

# IAMES2024

3rd IFAC workshop on Integrated Assessment Modeling for Environmental Systems

| <b>Wednesday May 29 - Sustainable resources management</b> |   |  |
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| From 9   | Registration  |  |
| 12-13.15   | <b>Technical Committee meeting</b>  |  |
| 13.30-14.30  | Welcome Lunch   |  |
| 14.30-14.40  | <b>IAMES Opening</b>  | <b>Marco Testa</b> (Delegate of the Rector for Savona Campus)<br><b>Ronald van Nooijen</b> (Chair of IFAC CC6-Bio- and Ecological Systems)<br><b>Marialuisa Volta</b> (Chair of IFAC TC 6.3- Modelling and Control of Environmental Systems)<br><b>Michela Robba</b> (Chair of IAMES 2024) |
| 14.40-14.55  | <b>Plenary</b>  | <b>Roadmap to sustainability</b>   <b>University of Genova Sustainability Commission</b>   |
| 14.55-15.40  | <b>Plenary</b>  | <b>Changing climate and technology reshape the future of African hydropower</b>   <b>Prof. Andrea Castelletti</b> (Polytechnic of Milan)   |
| 15.40-16   | <b>Industrial Keynote</b>   | <b>Technologies designer to empower every facet of water-related project</b>   <b>Silvia Torretta</b> (Senior Marine and Water Resources Engineer, DHI Group)  |
| 16-16.30   | Coffee Break  |  |
| <b>16.30-17.30</b>   | <b>Invited Session: <i>Advanced design, retrofit, operation and maintenance of water resources systems</i> (Chairs: Silvia Maria Zanolì, Crescenzo Pepe, Maria Macchiaroli)</b> |  |
| 16.30-16.45  | Promotion of Socio-Environmental Sustainability by Water Utilities: Optimal Budget's Estimation and Results' Analysis of Varying Company Size                                   | Luigi Dolores*, Maria Macchiaroli, Gianluigi De Mare   |
| 16.45-17   | Unknown Input Observer Scheme for Open-flow Irrigation Channels   | Juan Pablo Arango Restrepo*, Lucien Etienne, Gregory Conde, Eric Duviella, Kokou Languéh, Vicenç Puig, Pablo Segovia, Nicanor Quijano, Carlos Ocampo-Martinez  |
| 17-17.15   | Assessment model of tariff structure for sustainable management of water resources systems  | Maria Macchiaroli  |
| 17.15-17.30  | Model Predictive Control for water management of a two-reservoir hydroelectric power plant  | Silvia Maria Zanolì  |
| <b>17.30-18.30</b>   | <b>Integrated Water Management</b>  |  |
| 17.30-17.45  | A comparison of physics- and data-based modeling of rural drainage systems  | Henry Baumann*, Alexander Schaum, Nanna Høegh Ravn, Thomas Meurer, Lina Nybo Jensen  |
| 17.45-18   | Situation and ordering based control of a polder-boezem system  | Ronald Robert Paul van Nooijen*, Alla G. Kolechkina, Thomas Berends, P. E. R. M. van Leeuwen   |
| 18-18.15   | Multi-set based model predictive control to explore large freshwater resources  | Javier García Martín*, Alejandro Anderson, Ignacio J. Sánchez, Agustina Djorge, Eric Duviella, Jose M. Maestre   |
| 18.15-18.30  | A Mixed-Integer Dynamic and Stochastic Algae Process Optimization   | Sercan Kivanc, Ozgun Deliismail, Hasan Sildir*   |

| <b>Thursday May 30 - Sustainable energy</b> |   |  |  |
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| 9-10  | <b>Plenary</b>  | Distributed Optimization in a Renewable-rich Grid Edge   | <b>Anuradha Annaswamy</b><br>(Massachusetts Institute of Technology)                                   |
| 10-10.15                                    | <b>Industrial Keynote</b>   | Information Technology supporting decision-making in energy distribution   | <b>Antonio Iavarone</b> (Head of Digital Innovation at IREN Group)                                     |
| 10.15-10.30                                 | <b>Industrial Keynote</b>   | Innovative technologies for sustainable energy   | <b>Innovation Pole on Energy, Environment and Sustainable Development</b>                              |
| 10.30-10.45                                 | <b>Industrial Keynote</b>   | Training and technological transfer for sustainable energy: synergies between University and companies                   | <b>Elisabetta Arato</b> (President Innovation Pole on Energy, Environment and Sustainable Development) |
| 10.45-11.15                                 | Coffee Break  |  |  |
| <b>11.15-12.15</b>                          | <b>Invited Session: Sustainable Districts' Optimization and Control (Chairs: Luca Parodi, Virginia Casella, Yassine Ennassiri)</b>      |  |  |
| 11.15-11.30                                 | Optimization of Electric Bus Charging: Integrating Discrete Event Modeling in Public Transportation Systems                             | Virginia Casella, Riccardo Minciardi, Luca Parodi*   |  |
| 11.30-11.45                                 | Influence of Distributed Energy Resources on the performance of phase topology identification in distribution networks                  | Sebastián García*, Stefano Bracco, Javier M. Mora-Merchán, Diego F. Larios, Enrique Personal, Carlos León                |  |
| 11.45-12                                    | Modeling of Photovoltaic-Thermal Systems Using Multivariate Polynomial Regression   | Kamran Moradi, Fereshteh Jafari, Fariba Moghaddam*, Qobad Shafiee  |  |
| 12-12.15                                    | Nonlinear System Identification and Predictive Control for Waste Heat Recovery with Heat Pumps  | Ansgar Reimann*, Jan Küpper, Max Rose, Johannes Schiffer   |  |
| <b>12.15-13.15</b>                          | <b>Sustainable Energy I</b>   |  |  |
| 12.15-12.30                                 | On the Use of Optimized Models for Energy Management System in Multi Energy Hydrogen and Electric Vehicle Applications                  | Marco Giuntoli*, Marina Santarelli, Pablo Almaleck, Francesco Baccino, Mara Cosentino, Pietro Serra, Katarzyna Furmanska |  |
| 12.30-12.45                                 | Process simulation and optimization of membrane separation system for CO2 capture from coal-fired power plants                          | sa Li, Xiao Wu*, Yiguo Li, Lei Pan (China)   |  |
| 12.45-13                                    | Smart Grid Stochastic optimization with Ant Colony-based Scenario Generation  | Daniel Fernandez Valderrama*, Giulio Ferro, Juan Ignacio Guerrero, Carlos León, Luca Parodi, Michela Robba               |  |
| 13-13.15                                    | CCEM: A System Dynamics Earth Model for Capturing Beliefs Related to the Coupling of Energy, Economy and Global Warming                 | Yves CASEAU  |  |
| 13.30-14.30                                 | Lunch   |  |  |
| <b>14.30-15.30</b>                          | <b>Invited Session: Optimization and Simulation of RES-integrated Electric Mobility Systems (Chairs: Stefano Bracco, Matteo Fresia)</b> |  |  |
| 14.30-14.45                                 | Optimal Operation of an Innovative Electric Vehicle Charging Hub directly fed by Renewables   | Alphonse Francis*, Matteo Fresia, Stefano Bracco, Edoardo Barabino   |  |
| 14.45-15                                    | Probabilistic Power Forecasting in a Microgrid for the Integration of Distributed Energy Resources                                      | Antonio Parejo*, Stefano Bracco, Sebastián García, Enrique Personal, Juan Ignacio Guerrero, Carlos León (Spain)          |  |

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| 15-15.15           | Energy Management System for a Smart Green Nanogrid feeding a Research Laboratory with Autonomous Mobile Robots | Matteo Fresia*, Lorenzo De Simone, Ilaria Traverso, Stefano Bracco, Silvia Siri   |
| 15.15-15.30        | Optimal Scheduling of Integrated Energy Systems Considering Closed-loop Dynamic Tracking Performances           | Xin Xiong, Yuhui Jin, Junli Zhang, Jiong Shen, Xiao Wu*                           |
| <b>15.30-16.15</b> | <b>Sustainable Energy II</b>  |   |
| 15.30-15.45        | Evaluation and Refinement of a Novel Data-Driven Inverse Integrated Assessment Model focusing on Primary Energy | Iman Goudarzi*, M. Dekker Mark, Giorgio Guariso, van Vuuren Detlef                |
| 15.45-16           | A Tool to Optimize the Participation of BESS to the UK Ancillary Services Market                                | Virginia Casella, Alice La Fata*, Stefano Suzzi, Giulia Barbero, Riccardo Barilli |
| 16-16.15           | SustainableTech - A Holistic Framework for Integrated Techno-Economic and Sustainability Assessments            | Thiago L. Silva*, Elijah Tremblay, Tuva Grytli, Ragnhild Skagestad, Nils Eldrup   |
| 16.30-19.30        | Tour  |   |
| 19.30-23           | Social Dinner   |   |

| <b>Friday May 31 - Risk Management and Sustainability</b> |   |   |  |
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| 9-9.45  | <b>Plenary</b>  | On-the-field data collection and numerical wildfire simulation for risk management of firefighting activities             | <b>Emanuele Gissi</b> (Italian Fire and Rescue Service, Italy)   |
| 9.45-10   | <b>Plenary keynote</b>  | Natural and Technological risk assessment and management: the experience of CIMA Research Foundation                      | <b>Eva Trasforini</b> (International Centre for Environmental Monitoring (CIMA Research Foundation))                                   |
| 10-10.15  | <b>Industrial Keynote</b>   | Innovation and technological transfer for risk management and security  | <b>Paola Girdinio</b> (President of START 4.0 National Competence Center on security and optimization of strategic infrastructures)    |
| 10.15-10.35   | <b>Industrial Keynote</b>   | Innovative technologies for the management of critical infrastructures  | <b>START 4.0 National Competence Center</b>  |
| 10.35-11  | <b>Plenary Keynote</b>  | Models as maps: how integrated assessment tools can be used to support decision making                                    | <b>Fabian Wagner</b> (Dean for Capacity Development and Academic Training, IIASA-International Institute for Applied Systems Analysis) |
| 11-11.30  | Coffee Break  |   |  |
| <b>11.30-13.30</b>  | <b>Technical Session: Risk Management and sustainability</b>                                      |   |  |
| 11.30-11.45   | Machine Learning-Driven Dynamic Maps Supporting Wildfire Risk Management                          | Nicolò Perello*, Giorgio Meschi, Andrea Trucchia, Mirko d'Andrea, Francesco Baghino, Silvia degli Esposti, Paolo Fiorucci |  |
| 11.45-12  | Operational Application of Mathematical Modeling for Enhanced Wildfire Risk Management in Liguria | Francesco Baghino*, Emanuele Gissi, Nicolò Perello, Paolo Fiorucci  |  |
| 12-12.15  | Laying the foundations for the dysfunctional analysis of a territory                              | Francois Pérès, Jose Galindo Barco, Carmen Martin, Jagannath Aryal  |  |

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| 12.15-12.30     | Integrating Indigenous Knowledge and Scientific Approaches for Flood Risk Management in Somalia  | Ali Abdullahi Abdi   |
| 12.30-12.45     | Bayesian identification and stochastic model predictive control for water level regulation in a lake                                     | Muhammad Jibrán*, Erik Weyer, Wenyan Wu  |
| 12.45-13        | Automated generation of hydraulic models and its use for sensitivity analysis: Channel response time sensitivity                         | Ronald Robert Paul van Nooijen*, Alla G. Kolechkina  |
| 13-13.15        | Optimal Strategies for Climate Change Mitigation   | Michele Arrighini*, Laura Zecchi, Claudio Marchesi, Marialuisa Volta   |
| 13.15-13.30     | A second-order dynamic model of the mean global carbon cycle   | Enrico Canuto, Daniele Mazza, Carlo Novara*  |
| 13.30-14.30     | Lunch  |  |
| <b>14.30-16</b> | <b>Technical Session: Sustainable mobility and air pollution</b>   |  |
| 14.30-14.45     | Designing Diversity-aware Sustainable Mobility Policies in Social Networks: a Data-driven Approach                                       | Eugenia Villa*, Francesco Govigli, Valentina Breschi, Mara Tanelli   |
| 14.45-15        | Level of Air Pollution, Sources, and Possible Ways for Mitigation: Indian Capital Region Perspective                                     | Adil Wazeer, Apurba Das, Chamila H Dasanayaka, Chamil Abeykoon*  |
| 15-15.15        | The role of energy policies for air pollution control in the Po Valley   | Laura Zecchi*, Michele Arrighini, Giorgio Guariso, Marialuisa Volta  |
| 15.15-15.30     | Truck Emission Forecasting and Peak Mitigation in a Port Terminal  | Rexhina Hoxha*, Stefano Cangelosi, Simona Sacone, Enrico Zero  |
| 15.30-15.45     | Optimizing a Capacitated Vehicle Routing Problem with Scheduled Arrival, Split Deliveries within Time Windows and Emission Consideration | Mohammad Javad Jafari*, Giulio Ferro, Alessandro Magni, Alberto Mereu, Riccardo Minciardi, Massimo Paolucci, Michela Robba |
| 14.45-16        | Towards Sustainable Last-Mile Delivery: Introducing an Off-Peak Urban Policy to Mitigate Environmental and Social Impacts                | Renata MANSINI, Filippo Ranza*, Roberto Zanotti  |
| <b>16</b>       | <b>IAMES CLOSURE</b>   |  |



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