# ISA Analysis Division Program

**May 05 - 09, 2019**

**Galveston Convention Center**

## The 64th Annual Symposium of the Analysis Division

## *"Returning to the Sea"*

| Date/Time | Session /Topic | Title / Developer | Location |
|---|---|---|---|
| **SUNDAY May 05, 2019** | | | |
| 7:30 - 5:00 | Registration | Symposium and Short Course Registration | |
| 8:00 - 8:15 | Track 1 | **Fundamentals of Process Analysis** | |
| | | Introductions - Safety Moment, Introduction: Instructors and ISA AD chair, Class attendee introductions: Name, Company, Analyzer Role, Agenda Review & Class Protocol | |
| | | ***J.C. Arènes - Education Chair*** | |
| 8:15 - 9:15 | Track 1 | **Fundamentals of Process Analysis** | |
| | Session 1 | Fundamentals of Spectroscopy | |
| | | ***Bob Bear - Instructor*** | |
| 9:15 - 10:15 | Track 1 | **Fundamentals of Process Analysis** | |
| | Session 2 | Fundamentals of Oxygen Analysis | |
| | | ***Stuart Simmonds - Instructor*** | |
| 10:15 - 10:30 | Track 1 | **Break** | |
| 10:30 - 11:30 | Track 1 | **Fundamentals of Process Analysis** | |
| | Session 3 | Fundamentals of Moisture & Dew Point Measurements | |
| | | ***John Kerney - Instructor*** | |
| 11:30 - 12:00 | Track 1 | **Lunch** | |
| 12:00 - 2:00 | Track 1 | **Fundamentals of Process Analysis** | |
| | Session 4 | Fundamentals of Gas Chromatography | |
| | | ***Ulrich Gokeler - Instructor*** | |
| 2:00 - 2:15 | Track 1 | **Break** | |

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|---|---|---|---|
| **2:15 - 3:15** | **Track 1** | **Fundamentals of Process Analysis** | |
| | **Session 5** | Fundamentals of pH, Dissolved Oxygen and Conductivity Measurements | |
| | | ***Tony Sandfoss - Instructor*** | |
| | | | |
| **3:15 - 4:15** | **Track 1** | **Fundamentals of Process Analysis** | |
| | **Session 6** | Concepts in Analyzer Integration | |
| | | ***Michael Hoffman - Instructor*** | |
| | | | |
| **4:15 - 4:30** | **Track 1** | **Fundamentals of Process Analysis** | |
| | | Conclusion - Q&A and Review of Fundamentals Training | |
| | | ***J.C. Arènes - Education Chair*** | |

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|---|---|---|---|
| **8:00 - 4:30** | **Track 1** | **Advanced Course: Increasing Sample System Reliability by Better Design** | |
| | **Session 7** | This is a fast-moving course that explains many of the engineering procedures needed to design a gas or liquid sampling system for a process analyzer – all in about 7 hours of class time. The subjects to be covered include: • Sources of time delay • How to calculate transport lag for liquid and gas samples • How to evaluate a process tap location • The advantages of using a sampling probe – or not • Probe resonance calculations • The ideal fluid velocity in sample lines • Velocity and flow rate in complex sample lines • Turbulence and pressure loss in complex sample lines • How to determine friction factors • How to optimize the sample line sizes • Why partial pressure causes condensation • How to calculate the amount of condensation • Understanding the wet and dry basis of analysis • How to decide the temperature of heated lines or cabinets • How to solve the two big vaporizer problems • Why a phase diagram is a useful tool • The very strange consequence of allowing any condensation at all. Attendees will receive a course workbook that contains all of the presentation slides and detailed descriptions of the procedures used. The workbook also contains several class exercises that are completed during the course – most involving calculations. Since this is an advanced level class, the Instructor will assume you are aware of the basic objectives of a sampling system: to deliver a compatible, timely, and representative sample to a process analyzer in a reliable, cost-effective and safe manner. | |
| | | ***Phil Harris - Instructor*** | |
| | | | |
| | | | |
| **8:00 - 4:30** | **Track 1** | **Advanced Course: Multivariate Analysis for Inferentials and Analyzers** | |
| | **Session 8** | This course examines a series of multivariate analytical techniques critical to the efficient operation of process monitoring and control. The data sources are from both process variable and analyzer sources. The course will demonstrate how to drink from a firehose; take the process variables and quickly turn them into a simplified data feed that can be interpreted for either optimizing process performance or developing a stronger understanding of the data. For the analyzers, the focus is on streamlining chemometric model construction to make the analyzers significantly more robust when put into routine practice. This class will also benefit those who perform both routine and irregular maintenance of chromatographic and spectroscopic instruments in both process and laboratory settings. A breakdown of the steps is provided to best process data for near infrared and Raman and maintain the calibration. Chromatographic applications will also be discussed and how the process leads to the simplification of calibration maintenance. The approaches described are independent of both hardware and software. By the end of the course, attendees will have been instructed on chemometrics best practices and the practical application of new techniques. | |
| | | ***Dr Brian Rohrback - Instructor*** | |
| | | | |
| | | | |
| **4:15 - 5:05** | **Analysis Division** | **ISA SP-76 Business Meeting** | |
| | | ***Wes Carter - AD SP-76 Chair*** | |
| | | | |
| **5:15 - 6:15** | **Analysis Division** | **Analysis Division Business Meeting** | |
| | | ***AD Director Cynthia Cauthen (Chair) and AD Director-Elect Stuart Simmonds (Recording Secretary)*** | |
| | | | |
| **6:00 - 7:30 PM** | | **Vendor Exhibit Tables** | **Analytical Technology Pavilion in Exhibit Hall A** |
| | | ***Hospitality and Welcoming to AD*** | |

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## MONDAY MAY 06, 2019

| | | | |
|---|---|---|---|
| **6:00 - 8:00** | **Attendee** | **Attendee Breakfast** | **TBD** |
| **7:30 - 5:00** | **Registration** | **Symposium Registration** | **TBD** |
| **8:00 - 5:00** | **Spouses Program** | **Spouses Lounge - Tours, Shopping, Site-Seeing, & Recreation (open from 7:30 AM - 10 PM)** | **Conference Room 205** |

| Date/Time | Session | Paper Title - Author - Presenter | Location |
|---|---|---|---|
| **8:00 - 8:15** | **General Session** | **Welcome Introduction - Ms Cindy Cauthen, (AD Director)** | **Ballroom A - B** |
| **8:15 - 9:45** | **General Session** | **Session 1 - Fired Equipment Analyzers, Session Moderator - Wes Carter** | |
| | AD.19.01.01 | TDLAS For Furnace Safety | Ballroom A - B |
| | | Dr. Peter Geiser | |
| | | NEO | |
| | AD.19.01.02 | Multi-laser *in-situ* analyzer for real time control of deSOx and deNOx processes in a waste incinerator plant | |
| | | Pawel Kluczynski, Krzysztof Siembab, Mateusz Strazewski, Jakub Kaczmarek | |
| | | Airoptic | |
| | AD.19.01.03 | Combination of OFCEAS Spectroscopy and Low Pressure sampling for Real time measurement of H2S in varying hydrocarbon matrices | |
| | | David Chauvel | |
| | | Durag Group - AP2E | |
| **9:45 - 10:30** | **Break** | **Vendor Exhibit Tables** | **Analytical Technology Pavilion in Exhibit Hall A** |
| **10:30 - 12:00** | **General Session** | **Session 2 - Miscellaneous Applications, Session Moderator - Stuart Simmonds** | |
| | AD.19.02.01 | Comparison of Different VIV Abatement Techniques | Ballroom A - B |
| | | Arthi Appathurai, Paul Clews, and Xenia Vazquez | |
| | | CAE | |
| | AD.19.02.02 | Not Sample Systems – Process Interfaces | |
| | | David Novak | |
| | | Siemens | |
| | AD.19.02.03 | Deployment of Wireless Technology to Protect Environment and Save Energy in Haradh Gas Plant | |
| | | Najeeb Al-Hashim and Selvam Daniel | |
| | | Saudi Aramco | |
| **12:00 - 1:15** | **Lunch** | **Vendor Exhibit Tables** | **Analytical Technology Pavilion in Exhibit Hall A** |
| **1:15 - 2:45** | **General Session** | **Announcements - Information - Ms Cindy Cauthen (AD Director)** | **Ballroom A - B** |
| | | **Session 3 - Analyzers in Natural Gas Applications, Session Moderator - Al Kania** | |
| | AD.19.03.01 | Plasmonic mercury analysis for natural gas processing | Ballroom A - B |
| | | Jay James Ph.D., Jeffrey Crosby Ph.D., and Donald Lucas Ph.D. | |
| | | Picoyune | |
| | AD.19.03.02 | A Case Study of Fugitive Emissions at Producing Gas Wells | |
| | | Steve Smith, Les Howe, and Justin Smith | |
| | | Smith Analytical | |
| | AD.19.03.03 | ON-LINE MEASUREMENTS OF CARBON DIOXIDE IN NATURAL GAS LIQUIDS RECOVERY PROCESS | |
| | | Airat Amerov | |
| | | Ametek | |
| **2:45 - 3:30** | **Break** | **Vendor Exhibit Tables** | **Analytical Technology Pavilion in Exhibit Hall A** |
| **3:30 - 5:00** | **General Session** | **Session 4 - New Developments, Session Moderator - Tim Kuiken** | |
| | AD.19.04.01 | STATISTICAL PROCESS CONTROL AND MULTIVARIATE ANALYSIS | Ballroom A - B |
| | | Michael Roberto | |
| | | NWA Software | |
| | AD.19.04.02 | Designing, Developing and Deploying Cybersecure Process Analyzers | |
| | | Peter Traynor | |
| | | Scheider Electric | |
| | AD.19.04.03 | Opportunity Crudes present major Benefits and Risks | |
| | | Robert Sherman and Gary Rathwell | |
| | | Enterprise Consultants | |
| **9:00 - 7:30** | | **Vendor Exhibit Tables** | **Analytical Technology Pavilion in Exhibit Hall A** |
| **5:00- 7:30 PM** | | ***Reception in Analytical Technology Pavilion in Exhibit Hall A*** | |

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### TUESDAY MAY 07, 2019

| | | | |
|---|---|---|---|
| 6:00 - 8:00 | Attendee | Attendee Breakfast | TBD |
| 7:30 - 5:00 | Registration | Symposium Registration | TBD |
| 7:30 - 5:00 | Visitors | VIP Visitors' Day | Analytical Technology Pavilion in Exhibit Hall B |
| 8:00 - 5:00 | Spouses Program | Spouses Lounge - Tours, Shopping, Site-Seeing, & Recreation (open from 7:30 AM - 10 PM) | Conference Room 205 |

| Date/Time | Session | Paper Title - Author - Presenter | Location |
|---|---|---|---|
| 8:05 - 8:15 | General Session | Welcome Introduction - Ms Cindy Cauthen, (AD Director) | Ballroom A - B |
| 8:15 - 9:45 | General Session | Session 5 - Calibration Topics, Session Moderator - Tracy Dye | Ballroom A - B |
| | AD.19.05.01 | Rethinking Calibration for Process Spectromters | |
| | | Will Warkenton and Brian Rohrback | |
| | | Chevron and Infometrix | |
| | AD.19.05.02 | Review of process analyzer instrument standardization and calibration transfer for gasoline/diesel blending application | |
| | | Dr Honggang [Hank] Li and Dr James Brown | |
| | | Schneider | |
| | AD.19.05.03 | EPA PROTOCOL GAS STANDARDS UPDATE | |
| | | Andy Shurtloff | |
| | | Airgas | |
| 9:45 - 10:30 | Break | Vendor Exhibit Tables | Analytical Technology Pavilion in Exhibit Hall A |
| 10:30 - 12:00 | General Session | Session 6 - Management Systems and the Holmesian Fallacy, Session Moderator - Bac Vu | Ballroom A - B |
| | AD.19.06.01 | Data usage and quality in Digital Transformation | |
| | | Wouter Last | |
| | | Hint US | |
| | AD.19.06.02 | Analytical Reliability: A Maintenance Strategy | |
| | | Michael Hoffman | |
| | | Siemens | |
| | AD.19.06.03 | hf: a Holmesian Fallacy and the Mystery of Hydrofluoric Alkylation Catalyst Analysis | |
| | | Marcus Trygstad and Kevin Landreth | |
| | | Consultants | |
| 12:00 - 1:15 | Lunch | Vendor Exhibit Tables | Analytical Technology Pavilion in Exhibit Hall A |
| 1:15 - 2:45 | General Session | Announcements - Information - Ms Cindy Cauthen (AD Director) | Ballroom A - B |
| | | Session 7 - Water Measurement Applications, Session Moderator - Alan Cowie | Ballroom A - B |
| | AD.19.07.01 | Monitoring Trace Levels of Water in Cracked Gas at the Outlet of Molecular Sieve Dryer Vessels Using Tunable Diode Laser Absorption Spectroscopy (TDLAS) Analyzers | |
| | | Gary Englehart, Dr. Sherry Liu and Luc Broekaert | |
| | | SpectraSensors | |
| | AD.19.07.02 | High Temperature Combustion –TOC (Total Organic Carbon) | |
| | | CT Starkweather | |
| | | Liquid Analytical Resources | |
| | AD.19.07.03 | Tackling the calibration problem of water measurement in gases at low concentrations | |
| | | B. L. Livingstone and J.J. Gunnell | |
| | | Emerson | |
| 2:45 - 3:30 | Break | Vendor Exhibit Tables | Analytical Technology Pavilion in Exhibit Hall A |
| 3:30 - 4:45 | General Session | Session 8 - Market Place and International, Session Moderator - Brian Rohrback | Ballroom A - B |
| | AD.19.08.01 | Global Update | |
| | | Mo Loch | |
| | | DMS | |
| | AD.19.08.02 | PAI Partners Market Update | |
| | | Glenn Cudiamat, Stephen Walton, and Jim Tatera | |
| 5:30 - 6:30 | Banquet Social Hour | | Analytical Technology Pavilion in Exhibit Hall A |
| 6:30 - 8:00 | Banquet | Speaker - NASA | Ballroom D |
| | | | Pasadena Convention Center |
| 9:00 AM - 5:00 PM | | Vendor Exhibit Tables (closed during and after Banquet) | Analytical Technology Pavilion in Exhibit Hall A |
| | | *Desserts in Analytical Technology Pavilion in Exhibit Hall B* | |

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## WEDNESDAY MAY 08, 2019

| | | | |
|---|---|---|---|
| 6:00 - 8:00 | Attendee | Attendee Breakfast | TBD |
| 7:30 - 5:00 | Registration | Symposium Registration | TBD |
| 8:00 - 5:00 | Spouses Program | Spouses Lounge - Tours, Shopping, Site-Seeing, & Recreation (open from 7:30 AM - 10 PM) | Conference Room 205 |

| Date/Time | Session | Paper Title - Author - Presenter | Location |
|---|---|---|---|
| 8:05 - 8:15 | General Session | Welcome Introduction - Ms Cindy Cauthen, (AD Director) | Ballroom A - B |
| 8:15 - 9:45 | General Session | Session 9 - Analyzer Applications [I], Session Moderator - JC Arenes | |
| | AD.19.09.01 | How we turned an FTIR spectrometer into a universal concentration meter for the bulk and petrochemical industries | |
| | | Dan Wood, Jonathon Speed, Stephanie Wood. | |
| | | KEIT | |
| | AD.19.9.02 | How to add value on high viscosity products & residues using process viscometer | |
| | | P Burg | |
| | | Sofraser | |
| | AD.19.09.03 | ISA Working Group - Vortex Shedding Probes | TBD |
| | | By Invitation | |
| 9:45 - 10:30 | Break | Vendor Exhibit Tables | Analytical Technology Pavilion in Exhibit Hall B |
| 10:30 - 12:00 | General Session | Session 10 - Analyzer Applications [II], Session Moderator - Rod Spitler | Ballroom A - B |
| | AD.19.10.01 | Real-time Flare Control with Mass Spectrometers | |
| | | Jim Brenner, Haley Gabor, Chuck DeCarlo | |
| | | Extrel | |
| | AD.19.10.02 | FEED FORWARD ANALYSIS IN SULFUR RECOVERY UNITS | |
| | | Parisa Akhshi | |
| | | Ametek | |
| | AD.19.10.03 | | |
| | | PAPER WITHDRAWN | |
| 12:00 - 1:15 | Lunch | Vendor Exhibit Tables | Analytical Technology Pavilion in Exhibit Hall B |
| 1:15 - 2:15 | General Session | Announcements - Information - Ms Cindy Cauthen (AD Director) | Ballroom A - B |
| | | Session 11 - TDL Analyzer Developments, Session Moderator - Paul Cammarata | |
| | AD.19.11.01 | OPTICAL PATHLENGTH FOLDING VIA PRISM MECHANISM FOR USE WITH AN IN-SITU WAFER TUNABLE DIODE LASER SPECTROMETER | Ballroom A - B |
| | | Tyler Schertz, Ph.D., Jean-Nicolas Adami, Ph.D., Johanna Weigel, Ph.D. | |
| | | Mettler Toledo | |
| | AD.19.11.02 | Detection and Measurement of Broadband Molecules using arrays of QCLs | |
| | | G. Smirne | |
| | | Emerson | |
| | AD.19.11.03 | | |
| | | PAPER WITHDRAWN | |
| 2:15 - 3:00 | Break | Vendor Exhibit Tables | Analytical Technology Pavilion in Exhibit Hall B |
| 3:00 - 4:00 | General Session | Session 12 - Session Moderator | Ballroom A - B |
| | AD.19.12.01 | Panel Discusssion on Analytical Measreuments in the Natural Gas Industry | |
| 4:00 - 4:30 | General Session | *GTFK Award and POY Award - Moderator Paul Cammarata* | |
| | | *Closing Remarks- Ms Cindy Cauthen (AD Director)* | |
| 9:00 AM - 3:15 PM | | Vendor Exhibit Tables | Analytical Technology Pavilion in Exhibit Hall B |

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| Date/Time | Session | Title / Developer | Location |
|---|---|---|---|
| **THURSDAY MAY 09, 2019** | | | |
| 7:30 - 4:30 | Registration | Vendor Training Registration | Check in at Registration |
| 12:00 - 1:00 | Lunch | | TBD |
| 8am - Noon | COSA Xentaur | **Combustion Calorimetry for the COSA9610 and 9700 Series**<br>Combustion Calorimetry for the COSA9610 and 9700 Series: This hands-on class will begin with brief overview of Combustion Calorimetry for the COSA9610 and 9700 series and move to the maintenance and troubleshooting application issues seen in the field for flare gas, fuel gas and custody transfer. Main areas to be covered for the maintenance will be the filtration pressure regulation, critical flow restrictors and combustion section components. Other areas covered will be the choosing of calibration gases, calibration procedures along with the electrical requirements and digital communication.<br>Dr. David Hailey | |
| 8am - Noon | Ametek | **888 Sulfur Recovery Tail Gas Analyzer**<br>As AMETEK's third generation sulfur recovery tail gas analyzer, the 888 brings all of the best elements of the iconic 880 NSL analyzer with a number of key improvements. This training will cover the differences between the 880 and 888 as well as sample system overview and practices. Relevant hands-on instruction will also be provided for basic maintenance, analyzer operation and software basics.<br>Duane Overholt | |
| 8am - 5pm | Siemens | **Maxum Edition II (Gas Chromatograph)**<br>This will be a hands-on training class with live analyzers and NAUs networked. After a product update on the MAXUM GC platform, training will be given on upgrading a MAXUM GC to latest SysCon, color touch screen display and GCP software. A free 60-day demo CD of the Gas Chromatograph Portal (GCP) will be given to class attendees as part of hands-on GC workstation training. Attendees are encouraged to bring their laptops for assistance in installing the software. There will also be a review of using the MAXUM's advanced maintenance functions by reviewing the Statistic Monitoring (StatMon) and Analytical System Monitor (ASM) software package. Finally, we will have an open session to discuss specific topics of interest by the attendees.<br>Ulrich Gokeler | |
| 8:00 - Noon | Yokogawa | **TDLS8000 Quick Startup, Troubleshooting and Maintenance**<br>Topics will include the following:<br>Basic Theory of the TDLS<br>Understand Application Essentials<br>Use the TruePeak Software<br>Learn Calibration and Validation<br>Learn to use Troubleshooting Diagnostics<br>Dale Cathey | |
| 1pm - 5pm | Yokogawa | **GC8000 (Gas Chromatograph) Operation and Maintenance**<br>Class will start with brief overview of Chromatography basics to establish a common footing for all present. Primary component service procedures and recommendations will then be covered, for such items as Oven Valves, Liquid Sample Valves, and key parts. Programming and program modification will be next topic as done both on the unit and remotely accessed. This will cover standard chromatography, concurrent chromatography, and parallel chromatography as done on the GC8000 platform. The attendees will have the opportunity to actually perform these normal operations (change gate times, valve timing, standard area, cal factor etc.) and as well as the re-integration function on training units present.<br>Dale Cathey | |
| 8am - Noon | ABB | **PGC5000 and the STAR Analyzer Management System**<br>This class provides an introductory operational overview of the PGC5000 process gas chromatograph and the STAR Analyzer Management System. Students will go through each operational menu of the highly versatile PGC5000 platform and review in general the analytical components and configurations that support basic GC applications and analyses. A brief overview of the new PGC5000 oven with integrated controller (PGC5000 IC) and optional wireless UI will also be provided. Finally, the STAR Analyzer Management System will be introduced including, STAR Client operations (statistical quality control, remote monitoring, trending, analyzer availability, maintenance logs and PGC1000 UI), STAR Server operations (network architecture, data storage and retrieval), how to remotely manage all files on all networked analyzers, and linking existing VistaNET networks and hardware with STAR including 3rd party OPC servers. A question and answer session touching on specific topics and questions coming from our students will conclude the hands-on training.<br>Tracy Dye | |
| 8am - Noon | Extrel | **Mass Spec Gas Analyzers: Operation and Maintenance**<br>Industrial mass spectrometers are fast, full-composition gas analyzers used for flare gas compliance, trace contaminants in air, and fence line monitoring. They continuously quantify hydrocarbons, sulfurs, air components, VOCs, and other chemicals in complex, dynamic samples. This course will cover all the basics of operation, maintenance and application. Come see the mass spec, learn hands-on how to calibrate and run an analysis, and perform a full PM.<br>Haley Gabor | |
| 1pm - 4pm | Extrel | **Real-time Flare Control: A Mass Spectrometer's Advantage**<br>As refineries continue to optimize their approach to RSR 63.670 compliance, new regulations for flare emissions are set to hit a broad range of industries over the next five years. The goal is to ensure the destruction of Hazardous Air Pollutants (HAPs) prior to release into the atmosphere, but drastic changes in vent gas composition make controlling that efficiency difficult. Getting the full composition of the vent gas quickly allows operations to apply corrections as soon as possible. Flare gas mass spectrometers measure hydrogen, hydrocarbons, carbon oxides, sulfurs, moisture and various volatile organics. In addition to reporting concentrations, the Net Heating Value (NHV) can also be reported to the control system in seconds. Examples of real-life flaring events will be discussed along with comparisons of analytical techniques during those events.<br>Jim Brenner | |
| 8am - Noon | Thermo Fisher | **SOLA iQ Total Sulfur Analyzer**<br>This class will demonstrate the ease with which our SOLA iQ undergoes routine maintenance; our knowledgeable trainer will show you how with minimal experience the replacement components are swapped out and the analyzer brought back up and running with minimal downtime. We will also be on hand to answer any questions you may have about the operation and maintenance of the SOLA iQ and provide attendees with the differences between the SOLA II and the new SOLA iQ platform with it's simple but effective touch screen user interface and features.<br>Jim Keasbey | |