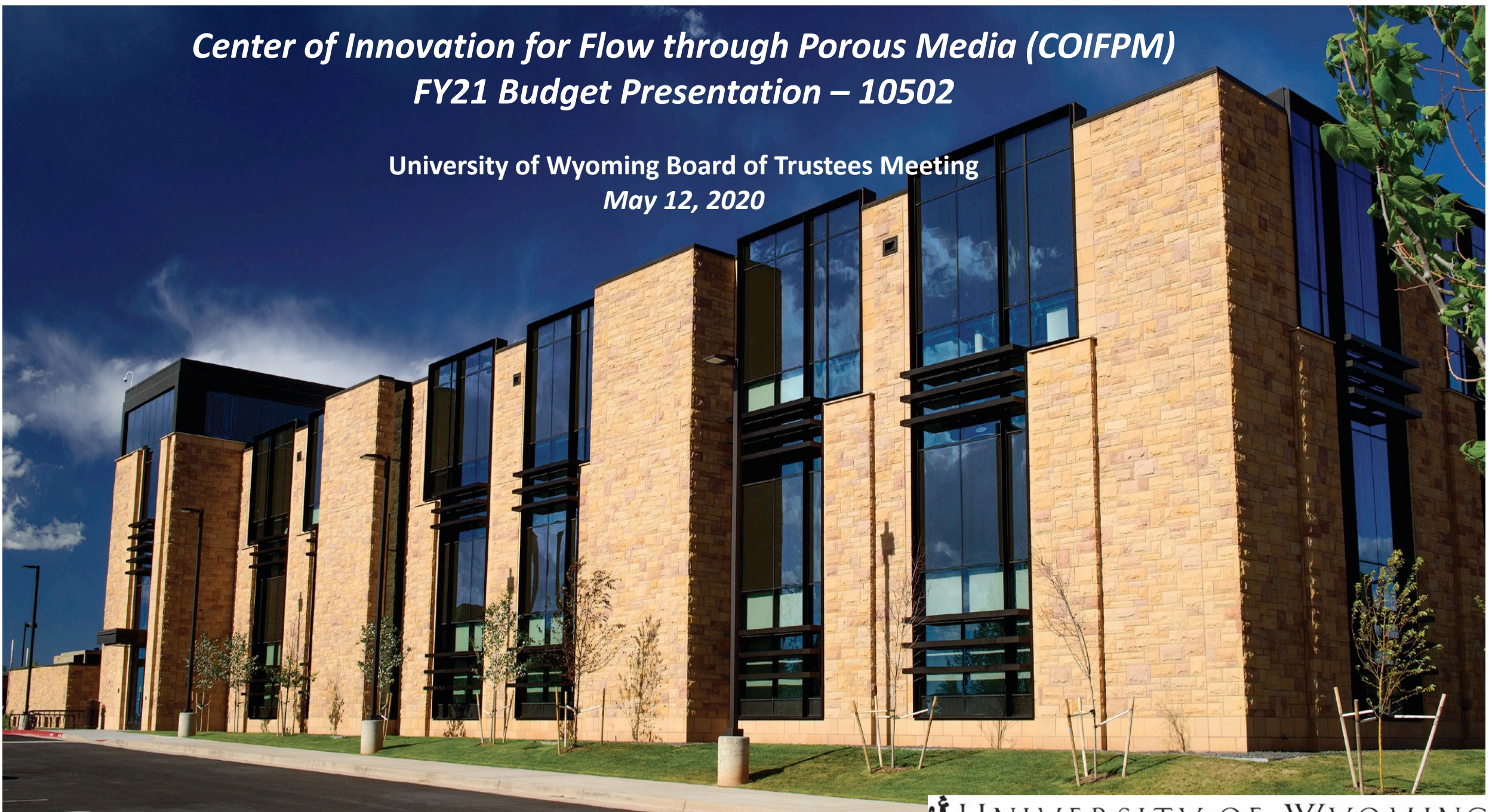


*Center of Innovation for Flow through Porous Media (COIFPM)  
FY21 Budget Presentation – 10502*

*University of Wyoming Board of Trustees Meeting  
May 12, 2020*





# Partners/Contributors/Collaborators



*Marian H. Rochelle*

**HALLIBURTON**

*Tom and Shelley Botts*

# COIFPM Members

Mahdi Khishvand



2016

Mohammad Sabti



2017

Vahideh Mirchi



2018

Elizabeth Barsotti



2019

Abdelhalim I Mohamed



2020

## COIFPM Members:

- ✓ **Twenty-two (22) PhD & two (2) MSc students**
- ✓ **Seven (7) post-doctoral research associates**
- ✓ **Five (5) staff members**
- ✓ **Five (5) full-time professionals (technical services branch)**
- ✓ **Several more graduate students are being recruited to join the program**
- ✓ **Graduated fifteen (15) PhD & seven (7) MSc students**
- ✓ **An international team (from more than 20 countries)**
- ✓ **One of the largest research groups on campus**

We are proud that for the fifth year in a row, a member of the COIFPM research team placed first in the regional Society of Petroleum Engineers (SPE) Student Paper Contest. And for the past two years, COIFPM PhD students, Elizabeth Barsotti (2019) and Vahideh Mirchi (2018), won the first place in the International Student Paper Contest hosted by SPE.

Note: Photos of several COIFPM research team members are shown.

# Examples of technologies being developed



- Foam-assisted hydrocarbon gas injection in unconventional reservoirs
- Digital Rock Technology to predict multiphase flow properties needed to evaluate performance of IOR/EOR processes, geologic sequestration of CO<sub>2</sub>, etc.
- Stimulation chemicals to enhance unconventional well productivity
- Enhanced oil recovery using nanofluids
- Wettability reversal agents/methodologies for rock matrix and proppants
- Confined fluid phase behavior predictions for unconventional reservoirs

**Many of the technologies being developed at COIFM have applications in other science and engineering problems.**



# Contributions to the State

- Direct involvement with Enhanced Oil Recovery Institute (EORI) on a project in Power River Basin.
- Development of key Enhanced Oil Recovery (EOR) technologies for unconventional and conventional reservoirs that can be deployed in Wyoming.
- COIFPM provides leading-edge scientific support for initiatives focused on effective development of Wyoming's significant hydrocarbon resources (conventional and unconventional). Dr. Piri is currently working closely with the new Executive Director of the School of Energy Resources, Dr. Holly Krutka, on an initiative to directly assist oil and gas producers in Wyoming using COIFPM technologies.
- Significantly increases external funding for research initiatives in Wyoming through competitive and innovative research and unparalleled reputation (more than \$70 million in external funding since 2005).
- COIFPM attracts the world's best talent to work on critical flow in porous media problems in Wyoming. This is the most important factor that controls the development of pivotal technologies needed for development of the State's hydrocarbon resources and diversification of its economy through commercialization.



# Commercialization & Piri Technologies, LLC

- Piri Technologies commercializes unique technologies developed at the University of Wyoming in the broad area of Flow through Porous Media.
- Since the start of its operation in September 2017, it has developed projects with large national and international corporations. This indicates that its technologies are relevant globally.
- It currently employs five (5) highly-talented professionals with advanced degrees. Four (4) of these employees are University of Wyoming graduates.
- Piri Technologies can provide solutions to some of the technical challenges that the oil and gas entities in Wyoming encounter in enhancing hydrocarbon recovery.





# External Funding

Over the last fourteen years, the external funding granted by various entities to Professor Mohammad Piri’s research program on Flow through Porous Media at the University of Wyoming has exceeded **\$70 million**. This amount DOES NOT include State matching funds. Examples of such grants are listed here:

Sponsoring entity	Approximate external funding (excluding State matching funds)
Department of Energy	\$1,400,000
Hess Corporation	\$5,000,000
Hess Corporation	\$5,000,000
Saudi Aramco	\$2,890,000
FEI	\$10,500,000
FEI	\$1,500,000
Halliburton	\$1,000,000
Hess Corporation	\$15,000,000
Baker Hughes	\$500,000
Baker Hughes	\$1,000,000
Alchemy Sciences	\$2,500,000
Department of Energy	\$10,000,000
Hess Corporation	\$12,000,000

- COIFPM is a world-class research entity with an unprecedented track record in scholarly activity, technology development, and fundraising. It has a remarkable potential for future growth with appropriate investment and planning.
- COIFPM continually pursues other external funding opportunities.

*~\$70 Million+*  
*External Funding*



# Strategic Initiatives



- Innovation and Commercialization
- Continued Diversification of Research Portfolio
- Interdisciplinary Research and Collaboration
- Data Storage and High Performance Computing

# Requested Funding vs. Proposed Funding

COIFPM GENERAL BUDGET - 10502 [REQUESTED]		
FY21 BUDGET REVENUE		
Total Direct Allocation	\$ 2,600,000	
<b>Other COIFPM Revenue (approximate annual amount)</b>		
IDC - Piri Equipment Maintenance & Acquisition	\$ 200,000	
Piri Technologies Equipment Rent	\$ 100,000	
Equipment Maintenance to be Supported by Research Grants	\$ 350,000	
Income to be generated through services provided by COIFPM	\$ 10,000	
<b>Total Other Revenue</b>	<b>\$ 660,000</b>	
<b>Total Revenue - COIFPM &amp; Direct Allocation</b>		<b>\$ 3,260,000</b>
FY21 BUDGET EXPENSES		
<i>Personnel</i>		
Total Budgeted Salaries	\$ 1,175,000	
<b>Total Personnel</b>		<b>\$ 1,175,000</b>
<i>Operating Expenses</i>		
Recurring Expenses		
Total Recurring Expenses	\$ 2,055,000	
Other Recurring Expenses & Support		
Total Other Recurring	\$ 30,000	
One-Time Expenses & Support		
Total One-Time Support	\$ -	
<b>Total Operating Expenses</b>		<b>\$ 2,085,000</b>
<b>Total Budgeted Expenses</b>		<b>\$ 3,260,000</b>
SUMMARY OF BUDGET		
Total Revenue		\$ 3,260,000
Total Expenditures		\$ 3,260,000
Total Sources Less Expenses		\$ -

COIFPM GENERAL BUDGET - 10502 [PROVIDED]		
FY21 BUDGET REVENUE		
Total Direct Allocation	\$ 757,906	
<b>Other COIFPM Revenue (approximate annual amount)</b>		
IDC - Piri Equipment Maintenance & Acquisition	\$ 200,000	
Piri Technologies Equipment Rent	\$ 100,000	
Equipment Maintenance to be Supported by Research Grants	\$ -	
Income to be generated through services provided by COIFPM	\$ 10,000	
<b>Total Other Revenue</b>	<b>\$ 310,000</b>	
<b>Total Revenue - COIFPM &amp; Direct Allocation</b>		<b>\$ 1,067,906</b>
FY21 BUDGET EXPENSES		
<i>Personnel</i>		
Total Budgeted Salaries	\$ 657,906	
<b>Total Personnel</b>		<b>\$ 657,906</b>
<i>Operating Expenses</i>		
Recurring Expenses		
Total Recurring Expenses	\$ 410,000	
Other Recurring Expenses & Support		
Total Other Recurring	\$ -	
One-Time Expenses & Support		
Total One-Time Support	\$ -	
<b>Total Operating Expenses</b>	<b>\$ -</b>	<b>\$ 410,000</b>
<b>Total Budgeted Expenses</b>		<b>\$ 1,067,906</b>
SUMMARY OF BUDGET		
Total Revenue		\$ 1,067,906
Total Expenditures		\$ 1,067,906
Total Sources Less Expenses		\$ -