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# GFPS 2022

**FINAL PROGRAM**

## 2022 IEEE Global Fluid Power Society PhD Symposium

**Napoli - Italy | October 12 - 14, 2022**  
Congress Centre of the University Federico II

### GENERAL CHAIRS

**Adolfo Senatore**  
*University of Naples Federico II*  
Naples, Italy

**Emma Frosina**  
*University of Sannio*  
Benevento, Italy



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**2022 IEEE Global Fluid Power Society  
PhD Symposium**

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## GENERAL CHAIRS

**Adolfo Senatore**, *University of Naples Federico II, Italy*

**Emma Frosina**, *University of Sannio, Benevento, Italy*

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**Pasquale Borriello**, *University of Naples Federico II, Italy*

**Raffaele De Rosa**, *University of Naples Federico II, Italy*

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**Luca Romagnuolo**, *University of Naples Federico II, Italy*

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**Travis Wiens**, *University of Saskatchewan, Canada*

**Barbara Zardin**, *University of Modena and Reggio Emilia, Italy*

## ORGANIZING SECRETARIAT



EVENTI E CONGRESSI

Rione Sirignano 5 - 80121 Napoli (Italy)

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[www.mcmcongressi.it](http://www.mcmcongressi.it)



## GENERAL INFORMATION

### SYMPOSIUM VENUE

Congress Centre, University of Naples Federico II  
Address: Via Partenope, 36 - Napoli (Italy)

### REGISTRATION AND SYMPOSIUM SECRETARIAT

Location: Congress Centre, Ground floor

### OPENING TIME:

October 11, 2022: from h. 02.00 pm to 07.00 pm

October 12, 2022: from h. 08.30 am to 06.00 pm

October 13, 2022: from h. 08.30 am to 06.00 pm

October 14, 2022: from h. 08.30 am to 05.00 pm

**An Info Point will be located in the Exhibition area at the first floor**

### ONSITE REGISTRATION FEES

Regular: eur 600,00

Student: eur 250,00

Ticket for welcome cocktail on October 11: eur 75,00

Ticket for social dinner on October 13: eur 100,00

**Additional tickets for social event can be purchased at the onsite secretariat desks and are subjected to availability of places**

All prices are VAT 22% included

### NAME BADGE

For identification purpose and admission to the Symposium badges are expected to be worn at all times during the symposium.

**INTERNET WIRELESS** connection is available at the conference venue and the account for login will be provided during the conference.

### MEALS

Coffee breaks and lunches will be served according to the program schedule at the Symposium site on the first floor.

### DRESS CODE

Smart casual is suggested for academic sessions, welcome cocktail and social dinner.

### CURRENCY EXCHANGE

Most banks provide exchange service for foreign currency and traveler's checks. Credit cards such as Mastercard, Visa and Amex are accepted in most hotels, shopping centers and restaurants. However, they may not be accepted at small scaled shops or restaurants.

### ELECTRICITY

The voltage is 220V in Italy.

### TIPS & TAX

Tipping is welcome but not mandatory for taxi and restaurants

### PRESENTER INSTRUCTIONS

#### Oral Presentations

Presentations should last no longer than 25 including 5 minutes for discussion and changeover to the next speaker. The screen is in widescreen (16:9) format.

Each speaker is requested to bring along with them the presentation on a USB pen and to upload the presentation at the technical console located next to both rooms at least 1 hour before the session starts.

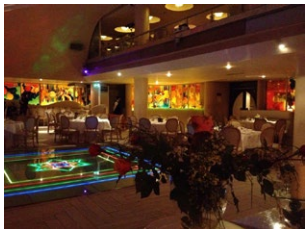


## AUDIO-VISUAL EQUIPMENT

Presentation room is equipped with projector for computer based presentations. Presentations should be prepared in PowerPoint or PDF. Presenters will be provided with a remote controller, with integrated laser pointer, that can be used to advance slides in PowerPoint. Slides with movies (*format .MOV or MP4*) must be checked for playback on the laptop. For Mac users: Power Point slides are normally compatible. If you use "Keynote" please take care that the file is converted in PDF. The use of one's personal laptop is strongly discouraged.

## SOCIAL PROGRAM INFORMATION

### WELCOME COCKTAIL



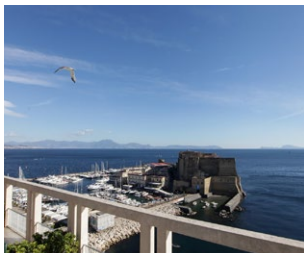
*Time:* 07:00-09.00 pm, October 11<sup>th</sup>

*Venue:* Roof Top Hotel Royal (10<sup>th</sup> Floor)

*Address:* Via Partenope, 38 (seafront district)

The venue is located at walking distance from the Congress Centre

### SOCIAL DINNER



*Time:* 07.30-11.00 pm, October 13<sup>th</sup>

*Venue:* Rosolino Club Restaurant

*Address:* Via Nazario Sauro 7

A nice typical Neapolitan entertainment will be offered to the participants.

The venue is located at walking distance from the Congress Centre

## TECHNICAL VISIT TO STEMS

Technical visit to STEMS Research Laboratories

*Time:* 03.00 pm – 06.30 pm

*Address:* Viale Marconi, 4

Participation is limited to delegates who did reserve their seat in advance.

A bus will depart from the Hotel Royal Continental (Via Partenope, 38) at h. 03.00 pm and will return at h. 06.30 pm

## MULTIFUNCTIONAL SPACE

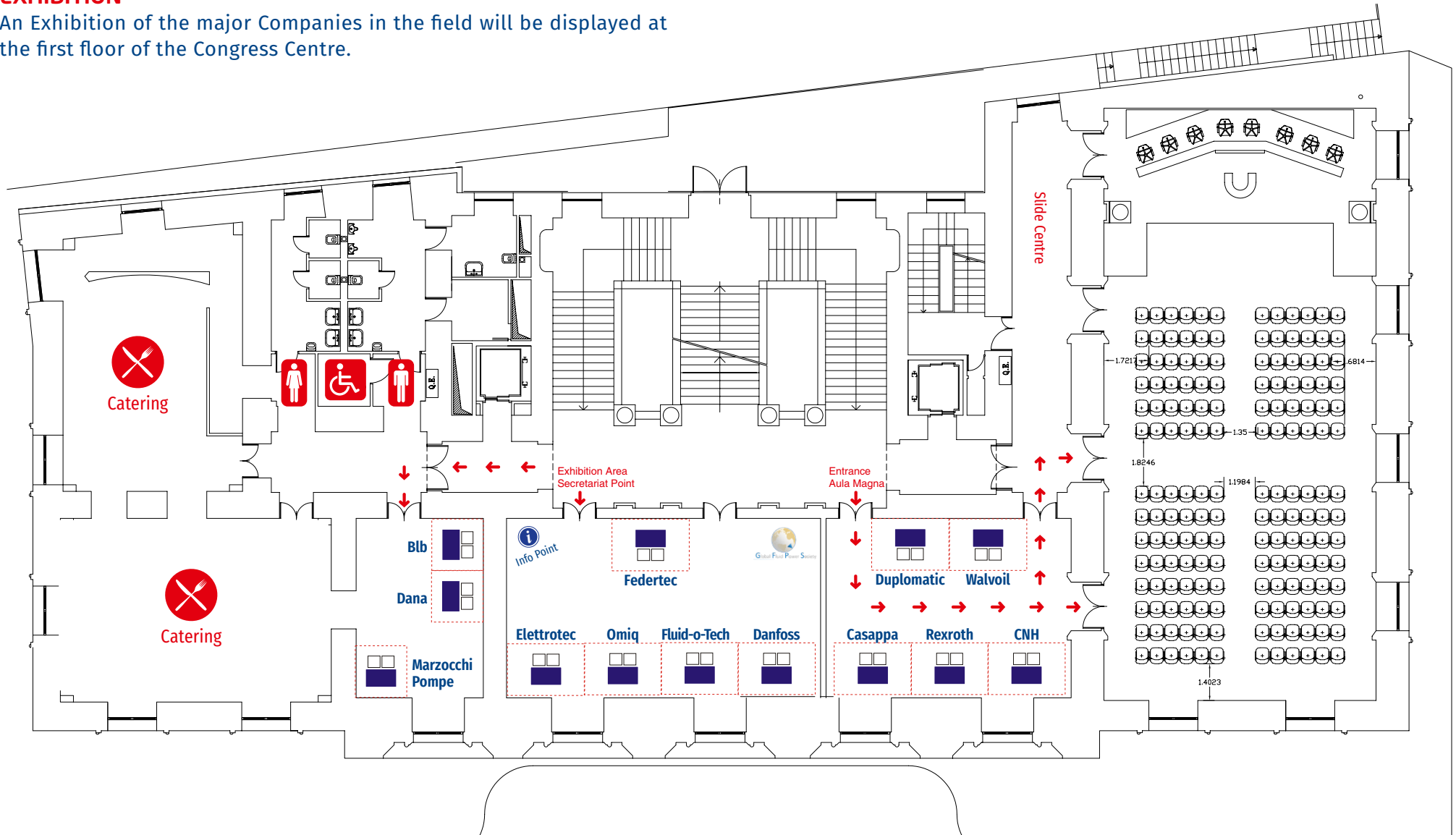
A multifunctional space will be at the participants' disposal on October 12, 13 from h. 9.30 to 18.00 and on October 14 from h. 9.30 to 16.00.

The space is located on the 3<sup>rd</sup> floor of the Congress Centre and equipped with wifi connection, desks, armchairs and tables for meetings or as workspace.



## EXHIBITION

An Exhibition of the major Companies in the field will be displayed at the first floor of the Congress Centre.





## OUR SPONSORS

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## PROGRAM AT A GLANCE

### TUESDAY, OCTOBER 11, 2022

02:00 pm | 07:00 pm Registrations @Congress Centre of the University Federico II  
 03:00 pm | 06:30 pm Technical Visit @Stems Laboratories  
 07:00 pm | 09:00 pm Welcome Cocktail @Hotel Royal Continental

### WEDNESDAY, OCTOBER 12, 2022

08:30 am Registrations

**AULA MAGNA | 1<sup>st</sup> floor**  
**Opening Ceremony**

09:00 am | 10:00 am

10:00 am | 10:45 am **Plenary Session 1: Rudolf Sheidl: "Symbiotic Fluid Power"**

10:45 am | 11:15 am *Coffee Break*

<b>AULA MAGNA   1<sup>st</sup> floor</b>	<b>AULA A   Ground floor</b>
<b>Session 1 - Pumps and Motors 1</b>	<b>Session 4 - Fluid power components, architectures and systems 1</b>

11:15 am | 01:00 pm

01:00 pm | 02:00 pm *Lunch*

<b>Session 2 - General Session 1</b>	<b>Session 5- Pumps and Motors 2</b>
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02:00 pm | 03:40 pm

03:40 pm | 04:10 pm *Coffee Break*

<b>Session 3- Fluid power components, architectures and systems 2</b>	<b>Session 6 - Novel energy efficient components and systems</b>
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04:10 pm | 05:50 pm

### THURSDAY, OCTOBER 13, 2022

<b>AULA MAGNA   1<sup>st</sup> floor</b>	<b>AULA A   Ground floor</b>
<b>Session 7 - Control methodologies for fluid power systems and applications</b>	<b>Session 10 - Pumps and Motors 3</b>

09:00 am | 10:40 am

10:40 am | 11:20 am *Coffee Break*

**AULA MAGNA | 1<sup>st</sup> floor**

11:20 am | 12:05 pm **Plenary Session 2 - Katharina Schmitz: "Fluid Power - A sustainable motion technology"**

12:05 pm | 01:00 pm *Lunch*

**AULA MAGNA | 1<sup>st</sup> floor**

01:00 pm | 03:00 pm **Industry panel 1 - Technology trends and R&D methods**

<b>AULA MAGNA   1<sup>st</sup> floor</b>	<b>AULA A   Ground floor</b>
<b>Session 8 - Fluid power drives and transmissions 1</b>	<b>Session 11 - Tribology</b>

03:00 pm | 04:40 pm

04:40 pm | 05:10 pm *Coffee Break*

<b>Session 9- Mobile and aerospace applications</b>	<b>Session 12 - Control methodologies for fluid power systems and applications</b>
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05:10 pm | 06:50 pm

07:30 pm | 11:00 pm **Gala Dinner - Rosolino Club Restaurant**

### FRIDAY, OCTOBER 14, 2022

<b>AULA MAGNA   1<sup>st</sup> floor</b>	<b>AULA A   Ground floor</b>
<b>Session 13 - Pumps and Motors 4</b>	<b>Session 15 - Fluid power components, architectures and systems 3</b>

09:00 am | 10:40 am

10:40 am | 11:20 am *Coffee Break*

**AULA MAGNA | 1<sup>st</sup> floor**

11:20 pm | 12:05 pm **Plenary Session 3 - Kim A. Stelson: "Energy Saving Fluid Power Technology for Off-Highway Vehicles"**

12:05 pm | 01:00 pm *Lunch*

**AULA MAGNA | 1<sup>st</sup> floor**

01:00 pm | 03:00 pm **Industry panel 2 - Applied Innovations**

<b>AULA MAGNA   1<sup>st</sup> floor</b>	<b>AULA A   Ground floor</b>
<b>Session 14- Fluid power drives and transmissions 2</b>	<b>Session 16 - General Session 2</b>

03:00|04:40PM

4.40 pm **Ending Ceremony**





## FINAL PROGRAM

### Tuesday, October 11, 2022

02:00 pm | 07:00 pm Registrations @Congress Centre of the University Federico II

03:00 pm | 06:30 pm Technical Visit @Stems Laboratories

07:00 pm | 09:00 pm Welcome Cocktail @Hotel Royal Continental

### Wednesday, October 12, 2022

Congress Centre of the University Federico II

08:30 am Registrations

### AULA MAGNA | 1<sup>st</sup> Floor

Wednesday, October 12, 2022

09:00 am | 10:00 am **OPENING CEREMONY**

10:00 am | 10:45 am **PLENARY SESSION 1 | "SYMBIOTIC FLUID POWER"**  
Rudolf Sheidl

10:45 am | 11:15 am *Coffee Break*

11:15 am | 01:00 pm **SESSION 1 | PUMPS AND MOTORS 1**  
Chair: Massimo Rundo

11:15 am | 11:40 am **Analysis of Compensation Ratios and Control Torques of an Axial Piston Pump with Rotated Valve Plates**  
**T. Heeger**; S. Wegner; L. Ericson

11:40 am | 12:05 pm **A CFD Methodology for the Analysis of the Slipper-Swash Plate Dynamic Interaction in Axial Piston Pumps**

**G. Muzzioli**; F. Paltrinieri; L. Montorsi; M. Milani

12:05 pm | 12:30 pm **Validated Efficiency Improvements by Implementation of Structures on the Slipper Surface of an Axial Piston Pump**

**S. Horn**; R. Ivantysyn; J. Weber

12:30 pm | 12:55 pm **Design of a Lead-Free Slipper Bearing for Low Speed Axial Piston Pump Applications**

**R. Ivantysyn**; S. Horn; J. Weber

01:00 pm | 02:00 pm *Lunch*

**02:00 pm | 03:40 pm SESSION 2 | GENERAL SESSION 1**

Chair: Luca Romagnuolo

02:00 pm | 02:25 pm **Combined Multidimensional Approaches for the Simulation of Flow Trough a Wall-Flow Particulate Filter**

**A.N. Impiombato**, G. Discepoli, F. Paltrinieri, M. Milani, L. Montorsi

02:25 pm | 02:50 pm **Using Nonlinear Observers as Virtual Sensors in Hydraulically Actuated Equipment in Industrial IoT Systems**

**V. Zhidchenko**; Y. Shabbouei Hagh; E. Startcev; H. Handroos

02:50 pm | 03:15 pm **Dynamic Fluid Simulation of Hydraulic Oil Flow Inside Fatigue Cracks During Transient Loads**

**L. Michiels**; M. Geimer

03:15 pm | 03:40 pm **Implementation of a Variational Autoencoder for Dimension Reduction of a Hydraulic System**

**F. Brumand-Poor**; F. Makansi; J. Liao; K. Schmitz

03:40 pm | 04:10 pm *Coffee Break*



04:10 pm | 05:50 pm **SESSION 3 | FLUID POWER COMPONENTS,  
ARCHITECTURES AND SYSTEMS 2**  
Chair: **Yannick Duensing**

- 04:10PM | 04:35 pm **An Efficient Simulation Approach to Determine the Thermal Equilibrium of Drive Systems in Mobile Machinery**  
**E. Pohl**; S. Osterland; J. Weber
- 04:35 pm | 05:00 pm **Digital Electro Hydraulic Actuator with Variable Speed Digital Hydraulic Pump: A Design Overview**  
**D. Oliveira e Silva**; M.P. Nostrani; R.S. Lopes Junior; G. Waltrich; P. Krus; V.J. De Negri
- 05:00 pm | 05:25 pm **Modelling and Frequency Domain Analysis of Fluid-Structure Interaction in a Bent Pipeline**  
**P. Treml**; B. Manhartsgruber
- 05:25 pm | 05:50 pm **Parametric Stability Analysis of Pneumatic Valves Using Convex Optimization**  
**G. de Carvalho**; P. Massioni; E. Bideaux; S. Sesmat; F. Bristiel

**AULA A | Ground Floor**  
Wednesday, October 12, 2022

11:15 am | 12:55 pm **SESSION 4 | FLUID POWER COMPONENTS,  
ARCHITECTURES AND SYSTEMS 1**  
Chair: **Tatiana Minav**

- 11:15 am | 11:40 am **A Piezo-Electrically Actuated Valve for Hydraulic Exoskeleton Drives - Modelling and Measurement of a Prototype**  
**P. Zagar**; R. Scheidl
- 11:40 am | 12:05 pm **Different Solutions for the Achievement of Variable Margin Load Sensing Systems: Energy Saving and Increased Performance**  
**D. Mesturini**; M. Scolari; F. De Martino; U. Busani
- 12:05 pm | 12:30 pm **Numerical Simulations of a High Frequency Switching 4/2 ON/OFF Valve for Pulse Modulation Switching Digital Circuits**  
**F. Sciatti**; P. Tamburrano; A.R. Plummer; E. Distaso; P. De Palma; R. Amirante
- 12:30 pm | 12:55 pm **Design for Structural Durability of an Hydraulic Main Valve for Mobile Applications**  
F. Ciardo; G. Meneghetti; E. Caldesi; C. Dolcin;  
**A. Cervi**; D. Mesturini
- 01:00 pm | 02:00 pm *Lunch*



**02:00 pm | 03:40 pm SESSION 5 | PUMPS AND MOTORS 2**

Chair: **Fabrizio Paltrinieri**

- 02:00 pm | 02:25 pm **Analyses of Engineered Surfaces for Performance Improvements of External Gear Pumps**  
**P. Casoli**, F. Scolari, C.M. Vescovini, C. Rossi, A. Lettini
- 02:25 pm | 02:50 pm **Numerical Modeling of Helical External Gear Pump Through a Novel CFD Approach Using Simerics MP+**  
**P. Mazzei**; A. Senatore; E. Frosina; S. Bulleri
- 02:50 pm | 03:15 pm **Numerical Modeling of Helical External Gear Pump Through a Lumped Parameter Approach**  
**P. Mazzei**; E. Frosina; S. Bulleri; A. Senatore
- 03:15 pm | 03:40 pm **High Fidelity Data Generation and Fault Diagnosis of a Gear Pump**  
**K. Lakshmanan**; F. Tessicini; A.J. Gil; F. Auricchio
- 03:40 pm | 04:10 pm *Coffee Break*

**04:10 pm | 05:50 pm SESSION 6 | NOVEL ENERGY EFFICIENT COMPONENTS AND SYSTEMS**

Chair: **Eric Bideaux**

- 04:10 pm | 04:35 pm **System for Recovering Energy in Hydraulic Circuit by Using a Small Pelton Turbine**  
**M. Rizzoli**; G. Cillo; B. Zardin; D. Manfredi; M. Borghi
- 04:35 pm | 05:00 pm **Path Planning and Lightweight Design of 3D Fluid Channels Based on Additive Manufacturing**  
Y. Zhu; **Y. Gu**
- 05:00 pm | 05:25 pm **A Practical Numerical Method to Map the Energy Efficiency of Individual Electro-Hydraulic Drives**  
**D. Padovani**
- 05:25 pm | 05:50 pm **Development of a Bi-Stable Mechanism for Efficiency Optimization of Pneumatic Pressure Boosters**  
**M. Schmid**; O. Reinertz; K. Schmitz

**Thursday, October 13, 2022**

**AULA MAGNA | 1<sup>st</sup> Floor**

Thursday, October 13, 2022

**09:00 am | 10:40 am SESSION 7 | CONTROL METHODOLOGIES FOR FLUID POWER SYSTEMS AND APPLICATIONS 1**

Chair: **Damiano Padovani**

- 09:00 am | 09:25 am **Loading System for Wind Turbine Drivetrain Test Bench with Model-Based Compensation Control Strategy**  
**D. Li**; Y. Gu; Y. Lin; J. Song; X. Feng; H. Liu
- 09:25 am | 09:50 am **Cartesian Damping Controller with Nonlinear Control for a Floating-Base Hydraulic Manipulator**  
**P. Mustalahti**; J. Mattila
- 09:50 am | 10:15 am **Real-Time Trajectory Scaling Algorithm for Hydraulic Manipulators Subject to Limited On-Board Power**  
**L. Hulttinen**; J. Mattila
- 10:15 am | 10:40 am **Compliance Motion Control of the Hydraulic Dual-Arm Manipulator Based on Virtual Decomposition Control**  
**B. Sun**; M. Cheng; R. Ding; B. Xu; J. Mattila
- 10:40 am | 11:20 am *Coffee Break*

**11:20 am | 12:05 pm PLENARY SESSION 2 | "FLUID POWER - A SUSTAINABLE MOTION TECHNOLOGY"**

**Katharina Schmitz**

12:05 pm | 01:00 pm *Lunch*



01:00 pm | 03:00 pm **INDUSTRY PANEL SESSION 1**  
**TECHNOLOGY TRENDS AND R&D METHODS**

Chair: **Andrea Vacca**

01:00 pm | 01:15 pm **Digitalization to support new challenges towards electrification**

Marco Brunelli



01:15 pm | 01:30 pm **Casappa Innovation pills on Digitalization & Electrification**

Marco Guidetti



01:30 pm | 01:45 pm **Virtual simulation and digital twin to improve the design of off-road machines**

Gennaro Monacelli



01:45 pm | 02:00 pm **DANA'S SYSTEMIC APPROACH FOR NEW TECHNOLOGIES AND INTEGRATED FUNCTIONS R-EVOLUTION**

Luca Riccò



02:00 pm | 02:15 pm **DDP & Editron Drive as new, intelligent and efficient Danfoss system solution**

Marco Zecchi



02:15 pm | 02:30 pm **Two good reasons to use CFD in the development of Fluid Power Components**

Federico Monterosso



02:30 pm | 02:45 pm **A conservative science based on solid roots with a broadening multidisciplinary future. The vision of Parker Hannifin**

Germano Franzoni



02:45 pm | 03:00 pm **Final discussion**



03:00 pm | 04:40 pm **SESSION 8 - FLUID POWER DRIVES AND TRANSMISSIONS 1**

Chair: **Luca Montorsi**

03:00 pm | 03:25 pm **Experimental Investigation of the Suction Capabilities of an Innovative High Speed External Gear Pump for Electro-Hydraulic Actuated Automotive Transmissions**

**M. Milani**; L. Montorsi; F. Paltrinieri

03:25 pm | 03:50 pm **Study of a Dual Layout Input-To-Output Coupled Hydromechanical Transmission**

A. Rossetti; N. Andretta; **A. Macor**

03:50 pm | 04:15 pm **Simulation Model of Hydraulic Generator with Variable Flow Direction**

**K. Dąbek**, K. Kędzia, P. Osiński

04:15 pm | 04:40 pm **CFD and SPH Methodologies: A Predictive Capability Comparison Based on a Real Test Case**

G. Muzzioli; **M. Venturelli**; P. P. Rinaldi; M. Stefani; F. Paltrinieri; L. Montorsi; M. Milani

04:40 pm | 05:10 pm *Coffee Break*

05:10 pm | 06:50 pm **SESSION 9 - MOBILE AND AEROSPACE APPLICATIONS**

Chair: **Heikki Markos Handroos**

05:10 pm | 05:35 pm **Energy-Efficiency Comparison of Different Implement Power-Train Concepts to Each Other and Between Different Heavy-Duty Mobile Machines**

**D. Fassbender**; C. Brach; T. Minav

05:35 pm | 06:00 pm **0D-1D Numerical Modelling of a Battery Cooling System Used in BEVs Under Different Driving Operating Scenarios**

**F. Denti**; G. Discepoli; M. Venturelli; F. Paltrinieri; L. Montorsi; M. Milani

06:00 pm | 06:25 pm **Degradation Identification of an EHA Piston Pump by Analysis of Load-Holding States**

**Y. Duensing**; A. Merkel; K. Schmitz

06:25 pm | 06:50 pm **CFD Simulations of Flow Field in Flapper-Nozzle Pilot Valve with Vortex Generators**

**T. Li**; J. Peng; S. Li

07:30 pm | 11:00 pm *Social dinner*



## AULA A | Ground Floor

Thursday, October 13, 2022

### 09:00 am | 10:40 am SESSION 10 | PUMPS AND MOTORS 3

Chair: **Roman Ivantysyn**

09:00 am | 09:25 am **Development of a Numerical Approach for the CFD Simulation of a Gear Pump Under Actual Operating Conditions**

**F. Orlandi**; G. Muzzioli; M. Milani; F. Paltrinieri; L. Montorsi

09:25 am | 09:50 am **Simulation Model of a Helical Gear Pump for the Evaluation of the Filling Capability**

**A. Corvaglia**; M. Rundo; S. Bonati; M. Rigosi

09:50 am | 10:15 am **Modelling and Experimental Validation of the Dynamic Startup Behavior of External Spur Gear Motor**

**A. J Pawar**; A. Vacca; M. Rigosi

10:15 am | 10:40 am **CFD Simulation of Helical External Gear Pump with Asymmetric Tooth Profile: Development of 3D Helical Mesh Generation and Motion Algorithm and Experimental Validation**

**U. Duzel**; S. Dhar; M. Zecchi; H. Gao; H. Ding

10:40 am | 11:20 am *Coffee Break*

### 03:00 pm | 04:40 pm SESSION 11 | TRIBOLOGY

Chair: **Luca Romagnuolo**

03:00 pm | 03:25 pm **Influence of the Pressure-Viscosity Behavior of Different Base Oils on the Formation of Lubricating Films in Tribological Contacts**

**S. Deuster**; A. Holzer; K. Schmitz

03:25 pm | 03:50 pm **Topology Optimization of Fluid Cooling Systems for Machine Tools**

**C. Steiert**; J. Weber; J. Weber

03:50 pm | 04:15 pm **Thermal-Fluid Optimization Model of Small-Scale Hydraulic Conduits**

**J. J. Bies**; W. Durfee

04:15 pm | 04:40 pm **Elastodynamic Performance Evaluation and Comparison in Hydraulic and Electromechanical Linear Actuator Driven Heavy-Duty Manipulators**

A. Vesterinen; G. R. Petrović; J. Mattila

04:40 pm | 05:10 pm *Coffee Break*

### 05:10 pm | 06:50 pm SESSION 12 - CONTROL METHODOLOGIES FOR FLUID POWER SYSTEMS AND APPLICATIONS 2

Chair: **Pauli Mustalahti**

05:10 pm | 05:35 pm **Pressure Feedback Control of Electro-Hydraulic Actuators Using Fixed Displacement Hydraulic Machines**

S. Qu; **H. Assaf**; A. Vacca; E. Busquets

05:35 pm | 06:00 pm **Active Damping Control of the Large-Scale Flexible Hydraulic Manipulators with Independent Metering System**

**R. Jia**; J. Zhang; R. Ding; F. Zhang; J. Shen; B. Xu

06:00 pm | 06:25 pm **New Hydraulic Control Technologies for Improving the Energy Efficiency of the Hydraulic System of Agricultural Tractors and Their Implements**

X. Tian; X. Guo; P. Stump; **G.B. Dessy**; A. Vacca; S. Fiorati; F. Pintore

06:25 pm | 06:50 pm **Energy Saving Enhancement Through 3-Way Downstream Compensator Main Valve, a Viable Option for Efficient Off-Highway Applications**

**C. Dolcin**; G. Ganassi; U. Busani; F. De Martino

07:30 pm | 11:00 pm *Social dinner*



## Friday, October 14, 2022

Congress Centre of the University Federico II

### AULA MAGNA | 1<sup>st</sup> Floor

Friday, October 14, 2022

#### 09:00 am | 10:40 am SESSION 13 | PUMPS AND MOTORS 4

Chair: **Antonio Rossetti**

09:00 am | 09:25 am **Design, Modeling, and Experimental Characterization of a Fast Additively Manufacturable MRI-Compatible Pneumatic Motor for Surgical Robots**  
**M. Li**; J. Zhang; X. Wu; J. Yuan; X. Wang; Y. Ye; B. Ding

09:25 am | 09:50 am **CFD Modelling Strategies for Pendulum Pumps**  
**F. Monterosso**

09:50 am | 10:15 am **A Study on a Twin-Screw Pump for Thermal Management Systems by Means of CFD Using SimericsMP+<sup>®</sup>: Experimental Validation and Focus on Pressure Pulsation**  
**P. Borriello**; E. Frosina; P. Lucchesi; A. Senatore

10:15 am | 10:40 am **Elika, Variable Flow with Fixed Displacement Helical Pump**  
C. Marzocchi Tabacchi; **A. Rimondi**; D. Persici

10:40 am | 11:20 am *Coffee Break*

#### 11:20 am | 12:05 pm **PLENARY SESSION 3 | "ENERGY SAVING FLUID POWER TECHNOLOGY FOR OFF-HIGHWAY VEHICLES"**

**Kim A. Stelson**

12:05 pm | 01:00 pm *Lunch*

#### 01:00 pm | 03:00 pm **INDUSTRY PANEL SESSION 2**

##### **APPLIED INNOVATIONS**

Chair: **Emma Frosina**

01:00 pm | 01:15 pm **The Future of Electronified Hydraulics**  
Enrique Busquets



A Bosch Company

01:15 pm | 01:30 pm **Off-road electrified vehicle and hydraulics evolution**  
Davide Cristofori



01:30 pm | 01:45 pm **A new paradigm for improving energy-efficiency through Synchronous Reluctance Motor Technology**  
Paolo Leutenegger



01:45 pm | 02:00 pm **Fluid-o-Tech: Smart Fluidics and Digitalization**  
Diego Andreis



02:00 pm | 02:15 pm **Silent Modular Pumps Development**  
Carlo Marzocchi





02:15 pm | 02:30 pm **From Component to System: a change of approach for an efficient hydraulics**

Davide Mesturini



02:45 pm | 03:00 pm **Final discussion**

**03:00 pm | 04:40 pm SESSION 14 | FLUID POWER DRIVES AND TRANSMISSIONS 2**

Chair: **Barbara Zardin**

03:00 pm | 03:25 pm **Modeling and Design of a Parallel Electric-Hydraulic Hybrid Wheel Loader Considering Battery Aging**

**H. Zhang**; F. Wang; B. Xu

03:25 pm | 03:50 pm **Design of a Hydromechanical Transmission for a City Streetsweeper: Efficiency and Fuel Consumption Evaluation**

**F. Alberti**; D. D'Andrea; G. Risitano; A. Rossetti;  
L. Scappaticci

03:50 pm | 04:15 pm **Study on the Energy Efficiency Performance of a Battery-Powered Hybrid Hydrostatic Wheel Loader**

**Q. Zhang**; F. Wang; B. Xu

04:15 pm | 04:40 pm **An Electric-Hydrostatic Energy Storage Solution to Hydraulic Hybrid Powertrains**

**Z. Lin**; F. Wang; B. Xu

**04:40 pm ENDING CEREMONY**

## AULA A | Ground Floor

Friday, October 14, 2022

**09:00 am | 10:40 am SESSION 15 | FLUID POWER COMPONENTS, ARCHITECTURES AND SYSTEMS 3**

Chair: **Paolo Tamburrano**

09:00 am | 09:25 am **Generation and Validation of a Real Time Multibody Model for Off-Highway Vehicles, Aiming at the Design of Suspension Systems**

**A. Fornaciari**; B. Zardin; M. Borghi

09:25 am | 09:50 am **A Parametric Study on Architectures Using Common-Pressure Rail Systems and Multi-Chamber Cylinders**

**M. Bertolin**; A. Vacca

09:50 am | 10:15 am **Challenges in the Designing Process of Hydraulic Cylinders Made of Plastics**

**P. Stryczek**

10:15 am | 10:40 am **Identifying The Future Research Trend for Using Speed-Controlled Hydraulic Cylinders in Offshore Applications through Literature Survey**

**W. Zhao**; M.K. Ebbesen; T.O. Andersen

10:40 am | 11:20 am *Coffee Break*

12:05 pm | 01:00 pm *Lunch*

**03:00 pm | 04:40 pm SESSION 16 | GENERAL SESSION 2**

Chairman: **Victor Zhidchenko**

03:00 pm | 03:25 pm **Evaluation of Nonlinear MIMO Controllers for Independent Metering in Mobile Hydraulics**

**L. Bachmann**; A. Sitte; J. Weber





03:25 pm | 03:50 pm **The Modeling and Simulation of a Solenoid Valve for Industrial Applications**

**K. Upadhyay**; S. Ma; R. Yu; H. Zhou

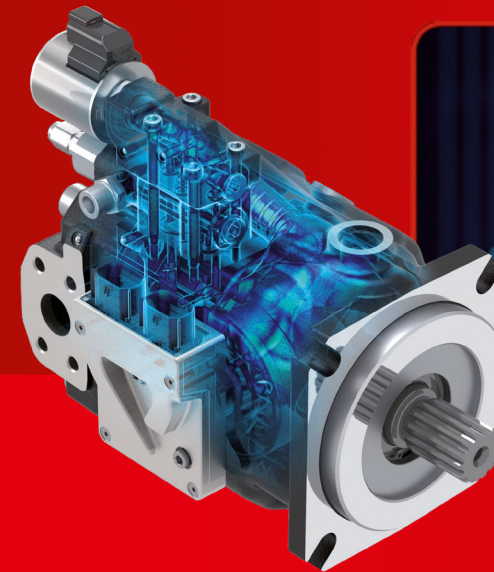
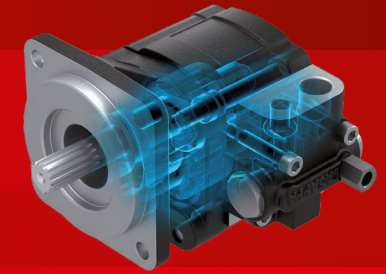
03:50 pm | 04:15 pm **Connecting Innovations: a Novel Platform and Assisted Marketplace to Drive Deep Decarbonization in Industrial Automation**

**E. Rakova**

04:15 pm | 04:40 pm **An innovative solution to control a highly complex actuation plant**

**P. Leutenegger**

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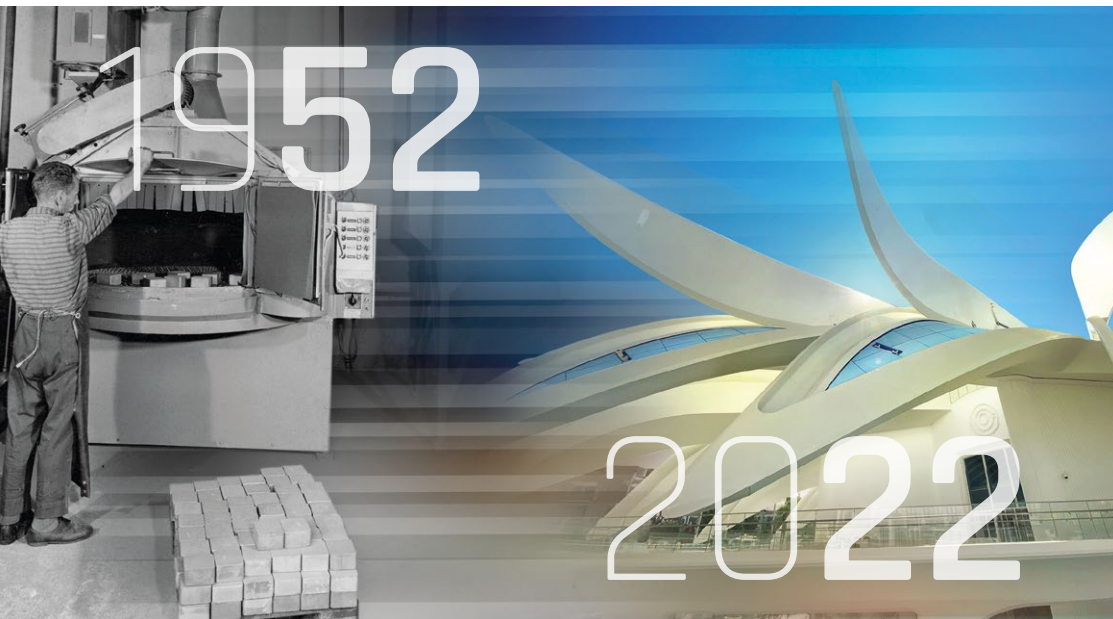
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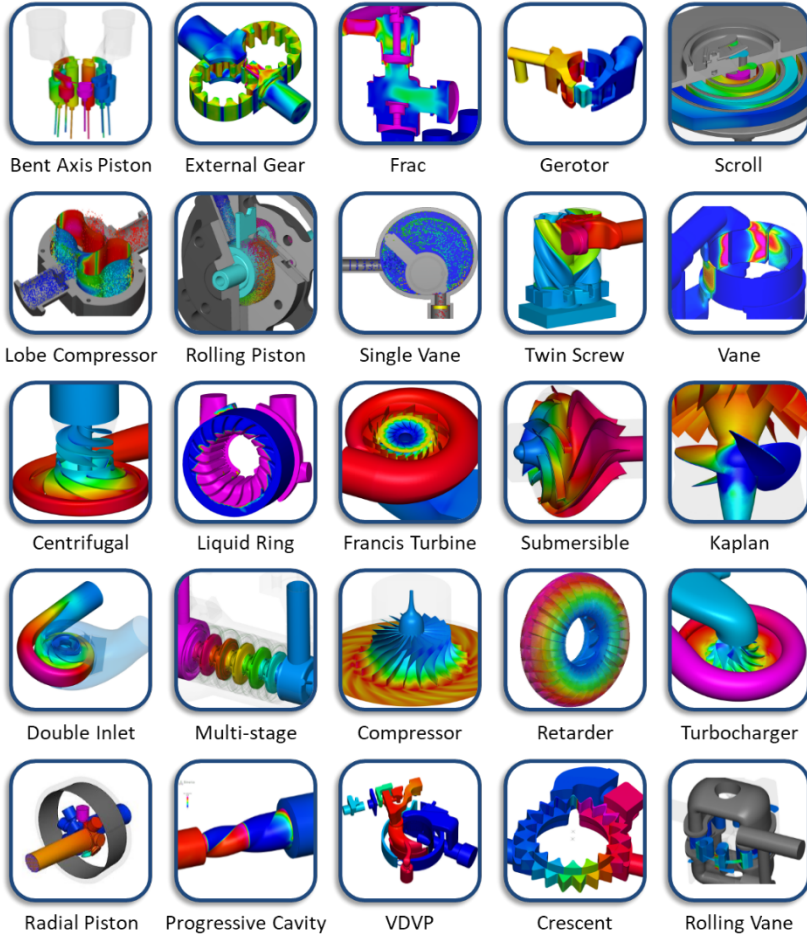
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