.30 **ID 457**
Experimental identification of an aircraft piccolo tube exhibiting nonsmooth nonlinearities
Tilan Dossogne[1], Maarten Schoukens[2], Bruno Bernay[3], Jean-Philippe Noel[1], Gaetan Kerschen[1]
[1]University of Liege, Aerospace and Mechanical Engineering, Liege, Belgium
[2]Vrije Universiteit Brussel, Department ELEC, Brussels, Belgium
[3]SONACA SA, Icing and Dynamic Simulation, Gosselies, Belgium

09.50 **ID 490**
Model reduction for mercury porosimetry: invasion percolation on regular, exotic and random networks
Bendegúz Dezső Bak
Budapest University of Technology and Economics, Department of Fluid Mechanics, Budapest, Hungary

10.30 - 11.00 **Coffee break**

Room 1 (KF51)

11.00 - 12.00 **Keynote lecture**

Autonomous assembly of a team of flexible spacecraft
Haiyan Hu
School of Aerospace Engineering, Beijing Institute of Technology, Beijing, China

12.00 - 13.30 **Lunch break**

Room 1 (KF51)

13.30 - 15.30 **MS 09 / IV.**
Nonlinear Dynamics in Engineering Systems

Chair:
Yuri Vladimirovich Mikhlin

Co-chair:
Katica Hedrih

13.30 **ID 158**

Dynamics of ball bearings with damages at outer raceway surface - vibration response under different loads

Ivana Atanasovska[1], Natasa Soldat[2]

[1]Mathematical Institute of Serbian Academy of Sciences and Arts, Department of Mechanics, Belgrade, Serbia

[2]University of Belgrade - Faculty of Mechanical Engineering, Machine Design Department, Belgrade, Serbia

13.50 **ID 265**

Nonlinear rotordynamic-thermal analysis of micro gas turbines

Frans Duijnhouwer, Rob Fey, Henk Nijmeijer

Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands

14.10 **ID 281**

Torsional vibrations in truck powertrains with dual mass flywheel having piecewise linear stiffness

Lina Wramner

Chalmers University of Technology, Applied Mechanics, Gothenburg, Sweden

14.30 **ID 308**

Non-linear dynamics of a rotor system with compliant seal

Simon Baeuerle, H. Hetzler

University of Kassel, Engineering Dynamics Group, Kassel, Germany

14.50 **ID 342**

Non-linear dynamics of a heavy mass particle and rolling ball along curvilinear trace of series of circle arcs: Phase trajectory portraits, some analogies and vibro-impacts

Katica Hedrih (Stevanovic)

Mathematical Institute of Serbian Academy of Sciences and Arts, Department of Mechanics, Belgrade, Serbia

15.10 **ID 22**

Evaluating nonlinear responses of asphalt concrete mixtures under time-dependent loading: in view of three representation functions

Chun-Hsing Ho, Cristina Pilar Martin Linares

Northern Arizona University, Department of Civil and Environmental Enigneering, Flagstaff, USA

Room 2 (K174)

13.30 - 15.30 **MS 11 / IV.**
Systems with Time Delay

Chair: Zaihua Wang

Co-chair: Tamas Insperger

13.30 **ID 201**
Stochastic sensitivity in dynamic bifurcations with delayed feedback revealed through multiple scales analysis
Rachel Kuske
Georgia institute of Technology, Department of Mathematics, Atlanta, USA

13.50 **ID 98**
Delayed random relays
Koki Shugishita, Toru Ohira
Nagoya University, Graduate School of Mathematics, Nagoya, Japan

14.10 **ID 4**
On some extension of center manifold method
Pavel Nesterov
Yaroslavl State University, Department of Mathematics, Yaroslavl, Russia

14.30 **ID 276**
Switching to nonhyperbolic cycles from codim-2 bifurcations of equilibria in DDEs
Maikel Bosschaert[1], Yuri Kuznetsov[2], Sebastiaan G. Janssens[2]
[1]Hasselt University, Mathematical Department, Hasselt, Belgium
[2]University of Utrecht, Mathematical Department, Utrecht, The Netherlands

14.50 **ID 477**
Non-smooth torus to identify domain of attraction of stable milling processes
Zoltan Dombovari[1], Jokin Munoa[2], Rachel Kuske[3], Gabor Stepan[1]
[1]Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary
[2]IK4 Ideko Research Alliance, Dynamics and Control, Elgoibar, Spain
[3]Georgia institute of Technology, School of Mathematics, Atlanta, USA

Room 3 (K155)

13.30 - 15.30 **MS 03 / IV.**
Computational Methods

Chair: Jan Sieber
Co-chair: Mattia Serra

13.30 **ID 40**
Numerical study on the waveform evolution in metal material
Lan Wei, Xin Yu, Miao Zheng, YuXia Liu
Institute of Applied Physics and Computational Mathematics, Beijing, China

13.50 **ID 194**
Cylindrical cavity evolution in a plane parallel potential flow of the perfect incompressible fluid
Nikita Baykov[1], Alexander Petrov[2]
[1]Lomonosov Moscow State University, Department of Mathematics and Mechanics, Moscow, Russia
[2]Ishlinsky Institute for Problems in Mechanics RAS, Mechanics of Systems, Moscow, Russia

14.10 **ID 216**
Lagrangian and Eulerian coherent structures in complex dynamical systems
Mattia Serra, George Haller
ETH Zürich, Department of Mechanical Engineering, Zürich, Switzerland

14.30 **ID 241**
Recent advances in the theory of Lagrangian coherent structures for three-dimensional flows
David Oettinger, George Haller
ETH Zürich, Department of Mechanical and Process Engineering, Zürich, Switzerland

14.50 **ID 326**
Analysis of coupled finite-volume/Monte-Carlo methods for plasma edge simulation in fusion reactors
Giovanni Samaey[1], Matthias Baeten[1], Bert Mortier[1], Tine Baelmans[†2]
[1]KU Leuven, Department of Computer Science, Leuven, Belgium
[2]KU Leuven, Department of Mechanical Engineering, Leuven, Belgium

15.10 **ID 367**
Extraction and prediction of coherent patterns in incompressible flows through space-time Koopman analysis
Dimitrios Giannakis
New York University, Courant Institute of Mathematical Sciences, New York, USA

13.30 - 15.30 **MS 08 / IV.**
Nonlinear Phenomena in Mechanical and Structural Systems

Chair: Bala Balachandran
Co-chair: Sotirios Natsiavas

13.30 **ID 371**
Experimental studies with drill string: effects of drill mud
Meryem Kanzari[1], Mohammed Yousef Alqaradawi[1], Balakumar Balachandran[2]
[1]*Qatar University, Mechanical Engineering, Doha, Qatar*
[2]*University of Maryland, Mechanical Engineering, Maryland, USA*

13.50 **ID 414**
Experimental and numerical study of nonlinear galloping oscillations interfering with vortex-induced excitation
Claudio Mannini, Tommaso Massai, Antonino Maria Marra
University of Florence, Department of Civil and Environmental Engineering, Florence, Italy

14.10 **ID 148**
Nonlinear dynamics analysis of a rotor-damper system through nonlinear Galerkin method on approximate inertial manifold
Yuefang Wang[1], Jin Huang[1], Lihua Huang[2]
[1]*Dalian University of Technology, Department of Engineering Mechanics, Dalian, China*
[2]*Dalian University of Technology, Faculty of Infrastructural Engineering, Dalian, China*

14.30 **ID 249**
Nonlinear electromechanical interactions in rotordynamics of electrical machines
Felix Boy, Hartmut Hetzler
University of Kassel, Mechanical Engineering, Kassel, Germany

14.50 **ID 442**
Effect of softening constitutive law on column buckling
Soheil Fatehiboroujeni, Derek Hollenbeck, Sachin Goyal
University of California, Merced, Department of Mechanical Engineering, Merced, USA

15.10 **ID 405**
Finding periodic solutions in the dynamics of metal cutting via averaging
Tamás Gábor Molnár, Tamás Insperger, Gábor Stépan
Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

Room 5 (K150)

13.30 - 15.30 **MS 18 / IV.**
Control and Synchronization in Nonlinear Systems

Chair: Nathan van de Wouw

Co-chair: Elena Panteley

13.30 **ID 101**
Effects of an external parameter on the synchronization threshold of time-delayed Hindmarsh-Rose neurons
Isaac Topiltzin, Castanedo Guerra
Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands

13.50 **ID 190**
Tweezer control for chimera states in small networks
Iryna Omelchenko[1], Oleh E. Omel'chenko[2], Anna Zakharova[1], Matthias Wolfrum[2], Eckehard Schöll[1]
[1]Technische Universität Berlin, Institut für Theoretische Physik, Berlin, Germany
[2]Weierstrass Institute, Berlin, Germany

14.10 **ID 193**
Computing partial synchronization manifolds of delay-coupled systems
Wim Michiels[1], Libo Su[1], Erik Steur[2], Henk Nijmeijer[3]
[1]KU Leuven, Department of Computer Science, Heverlee, Belgium
[2]Eindhoven University of Technology, Institute of Complex and Molecular Systems, Eindhoven, The Netherlands
[3]Eindhoven University of Technology, Mechanical Engineering, Eindhoven, The Netherlands

14.30 **ID 255**
Beyond complete synchronization of identical systems: multidimentional dynamic consensus
Elena Panteley, Antonio Loria
L2S (Laboratoire des signaux et systèmes), CNRS (Centre national de la recherche scientifique), CentraleSupelec, Gif sur Yvette, France

14.50 **ID 359**
Delay-independent partial synchronization in networks of non-identical nonlinear systems with transmission delay coupling
Toshiki Oguchi, Manabu Suzuki, Daisuke Yanagi
Tokyo Metropolitan University, Department of Mechanical Engineering, Tokyo, Japan

15.10 **ID 120**
Analysis of synchronization in mutually coupled MEMS oscillators via surface acoustic waves using a simplified non-linear model
Mohana Das Govind, Manoj Pandey
Indian Institute of Technology Madras, Department of Mechanical Engineering, Chennai, India

Room 6 (KF81)

13.30 - 15.30 **MS 10 / IV.**
Non-Smooth Dynamics

Chair:
Remco Ingmar Leine

Co-chair:
Vincent Acary

13.30 **ID 156**
Low-dimensional piecewise smooth maps with an unpredictable number of switching manifolds
Viktor Avrutin[1], Zhanybai T. Zhusubaliyev[2], Erik Mosekilde[3]
[1]University of Stuttgart, Institute for Systems Theory and Automatic Control, Stuttgart, Germany
[2]Southwest State University, Department of Computer Science, Kursk, Russia
[3]Technical University of Denmark, Department of Physics, Lyngby, Denmark

13.50 **ID 164**
Lyapunov stability and existence results of measure differential inclusions - applications in nonsmooth mechanics with singular mass matrices
Manuela Paschkowski
Martin Luther University Halle-Wittenberg, Institute for Mathematics, Halle, Germany

14.10 **ID 178**
A solution of the general single contact frictionless problem using tools of b-geometry
Sotirios Natsiavas[1], Elias Paraskevopoulos[2]
[1]Aristotle University, Faculty of Mechanical Engineering, Thessaloniki, Greece
[2]Aristotle University, Department of Mechanical Engineering, Thessaloniki, Greece

14.30 **ID 273**
Spectrum of an impact oscillator via nonsmooth modal analysis
Anders Thorin, Mathias Legrand
McGill University, Mechanical Engineering, Montreal, Canada

14.50 **ID 292**
Comparison between piecewise linear and smooth dynamics: A case study of decomposing a degenerate bifurcation
Barnabas M. Garay, Miklós Koller, Marcell Simkó
Pazmany Peter Catholic University, Faculty of Information Technology and Bionics, Budapest, Hungary

15.10 **ID 296**
Fluid-structure interaction simulations of heart valves with dynamic contact
Maria Giuseppina Chiara Nestola, Patrick Zulian, Rolf Krause
Università della Svizzera Italiana, Institute of Computational Science, Lugano, Switzerland

Room 7 (KF88)

13.30 - 15.30 **MS 13 / I.**
Nonlinear Dynamics in Biological Systems

Chair: Gergely Röst
Co-chair: Jüri Engelbrecht

13.30 **ID 14**
Waves in biomembranes with amplitude-dependent nonlinearities
Jüri Engelbrecht, Tanel Peets, Kert Tamm
Tallinn University of Technology, Institute of Cybernetics, Tallinn, Estonia

13.50 **ID 52**
An influence of nonlinearity and discontinuity on sound transfer in reconstructed middle ear
Rafal Rusinek
Lublin University of Technology, Department of Applied Mechanics, Lublin, Poland

14.10 **ID 128**
Monomolecular reaction networks: flux-influenced sets and balloons
Nicola Vassena[1], Hiroshi Matano[2]
[1]Free University Berlin, Department of Mathematics, Berlin, Germany
[2]University of Tokyo, Department of Mathematics, Tokyo, Japan

14.30 **ID 313**
Modeling of controllable support stiffness bio-inspired by tactile sensor systems
Carsten Behn, Moritz Scharff, Thomas Helbig, Danja Voges, Hartmut Witte, Joachim Steigenberger
Technische Universitaet Ilmenau, Department of Mechanical Engineering, Ilmenau, Germany

14.50 **ID 372**
Analysis of oscillatory motions of chromosomes during anaphase using biomechanical oscillatory model of mitotic spindle
Andjelka Hedrih[1], Katica (Stevanović) Hedrih[1,2]
[1]Mathematical Institute of Serbian Academy of Sciences and Arts, Department of Mechanics, Belgrade, Serbia
[2]Faculty of Mechanical Engineering, University of Nis, Nis, Serbia

15.10 **ID 418**
Dynamics of statically pre-loaded human aorta with residual stresses
Marco Amabili
McGill University, Mechanical Engineering, Montreal, Canada

Room 8 (KF82)

13.30 - 15.30 **MS 02 / II.**
Asymptotic Methods

Chair: Jan Awrejcewicz
Co-chair: Wim T. Van Horssen

13.30 **ID 19**
On perturbations methods and their applicability in the study of vibrations of axially moving strings and beams
Wim T. Van Horssen
Delft University of Technology, Delft Institute of Applied Mathematics, Delft, The Netherlands

13.50 **ID 99**
On the mathematical justification of viscoelastic shell models
Gonzalo Castiñeira Veiga[1], Ángel Rodríguez-Arós[2]
[1]Universidade de Santiago de Compostela, Department of Applied Mathematics, Santiago de Compostela, Spain
[2]Universidade da Coruña, Department of Mathematics, A Coruña, Spain

14.10 **ID 152** **CANCELLED**
Internal resonances of a non-linear heterogeneous rod: influence of dispersion and dissipation
Igor Andrianov[1], Vladyslav Danishevskyy[2], Bernd Markert[1], Graham Rogerson[2]
[1]RWTH Aachen University, Institute of General Mechanics, Aachen, Germany
[2]Keele University, School of Computing and Mathematics, Keele, United Kingdom

14.30 **ID 256**
On time-varying velocity for an axially moving string under viscous damping
Sajad H. Sandilo
Quaid-e-Awam University of Engineering, Science and Technology, Department of Mathematics, Nawabshah, Pakistan

14.50 **ID 428**
Small-scale counter-rotating Darrieus wind turbine
Liubov Klimina[1], Ekaterina Shalimova[1], Vitaly Samsonov[1], Ching-Huei Lin[2]
[1]Lomonosov Moscow State University, Institute of Mechanics, Moscow, Russia
[2]Chien Hsin University of Science and Technology, Electrical Engineering, Moscow, Russia

15.10 **ID 444**
Semi-analytical investigation of unsteady free-boundary flows
Evqenii Karabut[1], Aleksander Petrov[2], Elena Zhuravleva[3]
[1]Lavrentyev Institute of Hydrodinamics, Russian Academy of Sciences, Novosibirsk, Russia
[2]Institute for Problems in Mechanics, Russian Academy of Sciences, Russian Academy of Sciences, Moscow, Russia
[3]Lavrentyev Institute of Hydrodinamics, Applied Mathematics, Novosibirsk, Russia

Room 9 (KF87)

13.30 - 15.30 **MS 01 / II.**
Reduced-Order Modeling and System Identification

Chair: Michael McFarland
Co-chair: Dennis Grunert

13.30 **ID 244**
Towards the adoption of the stiffness evaluation procedure as non-intrusive, non-linear model reduction method in car crash simulations
Dennis Grunert, Jörg Fehr
University of Stuttgart, Institute of Engineering and Computational Mechanics, Stuttgart, Germany

13.50 **ID 275**
Experimental frequency response synthesis for nonlinear systems
Simon Peter[1], Maren Scheel[2], Malte Krack[2], Remco Ingmar Leine[1]
[1]University of Stuttgart, Insitute for Nonlinear Mechanics, Stuttgart, Germany
[2]University of Stuttgart, Institute of Aircraft Propulsion Systems, Stuttgart, Germany

14.10 **ID 280**

Towards experimental nonlinear modal analysis of systems with nonlinear damping

Maren Scheel[1], Simon Peter[2], Remco Ingmar Leine[2], Malte Krack[1]

[1]University of Stuttgart, Institute of Aircraft Propulsion Systems, Stuttgart, Germany

[2]University of Stuttgart, Insitute for Nonlinear Mechanics, Stuttgart, Germany

15.30 - 16.00 **Coffee break**

Room 1 (KF51)

16.00 - 18.00 **MS 09 / V.**

Nonlinear Dynamics in Engineering Systems

Chair: Katica Hedrih

Co-chair: Antonio Papangelo

16.00 **ID 46**

Vibration localization and snaking bifurcations in a purely mechanical system

Antonio Papangelo[1], Aurelien Grolet[2], Norbert Hoffmann[1,4], Michele Ciavarella[3]

[1]Hamburg University of Technology, Mechanical Engineering Department, Hamburg, Germany

[2]ENSAM, Department of Mechanics, Lille, France

[3]Polytechnic of Bari, Mechanical Engineering Department, Bari, Italy

[4]Imperial College London, Department of Mechanical Engineering, London, United Kingdom

16.20 **ID 168** **CANCELLED**

Study on the nonlinear model reduction of the flexible multibody system described by the spatial gradient-deficient beam element of ANCF

Yixuan Tang

Nanjing University of Aeronautics and Astronautics, School of Aeronautics and Astronautics, Nanjing, China

16.40 **ID 218**
Nonlinear phenomena in AFM arrays
Samuel Jackson, Stefanie Gutschmidt
University of Canterbury, Department of Mechanical Engineering, Christchurch, New Zealand

17.00 **ID 312**
Saturated adaptive control of muscle-like compliant manipulation systems
Carsten Behn, Konrad Siedler
Technische Universitaet Ilmenau, Department of Mechanical Engineering, Ilmenau, Germany

17.20 **ID 388** **CANCELLED**
Power flow of nonlinear vibration isolation with high-static-low-dynamic stiffness
Zeqi Lu[1], Li-Qun Chen[2]
[1]Shanghai University, Shanghai Institute of Applied Mathematics and Mechanics, Shanghai, China
[2]Shanghai University, Department of Mechanics, Shanghai, China

Room 2 (K174)

16.00 - 18.00 **MS 11 / V.**
Systems with Time Delay

Chair: Eric Butcher
Co-chair: Zaihua Wang

16.00 **ID 84**
Stability of time-delay systems: from integer-order to fractional-order systems
Zaihua Wang
Nanjing University of Aeronautics and Astronautics, State Key Lab of Mechanics and Control of Mechanical Structures, Nanjing, China

16.20 **ID 510**
Intermittent delay feedback control as an origin of physiological movement variability
Taishin Nomura[1], Yasuyuki Suzuki[1], Ken Kiyono[1], Pietro Morasso[2]
[1]Osaka University, Graduate School of Engineering Science, Osaka, Japan
[2]Italian Institute of Technology, Genova, Italy

16.40 **ID 426**
Delayed tyre model in vehicle shimmy
Tian Mi
Southeast University, School of Mechanical Engineering, Nanjing, China

17.00 **ID 430**
Balancing on accelerating skateboard
Balazs Varszegi[1], Denes Takacs[2], Tamas Insperger[1]
[1]Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary
[2]MTA-BME Research Group on Dynamics of Machines and Vehicles, Budapest, Hungary

17.20 **ID 462**
Hopf bifurcation in a nonlinear mechanical model of human balancing with delayed PDA control
Li Zhang
Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering, Nanjing, China

17.40 **ID 500**
Solution of scale dynamic systems
Aftab Ahmed, Erik Verriest
Georgia Institute of Technology, Electrical and Computer Engineering, Atlanta, USA

Room 3 (K155)

16.00 - 18.00 **MS 03 / V.**
Computational Methods

Chair: Themistoklis Sapsis
Co-chair: Claudia Wulff

16.00 **ID 7**
An asymptotic-preserving stochastic Galerkin method for the semiconductor Boltzmann equation with random inputs and diffusive scalings
Liu Liu, Shi Jin
University of Wisconsin-Madison, Department of Mathematics, Madison, USA

16.20 **ID 61**
Fractional order convergence of time-discretizations for semilinear PDEs
Claudia Wulff
University of Surrey, Department of Mathematics, Guildford, United Kingdom

16.40 **ID 90**
Combined error estimates for numerical continuation of stochastic systems
Christian Kuehn
Technical University of Munich, Department of Mathematics, Muenchen, Germany

17.00 **ID 357**
Path-based measures of transport and expansion rates in stochastic flows
Michal Branicki, Kenneth Uda
University of Edinburgh, Department of Mathematics, Edinburgh, United Kingdom

17.20 **ID 360**
Probabilistic quantification of extreme events in complex systems
Themistoklis Sapsis, Mustafa Mohamad
Massachusetts Institute of Technology, Mechanical Engineering, Cambridge, USA

17.40 **ID 453**
Set oriented numerical methods for spatially dependent parameter uncertainty
Michael Dellnitz, Adrian Ziessler
University of Paderborn, Department of Mathematics, Paderborn, Germany

Room 4 (K134)

16.00 - 18.00 **MS 08 / V.**
Nonlinear Phenomena in Mechanical and Structural Systems

Chair: Sotirios Natsiavas
Co-chair: Jerzy Warmiński

16.00 **ID 449**
Perturbation analysis on the dynamic behaviours of planetary gear sets with friction
Chao Xun, Xinhua Long
Institute of Vibration, Noise and Shock, School of Mechanical Engineering, Shanghai, China

16.20 **ID 422**
Passive/active thermal dynamics in the coupled nonlinear vibrations of laminated plates
Valeria Settimi, Eduardo Saetta, Giuseppe Rega
Sapienza University of Rome, Department of Structural and Geotechnical Engineering, Rome, Italy

16.40 **ID 436**
Dynamics and fracture of impacted sandwich composites under time varying loads: Numerical modelling and simulations
Vyacheslav Burlayenko
National Technical University "KhPI", Applied Mathematics, Kharkov, Ukraine

17.00 **ID 448**
Wrinkling patterns of thin films under finite membrane strain
Eszter Fehér, András Árpád Sipos
Budapest University of Technology and Economics, Department of Mechanics, Materials and Structures, Budapest, Hungary

17.20 **ID 459**
Nonlinear material modelling of an airsoft pellet applied for impulse excitation
Szabolcs Berezvai, Attila Kossa, Gabor Stepan
Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

17.40 **ID 237**
Fatigue behavior of heat-damaged and FRP repaired beams
Rami Haddad, Yasmeen Obaidat
Jordan University of Science and Technology, Department of Civil Engineering, Irbid, Jordan

Room 5 (K150)

16.00 - 18.00 **MS 18 / V.**
Control and Synchronization in Nonlinear Systems

Chair: Bernard Brogliato
Co-chair: R.H.B. Fey

16.00 **ID 76**
Switching between coexisting stable periodic solutions by impulsive forces with an application to a vibrating plate
D.W.M. Veldman, R.H.B. Fey, H.J. Zwart
Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands

16.20 **ID 165**
A robust-tube MPC approach for the analysis of load response of power plants
Istvan Selek, Jeno Kovacs
University of Oulu, Finland, Systems Engineering Research Group, Oulu, Finland

16.40 **ID 183**
Nonlinear control and stability analysis of a stroke limited inertial actuator in velocity feedback
Mattia Dal Borgo, Maryam Ghandchi Tehrani, Stephen John Elliott
University of Southampton, Institute of Sound and Vibration Research, Southampton, United Kingdom

17.00 **ID 232**
Dynamic data-driven adaptive observations in a vortex flowfield
Ryne Beeson, Hoong Chieh Yeong, Navaratnam Sri Namachchivaya
University of Illinois at Urbana-Champaign, Department of Aerospace Engineering, Urbana, USA

17.20 **ID 288**
Low-pass filter with hybrid integrator-gain switching for increased bandwidth
Marcel Heertjes
Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands

17.40 **ID 401**
Modelling and control of a simplified system under external disturbance
Gangsig Shin
KINS, Dept of safety research, Daejeon, South Korea

Room 6 (KF81)

16.00 - 18.00 **MS 16 / I.**
Random Dynamical Systems - Recent Advances and New Directions

Chair: Rachel Kuske
Co-chair: Daniil Yurchenko

16.00 **ID 66**
Evolutionary dynamics of membership distribution functions of a forced triple well potential system with fuzzy uncertainty
Ling Hong
Xi'an Jiaotong University, State Key Lab for Strength and Vibration, Xi'an, China

16.20 **ID 169**
Energy conversion in a dynamic vibro-impact system with dielectric elastomers
Gordon Thomson, Daniil Yurchenko
Heriot-Watt University, Institute of Mechanical, Process and Energy Engineering, Edinburgh, United Kingdom

16.40 **ID 419**
Nonlinear random vibrations of stretched beam discretized by finite difference scheme and excited by Gaussian white noise
Guo-Kang Er
University of Macau, Department of Civil and Environmental Engineering, Macau SAR, China

17.00 **ID 429**

Approximation of top Lyapunov exponent of stochastic delayed turning model using Fokker-Planck approach

Henrik Tamas Sykora[1], Walter V. Wedig[2], Daniel Bachrathy[1], Gabor Stepan[1]

[1]Budapest University of Technology and Economics, Applied mechanics, Budapest, Hungary

[2]Karlsruhe Institue of Technology, Institute for Applied Mechanics, Karlsruhe, Germany

17.20 **ID 177** **CANCELLED**

Statistics of the response of a dry-friction oscillator stochastically excited

Roberta Lima, Rubens Sampaio

Pontifícia Universidade Católica do Rio de Janeiro, Departamento de Engenharia Mecânica, Rio de Janeiro, Brazil

Room 7 (KF88)

16.00 - 18.00 **MS 13 / II.**

Nonlinear Dynamics in Biological Systems

Chair: Sachin Goyal

Co-chair: John Milton

16.00 **ID 35**

Izhikevich neural networking model; Master neurons & slave neurons and applications in modeling Alzheimer's disease; Delay in the signal and eventually periodic solutions

Maksims Zigunovs[1,4], Michael Radin[2], Alexander Pisarchik[3]

[1]Riga Technical University, Institute of Applied Mathematics, Faculty of Computer Science and Information Technology, Riga, Latvia

[2]Rochester Institute of Technology, Department of Applied mathematics, Rochester, New York, USA

[3]Madrid Technical University, Center of Biomedical Technology, Madrid, Spain

[4]Liepaja University, Institute of Science and Innovative Technologies, Faculty of Science and Engineering, Liepaja, Latvia

16.20 **ID 408**

Expert stick balancing: Levy distributions and the edge of stability

John Milton

The Claremont Colleges, W M Keck Science Department, Claremont, USA

16.40 **ID 411**
Three-segmented hopping leg for the analysis of human running locomotion
László Fekete[1], Bernd Krauskopf[2], Ambrus Zelei[3]
[1]Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary
[2]The University of Auckland, Department of Mathematics, Auckland, New Zealand
[3]MTA-BME Research Group on Dynamics of Machines and Vehicles, Budapest, Hungary

17.00 **ID 481**
Proper orthogonal decomposition analysis of impact-induced dynamics of the olive tree branch: a paradigm of a complex soft-stiff structure in biomechanics
Ioannis Georgiou
National Technical University of Athens, School of Naval Architecture and Marine Engineering, Athens, Greece

17.20 **ID 505**
The role of vibrations in tactile perception
Marco Barbieri, Ramona Fagiani
University of Modena and Reggio Emilia, Department of Engineering Enzo Ferrari, Modena, Italy

17.40 **ID 3**
Periodic orbits of a neuron model with periodic internal decay rate
Michael Radin
Rochester Institute of Technology, School of Mathematical Sciences, Rochester, New York, USA

Room 8 (KF82)

16.00 - 18.00 **MS 02 / III.**
Asymptotic Methods

Chair: Igor V. Andrianov
Co-chair: Alexey Porubov

16.00 **ID 198**
Control of nonlinear localized waves by an external action
Alexey Porubov
Institute of Problems of Mechanical Engineering, Department of Micromechanics of Materials, Saint Petersburg, Russia

16.20 **ID 197**
Forced resonance vibrations of the dissipative spring-pendulum system
Yuri Vladimirovich Mikhlin
National Technical University "KhPI", Applied Mathematics, Kharkov, Ukraine

16.40 **ID 343**
Energy method applied to the asymptotic methods of non-linear mechanics
Katica Hedrih (Stevanovic)
Mathematical Institute of Serbian Academy of Sciences and Arts, Department of Mechanics, Belgrade, Serbia

17.00 **ID 424**
Energy transport and localization in the system of harmonically coupled pendulums
Margarita Kovaleva, Valeri Smirnov, Leonid Manevitch
Semenov Institute of Chemical Physics, Russian Academy of Sciences, Department of Polymers and Composite Materials, Moscow, Russia

17.20 **ID 489**
2D control of energy transport in the locally resonant unit cell model with self excitation
Margarita Kovaleva[1], Nina Ryazan[2], Yuli Starosvetsky[2]
[1]Semenov Institute of Chemical Physics, Russian Academy of Sciences, Department of Polymers and Composite Materials, Moscow, Russia
[2]Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

17.40 **ID 6**
Stochastic Asymptotic-preserving Galerkin methods for multiscale kinetic equations with uncertainties
Shi Jin
Institute of Natural Sciences, Shanghai Jiao Tong University, China and Department of Mathematics, University of Wisconsin, Madison, USA

Room 9 (KF87)

16.00 - 18.00 **MS 01 / III.**
Reduced-Order Modeling and System Identification

Chair: Michael McFarland
Co-chair: Li-Qun Chen

16.00 **ID 65**
Reduced-order modeling of strongly nonlinear systems using measured time series
Keegan Moore[1], Christopher Herrera[2], Mehmet Kurt[3], Melih Eriten[4], Michael McFarland[2], Lawrence Bergman[2], Alexander Vakakis[1]
[1]University of Illinois at Urbana-Champaign, Department of Mechanical Science and Engineering, Champaign, USA
[2]University of Illinois at Urbana-Champaign, Department of Aerospace Engineering, Champaign, USA
[3]Stanford University, Department of Bioengineering, Stanford, USA
[4]University of Wisconsin-Madison, Department of Mechanical Engineering, Madison, USA

16.20 **ID 129**
Applications of spectral submanifolds in nonlinear modal analysis
Sten Ponsioen, George Haller
ETH Zürich, Institute for Mechanical Systems, Zürich, Switzerland

16.40 **ID 400** **CANCELLED**
Nonparametric identification of a nonlinear piezoelectric vibration energy harvester
Li-Qun Chen[1], Tianchen Yuan Yuan[2]
[1]Shanghai University, Department of Mechanics, Shanghai, China
[2]Shanghai University, Shanghai Institute of Applied Mathematics and Mechanics, Shanghai, China

17.00 **ID 443**
Parameter estimation for nonsymmetric matrix Riccati differential equations
David Swigon
University of Pittsburgh, Department of Mathematics, Pittsburgh, USA

17.20 **ID 530** **CANCELLED**
Linearizability condition of nonlinear form of Riccati equation
Ruma Dutta
Ohio State University, Applied Mathematics, Columbus, USA

Wednesday, 28 June 2017

Room 1 (KF51)

08.30 - 10.30 **MS 09 / VI.**
Nonlinear Dynamics in Engineering Systems

Chair: Marco Amabili
Co-chair: Jun Jiang

08.30 **ID 396**
Analysis of a remarkable singularity in a nonlinear DDE
Matthew Davidow[1], B Shayak[2], Richard Rand[3]
[1]Cornell University, Center for Applied Mathematics, Ithaca, USA
[2]Cornell University, School of Mechanical and Aerospace Engineering, Ithaca, USA
[3]Cornell University, Department of Mathematics and Department of Mechanical and Aerospace Engineering, Ithaca, USA

08.50 **ID 417**
Identification of nonlinear damping for large-amplitude vibrations of plates and shells
Marco Amabili
McGill University, Department of Mechanical Engineering, Montreal, Canada

09.10 **ID 479** **CANCELLED**
On dynamics of a particle tethered to a rigid body by two unilateral constraints
Alexander V. Rodnikov
Moscow Aviation Institute (National Research University), Applied Mathematics and Physics, Moscow, Russia

09.30 **ID 483**
Modelling and simulation of vibrocompaction processes
Javier González Carbajal, Daniel García-Vallejo, Jaime Domínguez
Universidad de Sevilla, Mechanical and Manufacturing Engineering, Sevilla, Spain

09.50 **ID 497**
Observation of vibratory force phenomena
Tadeusz Majewski
Universidad de las Americas-Puebla, Department of Indutrial and Mechanical Engineering, Puebla, Mexico

10.10 **ID 113**
Transient responses and bifurcation behavior of a piecewise smooth rotor/stator rubbing system under noise excitation
Jun Jiang
Xi'an Jiaotong University, State Key Lab for Strength and Vibration, Xi'an, China

Room 2 (K174)

08.30 - 10.30 **MS 11 / VI.**
Systems with Time Delay

Chair: Tamas Insperger
Co-chair: Eric Butcher

08.30 **ID 485**
Borehole spiraling as limit cycle of directionally unstable drilling systems
Julien Marck, Emmanuel Detournay
University of Minnesota, Department of Civil, Environmental and Geo-Engineering, Minneapolis, USA

08.50 **ID 330**
Delay system modelling and analysis of a down-hole tool in drilling systems
Nathan Van de Wouw[1,2,3], Thijs Vromen[1], Emmanue Detournay[2], Henk Nijmeijer[1]
[1]Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands
[2]University of Minnesota, Department of Civil, Environmental and Geo-Engineering, Minneapolis, USA
[3]Delft University of Technology, Delft Center for Systems and Control, Delft, The Netherlands

09.10 **ID 369**
Post-critical vibrations in an auto-resonant axial-torsional vibratory drilling system
Alexander Gouskov[1], Mikhail Guskov[2]
[1]Bauman Moscow State Technical Uniersity, Applied Mechanics, Moscow, Russia
[2]ENSAM, PIMM Laboratory, Paris, France

09.30 **ID 29**
Axial and torsional dynamics of a distributed drill string system
Ulf Jakob Fløe Aarsnes[1], Nathan Van de Wouw[2]
[1]International Research Institute of Stavanger, Drilling & Well Technology, Oslo, Norway
[2]Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands

09.50 **ID 518**
Drilling dynamics under 1:1 internal resonance between axial and torsional modes
Sunit K. Gupta, Pankaj Wahi
Indian Institute of Technology Kanpur, Department of Mechanical Engineering, Kanpur, India

10.10 **ID 115**
Planar motions in grinding chatter
Yao Yan
University of Electronic Science and Technology of China, School of Aeronautics and Astronautics, Chengdu, China

Room 3 (K155)

08.30 - 10.30 **MS 12 / I.**
Micro- and Nano-Electro-Mechanical Systems

Chair: Anil Bajaj
Co-chair: Slava Krilov

08.30 **ID 25**
Parametric amplification of acoustically-excited micromechanical oscillators using fringing electrostatic fields
Stella Lulinsky[1], Tsvi Schmilovich[1], Bojan Rob Ilic[2], Slava Krylov[1]
[1]Tel Aviv University, School of Mechanical Engineering, Tel Aviv, Israel
[2]National Institute of Standards and Technology, Center for Nanoscale Science and Technology, Gaithersburg, USA

08.50 **ID 358**
Room-temperature stochastic switching in a Duffing graphene resonator
Samer Houri, Robin Dolleman, Peter Steeneken, Herre Van der Zant
Delft University of Technology, Kavli Institute of Nanoscience, Delft, The Netherlands

09.10 **ID 365**
The influence of imperfections on the spatio-temporal dynamics of a parametrically excited nonlinear viscoelastic micro-beam-string
Prashant Kambali[1], Karin Mora[2], Oded Gottlieb[1]
[1]Technion – Israel Institute of Technology, Mechanical Engineering, Haifa, Israel
[2]University of Paderborn, Electrical Engineering, Paderborn, Germany

09.30 **ID 72**
A degenerate mode magnetic acoustic resonator
Barry Gallacher[1], Jim Burdess[1], Z Hu[1], Harriet Grigg[1], Carl Dale[2], Chen Fu[2], Neil Keegan[2], John Hedley[1], Julia Spoors[2]
[1]Newcastle University, Department of Mechanical, Materials and Manufacturing Engineering, Newcastle upon Tyne, United Kingdom
[2]Newcastle University, Institute of Cellular Medicine, Newcastle upon Tyne, United Kingdom

09.50 **ID 517**
Uncertainty quantification and response reliability for a nonlinear resonant MEMS t-beam structure undergoing 1:2 autoparametric resonance
Anil K. Bajaj, Rajat Goyal
Purdue University, School of Mechanical Engineering, West Lafayette, USA

10.10 **ID 64**
Devil's staircase in an optomechanical cavity
Eyal Buks
Technion – Israel Institute of Technology, Electrical Engineering, Haifa, Israel

Room 4 (K134)

08.30 - 10.30 **MS 08 / VI.**
Nonlinear Phenomena in Mechanical and Structural Systems

Chair: Jerzy Warmiński
Co-chair: Bala Balachandran

08.30 **ID 393**
Uncovering detached resonance curves in single degree-of-freedom systems
Giuseppe Habib[1], Giuseppe Cirillo[2], Gaetan Kerschen[3]
[1]Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary
[2]University of Cambridge, Department of Engineering, Cambridge, United Kingdom
[3]University of Liege, Aerospace and Mechanical Engineering, Liege, Belgium

08.50 **ID 239**
Spectral submanifolds and exact model reduction for nonlinear beam dynamics
Florian Kogelbauer, George Haller
ETH Zürich, Department of Mechanics, Zürich, Switzerland

09.10 **ID 325**
Bifurcations of relative equilibria sets of a massive point on an uniformly rotating spherical asteroid
Alexander Burov[1], Ivan Kosenko[2], Ekaterina Shalimova[3]
[1]Dorodnicyn Computing Centre, Federal Research Center "Computer Science and Control" of Russian Academy of Sciences, Department of Mechanics, Moscow, Russia
[2]Lomonosov Moscow State University, Department of Theoretical Mechanics, Moscow, Russia
[3]Lomonosov Moscow State University, Institute of Mechanics, Moscow, Russia

09.30 **ID 452**

A modified two-timescale incremental harmonic balance method for steady-state quasi-periodic responses of nonlinear systems

Ren Ju[1], Wei Fan[2], Weidong Zhu[3], Jianliang Huang[1]

[1]Sun Yat-sen University, Department of Applied Mechanics, Guangzhou, China

[2]Harbin Institute of Technology, Division of Dynamics and Control, Harbin, China

[3]University of Maryland, Baltimore County, Department of Mechanical Engineering, Baltimore, USA

09.50 **ID 124**

The threshold behaviour of chaotization phenomenon for multiple frequency perturbations in a cell

Mikhail Guzev[1], Konstantin Koshel[2]

[1]Institute for Applied Mathematics Far Eastern Branch Russian Academy of Sciences, Far Eastern Branch Russian Academy of Sciences, Vladivostok, Russia

[2]Pacific Oceanological Institute of FEB RAS, Far Eastern Branch Russian Academy of Sciences, Vladivostok, Russia

10.10 **ID 395**

Compensating symmetry breaking in planetary gearboxes by means of tooth profile modifications

Francesco Pellicano, Asma Masoumi, Marco Barbieri

University of Modena and Reggio Emilia, Department of Engineering Enzo Ferrari, Modena, Italy

Room 5 (K150)

08.30 - 10.30 **MS 04 / I.**
Experiments in Nonlinear Dynamics and Control

Chair: Hiroshi Yabuno

Co-chair: Rafael Sanchez Crespo

08.30 **ID 17**

Model free control of a 2-input and 2-output helicopter system

Ying Xin[1], Zhi-Chang Qin[2], Wei-Guo Wu[1], Jian-Qiao Sun[3]

[1]Tianjin University, Department of Mechanics, Tianjin, China

[2]Shandong University of Technology, Department of Mechanics, Zibo, China

[3]University of California, Merced, School of Engineering, Merced, USA

08.50 **ID 31**

Chaotic triangle wave generator implementing Chua circuit towards DC/DC converter control

Alexandros Kordonis, Yusuke Nakakohara, Hirotaka Otake

ROHM Co., Ltd., Discrete and Module Production (R&D), Kyoto, Japan

09.10 **ID 159**

Experimental testing of rotor-stator contact in a coupled double rotor system

Rafael Sanchez Crespo[1], Alexander D. Shaw[1], Alan R. Champneys[2]

[1]Swansea University, College of Engineering, Swansea, United Kingdom

[2]University of Bristol, Department of Engineering Mathematics, Bristol, United Kingdom

09.30 **ID 303**

Measurement of backbone curves of a nonlinear piezoelectric cantilever beam

Vivien Denis[1], Marguerite Jossic[2], Alexandre Renault[1], Christophe Giraud-Audine[3], Olivier Thomas[1]

[1]Arts et Metiers ParisTech, Lille, France

[2]Université Pierre et Marie Curie, Institut JLR d'Alembert UMR CNRS, Paris, France

[3]Arts et Metiers ParisTech, L2EP, Lille, France

09.50 **ID 508**

Parametric excitation and detection of electrostatic MEMS actuators

Alaa Elhady[1], Sangtak Park[1], David Effa[2], Eihab Abdel-Rahman[1], Mustafa Yavuz[2]

[1]University of Waterloo, Systems Design Engineering, Waterloo, Canada

[2]University of Waterloo, Mechanical and Mechatronics Engineering, Waterloo, Canada

10.10 **ID 48**

Data preparation for execution of experiments on rigid body motion in a resisting medium

Maxim V. Shamolin

Lomonosov Moscow State University, Institute of Mechanics, Moscow, Russia

08.30 - 10.30 **MS 16 / II.**
Random Dynamical Systems - Recent Advances and New Directions

Chair: Daniil Yurchenko
Co-chair: Radek Erban

08.30 **ID 91**
Oscillation patterns in stochastic fast-slow systems
Christian Kuehn
Technical University of Munich, Department of Mathematics, Muenchen, Germany

08.50 **ID 441**
Multiscale methods and inverse problems in modelling of intracellular processes
Radek Erban
University of Oxford, Mathematical Institute, Oxford, United Kingdom

09.10 **ID 491**
A chaotic linear operator on the space of odd 2π–periodic functions
Márton Kiss[1], Tamás Kalmár-Nagy[2]
[1]Budapest University of Technology and Economics, Institute for Mathematics, Budapest, Hungary
[2]Budapest University of Technology and Economics, Department of Fluid Mechanics, Budapest, Hungary

09.30 **ID 495**
Advantages of alpha-stable distribution fits for dynamic responses of nonlinear structures subjected to random excitations
Vikram Pakrashi[1], Bidroha Basu[2]
[1]University College Dublin, Mechanical and Materials Engineering, Dublin, Ireland
[2]Trinity College Dublin, Civil, Structural and Environmental Engineering, Dublin, Ireland

09.50 **ID 523**
Towards a bifurcation theory for random dynamical systems
Jeroen Lamb
Imperial College London, London, United Kingdom

10.10 **ID 526**
Hyperbolic periodic orbits in nongradient systems and small-noise-induced metastable transitions
Molei Tao
Georgia Institute of Technology, School of Mathematics, Atlanta, USA

08.30 - 10.30 **MS 14 / I.**
Nonlinear Dynamics for Engineering Design

Chair: Stefano Lenci
Co-chair: Carlos Mazzilli

08.30 **ID 30**
Asynchronous modes of vibration in a heavy-chain model with linear and rotational springs
Carlos Mazzilli[1], Stefano Lenci[2]
[1]Universidade de São Paulo, Departamento de Engenharia de Estruturas e Geotécnica, São Paulo, Brazil
[2]Università Politecnica delle Marche, Dipartimento di Ingegneria Civile, Edile e Architettura, Ancona, Italy

08.50 **ID 121**
Seismic performance of base-isolated structures based on the force analogy method
Jiting Qu, Wenqi Fang
Dalian University of Technology, Department of Civil Engineering, Dalian, China

09.10 **ID 137**
Fundamental study on dynamic property of scissoring bridge for disaster relief
Yuki Chikahiro[1], Ario Ichiro[2], Adachi Kotaro[2], Shimizu Shigeru[1], Zenzai Seiya[1], Piotr Pawlowski[3], Graczykowski Cezary[3], Holnicki-Szulc Jan[3]
[1]Shinshu University, Department of Water Environment & Civil Engineering, Nagano, Japan
[2]Hiroshima University, Department of Civil & Environmental Engineering, Higashi Hiroshima, Japan
[3]Polish Academy of Sciences, Institute of Fundamental Technological Research, Warsaw, Poland

09.30 **ID 243**
On the two degrees of freedom oscillator with nonlinear stiffness coupling: theoretical and experiment results
Gianluca Gatti[1], Michael Brennan[2], Ivana Kovacic[3]
[1]University of Calabria, Department of Mechanical Energy and Management Engineering, Cosenza, Italy
[2]UNESP, Departamento de Engenharia Mecânica, Ilha Solteira (SP), Brazil
[3]University of Novi Sad, CEVAS, Novi Sad, Serbia

09.50 **ID 315**
The NSCD method for dynamic analyses of ancient masonry tower under transversal dynamic loadings
Francesco Clementi, Angela Ferrante, Stefano Lenci
Polytechnic University of Marche, Department of Civil and Building Engineering and Architecture, Ancona, Italy

10.10 **ID 509**
Seismic damage analysis of a Hungarian historical peasant house archetype
Eduardo Charters Morais
Budapest University of Technology and Economics, Structural Engineering, Budapest, Hungary

Room 9 (KF87)

08.30 - 10.30 **MS 20 / I.**
Wave Propagation in Mechanical Systems

Chair: Vassilios Rothos
Co-chair: Yannis Georgiou

08.30 **ID 53**
Solitary waves in dimer binary collision model: a comparative study with granular dimers
Zaid Ahsan[1], K. R Jayaprakash[2]
[1]University of Illinois at Urbana Champaign, Department of Mechanical Science and Engineering, Champaign, USA
[2]Indian Institute of Technology Gandhinagar, Mechanical Engineering, Gandhinagar, India

08.50 **ID 54**
Wave propagation in granular dimers mounted on linear elastic foundation
Zaid Ahsan[1], K. R Jayaprakash[2]
[1]University of Illinois at Urbana Champaign, Department of Mechanical Science and Engineering, Champaign, USA
[2]Indian Institute of Technology Gandhinagar, Mechanical Engineering, Gandhinagar, India

09.10 **ID 57**
Influence of metal internal defect on the propagation of shock wave
Miao Zheng
Institute of Applied Physics and Computational Mathematics, Beijing, China

09.30 **ID 68**
Numerical investigation of pad or air gap between the high explosive and flyer in impelling
Xin Yu
Institute of Applied Physics and Computational Mathematics, Applied Mechanics, Beijing, China

09.50 **ID 209**
Wave propagation in nonlinear implicit lattices
Vassilios M. Rothos
Aristotle University, Thessaloniki, Greece, Department of Mechanical Engineering, Thessaloniki, Greece

10.10 **ID 364**
Parameter sensitivity in experimental wave propagation studies with beam like structures: shadow of chaotic scattering in continuum structural dynamics?
Ioannis Georgiou
National Technical University of Athens, School of Naval Architecture and Marine Engineering, Athens, Greece

10.30 - 11.00 **Coffee break**

Room 1 (KF51)

11.00 - 12.00 **Keynote lecture**

Internal resonances in tiny structures: new results and practical applications
Steven Shaw[1,2]
[1]*Department of Mechanical and Aerospace Engineering, Florida Institute of Technology, Melbourne, FL, USA*
[2]*Departments of Mechanical Engineering and Physics and Astronomy, Michigan State University, East Lansing, MI, USA*

12.00 - 13.30 **Lunch break**

13.30 - 18.00 **Half day excursion**

Thursday, 29 June 2017

Room 2 (K174)

08.30 - 10.30 **MS 21 / I.**
Traffic and Vehicle Dynamics

Chair: Bart Besselink
Co-chair: Gábor Orosz

08.30 **ID 309**
Nonlinear analysis of the body sway of car-trailer combinations with nonlinear shock absorber and tire characteristics
Ning Zhang, Jian Ma, Tian Mi, Guo-dong Yin
Southeast University, School of Mechanical Engineering, Nanjing, China

08.50 **ID 334**
The impact of non-smoothness in the tyre-force characteristics on the nonlinear dynamics of towed vehicles
Sandor Beregi, Denes Takacs
Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

09.10 **ID 397**
Robust dynamic vehicle routing for on-demand systems under light load
Hyongju Park[1], Matthew Johnson-Roberson[2], Ram Vasudevan[1]
[1]University of Michigan Ann Arbor, Department of Mechanical Engineering, Ann Arbor, USA
[2]University of Michigan Ann Arbor, Department of Naval Architecture and Marine Engineering, Ann Arbor, USA

09.30 **ID 446**
Simplified model of rocking suitcases
Hanna Horvath[1], Denes Takacs[2]
[1]Budapest University of Technology and Economics, Faculty of Mechanical Engineering, Budapest, Hungary
[2]MTA-BME Research Group on Dynamics of Machines and Vehicles, Department of Applied Mechanics, Budapest, Hungary

09.30 **ID 496**
Analysis of traffic data by considering nonlinearity and nonstationarity
Bidisha Ghosh, Bidroha Basu, Vikram Pakrashi
Trinity College Dublin, Civil, Structural and Environmental Engineering, Dublin, Ireland

10.10 **ID 534**
New driver assistance functions for commercial vehicles
Peter Frank
Knorr-Bremse Commercial Vehicle Systems, Research & Development Center, Budapest, Hungary

Note that the afternoon session of MS 21 will be held in Room 9 (KF87).

Room 3 (K155)

08.30 - 10.30 **MS 12 / II.**
Micro- and Nano-Electro-Mechanical Systems

Chair: E.M. Abdel-Raman
Co-chair: Dmitrii Skubov

08.30 **ID 403** **CANCELLED**
Equilibrium forms bifurcation of the nonlinear NEMS/MEMS
Dmitrii Skubov[1], Dmitrii Indeitsev[1], Lev Shtukin[1], Alexey Lukin[2], Ivan Popov[2]
[1]Institute of Problems of Mechanical Engineering Russian Academy of Sciences, Applied Mathematics, Saint Petersburg, Russia
[2]St. Petersburg Polytechnic University, Department of Mechanical and Process Engineering, Saint Petersburg, Russia

08.50 **ID 77**
Analysis of a simplified MEMS oscillator
Richard Rand[1], Alan Zehnder[2], B Shayak[2]
[1]Cornell University, Department of Mathematics and Department of Mechanical and Aerospace Engineering, Ithaca, USA
[2]Cornell University, Department of Mechanical and Aerospace Engineering, Ithaca, USA

09.10 **ID 114**
Dynamic release condition for latched curved micro beams
Lior Medina[1], Rivka Gilat[2], Slava Krylov[3]
[1]Tel Aviv University, Faculty of Mechanical Engineering, Tel Aviv, Israel
[2]Faculty of Engineering, Ariel University, Department of Civil Engineering, Ariel, Israel
[3]Tel Aviv University, School of Mechanical Engineering, Tel Aviv, Israel

09.30 **ID 233** **CANCELLED**
Nonlinear dynamics of microplate-based imperfect MEMS
Mergen Ghayesh[1], Hamed Farokhi[2]
[1]University of Adelaide, School of Mechanical Engineering, Adelaide, Australia
[2]McGill University, Mechanical Engineering, Montreal, Canada

09.50 **ID 81** **CANCELLED**

Pull-in instability of a typical electrostatic MEMS resonator and its suppression by a delayed position feedback

Shang Huilin

Shanghai Institute of Technology, School of Mechanical Engineering, Shanghai, China

10.10 **ID 228**

Simulations in nonlinear behavior of an electrostatically-actuated corrugated diaphragm in microelectromechanical system tunable filters

Yu-Chiao Wu, Dimitrios Peroulis

Purdue University, Birck Nanotechnology Center, Indiana, USA

Room 1 (KF51)

08.30 - 10.30 **MS 05 / I.**
Slow-Fast Systems and Phenomena

Chair: Jon Juel Thomsen

Co-chair: D. Dane Quinn

08.30 **ID 92**

Non-hyperbolic singularities in fast-slow chemical oscillators

Christian Kuehn

Technical University of Munich, Department of Mathematics, Muenchen, Germany

08.50 **ID 246**

Effect of periodic chip formation on the stability of turning processes

Gergely Gyebrószki[1], Daniel Bachrathy[1], Gábor Csernák[2], Gabor Stepan[1]

[1]Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

[2]MTA-BME Research Group on Dynamics of Machines and Vehicles, Budapest, Hungary

09.10 **ID 322**

Interacting global and slow manifolds

Jose Mujica, Bernd Krauskopf, Hinke Osinga

University of Auckland, Department of Mathematics, Auckland, New Zealand

09.30 **ID 502**

Dynamics of a small stiff spherical particle in an acoustic standing wave in fluid

Vladimir Vanovskiy[1], Alexander Petrov[2]

[1]Moscow Institute of Physics and Technology (MIPT), Department of General Physics, Dolgoprudny, Russia

[2]Institute for Problems in Mechanics, Russian Academy of Sciences, Laboratory of Mechanics of Systems, Moscow, Russia

09.50 **ID 471**

Convergence of equation-free methods in the case of finite time scale separation with applications to deterministic and stochastic systems

Jan Sieber[1], Christian Marschler[2], Jens Starke[3]

[1]University of Exeter, College of Engineering, Mathematics and Physical Sciences, Exeter, United Kingdom

[2]Technical University of Denmark, Department of Mathematics and Computer Science, Lyngby, Denmark

[3]University of Rostock, Institute for Mathematics, Rostock, Germany

Room 5 (K150)

08.30 - 10.30 **MS 04 / II.**

Experiments in Nonlinear Dynamics and Control

Chair: Hiroshi Yabuno

Co-chair: Fabian Schnelle

08.30 **ID 104**

Experiments on adaptive nonlinear model predictive control of a pendulum

Fabian Schnelle, Peter Eberhard

University of Stuttgart, Institute of Engineering and Computational Mechanics, Stuttgart, Germany

08.50 **ID 185**

Experimental characterisation of tape spring nonlinear compliant mechanisms

Florence Dewalque[1], Cédric Schwartz[2], Vincent Denoël[2], Jean-Louis Croisier[2], Bénédicte Forthomme[2], Olivier Brüls[1]

[1]University of Liege, Department of Aerospace and Mechanical Engineering, Liege, Belgium

[2]University of Liege, Laboratory of Human Motion Analysis, Liege, Belgium

09.10 **ID 404**

Nonlinear characteristics of hunting motion of a railway wheel set by using a roller rig

Weiyan Wei

University of Tsukuba, School of Mechanical and Systems Engineering, Tsukuba, Japan

09.30 **ID 522**

Dynamical response identification of a class of nonlinear hysteretic systems

Biagio Carboni[1], Walter Lacarbonara[1], Patrick Brewick[2], Sami Masri[2]

[1]Sapienza University di Roma, Department of Structural and Geotechnical Engineering, Rome, Italy

[2]University of Southern California, Department of Civil and Environmental Engineering, Los Angeles, USA

09.50 **ID 142**
Stabilization control for self-excited oscillation of cantilevered fluid-conveying pipe
Beiming Yu
University of Tsukuba, School of Mechanical and Systems Engineering, Tsukuba, Japan

Room 6 (KF81)

08.30 - 10.30 **MS 17 / I.**
Time-periodic systems

Chair: Subhash C. Sinha
Co-chair: Miguel Barrios

08.30 **ID 88**
A feasible analysis of quasi-periodic Mathieu equations via Floquét theory Part I.
Ashu Sharma, Subhash Sinha
Auburn University, Department of Mechanical Engineering, Auburn, USA

08.50 **ID 88**
A feasible analysis of quasi-periodic Mathieu equations via Floquét theory Part II.
Ashu Sharma, Subhash Sinha
Auburn University, Department of Mechanical Engineering, Auburn, USA

09.10 **ID 112**
Hopf bifurcation in a delayed nonlinear Mathieu equation
Alexander Bernstein[1], Si Mohamed Sah[2], Robert Meller[3], Richard Rand[4]
[1]Cornell University, Center for Applied Mathematics, Ithaca, USA
[2]KTH Royal Institute of Technology, Nanostructure Physics, Stockholm, Sweden
[3]Cornell University, Department of Physics, Ithaca, USA
[4]Cornell University, Department of Mathematics and Department of Mechanical and Aerospace Engineering, Ithaca, USA

09.30 **ID 126**
On the analysis of quasi-periodic systems and a novel "deterministic" explanation of the stochastic resonance phenomenon
Iliya Blekhman[1], Vladislav Sorokin[2]
[1]Institute of Problems of Mechanical Engineering Russian Academy of Sciences, Vibromechanics , Saint Petersburg, Russia
[2]University of Auckland, Department of Mechanical Engineering, Auckland, New Zealand

09.50 **ID 532**
Minimum damping needed for vanishing an unstable pocket of a Hill equation
Carlos Franco Tello, Joaquín Collado M., Miguel Luis Ramirez Barrios
CINVESTAV, Department of Automatic Control, Mexico City, Mexico

10.10 **ID 307**
Damped Hill's Equation and its application to attenuate vibrations
Miguel Luis Ramirez Barrios, Joaquín Collado
CINVESTAV, Department of Automatic Control, Mexico City, Mexico

Room 7 (KF88)

08.30 - 10.30 **MS 14 / II.**
Nonlinear Dynamics for Engineering Design

Chair: Marco Amabili
Co-chair: Enrico Babilio

08.30 **ID 49**
An anisometric dynamical integrity measure and its seamless variation with respect to other measures
Pierpaolo Belardinelli[1], Stefano Lenci[2], Giuseppe Rega[3]
[1]Delft University of Technology, Precision and Microsystem Engineering, Delft, The Netherlands
[2]Polytechnic University of Marche, Department of Civil and Building Engineering and Architecture, Ancona, Italy
[3]Sapienza University di Roma, Department of Structural and Geotechnical Engineering, Rome, Italy

08.50 **ID 175**
Hydrodynamics and stochastic dynamics of a parametric pendulum wave energy converter
Daniil Yurchenko[1], David Forehand[2], Ciaran Gilbert[3], Athanasios Giannenas[1], Panagiotis Alevras[4]
[1]Heriot-Watt University, Institute of Mechanical, Process and Energy Engineering, Edinburgh, United Kingdom
[2]University of Edinburgh, College of Engineering, Edinburgh, United Kingdom
[3]Strathclyde University, College of Engineering, Glasgow, United Kingdom
[4]Loughborough University, School of Mechanical, Electrical and Manufacturing Engineering, Loughborough, United Kingdom

09.10 **ID 182**
A nonlinear model for design of beams operating in largely deformed configurations
Enrico Babilio[1], Stefano Lenci[2]
[1]University of Naples 'Federico II', Department of Structures for Engineering and Architecture (DiSt), Naples, Italy
[2]Polytechnic University of Marche, Department of Civil and Building Engineering and Architecture, Ancona, Italy

09.30 **ID 270**
Effect of gravity on the nonlinear dynamics of an overhung rotor with annular rubs
Elijah. T Chipato, A. D Shaw, M. I Friswell
Swansea University, College of Engineering, Swansea, United Kingdom

09.50 **ID 484**
Parametric study of the force acting on a target during an aircraft impact
Lili Eszter Laczák[1], György Károlyi[2]
[1]Budapest University of Technology and Economics, Department of Structural Engineering, Budapest, Hungary
[2]Budapest University of Technology and Economics, Institute of Nuclear Techniques, Budapest, Hungary

Room 8 (KF82)

08.30 - 10.30 **MS 15 / I.**
Energy Transfer and Harvesting in Nonlinear Systems

Chair: Oleg Gendelman
Co-chair: Sandra Chiacchiari

08.30 **ID 467** **CANCELLED**
Mitigating tsunamis via nonlinear triad resonance
Usama Kadri
Cardiff University, School of Mathematics, Cardiff, United Kingdom

08.50 **ID 39**
Energy exhanges in a system of a forced linear structure coupled to a chain of nonlinear oscillators
Simon Charlemagne, Alireza Ture Savadkoohi, Claude-Henri Lamarque
ENTPE (Ecole Nationale des Travaux Publics de l'Etat), LTDS UMR CNRS 5513, Vaulx-en-Velin, France

09.10 **ID 79**
Front propagation in bi-stable non-degenerate systems: model dependence and universality
Itzhak Shiroky, Oleg Gendelman
Technion – Israel Institute of Technology, Department of Mechanical Engineering, Haifa, Israel

09.30 **ID 464**
Passive vibration control with a bistable nonlinear absorber
Volodymyr Iurasov[1], Pierre-Olivier Mattei[2]
[1]Aix-Marseille University, CNRS, Centrale Marseille, LMA, Marseille, France
[2]LMA (CNRS, UPR 7051), LMA, Marseille, France

09.50 **ID 501**
Extreme response mitigation of stochastically forced nonlinear structures
Themistoklis Sapsis
Massachusetts Institute of Technology, Mechanical Engineering, Cambridge, United States of America

10.10 **ID 340**
Vibration-based energy harvesting via a bistable system: experimental study
Sandra Chiacchiari[1], Francesco Romeo[1], Michael McFarland[2], Lawrence A Bergman[2], Alexander F Vakakis[2]
[1]Sapienza University of Rome, Dipartimento di Ingegneria Strutturale e Geotecnica, Rome, Italy
[2]University of Illinois at Urbana-Champaign, College of Engineering, Urbana, USA

Room 9 (KF87)

08.30 - 10.30 **MS 20 / II.**
Wave Propagation in Mechanical Systems

Chair: Francesco Romeo
Co-chair: Yuri Gaponenko

08.30 **ID 199**
Symmetry-induced dynamic localization in lattice structures
Nathan Perchikov, Oleg V. Gendelman
Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

08.50 **ID 210**

Variety of interfacial patterns in miscible fluids induced by vibrations

Yuri Gaponenko, Viktar Yasnou, Aliaksandr Mialdun, Valentina Shevtsova

Université Libre de Bruxelles, Microgravity Research Center, Brussels, Belgium

09.10 **ID 486**

Stability of capillary waves of finite amplitude

Mariana Lopushanski[1], Alexander Petrov[2]

[1]Moscow Institute of Physics and Technology (MIPT), Higher Mathematics Department, Moscow, Russia

[2]Institute for Problems in Mechanics, Russian Academy of Sciences, Laboratory of Mechanics of Systems, Moscow, Russia

09.30 **ID 122** **CANCELLED**

On the nonlinear wave dynamics of tensegrity columns

Ada Amendola[1], Gerardo Carpentieri[1], Chiara Daraio[2], Fernando Fraternali[3]

[1]University of Salerno, Department of Civil Engineering, Fisciano (SA), Italy

[2]California Institute of Technology, Engineering and Applied Science, Pasadena, California, USA

[3]University of Salerno, Department of Civil Engineering, Fisciano (SA), California, USA

09.50 **ID 356**

A numerical study of elastic Fano resonances in degeneracy-broken trapped mode resonators for biosensing applications

Harriet Grigg[1], Barry Gallacher[1], Carl Dale[2], Nathan Craig[1]

[1]Newcastle University, School of Mechanical and Systems Engineering, Newcastle upon Tyne, United Kingdom

[2]Newcastle University, Institute of Cellular Medicine, Newcastle upon Tyne, United Kingdom

10.10 **ID 533**

Thermalization of a coupled oscillator chain

Giovanni Salesi, Marta Greselin

University of Bergamo, Dipartimento di Ingegneria e Scienze Applicate, Dalmine, Italy

10.30 - 11.00 **Coffee break**

Room 1 (KF51)

11.00 - 12.00 **Keynote lecture**

Tailoring nonlinearity for advanced engineering design: linearization, optimization and practical realization
Gaëtan Kerschen
Space Structures and Systems Laboratory, Aerospace and Mechanical Engineering Department, University of Liège, Belgium

12.00 - 13.30 **Lunch break**

Room 3 (K155)

13.30 - 15.30 **MS 12 / III.**
Micro- and Nano-Electro-Mechanical Systems

Chair:
Slava Krilov

Co-chair:
Sebastien Baquet

13.30 **ID 250**
Effect of geometric and material nonlinearities on the dynamic behaviour of PMUTs
Ajay Dangi[1], Rudra Pratap[2]
[1]Indian Institute of Science, Mechanical Engineering, Bangalore, India
[2]Indian Institute of Science, Centre for Nano Science and Engineering, Bangalore, India

13.50 **ID 254**
Reduction of amplitude fluctuations in synchronized MEMS-based oscillators
Martial Defoort[1], Oriel Shoshani[2], Steven Shaw[3], David Horsley[1]
[1]University of California Davis, Department of Mechanical and Aerospace Engineering, Davis, USA
[2]Ben-Gurion University of the Negev, Department of Mechanical Engineering, Beer-Sheva, Israel
[3]Florida Institute of Technology, Department of Mechanical and Aerospace Engineering, Melbourne, USA

14.10 **ID 257**

Three to one internal resonance of modes with different decay rates

Oriel Shoshani[1], Steven Shaw[2], Mark Dykman[3]

[1]Ben-Gurion University of the Negev, Department of Mechanical Engineering, Beer-Sheva, Israel

[2]Florida Institute of Technology, Department of Mechanical and Aerospace Engineering, Melbourne, USA

[3]Michigan State University, Department of Physics and Astronomy, East Lansing, USA

14.30 **ID 271**

Mass detection through parametric analysis and symmetry-breaking in a MEMS array

Clément Grenat[1], Van-Nghi Nguyen[1], Sébastien Baguet[1], Régis Dufour[1], Claude Henri Lamarque[2]

[1]INSA Lyon, LaMCoS CNRS UMR5259, Villeurbanne, France

[2]ENTPE, LTDS UMR CNRS 5513, Vaulx-en-Velin, France

14.50 **ID 302**

Non-linear dynamics of opto-thermally excited atomically thin graphene resonators

Robin Dolleman[1], Farbod Alijani[2], Herre Van der Zant[1], Peter Steeneken[1]

[1]Delft University of Technology, Kavli Institute of Nanoscience, Delft, The Netherlands

[2]Delft University of Technology, Precision and Microsystem Engineering, Delft, The Netherlands

15.10 **ID 311**

Bistability of a cantilever actuated by fringing electrostatic fields

Naftaly Krakover, Slava Krylov

Tel Aviv University, School of Mechanical Engineering, Tel Aviv, Israel

Room 1 (KF51)

13.30 - 15.30 **MS 05 / II.**
Slow-Fast Systems and Phenomena

Chair: D. Dane Quinn

Co-chair: Jon Juel Thomsen

13.30 **ID 161**

Dynamic bifurcations in slow-fast system of neuronal excitability

Vladimir Nekorkin, Sergey Kirillov

Institute of Applied Physics of the Russian Academy of Science, Nonlinear dynamics, Nizhni Novgorod, Russia

13.50 **ID 291**
Multi-scale dynamics in microstructures
Annalisa Iuorio[1], Christian Kuehn[2], Peter Szmolyan[1]
[1]*Vienna University of Technology, Department of Mathematics, Vienna, Austria*
[2]*Technical University of Munich, Faculty of Mathematics, Munich, Germany*

14.10 **ID 262**
The Painlevé paradox and blowup - Part I
Kristian Uldall Kristiansen
Technical University of Denmark, Applied Mathematics, Copenhagen, Denmark

14.30 **ID 482**
The Painlevé paradox and blowup - Part II
John Hogan
University of Bristol, Department of Engineering Mathematics, Bristol, United Kingdom

14.50 **ID 506**
Slow-fast Hamiltonian systems: dynamics and bifurcations
Lev Lerman
Lobachevsky State University of Nizhni Novgorod, Department of Differential Equations, Nizhni Novgorod, Russia

Room 5 (K150)

13.30 - 15.30 **MS 04 / III.**
Experiments in Nonlinear Dynamics and Control

Chair:
David Barton

Co-chair:
Shinichi Maruyama

13.30 **ID 162**
Experimental tracking of limit-point bifurcations using control-based continuation
Ludovic Renson, D.A.W Barton, Simon Neild Neild
University of Bristol, Department of Engineering Mathematics, Bristol, United Kingdom

13.50 **ID 264**
Experiments and analysis on nonlinear vibrations of a post-buckled stepped beam
Shinichi Maruyama, Motofumi Hachisu, Ken-ichi Nagai, Takao Yamaguchi
Gunma University, Department of Mechanical Science and Technology, Kiryu, Japan

14.10 **ID 299**
Numerical continuation for edge following in tactile robotics
David Barton
University of Bristol, Department of Engineering Mathematics, Bristol, United Kingdom

14.30 **ID 351**
Nonlinear system identification of a beam with magnetic restoring forces
Gleb Kleyman, Sebastian Schwarzendahl, Jörg Wallaschek
Institute of Dynamics and Vibration Research, Leibniz Universität Hannover, Department of Mechanical Engineering, Hannover, Germany

14.50 **ID 478**
Vibration-based testing of bolted joints
Jon Thomsen[1], Si Mohamed Sah[1], Alexander Fidlin[2], Dmitri Tcherniak[3]
[1]Technical University of Denmark, Department of Mechanical Engineering, Kgs. Lyngby, Denmark
[2]Karlsruhe Institute of Technology, Department of Engineering Mechanics, Karlsruhe, Germany
[3]Brüel & Kjær (Sound and Vibration Measurement), Innovation Department, Nærum, Denmark

15.10 **ID 406**
Experimental analysis of a rotor system with two-phase flow squeeze film dampers under low supply pressure
Bingbing Han, Qian Ding, Wei Zhang, Liqing Li, Shengbo Fan
Tianjin University, Department of Mechanics, Tianjin, China

Room 6 (KF81)

13.30 - 15.30 **MS 17 / II.**
Time-periodic systems

Chair: Thomas Pumhössel
Co-chair: Tamas Kalmar-Nagy

13.30 **ID 24**
Large time-periodic systems in engineering applications
Peter Hagedorn, Artem Karev
Technische Universität Darmstadt, Mechanical Engineering Department, Darmstadt, Germany

13.50 **ID 86**
On the influence of contact compliance and stiction on vibrational smoothing of dry friction
Simon Kapelke, Wolfgang Seemann, Alexander Fidlin
Karlsruhe Institute of Technology, Institute of Engineering Mechanics, Karlsruhe, Germany

14.10 **ID 260**
Impulsive damping of mechanical systems: periodic solutions and energy harvesting
Thomas Pumhössel[1], Maryam Ghandchi-Tehrani[2]
[1]Institute of Mechatronic Design and Production, Johannes Kepler University Linz, Austria, Faculty of Engineering and Natural Sciences, Linz, Austria
[2]Institute of Sound and Vibration Research, University of Southampton, Faculty of Engineering and Environment, Southampton, United Kingdom

14.30 **ID 361**
Stability and control of the fractional damped delayed mathieu equation
Eric Butcher, Arman Dabiri
University of Arizona, Aerospace and Mechanical Engineering, Tucson, USA

14.50 **ID 375**
Stability of amplitude chimeras in oscillator networks
Eckehard Schöll
Technische Universität Berlin, Physics, Berlin, Germany

15.10 **ID 184**
Modal analysis of structures in periodic states
Barend Bentvelsen, Arnaud Lazarus
CNRS - Université Pierre et Marie Curie, Department of Engineering Mechanics, Paris, France

Room 7 (KF88)

13.30 - 15.30 **MS 14 / III.**
Nonlinear Dynamics for Engineering Design

Chair: Lidiya Kurpa
Co-chair: Ivana Kovacic

13.30 **ID 70**
Nonlinear vibrations of functionally graded shallow shells of a complex planform in thermal environments
Jan Awrejcewicz[1], Lidiya Kurpa[2], Tatiana Shmatko[3]
[1]Lodz University of Technology, Department of Automation, Biomechanics and Mechatronics, Lodz, Poland
[2]National Technical University "KhPI" , Department of Applied Mathematics, Kharkov, Ukraine
[3]National Technical University "KhPI", Department of Higher Mathematics, Kharkov, Ukraine

13.50 **ID 102**
Nonlinear dynamics of a fluid-filled hollow microcantilever subjected to flowing particles
Farbod Alijani, Pierpaolo Belardinelli, Murali Ghatkesar
Delft University of Technology, Department of Mechanical, Materials and Manufacturing Engineering, Delft, The Netherlands

14.10 **ID 154**
Numerical analysis of a non-linear energy sink (NES) for the parametric excitation of a submerged cylinder
Guilherme Rosa Franzini, Beatriz Sayuri Sato, Giovanna Ribeiro Campedelli
University of São Paulo, Department of Structural and Geotechnical Engineering, São Paulo, Brazil

14.30 **ID 172**
Non-linear dynamics for contactless characterization of graphene
Farbod Alijani[1], Dejan Davidovikj[2], Marco Amabili[3], Peter G. Steeneken[1]
[1]Delft University of Technology, Precision and Microsystem Engineering, Delft, The Netherlands
[2]Delft University of Technology, Nanostructure Physics, Delft, The Netherlands
[3]McGill University, Department of Mechanical Engineering, Montreal, Canada

14.50 **ID 207**
Sympodial fractal structures: tree-inspired concept for biomimetic engineering design
Ivana Kovacic[1], Dragi Radomirovic[2], Dusan Arsic[3], Miodrag Zukovic[1]
[1]University of Novi Sad, CEVAS, Novi Sad, Serbia
[2]University of Novi Sad, Faculty of Agriculture, Novi Sad, Serbia
[3]University of Novi Sad, Faculty of Technical Sciences, Novi Sad, Serbia

15.10 **ID 219**
Analysis of non-linear dynamic behaviours in asphalt concrete pavements under temperature variations
Amal Abdelaziz, Chun-Hsing Ho, Junyi Shan
Northern Arizona University, College of Engineering, Flagstaff, USA

Room 8 (KF82)

13.30 - 15.30 **MS 15 / II.**
Energy Transfer and Harvesting in Nonlinear Systems

Chair: Oleg Gendelman

Co-chair: Yuri Sudenkov

13.30 **ID 56**

Analytical solution for energy harvesting from nonlinear transverse vibration of an asymmetric bimorph piezoelectric plate

Hamed Shorakaei[1], Alireza Shooshtari[1], Giuseppe Rega[2]

[1]Bu-Ali Sina University, Department of Mechanical Engineering, Hamedan, Iran

[2]Sapienza University di Roma, Department of Structural and Geotechnical Engineering, Rome, Italy

13.50 **ID 74**

Energy exchange and localization in essentially nonlinear oscillatory systems: canonical formalism.

Oleg Gendelman[1], Themistoklis Sapsis[2]

[1]Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

[2]Massachusetts Institute of Technology, Department of Mechanical Engineering, Boston, USA

14.10 **ID 127** **CANCELLED**

Nonequilibrium response of solids to thermal and mechanical perturbances of submicro and nanosecond duration

Yuri Sudenkov[1], Vera Sventitskaya[2], Boris Zimin[3]

[1]St.Petersburg State University, Department of Mechanics, St.Petersburg, Russia

[2]BSTU "VOENMEH", Department of Mathematics, St.Petersburg, Russia

[3]Institute of Problems of Mechanical Engineering, Department of Mechanics, St.Petersburg, Russia

14.30 **ID 139**

Three-dimensional energy channeling in unit-cell model coupled to a spherical rotator

Jayaprakash K. R.[1], Yuli Starosvetsky[2]

[1]Indian Institute of Technology Gandhinagar, Mechanical Engineering, Gandhinagar, India

[2]Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

14.50 **ID 295**

Passive realization of a nonlinear piezoelectric tuned vibration absorber with a saturable inductor

Boris Lossouarn[1], Jean-François Deü[2], Gaetan Kerschen[1]

[1]University of Liege, Department of Aerospace and Mechanical Engineering, Liege, Belgium

[2]Conservatoire national des arts et métiers, Structural Mechanics and Coupled Systems Laboratory, Paris, France

15.10 **ID 224**

Numerical studies on piezoelectric energy harvesting from vortex-induced vibrations considering cross-wise and in-line oscillations

Lucas Oliveira Bunzel, Guilherme Rosa Franzini

University of São Paulo, Department of Structural and Geotechnical Engineering, São Paulo, Brazil

13.30 - 15.30 **MS 21 / II.**
Traffic and Vehicle Dynamics

Chair: Gábor Orosz
Co-chair: Bart Besselink

13.30 **ID 93**
Cooperative intersection automation using virtual platoons
Alejandro Ivan Morales Medina, Nathan Van de Wouw, Henk Nijmeijer
Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands

13.50 **ID 230**
String stability for cascaded systems subject to disturbances
Bart Besselink[1], Karl H. Johansson[2]
[1]University of Groningen, Johann Bernoulli Institute for Mathematics and Computer Science, Groningen, The Netherlands
[2]KTH Royal Institute of Technology, Department of Automatic Control, Stockholm, Sweden

14.10 **ID 247**
Nonlinear traffic modeling for urban road network and related robust state estimation
Tamás Tettamanti, Márton Tamás Horváth, István Varga
Budapest University of Technology and Economics, Department of Control for Transportation and Vehicle Systems, Budapest, Hungary

14.30 **ID 398**
Artificial potential functions for control of automated vehicles
Elham Semsar-kazerooni[1], Jeroen Ploeg[1], Koos Elferink[2], Henk Nijmeijer[2]
[1]TNO, Integrated vehicle safety, Helmond, The Netherlands
[2]Eindhoven University of Technology, Mechanical Engineering, Eindhoven, The Netherlands

14.50 **ID 504**
Nonholonomic lane change maneuvers for connected and autonomous vehicles
Gábor Orosz, Yiming Zhang, Wubing Qin, Chaozhe He, Avedisov Sergei
University of Michigan Ann Arbor, Department of Mechanical Engineering, Ann Arbor, USA

15.30 - 16.00 Coffee break

Room 1 (KF51)

16:00 - 18:00 Poster session

ID 11
Pulses and snakes in the Ginzburg–Landau equation
Stefan Mancas[1], Roy Choudhury[2]
[1]*Embry-Riddle Aeronautical University, Department of Mathematics, Daytona Beach, USA*
[2]*Univ. of Central Florida, Department of Mathematics, Orlando, USA*

ID 12
Competitive modes as reliable predictors of chaos versus hyperchaos and as geometric mappings accurately delimiting attractors
Marianna Pensky, Roy Choudhury
Univ. of Central Florida, Department of Mathematics, Orlando, USA

ID 21
Modified statistical linearization for analysing chaotic parametric space of weak-noise excited Duffing oscillator
Ren-Jung Chang, Jun-Fu Liu, Cheng-Tang Fan
National Cheng Kung University, Mechanical Engineering Department, Tainan, Taiwan

ID 23
Resonance phenomena in a two-layer shear flow interacting with two vortices in bottom layer
Eugene Ryzhov, Konstantin Koshel
Pacific Oceanological Institute of FEB RAS, Geophysical Hydrodynamics, Vladivostok, Russia

ID 27
Binary gas mixture in a high-speed channel
Sahadev Pradhan
Department of Chemical Engineering, Indian Institute of Science, Department of Chemical Engineering, Bangalore, India

ID 41
Non-linear dynamics of an Disc Brake System under Moving Loads
Qian Ding, Xin Sui
Tianjin University, Department of Mechanics, Tianjin, China

ID 43
Dynamic analysis of a flexible manipulator with embedded PZT actuators based on FE method
Shao Minqiang
Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering, Nanjing, China

ID 47
Using a robust torus to control chaos in low density beams
Meirielen De Sousa, Iberê Caldas
University of São Paulo, Institute of Physics, São Paulo, Brazil

ID 103
Application of the time-fractional diffusion equation to describing the methanol transport in the catalyst grain for methanol-to-olefin reaction
Alexey Zhokh, Peter Strizhak
National Academy of Sciences of Ukraine, Pisarzhevsky Institute of Physical Chemistry, Kiev, Ukraine

ID 130
Long-term stochastic stability of locally stable dynamical systems with respect to white noise
Oskar Sultanov
Institute of Mathematics, Ufa Scientific Center, Russian Academy of Sciences, Department of Differential Equations, Ufa, Russia

ID 155
Performance analysis of a CFRP reinforced concrete slab under a transient dynamic loading
Lihua Huang, Yuanyuan Dong
Dalian University of Technology, Faculty of Infrastructural Engineering, Dalian, China

ID 170
Nonlinear dynamics of a functionally graded nonlocal nanobeam in thermal environment by using incremental harmonic balance and Melnikov method
Danilo Karličić, Milan Cajić
Mathematical Institute of Serbian Academy of Sciences and Arts, Department of Mechanics, Belgrade, Serbia

ID 189 **CANCELLED**

Quantifying dynamics of force networks in dense particulate matter using topological measures

Lou Kondic[1], Lenka Kovalcinova[1], Miro Kramar[2], Konstantin Mischaikow[3]

[1]New Jersey Institute of Technology, Department of Mathematical Sciences, Newark, USA

[2]Tohoku University, Hiraoka Laboratory, Sendai, Japan

[3]Rutgers University, Department of Mathematics, Piscataway, USA

ID 214

Integral representation of fractional Euler-Lagrange equation with mixed boundary conditions

Mariusz Ciesielski[1], Tomasz Blaszczyk[2], Jaroslaw Siedlecki[2]

[1]Institute of Computer and Information Sciences, Czestochowa University of Technology, Czestochowa, Poland

[2]Institute of Mathematics, Czestochowa University of Technology, Czestochowa, Poland

ID 215

Imitation of synaptic coupling of electronic neurons by memristive device

Svetlana Gerasimova[1], Alexey Mikhaylov[2], Alexey Belov[2], Dmitry Korolev[2], Victor Kazantsev[1]

[1]Lobachevsky State University of Nizhni Novgorod, Institute of Biology and Biomedicine, Nizhni Novgorod, Russia

[2]Lobachevsky State University of Nizhni Novgorod, Research Institute of Physics and Technology, Nizhni Novgorod, Russia

ID 231

Nonlinear dynamical response of fluid conveyed thin-walled piezoelectric cylindrical shell

Alireza Shooshtari, Vahid Atabakhshian

Bu-Ali Sina University, Department of Mechanical Engineering, Hamedan, Iran

ID 251

Thermodynamical formalism of fractals via Fisher information: Rényi dimensions

Bence Godó

University of Debrecen, Faculty of Science and Technology, Debrecen, Hungary

ID 258

On the trajectory planning for the control of all state variables for torque-unit manipulator

Koji Yoshida

Okayama University of Science, Department of Mechanical Systems Engineering, Okayama, Japan

ID 263
Vibration power flow analysis of typical nonlinear oscillators
Jian Yang
University of Nottingham Ningbo China, Department of Mechanical, Materials and Manufacturing Engineering, Ningbo, China

ID 267
The driven Rayleigh-van der Pol oscillator
René Bartkowiak
University of Rostock, Applied Mechanics, Rostock, Germany

ID 278
Chattering motion of rigid objects
Tamás Baranyai, Péter L. Várkonyi
Budapest University of Technology and Economics, Department of Mechanics, Materials and Structures, Budapest, Hungary

ID 306 **CANCELLED**
Inclusion–exclusion principle and description of potential of rigid bodies with irregular mass distribution
Alexander Burov[1,3], Anna Guerman[2], Vasily Nikonov[3],
[1]National Research University "Higher School of Economics", Department of Mathematics, Moscow, Russia
[2]University of Beira Interior, Department of Electromechanical Engineering, Covilha, Portugal
[3]Dorodnicyn Computing Centre, Federal Research Center "Computer Science and Control" of Russian Academy of Sciences, Department of Mechanics, Moscow, Russia

ID 310
Dance-like motions in optimal walking
Ulrich Römer, Alexander Fidlin
Karlsruhe Institute of Technology, Institute of Engineering Mechanics, Karlsruhe, Germany

ID 317
Asymptotic study of the model of a rowing boat
Liubov Klimina[1], Marat Dosaev[1], Rinaldo Garziera[2], Shyh-Shin Hwang[3]
[1]Lomonosov Moscow State University, Institute of Mechanics, Moscow, Russia
[2]University of Parma, Department of Industrial Engineering, Parma, Italy
[3]Chien Hsin University of Science and Technology, Mechanical Engineering Department, Taoyuan City, Taiwan

ID 336
Electronic circuit emulation and numerical simulation of a fractional nonlinear macroeconomic dynamic model
Sergio Adriani David[1], Clovis Fischer[1], Clivaldo Oliveira[2]
[1]Universidade de São Paulo, Department of Biosystems Engineering (ZEB), Pirassununga, Brazil
[2]Federal University of Grande Dourados, Departamento de Engenharia Mecânica, Dourados, Brazil

ID 341
Power generation of a pendulum energy converter excited by random loads
Leo Dostal, Marc-André Pick
Hamburg University of Technology, Institute of Mechanics and Ocean Engineering, Hamburg, Germany

ID 347
Different models for balancing using accelerometer
András Balázs Kovács, Tamás Insperger
Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

ID 394
An approximation method for solving a class of time-delay systems with constant time-delay
Mengshi Jin, Hanwen Song, Jian Xu
Tongji University, School of Aerospace Engineering and Applied Mechanics, Shanghai, China

ID 409
Entrainment and bifurcation dynamics of a dry friction oscillator
Charles Jacob, Bipin Balaram, B. Santhosh
Amrita University, Department of Mechanical Engineering, Coimbatore, India

ID 427
Analysis of the forced vibration of geometrically nonlinear cantilever beam with lumping mass by multiple scale Lindstedt-Poincaré method
Hai-En Du, Guo-Kang Er, Vai Pan Iu
University of Macau, Department of Civil and Environmental Engineering, Macau SAR, China

ID 438
Bifurcations of periodic solutions for systems with discontinuities
Jacob Meijaard
Olton Engineering Consultancy, Enschede, The Netherlands

ID 445
Optimal state feedback design with LMI techniques for the torque control of a nonlinear hydrostatic transmission
Harald Aschemann, Robert Prabel
University of Rostock, Faculty of Mechanical Engineering, Rostock, Germany

ID 455
Dynamics of the basketball rolling along the rim
Vince Havas, Mate Antali, Gabor Stepan
Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

ID 474
Friction dependency of the controllability of rigid bodies in ideal fluids
Sergey M. Ramodanov[1], Alexey A. Kireenkov[2]
[1]Blagonravov Institute of Machines Science of the Russian Academy of Sciences, Department of Machine Mechanics, Moscow, Russia
[2]Ishlinsky Institute for Problems in Mechanics RAS - Moscow Institute of Physics and Technology (State University), Laboratory of Mechanics of Systems, Department of Higher Mathematics, Moscow - Dolgoprudny, Russia

ID 475
On the Kukles cubic system
Valery Gaiko
National Academy of Sciences of Belarus, United Institute of Informatics Problems, Minsk, Belarus

ID 494
Proper orthogonal decomposition of delay-differential equations
Balázs Heizer, Tamás Kalmár-Nagy
Budapest University of Technology and Economics, Department of Fluid Mechanics, Budapest, Hungary

ID 516
Non-smooth modelling of a periodic structure with contact-friction and aero-elastic couplings
Miroslav Byrtus[1], Michal Hajzman[1], Ladislav Pust[2]
[1]University of West Bohemia, Department of Mechanics, Plzen, Czech Republic
[2]Institute of Thermomechanics AS CR, v.v.i., -, Prague, Czech Republic

ID 519 **CANCELLED**
Generalized time history earthquake record for nonlinear dynamic analysis
Khaldoon Bani-Hani, Mu'ath Abu Qamar
Jordan University of Science and Technology, Civil, Structural and Environmental Engineering, Irbid, Jordan

ID 520
Structural and thermal analysis of 3D printing process
Ming-Hisao Lee[1], Shou-I Chen[2], Keng-Liang Ou[3]
[1]National Center for High-performance Computing, Hsinchu, Taiwan
[2]Instrument Technology Research Center, NARL, Hsinchu, Taiwan
[3]Taipei Medical University, School of Dentistry, College of Oral Medicine, Taipei, Taiwan

ID 525
Low-frequency response of controlled systems on a high-frequency parametric excitation
Eugen Kremer, Sawa Antipov
LuK GmbH & Co.KG, Finite Elements / Dynamics Team, Buehl/Baden, Germany

ID 527
A dynamical model for SIS epidemic propagation on adaptive networks
Ágnes Bodó, Péter L. Simon
Eötvös Loránd University Budapest, Department of Applied Analysis and Computational Mathematics, Budapest, Hungary

19.00 - 24.00 **Farewell Dinner**

Friday, 30 June 2017

Room 3 (K155)

08.30 - 10.30 **MS 12 / IV.**
Micro- and Nano-Electro-Mechanical Systems

Chair: Anil Bajaj

Co-chair: Ashok Kumar Pandey

08.30 **ID 320** **CANCELLED**
1:1 Internal resonance of two transverse modes of a microbeam using approximate mode shape
Ashok Kumar Pandey[1], Prashant N. Kambali[2], Gynadutta Swain[3]
[1]Indian institute of Technology Hyderabad, Mechanical and Aerospace Engineering, Hyderabad, India
[2]Technion – Israel Institute of Technology, Department of Mechanical Engineering, Haifa, Israel
[3]Mercedes Benz, Bangalore, India

08.50 **ID 329**
A multiple scales analysis of very large-scale arrays of globally coupled MEMS resonators
Chaitanya Borra[1], Conor S. Pyles[2], D. Dane Quinn[1], Jeffrey F. Rhoads[2]
[1]The University of Akron, Department of Mechanical Engineering, Akron, USA
[2]Purdue University, School of Mechanical Engineering, West Lafayette, USA

09.10 **ID 378**
Demonstration of electrostatic MEMS bifurcation sensors
Majed Alghamdi[1], Mahmoud Khater[2], Stewart Katherine[3], Ayman Alneamy[1], Ridha Almikhlafi[1], Sangtak Park[1], Eihab Abdel-Rahman[1], Alexander Penlidis[3]
[1]University of Waterloo, Systems Design Engineering, Waterloo, Canada
[2]KFUPM, Mechanical Department, Dahran, Saudi Arabia
[3]University of Waterloo, Chemical Engineering, Waterloo, Canada

09.30 **ID 435**
Direct and parametric entrainment of a graphene oscillator
Samer Houri, Santiago Cartamil-Bueno, Menno Poot, Peter Steeneken, Herre Van Der Zant, Warner Venstra
Delft University of Technology, Kavli Institute of Nanoscience, Delft, The Netherlands

Room 4 (KF51)

08.30 - 10.30 **MS 05 / III.**
Slow-Fast Systems and Phenomena

Chair: Jon Juel Thomsen
Co-chair: D. Dane Quinn

08.30 **ID 324**
Twin canards and MMOs in a chemical reaction model
Cris Hasan, Bernd Krauskopf, Hinke Osinga
University of Auckland, Department of Mathematics, Auckland, New Zealand

08.50 **ID 349**
Exact model reduction for a von Kármán beam
Shobhit Jain, George Haller, Paolo Tiso
ETH Zürich, Institute for Mechanical Systems, Zürich, Switzerland

09.10 **ID 421**
Motion control of a flexible underactuated manipulator by using high-frequency excitation
Satoshi Kobayashi, Hiroshi Yabuno
University of Tsukuba, Graduate School of System and Information Engineering, Tsukuba, Japan

09.30 **ID 468** **CANCELLED**
Faraday waves from acoustic - gravity wave theory
Usama Kadri
Cardiff University, School of Mathematics, Cardiff, United Kingdom

09.50 **ID 528**
The existence of extremal solutions for a coupled system of nonlinear fractional integro-differential equations
Neda Khodabakhshi
Amirkabir University of Technology, Department of Mathematics and Computer Science, Tehran, Iran

08.30 - 10.30 **MS 17 / III.**
Time-periodic systems

Chair: Tamas Kalmar-Nagy
Co-chair: Thomas Pumhössel

08.30 **ID 145**
Optimal timing control using the augmented phase reduction
Bharat Monga, Jeff Moehlis
University of California, Santa Barbara, Department of Mechanical Engineering, Santa Barbara, California, USA

08.50 **ID 488**
Stability and vibration amplitude of the quasi periodic delayed Mathieu equation with frequency-modulated coefficients
Daniel Bachrathy
Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

09.10 **ID 212**
Interaction of period-1 orbits in a dual-frequency driven asymmetric nonlinear oscillator
Ferenc Hegedűs[1], Werner Lauterborn[2], Ulrich Parlitz[3], Robert Mettin[2]
[1]Budapest University of Technology and Economics, Department of Hydrodynamic Systems, Budapest, Hungary
[2]Georg-August-Universität Göttingen, Third Institute of Physics, Göttingen, Germany
[3]Max Planck Institute for Dynamics and Self-Organization, Biomedical Physics Group, Göttingen, Germany

09.30 **ID 225**
A discrete predator-prey conflict model with defense term
Markus Messer[1], Joachim Messer[2]
[1]Technische Hochschule Mittelhessen, Department of Mechanical Engineering, Friedberg, Germany
[2]Justus-Liebig-Universität, Institut für Theoretische Physik, Gießen, Germany

09.50 **ID 487**
Linear flows in the rapid distortion limit: dynamical systems analysis of the Kelvin-Townsend equations
Tamas Kalmar-Nagy[1], Sharath Girimaji[2]
[1]Budapest University of Technology and Economics, Department of Fluid Mechanics, Budapest, Hungary
[2]Texas A&M University, Aerospace Engineering, College Station, USA

08.30 - 10.30 **MS 14 / IV.**
Nonlinear Dynamics for Engineering Design

Chair: Marco Amabili
Co-chair: Olivier Thomas

08.30 **ID 176**
Vibrations of rotating composite blades with embedded nonlinear piezoelectric elements
Jerzy Warminski, Jaroslaw Latalski
Lublin University of Technology, Department of Applied Mechanics, Lublin, Poland

08.50 **ID 44**
A generalised nonlinear isolator-elastic beam interaction analysis for extremely low or high supporting frequency
Jing Tang Xing[1], Yeping Xiong[1], Kamal Djidjeli[2], Khairiah Kamilah Turahim[1]
[1]University of Southampton, Faculty of Engineering and Environment, Southampton, United Kingdom
[2]Yaroslavl State University, Faculty of Engineering and Environment, Southampton, United Kingdom

09.10 **ID 277**
Maximum vibration amplitude during run-up of a Jeffcott rotor at parametric anti-resonance
Fadi Dohnal
UMIT, Department of Biomedical Informatics and Mechatronics, Lienz, Austria

09.30 **ID 346**
Direct antiresonance continuation for non linear dynamic absorbers
Olivier Thomas[1], Alexandre Renault[1], Hervé Mahé[2]
[1]Arts et Metiers ParisTech, LSIS UMR CNRS 7296, Lille, France
[2]Valeo Transmission, Amiens, France

09.50 **ID 425**
Optimization of planetary gear systems
Marco Barbieri, Asma Masoumi, Francesco Pellicano
University of Modena and Reggio Emilia, Dipartimento di Ingegneria Enzo Ferrari, Modena, Italy

08.30 - 10.30 **MS 15 / III.**
Energy Transfer and Harvesting in Nonlinear Systems

Chair: Dane Sequeira
Co-chair: Krzysztof Kecik

08.30 **ID 512**
Parametric resonance of a nonlinear energy harvester for torsional vibrations
Panagiotis Alevras[1], Stephanos Theodossiades[1], Homer Rahnejat[1], Tim Saunders[2]
[1]Loughborough University, Wolfson School of Mechanical and Manufacturing Engineering, Loughborough, United Kingdom
[2]Ford Engineering Research Centre, Dunton, United Kingdom

08.50 **ID 211**
Energy recovery from a pendulum vibration absorber with a maglev harvester
Krzysztof Kecik[1], Piotr Brzeski[2], Andrzej Mitura[1], Przemyslaw Perlikowski[2]
[1]Lublin University of Technology, Department of Applied Mechanics, Lublin, Poland
[2]Lodz University of Technology, Division of Dynamics, Lodz, Poland

09.10 **ID 297**
Nonlinear vibration energy harvesting using piezoelectric tiles placed in stairways
Connor Edlund[1], Subramanian Ramakrishnan[2]
[1]University of Minnesota, Department of Electrical Engineering, Duluth, USA
[2]University of Minnesota, Department of Mechanical and Industrial Engineering, Duluth, USA

09.30 **ID 461**
Experimental study of noise reduction using an hybrid electro-acoustic NES
Pierre-Yvon Bryk, Sergio Bellizzi, Renaud Côte
Aix-Marseille University, CNRS, Centrale Marseille, LMA, Marseille, France

09.50 **ID 492**
Energy harvesting from vortex induced vibration using period-1 rotation of parametric pendulum
Santanu Das, Pankaj Wahi
Indian Institute of Technology Kanpur, Department of Mechanical Engineering, Kanpur, India

10.10 **ID 28**
Inverse scattering problems for the perturbed biharmonic operator
Valery Serov
University of Oulu, Finland, Department of Mathematics, Oulu, Finland

10.30 - 11.00 **Coffee break**

Room 1 (KF51)

11.00 - 12.00 **Keynote lecture**

Exact model reduction for nonlinear oscillations: from equations to data sets
George Haller
Chair in Nonlinear Dynamics, Institute for Mechanical Systems, ETH Zürich

12.00 - 13.00 **Closing Ceremony**

Announcement of ENOC 2017 Young Scientist's Prize and Best Poster Award

COMMITTEE MEETINGS

Sunday, 25 June 2017

Room K195

17.00 **Meeting of the European Nonlinear Oscillations Conference Committee (ENOCC)**

Thursday, 29 June 2017

Room K195

17.00 **Meeting of the European Nonlinear Oscillations Conference Committee (ENOCC)**

Tuesday, 27 June 2017

Editorial meeting of the International Journal of Dynamics and Control

Exact time and venue: TBA

AUTHOR INDEX

USEFUL INFORMATION

Climate
The climate of Budapest is continental, at the end of June we expect very hot summer weather with a maximum daily temperature of 28-35 °C. Protect yourself from sunshine and make sure to hydrate regularly.

Time Zone
Central European Summer Time (CEST): UTC+02:00

Insurance
The registration fee does not include provision for the insurance of participants against personal accidents, illness, cancellation, theft, property loss or damage. Participants are advised to take adequate personal travel insurance.

Local currency
The Forint (HUF) is the official national currency in Hungary. The exchange rates may vary in different banks, exchange offices and hotels, the exchange rate is around 1 Euro = 310 HUF. All the major credit cards are accepted in Hungary.

Electricity
The AC electrical network in Hungary operates at 230V, 50 Hz.

Recommended Taxi Company
To reach the hotels or the conference venue and to avoid any inconvenience, organisers recommend to use the City Taxi taxi company: +36 1 211 1111, www.citytaxi.hu. Please note, that all licensed taxi companies have yellow cars and have the same rates, placed clearly visible on the screens.

Parking
If you drive a personal or rented car, always try to park at a guarded parking lot and do not leave any valuables in the car. Please note, that Budapest is divided into parking zones, with one parking meter in each street. The maximum parking time duration is 2 hours, tariffs may vary.

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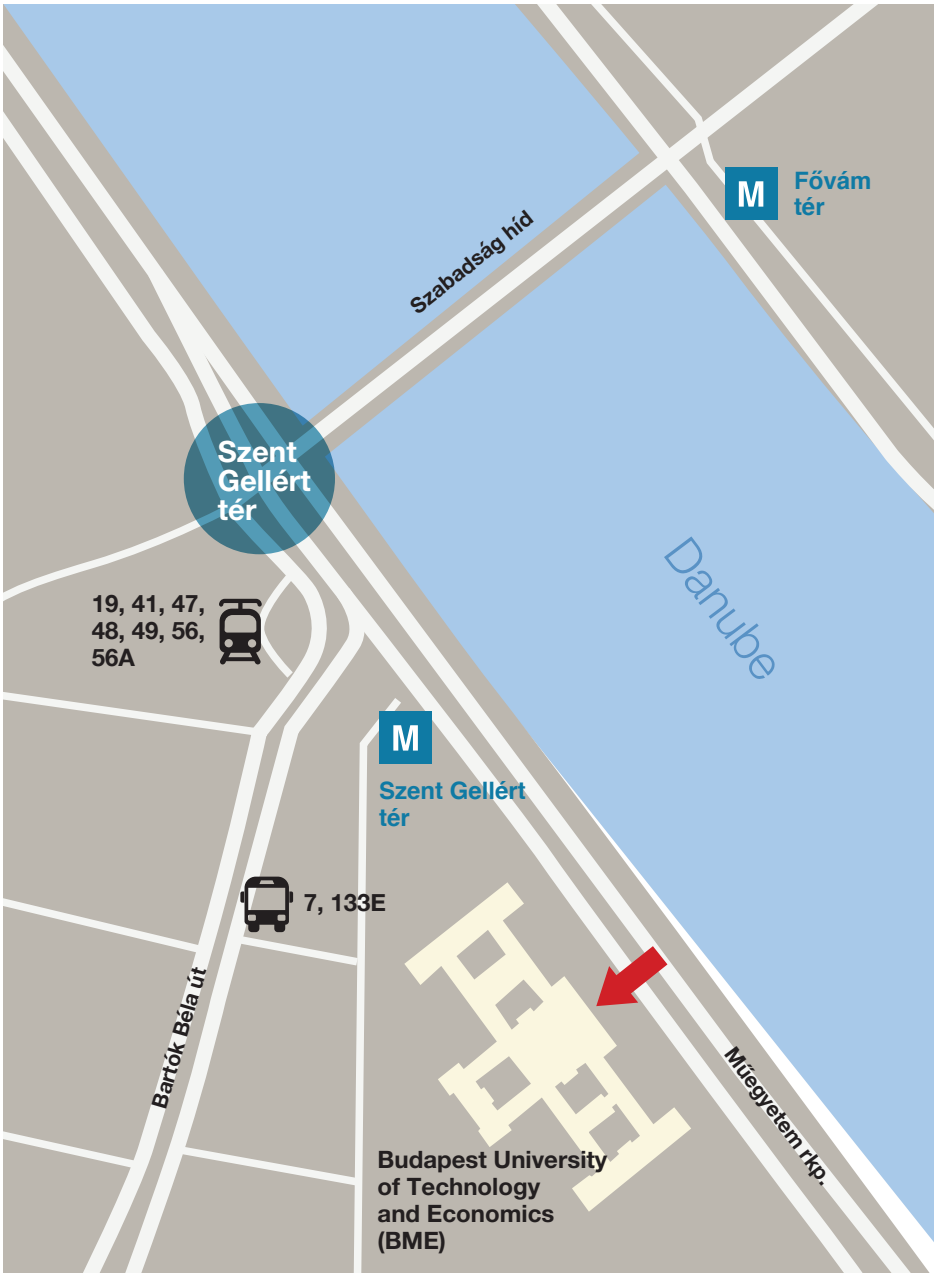
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Bartók Béla út
Műegyetem rkp.
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