

Information & Programme



The 8th International Conference on Swimming Pool and Spa

18-22 March 2019

Marseille, France



Welcome Message

It is a great honor and pleasure to welcome you to the 8th *International Conference on Swimming Pool and Spa* (8th ICSPS) to be held on March 18-22, 2019 at the City Event Center-Vieux-Port, Marseille, France.

This biennial conference on Swimming Pool and Spa was held for the first time in Budapest in 2005. Over 14 years since that date, the conference has provided opportunity for scientists, policy makers, pool managers, equipment manufacturers, engineers and other professionals to share their research and their best experiences and practices to improve the beneficial effects of swimming and bathing to health and wellbeing. The 8th International Conference on Swimming Pool and Spa will continue to focus on health, safety and quality of swimming pools and spas with oral and flash poster presentations during a four-day conference.

This 8th edition is organized under the auspices of the French Ministry of Health and the presence of health agencies from several European countries is evidence of the interest to achieve ongoing improvements in environmental and health surveillance of bathing. This edition will also bring together the experience of water treatment and analysis manufacturers and pool managers, with the expertise of internationally recognized scientists in the field of chemical and microbiological analysis and treatment. There is no doubt that this multi-disciplinary approach will improve good management practice for the conference attendants.

We hope everyone will enjoy this conference and will enjoy visiting Marseille, the capital of Provence.

Jean-Luc Boudenne & Tarek Manasfi
Chairs of the 8th ICSPS

Conference location :

City Event Centre
2 rue Henri Barbusse,
Marseille, France



Technical visit **Monday March 18th**: [How Marseille has assured its drinking water supply?](#)

You should be registered for this extra-activity (50€). More info [here](#).

Please note that if you have not registered to this excursion during your on-line registration, it is still possible to pay (only cash) for this activity on-site on Monday March 18th between 12:30 and 13:00.

However, it is important to warn us before March 11th that you intend to participate in this activity at: 8thswimpoolspa@sciencesconf.org

- Payment (if not paid when registering to the conference): only Monday 18 March from 12:30 to 13:00 at the registration desk (City Centre Vieux-Port - 1st Floor)
- Departure for the technical visit at 13:00 in front of the City Center Vieux-Port
- Come back to the City Centre Vieux-Port at 18:00.

From 13:00 – 18:00 h the excursion will take place. The bus for the excursion will leave at 13:00 h from the entrance of the City Event Centre. Please be in time since we cannot wait for you. The bus will leave at 17:30 h from the Palais Longchamp back to the City Event Center for the welcome reception.

[Information on the Welcome reception on Monday March 18th](#)

The welcome reception will take place on Monday March 18th from 19:00 - 21:00 h at the City Event Center. There will be served drinks and snacks surrounded by a Provencal musical atmosphere.

[Information about the « surprise » event on Wednesday March 20th](#)

Please note that this extra-activity is free.

At 18:00, we will go on foot (10-minute-walk) to the location of this surprise event. During this walk, we will make a stop to take a **group photo of the**

participants in the conference. Please dress informally for this event. Drinks and snacks will be served.

Information about the conference dinner on Thursday March 21th

The conference dinner will take place at the restaurant “Le Quai du 7^{ème}” from 20:00 - 24:00, preceded by an aperitif from 19:00 to 20:00. The “Le Quai du 7^{ème}” is a 12 minutes walk from the City Event Center, located next to the « Radisson Blu hôtel ».

After the dinner, you can go your own way back to your hotel.



Nautical event Friday March 22nd: BOAT EXCURSION: *Discover the calanques, the Bay of Marseille and the If castle*

You should be registered for this extra-activity (50€). More info [here](#).

Please note that if you have not registered to this excursion during your on-line registration, it is still possible to pay (only cash) for this activity on-site by Wednesday March 20th at the registration desk.

However, it is important to warn us before March 11st that you intend to participate in this activity at: 8thswimpoolspa@sciencesconf.org

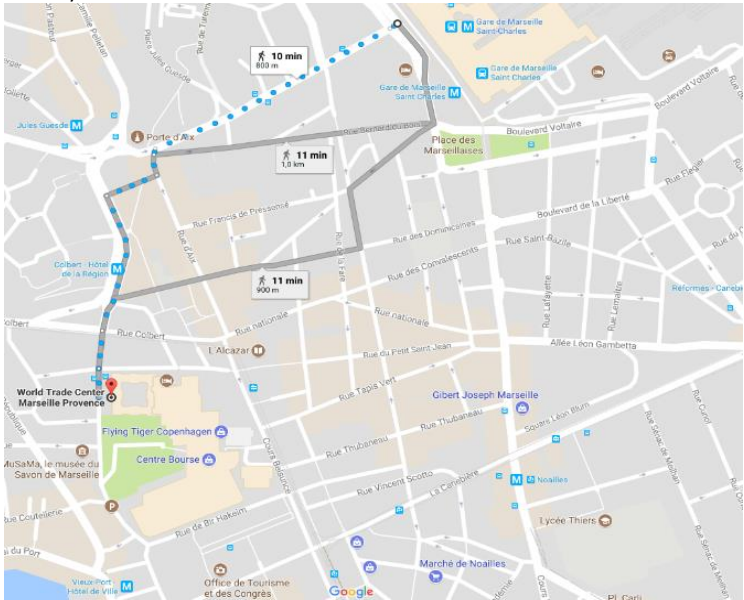
Transport from Marseille Provence Airport to Marseille city center:

- A direct shuttle can transport you from Marseille Provence Airport to Marseille city center. There is a departure from airport every 20 minutes from 4.50 am to 00.10 a.m. The shuttle will take you directly to Marseille Saint-Charles Railway Station in approx. 25 minutes. Cost of the single ticket is €8.30. For more information, visit the [Marseille-Provence Airport Shuttle](#).
- You can take a free shuttle between Marseille-Provence Airport and Vitrolles-Aéroport Marseille-Provence train station (journey time about 5 minutes). You can then reach Saint-Charles Railway Station by Regional Express Train (TER) in 20 minutes (line towards Toulon / Marseille, 4th stop - ticket price € 5.10).
- You can take a taxi directly at the exit of the airport terminal. The means of payment are cash and French checks and most taxis accept credit cards. The fare is about 55 euros at day and 65 euros at night.

- You can rent a car from 7:00 to 23:30. It is advisable to book the car before your arrival: [click here](#).

Join the City Center Vieux-Port from Marseille Saint-Charles Railway station

You can reach the conference venue by walking for approximately 10 minutes (see map below).



You can also take Line 1 of the metro. The conference venue is equidistant between the Colbert and Vieux-Port stations (see map below). The ticket price for a trip is €1.70.



Outline Programme “8th Swimming Pool and Spa Conference” 18 – 22 March 2019

Monday

18-03-2019

12:30-13:00

Last registration for the technical visit

13:00-18:00

Technical visit

18:00-19:00

Registration

19:00-21:00

Welcome reception

Tuesday

19-03-2019

08:30-09:30

Registration

09:30-10:00

Opening ceremony

10:00-10:30

Coffee break

10:30-12:30

Session 1: Chemical risks (Part 1)

12:30-14:00

Lunch

14:00-15:40

Session 2: Removal of contaminants (Part 1)

15:40-16:10

Coffee break

16:10-17:30

Session 3: Health and safety issues

Wednesday

20-03-2019

09:00-10:30

Session 4: Microbiological risks (Part 1)

10:30-11:00

Coffee break

11:00-12:50

Session 5: Chemical risks (Part 2)

12:50-14:00

Lunch

14:00-15:30

Session 6: Removal of contaminants (Part 2)

15:30-16:00

Coffee break

16:00-18:00

Flash poster presentations

18:00-20:30

Surprise event

Thursday

21-03-2019

08:30-09:00

Registration

09:00-10:00

Session 7: Microbiological risks (Part 2)

10:00-10:20

Session 8: Energy cost savings

10:20-10:50

Coffee break

10:50-12:20

Session 9: On-line and off-line measurement of water and air quality

12:20-14:00

Lunch

14:00-15:30

Session 10: Guidelines and regulations

15:30-16:00

Coffee break

19:00-20:00	Aperitif
20:00-24:00	Gala dinner, with presentations and selection of next ICSPS

Friday	22-03-2019
09:30-10:30	<i>Session 11: Chemically untreatable waters</i>
10:30-11:00	Coffee break
11:00-12:00	Open discussion
12:00-13:00	Closing of the conference (awards) and lunch
13:30-18h00	Nautical event



GACHES CHIMIE group was founded in 1948 in Toulouse, France, and offers chemicals and related services in several fields, and more particularly for water treatment: drinking water, process water, irrigation and swimming pool.

The company has developed GARO®Filtre, a filter media made of recycled glass granules to be used in replacement of traditional sand in all types of sand filters whose applications range from swimming pool water treatment, process or drinking water production to wastewater tertiary treatment. GARO®filtre improves filtration quality while reducing operating costs (savings in backwash water, of energy, lifetime increased).



GACHES Chimie also promotes quantitative ATP-metry, a reliable, sensitive, field analysis to determine total flora of surfaces or water. It is becoming a tool for cleaning and disinfection management of swimming pool surface, as well as a real-time microbiological water quality indicator in swimming pool.

Detailed Conference Programme

Tuesday	19-03-2019
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08.30 – 09.30	Registration
09.30 – 10.00	Opening ceremony
10.00 – 10.30	Coffee break

Session 1	<u>Chemical risks (Part 1)</u>
Chairs	Polonca TREBSE & Tarek MANASFI

10.30 – 11.10	KL1: <i>OPTIMIZATION OF AIR QUALITY IN CHLORINATED, INDOOR SWIMMING POOL FACILITIES</i> E.R. Blatchley III, Purdue University, USA
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11.10 – 11.30	O1: <i>CYANOGEN CHLORIDE IN SWIMMING POOL WATER</i> L. Erdinger, University of Heidelberg, Germany
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11.30 – 11.50	O2: <i>IDENTIFICATION OF AVOBENZONE BY-PRODUCTS FORMED BY VARIOUS DISINFECTANTS IN DIFFERENT SWIMMING POOL WATERS</i> A.T. Lebedev ¹ , M. BavconKralj, O.V. Polyakova, V.B. Artaev, E. Detenchuk, Z.Chen, <u>P. Trebše</u> ¹ Lomonosow Moscow State University, Russia ² University of Ljubljana, Slovenia
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11.50 – 12.10	O3: <i>DISINFECTION OF SWIMMING POOL WATER WITH CHLORINE GAS GENERATED IN SITU BY SALT ELECTROLYSIS AND ITS EFFECT ON CHLORATE AND PERCHLORATE CONCENTRATIONS</i> A. Reuss, Ospa Apparatebau Pauser GmbH & Co. KG
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12.10 – 12.30	O4: <i>THE OCCURRENCE OF TRIHALOMETHANES IN RECREATIONAL WATER IN TULKARM DISTRICT, PALESTINE</i> A. Kanan, Al-Quds University, Palestinian Territories
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12.30 – 14.00	Lunch
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Session 2
Chairs **Removal of contaminants (Part 1)**
Christiane HÖLLER & Maarten KEUTEN

- 14.00 – 14.40 *KL2: THE INFLUENCE OF UV ON SWIMMING POOL CONTAMINANTS*
M. Keuten, University of Delft, the Netherlands
- 14.00 – 15.00 *O5: MAKING POOL WATER WATER SAFER? USING COPPER/SILVER ELECTROLYSIS DISINFECTANT TO REDUCE DBP FORMATION*
J. Allen, M.J. Plewa, D.M. DeMarini, L.E. Quirk, S.D. Richardson
University of South Carolina, USA
- 15.00 – 15.20 *O6: MICROBIAL INACTIVATION, DISINFECTION BY-PRODUCTS FORMATION AND MICROPOLLUTANT REMOVAL DURING THE APPLICATION OF UVOX REDOX® TREATMENT IN SWIMMING POOL WATER*
Y. Ekowati¹, G. Ferrero¹, Maria José Farré², M. D. Kennedy^{1,3},
G. Buttiglieri²
¹IHE Delft Institute for Water Education, Delft, the Netherlands
²Catalan Institute for Water Research -ICRA-, Spain
³Delft University of Technology, Delft, the Netherlands
- 15.20 – 15.40 *O7: DISINFECTION EFFICIENCY IN TROPICAL-CLIMATE SWIMMING POOLS: CASE STUDY OF PISCILAGO WATER PARK, GIRARDOT – COLOMBIA*
D. Vega¹, Y. Sanchez²
¹Universidad de Cundinamarca, Colombia
²Escuela Colombiana de Ingeniería Julio Garavito, Colombia
- 15.40 – 16.10 Coffee break

Session 3
Chairs **Health and safety issues**
Vincent HILL & Franciska SCHETS

- 16.10 – 16.50 *KL3: AQUATICS 2030 IN THE UNITED STATES: FACILITATING A SYSTEMS-BASED APPROACH TO IMPROVING AQUATIC HEALTH AND SAFETY IN A DE-CENTRALIZED REGULATORY LANDSCAPE*

M. Beach, Center for Disease Control and Prevention, USA

16.50 – 17.30 KL4: DBP EXPOSURE AND HEALTH RISKS AMONG SWIMMERS
C. Villanueva, Barcelona Institute for Global Health, Spain

Wednesday 20-03-2019

08.30 – 09.00 **Registration**

Session 4 **Microbiological risks (Part 1)**
Chairs **Athena MAVRIDOU & Rachel CHALMERS**

09.00 – 09.30 KL5: *CRYPTOSPORIDIUM IN SWIMMING POOL WATERS*
P. Karanis, University of Cologne, Germany

09.30 – 09.50 O8: *INFECTIVE RISK FROM ACANTHAMOEBA AND ADENOVIRUS IN SWIMMING POOLS: A REVIEW OF THE LITERATURE*
L. Bonadonna, R. Briancesco, A.M. Coccia, S. Della Libera, G. La Rosa
Italian Institute of Health, Italy

09.50 – 10.10 O9: *POTENTIAL TRANSMISSION PATHWAYS OF CLINICALLY RELEVANT FUNGI IN INDOOR SWIMMING POOL FACILITIES*
Y. Ekowati¹, G. Ferrero¹, M.D. Kennedy^{1,2}, A.M. de Roda Husman^{3,4}, F.M. Schets³
¹IHE Delft Institute for Water Education, Delft, The Netherlands
²Delft University of Technology, The Netherlands
³National Institute for Public Health and the Environment, The Netherlands
⁴Utrecht University, The Netherlands

10.10 – 10.30 O10: *ABUNDANCE OF ANTIBIOTIC RESISTANT BACTERIA IN HOTEL POOLS AND SPA FACILITIES*
D. Köck, S. Huber, M. Schierling, C. Höller
Bavarian Health and Food Safety Authority, Germany

10.30 – 11.00 Coffee break

Session 5	<u>Chemical risks (Part 2)</u>
Chairs	Henrik R. ANDERSEN & Haipu LI
11.00 - 11.30	<p>KL6 : <i>DISINFECTION BYPRODUCTS IN SWIMMING POOL, CHEMICAL RISK AND CONTROL STRATEGY</i></p> <p>S. Chowdhury, King Fahd University of Petroleum and Minerals, Saudi Arabia</p>
11.30 – 11.50	<p>O11: <i>OCCURRENCE OF DISINFECTION BY-PRODUCTS IN SWIMMING POOLS OF A DEVELOPING CITY, CHINA</i></p> <p><u>H. Li</u>, F. Peng, Z. Yang, H. Lee</p> <p>Central-South University, China</p>
11.50- 12.10	<p>O12: <i>COMPREHENSIVE ASSESSMENT OF THE INDOOR AIR QUALITY IN A CHLORINATED OLYMPIC-SIZE SWIMMING POOL</i></p> <p><u>F. Felgueiras</u>¹, Z. Mourão¹, H. Santos¹, E.O. Fernandes², M.F. Gabriel¹</p> <p>¹Institute of Science and Innovation in Mechanical and Industrial Engineering, Portugal</p> <p>²University of Porto, Portugal</p>
12.10 – 12.30	<p>O13: <i>BROMINATED DISINFECTION BY-PRODUCTS IN SWIMMING POOL WATER</i></p> <p>L. Erdinger¹, C. Höller²</p> <p>¹University of Heidelberg, Germany</p> <p>²Bavarian Health and Food Safety Authority, Germany</p>
12.30 – 12.50	<p>O14: <i>FORMATION OF DISINFECTION BY-PRODUCTS FROM BODY FLUID ANALOGUES IN CHLORINATED SEAWATER</i></p> <p>T. Manasfi^{1,2}, O. Boukaroum², J.-L. Boudenne²</p> <p>¹Swiss Federal Institute of Aquatic science and Technology - EAWAG, Switzerland</p> <p>²Aix-Marseille University, France</p>
12.50 – 14.00	Lunch

Session 6
Chairs

Removal of contaminants (Part 2)
Maria-José FERRE & Wolfgang UHL

14.00 – 14.30

KL7: *DBP-CONTROL THROUGH WATER TREATMENT PROCESSES*

W. Uhl, Norwegian Institute for Water Research, Norway

14.30 – 14.50

O15: *COMPARISON OF HEAD-LOSSES AND CUTOFF SIZES OF THREE GRANULAR MEDIA USED FOR THE FILTRATION OF PUBLIC SWIMMING POOL WATER. A LAB SCALE STUDY*

C. Fleith, Ethis, France

14.50 – 15.10

O16: *OPERATION AND EFFICIENCY CHARACTERISATION OF SWIMMING-POOL WATER FILTRATION*

C. Mangeruca, Gaches Chimie, France

15.10 – 15.30

O17: *ASSESSING THE IMPACT OF HALL RENOVATION ON CHLORINATION BY-PRODUCTS FORMATION AND TRANSFER IN A PILOT POOL UNIT*

L. Tsamba, O. Correc, A. Couzinet

Centre Scientifique et Technique du Bâtiment -CSTB-, France

15.30 – 16.00

Coffee break

Session 7
Chairs

Flash poster presentation
Bruno COULOMB & Kamilla M.S. KAARSHOLM

16.00 – 18.00

P1: *ENERGY USE AND INDOOR AIR QUALITY IN NORWEGIAN SWIMMING POOL FACILITIES*

T.B. Nitter, S.N. Olsen, K.V.H. Svendsen, B. Aas

Norwegian University of Science and Technology (NTNU),
Trondheim, Norway

P2: *FORMATION OF DISINFECTION BY-PRODUCTS DURING CHLORINATION OF NITROGENOUS COMPOUNDS*

F. Peng, H. Li, Z. Yang, H. Lee

Central-South University, China

P3: AQUEOUS TRANSFORMATION OF SELECTED MICROPOLLUTANTS IN OUTDOOR AND INDOOR SWIMMING POOLS

E. Kudlek, A. Lempart, M. Dudziak
Silesian University of Technology, Poland

P4: CHEMICAL CONTAMINANTS IN POOL WATERS: RISK ASSESSMENT FOR HUMAN HEALTH

E. Righi, G. Predieri, S. Castiglioni, F. Riva, E. Zuccato, G. Fantuzzi.

University of Modena and Reggio Emilia, Italy
Institute for Pharmacological Research, Italy

P5: EFFECTIVENESS AND SAFETY OF UV-RADIATION TREATMENT IN SWIMMING-POOL

C. Catastini¹, J.L Boudenne², M. Brigante³, N. Cimetiere⁴, F. Gérardin⁵, P. Humeau⁶, A. Le Guennic⁷, I. Rouvie-Laurie⁸, M.P. Sauvart-Rochat³, P. Panetier¹

¹ANSES, France; ²Université d'Aix Marseille, France;
³Université Blaise Pascal, France; ⁴École Nationale Supérieure de Chimie de Rennes, France; ⁵INRS, France; ⁶ENGIE, France;
⁷ARS Pays de Loire, France; ⁸LHVP, France

P6: FACTORS INFLUENCING THE CONTENT OF THMs AND COMBINED CHLORINE IN SWIMMING POOL WATER

J. Wyczarska-Kokot, A. Lempart, M. Dudziak, E. Łaskawiec
Silesian University of Technology, Poland

P7: INFLUENCE OF SWIMMING POOL WATER RECIRCULATION REGIME ON STAPHYLOCOCCUS SPECIES CONCENTRATION AT SUBSURFACE

S. Labarthe, J. Lagièrre, K. Dubourg, F. Bauduer
University of Bordeaux, France

P8: ULTRAFILTRATION OF SWIMMING POOL WATER FOR CONTROLLING PSEUDOMONAS AERUGINOSA RE-GROWTH

E. Leoni, S. Marini, A. Masini, L. Dallolio
University of Bologna, Italy

P9: POTENTIAL OF ORGANIC MICROPOLLUTANTS EMISSION FROM SWIMMING ACCESSORIES INTO POOL WATER

A. Lempart, E. Kudlek, M. Dudziak
Silesian University of Technology

P10: THERMAL WATER QUALITY : STATE OF THE ART

Y. Sanchez, L. Cheu

Escuela Colombiana de Ingeniería Julio Garavito, Colombia

P11: DEVELOPMENT OF A SIMPLE PROCEDURE FOR TRIHALOMETHANES MEASUREMENT IN SWIMMING POOL WATER SAMPLES

R. Chehab, F. Robert-Peillard, B. Coulomb, J-L. Boudenne

Aix-Marseille University, France

P12: OCCURRENCE OF ENTERIC VIRUSES AND FREE LIVING AMOEBAE IN SWIMMING POOLS AND SPA, ROME 2015-2018

L. Bonadonna, R. Briancesco, A. M. Coccia, G. Bonanno Ferraro, P. Mancini, C. Veneri, S. Della Libera, M. Iaconelli, R. Paradiso, G. La Rosa

Italian National Institute of Health, Italy

P13: THE IMPACT OF HUMAN BODY FLUIDS LEVELS ON DBPs FORMATION IN SWIMMING POOLS

B. Ilker Harman¹, S.S. Kaplan Bekaroglu¹, A.A.S. Kanan⁴, A.A. Qahtan¹, M. Minaz¹, N.O. Yigit¹, N. Ates², T. Sardohan Koseoglu³, E. Tanacan¹

¹Suleyman Demirel University, Turkey ; ²Erciyes University, Turkey.

³Isparta University of Applied Science, Turkey ; ⁴Al-Quds University, Palestine

P14: IMPACT OF TWO DIFFERENT STRIPPING DEVICES ON THE TRICHLORAMINE AND CHLOROFORM CONCENTRATIONS IN SWIMMING POOL WATER

F. Gérardin, National Institute of Research and Safety -INRS-, France

18.00 – 20.00 Surprise event

08.30 – 09.00 **Registration**

Session 8 **Microbiological risks (Part 2)**
Chairs **Lucia BONADONNA & Panagiotis KARANIS**

09.00 – 09.30 O18: *OUTBREAKS ASSOCIATED WITH TREATED RECREATIONAL WATER - UNITED STATES, 2000-2014*
M.C. Hlavsa, V.A. Roberts, A.M. Kahler, J.M. Kunz, V.R. Hill, J.S. Yoder
Centers for Disease Control and Prevention, USA

09.30 – 09.50 O19: *RESISTANCE PROFILES OF E. coli ISOLATES DERIVING FROM TWO CENTRAL SWIMMING POOLS OF ATHENS IN GREECE*
C. Dioli¹, O. Papatzitze^{1,2}, A.-M. Kefala¹, D. Marios¹, A. Beloukas¹, A. Mavridou¹, O. Pappa^{1,3}
¹University of West Attica, Athens, Greece
²West Attica General Hospital “Santa Barbara”, Greece
³Central Public Health Laboratory, Greece

09.50 -10.10 O20: *FILTRATE AS SOURCE FOR LEGIONELLA IN POOL WATER - A STATISTICAL ANALYSIS OF AN EXTENSIVE DATASET*
W. Uhl^{1,2}, C. Höller³
¹Norwegian Institute for Water Research (NIVA), Norway
²Norwegian University of Science and Technology (NTNU), Norway.
³Bavarian Health and Food Safety Authority, Germany

10.10 – 10.40 Coffee break

Session 9 **On-line and off-line measurement of air and water quality**
Chairs **Fabien ROBERT-PEILLARD & Emanuele FERRETTI**

10.40 – 11.20 KL8: *ADVANCES IN MICROBIOTA KNOWLEDGE AND NGS TECHNOLOGIES: PERSPECTIVES FOR SURVEILLANCE IN RECREATIONAL WATERS*
V. Romano Spica, University of Rome “Foro Italico”, Italy

- 11.20 – 11.40 *O21: VALIDATION AND APPLICATION OF CRYPTOSPORIDIUM ASSAYS FOR SWIMMING POOL WATERS AND FILTER BACKWASH*
R.M. Chalmers^{1,2}, M. Luxford³, R. Johnston^{2,4}
¹Public Health Wales Microbiology, UK ; ²Pool Water Treatment Advisory Group, UK ; ³IDEXX, UK ; ⁴Public Health England, UK
- 11.40 – 12.00 *O22: AUTOMATED SYSTEM FOR THE ANALYSIS OF INORGANIC CHLORAMINES IN SWIMMING POOLS*
R. Chehab, F. Robert-Peillard, B. Coulomb, J-L. Boudenne
Aix-Marseille University, France
- 12.00 – 12.20 *O23: AN ALTERNATIVE METHOD TO MEASURE CHLORINE BASED ON A FOOD COMPATIBLE CHEMICAL*
K.M.S. Kaarsholm¹, E. Keliria², P. Mines¹, M. Antoniou², M. Havsteen Jakobsen¹, H.R. Andersen¹
¹Technical University of Denmark, Denmark
²Cyprus University of Technology, Cyprus
- 12.20 -14.00 Lunch
- Session 10** **Guidelines and regulations**
Chairs **Janice CALVERT & Michael J. BEACH**
- 14.00 – 14.30 *O24: SURF POOLS AND ARTIFICIAL WHITEWATER VENUES: ARE PUBLIC HEALTH AGENCIES PREPARED TO CATCH THE WAVE?*
V. Hill, M. Mattioli, M.C. Hlavsa, A.M. Kahler, J.R. Cope, J.L. Murphy, K.E. Fullerton
Centers for Disease Control and Prevention, USA
- 14.30 -14.50 *O25: IMPLEMENTATION OF THE NEW FRENCH LEGISLATION ON SWIMMING POOLS MANAGEMENT*
M. Guichard
French Ministry of Solidarity and Health, France
- 14.50. – 15.10 *O26: ASSESSMENT OF THE INDOOR AIR QUALITY IN 20 SWIMMING POOLS LOCATED IN THE NORTH REGION OF PORTUGAL*

M. F. Gabriel¹, M. Fernandes¹, F. Felgueiras¹, Z. Mourão¹, E.O. Fernandes²

¹Institute of Science and Innovation in Mechanical and Industrial Engineering, Portugal; ²University of Porto, Porto, Portugal

15.10 – 15.30 O27: *WASTEWATER HEAT RECOVERY TO WARM SWIMMING POOL WATERS*

L. STORA

Véolia, Marseille, France

15.30 – 15.50 O28: *THE MICROBIOLOGICAL WATER QUALITY IN PUBLIC SWIMMING PONDS*

F. Schets, G. Lynch, S. de Rijk, H.H.J.L. van den Berg, A. el Boukili, J.F. Schijven

National Institute for Public Health and the Environment (RIVM), the Netherlands

15.50 – 16.20 Coffee break

19.00 – 24.00 Aperitif & Gala dinner (Restaurant « Le Quai du 7^{ème} ») with presentations and selection of next ICSPS

Friday 22-03-2019

Session 11 **Chemically untreatable waters**

(Natural-biological ponds/thermal-therapaeutic pools)

Chairs **Daniela Köck & Vincenzo ROMANO SPICA**

09.30 – 09.50 O29: *NATURAL SWIMMING PONDS EXPERIENCE IN ITALY: AUTONOMOUS PROVINCE OF TRENTO CASE STUDY*

E. Ferretti¹, F. Guizzardi², M. Cerroni¹, L. Bonadonna¹

¹Italian Institute of Health, Italy

²Province Agency for Healthcare Services -APSS-, Italy

09.50 – 10.10 O30: *BIO-MINERAL FILTRATION: A TECHNOLOGY FOR A NEXT GENERATION OF BIO-POOL (RESIDENTIAL TO PUBLIC) AT REDUCED RUNNING COSTS*

F. Luizi¹, J.-F. Pognot¹, R. Werquin², A. Durieux²

¹Aquatic Science, Belgium

²LABIRIS, Belgium

- 10.10 – 10.30 *O31: UNTOUCHABILITY OF SPA THERMAL WATERS: STATE OF THE ART AND PERSPECTIVES FOR TREATMENT AND MONITORING WITHIN A PERSONALIZED WATER SAFETY PLAN*
F. Valeriani, L.M. Margarucci, G. Gianfranceschi, V. Romano
Spica
University of Rome “Foro Italico”, Italy
- 10.30 – 11.00 Coffee break
- 11.00 – 12.00 Open discussion
- 12.00 – 12.30 Closing of the conference (awards)
- 12.30 – 13.30 Lunch
- 13.30 – 18.00 Nautical event





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Société Chimique de France
Le réseau des chimistes



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