

# IOA<sup>3</sup> OZONE

N E W S

The Newsletter of the International Ozone Association



Atlanta, GA, Site of Next IOA-PAG Conference, August 26-29, 2019



# Ozone Generator

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▲ A10 series / air fed  
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## Applications

- Laboratory instrument
- Cooling tower water treatment
- Swimming pool
- Ozone laundry system
- Medical application
- Advanced oxidation
- Semiconductor
- Purified water treatment
- Waste water treatment
- Aquaculture and aquarium water treatment



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**OZONE NEWS**

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The International Ozone Association is a nonprofit educational and scientific organization dedicated to the collection and dissemination of information on, and to promote research in, any and all aspects of ozone and related oxygen species technologies. Membership is open to any individual, corporation, or organization having interest in the latest developments and advancements in ozone technology.

As a member of the IOA, you will receive bimonthly issues of the Ozone News newsletter, bimonthly issues of the technical journal Ozone: Science & Engineering (OS&E), and IOA's Publication Catalog which includes worldwide conference proceedings, monographs, and special reprints. In addition, members receive discounts on IOA worldwide publications and meetings.

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**Attention IOA Professionals**

**The IOA will be holding two meetings this year, a PAG regional conference in Atlanta, GA in August and the 24th World Congress in Nice, France in October. Please consider presenting a paper or poster presentation at one or both conferences. The call for papers for Nice is still open and there may still be selected openings for papers at the Atlanta conference. These are excellent venues for presenting your work and interacting with your educational and business peers.**

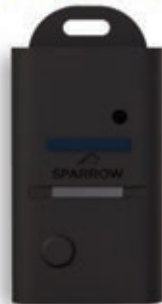
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## INDUSTRY NEWS

### WASSER BERLIN CANCELED



The biannual German trade fair, Wasser Berlin was scheduled for March 26-28, 2019. Due to a lack of exhibitors the organization was forced to cancel the event in 2019 and it is not anticipated that the event will return.

Wasser Berlin was one of the most important water events in Germany for years, drawing nearly 20,000 international water professionals and 450 exhibitors of water and wastewater technology.

Germany also has another large biannual water trade fair IFAT Munchen. This event draws 140,000 visitors and 3,300 exhibitors. Exhibitors were expressing an interest in exhibiting in IFAT rather than Wasser Berlin. IFAT will have their next trade fair May 4-8, 2020.

The IOA-EA3G Group had several successful regional conferences in parallel with Wasser Berlin. They were most generous in providing meeting space and other support to the IOA. We will miss our visits to Berlin.

*Source: Water News Europe*



### CALIFORNIA PROPOSES BILL TO HELP BREWERIES AND WINERIES RECYCLE THEIR WATER

State lawmakers in California want to make it easier for breweries and wineries to recycle their water.

A new bill introduced would create guidelines for reusing water from beer or wine processing for rinsing equipment and tanks. It also established water quality testing and treatment.

Among other provisions, the bill directs the State Water Board, in consultation with the California Department of Public Health -Food and Drug Branch, to develop regulations for microbiological chemical and physical water quality and treatment requirements for the onsite treatment and reuse of process water at breweries and wineries.

There should be a role for ozone here, for example in clean-in-place systems.

*Source: Industrial Water World 2/26/19*

### XYLEM SIGNS FIRST-OF-ITS-KIND REVOLVING CREDIT FACILITY IN U. S.

Xylem Inc. has announced execution of its new \$800 million Senior Unsecured Revolving Credit Facility. With this transaction, Xylem has replaced its five-year \$600 million revolving credit facility, while adding a sustainability-linked pricing mechanism to the new facility.

The deal is one of the first sustainable improvement loans in the U.S. and the first in the General Industrial Sector. The interest rate is index-linked to Xylem's overall sustainability performance as rated by Sustainalytics, a leading independent global provider of environmental, social and corporate governance (ESG) ratings. Improvements in Xylem's sustainability performance will reduce interest rates under the facility.

"We are excited to be the first water technology company in the U.S. to secure a sustainability-improvement loan that rewards our continued efforts to integrate sustainability and social value creation across our operations, and helps advance our strategy and mission to solve global water challenges," said Mark Rajkowski, Senior Vice President and CFO of Xylem.

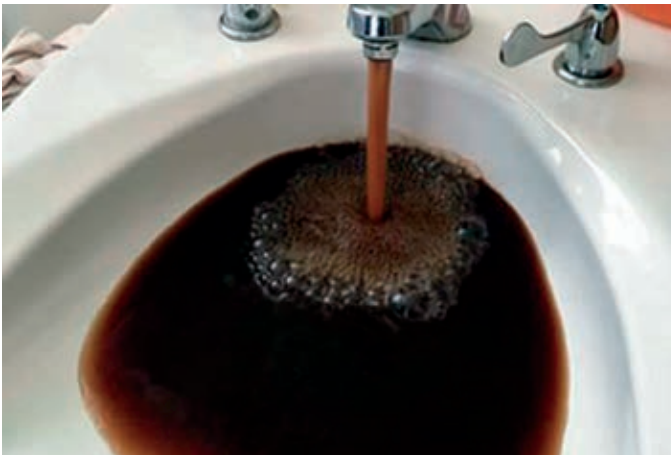
## Industry News (cont'd)

“As part of our mission to solve water, Xylem provides technology solutions that help customers around the world drive water and energy efficiencies and reduce impact on their local ecosystems,” said Claudia Toussaint, Senior Vice President, General Counsel & Corporate Secretary, and executive sponsor for ESG at Xylem. “We are also committed to reducing our own environmental footprint and helping communities in need become more water-secure. Sustainability is core to our company, our customers and our future.”

The revolving credit facility will be used for general corporate purposes.

Source: Xylem, Inc.

### THE HIDDEN DANGERS OF MANGANESE IN DRINKING WATER



Water Online Newsletter [www.wateronline.com](http://www.wateronline.com) recently summarized the top 10 technical articles published in their newsletter in 2018. The most read article was “*The Hidden Dangers of Manganese in Drinking Water*”, authored by Jim Lauria, VP Sales and Marketing, Mazzei Injector Company, LLC Bakersfield, CA. The paper first appeared in the May 21, 2018 issue of Water Online and is summarized below. Please visit the Mazzei website or [www.wateronline.com](http://www.wateronline.com) for the complete article.

Evidence indicates that manganese (Mn) is more than a nuisance: it’s a threat to health. It’s time to get serious about removing it from drinking water

Manganese (Mn) has long been recognized as a nuisance—its brown-to-black stains and metallic taste can make well water unpleasant, to say the least. In many areas across the U.S. and around the world, there’s plenty of manganese to be found. High levels of Mn occur in the U.S. along the Appalachian and


Adirondack ranges in the East. In the West, it’s common along the Sierras, Cascades and Coastal ranges. Dr. Samantha Ying of the University of California, Riverside studied the Glacial Aquifer that underlies 26 U.S. states and supplies drinking water to 41 million people, and found that 16.4 percent of the wells tested were contaminated with either Mn, arsenic, or both.

### Oxidation Opens Opportunities

Removing manganese (and iron, which often appears alongside it) from water is not very difficult. Oxygenating the water oxidizes the Mn into manganese dioxide (MnO<sub>2</sub>) precipitate which can then easily be filtered from the stream. When comparing oxidizing agents, ozone (O<sub>3</sub>)—which contains three oxygen atoms per molecule—is most effective, followed by oxygen (O<sub>2</sub>) and then air (21% of which is oxygen).

### Highly Efficient Mixing

The Mazzei GDT system illustrates how the process of injecting and mixing an oxidizer into a sidestream can be done with high efficiency.



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- ▶ less bromate formation



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## Industry News (cont'd)

The oxidizer—ozone, oxygen or air—is drawn into the water as it passes through a venturi injector, whose shape creates a low-pressure flow that pulls the gas into the stream, shearing and mixing it into solution. A Pipeline Flash Reactor (PFR) provides further mixing, maximizing the efficiency of the process and helping ensure the proper mixing and mass transfer of the oxidizer to create  $MnO_2$ .

The treated water containing high levels of dissolved oxygen is then directed through Mazzei MTM mixing nozzles into the main stream.

Contact with the dissolved oxygen or ozone quickly results in oxidation, which causes insoluble iron oxide and manganese dioxide particles to form in the stream. Smaller particles are captured in settling and flocculation technologies—plate or tube settlers, ballasted or solid/air flocculation, or sedimentation basins—while filtration through sand or anthracite media, "green sand" (glaucinite), catalytic media, biofiltration, membranes, or ion exchange collects larger particles.

Multi-stage approaches, such as a green sand filter before

ozonation and a media filter after it, can also be highly effective at removing Mn.

### Minimizing DBPs

As with any water treatment process involving chemical transformations, concerns about disinfection byproducts (DBPs) exist with manganese removal. Chlorine and chlorine dioxide can yield haloacetic acids (HAAs), trihalomethanes (THMs), chlorite and bromate. Ozone is gaining popularity in municipal water treatment because it can help avoid generating most of these DBPs; however, care must be taken to prevent the formation of bromates when the combination of high pH, high bromide levels, low dissolved organic carbon and low ammonia levels exist in the presence of high doses of ozone.

### The Time Is Now

As science increasingly points to the fact that waterborne manganese is more than a nuisance but is actually a threat to health, water professionals should take a hard look at monitoring for Mn and removing it from water at all levels—not just from individual home wells, but from commercial, industrial and municipal sources as well. We have the technology and the need is increasingly clear. Now is the time to get serious about manganese!

# OZONE: SAFE AND SIMPLE.



## Aqua ElectroOzone® M-Series Modular Ozone Generation System

The Aqua ElectroOzone® M-Series is the ideal solution for safe and reliable ozone production for municipalities requiring contaminant oxidation, control over disinfection byproducts or taste and odor issues. The system's modular design is up to 85% smaller than conventional ozone generators of the same capacity.

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**Industry News (cont'd)**

**MIOX Acquired by De Nora**

De Nora, a global leader in electrochemical technologies, announced it has acquired the Albuquerque-based MIOX business from Johnson Matthey for an undisclosed price.

The acquisition strengthens De Nora’s growing portfolio of water purification technologies that minimize environmental impact through improved energy efficiency, intelligent options, and chemical use reduction. De Nora’s on-site generation product offering includes electrochlorination systems using either seawater or brine for water treatment and biofouling control. The MIOX technology adds knowledge and experience in producing proprietary mixed oxidants such as sodium hypochlorite on site for advanced applications.

**XYLEM PROVIDES OZONE TO GRAND FORKS, NORTH DAKOTA**

Xylem Inc. has recently been selected to provide ozone generation facilities for the City of Grand Forks, ND in developing a new regional water plant. The facility will provide drinking water for 57,000 people in North Dakota’s

largest city. Xylem was selected by Black & Veatch and AE2S Consulting Engineers for the City of Grand Forks in a contract worth \$2.7 million.

The new facility will have a capacity of 20 million gallons per day and will have two Wedeco SMOevo 860 Ozone Generators each with a capacity of 500 pounds per day ozone

**SWISS RESEARCHERS IMPROVE REMOVAL OF MICROPOLLUTANTS WITH ACTIVATED CARBON POWDER**

According to a new Ecole Polytechnique Federale Lausanne (EPFL)-study a super-fine form of powdered activated carbon captures micropollutants more rapidly than the conventional kind. “As the next step, we will have to test the approach in a pilot study to be sure that it is workable in a full-scale wastewater treatment plant,” says Florence Bonvin, the lead author of the study.

The initial study showed that the super-finely ground activated carbon accelerated micropollutant removal rates by a fact of 5 or more. Swiss authorities have responded to increased micropollutant concentrations in Swiss lakes and rivers resulting in up to 100 plants requiring upgrades. Ozone treatment is the preferred approach but could present challenges when bromides are present in the water.

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Conventional powdered activated carbon can also be used, but the current technology is more expensive and requires more energy

Source; [www.waternewseurope.com](http://www.waternewseurope.com)

**NEWS IN BRIEF**

- The Walkerton Clean Water Centre, Walkerton, Ontario, Canada added a new pilot scale water treatment technology to its Technology Demonstration Facility: A fluidized bed ion exchange design to remove organics to control disinfection byproducts.
- BlueInGreen has officially relocated its headquarters to allow all professionals to work under the same roof. Their new mailing address is P.O. Box 9024, Fayetteville, AR 72703
- The White Rock, British Columbia, Canada, water treatment plant modifications should be operational by month's end, according to Dr. Saad Jasim who is coordinating the project. This \$15 million project includes an ozone process to control arsenic and manganese

**IOA NEWS**

**DR. JOOP KRUIHTOF RECEIVES IUVA LIFETIME ACHIEVEMENT AWARD**



At the February 10-13 IUVA World Congress in Sydney, Australia, Dr. Joop Kruithof was the recipient of the IUVA Lifetime Achievement Award for his professional dedication and lifetime achievement in promoting UV and the mission of the IUVA. Through his work with IUVA, Joop has made a substantial impact on the water research communities in Europe, Asia and the US.

Joop is also a long-time member of IOA and served as IOA President during 2004-2005.

The IOA offers congratulations to Joop for his award!



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**TONY'S COLUMN**

*Contributed by Tony Sacco, Spartan Technologies*

An Italian company based near Rome produces a large quantity of biodiesel. It is primarily produced from used frying oils sourced from Italy, France, Spain and Holland. In addition to biodiesel they also make distilled fatty acids, glycerin, and vegetable olein. For the most part these are byproducts of the biodiesel process. Biodiesel is produced through a transesterification reaction, a process in which a vegetable oil is reacted in excess of methyl alcohol in the presence of an alkaline catalyst. The products are sold throughout Europe.

They also produce electricity from biogas generated by their waste treatment processes and from distillation bottoms (pitch)

Their original wastewater treatment system included physical-chemical processes, activated sludge (oxygen based), and GAC. As the business is rapidly growing, their wastewater treatment facilities became undersized for their treatment objectives. The primary issue was higher recalcitrant COD after the biological stage with a significant increase in GAC consumption. The discharge COD target is 250 ppm. The

company investigated multiple technologies including UF, but membranes maintenance caused by fouling of the membranes was not acceptable.

DeNora Water Treatment (Capital Controls Ozone Group) was contacted to investigate if advanced oxidation using ozone might be a more economical option to reduce GAC consumption. DeNora's Capital Controls group is one of the oldest



continuously operating ozone companies in world with significant experience in industrial and municipal ozone water treatment. They recommended pilot testing of ozone based processes.

Tests were performed on site in a batch process using a 30 g/h ozone generator fed with LOX. Experiments were made with both ozone alone and ozone/peroxide. The ozone peroxide was done with a correction in pH to 9 with NaOH and H<sub>2</sub>O<sub>2</sub> injection with a 1:1 ratio with O<sub>3</sub>. The results showed that ozone/peroxide was a faster treatment option than ozone alone. This would be an expected result since molecular ozone is a

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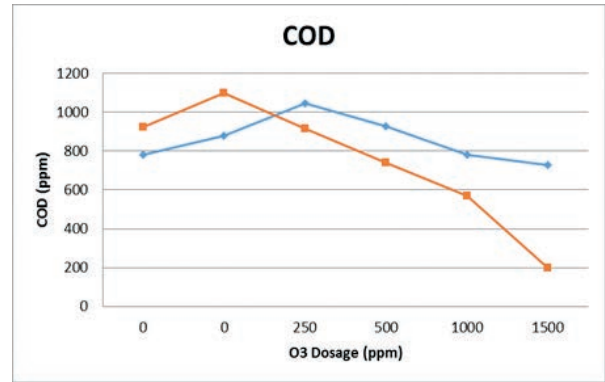


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slower reacting agent than the hydroxyl radical formed in the ozone/peroxide reaction.

The final design of the system required a 17 Kg/h ozone generator as a containerized package shown below to the left and a complete water treatment solution to the right. The ozone water mixing is done with a double stage side-stream pump injection system. A small amount of the ozone, about 0.5 Kg/h, is used for sludge reduction and control of filamentous bacteria.

The system has been in successful operation since 2014.



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**PLAN ON ATTENDING IOA-PAG ATLANTA CONFERENCE**



The next IOA conference will be the Pan American Group (PAG) conference August 26-29, 2019 at the Marriott Buckhead Hotel, Atlanta, GA.

Atlanta has its roots beginning in 1837 when it was picked at a site for the Western and Atlantic Railroad that would connect Georgia with Chattanooga, Tennessee and provide a trade route to points west. Unfortunately, much of the city was destroyed by fire in 1864 near the end of the Civil War in General Sherman’s “March to the Sea”. Atlanta arose again to become the leading city in the Southeastern United States.

Atlanta has three separate skylines – Downtown, Midtown and Buckhead. The Buckhead area is in northern Atlanta and is known for its upscale shops and boutiques and restaurants to meet any requirements. Two shopping malls, Lenox Square Mall and Phillips Plaza are only a short walk from the Marriott Buckhead.



The Atlanta airport is in the southern part of Atlanta, so taking a taxi from the airport to the hotel could be expensive and time consuming, especially during rush hour. The best solution is to

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take the MARTA Gold Line train from the airport to the Lenox Transit station, a 41-minute ride. This station is a very short walk from the hotel. IOA-PAG will be providing MARTA transit cards to all pre-registered attendees.

The conference activities are outlined in "Conference at a Glance" which appears on page 16 in this issue

### Ozone Workshop

On Monday, August 26, the day before the conference opening, a Workshop "All Things Ozone – Planning, Design, Maintenance and Training" will be held featuring several well-known ozone experts sharing their knowledge of ozone applications, operations and maintenance. The program will include the following presentations:

- *Benefits and Applications for Ozonation* (Erik Rosenfeldt, Hazen and Sawyer)
- *Planning: Bench-Scale and Pilot-Scale Testing Procedures* (Julia Lew, Southern Nevada Water Authority)
- *Design: Overview of AWWA Standard* (Ron Joost,



- Carollo)
- *Design: Ozone Contacting and Control Strategies for Disinfection and Oxidation Applications* (Chris Schulz, CDM Smith)
- *Operation: Lessons Learned* (Russ Navratil, County of Henrico)
- *Ozone Preventive Maintenance* (France Meder, Teledyne)



# World Class O<sub>3</sub> Output

Plasma Technics currently sells over 30 different products varying in ozone generating capacity from 10-450 grams/hr and ozone %wt 5% and 10%. All products are advanced micro processor based, supported by software and network devices, and UL/CSA listed. Proudly manufactured in the USA for over 25 years.



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- **Safety: Ozone and Oxygen Safety** (Ron Joost, Carollo)
- **Cost: Ozone System Costs for Municipal Water Treatment Applications** (Bill Mundy, Halton Region)
- **Open Discussion with Workshop Presenters**

### Keynote Address

The conference will open at 8:30 a.m. on August 27. The Keynote address **“Gwinnett’s Water Innovation Center – Collaboration Advancing Water Technologies”**, will be given by Melissa Meeker, Director of the Water Innovation Center.



With an aggressive focus on water supply resiliency, Gwinnett County (located immediately to the north east of the City of Atlanta) is boldly developing a Water Innovation Campus to meet the water resource needs of our vibrant and growing region. At nearly one million people, Gwinnett is considered one of the most diverse and fastest growing places in the US. The water need projections for residential, agricultural and industrial users in this region are formidable, and the need for innovative solutions to maximize efficiencies in our facilities is clear. Their approach is to integrate applied research, emerging technologies, collaboration with academia and industry, job training, and active and inclusive outreach.

Melissa Meeker is the Director of the Water innovation Center @Gwinnett and has more than 25 years of comprehensive experience in water resources management, with an emphasis on alternative water supply development and research, workforce development and public engagement. Melissa previously served as the Chief Executive Officer of The Water Environment and Reuse Foundation and was instrumental in the merger of three critical water-related research foundations.

She also served as Executive Director of the South Florida Water Management District and Deputy Secretary of the Florida Department of Environmental Protection, with responsibility for overseeing statewide water and

environmental restoration policy, including Everglades restoration. Meeker has a BS in Biology and a MS in Environmental Resource Management.

### Technical Program



The technical program is being finalized and the complete program will be published on the IOA-PAG website shortly. There will be approximately 35 technical papers given over two days in parallel sessions covering nearly all aspects of ozone technologies. There will also be a Round Table Discussion led by industry leaders.

### Technical Tour

The technical tour will occur on Thursday August 29, leaving the hotel at 8:00 a.m. The tour bus will return to the hotel by 4:00 p.m. The bus will not stop at the Atlanta airport. Attendees can use their MARTA card to take the train from the Lenox Transit Station to the airport.

The tour will focus on two Gwinnett County water treatment plants, the Shoal Creek Filter Plant producing drinking water and the F. Wayne Hill Water Resources Center which treats wastewater for reuse.

### Shoal Creek Filter Plant





Gwinnett County distributes safe drinking water to over 900,000 citizens through a network with more than 3,500 miles of water mains and 250,000 service connections. There are two water production plants included in the county system. Visitors will tour the Shoal Creek Filter Plant (SCFP) which uses ozone for primary disinfection and improved filter performance. SCFP's ozone system is sized for 1-log removal credit of *Cryptosporidium* using three 2400 lbs/day ozone generators, a sidestream injection downflow tube ozone dissolution system, and two 1 million-gallon serpentine baffled contactors. SCFP also houses two pilot plants, which are small scale versions of the full-scale treatment process. The pilots are used to conduct applied research and to optimize treatment processes.

#### F. Wayne Hill Water Resources Center



The F. Wayne Hill Water Resources Center (WRC) is one of the largest ozone and membrane wastewater treatment facilities in the world, with the ability to process up to 60 million gallons of wastewater per day. The facility includes traditional wastewater treatment processes followed by chemical clarifiers, ultrafiltration membranes, pre-ozone, biologically active carbon filters, and final ozone to produce very high-quality reclaimed water that is returned to Lake Lanier, the water supply for Gwinnett County and many other Atlanta metropolitan communities.



#### Social Events

An opening Exhibitors Reception will occur on Sunday evening prior to the opening of the conference on Monday morning. Tuesday will feature a special event, a Networking Reception at the Georgia Aquarium. The Georgia Aquarium is located in the center of Atlanta and attendees will use their MARTA transit card to reach the Aquarium.



The Georgia aquarium is one of the major exhibits in Atlanta and features six major exhibit galleries that contain more than 10 million gallons of water and showcase a fascinating variety of marine life.

The conference will close with the Conference Reception just after the technical sessions of Wednesday, August 28.

#### Registration

Registration for the Atlanta conference is now open. You can register online by visiting [www.ioa-pag.org](http://www.ioa-pag.org).

This is bound to be an exciting conference in an exciting venue. We hope you will consider attending and look forward to seeing you there.



# IOA Pan American Group Conference

## Schedule at a Glance

	Sunday 8/25/2019	Monday 8/26/2019	Tuesday 8/27/2019	Wednesday 8/28/2019	Thursday 8/29/2019	
8:00 AM	Registration				<b>Technical Tour (8AM-3PM)</b>  <b>IMPORTANT NOTES:</b> Tour bus will return to the <u>hotel</u> by 4 PM.  Due to the routing, There will <b>NOT</b> be a stop at the airport following this years tour.	
9:00 AM	IOA-PAG EOC Mtg	IOA PAG Board Meeting	All Things Ozone Workshop	Opening Session		Technical Sessions
10:00 AM				Coffee Break		
11:00 AM				Technical Sessions		
12:00 PM				Lunch		
1:00 PM	IOA Int'l Exec. Mtg	IOA Int'l Board Meeting		Technical Sessions		
2:00 PM				Technical Sessions		
3:00 PM	Int'l Committee Mtgs	Committee & Task Force Meetings		Coffee Break		
4:00 PM				Roundtable Discussions		Technical Sessions
5:00 PM				Networking Reception - Georgia Aquarium		Conference Reception
6:00 PM					Exhibitors Reception	
7:00 PM						
8:00 PM						
9:00 PM						
10:00 PM						
					<b>Legend</b> Meetings Technical Program Special Event	
					<b>Exhibitors Schedule</b> Setup Monday 12:00 - 5:00 PM Exhibits Open Tuesday 9:45 AM - 5:00 PM Wednesday 8:00 AM - 3:45 PM Tear Down Wednesday 3:45 - 6:00 PM	

**NEW IOA MEMBERS**

The International Ozonation Association takes great pleasure in welcoming our new members!

**ARGENTINA**

Francisco Carlos Bacchetta

Jorge Castro

**BELGIUM**

Mr. Kristof DEMEESTERE

**BRAZIL**

Wilfredo Urruchi

**GERMANY**

Mrs. Chioma IHENDU

Mrs. Karin SANDER-SEIDEL

Karl Josef SENN

**INDIA**

Mr. Sriniva Rao KARUTURI

Arshad MOOLJI

**JAPAN**

Dr. Takashi AZUMA

Dr. Chiaki TERASHIMA

Mr. Tetsuya TAMURA

**KOREA**

Sebong Jang

**MEXICO**

Alba Estela Jofre-y-Garfias

Octavio Trejo Chavero

**POLAND**

Jacek Niegiersz

**SERBIA**

Mr. Drako TAMINDZIC

**SINGAPORE**

Kevin Huang

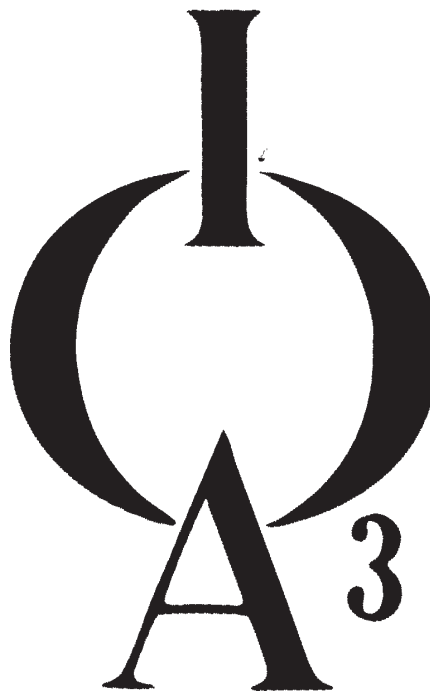
**UNITED STATES OF AMERICA**

Glenn Hunter

Richard Rosik

William Schwaner

Veronica Wood





## Upcoming IOA Meetings

### 2019

**June 20-21, 2019** 28th Japan Ozone Association Annual Conference, Tokyo Metropolitan Waterworks, Tokyo, Japan. **Information:** [www.j-ozone.org](http://www.j-ozone.org)

**August 26-29, 2019**, IOA Pan American Group Regional Annual Conference, Buckhead Marriott Hotel, Atlanta, GA. **Information:** [www.ioa-pag.org](http://www.ioa-pag.org). Conference and Hotel registration is open

**October 20-25, 2019**, IOA 24th World Congress and Exhibition, Hyatt Palais de la Méditerranée, Nice France. **Information:** [www.ioa-ea3g.org/congress](http://www.ioa-ea3g.org/congress). See call for abstracts in this issue.

### 2020

**August 17-20, 2020**, IOA Pan American Group Regional Annual Conference, South Point Hotel and Casino, Las Vegas, NV. **Information:** [www.ioa-pag.org](http://www.ioa-pag.org).

### 2021

**August 30- September 3, 2021**, IOA 25th World Congress and Exhibition, Caesars Windsor Hotel and Casino, Windsor, Ontario, Canada. Future information will be available in Ozone News or [www.ioa-pag.org](http://www.ioa-pag.org)

## Upcoming Meetings of Other Organizations

### 2019

**April 22-24, 2019**, Oman Energy & Water Conference and Exhibition, Muscat, Oman. **Information:** [www.energyandwateroman.com/](http://www.energyandwateroman.com/)

**April 23-27, 2019**, Water Quality Association Convention & Exposition, Las Vegas Convention Center, Las Vegas, NV. **Information:** [www.wqa.org](http://www.wqa.org)

**April 29-30, 2019**, AWWA International Symposium on Waterborne Pathogens, Tampa FL. **Information:** [www.awwa.org](http://www.awwa.org)

**May 9-11, 2019**, Asia Pool & Spa Expo, China Import and Export Fair Complex, Guangzhou, China. **Information:** [www.poolspabathchina.com](http://www.poolspabathchina.com)

**June 3-5, 2019**, Aquatech China, Shanghai, China.

**Information:** [www.aquatechtrade.com/china/](http://www.aquatechtrade.com/china/)

**June 9-12, 2019**, AWWA Annual Conference & Exposition (ACE 19), Colorado Convention Center, Denver, CO. **Information:** [www.awwa.org](http://www.awwa.org)

**June 16-20, 2019**, 12th IWA International Conference on Water Reclamation and Reuse, Berlin, Germany. **Information:** [www.iwa-network.org](http://www.iwa-network.org)

**July 5-9, 2019**, Singapore Water Week, Singapore. **Information:** [www.siww.com.sg/](http://www.siww.com.sg/)

**July 29 – August 1, 2019**, WEF-EESS Conference: Advancement in Water & Wastewater Treatment and Reuse, Singapore. **Information:** [www.wef.org/events](http://www.wef.org/events)

**September 3-5, 2019**, Aquatech Mexico, Mexico City Mexico. **Information:** [www.aquatechtrade.com/en/mexico](http://www.aquatechtrade.com/en/mexico)

**September 8-11, 2019**, 34th Annual WaterReuse Symposium, Marriott Marquis San Diego Marina, San Diego, CA. **Information:** [www.watereuse.org](http://www.watereuse.org)

**September 11-14, 2019**, Association of Water Technologies Annual Convention and Exposition, Palms Springs Convention Center and Renaissance Hotel, Palm springs, CA. **Information:** [www.awt.org](http://www.awt.org)

**September 21-25, 2019**, Water Environmental Federation Annual Technical Exhibition and Conference, McCormick Place, Chicago, IL. **Information:** [www.weftec.org](http://www.weftec.org)

**October 2-4, 2019**, WaterSmart Innovations Conference and Exposition, Las Vegas, NV. **Information:** [www.watersmartinnovations.com](http://www.watersmartinnovations.com)

**October 16-18, 2019**, World Aquatic Health™ Conference, Williamsburg Lodge, Williamsburg, VA. **Information:** [www.thewahc.org](http://www.thewahc.org)

**November 3-7, 2019**, AWWA Water Quality Technology Conference, Sheraton Dallas Hotel, Dallas, TX. **Information:** [www.awwa.org](http://www.awwa.org)

**November 5-7, 2019**, National Pool|Spa|Patio Expo, Morial Convention Center, Las Vegas, NV. **Information:** [www.poolspapatio.com](http://www.poolspapatio.com)

**November 5-8, 2019**, Aquatech Amsterdam, Amsterdam, the Netherlands. **Information:** [www.aquatrade.com/amsterdam/](http://www.aquatrade.com/amsterdam/)

**November 10-15, 2019**, AIChE Annual Meeting, Hyatt Regency Orlando, Orlando, FL. **Information:** [www.aiche.org](http://www.aiche.org)

The International Ozone Association  
is pleased to invite you to take part in the

## 24<sup>th</sup> World Congress & Exhibition

20 - 25 October 2019, Nice, France

# Ozone and Advanced Oxidation

## Leading-edge science and technologies

This event continues a long series of successful congresses organized worldwide to provide an international forum for all concerned with fundamental, engineering and applied aspects oxidation techniques involving ozone and advanced oxidation systems.

### SCOPE

The upcoming congress will host experts from all over the world to present and discuss the latest advances in knowledge and technology for development and application of processes based on ozone or any advanced oxidation system for:

- Environment preservation and human health protection: water, gas, soil and waste purification, water reuse and recycling, recovery of valuables
- Industrial manufacture and conditioning: pulp and paper, agri-food, electronics, chemicals, oil&gas, ...
- Medical therapy.

### OBJECTIVES

The IOA wishes to continue to offer the world the unique opportunity:

- To interface with scientists, researchers, students, engineers, users, technical experts,
- representatives of leading organizations from various disciplines,
- To share the latest information on research topics, current issues, technologies under development, new applications, full-scale experiences and equipments and products,
- To consider and discuss directions able to deliver innovative, competitive and sustainable solutions which address current and next challenges.

### PROGRAMME

The congress will feature:

- Three concurrent scientific and technical sessions including keynote lectures, oral communications, short oral presentations with connected poster exhibition and discussions (21-23 October),
- Exhibition of Industry's technologies, products and services (21-23 October),
- Technical visits of full-scale application plants (24-25 October),
- Social and cultural events for delegates and their guests: tours, congress dinner



## ANNOUNCEMENT

## CALL FOR PAPERS AND EXHIBITORS





## TOPICS OF INTEREST

relevant to the Congress theme include but are not limited to the combinations of:

- Chemical and biochemical reactions
- Reaction mechanisms
- Reaction kinetics and modeling
- Advanced oxidation processes
- Synergies with ozonation
- Hydrodynamics and mass transfer
- Reactor design / Modeling / Validation
- By-products formation and control
- Process optimization and control tools
- Ozone generation
- Multiphase reactors
- Gas diffusion devices
- Regulatory requirements
- Gas treatment and odor control
- Soil remediation
- Biosolids treatment
- Water disinfection
- Emerging contaminants, occurrence and treatment
- Pollutants removal
- Wastewater treatment for reuse or discharge
- Application in agricultural and industrial processes
- Decontamination/Modification of materials and surfaces
- Measurement and on-line monitoring
- Operation studies
- Competitiveness of technologies
- Medical applications
- ...

## SUBMISSION OF ABSTRACTS

Researchers, scientists, practitioners are invited to propose oral or poster presentations related to the theme topics.

Authors should submit an extended abstract in English of two pages (with tables and figures) by 12 April, 2019:

- Preferably online at [www.ioa-ea3g.org/IOA\\_congress/](http://www.ioa-ea3g.org/IOA_congress/)
- By e-mail with the submission form to the IOA-EA3G Secretariat.

Each proposal should be accompanied by the Submission form enclosed dully filled.

The Programme Committee will notify authors about the acceptance of their papers for oral or poster presentation before 17 May, 2019.

## SCHEDULE

12 April 2019	Submit abstracts by this deadline
12 April 2019	Book your booth, your sponsoring option
17 Mai 2019	Notification of acceptance of papers
24 Mai 2019	Early programme and registration
19 August 2019	Submit print ready papers
19 August 2019	Discover the final programme and register
20 October 2019	Attend the Congress with your guests

## AWARDS AND PUBLICATIONS

During the congress, the Programme Committee will select and award a prize to the best paper presented by a PhD student. All accepted papers will be printed in the congress proceedings handed out to participants at registration. After the congress, the editors of the IOA journal "Ozone: Science & Engineering" will make a final selection for a potential publication as peer-reviewed article.

## EXHIBITION AND SPONSORSHIP

The exclusiveness of the Congress allows exhibitors and sponsors an ideal opportunity to meet a unique and targeted audience. Organizations and companies are invited to support the Congress organization and to display their technologies, products and services related to the Congress theme.

For detailed information on exhibition and sponsoring options, please contact the Congress Office to make the most of this event.

IOA office [ioa@esip.univ-poitiers.fr](mailto:ioa@esip.univ-poitiers.fr)

## REGISTRATION

Registration will be available end May 2019.

The registration fees will cover scientific and technical sessions, book of abstracts, electronic proceedings, lunches, coffee breaks, exhibition, cultural and technical tours and congress dinner.

## CONGRESS VENUE

The Congress venue will be at the Hyatt Regency Hotel, Nice Palais de la Méditerranée.

## LANGUAGE

The official language will be English.

## CONTACT AND UPDATES

For any request: IOA-EA3G Secretariat

Fax +33(0)549 454 060

E-mail: [ioa@esip.univ-poitiers.fr](mailto:ioa@esip.univ-poitiers.fr)

## CONGRESS WEBSITE

[www.ioa-ea3g.org/IOA\\_congress](http://www.ioa-ea3g.org/IOA_congress)





### SUBMISSION

Authors are kindly invited to propose an extended abstract related to original contribution on any of the topics of the congress by 12 April 2019. Abstracts can preferably be submitted online at [www.ioa-ea3g.org/IOA\\_congress/](http://www.ioa-ea3g.org/IOA_congress/) or by e-mail to the IOA-EA<sub>3</sub>G secretariat. Each proposal submitted by e-mail should be accompanied by this submission form dully filled. An acknowledgement of receipt of your submission with ID number will be sent to your e-mail address after submission. If you do not receive any confirmation, your submission needs to be re-submitted.

For submission of abstract or request of further information, to be returned before 12 April 2019 by e-mail to: IOA-EA<sub>3</sub>G Secretariat, E-mail: [ioa@esip.univ-poitiers.fr](mailto:ioa@esip.univ-poitiers.fr)

### YOUR SUBMISSION OR REQUEST

I wish to submit an abstract, see the document enclosed sent by E-mail entitled: .....

Speaker's name:.....

Co-author's names: .....

**PREFERENCE!**  For **ORAL presentation**       For **POSTER presentation** (with oral summary)

I wish to receive the final program of the congress and information for registration

I wish to receive information on sponsoring options     I wish to receive information on exhibition

Other: .....

Please mark the field - theme and topic - to which the subject of your abstract belongs.

#### THEMES (choose only one please)

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Chemistry            | <input type="checkbox"/> Medicine                     | <input type="checkbox"/> Drinking water      |
| <input type="checkbox"/> Chemical Engineering | <input type="checkbox"/> Agri-Food application        | <input type="checkbox"/> Medical application |
| <input type="checkbox"/> Biology              | <input type="checkbox"/> Process industry application | <input type="checkbox"/> Other               |
| <input type="checkbox"/> Physics              | <input type="checkbox"/> Wastewater treatment         |  |

#### TOPICS (several allowed)

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Reaction mechanisms, kinetics, by-products           | <input type="checkbox"/> Modelling, validation, system design      | <input type="checkbox"/> Industrial applications                               |
| <input type="checkbox"/> Ozonation  | <input type="checkbox"/> Analytical methods                        | <input type="checkbox"/> In-field full scale applications                      |
| <input type="checkbox"/> Advanced oxidation                                   | <input type="checkbox"/> Agri-Food safety and quality              | <input type="checkbox"/> Product / Process R&D                                 |
| <input type="checkbox"/> Disinfection   | <input type="checkbox"/> Waste, Air and Soil treatment             | <input type="checkbox"/> Hybrid ozone processes                                |
| <input type="checkbox"/> Ozonolysis   | <input type="checkbox"/> Wash water, process water                 | <input type="checkbox"/> Innovative applications of ozone and related oxidants |
| <input type="checkbox"/> Hydraulics, hydrodynamics, mass transfer, contactors | <input type="checkbox"/> Wastewater treatment, recycling and reuse |  |
|   | <input type="checkbox"/> Ecosystem preservation                    |  |

### YOUR CONTACT DETAILS

Mrs.     Mr.    LAST NAME: ..... First Name: .....  IOA Member

Organisation: .....

Address: .....

Country: .....

Phone: + ..... Fax: + ..... E-mail: .....

### EDITORIAL GUIDELINES for abstract submission

- The abstract should be submitted in English as a Word file. The abstract length should be two A4 pages.
- The abstract must include title, author names and addresses, keywords, and the paragraphs introduction, methods, results with main table or figure, conclusions and key-literature.
- The text and the title must be free from abbreviations, except those commonly used.
- The title of the abstract must be free of trademarks and printed in CAPITAL LETTERS;
- For author name, please enter the FIRST NAME in full, followed by the LAST NAME, for each author without abbreviations (e.g. John Smith, and NOT J. Smith). There should be no more than 8 authors.

**SUBMISSION FORM    REQUEST FOR INFORMATION**



# 2019 International Ozone Association – Pan American Group Annual Conference and Exposition



## Announcement



**Marriott Buckhead Hotel  
Atlanta, Georgia  
August 26-29, 2019**

### Abstracts Due: Call for availability of space

Please submit your abstract(s) through our website:

<https://ioa-pag.org/2019-IOA-PAG-Conference-Atlanta>

Share your exciting Ozone and AOP technological advancements and experiences in this unique forum - showcasing the world's premier advanced treatment technologies! This conference will provide current technical, process and operational information to engineers, scientists, and end users of Ozone and Advanced Oxidation technologies with focus on municipal & industrial water, wastewater, water reuse and emerging contaminants in North and South America.

#### **TOPICS MAY INCLUDE:**

- \* Advanced Oxidation
- \* Biofiltration
- \* Bromate Formation and Control
- \* Chemical and Biochemical Reactions
- \* Disinfection
- \* DBPs Formation and Control
- \* Drinking Water Treatment
- \* Emerging Contaminants
- \* Marine Mammal Aquarium
- \* Operations and Maintenance
- \* Ozone Contactor Design
- \* Ozone Generation
- \* Ozone Mass Transfer
- \* Ozone Measurement
- \* Pools and Water Features
- \* Regulatory Perspectives
- \* Wastewater Treatment & Water Reuse

**ACCEPTED SPEAKERS:** Will receive a \$100 discount off of the early-bird conference registration fee!

**ATTENTION STUDENTS:** When submitting your abstract, let us know if you'd like to be considered for a Memorial Scholarship Award to receive a complimentary conference registration!

**Roundtable Discussions:** We will once again be featuring roundtable discussions in the Technical Program. If you would like to lead/moderate a discussion using this format, please submit your idea through the Call for Abstracts link.

For additional information please contact:  
Jennifer Fuel, Administration & Communications  
Officer; [jfuel@ioa-pag.org](mailto:jfuel@ioa-pag.org); 480-529-3787



# Reliable instruments for the **OZONE INDUSTRY**

Interference-Free Measurement of Dissolved Ozone



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Model A14/A11

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Model F12

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- Optional Self-Checking Sensors



**Portable Gas Detector**  
Model C16

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- Uses "Smart Sensors" for up to 33 Different Gases

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N E W S

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