



CSRW24

1st International Conference on Circularity, Sustainability and Resilience in Water, Wastewater and Sludge Management

February 11th - 13th, 2024
Varese, Italy

CONFERENCE PROGRAMME



**UNIVERSITÀ DEGLI STUDI
DELL'INSUBRIA**

Department of Theoretical
and Applied Sciences



**ARISTOTLE
UNIVERSITY
OF THESSALONIKI**

Department of Chemistry

ORGANIZED BY:



**UNIVERSITÀ DEGLI STUDI
DELL'INSUBRIA**

Department of Theoretical
and Applied Sciences



**ARISTOTLE
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WITH THE PATRONAGE OF:

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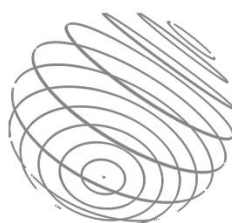
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Department of Theoretical and Applied Sciences (DiSTA), University of Insubria, Varese, IT

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The conference will be held in **Aula Magna Granero-Porati**, University of Insubria, Via Dunant 3, Varese, IT.

SOCIAL EVENTS:

On Tuesday 13th (14:30-16:30), a walking **guided tour** of the city center of Varese has been scheduled. The participation is free.

For any update, please visit the website www.csr24.it

Day 1 – Sunday, February 11

17:30 – 19:00

Registration & Welcome Cocktail

Day 2 – Monday, February 12

8:30 – 9:30

Registration

9:30 – 10:00

Opening

A. Tagliabue

Magnificent Rector of the University of Insubria

D. Galimberti

Mayor - Municipality of Varese

A. Coen Porisini

Municipality of Varese and University of Insubria

M. Ferrari

Director of the Department of Theoretical and Applied Sciences, University of Insubria

V. Torretta

President of Engineering Study Courses, Department of Theoretical and Applied Sciences, University of Insubria

10:00 – 10:45 **Plenary Presentation**

Enhanced municipal wastewater treatment for micropollutant abatement: The experience with ozonation

U. von Gunten^{1,2}

¹ Eawag, Swiss Federal Institute for Aquatic Science and Technology, CH-8600 Dübendorf, Switzerland

² EPFL, Swiss Federal Institute of Technology, CH-1015 Lausanne, Switzerland

10:45 – 11:00

Coffee break

Session 1 | Novel/enhanced treatment of wastewater

Chair: A. Zouboulis and A. Tolkou

11:00 - 11:15 **Keynote**

Acid mine drainage wastewater treatment technologies, emphasizing a neutralizing process by the use of ultrabasic rocks obtained as waste/by-product from chromite mining

*A. Zouboulis*¹, *E. Kokkinos*¹

¹ Laboratory of Chemical and Environmental Technology, Department of Chemistry, Aristotle University of Thessaloniki, 54124 Thessaloniki

11:15 - 11:30

Removal of dyes from wastewaters by adsorption on natural adsorbents: banana, orange and pomegranate peels

*A.K. Tolkou*¹, *E.K. Tsoutsas*², *I.A. Katsoyiannis*², *G.Z. Kyzas*¹

¹ Hephaestus Laboratory, Department of Chemistry, International Hellenic University, GR-65404 Kavala, Greece

² Laboratory of Chemical and Environmental Technology, Department of Chemistry, Aristotle University of Thessaloniki, GR-54124 Thessaloniki, Greece

11:30 - 11:45

Graphitic carbon nitride derivatives functionalized with bromine for wastewater depuration

*E. Russo*¹, *J.G. Souza*², *R.C. Martins*², *P. Sgarbossa*¹

¹ University of Padova, Department of Industrial Engineering, via F. Marzolo 9, 35131, Padova, Italy

² University of Coimbra, CIEQPFC - Department of Chemical Engineering, FCTUC, Coimbra, Portugal

11:45 - 12:00

Heavy Metals Separation in Wastewater Comparing Magnetic different magnetic nanoparticles embedded in alginate beads

*E. Sieni*¹, *M. Barozzi*², *P. Sgarbossa*³, *E. Russo*³, *A. Sandon*⁴, *A. Karaeva*¹, *S. Copelli*¹

¹ Department of Theoretical and Applied Sciences, Insubria University, Via Dunant 3, 21100, Varese, Italy

² Department of Science and High Technology, Insubria University, Via Valleggio 11, 22100, Como, Italy

³ Department of Industrial Engineering, Padova University, Via F. Marzolo 9, 35131, Padova, Italy

⁴ Department of Civil, Environmental and Architectural Engineering, Padova University, Via F. Marzolo 9, 35131, Padova, Italy

12:00 - 12:15

Hazard evaluation and prioritization of emerging contaminants in the aquatic environment using in silico approaches

*E. Postè*¹, *N. Chirico*¹, *A. Sgariboldi*¹, *M. Evangelista*¹, *C. Morosini*², *A. Re*³, *A. Karaeva*³, *E. Papa*¹

¹ QSAR Research Unit in Environmental Chemistry and Ecotoxicology, Department of Theoretical and Applied Sciences, University of Insubria, via J.H. Dunant 3, 21100 Varese (Italy)

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³ Department of Theoretical and Applied Sciences, University of Insubria, via J.H. Dunant 3, 21100 Varese (Italy)

12:15 - 12:30

Antimicrobial biomass-derived materials for wastewater treatment

E. Gover¹, A. Tavani², M. Marino³, D. Goi¹, A. Rondinella¹, L. Fedrizzi¹, P. Strazzolini³, C. Comuzzi³

¹ Department of Polytechnic of Engineering and Architecture (DPIA), University of Udine, Via del Cottonificio 108, 33100 Udine (Italy)

² Department of Medical Area – Biotechnology, University of Udine, Via delle Scienze 206, 33100 Udine (Italy)

³ Department of Agrifood, Environmental and Animal Sciences (Di4A), University of Udine, Via Sondrio 2/A, 33100 Udine (Italy)

12:30 - 12:50

Question Time and Discussion

12:50 – 14:15

Lunch

Session 2 | Energy saving and process optimisation

Chair: R. Canziani and F. Conti

14:15 - 14:30 **Keynote**

From energy consuming to energy neutral plants: how to get there?

R. Canziani¹

¹ Department of Civil and Environmental Engineering, Environmental Section, Polytechnic of Milan, Italy

14:30 - 14:45

Cost recovery and self-finance in waste management: lessons from sdc's operations in faridpur municipality

I. Khondoker Hamidul¹

¹ Society Development Committee (SDC), Bangladesh

14:45 – 15:00

Life Cycle Assessment applied to the construction phase of a wastewater treatment plant

L. Croce¹, P. Viotti¹

¹ Department of Civil, Construction and Environmental Engineering, Sapienza University of Rome, Via Eudossiana, 18, 00184, Rome, Italy

15:00 - 15:15

Circular and closed-loop approaches for algae: a bioeconomy perspective for Latvia

F. Romagnoli¹, R. Paoli¹, B. Ievina¹, M. Feofilovs¹

¹ Riga Technical University, Institute of Energy Systems and Environment, Azenes iela 12/1-601, LV-1048, Riga, Latvia

15:15 - 15:25

Environmental life cycle analysis of different water supply pipes: a case from Bologna, Italy

S. Pennellini¹, E. Awere², A. Rosatti¹, A. Bonoli¹

¹ Department of Civil, Chemical, Environmental and Material Engineering, University of Bologna, via Terracini 28, 40131, Bologna, Italy

² Department of Civil Engineering, Cape Coast Technical University, P.O. Box DL 50, Cape Coast, Ghana

15:25 - 15:35

The role of water in universities from a sustainable perspective

R. Giurea¹, A. Karaeva²

¹ Lucian Blaga University of Sibiu, Department of Industrial Engineering and Management, 4 Emil Cioran Street, Sibiu 550025, Romania

² University of Insubria, Department of Theoretical and Applied Sciences, 46 Via G.B. Vico, 21100 Varese, Italy

15:35 - 15:55

Question Time and Discussion

15:55 – 16:15

Coffee break

Session 3 | Treated wastewater reuse

Chair: G. Bertanza and M. Szabo

16:15 - 16:30 **Keynote**

Wastewater reuse in agriculture: a long story

G. Bertanza¹

¹ Department of Civil, Environmental, Architectural Engineering and Mathematics, University of Brescia, via Branze 43, 25123, Brescia, Italy

16:30 - 16:45

Water quality and wastewater reuse in buildings: actual problems and solutions

M. Szabó¹, A. Karaeva²

¹ Hungarian University of Agriculture and Life Sciences, Institute of Technology, Dept. Of Building Engineering and Energetics, Pater K. u. 1. Gödöllő, 2103 Hungary

² Department of Theoretical and Applied Sciences, Insubria University, Via Dunant 3, 21100, Varese, Italy

16:45 - 17:00

A post treatment of wastewater for its reuse

J. Jurík¹, R. Zakhar¹

¹ Department of Environmental Engineering, Faculty of Chemical and Food Technology, Slovak University of Technology in Bratislava, Radlinského 9, 812 37, Bratislava, Slovakia

17:00 - 17:15

Wastewater reuse for street sweeping in a full scale WWTP: the case of Besozzo

D. Cecconet¹

¹ Alfa S.r.l., Via Gaetano Bottini 5, 21013, Gallarate (VA), Italy

17:15 - 17:25

Wastewater treatment in touristic facilities of the Samarkand region of Uzbekistan

M.G.Nosirov¹, E.Kabilov¹

¹ Samarkand State University, Uzbekistan

17:25 - 17:35

Water and wastewater management and recycling in educational spaces: a case study of Karadeniz technical university in Trabzon, Türkiye

D. Navabiasl¹, F.G.K. Fard²

¹ Faculty of Engineering, Karadeniz Technical University, Trabzon, Turkiye

² Faculty of Forestry, Karadeniz Technical University, Trabzon, Turkiye

17:35 - 18:00

Question Time and Discussion

Day 3 – Tuesday, February 13

Session 4 | Emerging pollutants: the problem of microplastics

Chair: L. Pollegioni and E.C. Rada

09:30 - 09:50 **Keynote**

Advancing biological processing for valorization of plastic wastes

L. Pollegioni¹, C. Battaglia¹, G. Molla¹

¹ Department of Biotechnology and Life Sciences, University of Insubria, via J. H. Dunant 3, 21100 Varese, Italy

09:50 - 10:05

Life cascade: removal of mps and pfas from textile wastewater

I. Gambino¹, M. Antonelli², E. Baldini³, G. Bergna⁴, R. Bettinetti⁵, B. Cantoni², A. Di Guardo¹, S. Federici⁶, F. Malpei², E. Terzaghi¹, A. Zoccali²

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² Department of Civil and Environmental Engineering (DICA) Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133, Milano, Italy

³ Centro Tessile Serico Sostenibile (CTSS), Via Castelnuovo 3, 22100, Como, Italy

⁴ LARIANA DEPUR, Via Laghetto, 1, 22073 Fino Mornasco (CO), Italy

⁵ Department of Human sciences and Innovation for the Territory (DiSUIT), University of Insubria, Via Valleggio 11, 22100, Como, Italy

⁶ Department of Mechanical and Industrial Engineering, University of Brescia and INSTM Research Unit, Via Branze, 38, 25123, Brescia, Italy

10:05 - 10:20

Occurrence and removal of pharmaceuticals in Slovak wastewater treatment plants

I. Bodík¹, A. Vojs Staňová^{2,3}, K. Grabicová², D. Varjúová¹

¹ Slovak University of Technology in Bratislava, Faculty of Chemistry and Food Technology, Department of Environmental Engineering, Radlinského 9, SK-812 37 Bratislava, Slovak Republic

² University of South Bohemia in České Budějovice, Faculty of Fisheries and Protection of Waters, South Bohemian Research Center of Aquaculture and Biodiversity of Hydrocenoses, Zátíší 728/II, CZ-389 25 Vodňany, Czech Republic

³ Comenius University in Bratislava, Faculty of Natural Sciences, Department of Analytical Chemistry, Ilkovičova 6, SK-842 15 Bratislava, Slovak Republic

10:20 - 10:35

Microplastic release from synthetic clothes: from a problem to a resource

R. Zullo¹, E.C. Rada², S. Galafassi^{1,3}, B. Luzi¹, M. Carnevale Miino²

¹ CNR – National Research Council, Piazzale Aldo Moro, 7 - 00185 Roma, Italy

² Department of Theoretical and Applied Sciences, University of Insubria, 46 Via G.B. Vico, 21100 Varese, Italy

³ NBFC, National Biodiversity Future Center, Palermo 90133, Italy

10:35 - 10:50

Microplastics in wastewater treatment plants: a focus on the sludge line

*M. Carnevale Miino*¹, *M.C. Collivignarelli*^{2,3}, *A. Abbà*⁴, *S. Bellazzi*², *E.C. Rada*¹

¹ Department of Theoretical and Applied Sciences, University of Insubria, via J.H. Dunant 3, 21100, Varese, Italy

² Department of Civil Engineering and Architecture, University of Pavia, via Ferrata 3, 27100 Pavia, Italy

³ Interdepartmental Centre for Water Research, University of Pavia, via Ferrata 3, 27100 Pavia, Italy

⁴ Department of Civil, Environmental, Architectural Engineering and Mathematics, University of Brescia, via Branze 43, Brescia, 25123, Italy

10:50 - 11:05

Question Time and Discussion

11:05 – 11:25

Coffee break

Session 5 | Sludge management and integration with the cycle of waste

Chair: M. Ragazzi and M. Notarnicola

11:25 – 11:40 **Keynote**

Perspectives of sewage sludge management

*M. Ragazzi*¹

¹ Department of Civil, Environmental and Mechanical Engineering, University of Trento, Italy

11:40 – 11:55

Sewage sludge as a potential resource integrated in landfill biocovers: an experimental study

*G. Viti*¹, *A. Randazzo*¹, *S. Venturi*^{1,2}, *F. Tatàno*³, *F. Tassi*^{1,2}

¹ DST - Department of Earth Sciences, University of Florence, via G. La Pira 4, 50121 Florence, Italy

² IGG - Institute of Geosciences and Earth Resources, CNR - National Research Council, via G. La Pira 4, 50121 Florence, Italy

³ DiSPeA - Department of Pure and Applied Sciences, Section ChEM - Chemistry, Environment and Materials, University of Urbino "Carlo Bo", Campus Scientifico "E. Mattei", 61029 Urbino, Italy

11:55 – 12:10

Recovering sludge from wastewater treatment plants: the impact of thermal treatment of pharmaceuticals

*D. Varjúová*¹, *A. Vojs Staňová*^{2,3}, *K. Grabicová*², *R. Zakhar*¹, *I. Bodík*¹

¹ Slovak University of Technology in Bratislava, Faculty of Chemistry and Food Technology, Department of Environmental Engineering, Radlinského 9, SK-812 37 Bratislava, Slovak Republic

² University of South Bohemia in České Budějovice, Faculty of Fisheries and Protection of Waters, South Bohemian Research Center of Aquaculture and Biodiversity of Hydrocenoses, Zátíší 728/II, CZ-389 25 Vodňany, Czech Republic

³ Comenius University in Bratislava, Faculty of Natural Sciences, Department of Analytical Chemistry, Ilkovičova 6, SK-842 15 Bratislava, Slovak Republic

12:10 - 12:20

Sewage sludge desiccation through solar greenhouses: from pilot to full-scale

*M. Mainardis*¹, *T. Martin*², *N. De Bortoli*², *D. Goi*¹

¹ Polytechnic Department of Engineering and Architecture (DPIA), Università degli Studi di Udine, Via del Cottonificio 108, 33100 Udine (IT)

² CAFC S.p.A., Viale Palmanova 192, 33100 Udine (IT)

12:20 - 12:30

Optimization of phosphorus wet acid extraction from sewage sludge ashes

*G. Boniardi*¹, *A. Turolla*¹, *R. Canziani*¹

¹ Politecnico di Milano, Department of Civil and Environmental Engineering (DICA) - Environmental Section, Piazza Leonardo da Vinci 32, 20133, Milan, Italy

12:30 - 12:40

Biochar-recovery material from biological sewage sludge and agri-food waste

M.C. Collivignarelli^{1,2}, *F.M. Caccamo*¹, *S. Bellazzi*¹, *C. Milanese*³, *A. Karaeva*⁴, *S. Sorlini*⁵

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³ Pavia Hydrogen Lab, Department of Chemistry & C.S.G.I., University of Pavia, Viale Taramelli 16, 27100 Pavia, Italy

⁴ Department of Theoretical and Applied Sciences, Insubria University, Via Dunant 3, 21100, Varese, Italy

⁵ Department of Civil, Environmental, Architectural Engineering and Mathematics, University of Brescia, Via Branze 43, 25123, Brescia, Italy

12:40 - 12:50

Consideration on the environmental impacts of different treatments of sewage sludge

*M. Schiavon*¹, *L. Adami*²

¹ University of Padova, Department of Agronomy, Food, Natural Resources, Animals and Environment (DAFNAE), Via dell'Università 16, 35020 Legnaro, Italy

² University of Trento, Department of Civil, Environmental and Mechanical Engineering, Via Mesiano 77, 38123 Trento, Italy

12:50 - 13:00

Question Time and Discussion

13:00 – 14:30

Lunch

Session 6 | Groundwater: characterization, management and remediation

Chair: R. Sethi and G. Ionescu

14:30 - 14:50 **Keynote**

High-resolution site characterization for an effective aquifer cleanup

*R. Sethi*¹

¹ Department of Environment, Land and Infrastructure Engineering, Polytechnic of Turin, Italy

14:50 - 15:05

A sustainable approach for chlorinated solvent contaminated groundwater remediation: Raw Polyhydroxyalkanoates (PHA) as electron donor for BRD coupled with adsorption on biochar

*M. Petrangeli Papini*¹, *L. Lorini*¹, *M. Abruzzese*¹, *B. Matturro*², *S. Rossetti*²

¹ Department of Chemistry, Sapienza University of Rome, P.le Aldo Moro 5, 00185, Rome, Italy

² Water Research Institute (IRSA), National Research Council (CNR), Montelibretti, 00010, Italy

15:05 - 15:20

In-situ application of colloidal activated carbon for the remediation of chlorinated solvents contaminated groundwater: an Italian case study

*M. Cappelletti Zaffaroni*¹, *L. Ferioli*¹

¹ ERM Italia S.p.A., Via San Gregorio 38, 20124 Milan, Italy

15:20 - 15:35

Fungal lignocellulose-degrading enzymes and their application in bioremediation

*Anna Civzele*¹, *Linda Mezule*¹

¹ Water Systems and Biotechnology Institute, Riga Technical University, Latvia

15:35 - 15:45

Advanced nanoremediation processes for the effective removal of complex mixtures of persistent pollutants from groundwater

C. Bianco¹, S. Barbero¹, R. Sethi¹

¹ Groundwater Engineering Research Group, Department of Environment, Land and Infrastructure Engineering, Politecnico di Torino, Turin, Italy

15:45- 15:55

In situ remediation of chlorinated solvents-contaminated groundwater: from site characterization to the monitoring of natural attenuation (MNA) by biomolecular and isotopic tools

F. Formicola^{1,2}, A.S. Espinoza Tofalos¹, T. Stella¹, A. Franzetti², L. Colombo², G. Jaforte³, E. Zanardini⁴, C. Morosini⁴

¹ M3R s.r.l., Viale Ortles 22/4 20139 Milano, Italy

² University of Milano Bicocca, Department of Earth and Environmental Sciences (DISAT), Piazza della Scienza 1 20126 Milano, Italy

³ Systema Ambiente SpA , Via dei Santi 58 25129 Brescia, Italy

⁴ University of Insubria , Department of Science and High Technology, Via Valleggio 11 22100 Como, Italy

15:55 - 16:05

Biosensors for the detection of contaminants in wastewater

A. Cossettini¹, G. Facchin², D. Goi¹, M. Manzano²

¹ Department of Polytechnic of Engineering and Architecture (DPIA), University of Udine, Via del Cotonificio 108, 33100 Udine, Italy

² Department of Agrifood, Environmental and Animal Sciences (DI4A), University of Udine, Via Sondrio 2/A, 33100 Udine, Italy

16:05 - 16:20

Question Time and Discussion

Session 7 | Short communications

Chair: V. Torretta and E.C. Rada

16:20 - 17:20 | 5 min each

Wastewater treatment and sludge disposal in the Province of Varese: how a territory can shape the water treatment and the management of residues

C. Cosco¹

¹ Alfa S.r.l., Gallarate, Italy

Sludge management and integration with the cycle of waste

M. Falcone¹

¹ Neutalia President, Strada Comunale Per Arconate n. 121, 21052 Busto Arsizio (VA), Italy

Management of biological sludges in Lombardy: characteristics, data and rules

S. Padovani¹

¹ ARPA Lombardia, Milano, Italy

Incentives and barriers affecting the transition towards the circular economy: a systematic literature review

M. Scacchi¹, E. Maggi²

¹ Department of Economics (DiECO), University of Insubria, Italy

Arsenic (III) removal from water by the synergistic action of Graphene Oxide (GO) and Granular Ferric Hydroxide (GFH)

A.P.D. Baltrocchi¹, L. Maggi¹, A.K. Tolkou², A. Karaeva¹, G.Z. Kyzas²

¹ Department of Theoretical and Applied Sciences, University of Insubria, 46 Via G.B. Vico, 21100 Varese, Italy

² Department of Chemistry, International Hellenic University, GR-65404 Kavala, Greece

Arsenic and sulfadiazine adsorption by a fe-hydrochar produced from olive pomace

S. Monaco¹, G. Simonetti¹, I. Falcone², F. Di Caprio¹, F. Amato¹, F. Pagnanelli¹, M.L. Astolfi¹, A. Brasiello³, L. Toro⁴, E. Moscardini⁴, P. Altimari¹

¹ Department of Chemistry, Sapienza University of Rome, Italy

² Technosind S.r.l., Viale P. Togliatti 1639, 00155 Roma, Italy

³ Department of Chemical Engineering, Materials, Environment, Sapienza University of Rome, Italy

⁴ Ecorecycling S.r.l., Viale Palmiro Togliatti 1639, 00155 Rome, Italy

Taron dynamic filtration system: Xylem innovative technology for assisting overloaded and/or inefficient secondary treatment in WWTPs

A. Maggio¹

¹ Xylem, Italy

Session 8 | Posters

14:30 - 17:20

Microplastics in zooplankton: a case study in Lake Como, Italy

*J. Lawrence*¹, *E.C. Rada*², *S. Carnati*⁴, *C. Santolini*⁵, *A. Pozzi*⁶, *R. Bettinetti*⁷

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⁴ University School for Advanced Studies IUSS, Pavia, Italy

⁷ Department of Human Sciences, Innovation, and Territory - DiSUIT, University of Insubria, Via Valleggio 11, Como (Italy)

Microplastics in wastewater treatment plants: a scoping review at worldwide level

*A. Zoccali*¹, *F. Malpei*¹

¹ Politecnico Milano, Department of Civil and Environmental Engineering (DICA) - Environmental Section, Piazza Leonardo da Vinci 32, 20133 Milano, Italy

Integrating Nature-Based Solutions for Sustainable Water Management and Resilience Against Climate Change in Urban Context

*M. Feofilovs*¹, *E. Zinkēvičs*¹, *F. Romagnoli*¹, *A. Karaeva*²

¹ Institute of Energy Systems and Environment, Riga Technical University, 12/1 Azenes street, Riga, LV1048, Latvia

² Department of Theoretical and Applied Sciences, Insubria University, Via Dunant 3, 21100, Varese, Italy

Environmental and economic assessment of the widespread use of anaerobic digestion techniques

*A. Kiselev*¹, *R. Giurea*², *E. Magaril*¹

¹ Department of Environmental Economics, Ural Federal University, 620002, Mira str., 19, Ekaterinburg, Russia

² Lucian Blaga University of Sibiu, Bulevardul Victoriei 10, Sibiu 550024, Romania

Modelling wastewater treatment plant odour dispersion in weak wind conditions: importance of high resolution meteorological data

*C. Morosini*¹, *E. Zanardini*¹, *A. Karaeva*², *P. Favaron*³

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² DiSTA, University of Insubria, Via Dunant 3, Varese, Italy

³ Servizi Territorio Srl, Via Garibaldi 21, Cinisello Balsamo, Italy

Emerging pollutants: the problem of microplastics

*C. Battaqlia*¹, *G. Molla*¹, *L. Pollegioni*¹

¹ Department of Biotechnology and Life Sciences, University of Insubria, via J. H. Dunant 3, 21100 Varese, Italy

Assessment and Optimization of Wastewater Treatment in Uganda

*P. Castellani*¹

¹ Department of Theoretical and Applied Sciences, University of Insubria, 46 Via G.B. Vico, 21100 Varese, Italy

Emerging pollutants! Education and awareness of the plastic problem

*A. Draghici*¹, *M.E. Boatca*², *E.C. Rada*³, *D. Perniu*⁴, *V. Dermol*^{5,6}

¹ Politehnica University of Timisoara, Management Department, Romania

² Politehnica University of Timisoara, Romania

³ Insubria University, Theoretical and Applied Science Department

⁴ Transilvania University of Brasov, Romania, Product Design, Mechatonics and Environment Department

⁵ International School for Social and Business Studies, Slovenia

⁶ DERMOL LTd. Slovenia

Evaluation of the energy potential of wastewater treatment plant sludge from Romania

*G. Ionescu*¹, *N. Ion*¹, *C.A. Safta*¹

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Microplastic in the outlets of municipal wastewater treatment plants of a highly urbanized area in the Lombardy region, Italy

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Closing

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17:20 –17:50