



**Reservoir  
Characterization  
Research  
Laboratory**

# 2020 Research Prospectus



**TEXAS Geosciences**

The University of Texas at Austin  
Jackson School of Geosciences  
Bureau of Economic Geology



# Carbonate Reservoir Characterization Research Laboratory (RCRL)

## Mission

RCRL's mission is to use outcrop and subsurface geologic, geophysical, and petrophysical data from carbonate reservoir strata as the basis for developing new and integrated methodologies and concepts to better explain and describe the 3D reservoir environment, and to improve hydrocarbon recovery factors. In addition to this research mission, RCRL is dedicated to technology transfer and education, and consistently offers state-of-the-art training in the form of short courses, field seminars, in-house reviews of selected assets, and extensive graduate student supervision and guided research.

## Overall Research Goals

RCRL approaches reservoir characterization and exploration through four main scales of investigation: (1) platform-to-basin-scale stratigraphy; (2) reservoir architecture, including both matrix and nonmatrix systems (e.g., fractures and paleokarst); (3) structural and geomechanical properties characterization; and (4) pore networks and their reservoir distribution.

## Membership and Funding

We invite your company to participate in the continuation of the RCRL Carbonate Reservoirs Research Program for 2020. In 2020, the annual RCRL Industrial Associates contribution to the program will continue to be \$55,000 per year. To encourage sponsors to commit to a 2-year agreement so that we can better plan a longer-range research program and reduce the time and effort in securing agreements, we offer a 2-year (2020 and 2021) rate of \$50,000 per year. The agreement would be such that a Memorandum of Agreement (MOA) would be signed agreeing to a 2-year commitment, and payment would be due at the beginning of each year.

## Materials

Industrial sponsors receive research results at annual review meetings, in short courses, during mentoring activities, in publications, and on the continually updated, members-only RCRL website database (<http://www.beg.utexas.edu/rcrl/members/>). The searchable website protects the investment in RCRL research and makes previously presented material easy to locate. The data area contains digital presentations, including archived video and annotated presentations, core workshop guidebooks, and field-trip guidebooks. Supplemental data such as maps, core photos, porosity and permeability data, and digital outcrop reservoir models are available through our database.

## Interaction

We host an Annual Review Meeting with its associated Field Trip and Core Workshop (Oct. 12-16, 2020), a five-day training workshop is offered in the spring (May 11-15, 2020). These workshops are interactive and utilize subsurface data, along with applicable outcrop analogs to emphasize applications of key elements that are important to understanding carbonate systems and the importance to hydrocarbon production.

## Contact

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## Research Topics for 2020

### Permian shelf-to-basin stratigraphy of the in the Delaware and Midland Basins

- Stratigraphic architecture of Wolfcampian to Guadalupian platforms, shelf margins, slopes and basin fill of the Midland and Delaware Basins
- Characterization of mixed carbonate-siliciclastic slope to basin deposits in the Permian Basin and outcrop analogs of the Sierra Diablo, Guadalupe Mts., and Ely-Bird Spring (EBS) Basin, SE California
- Micropetrography and pore network characterization of Wolfcampian, Bone Spring and Avalon intervals in cores

### Austin Chalk lithofacies, mechanical and geochemical stratigraphy, fracture and reservoir performance characterization

- Regional depositional model of the Austin Chalk Group
- Lithofacies characterization of Austin Chalk in Texas and Louisiana
- Geochemical and mechanical stratigraphy of the Austin Chalk and transitional Eagle Ford
- Natural and hydraulic fracture impact on Austin Chalk reservoir performance in south Texas

### Mesozoic carbonate reservoir settings, margin variability and pore systems

- Shelf to basin architecture of Eastern and Central GOM
- Comparison of Cambrian, late Carboniferous and Cretaceous marine microbiolite and microbial-dominated boundstone development
- Jurassic to Lower Cretaceous slope and fan in outcrop (SE France, Portugal) and subsurface

### Cenozoic carbonate platforms, high-resolution stratigraphy, and structural configuration

- Mapping and characterization of grainstones within the MIS 5 system, Bahamian Platform to examine facies patterns and predictive diagenetic evolution
- Subsidence controls on Miocene carbonate platform in the Mut and Adana Basins, s. Turkey
- Shelf-to-basin seismic analysis of Tertiary mixed-carbonate siliciclastic depositional systems of Northwest Shelf, Australia

### Modeling carbonate systems

- Improved San Andres flow-unit development using sedimentological elements
- Fault-related fracture zones of the San Andres-Grayburg, Brokeoff Mountains, NM
- 3D modeling of slope and basin facies and reservoir and geomechanical properties, Delaware Basin

## Database Updates

- Searchable Catalog of RCRL Presentations and Extended Abstracts (*new*)
- Digital Outcrop Catalog to Arc-GIS (*coming in 2020*)
- RCRL Core Workshop Database to Arc-GIS (*coming in 2020*)



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## Industrial Associate Sponsors

The RCRL program has existed continuously since 1987, maintaining strong company sponsorship each year including 28 companies that supported our research initiatives in 2019

Anadarko	Continental	ION	PetroQuest Energy
Apache	Devon	Lundin Petroleum	Pioneer
BHP Billiton	Encana	Marathon	Sage Natural Resources
BP	Equinor	Matador	Saudi Aramco
Chesapeake	ExxonMobil	Oxy	Sinopec
Chevron	Fasken Oil and Ranch	Petrobras	Total
ConocoPhillips	Husky Energy	Petrochina	University Lands

## Research Group

### *Principal Staff*

Dr. Charles Kerans, Goldhammer Chair of Carbonate Geology, Principal Investigator

Dr. Robert Loucks, Senior Research Scientist, Principal Investigator

Dr. Xavier Janson, Research Scientist

Dr. Christopher Zahm, Research Scientist Associate

Mr. Robin Dommissie, Research Scientist Associate

Mr. Josh Lambert, Research Scientist Associate

Ms. Stephaine Lane, Program Coordinator

### *Associated Staff*

Mr. Jerry Lucia, Retired Emeritus

Dr. Toti Larson, MSRL, Research Scientist, Geochemist

Dr. Hongliu Zeng, STARR, Senior Research Scientist

Dr. Lucy Ko, Research Associate, Geochemist

Mr. Donald Brooks, STARR, Rock Mechanics Technician

Mr. Evan Sivil, MSRL, Research Technician

### *Collaborative Researchers*

RCRL collaborate closely with the Quantitative Clastics Laboratory (QCL) for the characterization of the mixed carbonate siliciclastic slope to deepwater deposits in the Permian Basins and in Australia.

### *RCRL Students and Alumni*

The RCRL is proud of the accomplishments of our current and former graduate students. Most of our graduated students are now working in the energy industry within research, production and exploration roles.

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