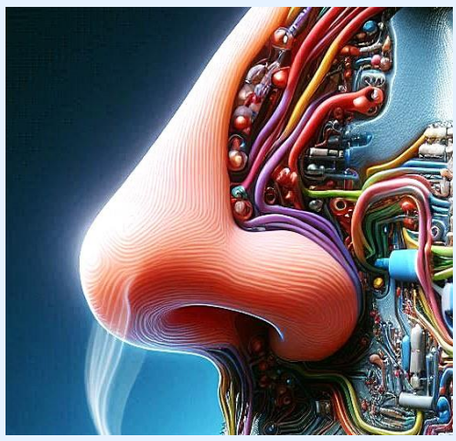
ACS
Orange County Section

Dinner Meeting and Scientific Presentation

Thursday, May 15, 2025

Waters Corporation Facility
3540 Howard Way,
Suite 100/125
Costa Mesa, CA 92626



Make your reservation NOW

Social: 5:30 PM Dinner: 6:00 PM Program & Presentation: 7:00 PM

Reservations

Please contact us as soon as possible, but no later than 12 noon on Monday, May 12, 2025 at OCACS@sbcglobal.net. Indicate if you will be attending the dinner and program or the program only. List all the names of attendees and special food requests like vegetarian or gluten free. There is a limit on the number of attendees, so make your reservation early.

Dinner cost is $25 for members and members' significant others; $35 for non-members or those without reservations. **Teachers and students who register for this meeting will receive a $10 discount on their dinner**. Since we are not at this time set up to accept credit cards, please plan on using a check or cash.

Note: OCACS pays the caterer on the basis of the number of dinner reservations made. Your reservation for dinner is a commitment to pay.

Presentation

Environmental Sensors:

Improving the wellbeing of people and the planet

Joseph R. Stetter, Ph.D.

JRS Technology, San Clemente , CA 92673

Abstract:

Environmental sensors enjoy a billion-dollar market and are advancing rapidly. They provide powerful tools for understanding and protecting our planet and promoting our wellbeing. Tiny sensors, in general, provide awareness on the spot, immediately, in both local and remote situations. Herein we will focus on a subset of environmental sensors, specifically electrochemical gas sensors also known as amperometric gas sensors (AGS). The unique characteristics and chemistry of the AGS, make is well-suited for gathering accurate and real-time concentration data on environmental gases like CO, NO2, SO2, and Ozone, which, when combined with T, P, RH and PM2.5, provide environmental air quality [AQ] information that can inform decision-making to protect human health and promote environmental sustainability. The modern AGS has origins in the fuel cell work of the 1960s but has come a long way since then. The electro-chemistry of the sensor allows simple design, low cost, long lifetime and high performance as illustrated by the modern home CO alarms. Contribution of the AGS to our society are exemplified in recent research and applications including: 1] providing real time data to improve environmental models of air quality [AQ], 2] developing wearable sensors to assess environmental health and the impact of AQ on public health, 2] enabling developments of renewable energy sources and sustainable agriculture, and 3] improving industrial safety, reducing leaks of hazardous gasses, and minimizing the financial impacts of lost product. Citizen science experiments show how the AGS can be used to predict and monitor wildfires, measure CO exposure during pregnancy for prevention of low birthweight babies, and efficient and safe rollout of clean hydrogen energy technology.

Speaker Biography

Joe received a Ph.D. in Physical Chemistry from the University at Buffalo (SUNY) in 1975 and has been a leading researcher, entrepreneur, author, educator, and mentor for more than 50 years. He founded, developed, and sold 4 companies based on more than 50 patents in chemical sensors. In his early career, Dr. Stetter developed both solid-state and electrochemical sensors, built the first operational sensor-array based instrument (electronic nose, 1982), and marketed the first electrochemical dosimeters for toxic gas exposure monitoring. Instruments and sensor products he championed over the years have been deployed for personal protection, industrial safety, and environmental monitoring. Joe worked in industry, government, NGOs, and Academia in both research and management positions. The sensors he invented and commercialized have saved lives, improved worker health, and promoted the well-being of people and the planet. As Professor of Chemistry at the Illinois

Institute of Technology, Dr. Stetter taught both graduate and undergraduate chemistry as well as entrepreneurship [in IIT's Stewart School of Business], while building his research group in advanced chemical sensing. Dr. Stetter received numerous awards for his work [TMAC entrepreneur of the year, IR-100 awards, DOE Tech Transfer awards], and published hundreds of scientific papers and holds over 50 patents. His work is the foundation of many sensor-based products at both his own startups and other companies and are still in use today. Dr. Stetter not only continues to innovate and develop products for the social good including "smart city, IoT-systems, and wearable" sensors, but also mentors a new generation of engineers and scientists. Dr. Stetter currently delivers high-tech services to industrial companies interested in sensor development, tech-transfer and entrepreneurship, and the commercialization of sensors for societal benefit.

Current Affiliations:

• Consultant/advisor [JRS Technology, San Clemente, CA 92673]

• Visiting Scholar, Mechanical Engineering – Georgia Tech., Atlanta GA

• ACS Emeritus Member

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American Chemical Society, Orange County Section

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