

# ISA Analysis Division Program

April 22 - 26, 2018

Galveston Island Convention Center

## The 63rd Annual Symposium of the Analysis Division

Date/Time	Session /Topic	Title / Developer	Location
<b>SUNDAY APRIL 22, 2018</b>			
7:30 - 5:00	Registration	Symposium and Short Course Registration	Convention Center Lobby
8:00 - 8:15	Track 1	<b>Fundamentals of Process Analysis</b> Introductions - Safety Moment, Introduction: Instructors and ISA AD chair, Class attendee introductions: Name, Company, Analyzer Role, Agenda Review & Class Protocol <i>J.C. Arènes, Educational Chair - Paul Barnard, Director</i>	Galleon I
8:15 - 9:15	Track 1 Session 1	<b>Fundamentals of Process Analysis</b> Analyzer Engineering - Basic Process Chemistry, Scoping Measurement Needs and Locations, P&IDs, Analyzer Technology Selection, Cost Estimates, Specification Packages and Application Data Sheets, Supplier Bid Evaluations, Drawing Reviews <i>Paul Cammarata - Instructor</i>	Galleon I
9:15 - 10:15	Track 1 Session 2	<b>Fundamentals of Process Analysis</b> Spectroscopy - Topics: Basic Spectroscopy, Beer's Law, Infrared Analyzers [dispersive, non-dispersive & FTNIR], Ultraviolet and Visible Analyzers, Raman, NMR, TDLs <i>Phil Harris - Instructor</i>	Galleon I
10:15 - 10:30	Track 1	<b>Fundamentals of Process Analysis</b> Break	
10:30 - 11:30	Track 1 Session 3	<b>Fundamentals of Process Analysis</b> Oxygen Analysis - Topics: TDL, Paramagnetic, Zirconium Oxide, Electrochemical, Chemiluminescence, Dissolved Oxygen <i>Stuart Simmonds - Instructor</i>	Galleon I
11:30 - 12:00	Track 1	<b>Fundamentals of Process Analysis</b> Lunch	
12:00 - 2:00	Track 1 Session 4	<b>Fundamentals of Process Analysis</b> Gas Chromatography - Topics: Basic Chromatography, Carrier, Columns, Injection Valves, Separation, Retention Time, Detectors, Process GC techniques, Applications, Analyzer Readout <i>Ulrich Gokeler - Instructor</i>	Galleon I
2:00 - 2:15	Track 1	<b>Fundamentals of Process Analysis</b> Break	
2:15 - 3:15	Track 1 Session 5	<b>Fundamentals of Process Analysis</b> Sample Conditioning System - Topics: Function of the sample conditioning system, design issues [temperature, pressure, flow rate, dew point, bubble point], sample probe, sample transport, sample lines, sample conditioning components [filters, rotameters, valves, switches], calibration & validation <i>Michael Hoffman - Instructor</i>	Galleon I
3:15 - 4:15	Track 1 Session 6	<b>Fundamentals of Process Analysis</b> System Design - Topics: building designs, utilities and infrastructure, sample systems and analyzers, data communications, engineering calculations, safety standards, drawing packages, factory acceptance tests, shipping and logistics, site acceptance tests, final documentation <i>Troy Lewis - Instructor</i>	Galleon I
4:15 - 4:30	Track 1	<b>Fundamentals of Process Analysis</b> Conclusion - Q&A and Review of Fundamentals Training <i>J.C. Arènes - Education Chair</i>	Galleon I
8:00 - 4:30	Track 1 Session 7	<b>Advanced Course: Increasing Sample System Reliability by Better Design</b> 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. <i>Tony Waters - Instructor</i>	Spinnaker

8:00 - 4:30	Track 1	<p><b>Advanced Course: Multivariate Analysis for Inferentials and Analyzers</b></p> <p><b>Session 8</b></p> <p>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.</p> <p>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.</p> <p>By the end of the course, attendees will have been instructed on chemometrics best practices and the practical application of new techniques.</p> <p><i>Brian Rohrback - Instructor</i>  <i>Michael Roberto - Instructor</i></p>	Harbor
4:40 - 5:15	Analysis Division	<p><b>ISA SP-76 Business Meeting</b></p> <p><i>Wes Carter - AD SP-76 Chair</i></p>	Harbor
5:15 - 6:15	Analysis Division	<p><b>Analysis Division Business Meeting</b></p> <p><i>AD Director Paul Barnard (Chair) and AD Director-Elect Cindy Cauthen (Recording Secretary)</i></p>	Harbor
6:00 - 7:30 PM		<p><b>Analytical Technology Pavilion</b></p> <p><i>Hospitality and Welcoming to AD</i></p>	Exhibit Hall B



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## MONDAY APRIL 23, 2018

7:30 - 5:00	Registration	Symposium Registration	Convention Center Lobby
8:00 - 5:00	Visitors	VIP Visitors' Day	Analytical Technology Pavilion
8:00 - 5:00	Spouses Program	Spouses Lounge - Tours, Shopping, Site-Seeing, & Recreation (open from 7:30 AM - 10 PM)	Check in at Registration
<b>Date/Time</b>	<b>Session</b>	<b>Paper Title - Author - Presenter</b>	<b>Location</b>
8:05 - 8:15	General Session	Welcome Introduction - Dr. Paul Barnard, (AD Director)	Galleon I - III
8:15 - 9:45	General Session	<b>Session 1 - Rod Spittler, Session Moderator</b>	Galleon I - III
	AD.18.01.01	VOC and LEL monitoring, a novel approach to meeting the requirements for multi-point monitoring of very different parameters with a combined analytical system Thermo Fisher Scientific Daniel Merriman, Graham Lewis	
	AD.18.01.02	Portable TDLAS for Trace Moisture Measurement Baker Hughes, a GE company Aniruddha Weing, Ph.D.	
	AD.18.01.03	ADVANCES IN NIR SPECTROSCOPY TO PROVIDE TRUE BOILING POINT ANALYSIS AND COMPOSITION OF CRUDE OIL AND REFINED FUELS JP3 Measurement Steve Fitzsimmons, Paul Little, Randy Bishop Ph D	
9:45 - 10:30	Break	Vendor Exhibit Tables	Analytical Technology Pavilion in Exhibit Hall B
10:30 - 12:00	General Session	<b>Session 2 - Tracy Dye, Session Moderator</b>	Galleon I - III
	AD.18.02.01	An Adaptable Optical Sensor for Chemometric Analysis Halliburton Jian Li, Daniel Stark	
	AD.18.02.02	Development of Self-Cleaning pH Electrode by UV Irradiation and Titanium Oxide (TiO <sub>2</sub> ) Photo-Catalytic Activity HORIBA Advanced Techno. Co., Ltd, Mie University Yuji Nishio, Tatsuoki Muroga, T. Hashimoto, A. Ishihara	
	AD.18.02.03	Contaminant monitoring using Total Organic Carbon (TOC) analysis in brine and saltwater samples for quality control and asset protection Suez Water Technologies & Solutions Amanda Scott	
12:00 - 1:15	Lunch	Vendor Exhibit Tables	Analytical Technology Pavilion in Exhibit Hall B
1:15 - 2:45	General Session	<b>Announcements - Information - Paul Barnard, (AD Director)</b> <b>Session 3 - Tim Kuiken, Session Moderator</b>	Galleon I - III
	AD.18.03.01	Analysis of Nitric Oxide (NO) in Simulated Cold Box Gases using the Dielectric Barrier Discharge Detector in Argon Mode ABB Analytical, Advanced Industrial Chemistry Corporation Dr. Jerry Clemons*, Tom Thomas, ABB Analytical, Lewisburg W.V. Matthew Monagle, Advanced Industrial Chemistry Corporation, Salida CO.	Galleon I - III
	AD.18.03.02	Analysis of SO <sub>2</sub> gas concentration in wet process streams Novatech James Osprey	
	AD.18.03.03	Challenges and Opportunities of Transferring GC Applications from Flame Based Detectors to Thermal Conductivity Detectors Siemens Analytical Products & Solutions Al Kania, Thomas Neuhauser	
2:45 - 3:30	Break	Vendor Exhibit Tables	Analytical Technology Pavilion in Exhibit Hall B
3:30 - 5:00	General Session	<b>Session 4 - Stuart Simmonds, Session Moderator</b>	Galleon I - III
	AD.18.04.01	TDLAS Analyzers For Online Process Control In Ethylene Production AMETEK Process Instruments Airat Amerov	
	AD.18.04.02	In-situ high-temperature combustion control with TDLAS Neo Monitors Ove Bjørøy, Junyang Wang, Svein-Erik Fossbråten, Peter Geiser	
	AD.18.04.03	APPLICATION OF TUNABLE LASER FORMALDEHYDE ANALYZER FOR REAL TIME PROCESS CONTROL AND EMISSION MONITORING IN WOOD PANEL INDUSTRY Airoptic Sp z o.o. Pawel Kluczynski	
9:00 - 7:30		Vendor Exhibit Tables (open all day)	Analytical Technology Pavilion in Exhibit Hall B
5:00- 7:30 PM		Reception in Analytical Technology Pavilion in Exhibit Hall B	



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## TUESDAY APRIL 24, 2018

7:30 - 5:00	Registration	Symposium Registration	Convention Center Lobby
8:00 - 5:00	Spouses Program	Spouses Lounge - Tours, Shopping, Site-Seeing, & Recreation (open from 7:30 AM - 10 PM)	Check in at Registration
Date/Time	Session	Paper Title - Author - Presenter	Location
8:05 - 8:15	General Session	Welcome Introduction - Paul Barnard, (AD Director)	Galleon I - III
8:15 - 9:45	General Session	Session 5 - Jerry Clemons, Session Moderator	Galleon I - III
	AD.18.05.01	<u>Optimized Hydrocarbon Sampling Methodology and Equipment in the presence of BS&amp;W according to ISO 3171 and API 8.2</u> OGM   Oil & Gas Measurement Limited, Enterprise Consultants International Wes Maru, Robert E. Sherman	
	AD.18.05.02	<u>OPTIMIZATION OF CHEMILUMINESCENCE DETECTOR FOR RELIABLE AND COST EFFECTIVE NITRIC OXIDE MEASUREMENT IN EMISSION MONITORING</u> Emerson Process Management GmbH & Co Dr. Jörg Gottschald, Dr. Marc Klaus Winter, Dr. Michael Kamphus	
	AD.18.05.03	<u>New Physical Property Analyzer rapiDist-4 for fast online control</u> BARTEC BENKE GmbH David Zengerly	
9:45 - 10:30	Break	Vendor Exhibit Tables	Analytical Technology Pavilion in Exhibit Hall B
10:30 - 12:00	General Session	Session 6 - J.C. Arènes, Session Moderator	Galleon I - III
	AD.18.06.01	<u>QCL - Moving from Research Tools to On-line Analyzers</u> Block Engineering Darryl Hazlett	
	AD.18.06.02	<u>Cost Impacts of Shelter Selection for Gas Analyzers</u> Emerson Automation Solutions Bonnie Crossland	
	AD.18.06.03	<u>Large Implementation of analyser Management System in a Petrochemical Plant</u> Hint Wout Last	
12:00 - 1:15	Lunch	Vendor Exhibit Tables	Analytical Technology Pavilion in Exhibit Hall B
1:15 - 2:45	General Session	Announcements - Information - Paul Barnard, (AD Director) Session 7 - Robert Sherman, Session Moderator	Galleon I - III
	AD.18.07.01	<u>Optimizing Natural Gas Liquid Production Using Near Infrared Spectroscopy</u> Insight Analytical Solutions Phil Harris	Galleon I - III
	AD.18.07.02	<u>Modern approaches in methane emission detection surveys and automated concentration classification</u> Red Hen Systems Bogdan Besfamylnvy	
	AD.18.07.03	<u>Validation Simplification in on-line Process Gas Chromatography</u> Siemens Industry, Inc. Ulrich Gokeler	
2:45 - 3:30	Break	Vendor Exhibit Tables	Analytical Technology Pavilion in Exhibit Hall B
3:30 - 4:45	General Session	Session 8 - Randy Hauer, Session Moderator	Galleon I - III
	AD.18.08.01	<u>Update of 2017 AD Symposiums UAE &amp; Singapore</u> DMS Global Mohammed Loch	
	AD.18.08.02	<u>The PAI Marketplace--A Review and Update of Worldwide Markets for Process Analytical Instruments</u> PAI Partners, Top Down Analytics Stephen Walton, Glenn Cudiamat	
5:30 - 6:30	Banquet Social Hour		Analytical Technology Pavilion in Exhibit Hall B
6:30 - 8:00	Banquet	Speaker - TBD	Grand Ballroom Galveston Convention Center
Breaks		Vendor Exhibit Tables (closed during and after Banquet)	Analytical Technology Pavilion in Exhibit Hall B



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## WEDNESDAY APRIL 25, 2018

7:30 - 5:00	Registration	Symposium Registration	Convention Center Lobby
8:00 - 5:00	Spouses Program	Spouses Lounge - Tours, Shopping, Site-Seeing, & Recreation (open from 7:30 AM - 10 PM)	Check in at Registration
<b>Date/Time</b>	<b>Session</b>	<b>Paper Title - Author - Presenter</b>	<b>Location</b>
8:05 - 8:15	General Session	Welcome Introduction - Paul Barnard, (AD Director)	Galleon I - III
8:15 - 9:45	General Session	Session 9 - Industry 4.0, Session Moderator Marcus Trygstad	Galleon I - III
	AD.18.09.01	Module-Based Process Analyzer System: "Industrie 4.0" Impact on Process Automation Siemens David Novak	
	AD.18.9.02	The Future of Online Process Analytical Measurements: Heading towards Process Monitoring 4.0 Dow Chemical Company Paul Cammarata	
	AD.18.09.03	IND4.0 for Process Analysis: An Opportunity for Common Solutions? SpectraSensors, Inc - An Endress+Hauser Company Peter van Vuuren	
9:45 - 10:30	Break	Vendor Exhibit Tables	
10:30 - 12:00	General Session	Session 10 - Industry 4.0, Session Moderator David Novak	Galleon I - III
	AD.18.10.01	Smart Analysers for Process monitoring 4.0 Emerson Jeff Gunnell	
	AD.18.10.02	PROCESS MONITORING 4.0 AND ELEVATION OF THE PROCESS ANALYTICAL ENTERPRISE Yokogawa Corporation of America Marcus Trygstad	
	AD.18.10.03	The PM 4.0 Analyzer: Form Follows Function Dow Chemical Company JD Tate	
12:00 - 1:15	Lunch	Vendor Exhibit Tables	
1:15 - 2:45	General Session	Announcements - Information - Dr. Paul Barnard, (AD Director) Session 11, Session Moderator Paul Cammarata	Galleon I - III
	AD.18.11.01	Prioritizing Multivariate Control 4.0 Infometrix, Inc. Brian Rohrback	
	AD.18.11.02	Development and use of data driven and mechanistic soft sensors for process control and optimization Sartorius Stedim Data Analytics AB Chris McCready	
	AD.18.11.03	Hardware and Software Sensors Fusion for Process Monitoring: An Industrial Application Dow Chemical Company Zhenyu Wang and Leo Chiang	
2:45 - 3:15	Break	Vendor Exhibit Tables	
3:15 - 4:45	General Session	Session 12 - Panel Session - New Refinery Sector Rule Requirements, Session Moderator Andy Shurtleff	Galleon I - III
	AD.18.12.01	Panel Session - New Refinery Sector Rule Requirements Andy Shurtleff, Air Gas Dr. Troy Boley, Spectrum Environmental Solutions - Wesley Carter- Shell Oil Company - Ulrich Gokeler- Siemens - Chuck DeCarlo- Extrel - Blair Sullivan- Hobre (Vector Controls)	
4:45 - 5:00	General Session	GTFK (Gilmer, Thomason, Fowler, Konrad) Award and Product of the Year Award - Moderator Paul Cammarata Closing Remarks- Paul Barnard (AD Director)	
Breaks		Vendor Exhibit Tables	Analytical Technology Pavilion in Exhibit Hall B



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Date/Time	Session	Title / Developer	Location
<b>THURSDAY APRIL 26, 2018</b>			
7:30 - 12:00	Registration	Vendor Training Registration	Convention Center Lobby
12:00 - 1:00	Lunch		Exhibit Hall B
8:00 - 12:00	Special Session	<b>"What will the Analysis Division Symposium look like in 2025"</b> Please join us in a discussion on the future of the Analysis Division	Galleon III
8:00 - 5:00	Track 4	<b>Siemens Training</b>	Galleon II
	Session 1	<b>Maxum Edition II (Gas Chromatograph)</b>	
	8 hours	After a brief product update on the Maxum GC platform, training will be given on upgrading a Maxum GC to use the new color touch screen display. 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. Plus a summary of maintenance and operational highlights and requirements for compliance analyzers such as on Flares (Total Sulfur, H2S, BTU), Cooling Towers (HRVOC) and Furnaces (CEMS). Finally, we will have an open session to discuss specific topics of interest by the attendees.	
8:00 - 12:00	Track 4	<b>Ametek Training</b>	Yacht
	Session 2	<b>Close-Coupled Extractive Combustion Analyzers for Control &amp; SIS Implementation (Models WDG-IV and WDG-V)</b>	
	4 hours	The measurement of combustion oxygen, combustibles (COe), and Hydrocarbons will be reviewed as applied to Fired Process heaters and Boilers for control and SIS (safety) implementation. Theory of sensor measurement, sample system, and installation guidelines will be reviewed. The AMETEK WDG-IV and V series of combustion analyzers provides advanced diagnostic capabilities and communication options that allow reduced maintenance, automatic operation validation, and data logging for Asset management and SIS. The analyzer diagnostics, required actions, recommended periodic maintenance guidelines, and communication interfaces will be discussed with WDG-V equipment provided for hands on instruction.	
8:00 - 5:00	Track 4	<b>Yokogawa Training</b>	Harbor
	Session 3 (AM)	<b>TDLS8000 Quick Startup, Troubleshooting and Maintenance</b>	
	4 hours	Topics will include the following: Basic Theory of the TDLS Understand Application Essentials Use the TruePeak Software Learn Calibration and Validation Learn to use Troubleshooting Diagnostics	
	Session 4 (PM)	<b>GC8000 (Gas Chromatograph) Operation and Maintenance</b>	
	4 hours	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.	
8:00 - Noon	Track 4	<b>Emerson</b>	Galleon I
	Session 5	<b>XA Series Gas Chromatographs Hands-On</b>	
	4 hour	The training will start with an overview of the XA Series gas chromatographs, with a focus on the common components across the platform. The differences between the GC's in the series will then be discussed, especially with regard to applications and installation considerations. The class will then look at the MON2020 software, focusing on the chromatogram viewer and the typical diagnostic reports. All attendees will receive a fully functioning copy of the MON2020 software as a part of the class. The final part of the class will look at some of the common hardware maintenance functions including overhauling analysis valves.	
8:00 - Noon	Track 4	<b>ABB</b>	Schooner
	Session 6 (AM)	<b>PGC5000 and the STAR Analyzer Management System</b>	
	4 hour	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.	
8:00 - Noon	Track 4	<b>ThermoFisher Scientific</b>	Technology Pavilion B1
	Session 7	<b>SOLA II Total Sulfur Analysers</b>	
	4 hour	At this class we will demonstrate the ease with which our SOLA II undergoes routine maintenance; our knowledgeable trainer will show how with minimal experience the replacement components are swapped out and the analyser back up and running in next to no time. We will also be on hand to answer any questions you may have about the operation and maintenance of the SOLA II and give attendees the opportunity to operate the simple but effective user interface for themselves.	
8:00 - 12:00	Track 4	<b>Falcon Analytical</b>	Technology Pavilion B1
	Session 8	<b>Ultrafast Gas Chromatography: In the Lab, In the Process, In the Field</b>	
	4 hour	Fast and micro GC techniques have a number of definitions. We will show one definition for these terms that are not mutually exclusive. Comparison and contrast to traditional process GC will be shown as well as the depth and breadth of application capabilities. Bring your favorite sample from C5 to C44 in a 2 ml screw top septum vial. You can run it yourself.	
8:00 - 5:00	Track 4	<b>Servomex</b>	Spinnaker
	Session 9 (AM)	<b>2700 Series Analyzers</b>	
	4 hour	Topics include: basic Zirconia and Thick Film Technology theory, software navigation, calibration procedures and interpretation of calibration data, analyzer and signal diagnostics, heater diagnostics, pneumatic diagnostics, filters, probe, pcb, sensors and heater replacement, installation and access requirements and location advise	
	Session 9 (PM)	<b>1910 / 2200 Paramagnetic Oxygen Analyzers</b>	
	4 hour	Topics include: basic Paramagnetic Technology theory, software navigation, calibration procedures and interpretation of calibration data, analyzer and signal diagnostics, sample system design, installation and access requirements	