

# UNIVERSITY OF ALBERTA – FUTURE ENERGY SYSTEMS

## HEAVY OIL

**\$8.1M** in research funding to 2023

**14** active hydrocarbon projects

**26** Principal Investigators and Co-Investigators

**70** students & post-doctoral fellows

### FROM THE INDUSTRIAL REVOLUTION UNTIL NOW

For centuries, hydrocarbons have provided the majority of the world's energy but we've come to realize the unintended consequences of emitting carbon dioxide to the atmosphere in affecting global climate. Worldwide, pressure is increasing to reduce new carbon introduced into the atmosphere. Since significantly reducing dependence on hydrocarbons will take time, we must be increasingly responsible in how these resources are developed and used, requiring research areas such as in-situ, non-aqueous recovery, and partial upgrading.

### CURRENT RESEARCH PROJECTS

Computational Seismic Full Waveform Inversion

Principal Investigator: [Mauricio Sacchi](#)

Developing Microwave Sensor Technology

Principal Investigator: [Masum Hossain & Ashwin Iyer](#)

How can passive seismic imaging techniques be used to monitor temporal variations in structures at CO<sub>2</sub> sequestration sites?

Principal Investigator: [Jeffrey Gu](#)

Reservoir Engineering and Enhanced Oil Recovery

Principal Investigator: [Hassan Dehghanpour](#)

Reservoir management and advanced optimization for thermal and thermal-solvent based recovery processes using fundamentals, scaled models, and machine learning

Principal Investigators: [Japan Trivedi & Ian Gates](#)

Thermal Well Design and Testing

Principal Investigator: [Alireza Nouri](#)

Unlocking the Physics and Chemistry of Bitumen, Water, Solvent, and Porous Media Interfaces- an Enabling Technology for New Production Process Development

Principal Investigators: [Apostolos Kantzas & Juliana Leung](#)

Use of Electrical Heating to Remove Condensate Banking in the Near-Wellbore Region of Shale Condensate Reservoirs

Principal Investigator: [Huazhou Li](#)

Wireless Communication and Power Delivery

Principal Investigator: [Rashid Mirzavand](#)

Asphaltene Behaviors and Models

Principal Investigator: [Hongbo Zheng](#)

Bitumen-Solvent Product Cleaning

Principal Investigator: [Qi Liu](#)

Dynamics of colloids in phase separation

Principal Investigator: [Xuehua Zhang](#)

Solvent Recovery and Removal from NAE Extraction Gangue

Principal Investigator: [Phillip Choi](#)

Low-cost catalysts and methodologies for partial upgrading of bitumen

Principal Investigator: [Jeffrey Stryker](#)

For the latest information:

[futureenergysystems.ca/oil](http://futureenergysystems.ca/oil)

