NODYCON 2023
PROGRAM

Third International Nonlinear Dynamics Conference

June 18-22, 2023

Edited by
The NODYCON 2023 Program Committee
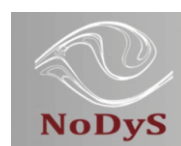Sapienza University of Rome

NODYCON 2023

Third International Nonlinear Dynamics Conference

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FOREWORD

Welcome to the Third International Nonlinear Dynamics Conference (NODYCON 2023)! NODYCON was first launched in 2019 as a way to continue the legacy of the renowned conference series initiated by Prof. Ali H. Nayfeh in 1986 at Virginia Tech, known as the Nonlinear Vibrations, Stability and Dynamics of Structures Conference. After Prof. Nayfeh's passing in 2017, who was also the founder of the esteemed Springer journal Nonlinear Dynamics in 1990, it was decided that a dedicated conference was needed to bring together the nonlinear dynamics community.

The inaugural NODYCON in 2019 served as a tribute to Prof. Nayfeh, recognizing his influential and inspiring scientific leadership in the field of nonlinear dynamics. Additionally, thanks to the generous support of Springer, the ALI H. NAYFEH Prizes were established in 2019 to recognize the best papers presented by graduate students and postdocs at the conference.

NODYCON 2023 holds significance for two reasons. Firstly, it marks the first hybrid post-pandemic conference of the NODYCON series. In 2021, due to the prevailing circumstances, NODYCON 2021, originally planned to be held in Rome, was transformed into a virtual online conference. Secondly, NODYCON 2023 will introduce the inaugural edition of the Ali Nayfeh Senior Award and the Early Career Award, which are supported by the NODYS Society.

In line with evolving paradigms, the call for papers for NODYCON 2023 attracted contributions that spanned traditional streams of nonlinear dynamics research while also highlighting the latest multi-disciplinary trends and developments in the field.

NODYCON 2023 received a remarkable response with 581 one-page abstracts submitted. Following rigorous reviews by external reviewers, the Program Committee, the Steering Committee, and the Advisory Committees, 486 abstracts were accepted for oral presentations while 28 abstracts were selected for presentation during the poster session. The diverse range of topics covered by these papers includes multi-scale dynamics, experimental dynamics, dynamics of structures, dynamics of adaptive and multifunctional metamaterial structures, reduced-order modeling, nonsmooth dynamics, nonlinear interactions, computational techniques, nonlinear system identification, dynamics of NEMS/MEMS/nanomaterials, multibody dynamics, fluid/structure interaction, the influence of nonlinearities on vibration control systems, nonlinear waves, ecosystem dynamics, social media dynamics, complexity in engineering, and network dynamics. These papers are organized into four major themes, which are also reflected in the technical sessions layout design:

A - Concepts and methods in nonlinear dynamics

B - Nonlinear dynamics of mechanical and structural systems

C - Nonlinear dynamics and control

D - Recent trends in nonlinear dynamics

We are pleased to announce that over 200 full papers have been submitted to Advances in Nonlinear Dynamics - Proceedings of the Third International Nonlinear Dynamics Conference (NODYCON

2023). The success of NODYCON 2023 hinges on the energy and enthusiasm of the researchers in the field of nonlinear dynamics who have contributed high-quality papers on a wide array of topics. We would like to extend our special appreciation to the committee members of the Organizing, Steering, and International Advisory committees, whose names are listed below, as well as the external reviewers who have dedicated their valuable time and efforts to assess numerous papers.

We gratefully acknowledge the auspices of the City of Rome and its Mayor, the Italian Ministry of Culture, AIMETA (Italian Society of Theoretical and Applied Mechanics), NODYS (International Nonlinear Dynamics Society), and the sponsorship of Springer Science & Business Media, MTS, Thales Alenia Space, Avio, and Polytec.

We hope that you will have an unforgettable conference experience at NODYCON 2023!

Walter Lacarbonara
NODYCON 2023 Chair
June 2023

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- GOLD –

MTS Systems is a global supplier of test systems and industrial position sensors. The company provides test and measurement solutions to determine the performance and reliability of vehicles, aircraft, civil structures, biomedical materials and devices and raw materials. Examples of MTS products include: aerodynamics simulators, seismic simulators, load frames, hydraulic actuators and sensors. The company operates in two divisions: Test and Sensors. MTS test systems are designed to simulate the forces and motions that materials, products, and structures are expected to encounter. MTS Sensors are used by manufacturers of plastic injection molding machines, steel mills, fluid power, oil, and gas, medical, wood product processing equipment, mobile equipment and alternative energy. Sensors division products are also used to measure fluid displacement, such as liquid levels for customers in the process industries. With the acquisition of PCB Piezotronics Inc. in 2016, MTS has increased Sensor products - microphones, vibration, pressure, force, torque, load, and strain sensors - and presence.

- GOLD –

Avio is a leading international group engaged in the construction and development of space launchers and solid and liquid propulsion systems for space travel. The experience and know-how built up over more than 50 years puts Avio at the cutting-edge of the space launcher sector, solid, liquid and cryogenic propulsion and tactical propulsion. Avio operates in Italy, France, and French Guyana with 5 facilities, employing approx. 1,200 highly qualified personnel, of which approx. 30% involved in research and development. Avio is a prime contractor for the Vega program and a sub-contractor for the Ariane program, both financed by the European Space Agency ("ESA"), placing Italy among the limited number of countries capable of producing a complete spacecraft.

- SILVER -

SPACE FOR LIFE, THALES ALENIA SPACE'S ASPIRATION!

A Joint Venture between Thales (67%) and Leonardo (33%), Thales Alenia Space is a global space manufacturer delivering, for more than 40 years, high-tech solutions for telecommunications, navigation, Earth Observation, environmental management, exploration, science, and orbital infrastructures. Thanks to our diversity of skills, talents and cultures, our customers (governments, institutions, space agencies, telecommunications operators), therefore have Space to Connect, Secure & Defend, Observe & Protect, Explore, Travel & Navigate. We also team up with Telespazio to form the Space Alliance, which offers a complete range of solutions including services. We are willing to have a win-win approach shared both with our partners and customers. The company recorded consolidated revenues of 2.2 billion euros in 2022 and has 8,500 employees. We operate in ten countries, with 17 facilities in Europe and an industrial plant in the United States. In Space, governments, institutions, and companies rely on Thales Alenia Space to design, operate and deliver satellite-based systems that help them position and connect anyone or anything, everywhere, help observe our planet, help optimize the use of our planet's – and our solar system's – resources.

- SILVER -

With over 400 employees worldwide, Polytec develops, produces, and distributes optical measurement systems for research and industry. The focus is on the technology areas of vibrometry, velocimetry, surface metrology, process analytics, machine vision and other optical technologies. Whether it's in space travel, architecture, medicine, nanotechnology, or mechanical engineering – Polytec expertise is always in demand across all industries. Laser vibrometry has proven its worth as an ideal tool for materials investigations – both for the measurement of structural dynamics and for the non-destructive detection and prevention of signs of fatigue. There is a wealth of applications in functional and long-term structural monitoring and in geological issues. Polytec manufactures a wide range of laser vibrometers that are the acknowledged gold-standard for non-contact vibration measurement. Laser Doppler vibrometers analyze samples of different size, from entire car bodies, large bridge parts over engines and actuators to micron-sized MEMS or delicate HDD components. Measuring the transfer functions, amplitudes and resonance frequencies in a non-intrusive way with the simple "point and shoot" method is the Single Point Vibrometer's specialty. With the laser-based MPV-800 Multipoint Vibrometer, it is possible to carry out time-synchronous measurements with up to 48 channels and represent both frequency-dependent and time-dependent deflection shapes. The fiber-optic sensor heads are freely configurable and allow to perform flexible measurements – both parallel to a surface or arranged individually around the sample.

UNDER THE AUSPICES OF

ROMA

Rome is the capital city of Italy. With 2,860,009 residents in 1,285 km² (496.1 sq mi), Rome is the country's most populated city and the third most populous city in the European Union by population within city limits. The Metropolitan City of Rome, with a population of 4,355,725 residents, is the most populous metropolitan city in Italy. Rome is located in the central-western portion of the Italian Peninsula, within Lazio (Latium), along the shores of the Tiber. Vatican City (the smallest country in the world) is an independent country inside the city boundaries of Rome, the only existing example of a country within a city. Rome is often referred to as the City of Seven Hills due to its geographic location, and also as the "Eternal City". Rome is generally considered to be the "cradle of Western civilization and Christian culture", and the centre of the Catholic Church. Across a span of 28 centuries, Roman history has been influential on the modern world, especially in the history of the Catholic Church, and Roman law has influenced many modern law systems [from Wikipedia].

SAPIENZA
UNIVERSITÀ DI ROMA

The Sapienza University of Rome (Italian: Sapienza – Università di Roma), also called simply Sapienza or the University of Rome, and formally the Università degli Studi di Roma "La Sapienza", is a public research university located in Rome, Italy. It is one of the largest European universities by enrollments and one of the oldest in history, founded in 1303. The university is one of the most prestigious Italian universities, commonly ranking first in national rankings and in Southern Europe. In 2018, 2019, 2021 and 2022 it ranked first in the world for classics and ancient history. Since the 2011 reform, Sapienza University of Rome has eleven faculties and 65 departments. Today, Sapienza with 140,000 students and 8,000 among academic and technical and administrative staff, is the largest university in Italy. The university has significant research programmes in the fields of engineering, natural sciences, biomedical sciences, and humanities. It offers 10 Masters Programmes taught entirely in English.

The Department of Structural and Geotechnical Engineering (DISG) has an illustrious history and a tradition of excellence in research, teaching, and activities towards the outside world, dating back to 1873. In scientific research there are three main areas: Mechanics of Solids and Structures, Structural Engineering and Geotechnical Engineering.

The Department's academic and research activities have achieved an international reputation for excellence in the areas of structural dynamics, seismic engineering, risk analysis, large-scale monitoring, the behaviour of complex structural and geotechnical systems, the design of structures, intelligent structures, the structural rehabilitation of historic and monumental buildings.

AIMETA (Italian Association of Theoretical and Applied Mechanics) brings together enthusiasts of mechanics in its various branches: theoretical, experimental, technical and applicative. Naturally everyone has a mentality suited to the direction in which his research and his teaching and professional activity are carried out, but for all the interest focuses on Mechanics, a very broad, multifaceted science in continuous development, "paradise of mathematical sciences", as said Leonardo, but also the foundation of all physical science.
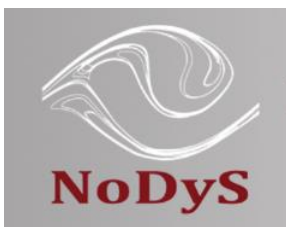
NODYS (International Society of Nonlinear Dynamics) is a society established in 2018 to enable knowledge sharing and dissemination, international collaboration, and skills development in the field of nonlinear dynamics.

The Ministry of Culture (MIC) is a department of the Italian government. It is responsible for the protection of culture and entertainment and the preservation of artistic, cultural and landscape heritage. Founded in 1974 as the Ministry for Cultural and Environmental Heritage, over the years it has taken on different denominations.

NODYCON 2023 Awards

NODYCON 2023 will feature three types of awards.

- The Ali H. Nayfeh Prizes (1st, 2nd, and 3rd Prize), in honor of Nonlinear Dynamics's founding editor, the late Professor Ali H. Nayfeh, supported by Springer for the best papers presented by graduate students and postdocs at NODYCON 2023.
- The Ali Nayfeh Senior Award supported by the NODYS Society
- The Early Career Award supported by the NODYS Society.

The Award ceremony will be held during the Conference Banquet, June 21, 2023. The Ali H. Nayfeh prize for the first place is €500, for the second place €400, and for the third place €300.

The Awards committee for NODYCON 2023 includes:

- Prof. Matthew Cartmell, University of Strathclyde, UK
- Prof. Angelo Luongo, University of L'Aquila, Italy
- Prof. C. Nat Nataraj, Villanova University, USA.
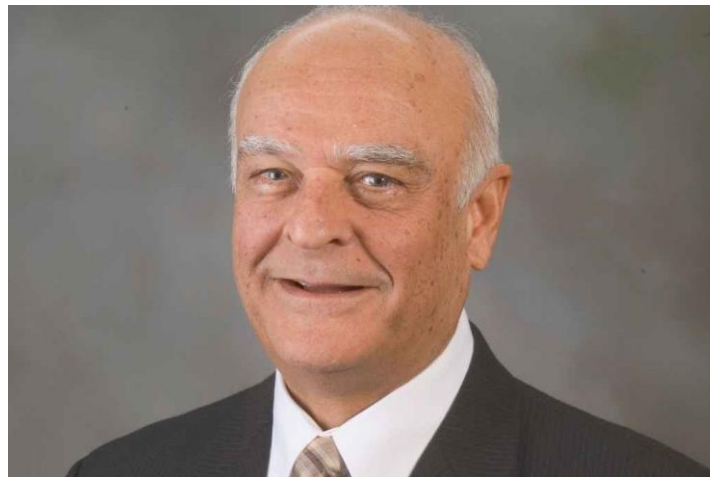
Ali H. Nayfeh, Professor Emeritus of Nonlinear Dynamics
21 December 1933 – 27 March 2017

ALI H. NAYFEH PRIZES

The evaluation grid is based on the quality of the written paper using the criteria of novelty, achievement, and potential impact. The papers were submitted to the NODYCON 2023 Special Issue of Nonlinear Dynamics or to the NODYCON 2023 Springer Proceedings. The Ali H. Nayfeh Prizes selected for the 2023 edition are shown below.

First Prize: Dr. Rohit Chawla for the paper 'Higher order transverse discontinuity mapping for hybrid dynamical systems', co-authored with Aasifa Rounak and Vikram Pakrashi, University College Dublin, Ireland

Second Prize: Dr. Ahmed Barakat for the paper 'Non-trivial solutions and their stability in a two-degree-of-freedom Mathieu-Duffing system', co-authored with Eva Weig and Peter Hagedorn, Technical University of Munich, Germany;

Third Prize: Dr. Andrei Faragau for the paper 'The interplay between the electro-magnetic and wave-induced instability mechanisms in the Hyperloop transportation system', co-authored with Rui Wang, Andrei Metrikine, and Karel N. van Dalen, TU Delft, Netherlands.

ALI H. NAYFEH SENIOR AWARD & NODYS EARLY CAREER AWARD

The Nonlinear Dynamics Society (NODYS) solicited nominations for the inaugural Ali H. Nayfeh Senior Award and the Early Career Award.

The Senior Ali H. Nayfeh Award was established to recognize exceptional impact of research contributions and education of researchers and/or practitioners, and general leadership in advancing the field. The Senior Award is not an end-of-career award as it also aims to recognize mid-career individuals with a remarkable record of contributions. The inaugural 2023 edition attracted outstanding nominations which made the work of the Award Committee quite challenging.

Prof. Steven Shaw, Florida Institute of Technology, USA

2023 SENIOR ALI H. NAYFEH AWARD

The NODYS Early Career Award is presented to an early-career recipient who demonstrates research excellence in the field of nonlinear dynamics. At the time of awarding, candidates must be under the age of 40 years, and be within 10 years of their terminal degree. The inaugural 2023 edition received strong nominations.

Dr. Pierpaolo Belardinelli, Polytechnic University of Marche, Italy

2023 NODYS EARLY CAREER AWARD

MONDAY JUNE 19, 2023
OPENING CEREMONY AND KEYNOTES

MONDAY – June 19, 2023

8:30 am - 8:55 am CET (Central European Time)	**OPENING CEREMONY**
8:55 am - 9:15 am CET	**LECTURE ON MICHELANGELO'S MOSE** PROF. IRENE BALDRIGA, SAPIENZA UNIVERSITY
9:15 am - 9:35 am CET	MUSIC INTERLUDE
9:35 am - 10:10 am CET	**KEYNOTE 1:** CHAOS IMPLIES EFFECTIVE CONTROLLABILITY OF EXTREME WEATHER TAKEMASA MIYOSHI RIKEN CENTER FOR COMPUTATIONAL SCIENCE, KOBE, JAPAN CHAIR: G. REGA
10:10 am - 10:45 am CET	**KEYNOTE 2:** THE DEVELOPMENT OF NONLINEAR NORMAL MODES USING INVARIANT MANIFOLDS - A HISTORY STEVEN W. SHAW DEPARTMENT OF MECHANICAL AND CIVIL ENGINEERING FLORIDA INSTITUTE OF TECHNOLOGY, MELBOURNE, FL 32901 USA. CHAIR: F. VESTRONI
10:45 am - 11:10 am CET	COFFEE BREAK

|	
11:15 am - 11:50 am CET	**KEYNOTE 3:** NONLINEAR DYNAMICS: FROM THEORETICAL TOOLS TO APPLICATIONS
	C.H. LAMARQUE
	DEPARTMENT OF MECHANICAL AND CIVIL ENGINEERING UNIV. LYON, ENTPE, LTDS UMR 5513 CNRS, FRANCE.
	CHAIR: M. HAJJ
11:50 am - 12:25 pm CET	**KEYNOTE 4:** DESIGN OF SELF-EXCITED OSCILLATOR NETWORKS AS NONLINEAR DYNAMIC SENSORS
	HARRY DANKOWICZ
	THE GRAINGER COLLEGE OF ENGINEERING, UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN.
	CHAIR: G. STEPAN
12:25 pm – 1:00 pm CET	**KEYNOTE 5:** SYNCHRONIZED WAVE MOTION BETWEEN A FLOWING FLUID AND A PHONONIC SUBSURFACE
	MAHMOUD I. HUSSEIN
	SMEAD DEPARTMENT OF AEROSPACE ENGINEERING SCIENCES DEPARTMENT OF PHYSICS (COURTESY) UNIVERSITY OF COLORADO BOULDER.
	CHAIR: C. NATARAJ

KEYNOTES

CHAOS IMPLIES EFFECTIVE CONTROLLABILITY OF EXTREME WEATHER

Takemasa Miyoshi

RIKEN Center for Computational Science, Kobe, Japan

The Observing Systems Simulation Experiment (OSSE) is a very powerful approach to evaluate observing systems and data assimilation methods in numerical weather prediction (NWP). In the OSSE, we generate a nature run (NR) using a model and simulate observations by sampling the NR. An independent model run with data assimilation of the simulated observations mimics an NWP system, and we compare it with the NR to evaluate the observations and data assimilation method.
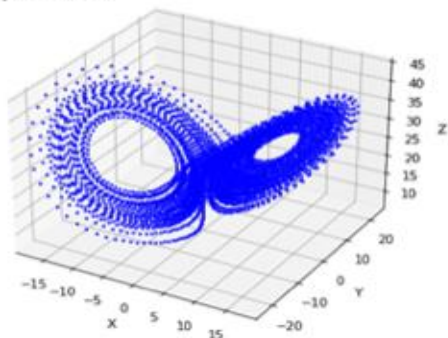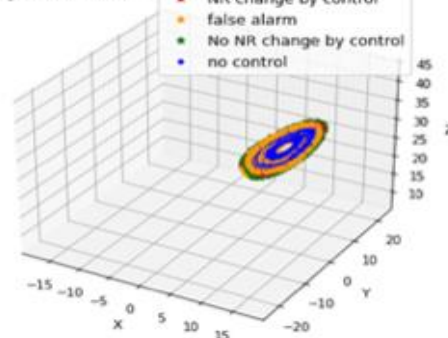
In this study, we extend the OSSE and design the Control Simulation Experiment (CSE), in which we add perturbations to the NR and try to modify it to a desired state. Investigating what perturbations are effective to avoid a high-impact weather event would be useful to understand the controllability of such an event. Since the weather system is chaotic, and even more so for disturbances, small differences generally lead to big differences, particularly for high-impact weather events. This suggests potentially effective control, i.e., small interventions would lead to big differences for high-impact weather events. Chaos control has been studied extensively in the field of dynamical systems theory, but taking advantage of dynamical instability to avoid certain trajectories has not been a main focus to the best of the authors' knowledge. We first tested this idea with the Lorenz-63 3-variable model and performed an OSSE with an ensemble Kalman filter (EnKF). We extended the OSSE by adding very small perturbations (only 3% of the observation error) to the NR and found an effective approach to control the trajectory to stay in one side of the Lorenz butterfly attractor without shifting to the other. Following the implications and understandings from the Lorenz-63 model experiments, we tested with the Lorenz-96 40-variable model to avoid the occurrences of extreme values, mimicking to avoid extreme events in NWP. Finally, we further extended the idea to test with realistic global and regional NWP models for a typhoon case and a local heavy rainfall case, respectively. This presentation will summarize the concept and methodology of CSE with some proof-of-concept demonstrations with the toy models

and realistic NWP models. This is an attempt to a potential paradigm change of NWP research from decades of predictability to the new era of controllability.

TAKEMASA MIYOSHI

Dr. Takemasa Miyoshi received his B.S. (2000) in theoretical physics on nonlinear dynamics from Kyoto University, and M.S. (2004) and Ph.D. (2005) in meteorology on ensemble data assimilation from the University of Maryland (UMD). Dr. Takemasa Miyoshi started his professional career as a civil servant at the Japan Meteorological Agency (JMA) in 2000. He was a tenure-track Assistant Professor at UMD in 2011. Since 2012 Dr. Miyoshi has been leading the Data Assimilation Research Team in RIKEN Center for Computational Science (R-CCS) and became Chief Scientist of RIKEN Cluster for Pioneering Research (CPR) and Deputy Director of RIKEN interdisciplinary Theoretical and Mathematical Sciences Program (iTHEMS) in 2018. Dr. Miyoshi's scientific achievements include more than 140 peer-reviewed publications and more than 180 invited conference presentations including the Core Science Keynote at the American Meteorological Society Annual Meeting (2015). Dr. Miyoshi has been recognized by several prestigious awards such as the Japan Geosciences Union Nishida Prize (2015), the Meteorological Society of Japan Award (2016), the Yomiuri Gold Medal Prize (2018), the Commendation by the Prime Minister for Disaster Prevention (2020), and the Award for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology (2022).

THE DEVELOPMENT OF NONLINEAR NORMAL MODES USING INVARIANT MANIFOLDS - A HISTORY

Steven W. Shaw

Department of Mechanical and Civil Engineering
Florida Institute of Technology, Melbourne, FL 32901 USA

Periodic oscillations of multi-degree-of-freedom conservative systems were known to the earliest investigators of dynamics. It is now widely recognized that such motions are quite special. The Lyapunov subcenter theorem describes local invariant manifolds that contain families of such motions under certain non-resonance conditions. In seminal work in the 1960's, Rosenberg developed methods for describing and constructing these motions for conservative systems and labeled them as nonlinear normal modes (NNMs).
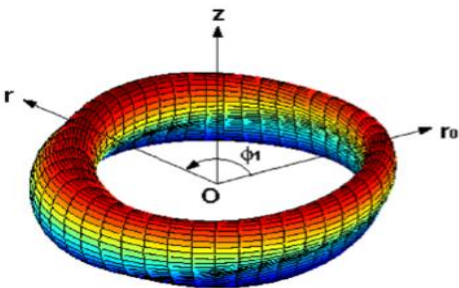
Work on conservative systems was continued by Rand, Vakakis, Pak, and others through the 70's and 80's, including results on stability and bifurcations. In the early 90's the NNM concept was generalized by the presenter and Pierre to include non-conservative systems by employing invariant manifold theory. This approach spawned subsequent efforts on computational methods for generating reduced-order models using NNMs and experimental methods for capturing them, and also raised a fundamental question about the uniqueness of the underlying invariant manifolds, which has only recently been resolved. This talk will provide a survey of these developments, with a focus on my involvement with the subject.

STEVEN W. SHAW

Steve Shaw received his Ph.D. in Theoretical and Applied Mechanics from Cornell University in 1983. He currently is Professor of Mechanical Engineering at Florida Institute of Technology and University Distinguished Professor Emeritus of Mechanical Engineering and Adjunct Professor of Physics at Michigan State University. He has also held visiting appointments at Caltech, the University of Michigan, the University of California-Santa Barbara, and McGill University. His honors include the ASME Henry Hess Award, the SAE Arch T. Colwell Merit Award, the ASME N. O. Myklestad Award, the ASME T. K. Caughey Dynamics Medal, and election to the rank o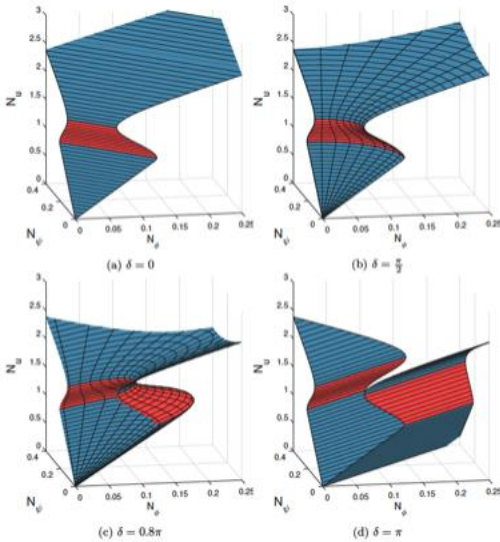f Fellow of the ASME. His research has focused on nonlinear dynamics and vibrations with applications to piecewise smooth systems, nonlinear normal modes, vibration absorbers, and micro/nano-electro-mechanical systems.

NONLINEAR DYNAMICS: FROM THEORETICAL TOOLS TO APPLICATIONS

Claude Henri Lamarque

Department of Mechanical and Civil Engineering

Univ. Lyon, ENTPE, LTDS UMR 5513 CNRS, France

In this talk, first, I recall a few mathematical results for nonlinear dynamical systems (smooth or nonsmooth). The idea is to show that various mathematical tools could be useful to improve understanding of applied nonlinear dynamics. For nonsmooth systems, I will recall how numerical methods could be built from models involving maximal monotone operators in deterministic of stochastic frame without or with delay. I will also give a few examples of physical systems that could be treated by this approach or NLCP approach. For smooth systems, I will give a few examples to discuss advantages and limitations of algebraic tools (Groebner basis) used to obtain periodic solutions (in the frame of normal form theory or in the frame of analytical method applied to polynomial nonlinear dynamical systems to solve the problem of multiplicity of nonlinear periodic solutions).

In the second part, I will recall the main ideas to develop nonlinear passive absorbers of Nonlinear Energy Sinks type and I will describe some results and applications of NESs. I will recall briefly how to design NESs and I will describe development of nonlinear passive control for different systems. For example, a cable with horizontal or vertical oscillations; oscillations of a pendulum (cable car) attached to its cable; a nonlinear absorber to control essential tremor.

CLAUDE HENRI LAMARQUE

Claude Henri Lamarque received his Ph.D. in Mechanics at Ecole Centrale de Lyon in 1992 and Habilitation at Univ. Lyon in 1998. He received Engineer diploma from ENTPE and M.Sc. in Applied Mathematics from Univ. St-Etienne in 1985. He has been Head of Geo-Materials Laboratory (2002-2008) and Head of Building and Civil Engineering Department at ENTPE (2009-2012), Head of ENTPE's site of LTDS UMR 5513 CNRS (2012-2022), Head of GDR CNRS 3437 DYNOLIN (national research group in nonlinear dynamics of structures, 2011-2018). He is member of EUROMECH and ENOC Committee. He is currently Prof. at ENTPE (Univ. Lyon). His research is focused on nonlinear dynamical systems (smooth or nonsmooth), nonlinear vibrations and acoustics, applications to passive control of oscillations, reduced-order modeling, NEMS/MEMS, dynamics of cables, adaptive metamaterials. He has published over 180 archival publications, 2 patents, and 3 monographs.
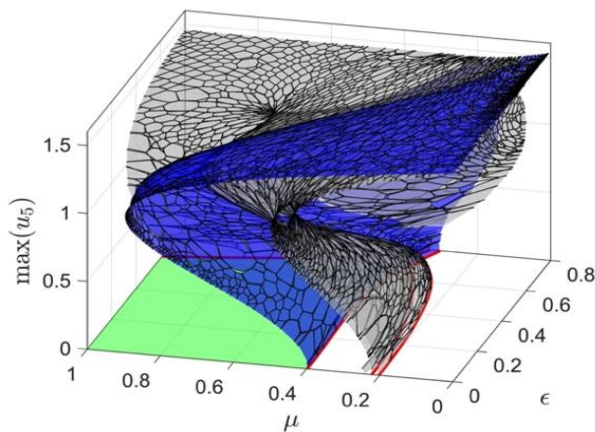
DESIGN OF SELF-EXCITED OSCILLATOR NETWORKS AS NONLINEAR DYNAMIC SENSORS

Harry Dankowicz

Professor of Mechanical Science and Engineering

The Grainger College of Engineering, University of Illinois at Urbana-Champaign

This keynote discusses sensor design ideas developed in the context of networks of coupled linear and nonlinear oscillators of arbitrary topology. As an example, it presents a hysteretic sensor design, in which short bursts of exogenous excitation result in sustained endogenous network activity that returns to a quiescent state only after a characteristic time and along a different path than when originally excited. The desired behavior is obtained through the coupling of self-excited oscillations with purposely designed rate laws for slowly varying nodal parameters, governed only by local interactions in the network. The proposed architecture and the sought dynamics take inspiration from complex biological systems that combine endogenous energy sources with a paradigm for distributed sensing and information processing. As a second example, a hybrid realization of a mass sensor is presented, in which the dynamics of a physical cantilever are coupled asynchronously with a nonlinear oscillator realized in a simulation model. An iterative algorithm ensures that the dynamics in the asymptotic limit mimics self-excited oscillations of a nonlinear oscillator network, while eliminating any effects of distortion from actuator latency. The use of parameter continuation techniques in the associated bifurcation analysis and design validation is illustrated using the open-source package coco.

HARRY DANKOWICZ

Harry Dankowicz is Professor of Mechanical Science and Engineering in The Grainger College of Engineering at the University of Illinois at Urbana-Champaign. He graduated from KTH Royal Institute of Technology in Stockholm, Sweden, with an M.Sc. in Engineering Physics in 1991 and from Cornell University with a Ph.D. in Theoretical and Applied Mechanics in 1995. Following postdoctoral and research associate appointments at KTH between 1995 and 1999, he joined the Department of Engineering Science and Mechanics at Virginia Polytechnic Institute and State University, where he remained until 2005. Since May 2021, he is Program Director for the Dynamics, Control and Systems Diagnostics Program in the Division of Civil, Mechanical and Manufacturing Innovation at the National Science Foundation. Prof. Dankowicz is a recipient of a

Junior Investigator Grant from the Swedish Foundation for Strategic Research and CAREER and PECASE awards from the US National Science Foundation, a Fellow of the ASME, and a recipient of the Fred Merryfield Design Award and Archie Higdon Distinguished Educator Award from the ASEE. In fall 2022, he concluded a ten-year term as Editor-in-Chief of ASME Applied Mechanics Reviews.

SYNCHRONIZED WAVE MOTION BETWEEN A FLOWING FLUID AND A PHONONIC SUBSURFACE

Mahmoud I. Hussein
Alvah and Harriet Hovlid Professor
Smead Department of Aerospace Engineering Sciences, Department of Physics (Courtesy)
University of Colorado Boulder

Flow control is a many-decades old engineering problem of a multi-disciplinary nature. It is concerned with devising passive or active means of intervention with the flow structure and its underlying mechanisms in a manner that causes desirable changes in the overall flow behaviour. For streamlined bodies cruising through a flow, such as air or water, there is a key interest in the control of flow instabilities which manifest as fluid waves. These are disturbances or fluctuations in the flow velocity field that if left to grow are likely to trigger transition of the flow from laminar to turbulent, which in turn causes significant increases in skin-friction drag. A rise in drag reduces the fuel efficiency in aircrafts and ships. It is therefore desired to device intervention methods to

Phononic subsurface (PSub)
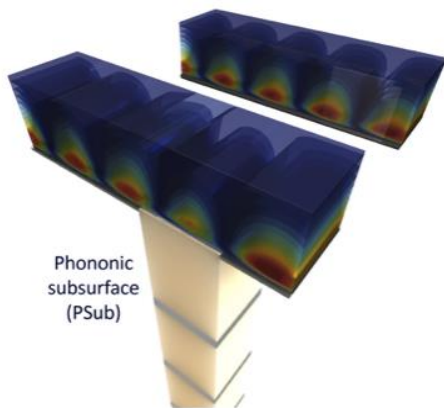
impede the growth of these instabilities. Alternatively, in some scenarios, the objective may be to speed up the growth of the instabilities and laminar-to-turbulent transition to prevent or delay flow separation. In recent research, we have shown that phonon motion underneath a surface interacting with a flow may be tuned to cause the flow to stabilize, or destabilize, as desired [Hussein et al., Proc. R. Soc. A, 2015]. The underlying control mechanism utilizes core concepts from crystal physics, primarily, the principle of destructive or constructive interferences and the notion of symmetry breaking. This is realized by installing a "phononic subsurface" (PSub), which is an architectured structure placed in the subsurface region and configured to extend all the way such that its edge is exposed to the flow, forming an elastic fluid-structure interface. The PSub may take the form of a phononic crystal or an elastic metamaterial, with finite extent, and is typically oriented perpendicular to the fluid-structure interface. It is engineered to exhibit specific frequency-dependent amplitude and phase response characteristics at the edge exposed to the flow. By simulating the 3D nonlinear Navier-Stokes equations, we will present results demonstrating perfectly synchronized passive phased response and energy exchange between the elastic domain of a PSub and the perturbation (instability) field within an interfacing flow. As an example, a flow in a channel retrofitted with a PSub underneath the channel walls will be considered. These results suggest a new paradigm in flow control based exclusively on principles from phonics.

MAHMOUD I. HUSSEIN

Mahmoud I. Hussein is the Alvah and Harriet Hovlid Professor at the Smead Department of Aerospace Engineering Sciences at the University of Colorado Boulder. He received a BS degree from the American University in Cairo (1994) and MS degrees from Imperial College London (1995) and the University of Michigan-Ann Arbor (1999, 2002). In 2004, he received a PhD degree from the University of Michigan-Ann Arbor, after which he spent two years at the University of Cambridge as a postdoctoral research associate. Dr. Hussein's research focuses on the dynamics of materials and structures, especially phononic crystals and metamaterials, at both the continuum and atomistic scales. His research considers areas that range from vibrations and acoustics of engineering materials and structures and passive flow control to lattice dynamics and thermal transport in semiconductor-based nanostructured materials. He has co-edited a book titled Dynamics of Lattice Materials published by Wiley in the emerging field of phononics.

SOCIAL PROGRAM

Social activities are a key component of the NODYCON 2023 Conference program. Social and cultural events provide a unique opportunity for everyone to catch up and engage with colleagues outside of sessions. The NODYCON events are listed below with a short description.

WELCOME PARTY, 18 June 2023, 5:30 pm - 8:30 pm

The welcome party takes place in the 15th century cloister of the Engineering Faculty situated next to the Basilica of St. Peter in Chains, best known for being home to Michelangelo's statue of Moses. A welcome party with drinks, nibbles, finger food, (and pasta) will be offered. It will be the first chance to catch up face-to-face with NODYCON friends and colleagues since the first conference in 2019.

OPENING CEREMONY, June 19, 8:30 am - 9:35 am
St. Peter in Chains Basilica

- **Opening, 8:30 am - 8:40 am**

  - Prof. W. Lacarbonara, NODYCON 2023 Chair

- **Institutional greetings, 8:40 am - 8:50 am**

  - Prof. S. Sarto, Sapienza Provost for Research

- **General Lecture: A "terrible" beauty: Michelangelo's Moses and the challenge of art, 8:55 am - 9:15 am**

  - Prof. Irene Baldriga, Sapienza University of Rome

The artist and biographer Giorgio Vasari used the expression "terribilità" to describe the sense of greatness and the impressive expertise achieved by Michelangelo in his creations. In such a perspective, the statue of Moses can be considered as an absolute example of the challenge between art and nature, where the imitation of reality seems to reach the sense of divine.

- **Music Interlude, 9:15 am – 9:35 am**

  "Solisti dell'Augusteo" Quartet

Alberto Mina, Ingrid Belli	Violins
David Bursak	Viola
Carlo Onori	Cello

COFFEE Break, June 19, 10:45 am- 11:10 am

Our first coffee break will be held in front of the impressive façade of the St. Peter in Chains Basilica under the portico leading into the church itself. This venue will also host keynote presentations and a short musical interlude prior to the coffee break.

ROMAN FORUM VISIT, June 20, 5:30 pm - 7:15 pm

Walking tour through the Roman forum, its temples, basilicas and ruins with direct access to the forum area starting from the Imperial forum. Groups of 25 attendees will be guided by English-speaking guides. Tickets, hats, and water will be provided.

COLOSSEUM UNDER THE MOONLIGHT, June 20, 8:10 pm

Travel back in time to the days of the Roman Empire to explore the dungeons, underground tunnels, and chambers of the Colosseum on this evening walking tour with special access to the arena floor. The visit will take place in groups of 20-25 attendees and will start at 8:10 pm. The following groups will be shifted by 15 minutes.

ENOGASTRONOMIC TOUR, June 21, 10:30 am - 13:30 pm

The tour will start in Campo de Fiori with a visit to a traditional family grocery shop and an iconic restaurant where deep-fried cod will be served with wine. Crossing the Tiber River, the tour will reach Trastevere (a lovely medieval neighborhood) where pasta will be served in a famous osteria restaurant. A street food icon, the Supplì, and the visit of the "King of Porchetta" will be the next highlights. The tour will end with the best organic gelato in Trastevere. Comfortable shoes are recommended to enjoy the 1.5 km walk.

VATICAN MUSEUMS & SISTINE CHAPEL, June 19, 2:00 pm - 5:00 pm

This three-hour tour will provide an intense overview of the Vatican Museums arts including the series of galleries in Raphael's Rooms to admire Renaissance arts. The Sistine Chapel will be the highlight. On this tour, you will also learn the secrets and legends about the chimney used for the black and white smoke or about Raphael and Michelangelo.

NODYCON CONFERENCE GALA DINNER & AWARD CEREMONY, June 21, 7:30 pm - 11:00 pm

The Gala Dinner and Award Ceremony will be a highlight of the conference, providing attendees with an opportunity to relax, network, and celebrate the achievements of their peers. The event will take place at the Brancaccio Palace, a stunning historical dwelling located near the Domus Aurea, just a short walk from the Conference venue. Upon arrival, attendees will be welcomed with drinks and finger food appetizers in the palace's beautiful gardens, providing a chance to socialize in the stunning surroundings. The gardens feature picturesque fountains, lawns, and colorful floral displays, creating an idyllic atmosphere for the start of the evening. As the sun begins to set, guests will make their way inside the palace's baroque-style interior, complete with frescoes and antique paintings. The seated dinner will feature a menu of regional specialties, carefully selected to showcase the best of local cuisine. Guests can expect a range of flavors and textures, with options available for all dietary requirements.

Throughout the evening, attendees will have the chance to network with their colleagues and enjoy musical entertainment. The dress code for the evening is cocktail attire, allowing attendees to dress up and feel special for the occasion. During the Gala dinner, the Award Ceremony will take center stage, celebrating the achievements of the Ali H. Nayfeh and NODYS Awardees. This is a not-to-be-missed opportunity to recognize excellence in the field and applaud the hard work and dedication of all involved.

PLENARY PROGRAM

SUNDAY – June 18, 2023	
5:30 pm - 8:30 pm CET (Central European Time)	**REGISTRATION & WELCOME**

MONDAY – June 19, 2023	
8:30 am - 9:00 am CET	**OPENING**
9:00 am - 9:15 am CET	**LECTURE ON MICHELANGELO'S MOSES** PROF. IRENE BALDRIGA, SAPIENZA UNIVERSITY
9:15 am -9:35 am CET	**MUSIC INTERLUDE** STRING QUARTET OF "AUGUSTAN SOLOISTS", A. MINA & I. BELLI (VIOLIN), D. BURSAK (VIOLA), C. ONORI (CELLO)

THURSDAY – June 22, 2023	
10:30 am- 11:30 am CET	NODYS GENERAL ASSEMBLY
11:30 am-12:00 pm CET	CLOSING CEREMONY

MONDAY JUNE 19, 2023
PARALLEL SESSIONS

The most updated version of the technical program is available at www.nodycon.org and on the Nodycon APP (PlayStore, AppStore).

DAY 1 – Monday, June 19, 2023		2:30 pm– 4:00 pm

NONSMOOTH SYSTEMS	**FRESCO ROOM**	https://uniroma1.zoom.us/j/96162365347

Chairs: M. Antali, P. Belardinelli

Kun Liu Wei Wu	Investigation on Vibro-impacts of Electric Powertrain in Regenerative Braking Process	2:30 pm – 3:00 pm
Soundararajan Ganesan Ardak Kashkynbayev Rakkiyappan Rajan	Quantized H∞ Filtering for Discrete-Time Markovian-Jump T-S Fuzzy Systems with Time-Varying Delays via Event-Trigger Mechanism	3:00 pm – 3:15 pm
Soumyajit Seth	Study the Bifurcations of a 2DoF Mechanical Impacting System	3:15 pm – 3:30 pm
Uganta Yadav Sunita Gakkhar	Analysis and bifurcations of non-smooth Filippov predator prey system with harvesting	3:30 pm – 3:45 pm
Hai Chen	Two-Dimensional Critical Dynamics of Kuramoto Model on Erdős-Rényi Random Graphs	3:45 pm – 4:00 pm
Aalokeparno Dhar Praveen Krishna	Modified Energy-based Time Variational Methods for Obtaining Periodic and Quasi-periodic Responses	2:30 pm – 3:00 pm

MECHANICAL SYSTEMS AND STRUCTURES (A)	**ROOM 15**	https://uniroma1.zoom.us/j/99166565545

Chairs: O. Thomas, F. Dohnal

Ying Meng Xiao Ye Mao Hu Ding Li-Qun Chen	Nonlinear vibrations of a composite circular plate with a concentrated mass: effects of equilibrium configurations	2:30 pm – 3:00 pm
Paolo Neri Jeremiah Holzbauer	Experimental Characterization and Numerical Modelling of Wire Rope Isolators	3:00 pm – 3:15 pm
Shan Fan Ling Hong Jun Jiang	Unveiling bifurcation mechanisms of quasiperiodic partial rub oscillations in a piecewise smooth rotor-stator system	3:15 pm – 3:30 pm

Venkoba Shrikanth Amar K. Gaonkar Pramod Kumar Verma	Predicting limit cycle of modified Rayleigh differential equation	3:30 pm – 3:45 pm
Anatoliy Azarov Alexander Gouskov Grigory Panovko	Features of precession of a flexible rotor with a different number of elastic supports located with a clearance in the plane of rotation	3:45 pm – 4:00 pm
darshan soni manoj pandey Anil Bajaj	Modelling Thermoelastic Damping in Nonlinear Plates with Internal Resonance	2:30 pm – 3:00 pm

NONLINEAR WAVE PROPAGATION   ROOM 17   https://uniroma1.zoom.us/j/957 74486194

Chairs: A. Pau, K. Van Dalen

YIN Huimin Qing PAN Chow K. W.	Doubly periodic solutions and breathers of the Hirota equation: Cascading mechanism and spectral analysis	2:30 pm – 3:00 pm
Siba Prasad Acharya Abhik Mukherjee M. S. Janaki	Excitations of distorted magnetosonic lump waves by orbital charged space debris objects in ionospheric plasma	3:00 pm – 3:15 pm
Vishal Vaibhav	Fast M-Component Direct and Inverse Nonlinear Fourier Transform	3:15 pm – 3:30 pm
Meng Wang Annamaria Pau	Nonlinear Lamb wave mixing in prestressed plates	3:30 pm – 3:45 pm

ANALYTICAL TECHNIQUES   ROOM 8   https://uniroma1.zoom.us/j/912 35201587

Chairs: Y. Mihklin, D. Zulli

Katica Hedrih (Stevanović)	Rolling a heavy ball on a revolving surface	2:30 pm – 3:00 pm
José Luis Díaz Palencia Julián Roa González	New results about compatibility conditions and solutions for a model of inerted gas in a vented fuel tank ullage	3:00 pm – 3:15 pm
Brigita Fercec Jaume Giné	The blow-up method applied to monodromic singularities of the plane	3:15 pm – 3:30 pm
Martin Lara Elena Fantino Roberto Flores	Nonlinear effects of the central body oblateness on the coplanar dynamics of solar sails	3:45 pm – 4:00 pm

MECHANICAL SYSTEMS AND STRUCTURES (B)　　　ROOM 5　

Chairs: C. Lamarque, A. Souza de Paula

Charlotte Geier　Said Hamdi Thierry Chancelier　Norbert Hoffmann　Merten Stender	Generating machine learning-based state maps from real-world friction-induced vibration data	2:30 pm – 3:00 pm
Walter Wedig	Multiple Periodic Symmetric Limit Cycles of Two Coupled Sommerfeld Rotors	3:00 pm – 3:15 pm
Chia-Ming Chang　Chung-Chen Liu	Semi-Active Control Algorithm with Control-Structure Interaction for Magnetorheological Damper Used in Seismically Excited Buildings	3:15 pm – 3:30 pm
Sebastian Willeke　Michael Steidl Norbert Reinsperger　Stephan Bohmeyer	Multiharmonic forced response analysis of a torsional vibration isolator using a nonlinear quasi-zero stiffness approach	3:30 pm – 3:45 pm
Sérvio Haramura Bastos　Rui Vasconcellos	Improving rotor stability through direct piezoelectric effect	3:45 pm – 4:00 pm

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DAY 1 – Monday, June 19, 2023	2:30 pm– 4:00 pm

MODAL INTERACTIONS AND ENERGY TRANSFER　　CLOISTER ROOM
In honor of Prof. G. Rega & F. Vestroni

Chairs: A. Luongo, W. Lacarbonara

Paolo Casini　Fabrizio Vestroni	A hysteretic vibration absorber for the mitigation of a flexible structure response	2:30 pm – 3:00 pm
Kevin Dekemele　Giuseppe Habib	Inverted resonance capture cascade from low to high modal frequency	3:00 pm – 3:15 pm
Sahar Rosenberg　Oriel Shoshani	Shape Optimization of Curved Mechanical Beams for Internal Resonance Enhancement	3:15 pm – 3:30 pm
Ahmed A. Barakat　Eva M. Weig Peter Hagedorn	On the non-trivial solutions and their stability in a two-degree-of-freedom Mathieu-Duffing system	3:30 pm – 3:45 pm
Oriel Shoshani　Steven Shaw	Nonlinear interactions of widely spaced modes	3:45 pm – 4:00 pm
Tiziana Comito　Miguel Bustamante	On the role of wave resonances in the nonlinear dynamics of discrete systems	2:30 pm – 3:00 pm

METAMATERIALS ROOM 24

Chairs: V. Pilipchuck, M. Lepidi

Aurélie Labetoulle Alireza Ture Savadkoohi Emmanuel Gourdon Claude-Henri LAMARQUE	Nonlinear interactions in a nonlinear time-dependent chain	2:30 pm – 3:00 pm
Mehmet Simsek Rick Schieni Laurent Burlion Onur Bilgen	A Metamaterial Concept using the Hybrid Position Feedback Control Method and Bistable Structural Elements	3:00 pm – 3:15 pm
Mustafa Alshaqaq Obaidullah Alfahmi Alper Erturk	Digitally programmable piezoelectric metamaterials and nonlinear electromechanical structures with synthetic impedance circuits	3:15 pm – 3:30 pm
Mohammad Bukhari Oumar Barry Alexander Vakakis	Acoustic non-reciprocity in strongly nonlinear locally resonant lattices	3:30 pm – 3:45 pm
Bao Zhao Xingbo Pu Bart Van Damme Andrea Bergamini Eleni Chatzi Andrea	A Nonlinear Metamaterial Induced by Nonlinear Damping Effect with Inertia Amplifiers	3:45 pm – 4:00 pm
Pravin kumar Ghodake	Inverse Design of Periodic and Quasi-Periodic Nonlinear Mechanical Metamaterial	2:30 pm – 3:00 pm

BIOMECHANICS ANS SMALL-SCALE ROBOTS ROOM 7

Chairs: Yang Liu, P. Tallapragada

Kevin Chen	Agile, robust, and multifunctional micro-aerial-robots powered by soft artificial muscles	2:30 pm – 3:00 pm
Jiapeng zhu Maolin Liao	Multi-objective optimization of a vibro-impact capsule moving in small intestine	3:00 pm – 3:15 pm
Kenneth Afebu Jiyuan Tian Evangelos Papatheou Yang Liu Shyam Prasad	AI assisted early bowel cancer detection using a self-propelled capsule robot.	3:15 pm – 3:30 pm
Jiyuan Tian Zepeng Wang Yang Liu Shyam Prasad	Dynamics of a soft capsule robot self-propelling in the small intestine via finite element analysis	3:30 pm – 3:45 pm
Shahin Sharafi Thomas Uchida	Human balance during quiet stance with physiological and exoskeleton time delays	3:45 pm – 4:00 pm

FLUID STRUCTURE INTERACTION   ROOM 7 https://uniroma1.zoom.us/j/97882213386

Chairs: G. Franzini, H. Taha

Mahdi Chehreghani Ahmed Shaaban Arun K. Misra Michael P. Païdoussis	Dynamics of curved cantilevered pipes conveying fluid	4:30 pm – 4:45 pm
Alaa Ahmed Lisheng Yang Muhammad R. Hajj Raju Datla Lei Zuo	Reduced-order Model for the Hydrodynamics of an oscillating Surge Wave Energy Converter	4:45 pm – 5:00 pm
Haithem Taha	Vibrational control: mysterious stabilization mechanism in bioinspired flying robots	5:00 pm – 5:15 pm
Larissa Drews Wayhs Lopes Douglas D. Bueno Carlos Cesnik	Aeroelastic limit cycle oscillations due to multi-element control surface with freeplay	5:15 pm – 5:30 pm
Syed Ibrar Hussain Iftikhar Ahmad Nida Yasmeen	The remarkable role of hydrogen in conductors with copper and silver nanoparticles by mixed convection using viscosity Reynold's model	5:30 pm – 5:45 pm
Feras Alfosail Shadid Nutaifat Qasim Saleem Americo Cunha Jr Mohammad Younis	Influence of Pulsating Internal flow on Marine Riser with Nonlinear Geometry	5:45 pm – 6:00 pm

MECHANICAL SYSTEMS AND STRUCTURES   ROOM 17 https://uniroma1.zoom.us/j/96944228372

Chairs: A.Hajjaj, A. Cammarano

Cristiano Martinelli Andrea Coraddu Andrea Cammarano	Experimental Analysis of a Nonlinear Piecewise Multi-Degrees of Freedom System	4:30 pm – 4:45 pm
Ahmed Dalaq Shadi Khazaaleh Mohammed Daqaq	An Origami Inspired Impact Energy Dissipator	4:45 pm – 5:00 pm
Pritam Ghoshal Qianyu Zhao James Gibert Anil Bajaj	Effect of Boundary Conditions on the Stability of a Viscoelastic Von Mises Truss	5:00 pm – 5:15 pm
Tetyana Shmatko Lidiya Kurpa Jan Awrejcewicz	Nonlinear free vibration of functionally graded shallow shells with variable thickness resting on elastic foundations	5:15 pm – 5:30 pm
Simon Kapelke	Subharmonic oscillations in PILine® ultrasonic motors	5:30 pm – 5:45 pm
Tetyana Shmatko Lidiya Kurpa Walter Lacarbonara	Free vibration analysis of functionally graded porous sandwich plates with a complex shape	5:45 pm – 6:00 pm

COMPUTATIONAL NONLINEAR DYNAMICS (A) FRESCO ROOM

Chairs: C. Nataraj, A. Steindl

Evangelos Koutras Elias Paraskevopoulos Sotirios Natsiavas	A general co-simulation approach based on a novel weak formulation at the interface	4:30 pm – 4:45 pm
Rohit Chawla Aasifa Rounak Vikram Pakrashi	Higher order transverse discontinuity mapping for hybrid dynamical systems	4:45 pm – 5:00 pm
Raffaele Capuano Nicolò Vaiana Luciano Rosati	An Algebraic Model for Hysteretic Responses exhibiting Cyclic Hardening and Softening Phenomena: Preliminary Results	5:00 pm – 5:15 pm
Junqing Wu Ling Hong Jun Jiang	An improved variable-coefficient harmonic balance method for quasi-periodic solutions	5:15 pm – 5:30 pm
Amir Shahhosseini Kiran D'Souza	Abstract Dynamics: An alternative approach to local Lyapunov exponents in examining local unpredictability	5:30 pm – 5:45 pm

REDUCED ORDER MODELS ROOM 24

Chairs: H. Dankowicz, De Bono

D. Dane Quinn David Najera-Flores Anthony Garland Konstantinos Vlachas Eleni Chatzi Michael Todd	Using Machine Learning Models To Represent Isolated Nonlinearities Within Structural Systems	4:30 pm – 4:45 pm
Joar Axås George Haller	Delay-embedded modal analysis for spectral submanifold identification	4:45 pm – 5:00 pm
Mingwu Li Shobhit Jain George Haller	Fast computation and characterization of forced response surface of high-dimensional systems via spectral submanifolds and parameter continuation	5:00 pm – 5:15 pm
Xiao Xiao Thomas Hill Simon Neild	Developing sufficiently accurate reduced-order models using an efficient error assessment method	5:15 pm – 5:30 pm
Max de Bono Simon Neild Rainer Groh Thomas Hill	Reduced-Order Models for Systems with Snap-Through	5:30 pm – 5:45 pm
Chaitanya Borra Nikhil Bajaj Jeffrey Rhoads D. Dane Quinn	Multiple Equilibrium States in Large Array Resonators	5:45 pm – 6:00 pm

COMPUTATIONAL NONLINEAR DYNAMICS (B)　　　CLOISTER ROOM

Chairs: F. Dohnal, A. Vizzaccaro

Mathias Legrand　Christophe Pierre	An Equality-Based Formulation for Vibrating Systems with Two-Dimensional Friction	4:30 pm – 4:45 pm
Zihan Zhao　Hiroshi Yabuno	Numerical Calculation of Dynamics of Wiper Blade with Attack Angle	4:45 pm – 5:00 pm
Steven Shaw　Sahar Rosenberg　Oriel Shoshani	A hybrid averaging and harmonic balance method for asymmetric systems	5:00 pm – 5:15 pm
D. Dane Quinn　Shaghayegh Rahimpour　Nikhil Bajaj　Aaron Batista　Carey Balaban	Neuromorphic Computing Based on Physical Systems with Biologically Inspired Learning Rules	5:15 pm – 5:30 pm
Mahmoud Ayyad　Muhammad R. Hajj　Arshad Mehmood　Imran Akhtar	Modeling Vortex-Induced Vibrations Displacement with Phenomena-Informed Neural Network	5:30 pm – 5:45 pm
Cui Chao　Jian Yang　Marian Wiercigroch	Energy transfer and dissipation in frictional systems with multiple contact interfaces	5:45 pm – 6:00 pm

EXPERIMENTAL DYNAMICS　　　ROOM 15

Chairs: H. Hetzler, F. Pellicano

Pawel Olejnik　Jan Awrejcewicz	A chain of real mechanical oscillators subjected to creep-slip friction and relatively high-frequency structural vibration	4:30 pm – 4:45 pm
Rochdi El Abdi	Vibration analysis of electrical connector under different environments	4:45 pm – 5:00 pm
Tong Zhou　Gaëtan Kerschen	Experimental Identification of Secondary Resonances using a Control-based Method	5:00 pm – 5:15 pm
Serena Occhipinti　Paolo Neri　Christian Maria Firrone　Daniele Botto	Analysis of Non-linear Vibrations Using DIC and the Smoothed Harmonics Method	5:15 pm – 5:30 pm
Pol D. Spanos　Alberto Di Matteo　Antonina Pirrotta	Rocking of rigid blocks on flexible foundations: modeling and experimental assessment	5:30 pm – 5:45 pm
Maksymilian Bednarek　Bipin Balaram　Donat Lewandowski　Jan Awrejcewicz	An Electromagnetic Softening Spring: Experiment and Simulation	5:45 pm – 6:00 pm

SYSTEM IDENTIFICATION AND SHM

ROOM 5

Chairs: Jin-Song Pei, Kougioumtzoglou

Authors	Title	Time
Amirali Sadeqi Dario Anastasio Stefano Marchesiello	Nonlinear system identification of a multi-story building with geometrical nonlinearity using a deterministic output-only-data approach	04:30 pm - 06:00 pm
Dario Anastasio Stefano Marchesiello Gianluca Gatti Paulo J. Gonçalves Alexander David Shaw Michael John	An investigation into model extrapolation and stability in nonlinear system identification	04:30 pm - 06:00 pm
Kenneth Afebu Yang Liu Evangelos Papatheou	Machine learning-based dynamic method of rock characterisation for rotary-percussive drilling.	04:30 pm - 06:00 pm
Quankun LI Qingzhou Zhao Mingfu Liao Fali Yang	An approach to monitor bolt faults in two-dimensional structures without reference	04:30 pm - 06:00 pm
Qinghua Liu Junyi Cao	Physics-informed sparse identification of bistable nonlinear energy sink	04:30 pm - 06:00 pm
Simon Baeuerle Timo Peter Baierl Hartmut Hetzler	Identification of non-linear model equations based on data-science approaches	04:30 pm - 06:00 pm

NONLINEAR VIBRATIONS CONTROL

ROOM 8

Chairs: N. Wierschem, M. Lanzerotti

Authors	Title	Time
David Reineke Kyle Nguyen Luyi Tang Mary Lanzerotti Walter Lacarbonara	Hoist Stabilization Design Method	04:30 pm - 06:00 pm
Lyes Nechak Pascal Morin	Nonlinear control of friction-induced vibrations by using cascade architecture	04:30 pm - 06:00 pm
kai xu Xugang Hua Walter Lacarbonara	Attenuating nonlinear effects of pendulum tuned mass damper by an isochronous spring	04:30 pm - 06:00 pm
Jacek Przybylski	Nonlinear vibration control of a slightly curved beam with distributed piezoelectric patches	04:30 pm - 06:00 pm
Harrish Joseph Mary Lanzerotti Walter Lacarbonara	Variable Length Control of a Planar Pendulum with Time Averaged Constant Cable Length	04:30 pm - 06:00 pm
Giuseppe Perna Maurizio De Angelis Ugo Andreaus	Preliminary numerical analysis of the Vibro-Impact Isolation systems under seismic excitations	04:30 pm - 06:00 pm

Tuesday June 20, 2023
Parallel Sessions

DAY 2 – Tuesday, June 20, 2023	8:30am– 10:00am

BIFURCATION AND DYNAMIC INSTABILITY ROOM 8
https://uniroma1.zoom.us/j/94243599465

Chairs: C. Mazzilii, D. Zulli

Motoyoshi Shibata Junta Umemoto Hiroshi Yabuno	Parametric resonance caused by mass imbalance on railway wheels	8:30 am– 8:45 am
Pau Becerra Zuniga Sebastien Baguet Benoit Prabel Clément Grenat Régis Dufour	Experimental and numerical analysis of a tube with clearance-induced impacts	8:45 am – 9:00 am
Simona Di Nino	Shear-torsional nonlinear galloping of base-isolated continuous beam	9:00 am – 9:15 am
Lokanna Hoskoti Mahesh M. Sucheendran	Nonlinear vibration of an inextensible rotating beam	9:15 am – 9:30 am
Akshay Pal Jayanta Bhattacharjee	Properties of a two parameter logistic map with delay	9:30 am – 9:45 am
Micael Junior Kamdem Nono Armand Anthelme Nanha Djanan Blaise Roméo Nana Nbendjo	Dynamics of a completely immersed nonlinear beam under the action of a sea wave	9:45 am – 10:00 am

COMPUTATIONAL NONLINEAR DYNAMICS ROOM 15
https://uniroma1.zoom.us/j/99529573518

Chairs: S. Natsiavas, A. Vizzaccaro

Sudhanva Kusuma Chandrashekhara Dejan Zupan	Dynamic response of spatial beams with material softening and strain localization	8:30 am– 8:45 am
Jonas Kappauf Simon Baeuerle Hartmut Hetzler	Analysis of self-excited stick-slip vibrations in a model for creep groan using a combined Finite-Difference/Harmonic Balance approximation method	8:45 am – 9:00 am
Enora Denimal Jie Yuan	Multi-scale uncertainty quantification of complex nonlinear dynamic structures with friction interfaces	9:00 am – 9:15 am

Arturo Buscarino Luigi Fortuna Gabriele Puglisi	Optimizing Multilayer Perceptrons to Approximate Nonlinear Quaternion Functions	9:15 am – 9:30 am
P Arjun Vinod V	Energy pumping of mechanical oscillators in an array configuration under impulse and parametric excitation	9:30 am – 9:45 am
Moslem Molaie Emamzadeh Farhad S. Samani Giovanni Iarriccio Antonio Zippo Francesco Pellicano	Spiral Bevel Gears nonlinear dynamics: chaotic response existence in multi degree of freedom systems	9:45 am – 10:00 am

ANALYTICAL TECHNIQUES   ROOM 17

Chairs: Nikhail Bajaj, T. Shmatko

Tiemo Pedergnana Nicolas Noiray	Exact potentials in multivariate Langevin equations	8:30 am– 8:45 am
Fangyan Lan Tieding Guo Wanzhi Qiao Houjun Kang	Softening/hardening dynamics of nonlinear foundation beam with linear stiffening effect	8:45 am – 9:00 am
Zsolt Iklodi Zoltan Dombovari	A study on an analytic optimization of variable pitch broaching	9:00 am – 9:15 am
Muqing Niu Li-Qun Chen	Analysis on nonlinear stiffness isolators revealing damping thresholds	9:15 am – 9:30 am
Martin Lara	Collinear point dynamics of a dumbbell satellite in fast rotation	9:30 am – 9:45 am
Dhananjaykumar Tandel Anindya Chatterjee Atanu Mohanty	Nonresonant averaging of an inhomogeneous nonlinear Mathieu equation	9:45 am – 10:00 am

DAY 2 – Tuesday, June 20, 2023   8:30am– 10:00am

NONLINEAR VIBRATIONS CONTROL   FRESCO ROOM

Chairs: M. Daqaq, A. Casalotti

Chao Zhang Hiroshi Yabuno	Performance Improvement of Autoparametric Vibration Absorber by Eliminating the Viscous Damping and the Nonlinearity	8:30 am– 8:45 am
Jun-Dong Fu Shui Wan Jiwei Shen Kevin Dekemele	Vibration control with a magnetic tristable NES on a cantilever beam	8:45 am – 9:00 am

jian yang Jian Yang	Nonlinear vibration isolators with spring damper inerter configured in linkages	9:00 am – 9:15 am
Clement Raimond Thomas Roncen Thierry Jardin Leonardo Sanches Guilhem Michon	Numerical and experimental study of a pneumatic Nonlinear Energy Sink	9:15 am – 9:30 am
Antonio Mihara Rene Medrano Torricos	Exact dynamical solution of the Kuramoto–Sakaguchi Model for finite networks of identical oscillators	9:30 am – 9:45 am

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DAY 2 – Tuesday, June 20, 2023   8:30am– 10:00am

ENERGY HARVESTING   ROOM 7   https://uniroma1.zoom.us/j/99575260966

Chairs: Lei Zuo, M. Ferretti

Mohammad Bukhari Oumar Barry	Self-tuning sliding mass electromagnetic energy harvester for dramatic frequency bandwidth enhancement	8:30 am– 8:45 am
Guilherme Franzini Vitor Maciel Maciel Guilherme Vernizzi Daniele Zulli	Simultaneous passive suppression and energy harvesting from galloping using a bi-stable piezoelectric nonlinear vibration absorber	8:45 am – 9:00 am
Haiqin Li Mengxin He Ding Qian	An electromagnetic vibro-impact nonlinear energy sink for effective energy harvesting and vibration reduction of vortex induced vibrations	9:00 am – 9:15 am
Camille Saint-Martin Adrien Morel Ludovic Charleux Emile Roux Aya Benhemou Quentin Demouron Adrien Badel	Escape from the potential well of bistable vibration energy harvesters using buckling level modifications	9:15 am – 9:30 am
Krzysztof Kecik Ewelina Stezycka Kateryna Lyubitska	Design and Optimization of Electromechanical Coupling in Electromagnetic Vibrational Harvester	9:30 am – 9:45 am
Pankaj Kumar S. Narayanan	Optimal Energy Harvesting from A Stochastically Excited Nonlinear Energy Sink	9:45 am – 10:00 am

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MEMS/NEMS   CLOISTER ROOM   https://uniroma1.zoom.us/j/94754364615

Chairs: M. Younis, O. Gottlieb

Jon Pratt	Managing parametric frequency noise using nonlinearity in a High-Q micromechanical torsion pendulum	8:30 am– 8:45 am

Giorgio Gobat Alessia Baronchelli Attilio Frangi	Reduced order modelling with Deep Learning methods of the steady-state response in MEMS	8:45 am – 9:00 am
Zhengliang Fang Stephanos Theodossiades Amal Hajjaj	A MEMS triple sensing scheme based on nonlinear coupled micromachined resonators	9:00 am – 9:15 am
Fehmi Najar Mehdi Ghommem Samed Kocer Alaaeldin Elhady Eihab Abdel-Rahman	Differential Capacitance Gas Sensors	9:15 am – 9:30 am
Ali Sarafraz Farbod Alijani	Emergence of nonlinear damping in nanomechanical systems from thermal interactions	9:30 am – 9:45 am
Hassen Ouakad Ayman Alneamy	Mode Localization of Electrostatically Coupled Shallow MEMS Arches	9:45 am – 10:00 am

FRACTIONAL ORDER SYSTEMS

ROOM 5

Chairs: Yangquan Chen, S. Carillo

Mattia Coccolo	Fractional damping term in the Helmholtz and Duffing nonlinear oscillators.	8:30 am– 8:45 am
Yu Guan Wei Li Dongmei Huang Natasa Trisovic	Reliability Problem of a Fractional Stochastic Dynamical System Based on Stochastic Averaging Method and Deep Learning Algorithm	8:45 am – 9:00 am
Fudong Ge YangQuan Chen	Regional state estimation of time-fractional reaction-diffusion SEIR model for COVID-19 with mobile sensors	9:00 am – 9:15 am
Nikola Nesic Milan Cajic Danilo Karlicic Julijana Simonović	Nonlinear vibration of small size beams on fractional visco-elastic foundation	9:15 am – 9:30 am
Jin Xie Tao Xi Zhaohui Liu	On the Dynamics Analysis of Microresonator System with Fractional-order	9:30 am – 9:45 am

BIOMECHANICS AND SMALL-SCALE ROBOTS II
(Organizer Prof. Y. Liu)

ROOM 24

Chairs: P. Tallapragada, S. Zarychta

Yang Liu	Utilizing the vibr-impact self-propelled capsule for lower gastrointestinal endoscopies	8:30 am– 8:45 am
Tatiana Figurina Dmitri Knyazkov	Rectilinear motion of a chain of interacting bodies in a viscous medium	8:45 am – 9:00 am

Shan Yin Jiajia Zhang Yang Liu	Parameter identification of a vibro-impact capsule robot through optimisation	9:00 am – 9:15 am
Sandra Zarychta Marek Balcerzak Artur Dąbrowski Andrzej Stefański	The closed-loop controller optimization of a discontinuous capsule drive with the use of neural network in the uncertain frictional environment	9:15 am – 9:30 am
Dóra Patkó Ambrus Zelei Giuseppe Habib	Comparison of feed-forward control strategies for hopping model with intrinsic muscle properties of different complexities	9:30 am – 9:45 am

MULTI BODY SYSTEMS

CLOISTER ROOM https://uniroma1.zoom.us/j/92816042911

Chairs: Nabil Chalhoub, Mate Antali

Ioannis Ntinopoulos Elias Paraskevopoulos Sotirios Natsiavas	Stability analysis for multibody systems subject to bilateral motion constraints	10:30am – 10:45 am
Pierangelo Masarati Gianni Cassoni Andrea Zanoni Aykut Tamer	Stability Analysis of Large-Scale Multibody Problems using Lyapunov Exponents	10:45 am – 11:00 am
Wei Dai Yongjun Pan	Real-time modeling of vehicle's longitudinal-vertical dynamics in ADAS applications	11:00 am – 11:15 am
Bradley Graham James Knowles Georgios Mavros	An Application of Bifurcation Analysis to Automotive Windscreen Wipers	11:15 am – 11:30 am
Stefan Holzinger Johannes Gerstmayr	Evaluation of Lie group Integration for Simulation of Rigid Body Systems	11:30 am – 11:45 am
Matthieu Serre Benoit Prabel Habibou Maitournam	A reduced model for conical contact dedicated to flexible multi-body dynamics	11:45 am – 12:00 pm
Pietro Pustina Cosimo Della Santina Alessandro De Luca	Recursive Inverse Dynamics of Flexible Multi-Body Systems based on Kane's Equations	12:00 pm – 12:15 pm

CHAOTIC SYSTEMS AND UNCERTAINTY I

ROOM 15 https://uniroma1.zoom.us/j/91819843062

Chairs: A. Cunha, E. Ponce Nùñez

Jesus M Seoane	Relativistic chaotic scattering	10:30am – 10:45 am

Simon Schiller Wolfgang Steiner	Nonlinear and chaotic dynamics of a vibratory conveying system	10:45 am – 11:00 am
Marcelo Messias	Time-Periodic perturbation leading to chaos in a planar memristor oscillator having a Bogdanov-Takens bifurcation	11:00 am – 11:15 am
Róbert Rochlitz Bendegúz Dezső Bak	Investigation of chaos in the mechanistic turbulence model	11:15 am – 11:30 am
Tommaso Alberti Davide Faranda Valerio Lucarini	The predictable chaos of rare events in complex systems	11:30 am – 11:45 am
jingyu sun lixiang li haipeng peng shengyu liu	Multidimensional nonlinearity Time Series Forecasting Based on Multi-reservoir Echo State Network	11:45 am – 12:00 pm
Pawel Olejnik Godiya Yakubu Jan Awrejcewicz	Quasi-periodicity of temporarily constrained variable-length elastic pendulum	12:00 pm – 12:15 pm
Markus Vogl	Chaos Measure Dynamics and a Multifactor Model for Financial Markets	12:15 pm – 12:30 pm

DAY 2 – Tuesday, June 20, 2023 — 10:30am– 12:30pm

NONLINEAR WAVE PROPAGATION   ROOM 7   https://uniroma1.zoom.us/j/94178843339

Chairs: M. Hussein, A. Pau

Andrei Faragau Marten Hollm Leo Dostal Andrei Metrikine Karel van Dalen	Investigation of a nonlinear gradient elasticity model for the prediction of seismic waves	10:30am – 10:45 am
Julia de Castro Motta Ada Amendola Fernando Fraternali	On the existence and properties of solitary waves traveling in tensegrity-like lattices	10:45 am – 11:00 am
Marco Lepidi Valeria Settimi	Harmonic and superharmonic components in periodic waves propagating through mechanical metamaterials with inertia amplification	11:00 am – 11:15 am
Jacek Gatlik Tomasz Dobrowolski	Effect of nonzero temperature on the process of penetration of the potential barrier through the kink	11:15 am – 11:30 am
Pravinkumar Ghodake	Harmonic Scattering of Waves from Crossed-Thin-Rectangular Nonlinear Inclusions	11:30 am – 11:45 am
Biswajit Bharat Jayaprakash K R Stefano Lenci	Wave Propagation in Carbon Nanotube with Bilinear Foundation	11:45 am – 12:00 pm
Ahmed Sallam Shima Shahab	Nonlinear distortion of high-intensity ultrasound holographic patterns	12:00 pm – 12:15 pm

Danial Saadatmand	Vacuum polarization energy in coupled-fermion $\phi4$ kink systems	12:15 pm – 12:30 pm

MECHANICAL SYSTEMS AND STRUCTURES

ROOM 17 https://uniroma1.zoom.us/j/92 173480707

Chairs: L. Rosati, I. Atanasovska

Hamid Ghorbani Bart Blockmans Wim Desmet	Development and validation of an efficient model for bearing strain creep prediction	10:30am – 10:45 am
Giovanni Formica Franco Milicchio Walter Lacarbonara	An enhanced pathfollowing scheme for nonsmooth dynamics via improved computation of the monodromy matrix	10:45 am – 11:00 am
Shihabul Haque Nilanjan Sasmal Jayanta Bhattacharjee	An extensible double pendulum and multiple parametric resonances	11:00 am – 11:15 am
Rafal Rusinek	Effect of magnet position in electro-magnetic transducer of middle ear implant	11:15 am – 11:30 am
Marina Shitikova Anastasiya Krusser	Analysis of forced vibrations of the nonlinear elastic plate on a viscoelastic foundation subjected to hard excitation from harmonic load	11:30 am – 11:45 am
Salvador Rodríguez-Blanco Javier González-Monge Carlos Martel	Accurate asymptotic description of nonlinear friction states for a detailed FEM model	11:45 am – 12:00 pm
Ivana Atanasovska Dejan Momcilovic Tatjana Lazovic	Mathematical Modelling of a Coefficient of Nonlinearity in Dynamics of Deep Groove Ball Bearing with Damage	12:00 pm – 12:15 pm
Junyeong Kim Sejun Park Ju H. Park S.M. Lee	Parameter Estimation for Linear Time-Varying (LTV) Uncertain System Using Physics-Informed Machine Learning	12:15 pm – 12:30 pm

ROTATING SYSTEMS

ROOM 5 https://uniroma1.zoom.us/j/92 200936902

Chairs: S. Baeuerle, Y. Vetyukov

Adrien Martin Andrea Opreni Alessandra Vizzaccaro LLoïc Salles Olivier Thomas Attilio Attilio Cyril Touzé	Reduced order modeling of rotating structures featuring geometric nonlinearity with the direct parametrisation of invariant manifolds method	10:30am – 10:45 am
CHAO PENG Alessandro Tasora Pin Lyu	A method for the analysis of the aeroelastic stability of slender wind turbines and its validation	10:45 am – 11:00 am
Ali Fasihi Grzegorz Kudra Jan Awrejcewicz	Nonlinear dynamics of asymmetric rotor subjected to rotor-stator contact	11:00 am – 11:15 am

Manas Ranjan Pattnayak Jayanta Kumar Dutt Raj Kumar Pandey	Nonlinear dynamics of an accelerating rotor supported on self-acting air journal bearings	11:15 am – 11:30 am
Yury Vetyukov	Transmission of rotation by a geometrically imperfect flexible shaft in a curved channel	11:30 am – 11:45 am
Junaid Ali Shveta Dhamankar Evan Parshall Gregory Shaver Anil Bajaj Keith Keith Douglas Hansel	Parametric resonances due to torsional oscillations in a multi-degree of freedom driveline coupled by a series of universal joints	11:45 am – 12:00 pm
Xu Ouyang Krzysztof Kamil Żur Hulun Guo	On the nonlinear dynamics of rotating hybrid nanocomposite blades with matrix crack	12:00 pm – 12:15 pm
Mohammad Al-Shudeifat Rafath Abdul Nasar	Effect of Rub-Impact on Backward Whirl Excitation in a Cracked Rotor System	12:15 pm – 12:30 pm

CONTROL OF NONLINEAR SYSTEMS ROOM 8 https://uniroma1.zoom.us/j/95710371896

Chairs: Yangquan Chen, H. Gutierrez

Maíra Martins da Silva Fernanda Thaís Colombo	Model-based and Model-free Control of a Parallel Manipulator with Flexible Links	10:30am – 10:45 am
Jun Moon Hyunwoo Kim	Super Twisting Sliding Mode Control with Accelerated Gradient Descent Method for Synchronous Reluctance Motor Control System	10:45 am – 11:00 am
Abdullah Alshaya	Vibration Control of Time-Varying Nonlinear Systems	11:00 am – 11:15 am
Hector Gutierrez	Assessment of Power Consumption Improvement in Position and Attitude Control of Spacecraft using Electromagnetic Force Assist	11:15 am – 11:30 am
Rick Schieni Mehmet Simsek Onur Bilgen Laurent Burlion	A Reference Governor for Constrained Control of a Multi Degree of Freedom Metamaterial	11:30 am – 11:45 am

MEMS/NEMS ROOM 24 https://uniroma1.zoom.us/j/95382314311

Chairs: J. Pratt, D. Caruntu

Laura Ruzziconi Rodrigo T. Rocha Wen Zhao Amal Hajjaj Mohammad Younis	Multiple internal resonances and impacting dynamics of micromachined arch resonators	10:30am – 10:45 am

Sasan Rahmanian Ayman Alneamy Yasser Shama Samed Kocer Eihab Abdel-Rahman Mustafa Mustafa	How to Excite Anti-Symmetric Modes in a Symmetric MEMS?	10:45 am – 11:00 am
Anish Kumar Oded Gottlieb	The response of nonlinear circular viscoelastic panels to electrodynamic excitation	11:00 am – 11:15 am
Dumitru Caruntu	Amplitude-Voltage Response of Superharmonic Resonance of Fourth Order of Electrostatically Actuated MEMS Cantilever Resonators	11:15 am – 11:30 am
Wagner Barth Lenz Rodrigo T. Rocha Fahimullah Khan Mohammad Younis	Control of an electrostatically actuated micro portal frame with 2:1 internal resonance subjected to damping disturbances	11:30 am – 11:45 am
Miguel Ramirez Barrios Fadi Dohnal	Vibration mitigation by two parametric anti-resonances in high-Q resonators: a preliminary case study	11:45 am – 12:00 pm
Piotr Skrzypacz Bek Kabduali Grant Ellis	Detection of pull-in and periodic solutions of magMEMS model using Sturm's theorem	12:00 pm – 12:15 pm
Ayman Alneamy Walter Lacarbonara Eihab Abdel-Rahman	Nonlinear modeling of micro-cantilever beams	12:15 pm – 12:30 pm

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NONLINEAR VIBRATIONS CONTROL   FRESCO ROOM   https://uniroma1.zoom.us/j/91519349158

Chairs: B. Mace, S. Di Nino

Zein Alabidin Shami Cyril Touze Christophe Giraud-Audine Olivier THOMAS	A Nonlinear Piezoelectric Shunt Absorber with 2:1 Internal Resonance	10:30am – 10:45 am
Maxime Morell Manuel Collet Emmanuel Gourdon Alireza Ture Savadkoohi	Control of an acoustic mode by a digitally created Nonlinear Electroacoustic Absorber at low excitation levels: Analytical and Experimental results	10:45 am – 11:00 am
Mohammad Amin Faghihi Shabnam Tashakori Ehsan Azadi Yazdi Nathan van de Wouw	Vibration control of lossless transmission lines with nonlinear terminators: a simplifying approach	11:00 am – 11:15 am
Emanuele De Bono Maxime Morell Manuel Collet Emmanuel Gourdon Alireza Ture Savadkoohi Claude-Henri Claude-Henri Morvan Ouisse Gael Matten	Nonlinear electroacoustic resonator at low excitation amplitudes: grazing incidence analysis.	11:15 am – 11:30 am
Mehran Shahraeeni Vladislav Sorokin Brian Mace Ashvin Thambyah Sinniah Ilanko	Damping and negative stiffness characteristics of an electromagnetic mechanism for vibration control	11:30 am – 11:45 am

NONSMOOTH SYSTEMS　　　　　　　CLOISTER ROOM　https://uniroma1.zoom.us/j/96715778895

Chairs: G. Stepan, E. Detournay

Kaidong Chen　He Zhang Nathan van de Wouw Emmanuel Detournay	An Alternative Approach to Model Milling Dynamics	2:00 pm – 2:15 pm
Mate Antali	Harmonic expansion and nonsmooth dynamics in a circular contact region with combined slip-spin motion	2:15 pm – 2:30 pm
Wei Dai　Jian Yang	Vibration attenuation of dynamic systems using multiple motion constraints	2:30 pm – 2:45 pm
Alessandro Tasora　Dario Fusai Dario Mangoni	Rheonomic frictional contacts for simulating drifting in conveyors and feeders	2:45 pm – 3:00 pm
Dheeraj Varma Manthena　C. P. Vyasarayani　Anindya Chatterjee	Horizontal table vibration for parts-centering without feedback	3:00 pm – 3:15 pm
Bipin Balaram　Jan Awrejcewicz	Entrainment in Self-Excited Filippov Systems	3:15 pm – 3:30 pm

COMPUTATIONAL NONLINEAR DYNAMICS　　　　ROOM 17　https://uniroma1.zoom.us/j/92112096360

Chairs: L. Salles, G. Formica

Christos Tselios　Panagiotis Georgiou　Christina (Tanya) Politi　Dimitris Alexandropoulos	Quantum-Dot spin-VCSEL based Reservoir Computing for Henon Attractor Reconstruction	2:00 pm – 2:15 pm
Eva Zupan　Bojan Cas　Dejan Zupan	On the velocity-based description in dynamic analysis of three-dimensional beams	2:15 pm – 2:30 pm
Bence Szaksz　Giuseppe Habib	Iterative algorithm for dynamical integrity assessment of systems subject to time delay	2:30 pm – 2:45 pm
Jerome Daquin　Carolina Charalambous	Phase space visualisation with non-variational chaos indicators	2:45 pm – 3:00 pm
Domenico Magisano　Leonardo Leonetti　Giovanni Garcea	Unconditionally stable time stepping scheme for large deformation dynamics of elastic beams and shells	3:00 pm – 3:15 pm
Ming-Hsiao Lee	A FEA model generation method for irregular-shaped and nonhomogeneous structures	3:15 pm – 3:30 pm

NONLINEAR WAVE PROPAGATION

FRESCO ROOM https://uniroma1.zoom.us/j/92538363017

Chairs: M. Lavrientev, S. Carillo

Sandra Carillo Cornelia Schiebold	On the asymptotical description of solutions to the matrix modified Korteweg-de Vries equation	2:00 pm – 2:15 pm
Mikhail Lavrentiev Andrey Marchuk Konstantin Oblaukhov Mikhail Shadrin	Fast numerical solution to nonlinear shallow water system	2:15 pm – 2:30 pm
Stanko Nikoli	The nature and formation of rogue waves for nonlinear Schrodinger equation	2:30 pm – 2:45 pm
Philippe Caillol	A vorticity wave packet breaking within a rapidly rotating vortex	2:45 pm – 3:00 pm
Khalil Al-Ghafri Mani Sankar	Chirped optical solitons in fiber Bragg gratings with dispersive reflectivity	3:00 pm – 3:15 pm
Xin Fang	Self-adaptive wave propagation and synthetical vibration reduction of strongly nonlinear mechanical metamaterials	3:15 pm – 3:30 pm

ANALYTICAL TECHNIQUES

ROOM 7 https://uniroma1.zoom.us/j/99159657538

Chairs: F. D'Annibale, T. Kalmar-Nagy

Mark Walth Richard Rand	Fourier Analysis of a Duffing Equation with Delay	2:00 pm – 2:15 pm
Davide Martini David Angeli Giacomo Innocenti Alberto Tesi	Sufficient conditions to exclude positive Lyapunov Exponents in the Thomas' system	2:15 pm – 2:30 pm
Kathiravan Thangavel	Modelisation of thermally induced jitter in a slender structure	2:30 pm – 2:45 pm
Martin Volvert Gaëtan Kerschen	Resonant phase lags of an oscillator with polynomial stiffness	2:45 pm – 3:00 pm
Fotios Georgiades	Introduction to The Perpetual Mechanics Theory and Future Directions	3:00 pm – 3:15 pm
Le Marrec Loic Lerbet Jean Hariz Marwan	Classification of the post-buckling solutions of a beam under large, but forceless, bending and torsion	3:15 pm – 3:30 pm

MECHANICAL SYSTEMS AND STRUCTURES IV   ROOM 24   https://uniroma1.zoom.us/j/92670591994

Chairs: A. Steindl, G. Franzini

Athanasios Tsetas Apostolos Tsouvalas Andrei Metrikine	Pile installation via axial and torsional vibrations - the Gentle Driving of Piles method	2:00 pm – 2:15 pm
Riddhika Mahalanabis Balakrishnan Ashok	Dynamics of a damped variable mass system: Leaky balloon with string	2:15 pm – 2:30 pm
Arturo Buscarino Carlo Famoso Luigi Fortuna	Recycled Smartdevices for Real-Time Monitoring of Civil Infrastructures	2:30 pm – 2:45 pm
Jobin Josey Balakrishnan Ashok	A spring-mass mechanical system with moving edges having rich dynamical behaviour	2:45 pm – 3:00 pm
Hamed Farokhi Eetu Kohtanen Alper Erturk	Parametric resonance and extreme motions of a cantilever with a tip mass: an experimental-theoretical study	3:00 pm – 3:15 pm
Douglas Roca Santo Leopoldo de Oliveira Elke Deckers	Flexible mechanisms as quasi-zero stiffness metamaterial resonators	3:15 pm – 3:30 pm

SYSTEM IDENTIFICATION AND SHM I   ROOM 8   https://uniroma1.zoom.us/j/94437733320

Chairs: P. Neri, Yongchao Yang

Bas Kessels Tom Janssen Rob Fey Nathan van de Wouw	Neural network hyperparameter tuning for online model parameter updating using inverse mapping models	2:00 pm – 2:15 pm
Dalton Stein David Chelidze	Reconstructing Nonlinear Backbone Curves from Smooth Coordinate Decomposition of Multivariate Impulse Response	2:15 pm – 2:30 pm
George Pasparakis Vasileios Fragkoulis Ioannis Kougioumtzoglou Michael Beer	A Bayesian compressive sampling technique for determining the equations of motion of nonlinear structural systems	2:30 pm – 2:45 pm
Raffaele Capuano Nicolò Vaiana Biagio Carboni	Experimental Characterization and Identification of the Shear Hysteretic Behavior of a Helical Wire Rope Isolator	2:45 pm – 3:00 pm
Quankun LI Qingzhou Zhao Mingfu LIAO Xiaobo Lei	A novel vibration response-based approach to monitor faults in bolted complex structures	3:00 pm – 3:15 pm

CONSTITUTIVE AND PHENOMENOLOGICAL MODELS I   ROOM 15

Chairs: El Abdi Rochdi, D. Anastasio

Jin-Song Pei Biagio Carboni Walter Lacarbonara	Modeling Asymmetric Hysteresis: Continuous Development using Experimental Data	2:00 pm – 2:15 pm
Nicolò Vaiana Luciano Rosati	Differential Formulation of the Vaiana-Rosati Model	2:15 pm – 2:30 pm
Srdjan Kostic Nebojša Vasović	Stochastic delay modelling of landslide dynamics	2:30 pm – 2:45 pm
Anahita Amiri Brandon Caasenbrood Danqing Liu Nathan van de Wouw Ines Lopez Arteaga	A replacement model for nonlinear dynamics of electro-active liquid crystal coatings	2:45 pm – 3:00 pm
Hossein Vatandoost Ramin Sedaghati Subhash Rakheja	A new methodology for nonlinear analysis of magneto-rheological elastomers behavior under large amplitude oscillatory axial (LAOA) loadings	3:00 pm – 3:15 pm
Nicolò Vaiana Luciano Rosati Xenofon Palios Nicos Makris	Preliminary Results on the Simulation of Pressurized Sand Dampers by the Vaiana-Rosati Model	3:15 pm – 3:30 pm

BIOMECHANICS AND SMALL-SCALE ROBOTS III (Organizer Prof. Y. Liu) ROOM 5

Chairs: Y. Liu, M. Martins Da Silva

Marek Balcerzak Sandra Zarychta Artur Dąbrowski Andrzej Stefański	Time-optimal control approximation for a discontinuous capsule drive	2:00 pm – 2:15 pm
Saptarshi Jana Abhishek Gupta	Walking on an uneven terrain with a SLIP model based compliant biped	2:15 pm – 2:30 pm
Zepeng Wang Jiyuan Tian Yang Liu Shyam Prasad	Dynamic modelling of a vibro-impact capsule robot self-propelling in the large intestine via finite element method	2:30 pm – 2:45 pm
Xiang Zhao Qi Wang Weidong Zhu Yinghui Li	Constrained Green's function for a beam with with arbitrary spring and nonlinear spring foundation	2:45 pm – 3:00 pm
Bo Wang Haohao Bi Yang Liu	Numerical investigation of a piezoelectric wrinkled film-based vibration sensor for the vibro-impact capsule robot	3:00 pm – 3:15 pm
Jialei Shi Wenlong Gaozhang Helge Wurdemann	Characterisation of Miniaturised Soft Continuum Robots with Reinforced Chambers	3:15 pm – 3:30 pm

Poster Session 1

DAY 2 – Tuesday, June 20, 2023	3:30pm– 4:00pm

DAY 2 – Tuesday, June 20, 2023	4:00pm– 5:00pm

NONSMOOTH SYSTEMS III

ROOM 7 — https://uniroma1.zoom.us/j/98872580969

Chairs: J. Ros, M. Ferretti

Enrique Ponce Emilio Freire Javier Ros Elisabet Vela	Limit cycle bifurcations from infinity in relay systems	4:00 pm – 4:15 pm
Aakash Khandelwal Nilay Kant Ranjan Mukherjee	Maneuvering a Stick in Three-Dimensional Space Using Impulsive Forces	4:15 pm – 4:30 pm
Javier Ros Enrique Ponce Emilio Freire	Three large amplitude limit cycles via Zero-Hopf bifurcation from infinity in 3D piecewise linear systems with symmetry.	4:30 pm – 4:45 pm

CHAOTIC SYSTEMS AND UNCERTAINTY II

CLOISTER ROOM — https://uniroma1.zoom.us/j/93322725074

Chairs: G. Karolyi, K. Kęcik

Carlos Mazzilli Guilherme Franzini	Structural reliability analysis based on the dynamic integrity of an attractor	4:00 pm – 4:15 pm
Kaio César Borges Benedetti Stefano Lenci Giuseppe Rega Paulo Gonçalves	Stochastic basins of attraction for uncertain initial conditions	4:15 pm – 4:30 pm
Nayher Andres Clavijo Giovani G. Gerevini Fabio Cesar Diehl José Carlos Pinto	Chaotic dynamic induced by PI control in offshore oil production plants.	4:30 pm – 4:45 pm
Der Chyan Lin	Resource sensitive game	4:45 pm – 5:00 pm

COMPUTATIONAL NONLINEAR DYNAMICS V   FRESCO ROOM

Chairs: H. Dankowicz, J. Knowles

Amir Kamyar Bagheri Valentin Sonneville Ludovic Renson	Computing Periodic Responses of Geometrically Nonlinear Structures Modelled using Lie Group Formulations	4:00 pm – 4:15 pm
Hangyu Fu Lawrence Bergman D. Michael McFarland Xiangle Cheng Huancai Lu	Operator Splitting in the Finite Element Analysis of Fokker-Planck Equations	4:15 pm – 4:30 pm
Quentin Ragueneau Luc Laurent Antoine Legay Thomas Larroque Romain Crambuer	Global Parametric Optimization for Structures with Nonlinear Joints in Vibration	4:30 pm – 4:45 pm
Bálint Bodor Giuseppe Habib	Saddle-node bifurcation prediction from pre-bifurcation scenario	4:45 pm – 5:00 pm

REDUCED ORDER MODELS   ROOM 24

Chairs: D. Quinn, G. Formica

Yunfei Fu Xisheng Lin Mengyuan Chu Fei Wang Zhi Ning Tim K.T. Tse Cruz Y. Li	A reduced-order modeling procedure to isolating energy- and evolution-wise dominant features of fluid-driven pollutant dispersion in a street canyon	4:00 pm – 4:15 pm
Hossein Soleimani Konstantinos Poulios Jonas Brunskog Niels Aage	Substructural FRF based reduction technique for nonlinear systems	4:15 pm – 4:30 pm
Alexander Stoychev Ulrich J. Römer	A comparison of parametrizations of invariant manifolds for nonlinear model reduction	4:30 pm – 4:45 pm
Yunfei Fu Xisheng Lin Bingchao Zhang Xinxin Feng Chun-Ho Liu Tim K.T. Tse Cruz Y.T. Li	Reduced-order model analysis of the pollutant dispersion on an urban street canyon	4:45 pm – 5:00 pm

MODAL INTERACTIONS AND ENERGY TRANSFER   ROOM 5

Chairs: F. D'Annibale, H. Taha

Ioannis Georgiou	Introducing a stack of eccentric rotors to semantically modify nonlinear flexible beam continua	4:00 pm – 4:15 pm

Dhananjaykumar Tandel Pankaj Wahi Anindya Chatterjee	Nonresonant interactions between a linear system and a light double limit cycle oscillator	4:15 pm – 4:30 pm
Rahul Das Anil Bajaj Sayan Gupta	Koopman operator based Nonlinear Normal Modes for systems with internal resonance	4:30 pm – 4:45 pm
Sergei Liazhkov Vitaly Kuzkin	Unsteady two-temperature heat transport in mass-in-mass chains.	4:45 pm – 5:00 pm

METAMATERIALS   ROOM 8   https://uniroma1.zoom.us/j/93365935046

Chairs: Aline de Paula, A. Lepidi

Jean Flosi Alireza Ture Savadkoohi Lamarque Claude-Henri	Towards the robust optimal design of nonlinear metamaterials	4:00 pm – 4:15 pm
Yichang Shen Walter Lacarbonara	Dispersion properties of metamaterial honeycombs embedding nonlinear resonators	4:15 pm – 4:30 pm
Camila da Silveira Zanin Samy Missoum Alireza Ture Savadkoohi Sebastien Baguet Regis Dufour	Modal interactions in a non-linear mass-in-mass periodic chain	4:30 pm – 4:45 pm
Behrooz Yousefzadeh Andrus Giraldo	Nonlinear reciprocal dynamics in systems with broken mirror symmetry	4:45 pm – 5:00 pm

EXPERIMENTAL DYNAMICS   ROOM 17   https://uniroma1.zoom.us/j/95429082125

Chairs: O. Bilgen, P. Wolsczack

Matthew Cartmell Edmondo A. Minisci	A laboratory scale Foucault pendulum for the measurement of frame-dragging	4:00 pm – 4:15 pm
Giovanni Iarriccio Antonio Zippo Molaie Moslem Francesco Pellicano	Quasi-zero stiffness vibration isolator under vertical seismic loads	4:15 pm – 4:30 pm
Nupur Saxena Samit Ray Chaudhuri	Rail-Structure-Interaction Parameters at Ballasted Viaduct in Rohtak-Gohana Elevated Stretch: instrumentation, Measurements and Interpretation	4:30 pm – 4:45 pm
Piotr Wolszczak Marcin Bednarz Grzegorz Litak	Tool wear supervising applying vibration modal analysis	4:45 pm – 5:00 pm

Chairs: F. Fernandez-Sanchez, L. Pastur

Karel van Dalen Andrei Faragau Andrei Metrikine	The influence of the frequency and velocity-dependent reaction force of the guideway on the vertical stability of the Hyperloop transportation system	4:00 pm – 4:15 pm
Daniele Zulli Angelo Luongo	The effect of the mean wind force on the post-critical galloping response of shallow cables	4:15 pm – 4:30 pm
Nan Deng Laurette Tuckerman Bernd R. Noack Luc Pastur	How non-generic coincidences of local bifurcations can occur in fluid mechanics	4:30 pm – 4:45 pm
Giovanni Migliaccio Manuel Ferretti Francesco DAnnibale	On the influence of external damping on the dynamics of a generalized Beck's beam	4:45 pm – 5:00 pm

Wednesday June 21, 2023
Parallel Sessions

DAY 3 – Wednesday, June 21, 2023	8:30am– 10:00am

BIFURCATION AND DYNAMIC INSTABILITY

ROOM 15   https://uniroma1.zoom.us/j/95890567471

Chairs: J. Ros, C. Pinto

Jesús García Pérez Amin Ghadami Leonardo Sanches Guilhem Michon Bogdan I. Epureanu	Data-driven bifurcation analysis using a parameter-dependent trajectory	8:30 am – 8:45 am
Eric Robbins Fernando Moreu	Investigating the Stability of a Strongly Nonlinear Structure Through Shaker Dynamics in Fixed Frequency Sine Tests	8:45 am – 9:00 am
Ahsan Naseer Imran Akhtar Muhammad R. Hajj	Hopf Bifurcation Analysis of the BVAM Model for Electrocardiogram	9:00 am – 9:15 am
Fanni Kádár Gabor Stepan	Bistability in pressure relief valve dynamics	9:15 am – 9:30 am
Adireddi Balaji Aswanth Thani Jayaprakash K R C. P. Vyasarayani	Dynamics of Delayed Piecewise Linear Mathieu Equation	9:30 am– 9:45 am
Moumita Ghosh Pritha Das	Dynamical analysis of spread of online misinformation and a delayed optimization technique	9:45 am – 10:00 am

COMPUTATIONAL NONLINEAR DYNAMICS

FRESCO ROOM   https://uniroma1.zoom.us/j/96551344553

Chairs: F. Vestroni, Krzysztof Kęcik

Samuel Quaegebeur Benjamin Chouvion Fabrice Thouverez	Mitigating vibration levels of mistuned cyclic structures by use of contact nonlinearities	8:30 am – 8:45 am
Chin-Long Lee	New elemental damping model for nonlinear dynamic response	8:45 am – 9:00 am

Arnaldo Casalotti Francesco DAnnibale	On the Nonlinear Dynamics of In-contact Bodies subject to Stick-Slip and Wear Phenomena	9:00 am – 9:15 am
Alessandra Paoloni Domenico Liberatore Daniela Addessi	Modified Bouc-Wen model with damage and flexibility increase for the dynamic analysis of masonry walls	9:15 am – 9:30 am

MECHANICAL SYSTEMS AND STRUCTURES   ROOM 7   https://uniroma1.zoom.us/j/94471665796

Chairs: M. Younis, M. Lepidi

Robert Kuether David Najera-Flores Matthew Southwick	Nonlinear Modes of Jointed Structures with As-built Surface Topography	8:30 am – 8:45 am
Mrunal Bhalerao Muhammad R. Hajj Lei Zuo	Numerical Simulation of a Bio-inspired, Bistable Plate System.	8:45 am – 9:00 am
Yuliia Surhanova Yuri Mikhlin	Regular and complex behaviour in the pendulum system under a magnetic field	9:00 am – 9:15 am
Muhao Chen Aguinaldo Fraddosio Andrea Micheletti Gaetano Pavone Mario Daniele Piccioni Robert E. Skelton	Nonlinear Dynamics Analysis of Actuation Strategies of Clustered Tensegrity V-Expander Structures	9:15 am – 9:30 am
Yuri Mikhlin Yana Lebedenko	Resonance steady states and transient in some non-ideal systems	9:30 am – 9:45 am
Alexey Malashin	Solving the problem of nonlinear oscillations of a pendulum on a flexible stretchable thread.	9:45 am – 10:00 am

VEHICLE DYNAMICS   CLOISTER ROOM   https://uniroma1.zoom.us/j/92771029363

Chairs: P. Masarati, S. Natsiavas

Alexander Schramm Silvio Sorrentino Alessandro De Felice	On the self-excited chatter vibration in motorcycles	8:30 am – 8:45 am
Alois Steindl Johannes Edelmann Manfred Plöchl	Investigation of the control characteristics for a driver-vehicle system with steering and throttle control	8:45 am – 9:00 am
Tobias Westmeier Daniel Kreuter Simon Baeuerle Hartmut Hetzler	Hybrid Autoregressive Neural Networks to predict forced nonlinear Vibrations	9:00 am – 9:15 am

Jakob Scheidl Yury Vetyukov Stefan Kaczmarczyk	Modelling and Simulation of the Nonlinear Vibrations of Axially Moving Long Slender Continua in Tall Host Structures	9:15 am – 9:30 am
Shaun Smith Duc Nguyen James Knowles Mark Lowenberg Sean Biggs	An Initial Bifurcation Analysis of an EV Pickup Truck	9:30 am – 9:45 am

ENERGY HARVESTING   ROOM 5 https://uniroma1.zoom.us/j/95192809288

Chairs: M. Daqaq, M. Bonnin

Giuseppe Giorgi	Leveraging 2:1 Parametric Resonance in a Notional Wave Energy Harvester	8:30 am – 8:45 am
Angelo M. Tusset Alisson L. Agusti Maria E. K. Fuziki Giane G. Lenzi	Numerical simulations of energy harvesting in a portal frame coupled with a nonlinear-energy sink	8:45 am – 9:00 am
Jiwei Shen shui wan Jun-Dong Fu Kevin Dekemele	A broadband magnet-induced cantilever piezoelectric energy harvester coupled to nonlinear energy sink	9:00 am – 9:15 am
Mohammad Khasawneh Mohammed Daqaq	Experimental testing of a bi-stable point wave energy absorber under harmonic wave excitations	9:15 am – 9:30 am

FRACTIONAL ORDER SYSTEMS   ROOM 17 https://uniroma1.zoom.us/j/98946139131

Chairs: P. Domanski, Lobna Said

Ya-Hui Sun Yong-Ge Yang YangQuan Chen	Reliability of fractional-order hybrid energy harvesters under random excitations	8:30 am – 8:45 am
Muhammad Ali Qureshi	Bird Like Trajectories in 6D Chaotic System Incorporated with Fractional Order, Memristor and Encryption.	8:45 am – 9:00 am
Sara Mustafa Wafaa Sayed Lobna Said Ahmed Radwan	Generalized Fractional-Order Complex Logistic Map and Fractals on FPGA	9:00 am – 9:15 am
Patryk Chaber Pawel Domanski	Fractional control performance assessment of the nonlinear mechanical systems	9:15 am – 9:30 am
Stepa Paunovic Milan Cajic Danilo Karlicic	Broadening the operational range of a fractionally damped piezoelectric energy harvester	9:30 am – 9:45 am

Luis M Palacios-Pineda Óscar Martínez-Romero Daniel Olvera-Trejo Alex Elias-Zúñiga	Fractal Response of a Nonlinear Packaging System	9:45 am – 10:00 am

BIOMECHANICS AND SMALL-SCALE ROBOTS IV (Organizer Prof. Y. Liu)   ROOM 24

Chairs: E. Abdel-Rahman, Y. Liu

Ali K. Hoshiar	Microrobot control from individual to collective	8:30 am – 8:45 am
Ruifeng Guo Yao Yan	Dynamics of a vibro-impact self-propelled capsule encountering a bump in the small intestine	8:45 am – 9:00 am
Shan Yin Yao Yan Joseph Paez Ch´avez Yang Liu	Complex dynamics of a vibro-impacting capsule robot in contact with a circular fold	9:00 am – 9:15 am
Kiana Abolfathi Jose A. Rosales Medina Hesam Khaksar James H. Chandler Klaus McDonald- Maier Keyoumars Ashkan Pietro Valdastri Ali K. Hoshiar	Shape Forming of a Soft Magnetic Microrobot Using Non-Homogeneous Magnetic Fields	9:15 am – 9:30 am
Moonkwang Jeong Felix Fischer Tian Qiu	Wireless force sensing of a micro-robot penetrating a viscoelastic solid	9:30 am – 9:45 am
Cheng Huang Yao Yan	A nonlinear model for identifying human-exoskeleton coupling parameters in lower extremities	9:45 am – 10:00 am

STOCHASTICITY AND NOISE   ROOM 8

Chairs: S. Lenci, J.M. Seone

Gergő Fodor Zoltán Kovács Daniel Bachraty	Modeling stick balancing with stochastic delay differential equations	8:30 am – 8:45 am
Qi Liu Yong Xu	Response statistics of a conceptual airfoil with consideration of extreme load conditions	8:45 am – 9:00 am
Ilias Mavromatis Apostolos Psaros Ioannis Kougioumtzoglou	A novel alternative formalism of the Wiener path integral technique - circumventing the Markovian assumption for the system response process	9:00 am – 9:15 am
Akshay Pal Jayanta Bhattacharjee	Diagrammatic perturbation theory for Stochastic nonlinear oscillators	9:15 am – 9:30 am

Ling Hong Jun Jiang Xiao-Ming Liu	Fuzzy Generalized Cell Mapping with Adaptive Interpolation (FGCM with AI) for Bifurcation Analysis of Nonlinear Systems with Fuzzy Uncertainties	9:30 am – 9:45 am
Kaio César Borges Benedetti Paulo Gonçalves Stefano Lenci Giuseppe Rega	Effect of an uncertain symmetry-breaking parameter on the global dynamics of the Duffing oscillator	9:45 am – 10:00 am

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DAY 3 – Wednesday, June 21, 2023   10:30 am-12:30 pm

NONSMOOTH SYSTEMS   ROOM 8

Chairs: R. Leine, P. Meehan

Simon Sailer Remco Leine	A complete stability chart for the Tippedisk	10:30 am – 10:45 am
Henrik Sykora Rachel Kuske Daniil Yurchenko	Efficient path integral formulation for the response statistics of stochastic vibro-impact systems	10:45 am – 11:00 am
Victoriano Carmona Fernando Fernández-Sánchez Douglas D. Novaes	Existence of a uniform upper bound for the number of limit cycles of planar piecewise linear systems	11:00 am – 11:15 am
Andjelka Hedrih Katica Hedrih (Stevanović)	Stability and instability of a complex biodynamical discrete structure on a cantilever coupled to nonlinear springs	11:15 am – 11:30 am
Bidhayak Goswami Anindya Chatterjee	Semi-Implicit Integration and Data-Driven Model Order Reduction for Structures with Hysteresis	11:30 am – 11:45 am
Enxhi Sulollari Karel van Dalen Alessandro Cabboi	Vibration-Induced Friction Force Modulation	11:45 am – 12:00 pm
Tomasz Burzynski Przemysław Perlikowski Piotr Brzeski	Time-dependent stability margin for autonomous, piece-wise, and discontinuous system	12:00 pm – 12:15 pm
A. Yassine Karoui Remco Leine	Model reduction of a periodically forced slow-fast continuous piecewise linear system	12:15 pm – 12:30 pm

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BIFURCATION AND DYNAMIC INSTABILITY   ROOM 15

Chairs: D. Quinn, H. Yabuno

Andrei Faragau Rui Wang Andrei Metrikine Karel van Dalen	The influence of the electro-magnetic levitation and its control strategy on the vertical stability of the Hyperloop transportation system	10:30 am – 10:45 am
Yasser Shama Rana Abdelrahman Sasan Rahmanian Samed Kocer Eihab Abdel-Rahman	A Comparative Study of Two Types of Bifurcation-Based Inertial MEMS Sensors	10:45 am – 11:00 am
Aleksandrs Ipatovs Dmitrijs Pikulins Chukwuma Victor Iheanacho Sergejs Tjukovs	The Complete Bifurcation Analysis of Buck Converter Under Current Mode Control	11:00 am – 11:15 am
Laura Di Gregorio Walter Lacarbonara	A quantitative Birkhoff Normal Form for geometrically nonlinear hinged-hinged beams	11:15 am – 11:30 am
Gilad Ben-Zvi Yizhar Or	Dynamics of Purcell's three-link microswimmer model with actuated-elastic joints	11:30 am – 11:45 am
Houjun Kang Yifei Wang Yunyue Cong	Vibration suppression of a cable-stayed beam with external excitations by a nonlinear energy sink	11:45 am – 12:00 pm
José Antunes Philippe Piteau Xavier Delaune Romain Lagrange Domenico Panunzio	A parsimonious identification approach in the frequency-domain for experimental fractional systems of unknown order	12:00 pm – 12:15 pm
Jithu Paul Yizhar Or Oleg Gendelman	Nonlinear dynamics and bifurcations of a planar undulating magnetic microswimmer	12:15 pm – 12:30 pm

COMPUTATIONAL NONLINEAR DYNAMICS   CLOISTER ROOM   https://uniroma1.zoom.us/j/99952015303

Chairs: S. Sorrentino, R. Kuether

Fabia Bayer Remco Leine	Optimal projection in a Koopman-based sorting-free Hill method	10:30 am – 10:45 am
Yunho Kim Dongsun Lee	Mass-conserving Allen--Cahn model for boundedness	10:45 am – 11:00 am
Giuseppe Battiato Christian Maria Firrone Valeria Pinto Antonio Giuseppe D'Ettole	An extensive test campaign of a turbine bladed disk in the presence of mistuning and underplatform dampers, and numerical validation	11:00 am – 11:15 am
Yong Xu Weili Guo	Response statistics of a conceptual two-dimensional airfoil in hypersonic flows with random perturbations	11:15 am – 11:30 am
Salama Hassona Wieslaw Marszalek	Self-supervised contrastive learning for chaotic time-series classification	11:30 am – 11:45 am
Dimiter Prodanov	Computation of the Wright function from its integral representation	11:45 am – 12:00 pm

Vincent Debut José Antunes Filipe Soares	Modelling string vibrations with unilateral impacts in fretted musical instruments through the modal Udwadia-Kalaba approach	12:00 pm – 12:15 pm
Tamil Arasan Bakthavatchalam Selvakumar Murugan Murugesan Vadivel Meiyazhagan Jaganathan Gopinath Balu Malaikannan Sankarasubbu	Active Learning for Probabilistic Machine Learning based modeling of Dynamical Systems	12:15 pm – 12:30 pm

FLUID STRUCTURE INTERACTION   ROOM 17   https://uniroma1.zoom.us/j/98438877743

Chairs: A. Arena, Xiang Zhao

Cruz Y. Li Zengshun Chen Xisheng Lin Tim K.T. Tse Yunfei Fu	A new Koopman-inspired approach to match flow field excitation with consequent structure responses for nonlinear fluid-structure interactions	10:30 am – 10:45 am
Bidhayak Goswami Indrasis Chakraborty Anindya Chatterjee	Small In-plane Oscillations of a Slack Catenary by the Rayleigh-Ritz method	10:45 am – 11:00 am
Anandamoy Mukhopadhyay Amar K. Gaonkar	Linear stability of thin liquid film flows over a uniformly heated slippery substrate under heat flux boundary condition	11:00 am – 11:15 am
Henry Francis Annapeh Victoria Kurushina	Vortex-induced forces and vibration of subsea structures in proximity to larger objects	11:15 am – 11:30 am
Nikita Finogenov Victoria Kurushina	Vortex-induced loads on subsea pipelines due to marine biofouling	11:30 am – 11:45 am

EXPERIMENTAL DYNAMICS II   ROOM 5   https://uniroma1.zoom.us/j/95101643562

Chairs: Carlos Mazzilli, D. Botto

Peter Meijers Panagiota Atzampou Andrei Metrikine	Experimental and numerical study of a magnetic pendulum	10:30 am – 10:45 am
Mark Blyth Krasimira Tsaneva-Atanasova Lucia Marucci Ludovic Renson	Effects of controller-induced dynamics on experimental bifurcation analysis	10:45 am – 11:00 am

James Oti Anthony Migash Ryan McDermott Joseph Cornell Nikhil Bajaj	A Platform for Data-Driven Nonlinear Dynamics and Mechatronics Education: A Student-Designed Spherical Magnetic Pendulum	11:00 am – 11:15 am
Ankit Sahay Abhishek Kushwaha Samadhan A. Pawar Midhun P. R. Jayesh M. Dhadphale R. I. Sujith	Delayed acoustic self-feedback control of limit cycle oscillations in a turbulent combustor	11:15 am – 11:30 am
Leonid Rizyaev Yizhar Or	Locomotion dynamics of an underactuated wheeled three-link robot	11:30 am – 11:45 am
Samarjeet Singh Amitesh Roy Jayesh M. Dhadphale Swetaprovo Chaudhuri R. I. Sujith	Modeling turbulent thermoacoustic transitions using a mean-field synchronization approach	11:45 am – 12:00 pm
Rudolf Toth Daniel Bachraty Gabor Stepan	Bifurcation scenarios in the hardware-in-the-loop experiments of highly interrupted milling processes	12:00 am – 12:15 pm
Ahmed Al Shekaili Yang Liu Evangelos Papatheou	Numerical and experimental investigation of nonlinear dynamics of downhole drilling	12:15 pm – 12:30 pm

SYSTEM IDENTIFICATION AND SHM I   ROOM 24

Chairs: M. Hajj, C. Nataraj

Zihan Liu Amirhassan Abbasi Prashant Kambali C. Nataraj	Uncertainty Quantification in Parameter Estimation Using Physics-integrated Machine Learning	10:30 am – 10:45 am
Thomas Simpson Nikolaos Dervilis Eleni Chatzi	Bayesian LSTM Neural Networks for Nonlinear System Identification	10:45 am – 11:00 am
Christos Lathourakis Alice Cicirello	Physics Enhanced Sparse Identification of Nonlinear Oscillator with Coulomb Friction	11:00 am – 11:15 am
Wei Liu Zhilu Lai Charikleia Stoura Kiran Bacsa Eleni Chatzi	Model-based Unknown Input Estimation via Partially Observable Markov Decision Processes	11:15 am – 11:30 am
Ye Zhao Bin Xu	Time-varying physical parameters and nonlinear restoring force nonparametric identification based on UKF and Sage-Husa algorithm	11:30 am – 11:45 am
Mehdi Akbarzadeh Sebastian Oberst Shahrokh Sepehrirahnama Benjamin Halkon	Application of SINDy for the discovery of governing equations of a trapped particle in an acoustic radiation force field	11:45 am – 12:00 pm
Ákos Tamás Köpeczi-Bócz Henrik Sykora Denes Takacs	Data-driven delay identification with SINDy	12:00 pm – 12:15 pm

AEROSPACE STRUCTURES

FRESCO ROOM https://uniroma1.zoom.us/j/96349581997

Chairs: G. Graglia, M. Bonney

Giulia Lanzara	Multi-layers radical morphing: shape transitions and vibration	10:30 am – 10:45 am
Valery Pilipchuk Steven Shaw Nabil Chalhoub	Control of orbital parameters of a dumbbell satellite using moving mass actuators	10:45 am – 11:00 am
Paolo Fisicaro Angelo Pasini Paolo Sebastiano Valvo	Three-dimensional deployment of cable nets for active removal of space debris	11:00 am – 11:15 am
Guoliang Ma Li-Qun Chen	Suspension nonlinear analysis and active vibration control of an aerospace structure	11:15 am – 11:30 am
Matthew Bonney David Wagg Tim Rogers	Modal Testing of In Situ BAE T1A Hawk Wing: Benchmark Dataset	11:30 am – 11:45 am
Giulia Lanzara	Vibration Damping in Fiber-Reinforced Bistable Composites with Magnetic Particles	11:45 am – 12:00 pm

PASSIVE ENERGY DAMPING

ROOM 7 https://uniroma1.zoom.us/j/97189126007

Chairs: A. Cammarano, N. Wierschem

Nicholas Wierschem Anika Sarkar	Approximate Analytical Investigation of the Variable Inertia Rotational Mechanism	10:30 am – 10:45 am
Wang Tao Ding Qian	Enhanced performance of nonlinear energy sink under harmonic excitation using acoustic black hole effect	10:45 am – 11:00 am
Balkis Youssef Remco Leine	Vibro-impact NES: Nonlinear mode approximation using the multiple scales method	11:00 am – 11:15 am
Sudip Chowdhury Arnab Banerjee Sondipon Adhikari	The optimum inerter-based isolation systems for dynamic response mitigation of multi-storey buildings	11:15 am – 11:30 am
Giulia Lanzara	Magnetic Field and Ferrite Particles Interaction for Membranes with Augmented Shock- Absorption Capability	11:30 am – 11:45 am

DAY 3 – Wednesday, June 21, 2023   02:00 pm-3:30 pm

FLUID STRUCTURE INTERACTION

ROOM 24 https://uniroma1.zoom.us/j/91459543019

Chairs: P. Meehan, M.M. Sucheendran

Francesco Pellicano Antonio Zippo Giovanni Iarriccio	Nonlinear Dynamics of Circular Cylindrical Shells Interacting with a Non-Newtonian Fluid	2:00 pm – 2:15 pm
Akshay Desai Souradip Chattopadhyay Amar K. Gaonkar Anandamoy Mukhopadhyay	Nonlinear stability of a thin viscoelastic film down a vertical wall: A numerical study	2:15 pm – 2:30 pm
Parasuramuni Naga Vishnu Jayaprakash K R	Dynamics of piecewise linear oscillator coupled with wake oscillator	2:30 pm – 2:45 pm
Paul Meehan	Investigation of Chaotic Flutter in a Wind Turbine Airfoil	2:45 pm – 3:00 pm
Jin-Der Lee	The nonlinear phenomena in the unstable region of a single heated channel natural circulation loop with supercritical water	3:00 pm – 3:15 pm
Masood Khalique	Closed-form solutions and conservation laws for a Korteweg-de Vries-like equation	3:15 pm – 3:30 pm

COMPUTATIONAL NONLINEAR DYNAMICS

ROOM 7 https://uniroma1.zoom.us/j/91968578803

Chairs: Brian Mace, Paolo Venini

Arturo Buscarino Carlo Famoso Luigi Fortuna	NASA DART Mission: a preliminary mathematical dynamical model and its nonlinear circuit emulation	2:00 pm – 2:15 pm
Abdolvahhab Rostamijavanani Shanwu Li Yongchao Yang	Physics-constrained Deep learning of nonlinear normal modes of spatiotemporal fluid flow dynamics	2:15 pm – 2:30 pm
Beata Jackowska-Zduniak	Numerical modeling and experimental validation of ballistic panel penetration	2:30 pm – 2:45 pm
Ahmed Al Shekaili Yang Liu Evangelos Papatheou	Finite element modelling of downhole rock breaking using a PDC bit	2:45 pm – 3:00 pm
Samir Llamazares-Elias Angel Tocino	Mean-reverting schemes for solving the CIR model	3:00 pm – 3:15 pm
Salvatore Sessa	An insight on the parameter identification of a new hysteretic model addressing asymmetric responses	3:15 pm – 3:30 pm

MULTI BODY SYSTEMS

ROOM 15

Chairs: V. Pilipchuck, J. Yuan

Andrzej Urbaś Krzysztof Augustynek Jacek Stadnicki	Influence of the rope sling system on dynamics of a carried load	2:00 pm – 2:15 pm
Zbyněk Šika Karel Kraus Jan Krivošej	Nonlinear effects in joints of multi-dimensional active absorbers for robotics	2:15 pm – 2:30 pm
Peter Varkonyi	Algorithmic verification of Lyapunov stability for rigid multi-contact systems subject to impact and friction	2:30 pm – 2:45 pm
Zitao Yu Jithu Paul Yizhar Or	Nonholonomic dynamics of steer-free rotor-actuated Twistcar	2:45 pm – 3:00 pm
Lisa Eberhardt Remco Leine Jonas Harsch Simon R. Eugster Perry Bartelt Helene Lanter	Application of Nonsmooth Dynamics to Rockfall Protection Ring Net Simulation	3:00 pm – 3:15 pm
Krzysztof Augustynek Andrzej Urbaś Jacek Stadnicki	A study on the dynamics of the flexible link mechanism with a spatial model of the translational joint with clearance	3:15 pm – 3:30 pm

BIFURCATION AND DYNAMIC INSTABILITY

ROOM 17

Chairs: S. Di Nino, Alvaro Lopez

Álvaro G. López	The electrodynamic origin of the wave-particle duality	2:00 pm – 2:15 pm
Zhengfa Li Zaigang Chen	Nonlinear dynamic characteristics and four contact states of a spur gear pair considered tooth profile error and extended tooth contact	2:15 pm – 2:30 pm
Susanna Maza Isaac A. Garcia	Non-autonomous inverse Jacobi multipliers and periodic orbits of planar vector fields	2:30 pm – 2:45 pm
Isaac A. Garcia Jaume Giné	The integral of the cofactor as a characterization of centers	2:45 pm – 3:00 pm
José Luis Echenausía Monroy Jonatan Pena Ramirez	Synchronization Based on Intermittent Sampling: PWL Multiscroll System	3:00 pm – 3:15 pm
Miklós Mincsovics Tamás Kalmár-Nagy	Fingered Stability Regions for Operator Splitting	3:15 pm – 3:30 pm

NONLINEAR VIBRATIONS CONTROL

ROOM 5

Chairs: L. Salles, A. Casalotti

Jian Peng Xiaowen Chen Lianhua Wang Stefano Lenci	Time-delay vibration reduction control of tension leg in submerged floating tunnel	2:00 pm – 2:15 pm
Louis MESNY Sebastien Baguet Simon Chesnè,	An adaptive nonlinear hybrid vibration absorber	2:15 pm – 2:30 pm
Stefania Lo Feudo Nicolò Vaiana	A 3D Structural Model for Nonlinear Dynamic Analyses of Rigid Blocks Supported by Wire Rope Isolators	2:30 pm – 2:45 pm
Sudip Chowdhury Arnab Banerjee Sondipon Adhikari	The enhanced nonlinear friction bearing isolators using negative stiffness inertial amplifiers	2:45 pm – 3:00 pm
Kapil Kumar Pankaj Wahi	Effect of wear flat length on the global dynamics of rotary drilling	3:00 pm – 3:15 pm
Mohammad Al-Shudeifat	Frequency-Energy Analysis of Coupled Linear Oscillator with Unsymmetrical Nonlinear Energy Sink	3:15 pm – 3:30 pm

SENSORS AND ACTUATORS

CLOISTER ROOM

Chairs: G. Lanzara, H. Yabuno

Zhang Mai Hiroshi Yabuno	A method for measuring the mass of multiple substances simultaneously in viscous environments	2:00 pm – 2:15 pm
Giulia Lanzara	Magneto-Dynamic Characterization of a Silicone Filament Embedded with Magnetic Composite Micro-Spheres	2:15 pm – 2:30 pm
Masoud Naghdi Haifeng Zhang	Evaluating the Shape of a Nonlinear Deformed PVDF Wearable Pressure Sensors by Analyzing the Acoustic Travelling Wave Speed	2:30 pm – 2:45 pm
Giulia Lanzara	Sensing Sound with Electrospun Piezo Materials on a 3D-Printed Structure	2:45 pm – 3:00 pm

NETWORKS SYNCHRONIZATION

ROOM 8

Chairs: J. Park, Sangmoon Lee

Gilad Yakir Yuval Levi Oded Gottlieb	Bifurcations and Chimera States in Self-Excited Inertia Wheel Pendulum Arrays	2:00 pm – 2:15 pm
Omer Livneh Oriel Shoshani	Anomalies in Synchronization of Globally Coupled Mechanical Metronomes	2:15 pm – 2:30 pm
Olesia Dogonasheva	Embedding dimension of the dynamical manifold in the phase space as a measure of chimera states	2:30 pm – 2:45 pm
Andrea Elizabeth Biju Sneha Srikanth Krishna Manoj Samadhan A. Pawar R. I. Sujith	Synchronised States and Transients in Minimal Networks of Oscillators	2:45 pm – 3:00 pm
Xiaolin Yuan Guojian Ren Yongguang Yu Wei Chen	Synchronization of Discrete-Time Fractional Complex Networks with Time Delays Via Event-Triggered Strategy	3:00 pm – 3:15 pm
Dhrubajyoti Biswas Sayan Gupta	Mirroring of synchronization in multilayer configuration of Kuramoto oscillators	3:15 pm – 3:30 pm

NONLINEAR PHENOMENA IN BIO AND ECOSYSTEMS DYNAMICS
FRESCO ROOM

Chairs: A. Cunha, A. Zippo

Antonio Zippo Francesco Pellicano Giovanni Iarriccio	Investigation of Parkinsonian tremor signals troughs nonlinear time series analysis	2:00 pm – 2:15 pm
Americo Cunha Jr David Barton Thiago Ritto	A data-driven uncertainty quantification framework for mechanistic epidemic models	2:15 pm – 2:30 pm
Guido Occhipinti Cosimo Solidoro Roberto Grimaudo Davide Valenti Paolo Lazzari	Non-stationary dynamics in a complex marine biogeochemical model	2:30 pm – 2:45 pm
Marcus Varanis Sadra Hemmati Murilo Filipus Felipe Abreu Jose M. Balthazar C. Nataraj	An Overview on Time-frequency Effects of ECG Signals Using Synchroextracting Transform	2:45 pm – 3:00 pm
Elena Tolkacheva	Novel approaches and â€œsimilarity scoreâ€	3:00 pm – 3:15 pm
Carla Pinto Dumitru Baleanu Amin Jajarmi	Control policies for dengue: insights from a mathematical model	3:15 pm – 3:30 pm

POSTER SESSION 2   CLOISTER AREA

DAY 3 – Wednesday, June 21, 2023   **3:30 pm– 4:00 pm**

FLUID STRUCTURE INTERACTION　　　　　　ROOM 15　https://uniroma1.zoom.us/j/94591107993

Chairs: F. Pellicano, M.M. Sucheendran

Aline Souza de Paula	Use of chaotic invariants to identify regimes in circulating fluidized beds	4:00 pm – 4:15 pm
Jiangming Jin　Jingxiao Huang D. Michael McFarland Alexander Vakakis　Lawrence Bergman　Huancai Lu	Experimental Study of Nonreciprocal Acoustic Energy Transfer in an Asymmetric Nonlinear Vibro-Acoustic System	4:15 pm – 4:30 pm
Xiang Zhao　Xu Jiang　Yinghui Li Weidong Zhu	Semi-analytic solutions for the bending-bending-torsion coupled forced vibrations of a rotating wind turbine blade by means of Green's functions	4:30 pm – 4:45 pm
Varun H S　Sunetra Sarkar	Effect of timescale in the flow fluctuations on a sub-critical aeroelastic system	4:45 pm – 5:00 pm
Mahdi Riazat　Mojtaba Kheiri	Nonlinear dynamics of imperfectly supported pipes conveying fluid	5:00 pm – 5:15 pm
SungWoong Choi	The structural behaviour of 66 kV submarine cable under sea waves and currents effect	5:15 pm – 5:30 pm

COMPUTIONAL NONLINEAR DYNAMICS　　　　ROOM 17　https://uniroma1.zoom.us/j/99558419284

Chairs: L. Rosati, Adrien Melot

Adrien Mélot　Enora Denimal Ludovic Renson	Parametric optimization of fold bifurcation points	4:00 pm – 4:15 pm
Paolo Venini　Marco Pingaro	Robust topology optimization under non-probabilistic uncertainties	4:15 pm – 4:30 pm
Angel Tocino　Samir Llamazares-Elias	Implicit Milstein schemes: the preservation of properties when solving the CIR equation	4:30 pm – 4:45 pm
Jielong Wang　Rongxin Feng	New formula of geometrically exact shell element undergoing large deformation and finite rotation	4:45 pm – 5:00 pm

Jun Lee Hamin Lee Cheonha Park Chang-wan Kim	A Study on Damage to Lithium-ion Battery Separator using Nonlinear Finite Element Analysis	5:00 pm – 5:15 pm
Ritapriya Pradhan Tanushree Bhattacharya Jayanta Bhattacharjee	A perturbation theory for the shape of central force orbits	5:15 pm – 5:30 pm

REDUCED ORDER MODELS

ROOM 24 https://uniroma1.zoom.us/j/93986567844

Chairs: O. Thomas, A. Grolet

Phanindra Tallapragada Colin Rodwell	Embodied hydrodynamic sensing and estimation using Koopman modes	4:00 pm – 4:15 pm
David Andr´as Horv´ath Janos Lelkes Tamas Kalm´ar-Nagy	Analysis of a data-driven planar drone model	4:15 pm – 4:30 pm
Alessandra Vizzaccaro Aurelien Grolet Marielle Debeurre Olivier Thomas	Computing Normal Forms of quadratic differential algebraic equations	4:30 pm – 4:45 pm
Gourav Kumbhojkar Amar K. Gaonkar	Model Order Reduction of Nonlinear Thermal Systems using DEIM	4:45 pm – 5:00 pm
Yongchao Yang Shanwu Li	Data-driven Nonlinear Normal Modal Identification and Reduced-order Modeling: A Physics-integrated Deep Learning Approach	5:00 pm – 5:15 pm

MECHANICAL SYSTEMS AND STRUCTURES

ROOM 5 https://uniroma1.zoom.us/j/98933967561

Chairs: F. Vestroni, Jin-Song Pei

Francesco DAnnibale Manuel Ferretti Angelo Luongo	Nonlinear dynamics of a visco-elastic beam under pulsating dead and follower forces	4:00 pm – 4:15 pm
B Shayak Bala Balachandran	Space sunshade for global warming mitigation: dynamics and station keeping	4:15 pm – 4:30 pm
Diptangshu Paul Jayaprakash K R	Oscillations of a Nonlinear Beam in Contact with a Rigid Cylindrical Constraint	4:30 pm – 4:45 pm
Shadi Khazaaleh Ahmed Dalaq Mohammed Daqaq	Origami Inspired Impact Energy Converter	4:45 pm – 5:00 pm
Meet Mehta Ganesh R.	Rocking Dynamics of Mud Motor Drilling using a Cosserat Rod Model	5:00 pm – 5:15 pm

Ravindra Masana Mohammed Daqaq	On the Statics and Torsional Dynamics of Coupled Kresling Origami Springs	5:15 pm – 5:30 pm

CONTROL OF NONLINEAR SYSTEMS

ROOM 12

Chairs: R. Sedaghati, Ling Hong

Csaba Budai Tamas Haba Gabor Stepan	On the stability of sampled-data systems with viscous damping and dry friction	4:00 pm – 4:15 pm
Ragul Ravi Ju H. Park Mathiyalagan Kalidas	Observer design for semi-linear stochastic partial differential equations	4:15 pm – 4:30 pm
Jose M. Balthazar Mauricio Ribeiro Hilson Henrique Daum	Some comments on Nonlinear Dynamic behaviour and Control of a Duffing 3D oscillator	4:30 pm – 4:45 pm
Panagiota Atzampou Peter Meijers Apostolos Tsouvalas Andrei Metrikine	Motion Control of a Pendulum via Magnetic Interaction	4:45 pm – 5:00 pm
Hongyu Chen Ti Chen	Koopman-Operator-Based Model Predict Control for Attitude Dynamics on SO (3)	5:00 pm – 5:15 pm
Etienne Gourc	Stabilization mechanism of limit cycle oscillation using control-based continuation and phase locked loop	5:15 pm – 5:30 pm

VEHICLE DYNAMICS

ROOM 8

Chairs: J. Knowles, J. Yuan

Illes Voros Denes Takacs	The effects of road curvature on the stability of path-following of automated vehicles	4:00 pm – 4:15 pm
Hanna Zsofia Horvath Adam Balint Feher Denes Takacs	Stability control of two-wheeled trailers	4:15 pm – 4:30 pm
Lukas Bürger Frank Naets	Analysis of nonlinear tire dynamics in high fidelity nonlinear Finite Element simulation	4:30 pm – 4:45 pm
Pankaj Wahi Vaibhav Dhar Dwivedi	Dynamic response of a geometrically nonlinear quarter car model with a MacPherson suspension travelling on a harmonic road profile	4:45 pm – 5:00 pm
Levente Mihalyi Denes Takacs	Reversing Along a Curved Path by an Autonomous Truck-Semitrailer Combination	5:00 pm – 5:15 pm

Chairs: Lei Zuo, E. Abdel-Rahman

João Pedro Norenberg Americo Cunha Jr Samuel da Silva Paulo Sergio Varoto	Probabilistic analysis of an asymmetric bistable energy harvester	4:00 pm – 4:15 pm
Hossam Alqaleiby Mahmoud Ayyad Muhammad R. Hajj Lei Zuo	Effects of energy harvesting from a piezoelectric element attached to a propelling flexible tail.	4:15 pm – 4:30 pm
Kailing Song Michele Bonnin Fabio Traversa Fabrizio Bonani	Stochastic analysis of a bistable piezoelectric energy harvester with a matched electrical load	4:30 pm – 4:45 pm
Shun Chen Liya Zhao	Enhancing Aeroelastic Wind Energy Harvesting Using Quasi-Zero Stiffness	4:45 pm – 5:00 pm

Thursday June 22, 2023
Parallel Sessions

DAY 4 – Thursday, June 22, 2023	9:00 am-10:00 am

COMPUTATIONAL NONLINEAR DYNAMICS

FRESCO ROOM — https://uniroma1.zoom.us/j/99342957733

Chairs: B. Carboni, N. Vaiana

Authors	Title	Time
Ankush Gogoi Satyam Panda Budhaditya Hazra Vikram Pakrashi	Geometric Ito-Taylor Weak 3.0 integration scheme for dynamical systems on manifolds	9:00 am – 9:15 am
Benyamin Mohebi Farzin Kazemi Neda Asgarkhani	Estimating seismic behavior of buckling-restrained braced frames using machine learning algorithms	9:15 am – 9:30 am
Benyamin Mohebi Neda Asgarkhani Farzin Kazemi Natalia Lasowicz	Machine learning-based estimation of interstory drift distribution in reinforced concrete structures	9:30 am– 9:45 am
Antonio Algaba Cinta Domínguez Moreno Manuel Merino Alejandro J. Rodriguez-Luis	Study of a double-zero bifurcation in a Lorenz-like system. Application to the analysis of the Lorenz system	9:45 am – 10:00 am

TRANSIENT DYNAMICS

CLOISTER ROOM — https://uniroma1.zoom.us/j/95077954307

Chairs: S. Lenci, A. Genda

Authors	Title	Time
Attila Genda Alexander Fidlin Oleg Gendelman	Safe Basins of Escape of a Weakly Damped Particle in a Truncated Quadratic Potential Well Under Harmonic Excitation	9:00 am – 9:15 am
giovanna Zimatore Giuseppe Orlando Maria Chiara Gallotta Cassandra Serantoni Giuseppe Maulucci Marco De Spirito	Locating transition behaviour in nonlinear signals	9:15 am – 9:30 am
György Károlyi Tamás Tél Dániel Jánosi	The transient charm of decay	9:30 am– 9:45 am
Teddy Craciunescu Andrea Murari	Detection of Regime Changes in the Dynamics of Thermonuclear Plasmas for the Disruptions Prediction Improvement	9:45 am – 10:00 am

MECHANICAL SYSTEMS AND STRUCTURES   ROOM 7   https://uniroma1.zoom.us/j/94284641396

Chairs: S. Sorrentino, Pankaj Wahi

Matteo Viscoti Francesco Tornabene Rossana Dimitri	Higher order theories for the static and dynamic analysis of anisotropic shell structures	9:00 am – 9:15 am
Phanindra Tallapragada	Internal actuators and parametric oscillations in unconventional robotic locomotion	9:15 am – 9:30 am
Michael Selwanis Mohammed Ibrahim Mohamed Khadr Ahmed Nemnem	Free balls in rotating or non-rotating tracks can mitigate rotor vibration	9:30 am– 9:45 am
Jayanta Kumar Dutt Krishanu Ganguly	Study of the effect of non-linear end supports on the unbalance response of the elastic shaft	9:45 am – 10:00 am

CONTROL OF NONLINEAR SYSTEMS   ROOM 5   https://uniroma1.zoom.us/j/91443707522

Chairs: Ling Hong, Yongguang Yu

Hector Vargas Alvarez Gianluca Fabiani Nikolas Kazanztis Constantinos Siettos Ioannis Kevrekidis	Control via Nonlinear Feedback Linearization with Machine Learning	9:00 am – 9:15 am
Rania loukil Ep kessentini	The migration of a Neural Network Observer training using the Deep Learning approach	9:15 am – 9:30 am
Marjan Moghanipour Afshin Banazadeh	Image-based aerial grasping of a moving target based on model predictive control	9:30 am– 9:45 am
Yinnan Luo Ulrich J. Römer Marten Zirkel Lena Zentner Alexander Fidlin	The Influence of a Non-Instantaneous Double Support Phase on the Efficiency of a HZD Controlled Bipedal Robot	9:45 am – 10:00 am

CHAOTIC SYSTEMS AND UNCERTAINITY   ROOM 24   https://uniroma1.zoom.us/j/94467955220

Chairs: Marcelo Messias, Lobna Said

Eric Campos-Canton Hector E. Gilardi-Velazquez Guillermo Huerta-Cuellar	Coexistence of hidden attractor and self-excited attractors on the plane	9:00 am – 9:15 am

Hisham Elrefai Lobna Said	Compact Multiplier-less CORDIC-Based on FPGA Implementation of a Sine map for Chaotic Applications	9:15 am – 9:30 am
aymene bacha Abdelghani Chelihi Chouki Sentouh	Fixed-time adaptive neural tracking control for a helicopter-like twin rotor MIMO system	9:30 am– 9:45 am
Sid Hichem Azzaz Mohamed salah Saadoudi Said	A new key generator based on an auto-switched hybrid chaotic system and its FPGA implementation	9:45 am – 10:00 am

BIOLOGICAL SYSTEMS DYNAMICS   ROOM 15   https://uniroma1.zoom.us/j/91910838515

Chairs: C. Nataraj, V.A. Makarov

Valeri Makarov Sergey Lobov Vasilisa Stepasyuk Julia Makarova	Synaptic scaling enables extreme selectivity in high-dimensional neurons	9:00 am – 9:15 am
Yasser Aboelkassem	Multiscale Model of Cardiac Muscle Contraction using Langevin Dynamics and Biological Elastic Network Analysis	9:15 am – 9:30 am
Samares Pal Sasanka Shekhar Maity Joydeb Bhattacharyya	Effects of rising sea surface temperature on the dynamics of coral-algal interactions	9:30 am– 9:45 am
Purnedu Mishra Dariusz Wrzosek	Chemical Signalling and Pattern Formation in Schoener's Predator-Prey Model	9:45 am – 10:00 am