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Wastewater and Biosolids Treatment and Reuse: Bridging Modeling and Experimental Studies

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Program

**Wastewater and Biosolids Treatment and Reuse:
Bridging Modeling and Experimental Studies**

**June 8-14, 2014
Otranto, Italy**

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Sunday, June 8, 2014

ARRIVAL AND WELCOME RECEPTION

17:00 – 19:00 Registration

19:00 – 20:00 Welcome reception

20:00 – 22:00 Dinner

NOTES

- Audiotaping, videotaping and photography of presentations are prohibited.
- Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).
- Speakers – Please leave at least 5 minutes for questions and discussion.
- Please do not smoke at any conference functions.
- Turn your cellular telephones to vibrate or off during technical sessions.
- Technical and poster sessions will be in the Conference Center.
- Meals will be in the restaurant.
- Be sure to check your contact information on the Participant List in this program and make any corrections to your name/contact information online. A corrected copy will be sent to all participants after the conference.

Monday, June 9, 2014 (session with simultaneous translation)

**PLENARY SESSION – WASTEWATER AND BIOSOLIDS TREATMENT AND REUSE:
WHAT DOES THE FUTURE HOLD?**

Session Chairs: Domenico Santoro and Antonio Lopez

- 08:00 – 08:45 On-Site registration
- 08:45 – 09:00 Opening remarks
- 09:00 – 09:30 **Keynote 1: Wastewater treatment: the paradigm shift**
Antonio Lopez, National Research Council (CNR), Water Research Institute, Italy
- 09:30 – 10:00 **Keynote 2: Role of anaerobic digestion in next generation wastewater treatment and biosolids management**
Damien Batstone, Queensland University, Australia
- 10:00 – 10:30 **Keynote 3: Approaches to rational microbial risk assessment of treated biosolids and wastewater**
Charles N. Haas, Drexel University, USA
- 10:30 – 11:00 Coffee break
- 11:00 – 11:30 **Keynote 4: Is industry ready to address wastewater treatment challenges?**
Marvin Devries, Trojan Technologies, Canada
- 11:30 – 12:00 **Keynote 5: Computational modeling: valuable tool or math exercise?**
Carlo Poloni, University of Trieste, Italy
- 12:00 – 12:30 Round Table
- 12:30 – 14:00 Lunch
- 14:00 – 15:00 *ad hoc* sessions / free time
- 15:00 – 19:30 Tour of Lecce
- 20:00 – 22:00 Dinner
- 22:00 – 23:00 Social hour

Tuesday, June 10, 2014

TECHNICAL SESSION A - WASTEWATER AND BIOSOLIDS TREATMENT AND REUSE: THE MATERIAL AND ENERGY "FACTORY"

Session Chairs: Wun Jern Ng and Giuseppe Mininni

- 08:45 – 09:00 Opening remarks
- 09:00 – 09:30 **Keynote 6: Perspectives of sewage sludge management in Europe and expected development of legislation**
Giuseppe Mininni, National Research Council (CNR), Water Research Institute, Italy
- 09:30 – 10:00 **Keynote 7: Sludge pretreatment methods for enhanced volatiles solids destruction and methane production**
Wun Jern Ng, NEWRI-Nanyang Technology University, Singapore
- 10:00 – 10:30 **Keynote 8: Harmless treatment and materials utilization of sludge containing high levels of heavy metals**
Guoren Xu, Harbin Institute of Technology, China
- 10:30 – 11:00 Coffee break
- 11:00 – 11:30 **Keynote 9: Valorization of sewage sludge via nitrite nutrients removal from anaerobic effluents**
Francesco Fatone, University of Verona, Italy
- 11:30 – 12:00 **Aerobic conditions prevail over scarce aeration and starvation conditions for activated sludge degradation**
Jonathan Habermacher, Eawag, Switzerland
- 12:00 – 12:30 Round Table
- 12:30 – 14:00 Lunch
- 14:00 – 16:00 *ad hoc sessions / free time*
- 16:00 – 16:20 **Innovative treatment solutions for sewage sludge management set up in the ROUTES FP7 project**
Giuseppe Mininni, National Research Council (CNR), Water Research Institute, Italy
- 16:20 – 16:40 **Impact of enhanced stabilization treatments on sludge quality and methane recovery**
Camilla Braguglia, National Research Council (CNR), Water Research Institute, Italy
- 16:40 – 17:00 **Comparative study of the mechanisms of ultrasonic, alkaline, and sono-alkaline pretreatment of industrial biosludge**
Santosh Pathak, AEBC-NEWRI-NTU, Singapore
- 17:00 – 17:20 **Sludge minimization: ozonolysis and pure oxygen autothermal thermophilic digestion**
Pier Luigi Radavelli, SIAD SpA, Italy

Tuesday, June 10, 2014 (continued)

- 17:20 – 17:40 **Influence of one step temperature increase acclimation method on microbial community dynamics during thermophilic biochemical methane potential test of an industrial wastewater**
Santosh Pathak, AEBC-NEWRI-NTU, Singapore
- 17:40 – 18:20 Coffee break
- 18:20 – 18:40 **Phototrophic bacteria for complete nutrient recovery from domestic wastewater**
Tim Huelsen UQ/AWMC, Australia
- 18:40 – 19:00 **Integrating the selection of PHA storing biomass and nitrogen removal via nitrite for the treatment of the sludge reject water**
Francesco Fatone, University Ca'Foscari of Venice, Italy
- 19:00 – 19:20 **The integrated biohydrogen reactor clarifier system (IBRCS): setup, performance, and application**
Hesham El Naggari, University of Western Ontario, Canada
- 19:20 – 19:40 **Sewage sludge valorization by pyrolysis using a mechanically fluidized reactor**
Franco Berruti, ICFAR/Western University, Canada
- 19:40 – 20:00 **Treatment of carbide slurry using electrocoagulation**
Shereen Hasan, UAEU, United Arab Emirates
- 20:00 – 22:00 Dinner
- 22:00 – 23:00 Poster session and social hour

Wednesday, June 11, 2014

TECHNICAL SESSION B - WASTEWATER AND BIOSOLIDS TREATMENT AND REUSE: THE WATER "FACTORY"

Session Chairs: Ronald Gehr and Franco Berruti

- 08:45 – 09:00 Opening remarks
- 09:00 – 09:30 **Keynote 10: How drugs in wastewater enforce advanced drinking water treatment**
Bram Martijn, PWN Technologies, Netherlands
- 09:30 – 10:00 **Keynote 11: New insights into the ultraviolet disinfection of wastewater**
Ramin Farnood, University of Toronto, Canada
- 10:00 – 10:30 **Keynote 12: Wastewater disinfection with UV or PAA: Are those surviving microbes really benign?**
Ronald Gehr, McGill University, Canada
- 10:30 – 11:00 Coffee break
- 11:00 – 11:30 **Keynote 13: High-rate sieve microfiltration as an alternative unit process to primary clarifiers**
Domenico Santoro, Trojan Technologies, Canada
- 11:30 – 12:00 **CFD optimized woven filter media for wastewater application**
Markus Knefel; GKD, Germany
- 12:00 – 12:30 Round Table
- 12:30 – 14:00 Lunch
- 14:00 – 16:00 *ad hoc* sessions and free time
- 16:00 – 16:20 **Peracetic acid use in north America as a wastewater disinfectant**
Thomas Mooney, PeroxyChem, USA
- 16:20 – 16:40 **Peracetic acid: a good choice for wastewater reuse**
Paola Toniolo, Solvay Chimica Italia Spa, Italy
- 16:40 – 17:00 **Agricultural reuse of treated wastewater: the case of Milano-Nosedo municipal wastewater treatment plant**
Francesca Pizza, MilanoDepur SpA, Italy
- 17:00 – 17:20 **Perfomic acid as disinfectant in wastewater treatments: effectiveness and comparisons**
Patrizia Ragazzo, ASI, Italy
- 17:20 – 17:40 **Large wastewater agricultural reuse with adaptive nutrient removal case study of Milano S. Rocco**
Luca Pedrazzi, Degremont, Italy
- 17:40 – 18:20 Coffee break

Wednesday, June 11, 2014 (continued)

- 18:20 – 18:40 **Sludge ozonation and intermittent aeration through the OSCAR® controller – A combined strategy for OPEX minimization in wastewater treatment**
Giuseppe Guglielmi, ETC Engineering, Italy
- 18:40 – 19:00 **Phenolic wastes valorization through bioenergy and bioactive compounds production**
Francesco La Cara, Istituto di Bioscienze e Biorisorse, CNR, Italy
- 19:00 – 19:20 **Evaluating the performance of spouted bed bio-reactor (SBBR) during aerobic biodegradation of 2,4 dichlorophenol (DCP)**
Taghreed Al-Khalid, UAE University, United Arab Emirates
- 19:20 – 19:40 **Ecotoxicological bioassays for treated wastewater monitoring and assessment**
Maria Giulia Lionetto, University of Salento, Italy
- 19:40 – 20:00 **Liquid waste treatment: can combined biological processes be really effective?**
Luca Rondi, University of Brescia, Italy
- 20:00 – 22:00 Dinner
- 22:00 – 23:00 Poster session and social hour

Thursday, June 12, 2014

TECHNICAL SESSION C - WASTEWATER AND BIOSOLIDS TREATMENT AND REUSE: THE ROLE OF MODELING

Session Chairs: Charles N. Haas and M. Concetta Tomei

- 08:45 – 09:00 Opening remarks
- 09:00 – 09:30 **Keynote 14: Modeling reactions between activated sludge fractions and ozone to optimize biosolids reduction processes**
Dominic Frigon, McGill University, Canada
- 09:30 – 10:00 **Keynote 15: Modeling of anaerobic digestion of sludge**
M. Concetta Tomei, National Research Council (CNR), Water Research Institute, Italy
- 10:00 – 10:30 **Keynote 16: Simulation based feed stream estimation of wastewater treatment plants using a surrogate model**
Peter Kern, Cologne University of Applied Sciences, Germany
- 10:30 – 11:00 Coffee break
- 11:00 – 11:30 **Keynote 17: Accelerating product innovation using computational fluid dynamics**
Ted Mao, Trojan Technologies, Canada
- 11:30 – 12:00 **Reactor configuration modeling for anaerobic digestion of waste activated sludge**
Daniele Montecchio, National Research Council, Water Research Institute, Italy
- 12:00 – 12:30 Round Table
- 12:30 – 16:00 Boxed Lunch & Excursion (Masseria L'Astore)
- 16:00 – 17:40 **Modeling and Optimization Workshop**
Vito Primavera, EnginSoft SpA, Italy
- Introduction to modeFRONTIER
 - Case Study 1
 - Case Study 2
 - Case Study 3
- 17:40 – 18:20 Coffee break
- 18:20 – 18:40 **Temperature adjustment and calibration of an ASM2D-ADM1 model**
Alessio Fenu, Aquafin, Belgium
- 18:40 – 19:00 **Optimal control for activated sludge alternating flow/aeration systems with more than two basins**
Alessio Fenu, Aquafin, Belgium

Thursday, June 12, 2014 (continued)

- 19:00 – 19:20 **Linear time invariant model of anaerobic digestion of waste activated sludge development and analysis**
Antonius Yudi Sendjaja, AEBC-NEWRI-NTU, Singapore
- 19:20 – 19:40 **Life cycle assessment of a full scale case study on agricultural reuse of treated agro-industrial wastewater**
Pompilio Vergine, National Research Council (CNR), Water Research Institute, Italy
- 19:40 – 20:00 **Surface modified cellulosic membrane and its application in membrane bioreactor (MBR) system**
Ning Yan, University of Toronto, Canada
- 20:00 – 20:20 **Equilibrium, kinetic and thermodynamic study of adsorption of rhodamine B from aqueous solution by activated carbon from *Peltophorum Pterocarpum* leaf**
Jeyaraj Boniface, Loyola College, India
- 21:00 – 23:00 Banquet Dinner in Otranto

Friday, June 13, 2014 (session with simultaneous translation)

TECHNICAL SESSION D - WASTEWATER AND BIOSOLIDS TREATMENT AND REUSE: FIELD STUDIES AND FULL-SCALE APPLICATIONS

Session Chairs: Gianfranco Boari and Antonio Lopez

- 08:00 – 08:45 On-site registration
- 08:45 – 09:00 Opening remarks
- 09:00 – 09:30 **Keynote 18: On the sustainable management of sewage sludge disposal in Apulia**
Adriana Lotito, Arpa Puglia & Politecnico Di Bari, Italy
- 09:30 – 10:00 **Keynote 19: Agricultural use of sewage sludge data as a tool for legislative revision**
Giuseppe Mininni, National Research Council (CNR), Water Research Institute, Italy
- 10:00 – 10:30 **Keynote 20: Developments in sludge dewaterability characterization**
Ludovico Spinosa, CEN/TC308/WG1 and ISO/TC275/WG6, Italy
- 10:30 – 11:00 Coffee break
- 11:00 – 11:30 **Wastewater reuse in Apulia: between dream and reality**
Antonio Lopez, National Research Council (CNR), Water Research Institute, Italy
- 11:30 – 12:00 **Wastewater reuse in Apulia: constraints and perspectives**
Vito Colucci, Apulia Hydric Authority (AIP), Italy
- 12:00 – 12:30 **Back to future: The success story of Fasano's agricultural wastewater reuse plant**
Oronzo Santoro, AquaSoil SrL, Italy
- 12:30 – 13:00 Round Table
- 13:00 – 15:00 Lunch
- 15:00 – 15:20 **Surface filtration technologies for municipal wastewater reuse for irrigation – Preliminary results of demo-scale activities**
Pompilio Vergine, National Research Council (CNR), Water Research Institute, Italy
- 15:20 – 15:40 **Wastewater treatment and reuse in the oil & petrochem industry – a case study**
Alberto Girardi, Degremont, Italy
- 15:40 – 16:00 **Design of semiconductors-based composites for the efficient photodegradation of organic micropollutants in water**
Giuseppe Mele, University of Salento, Italy
- 16:00 – 16:20 **Experimental measurement and modeling of radiation fields in TiO₂ nanoparticle photocatalysis**
Andrea Turolla, Politecnico de Milano, Italy
- 16:20 – 16:40 **Deep UV-LEDs based on group III-nitride for water disinfection applications**
Iolanda Pio, National Nanotechnology Laboratory CNR, Italy
- 16:40 – 17:00 Closing Remarks

Wastewater and Biosolids Treatment and Reuse: Bridging Modeling and Experimental Studies

Poster List

1. **Impacts of temperatures and physico-chemical conditions on biosolids electro-dewatering**
Dominic Frigon, McGill University, Canada
2. **Measurement and modeling of photogenerated holes and hydroxyl radicals production in TiO₂ nanoparticle photocatalysis**
Andrea Turolla, Politecnico di Milano, Italy
3. **Modeling of vertical constructed wetland for embedded greywater treatment**
Matjaz Nekrep Perc, University of Maribor, Slovenia
4. **Removal of arsenic from drinking water by coagulation-adsorption combined process**
Anna Scarlino, University of Salento, Italy
5. **Synthesis, characterization and binding studies of water compatible ion imprinted polymer as sorbent materials for Hg(II) removal from water**
Lucia Mergola, University of Salento, Italy
6. **Sawdust-based natural clay sorbents from removal of heavy metals from wastewater**
Lucia Mergola, University of Salento, Italy