



Austin, Texas USA  
Sept 19-23, 2022

# Final Program



Core Analysis in Carbon  
Geosequestration, Geothermal,  
and Nuclear-Waste Disposal

# From the 2022 President

Dear Colleagues and Friends

On behalf of the Society and the Board of Directors, I am pleased to welcome you to the Society of Core Analysts (SCA) International Symposium 2022. Happy to see you back in person in Austin, TX USA after two years of online formats!

This year's symposium theme is "Augment Core Analysis to Embrace Energy Transition". The world is changing rapidly and we are in the middle of important debates about energy security, energy transition and climate change. As the world changes, so do applications for SCAL. It can be stated that oil and gas will continue to play a major role as energy sources. However, there is consensus that emissions from fossil fuels must be avoided and the energetic geological potential must be used as sustainably as possible. This opens up great opportunities for our society to expand the SCA portfolio to include alternative energies and climate protection. Even if topics such as geological carbon and hydrogen storage and the use of geothermal energy have been subject for several years, we are making them explicit with this year's symposium – let's move on to the future!

Organizing an SCA symposium takes a lot of effort and requires passionate people. I would like to thank everyone who actively participated in the organization to make this symposium possible. The backbone of the symposium is the VP Technology, JinHong Chen, and his Technical Committee, who are responsible for all aspects of the technical program. JinHong and his team put together an excellent program with the high technical standard that we are used to from SCA. VP Arrangement, Tracie Walker organized the venue and the social program of the symposium. In this way, she takes care that everything runs smoothly, of our well-being and that we can enjoy the meeting – she is the key person. Last but not least, I would like to thank Melanie Young, our SCA Executive Director, for her invaluable support in all matters – Thank you all!

I am sure that we will have an excellent conference with interesting presentations, fruitful technical discussions and - finally again - lots of socializing and that we will move forward as a community. I look forward to seeing you in Austin!

Holger Ott

SCA President

# From the 2022 VP Arrangements

Howdy and Welcome Ya'!!!

On behalf of the Organizing Committee, I would like to welcome the attendees of the 2022 SCA Annual Symposium in Lakeway Texas. We hope that you will enjoy the beautiful setting here in the Texas Hill Country with the incredible views of Lake Travis. Welcome to this year's Symposium and we hope each of you enjoy our Symposium theme "Augment Core Analysis to Embrace Energy Transition".

During our conference, in the heart of the Hill Country, you will hopefully discover and enjoy the beauty and charm of the area and the city of Austin with all the many different aspects.

Austin, Texas is geographically and politically the center of the Lone Star State. Austin residents are made up of a diverse group of individuals, including musicians, politicians, university professors, students, and so on. The city is home to enough large sites of major technology corporations to have earned it the nickname "Silicon Hills." The slogan that many residents have picked up is Keep Austin Weird. The slogan is also used for a campaign to preserve smaller local businesses and resist excessive commercialization.

Austin, Texas is known for being the "Live Music Capital of the World" and is home to more than 100 live music venues. Austin is home to the Limits Music festival (ACL) which features 130 bands in over 3 days. Austin is not only known for their music, but is also known for the Texas Longhorns.

This gorgeous city averages around 300 days of sunshine a year. All that sunshine can be enjoyed through various outdoor activities and attractions. Austin has it all, whether you enjoy biking, hiking, mountain climbing, fishing, swimming, or boating.

Our young professionals' event will be spent right here on Lake Travis as we venture out onto the Lake on a "Party Boat". Individuals joining in on this fun adventure will have an opportunity to see some beautiful outcrops while enjoying the "cool" evening air and hopefully everyone gets an opportunity to see our gorgeous Hill Country fireflies.

We will discover more of the Texas Hill Country when we visit Hamilton Poole and Reimer's Ranch to learn more about the geology of the area with the traditional Friday field trip, led by the Bureau of Economic Geology.

With a large variety of vendors, technical veterans, industry leaders, and rising young professionals, the SCA meeting is a great opportunity for professional interaction, to share ideas, innovations, knowledge, best practices, products, and services. In the exhibition halls the vendors showcase their latest technical innovations and offerings in equipment and services.

I would like to thank the sponsors and vendors for their support, the authors and technical committee of the SCA for their dedication to make the SCA a passionate conference, and a

thank you for all the volunteers who helped in the organization. A very special thanks to Melanie Young who is the backbone of this organization.

Welcome Ya'!!!

Tracie Walker,  
VP Arrangement

## From the 2022 VP Technology

Dear Colleagues and Friends,

Welcome to the 2022 SCA International Symposium in Austin, Texas!

The theme of the 35<sup>th</sup> symposium is "Augment core analysis to embrace energy transition". People working in the energy and related sectors are facing a critical challenge as the world increasingly transitions towards clean energy. SCA, with our special expertise, can embrace the challenge and contribute to the transition. In consideration of this, I have invited four experts to give an opening workshop "Core Analysis in Carbon Geosequestration, Geothermal, and Nuclear-Waste Disposal". I would like to thank the four final presenters: Martin J. Blunt, Jon Burger, Igor Faoro, and Garrard Rodney. I am sure these presentations will be interesting and informative to all attendees.

The 2022 SCA technical program include 32 oral presentations in 11 sessions and 31 posters in two sessions. There are 46 manuscripts and 17 abstracts accepted from the 94 submitted abstracts.

Although I have attended the SCA multiple times and have organized other conference as chairperson, I was pleasantly surprised by the dedication, time, and efforts of the authors and technical committee to improve the manuscript quality. Quite a few manuscripts went through multiple rounds of review and revision. I would like to thank all the authors and the Technical Committee who represent the best of our society and are responsible for the high technical standard of this symposium.

My special thanks to Melanie Young, our SCA Executive Director, for her invaluable support in all matters and for her patience with my frequent impromptu phone calls.

Finally, I am looking forward to seeing you all in Austin, Texas for a successful gathering and technical communication after a two-year break!

JinHong Chen

SCA VP of Technology



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## 2022 Technical Committee

The SCA Technical Committee is the backbone of the Society of Core Analysts. Its members rank and evaluate the submitted abstracts and the technical quality of the manuscripts. In the review of each individual manuscript and in-depth discussions with the authors, many hours are spent until a manuscript is accepted. In many cases, the interaction between authors and TC members leads to a higher quality of individual manuscripts. As a result, the annual SCA symposia are packed with high-quality presentations. For this, sincere acknowledgement go to this year's Technical Committee members:

Adam Moss

Benjamin Nicot

Bo Gao

Carl Fredrik Berg

Carl Sondergeld

Cyril CAUBIT

David Potter

Einar Ebeltoft

Eric Withjack

Fabrice Pairoys

Harry Xie

Hassan Mahani

Hendrik Rohler

Holger Ott

Issa Abu Shiekah

Jim Funk

James Howard

John Mills

Jos Maas

Kory Holmes

Matthias Halisch

Mike Dick

Olga Vizika

Patrick Egermann

Rudolf Held

Ryan Armstrong

Shannon Eichmann

Stacey Althaus

Stephanie Perry

Stefano Pruno

Steffen Berg

Subhash Ayirala

Will Richardson

## Technical Achievement Darcy Award Recipient James Howard

James J. Howard spent much of his 40+ year career in the laboratory making measurements on a wide range of geological and petrophysical properties on reservoir rocks. He has co-authored 80+ relevant papers that cover a wide range of topics in core analysis and has several patents. He has B.S. and Ph.D. degrees in the geosciences, with his graduate work focused on geochemistry and clay mineralogy. Much of his career was in the oil and gas industry, with several short interludes at academic institutions along the way, and has ended up as an advisor to a software company involved with the digital rock world. His work has included the early development of NMR interpretation based on multi-exponential distributions, in-situ monitoring of multiphase flow experiments with NMR and then MRI, wettability characterization, high resolution imaging of rocks that included mineral mapping from SEM images, the CO<sub>2</sub>-CH<sub>4</sub> exchange process in natural gas hydrates and a range of measurements on very low permeability rocks at reservoir conditions. He is most proud of the accomplishments of the dozens of students and young professionals who have worked in his labs over the years.



He has belonged to a wide range of technical societies throughout his career, with the SCA being his favorite since he first heard about it in the late 1980s. He has served on the SCA Technical Review committee for a number of years. Several of his 19 co-authored SCA papers were selected as “Best of SCA” and published in *Petrophysics*.

# The Venue

The hotel is a beautiful setting for our conference and is admittedly a bit spread out. Below is a map of the facility and a listing of where you can find important meeting spaces. All coffee breaks will take place in the Exhibition Hall. There will also be signs throughout the Hotel to help guide you to your destination and volunteers to show you the way!

Opening Reception located in Sunset Room = G



Presentations in Rio Grande Ballroom = A

Exhibitions/Coffee Breaks in Vistas Ballroom = D

Lunch in Colorado Ballroom = I

Young Professional Event at the Marina = M

## **Golf – Sunday 18<sup>th</sup>, 8:00 a.m. – 2:30 p.m.**

**Course Name: The Hills of Lakeway, Live Oak Course**

Prizes

1st, 2nd, and 3rd Place

Closest to the Pin

Long Drive

Format will be individual Gross Scoring....no need to provide a handicap.

Tee Time: 9:00 am. With 8-minute intervals between foursomes.

Cap at 16 players

## **Short Courses – Monday 26<sup>th</sup>, 8:50 a.m. – 12:30 p.m.**

### **Short Workshop: Core Analysis in Carbon Geosequestration, Geothermal, and Nuclear-Waste Disposal**

A special thanks to the presenters who helped put this short workshop together; Martin Blunt, Jon Burger, Igor Faoro and Garrard Rodney.

Coffee and tea will be available during breaks. Lunch will be provided to attendees.

Short Course is Kindly Sponsored by:

## **Opening Reception – Monday 19<sup>th</sup>, 5:30p.m. -8:30 p.m.**

The Opening “Icebreaker” Reception will be held in the Sunset Room. Snacks and drinks will be served to foster a relaxed atmosphere to meet and greet both old and new colleagues.

Dress Code: Business casual

## **Technical Sessions – Monday 19th, Tuesday 20th, Wednesday 21st and Thursday 22nd, 8:15 a.m. - 5 p.m.**

(With the exception for start at 1:30 p.m. on Monday and end at 3:30 p.m. on Thursday).

Oral presentations: The Symposium will offer 32 oral presentations, 25 minute presentations followed by 5 minutes for discussion.

Poster sessions: The symposium will offer 31 posters, distributed in two poster sessions. Tuesday (Poster session Odd) and Wednesday (Poster Session Even).

## **Young Professionals Event – Tuesday 20th, 6:00-9:00 p.m.**

### **Lakeway Marina – Party Boat Tour**

Lakeway Marina 6:00 – Easy 2 minute walk to the marina from the hotel

Party Boat – 3 Hour Tour

Cook Out – Hot Dogs, Hamburgers, Vegan Burgers – Assorted Chips, etc.

Drinks – Beer, Whiteclaws, Canned Sodas, Water



Kindly Sponsored by: Shell

## **Awards Gala Dinner – Wednesday 21<sup>st</sup>, 6:30 - 9:30 pm**

The gala dinner will be held at the Star Hill Ranch, located at 15000 Hamilton Pool Rd. Austin, TX 78738. Buses will be picking everyone up at the Hotel at 6pm for transportation to the event. We will enjoy some great BBQ and Whiskey from the region.

Dress code: (Super Casual) Casual dress code or go all out Cowboy and Cowgirl Style. The evenings may still be warm in Texas and the venue may be a bit dusty so dress comfortably.

Gala Dinner is Kindly Sponsored by:

## **Optional Field Trip – Friday Sept 23rd, 9:00 a.m.- 3:15 p.m.**

### **Optional Friday Field Trip - Hamilton Pool Preserve and Reimers Ranch**

Leave Lakeway at 9:00 am on Friday, September 23rd

- Transportation and lunch provided.
- Hamilton Pool: 9:45 to 11:00 am
- Reimers Ranch – 11:30 am
- Lunch and Safety Briefing
- Geological Tour Outcrops 12:30 – 2:30 pm
- Arrive Back at Lakeway Hotel 3:15 pm

Note: Reimers ranch cores will be at the SCA conference for viewing throughout the week.

Trip Leaders: Charlie Kerans, Brian Hunt, Charlotte Sullivan, and Toti Larsen.

## **Publication of Proceedings**

The proceedings are prepared in USB format and will be given at the Symposium to all registered participants. Additional USBs may be ordered the SCA web site:

[www.SCAweb.org](http://www.SCAweb.org)

The SCA has decided to no longer carry printed copies of the proceedings.

## Exhibition Hours

Monday: 8:00 a.m. – 5:00 p.m.	*Exhibition Build-up starts at 8am
Tuesday: 8:15 a.m. – 5:00 p.m.	
Wednesday: 8:15 a.m. – 5:00 p.m.	
Thursday: 8:15 a.m. – 3:30 p.m.	*Exhibition Break-down can start after the afternoon break and complete by

## Exhibitors

**AMETEK Chandler Engineering** – AMETEK Chandler Engineering produces the highest quality instruments and measurement systems for the Oil and Gas Industry. Our portfolio includes Quizix precision pumps used in core flooding (NEW models available!), SCAL, EOR, and other fluid delivery applications, the 6100 Formation Response (formation damage) systems, Core flood/EOR flow systems, custom core flow systems for Steady State/Unsteady State permeability measurements, and the Chandler 3000 Series PVT systems for phase behavior studies.

**Core Laboratories** – Core Laboratories is a leading provider of proprietary and patented Reservoir Description and Production Enhancement services.

Core Laboratories remains dedicated to providing the technology you need to enhance your production. We continue to develop and acquire technologies that complement our existing products and services, and we disseminate these technologies throughout our global network. Core Laboratories' reservoir optimization technologies are used to increase total recovery from existing fields. Our services enable our clients to optimize reservoir performance and maximize hydrocarbon recovery from their producing fields. Core Laboratories has taken extensive measures to ensure the services and data provided by all of our worldwide companies are of the highest quality and integrity. Our commitment to applying and developing new technologies to optimize reservoir performance is unsurpassed in the oilfield service industry. This commitment to technology and to your bottom line makes Core Laboratories, The Reservoir Optimization Company™.

**Core Specialist Services** - Core Specialist Services are a consultancy that can support every type of core-based project from planning to core, through coring & wellsite, routine, SCAL, formation damage, and all kinds of specialized studies. Our strength lies not only within our internal team with 72 years of experience, but also with our extensive network of associate subject matter experts (SMEs) in a wide range of disciplines, including reservoir engineering, geomechanics, coring, well planning, and much more. If you need a core-related skill we don't have in-house, we can source it

Core Specialist Services support projects related to oil and gas, geothermal, carbon capture & storage, hydrogen storage, and radioactive waste management – principally from a core-related perspective but also with a wider scope in many cases. We can create a virtual team to support your project no matter where it is located globally.

Core Specialist Services has no bias toward a specific provider but seeks only to source the best services and solutions for our clients.

An exception is our working relationship with Craytive Technologies. We are showcasing their BaselineZ platform at this Symposium. BaselineZ is where core analysis and the sub-surface meet the Metaverse. The power of the platform has many facets but includes the ability to integrate and manage all types of core and sub-surface data and imagery in the Virtual Core Shed and Virtual Data Room - from nano-CT, thin section, to the whole core, well, field, basin, or region. It maximizes the value of collaboration as team members can join virtual meetings from anywhere there is an internet connection worldwide – all appearing in the same virtual space as avatars.

At Core Specialist Services our enthusiasm for core is second to none – please do come past of booth or talk to us anytime. We endorse all and every service provider exhibiting at the SCA and will promote any service & service provider we believe provides innovative and cost-effective solutions to our mutual clients in this rapidly changing world.

**DCI Corporation** – DCI offers innovative solutions to your core testing requirements. From turnkey systems to system components we can help you with your laboratory needs. DCI designs and manufactures both custom and standard core holders, accumulators, syringe pumps, acoustic separators, core flood systems, electrical resistivity systems, rock mechanics systems and much more. Stop by our booth to see how DCI can help you make better measurements on core properties.

**Diversified Well Logging** – Diversified Well Logging, LLC. is a forward looking geological service company and leader in Surface Measurement While Drilling (SMWD) operations. In our 70 year history, we have been a leader both offshore and onshore with our conventional and unconventional surface evaluation services. Our focus has been, and always will be,



the delivery of valuable data and solutions to our clients and partners, helping drive their capital efficiency and return on investment through our innovation and expertise.

Diversified employs a competent staff of over 150 field geologists and field engineers along with experienced field and support personnel. In addition, we maintain an experienced support staff in our operations centers of Reserve, Louisiana (Gulf Coast), Pennsylvania (Northeast Office), Cannonsburgh Pennsylvania (Geo steering Center), Corpus Christi, Texas (South/Central Texas Office), Midland, Texas (West Texas Office and Geo steering Center) and Conroe, Texas (Corporate Office). Our international branches include offices in Villahermosa, Mexico and the Asia Pacific region. All operations centers follow a comprehensive quality control & Safety program.

Our classic surface logging services are enhanced by rock and gas geochemistry performed in realtime. This geochemical/chemostratigraphic data in turn allows our geo steers to geo position each well with more accuracy and precision than by using gamma ray alone. We also deliver innovation with sample collection automation (RoboLogger™) which improves rock characterization whilst lowering HSE risk. We are now incorporating drilling data and offset well data utilizing A.I. Artificial intelligence and machine learning to generate petrophysical quality logs at lower cost and lower risk. The new deliverables improve our customer's capital efficiency and lower their finding and development costs.

**H2 Laboratories** - H2 Laboratories, a division of Green Imaging Technologies (GIT), is a rock core, NMR-based laboratory located in New Brunswick, Canada. By utilizing our long-term collaboration with Oxford Instruments, H2's team of NMR experts are able to create and develop client-specific NMR workflows with the objective to provide tangible solutions to our client's unique and ever-changing challenges.

**GeoTek** - Geotek is a group of companies specialising in the non-destructive analysis of geological cores. We supply our range of Multi-Sensor Core Logger (MSCL), hyperspectral imaging, and X-ray CT systems that use multiple geophysical and geochemical sensors to rapidly and automatically gather measurements on sediment or rock cores. The rugged nature of the equipment makes it suitable for use in either an onshore laboratory/repository environment or onboard survey and drilling vessels. Stop by our booth and discuss our dedicated core plug and core flood CT systems, and find out about our brand-new systems: BoxScan and Hyperspectral Core Imaging System integrating SpectraMap's Infrared Spectrometer technology

**Green Imaging Technologies, Inc** – Green Imaging Technologies is the industry leader in NMR rock core analysis. Our software is the backbone of the Oxford GeoSpec line of NMR Rock Core Analyzers, which are used by all major oil producers, oil service companies and the most active research institutes worldwide. Our customers have access to exclusive, patented measurements including NMR capillary pressure and quantitative saturation profiles. Our team of experts are focused on rock core analysis, and as such have developed relationships with the most respected researchers and experts in the NMR rock core analysis field. At this years' SCA we will be showcasing new applications such as our

latest work on the Oxford Instruments 10,000 PSI overburden cell. We will also be talking about how NMR can be utilized for other applications of interest, such as analyzing potential carbon storage reservoirs. Stop by the Green Imaging/Oxford Instruments booth in the exhibit hall to find out what is new in NMR rock core analysis.

**HOT Microfluidics GmbH** - HOT Microfluidics is the leading provider of turnkey microfluidic solutions & services for IOR/EOR, conformance control, hydrogen storage and CCS/CCUS. Our InspIOR® is the industry-leading reservoir-condition microfluidics technology platform – ready to target your fluidics challenges.

**Math2Market GmbH** - Math2Market develops the GeoDict software to provide a complete solution to our clients comprising software, support, project work, user training, and customized software development. The Digital Rock Physics and Digital Core Analysis (DRP-DCA) suite of GeoDict, in combination with imaging capabilities, is a purpose-built tool that enables its users to perform the entire workflow digitally and in-house with unmatched fast runtimes, handling of extremely large data sets, and low hardware requirements. Latest applications of GeoDict are the simulation of two-phase flow with consideration of the entire hysteresis cycle or the digital analysis of rocks for CO<sub>2</sub> sequestration techniques and storage mechanisms.

**MetaRock Laboratories** - A unique, diversely skilled company, MetaRock Laboratories has been providing a range of Automated Integration Solutions, Testing Systems and Services since 1996. Our custom-designed products, built to simulate and withstand very high temperatures and pressures, service a high-value segment in the Oil & Gas, Mining, Geotechnical & Medical Industry.

While our initial drive was to be known at the forefront of the Geomechanics testing field, our strong commitment to staying ahead of the technology and innovation curve—as well as meeting clients' needs has allowed us to extend our portfolio to a wide array of technology and automation solutions.

On the strength of our cross industry experience, MetaRock Laboratories provides a wide range of consulting services in areas of Rock Mechanics and Core Analysis, Custom Software Development and Automation.

**Object Research Systems** - All things scientific imaging. Server and workstation solutions for visualization, deep learning image enhancement and automated segmentation, image analysis and numerical modeling.

**Oxford Instruments** – Oxford Instruments will display the renowned GeoSpec line of NMR rock core analysers, including GeoSpec12 which offers ten times greater sensitivity and 100 times faster measurements on tight rocks and low porosity samples. The GeoSpec range measures standard core parameters such as pore size distributions, BVI, FFI, porosity, and T<sub>2</sub> cut-off on a single instrument, and can perform advanced measurements such as capillary pressure and spatially resolved T<sub>2</sub> distributions with the exclusive use of

Green Imaging Technologies' software. We will also be available to discuss new applications such as gas isotherms, wettability and relative permeability.

**PanTerra** – PanTerra is an integrated laboratory, geosciences, and engineering consultancy serving the international energy industry for more than 30 years. Our services include conventional and special core analysis, PVT, production chemistry, Enhanced Oil Recovery, subsurface evaluation and modelling, field development, sourcing studies, engineering and project management services. Capitalizing on our in-house expertise, PanTerra also specializes in recruitment and secondment of subsurface professionals and additionally offers a unique blend of E&P learning customized to individual needs. For more information please visit [www.panterra.nl](http://www.panterra.nl) or connect via our LinkedIn page.

**Prores AS**– Prores is a Norwegian employee-owned corporation built on knowledge and with an ambition to bridge the gap from ideas to solutions. Prores consists of an integrated team of researchers and engineers with an extensive network offering petroleum expertise, technology, and software development. We offer high quality solutions for petroleum asset operations. All our products are developed in-house in close cooperation with our industrial partners. The latest spin-offs from Prores are WellGuard AS and WellStarter AS, where Prores remains a majority owner. WellGuard technology is a wireline logging tool for precision measurements of cement barrier integrity through multiple consecutive casings to detect debonding, micro-annuli, cracks, and fluid channels prior to P&A operations. Wellstarter HIPLog is a wireless downhole flow monitoring solution based on heat pulses released into the well stream providing the inflow profile of oil, gas, and water in producing wells. At-the-Bit Mud Loss Control is a new initiative currently being developed in Prores AS. Our Sendra software is the market leading software for experimental history matching and SCAL analysis. For more information on our solutions and services, please visit our website at [www.prores.no](http://www.prores.no).

**Rotunda Scientific Technologies LLC** - Rotunda Scientific Technologies LLC provides innovative radiation measurement and protection products to the energy industry. Our offering includes several gamma spectrum core loggers, multichannel analyzers, and a positive displacement pump manufactured for use with corrosive solvents such as brine. The GMS310 and GMS312 Gamma Spectrum Core Loggers are designed for core sample analysis (Spectral Gamma, API and Percent Concentration) in the rugged environment of the exploration site and will be available at our booth for you to evaluate. In addition to the GMS310 and GMS312, we offer many other state of the art radiation detection and protection products for use during exploration or nondestructive testing. You are invited to see these products at our booth #13 during the SCA Annual Meeting. We look forward to meeting you for the first time or seeing you again and catching up!

**Qmineral** – Qmineral is an independent material test laboratory and one of the most important mineralogy/XRD labs worldwide. We were the first lab to win the “Reynolds

cup” (aka the World Championship of quantitative mineralogy) for two consecutive times. We are specialized in the analysis of clay bearing samples and the detailed structural analysis of a rock’s clay minerals.

Qmineral has just launched its new service for quantitative mineralogy, named HSMQ (High Speed Mineralogical Analysis). HSMQ is a tool to quantify the mineralogy of a sample very accurately and quickly - about 40 times faster than with XRD, allowing you to characterize a virtually unlimited amount of samples in a very short time

**Vinci Technologies** – Vinci Technologies’ origins began with the manufacturing of highly specialized laboratory and field instruments for the oil & gas industry. Throughout this history, Vinci has continuously developed new instruments to address emerging challenges such as carbon footprint, environment and global awareness.

**Vindum Engineering Inc. - MANUFACTURER OF PRECISION HIGH PRESSURE PULSE-FREE PUMPS, VALVES AND FLUID FLOW EQUIPMENT**

Vindum VP Series Pumps: High Precision, Continuous Pulse-Free Metering Pumps

Latest generation design: lower cost, higher performance

Models up to 25,000 psi

Ambient Temperature or High Temperature (up to 160C) Options

Gas or Liquids, including CO<sub>2</sub>

New Vindum VPL Series Pumps: Large Volume Cylinder Pumps

Easily upgrade to continuous pulse-free flow with 2 pumps

Syringe Piston Design with cylinder wash area

CV Valves Standard

VPware Software Included

Gas or Liquids, including CO<sub>2</sub>

CV Valves: Constant-Volume, High-Pressure Valves

Air activation

High Temperature applications (up to 300C)

Gas or Liquids, 2-Way and 3-Way Models

MV Hastelloy Valves & Fittings: Modular Manual Valve System

Mountable, compact design saves space

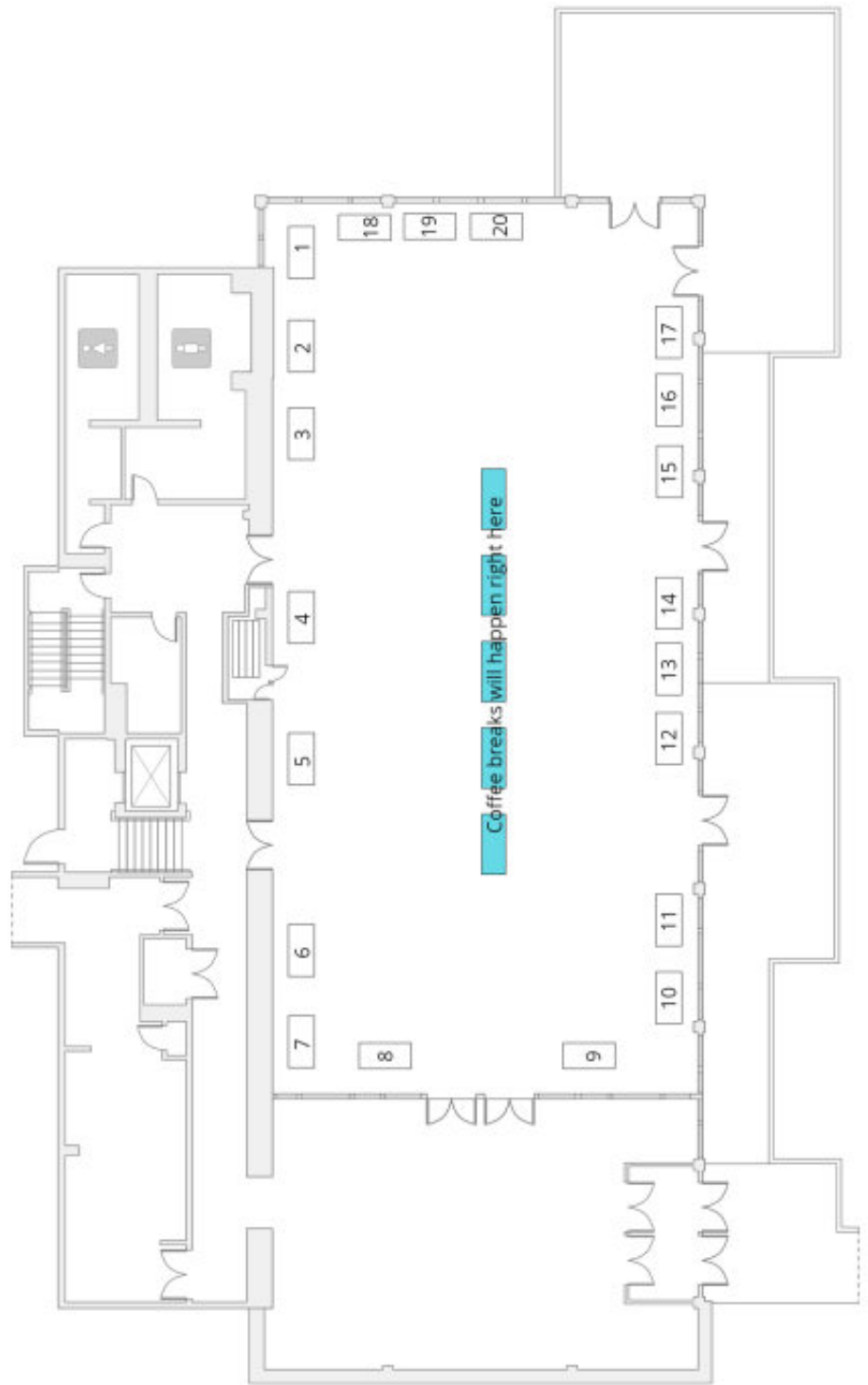
O-ring seals: replaceable, various seal materials

Lower Cost Hastelloy Design

In-stock for immediate delivery

# Booth Layout

1. Diversified Well Logging
2. Core Laboratories
3. PanTerra Laboratory Services BV
4. Core Specialist Services
5. Qmineral
6. Vindum Engineering
7. Vindum Engineering
8. HOT Microfluids
9. Geotek Ltd
10. Green Imaging Technologies, Inc
11. Oxford Instruments
12. H2 Laboratories
13. Rotunda Scientific Technologies
14. AMETEK Chandler Engineering
15. Math2Market GmbH
16. DCI Corporation
17. Vinci Technologies
18. MetaRock Laboratories
19. Object Research Systems
20. Prores AS





**Sunday, Sep 18**

**8:00 – 2:30**

Optional Golf Event - The Hills of Lakeway, Live Oak Course  
Please meet in Hotel Lobby for 8:00am

**Monday, Sep 19**

**8:00 – 5:00**

**Registration Desk Open**

## Short Course Program

### Short Workshop: Core Analysis in Carbon Geosequestration, Geothermal, and Nuclear-Waste Disposal

**MONDAY, September 19, 2022**

#### Short Workshop: Core Analysis in Carbon Geosequestration, Geothermal, and Nuclear-Waste Disposal

Moderator: JinHong Chen

8:30 – 8:50

Welcome and safety moment

8:50 – 9:40

Flow in Porous Media in the Energy Transition

Presenter: Martin Blunt

9:40 – 10:30

What Do We Need to Know for Designing a Reliable  
Carbon Storage Project?

Presenter: Jon Burger

10:30 – 11:00

Coffee Break

**Kindly Sponsored by: AMETEK Chandler  
Engineering**

11:00 – 11:45

Core Analysis in Geothermal: Supporting the Energy  
Transition

Presenter: Igor Faoro

11:45 – 12:30

Core and Petrophysics Analysis as Complementary  
Datasets for Geological Disposal of Nuclear Waste at  
NAGRA

Presenter: Garrard Rodney

12:30 – 1:30

Lunch

**Kindly Sponsored by: TOTALEnergies**



# Augment Core Analysis to Embrace Energy Transition

## Technical Program

Monday, September 19, 2022

**1:30 – 3:00**                      **Session 1: Core Analysis Embracing Energy Transition**

**Chairs: C. Berg and H. Xie**

SCA01                      Displacement Stability Revisited – A New Criterion for the Onset of Viscous Fingering

Jos G. Maas, Niels Springer, Albert Hebing, and Steffen Berg

SCA02                      Advanced Digital-SCAL Measurements of Gas Trapping in Sandstone

Ying Gao, Tibi Sorop, Niels Brussee, Hilbert van der Linde, Ab Coorn, Matthias Appel, and Steffen Berg

SCA03                      Integrated Thermo-Poro-Mechanical Characterization for CO<sub>2</sub> Sequestration at Deep Aquifer Conditions

Sudarshan Govindarajan, Munir Aldin, Akshay Thombare, Omar Abdulbaki, Deepak Gokaraju, Abhijit Mitra, and Robert Patterson

**3:00 - 3:30**                      **Coffee Break**

**Kindly Sponsored by: AMETEK Chandler Engineering**

**3:30- 5:00**                      **Session 2: Improved SCAL Techniques and Interpretation 1**

**Chairs: E. Ebeltoft and M. Dick**

SCA04                      Wireless Acquisition for Resistivity Index in Centrifuge – Wiri: A Comparative Study of Three Pc-RI Methods

Quentin Danielczick, Ata Nepesov, Laurent Rochereau, Sandrine Lescoulie, Victor De Oliveira Fernandes, and Benjamin Nicot

SCA05                      Unraveling Electrokinetics – A Brand New and Innovative Workflow for the Quantification of Electrokinetic Properties of Siliciclastic Rocks

Matthias Halisch, Stephan Kaufhold, and Christian Weber

SCA06

Analytical Models for Predicting the Formation Resistivity Factor and Resistivity Index at Overburden Conditions

Meysam Nourani, Stefano Pruno, Mohammad Ghasemi, Muhamet Meti Fazlija, Byron Gonzalez, and Hans-Erik Rodvelt

**5:30 - 8:30**

**Opening Reception “Icebreaker Reception” – Sunset Room**

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**Tuesday, September 20, 2022**

**7:30 – 5:00                    Registration Desk Open**

**8:15 - 9:45                    Session 3: Laboratory Core Analysis 1**

**Chairs: B. Gao and S. Althaus**

SCA07                    THz Imaging to Map the Microporosity Distribution in Carbonate Rocks  
Shannon L. Eichmann, Jacob Bouchard, Hooisweng Ow, Doug Petkie,  
and Martin Poitzsch

SCA08                    Innovations in Low UCS Core Acquisition and Quality Assessment  
Using Digital Rock Physics  
Dmitry Lakshtanov, Jennie Cook, Yuliana Zapata, Dave Saucier, Robin  
Eve, Mark Lancaster, Nathan Lane, Glen Gettemy, Kevan Sincock,  
Elizabeth Liu, Rosemarie Geetan

SCA09                    Angle-Dependent Ultrasonic Wave Propagation in Rocks for Estimating  
High-Resolution Elastic Properties of Complex Core Samples  
Daria Olszowska, Gabriel Gallardo-Giozza, Domenico Crisafulli, and  
Carlos Torres-Verdín

**9:45 - 10:15                    Coffee Break**

**Kindly Sponsored by: Math2Market**

**10:15 – 11:45                    Session 4: Pore Scale Imaging and Modeling 1**

**Chairs: M. Halisch and S. Pruno**

SCA10                    Pore Network Simulations Coupled with Innovative Wettability Anchoring  
Experiment to Predict Relative Permeability of a Mixed-Wet Rock  
Mohamed Regaieg, Franck Nono, Titly Farhana Faisal, Clément  
Varloteaux, and Richard Rivenq

SCA11                    EIRock-Net: Assessing the Utility of Machine Learning to Initialize 3D  
Electric Potential Simulations  
Bernard C. Chang, Javier E.Santos, Rodolfo Victor, and Maša

SCA12                    A Bayesian Optimization Approach to the Extraction of Intrinsic Physical  
Parameters from T2 Relaxation Responses  
Rupeng Li, Igor Shikhov, and Christoph H. Arns

<b>11:45 - 1:00</b>	<b>Lunch</b> <b>Kindly Sponsored by: Chevron</b>
<b>1:00 – 3:00</b>	<b>Poster Session (Odd Numbers)</b>
<b>3:00 - 3:30</b>	<b>Coffee Break</b> <b>Kindly Sponsored by: Math2Market</b>
<b>3:30 – 4:00</b>	<b>Exhibitor presentations</b>  H2 Laboratories, Green Imaging Technologies, Inc., Oxford Instruments, Vindum Engineering, Inc., AMETEK Chandler Engineering, Qmineral, Core Laboratories.
<b>4:00 – 5:00</b>	<b>Session 5: Unconventionals and Source Rocks</b> <b>Chairs: J. Howard and E. Eichmann</b>
SCA13	Shale Characterization Using Magnetic Resonance  Mohammad Sadegh Zamiri, Jiangfeng Guo, Florea Marica, Laura Romero-Zerón, and Bruce J. Balcom
SCA14	The Effect of Nanoconfinement on the Phase Behavior of Ethane/N-Propane Binary Mixture: An Experimental Study at Varying Pore Sizes and Compositions  Keerti Vardhan Sharma, Rami M. Alloush, Karem Al-Garadi, and Mohammad Piri
<b>6:00 – 9:00 p.m.</b>	<b>Young Professional Event – Lakeway Marina – Party Boat Tour</b> <b>Kindly Sponsored by: Shell</b>

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**Wednesday, September 21, 2022**

**7:30 – 5:00**            **Registration Desk Open**

**8:15 – 9:45**            **Session 6: Pore Scale Imaging and Modeling 2**

**Chairs: J. Maas and S. Eichmann**

SCA15            Forced Imbibition and Uncertainty Modelling Using the Morphological Method

Pit Arnold, Mario Dragovits, Sven Linden, Fatime Zekiri, and Holger Ott

SCA16            Initial States of Core Flooding Techniques Evaluation: A Global Pore-Scale Investigation

Franck Nono, Cyril Caubit, and Richard Rivenq

SCA17            Numerical Study of NMR Relaxation Responses in Synthetic Clayey Sandstone by Dual-Scale Modeling

Yingzhi Cui, Igor Shikhov, and Christoph Arns

**9:45 - 10:15**            **Coffee Break**

**10:15 – 11:45**            **Session 7: Application of Artificial Intelligence/Machine Learning**

**Chairs: H. Ott and J. Schembre-McCabe**

SCA18            Artificial Intelligence Assisted Quantitative Petrophysical Properties Analysis using Core Images and Well Logs

Tao Lin, Mokhles Mezghani, Chicheng Xu, and Weichang Li

SCA19            Combining High-Resolution Core Data and Machine Learning Schemes to Develop Sustainable Core Analysis Practices

Christophe Germy, Tanguy Lhomme, Luc Perneder, and John Cummings

SCA20            Prediction of Centrifuge Capillary Pressure Using Machine Learning Techniques

Brandon Jeremy Bursey, Erfan Mohagheghian, Edison Sripal, and Lesley Anne James

**11:45 - 1:00**

**Lunch**

**1:00 – 3:00**

**Poster Session 2 (Even Numbers)**

**3:00 – 3:30**

**Coffee Break**

**3:30 – 4:00**

**Exhibitor Presentations**

Core Specialist Services, Rotunda Scientific Technologies, PanTerra Laboratory Services BV, Geotek Ltd, HOT Microfluidics, Diversified Well Logging, Math2Market GmbH, Vinci Technologies, DCI Corporation

**4:00 – 5:00**

**Session 8: Wettability & others**

**Chairs: J. Maas and S. Althaus**

SCA21

Digital Rock Workflow to Calculate Wettability Distribution in A Reservoir Rock

Ashraful Islam, Rafael Tio Salazar, and Bernd Crouse

SCA22

Fast Wettability Assessment on Small Rock Samples Using A 3D, High-Resolution, Image-Based Amott-Like Test

Maria Repina, Regis Brugidou, Alexandre Dufour, and Richard Rivenq

**6:30 – 9:30**

**Gala Dinner – Star Hill Ranch**

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**Thursday, September 22, 2022**

**7:30 – 3:00            Registration Desk Open**

**8:15 - 9:45            Session 9: Improved SCAL Techniques and Interpretation 2**

**Chairs: S. Pruno and W. Richardson**

SCA23            Hybrid Technique for Setting Initial Water Saturation on Core Samples

Victor Fernandes, Cyril Caubit, Benjamin Nicot, Fabrice Pairoys, Henri Bertin, and Jean Lachaud

SCA24            Water-Gas Imbibition Relative Permeability: Literature Review, Direct versus Indirect Methods and Experimental Recommendations

Fabrice Pairoys, Cyril Caubit

SCA25            Geomechanical Deformation of Saturated Porous Media under Various Wettability Conditions: A Pore-scale Investigation

Ahmed Zankoor, Rui Wang, Maziar Arshadi<sup>1</sup> and Mohammad Piri

**9:45 - 10:15            Coffee Break**

**10:15 – 11:45        Session 10: Laboratory Core Analysis 2**

**Chairs: E. Ebeltoft and H. Xie**

SCA26            A Combinational NMR and Dielectric Technique Using Spectral NMR Mapped Distributions of Dielectric Relaxation

James J. Funk, Michael Myers, and Lori Hathon

SCA27            Experimental Time-Lapse Visualization of Mud-Filtrate Invasion and Mudcake Deposition in Complex Rocks Using X-Ray Radiography

Pierre Aéreus, Carlos Torres-Verdín, and Nicolas Espinoza

SCA28            Causal Protocols to Assess the Viability of Native State or Restored State Preparation

Jules Reed, Stefano Pruno, Izaskun Zubizarreta, and Rolf Johansen

**11:45 – 12:15 Business Meeting and Lunch**

**12:15 - 1:30 Lunch**

**1:30 – 3:30 Session 11: Displacement Mechanisms/EOR/IOR**

**Chairs: J. Funk and M. Halisch**

- SCA29 Carbonated Water Injection for Heavy Oil Recovery  
Jinxun Wang, Abdulkarim M. AlSofi, Hassan Behairy, Abdullah M. Boqmi, and Sinan Caliskan
- SCA30 Carbonated Smart Water Injection for Optimized Oil Recovery in Chalk at High Temperature  
Md Ashraful Islam Khan, Sander Haaland Kleiberg, Ivan Dario Pinerez Torrijos, Tina Puntervold, and Skule Strand
- SCA31 Nano-Colloid Based Suspensions and Emulsions Used as Means for Enhanced Oil Recovery  
Anastasia Strekla, Christina Ntente, Maria Theodoropoulou, and Christos Tsakiroglou
- SCA33 Simultaneous Interpretation and Uncertainty Analysis of SCAL Data from Complex Rocks  
Omideza Amrollahinasab, Siroos Azizmohammadi, and Holger Ott

**3:30 Closing Remarks**



## Posters Presentations

	** Posters with odd numbers present on Tuesday and with even numbers present on Wednesday
Posters with Manuscript	
SCA34	<p>Capturing the Wetting State of An Aged-Carbonate Core Through Pore-Scale Multiphase Flow Simulations</p> <p>Tingting Wang, Ying Da Wang, Chenhao Sun, James E. McClure, Peyman Mostaghimi, and Ryan T. Armstrong</p>
SCA35	<p>Comparison of Three-Dimensional Permeability Inversion from Positron Emission Tomography Experimental Data Using Convolutional Neural Networks and Ensemble Kalman Filter</p> <p>Zitong Huang and Christopher Zahasky</p>
SCA36	<p>Digital Rocks Portal (Digital Porous Media): Connecting Data, Simulation and Community</p> <p>Maša Prodanović, Maria Esteva, James McClure, Bernard C. Chang, Javier E. Santos, Anuradha Radhakrishnan, Ankita Singh, and Hasan Khan</p>
SCA37	<p>Pore-scale Analysis of CO<sub>2</sub>-brine Displacement in Berea Sandstone and Its Implications to CO<sub>2</sub> Injectivity</p> <p>Guangyuan Sun, Zhuang Sun, Andrew Fager, and Bernd Crouse</p>
SCA38	<p>Core Characterization of Patterson #5-25 Well for Carbon Capture and Storage in Western Kansas</p> <p>Thomas Paronish, Rhiannon Schmitt, Dustin Crandall, Franek Hasiuk, Eugene Holubnyak, and Jingyao (Jenny) Meng</p>
SCA39	<p>An Approach for Image-Based Quantification of Fines Migration in Geologic Columns and Core Samples</p> <p>Collin R. Sutton and Christopher Zahasky</p>
SCA40	<p>An Integrated Petrophysical Analysis Based on NMR, Organic Geochemistry and Mineralogy. The Vaca Muerta Source Rock-Unconventional Play at Different Thermal Maturities</p> <p>Diana Masiero, Marcos Comerio, Esteban Domené, Gabriela Vila, Bernarda Epele, Mariano Cipollone, Mariela Silka, Carlos Camacho, Lourdes Vera López, and Silvina Chiappero</p>

SCA41	Some Useful Guidelines for Whole Core CT-Scanning for Petrophysical Applications Shameem Siddiqui
SCA42	Investigation Pore Geometry Wettability Preference in Oolitic Oil Reservoir: Pore Scale Imaging and Modelling Study Hussien Al-Ajaj, Ralph Flori, Saleh Alsayegh, Haidar AlMubarak, and Waleed Al-Bazzaz
SCA43	Rapid, High Resolution Probe Screening Techniques for Core Analysis and their Potential Usefulness for Hydrocarbon or Energy Transition Applications Emmanuel Okwoli and David K. Potter
SCA44	Applications of Temperature Dependent Paramagnetic Properties for Quantifying Mineral Content and Extending the Use of Paramagnetic Dopants for Laboratory or Borehole Analysis of NMR Data Cody W. Good and David K. Potter
SCA45	Modification of the SDR Equation for Permeability Prediction Andreas Weller and Zeyu Zhang
SCA46	Towards Multiscale Digital Rocks: Application of a Sub-Resolution Production Model to a multiscale Sandstone Rafael Salazar-Tio, Andrew Fager, Guangyuan Sun, Bernd Crouse, Rui Xu, Brett Wendt, and Adam Lewis
SCA47	Chemostratigraphic Analysis as A Powerful Tool for the Lateral Continuity of Structurally Complex Reservoirs: A Case Study Liborius-Parada Andreina, Medina-Macedo Marlen, Tonner Dave, Hughes Simon, and McCulley Meri
<b>Posters without Manuscript</b>	
SCA48	Carbon Capture and Storage (CCS), Evaluation of Carbon Dioxide Storage Efficiency at the Western Siberia Field Pavel Golub, Andrei Cheban, and Evgenii Romanov
SCA49	A Joint Workflow Towards a Reliable Quantification and Understanding of NMR Surface Relaxivity Matthias Halisch, Raphael Dlugosch, Zeyu Zhang, and Andreas Weller

SCA50	<p>Comparison of Geophysics- and Core-Based Wettability Assessment Methods: An Experimental Study Using Artificial Grain Packs</p> <p>Zulkuf Azizoglu and Zoya Heidari</p>
SCA52	<p>Multi-Scale 3D Carbonate Digital Rock Reconstruction: Traditional or Machine Learning Approaches?</p> <p>Yiteng Li, Xupeng He, Marwa AlSinan, Hyung Kwak and Hussein Hoteit</p>
SCA53	<p>NMR T2 Response versus Roughness: A Numerical and Analytical Study</p> <p>Yiteng Li, Xupeng He, Marwa AlSinan, Hyung Kwak, and Hussein Hoteit</p>
SCA54	<p>Nuclear Magnetic Resonance Laboratory Study of A Tight Sandstone for Robust Permeability Prediction</p> <p>Jun Gao, Hyung Kwak, Abdullah Alkhalidi, and Gabor Hursan</p>
SCA55	<p>NMR Spin-spin Relaxation in Unconventional Source Rocks</p> <p>Z. Harry Xie</p>
SCA56	<p>SEM Image-Constrained Process-Based Modeling for Relative Permeability Estimation of Carbonate-Rich Mudrock</p> <p>Christopher J. Landry and Masa Prodanovic</p>
SCA57	<p>Multi-Phase Flow in Fractured Rocks: From Pore-Scale Processes to Field-Scale Responses</p> <p>Xupeng He, Marwa AlSinan, Hyung Kwak, and Hussein Hoteit</p>
SCA58	<p>Direct Measurement of In-Situ Hydrogen-Water-Quartz System Relative Permeability for Underground Hydrogen Storage in A Depleted Gas Reservoir</p> <p>Scott Higgs, Ying Da Wang, Jonathan Ennis-King, Samuel J. Jackson, Ryan T. Armstrong, and Peyman Mostaghimi</p>
SCA59	<p>Characterization of Surface Conductivity of Clays</p> <p>Viacheslav Emelianov, Zeyu Zhang, Konstantin Titov, Matthias Halisch<sup>3</sup>, and Andreas Weller</p>
SCA60	<p>Manganese-Ion Based Tailored Waterflooding Processes for Carbonates</p> <p>Amani Alghamdi, Saleh Salah, Mohammed Otaibi, Subhash Ayirala, and Ali Yousef</p>

SCA61	<p>Development and Testing of A New 10000 PSI NMR Overburden Probe</p> <p>Michael Dick, Dragan Veselinovic, Taylor Kenney, and Derrick Green</p>
SCA62	<p>A Semi-Analytical Model for Capillary Entry Pressure of Pores in Carbonates with Varying Wettability States</p> <p>Yanbin Gong, Bradley William McCaskill, Mohammad Sedghi, and Mohammad Piri</p>
SCA63	<p>In-situ Characterization of Carbonate/Oil/SmartWater Interfacial Layers Using Advanced EM Techniques</p> <p>Dongkyu Cha, Mohammed B. AlOtaibi, Subhash Ayirala, Ahmed Gmira, and Ali A. Yousef</p>
SCA64	<p>Study on Adsorption Behavior of a New Type Gemini Surfactant onto Quartz Surface by Molecular Dynamics Method</p> <p>Weifeng Lyu</p>
SCA65	<p>Novel Evaluation of Oil Recovery in Rock-Like Mixed-Wet Microfluidic Systems</p> <p>Abdullah AlOmier, Antonia Sugar, Dongkyu Cha, Subhash Ayirala, Mohammed AlOtaibi, Ali Yousef, and Hussein Hoteit</p>

Friday, September 23, 2022

9:00 a.m. – 3:15 p.m.	<p>Optional Friday Field Trip Hamilton Pool Preserve and Reimers Ranch Leave Lakeway at 9:00 am on Friday, September 23rd</p> <ul style="list-style-type: none"><li>• Transportation and lunch provided.</li><li>• Hamilton Pool: 9:45 to 11:00 am</li><li>• Reimers Ranch – 11:30 am</li><li>• Lunch and Safety Briefing</li><li>• Geological Tour Outcrops 12:30 – 2:30 pm</li><li>• Arrive Back at Lakeway Hotel 3:15 pm</li></ul> <p>Note: Reimers ranch cores will be at the SCA conference for viewing throughout the week. Trip Leaders: Charlie Kerans, Brian Hunt, Charlotte Sullivan, and Toti Larsen.</p>
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- Delegate Bags kindly sponsored by Vindum Engineering
- Lanyards kindly sponsored by H2 Laboratories
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# Notes

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