Flotation 2016

7th International IWA Conference on Flotation for Water and Wastewater Systems

Conference Programme

26 – 30 September, 2016
Toulouse, France

Principal Sponsors

SERINOL
Institut de la Filtration et des Techniques Séparatives
Institut National des Sciences Appliquées
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Organizers

Ian Crossley
Hazen and Sawyer

Pascal Guiraud
Institut National des Sciences Appliquées
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Organizations supporting the event
Monday, 26 September 2016

17:00 - 19:30  Registration

19:30 - 21:00  Welcoming Wine and Snacks at (place to be fixed), Toulouse

Tuesday, 27 September 2016

8:00 – 9:00  Registration at (place to be fixed), INSA Campus

9:00 – 9:30  Opening Ceremony and Welcoming Remarks:
             Bertrand Raquet, Head of INSA Toulouse
             Ian Crossley, Chairman of the Technical Committee
             Pascal Guiraud, Chairman of the Organizing Committee

9:30 – 10:15  Keynote Address:
              Matthew Valade, et al.
              New York City’s Croton Water Filtration Plant: A 100-year journey
culminating in the startup of world’s largest DAF treatment plant

10:15 – 10:50  Coffee Break

Session 1: Leading Papers (Combined Session)

10:50 – 11:30  Leading Paper 1
               Mooyoung Han
               Bubble Technology: A New Horizon beyond Flotation

11:30 – 12:10  Leading Paper 2
               Ligia Tiruta-Barna
               Environmental assessment and eco-design of water treatment processes

12:10 – 14:00  Lunch (provided)
### Session 2: Wastewater Treatment

**14:00 – 14:30**
Oscar Sanchez, et al.  
Recovery of particulate matter from a high-rate moving bed biofilm reactor by rapid dissolved air flotation

**14:30 – 15:00**
Petri Jokela, et al.  
Tertiary treatment of municipal wastewaters by high-rate dissolved air flotation

**15:00 – 15:30**
Passkorn Kanthongthip, John Novak  
The roles of temperature surfactant and pH on the performance of dissolved air flotation in wastewater treatment

**15:30 – 16:00** **Coffee Break**

### Session 3: Industrial Water Treatment

Jessica Younker, Margaret Walsh  
Clarification of hybrid adsorbent-coagulated floc particles by DAF for enhanced treatment of petroleum industry wastewater

Laura Turni, et al.  
Separation of chromite particles from silicate minerals by flotation

### Session 4: Drinking Water

**16:00 – 16:30**
Francisco Gross  
Two decades of experience of a large DWTP upgrade with DAF in South America

**16:30 – 17:00**
David Taylor, Andrew Elphinston  
Back to Basics - A case study of DAF Plants in North Wales

### Session 5: Research

Ming Zhang, Pascal Guiraud  
Dispersion features and nanoparticle flotation performance of colloidal gas aphron

Nattawin Chawaleesponsiya, Pisut Painmanakul, Pascal Guiraud  
Development of Single Bubble Experiment for Observing Bubble-Oil Aggregate Interaction

**17:00 – 19:30** **Poster Session and Wine and Cheese Reception**

**Free time for attendees**
Conference Program

Wednesday, 28 September 2016

8:15 AM  
Departure by bus from INSA Toulouse

Visit of the Carcassonne Medieval City

10:00

12:30  
Lunch (provided)

14:30  
Departure to Fontfroide Abbey

Visit of the Fontfroide Abbey

16:00

18:00  
Wine Tasting

19:30  
Conference Dinner within the Abbey

22:30  
Return by bus to Toulouse Centre
**Thursday, 29 September 2016**

### Session 6: Drinking Water

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<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>8:30 – 9:00</td>
<td>Urs Arnold, et al.</td>
<td>New Design Process for Drinking Water Production with Flotation Unit “DAFFI”</td>
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<tr>
<td></td>
<td>Xuezhi Zhang, Lan Wang, Qiang Hu</td>
<td>Harvesting Microalgal Biomass using High pH Pretreatment - Dissolved Air Flotation</td>
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<tr>
<td>9:00 – 9:30</td>
<td>Liesbeth Verdickt, Jan Cromphout</td>
<td>Optimization of the hydraulics of a full scale flotation plant by means of lamellae separators</td>
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<td>Tschung-il Kim, Hyunje Park, et al.</td>
<td>Onsite algae harvesting using micro and nano(sub-micron) bubbles</td>
</tr>
<tr>
<td>9:30 – 10:00</td>
<td>Tian Hai, Shi Yucheng, Ma Jun</td>
<td>Development of dissolved air flotation for drinking water treatment in China</td>
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**Coffee Break and Poster Session**

### Session 8: Pilot Test Simulation

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<tr>
<th>Time</th>
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<th>Topic</th>
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<tbody>
<tr>
<td>10:50 – 11:20</td>
<td>Tony Amato</td>
<td>Seawater Pretreatment Using Dissolved Air Flotation Pilot Plant To World Scale</td>
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<td>Dries Vandamme, et al.</td>
<td>Floc size dynamics in flotation-based separation for marine microalgae biomass production</td>
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<td>Aguiar Janaina, et al.</td>
<td>Evaluation of the effect of anionic surfactants in oil in water emulsions separation by flotation</td>
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<td></td>
<td>Nattawin Chawaloeshponsiya, et al.</td>
<td>Study of lubricating oily-emulsion treatment by induced air flotation (IAF) with coagulation: experimental results and modeling</td>
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**Lunch (provided)**
<table>
<thead>
<tr>
<th>Time</th>
<th>Session 10: Design Developments</th>
<th>Session 11: Contaminant Removal</th>
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</thead>
<tbody>
<tr>
<td>14:00 – 14:30</td>
<td>Tian Hai, Shi Yucheng, Ma Jun</td>
<td>Ming Zhang, et al. Humic-acid-enhanced dissolved air flotation process for the removal of TiO2 nanoparticles</td>
</tr>
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<td></td>
<td>Simulation and optimization design of an improved flotation nozzle by cavitation theory</td>
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<tr>
<td>14:30 – 15:00</td>
<td>Liesbeth Verdickt, Jan Cromphout</td>
<td>J.C. Liu</td>
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<td>Characterization of a pneumatically adjustable saturation nozzle</td>
<td>Flotation Separation of Strontium via Phosphate Precipitation</td>
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<td>15:00 – 15:30</td>
<td>Nathalie Vigneron-Larosa, et al.</td>
<td>Julie Chapelain, et al. Soil remediation after radioactive contamination; Study of illite clay extraction by dispersed air flotation in a new instrumented column</td>
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<td>Spidflow™ for wastewater treatment: high rate clarification without chemicals</td>
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<td>15:30 – 16:00</td>
<td>Coffee Break and Poster Session</td>
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<tr>
<td>16:00 – 16:30</td>
<td>Session 12: New Ideas</td>
<td>Session 13: Contaminant Removal – continued and Modelling</td>
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<tr>
<td>16:30 – 17:00</td>
<td>Francisco Gross Integrated CEPT and biofilm nitrogen removal processes with DAF clarification for compact WWTP solutions - TRICKDAF® process</td>
<td>Tian Hai, Shi Yucheng, Ma Jun Simulation and design of a high rate dissolved air flotation tank for drinking water treatment</td>
</tr>
<tr>
<td>17:00 – 17:30</td>
<td>Tian Hai, Shi Yucheng, Ma Jun Application of a compact high rate dissolved air flotation system on a drinking water plant upgrading</td>
<td>Lucie Vialaret-Enrico, et al. Experimental determination and modelling of nanoparticle flotation efficiency</td>
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**Free time for attendees**
Friday, 30 September 2016

Session 14: Closing Papers

9:00 – 9:30 AM   Ramiro Etchepare, André Azevedo, Jorge Rubio
Nanobubbles: their role in dissolved air flotation

9:30 – 10:00    Kristen Barrett, Matthew Valade
Progression of Dissolved Air Flotation Applications in North America

10:00 – 10:30   Summary of Conference – key issues – Ian Crossley and Pascal
Guiraud

10:30 – 11:30   Coffee Break and Poster Session

11:30 – 12:00   Session 15: Discussion and
Closing Remarks

12:00          Disperse
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Organization</th>
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<tbody>
<tr>
<td>Dissolved Air Flotation for Treating Oilfield Produced Water - Preliminary Results</td>
<td>Ali Ahmed, Al-Shukaili Maryam, Al-Aisri Asila, Al-Mamari Maryam</td>
<td>Sohar University (Oman)</td>
</tr>
<tr>
<td>Intensification of gas-liquid mass transfer by reduction of bubble size using new approach of Micro bubble splitting to nanobubbles</td>
<td>Temesgen Tatek¹, Han Mooyoung, Kim Tschung-il²</td>
<td>1 - Department of Civil and Environmental Engineering, Seoul National University (South Korea), 2 - Integrated Research Institute of Construction and Environmental Eng., Seoul National University (South Korea)</td>
</tr>
<tr>
<td>Application of sub-micro bubble for aeration of wastewater treatment</td>
<td>Intae Shim, Tschung-il Kim Mooyoung Han</td>
<td>Dept. of Civil and Environmental engineering, Seoul National University, Seoul, (South Korea)</td>
</tr>
<tr>
<td>Novel hollow-fiber membrane module for water and wastewater treatment</td>
<td>Nigam K.D.P. Singh Jogender</td>
<td>Indian Institute of Technology, Delhi (India)</td>
</tr>
<tr>
<td>Development of water treatment process and strategy for shale gas produced water in Jiangning, China.</td>
<td>Lee Yonghyeon¹, Khim Jeehyeong¹, Cui Mingcan¹, Kim Dongkwan², Kim Jeongwon¹</td>
<td>1 - Korea University (South Korea), 2 - Mine Reclamation Corporation (South Korea)</td>
</tr>
<tr>
<td>Coagulative colloidal gas aphrons in flotation for decoloration of fermented industrial wastewaters</td>
<td>Zhang Ming, Xie Li, Zhou Qi</td>
<td>College of Environmental Science and Engineering, Tongji University (China)</td>
</tr>
<tr>
<td>Pre-treatment of suspensions before flotation and post-treatment of phases separated by flotation in a liquid-solid separation process</td>
<td>Ginisty Pascal, Sirvain Marie-Andrée, Ben Aim Roger</td>
<td>Institute of Filtration and Techniques of Separation, Agen (France)</td>
</tr>
<tr>
<td>Microalgae harvesting strategies: Bottleneck in microalgae wastewater treatment technologies</td>
<td>Arbib Zouhayr</td>
<td>FCC aqualia (Spain)</td>
</tr>
</tbody>
</table>
### Demonstration study of multi-functioned floating treatment wetlands for improving water quality in stagnant river

Yoon Young H.
Lim Hyun Man
Kim Won Jae
Park Jae Ro
Korea Institute of Civil engineering and Building Technology (South Korea)

### Changing the surface characteristics of the microbubbles in DAF systems by the addition of cationic polymers in recirculating pressurized and its effect on the overall efficiency of the process

Migliato Marega
Gabrielle Penalva
Reali Marco Antonio
Soraia Meca Karen
Escola de Engenharia de São Carlos (Brazil)

### Efficiency evaluation of polyethyleneimine on oil removal from produced water by Dissolved Air Flotation System

Santos Allan
Mansur Claudia
Oliveira Luis Fernando
Magalhães Jeniffer
Aguiar Janaina
Instituto de Macromoléculas Eloisa Mano (Brazil)

### Development of supersaturated nano bubble with low energy using advanced air saturator of DAF

Maeng Minsoo
Seok Dockko
Tschungil Kim
Mooyoung Han
Hosoo Kim
Dept. of Civil and Environmental engineering, Seoul National University, Seoul (South Korea)

### The influence of the cross-flow velocity on the performance of a DAF pilot plant applied for water treatment

Marco Reali
Claudio Araujo
Escola de Engenharia de São Carlos (EESC-USP), São Carlos-SP (Brazil)