



2019 ARMA HFC Workshop

Efficient Energy: Observations, Monitoring, & Diagnostics

June 27, 2019 | New York

HYDRAULIC FRACTURING COMMUNITY

- **550+** members from 30+ countries

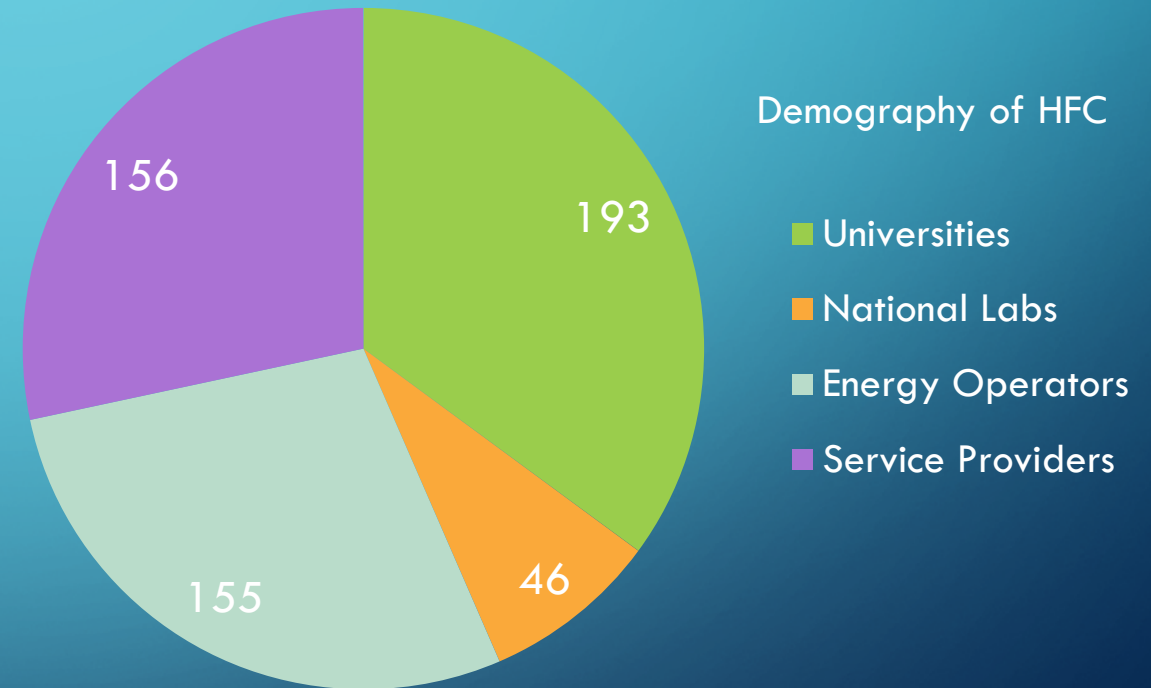
238 organization: 76 universities, 24 national labs, 55 energy operators, 83 service providers

- Monthly e-newsletter

Member activities, HF meetings, technology spotlights, job postings

- Annual Workshops

- 2016: Initiation, Propagation, and Closure
- 2017: Physics and Model Benchmark
- 2018: Value of HF Technologies
- 2019: Observation, Monitoring, Diagnostics



ARMA TECHNICAL COMMITTEE ON HYDRAULIC FRACTURING

Mission Statement

- Investigate and
- Promote environ

Gang Han (Chair)	Aramco Services Company
John McLennan (co-Chair)	University of Utah
Joe Morris (co-Chair)	Lawrence Livermore National Lab
Mark Zoback	Stanford University
Mukul Sharma	University of Texas at Austin
Ahmad Ghassemi	Oklahoma University
Maurice Duseault	University of Waterloo
Sid Green	Enhanced Production, Inc.
Mike Smith	Premier Oilfield Group
Derek Elsworth	Pennsylvania State University
Doug Blankenship	Sandia National Lab
David Cramer	ConocoPhillips
Herbert Einstein	Massachusetts Institute of Technology
Kirk Bartko	Saudi Aramco
Branko Damjanac	Itasca
Abdelwahab Noufal	ADNOC
Andrew Bunger	University of Pittsburgh



WHAT WE CAN “SEE” FROM HYDRAULIC FRACTURING

- Most Expensive Workshop (>\$300MM)
- Six Mine-back or Core-through Field Projects, Lab Observations

MWX in Colorado, HFTS in Permian Basin, EGS COLLAB in South Dakota, MSEEL in West Virginia, FORGE in Utah, COP in Eagle Ford

- Twelve Operators

Shell, Pioneer, Occidental Petroleum, ConocoPhillips, Total, ExxonMobil, Japan Oil, Gas, and Metals National Corporation, Petroleum Development Oman, Saudi Aramco, British Petroleum, Chevron, and Apache

- **First-time have beers**

ORGANIZING COMMITTEE

Kent Perry – Gas Technology Institute

Doug Blankenship – Sandia National Lab

John McLennan – University of Utah

Joe Morris – Lawrence Livermore National Lab

Robert Hurt – Pioneer Natural Resources

Ahmed Alawi – Saudi Aramco

Alexei Savitski – Shell

Shekhar Gosavi – ExxonMobil

Ivan Gil – BP

David Cramer – ConocoPhillips

Seth Buseti – Aramco

James Kessler – OXY

Shugang Wang – Chevron

Mojtaba Shahri – Apache Corporation

TECHNICAL AGENDA

- **7:45 – 9:55 Mine-Back and Core-Through Experiments**

Chairs: Ken Perry (GTI), Joe Morris (LLNL)

- **10:10 – 12:00 Field and Lab Observations**

Chairs: Doug Blankenship (SNL), Ahmed Alawi (SAO)

- **12:00 – 12:50 Lunch**

Keynote: A New Technique & Field Results for Quantifying Pressure Interference in Permian Basin Wolfcamp Horizontal Shale Wells, Kyle Scott, Pioneer National Resources

- **12:50 – 15:00 Fracture Monitoring and Diagnostics I**

Chairs: Alexei Savitski (Shell), Ivan Gil (BP)

- **15:15 – 17:25 Diagnostics II: Pressure and Production Responses**

Chairs: Robert Hurt (PXD), Holger Meier (XOM)

- **17:25 – 17:40 Closing Mark: Reality Check**

- **17:40 – 19:00 Social Networking**