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Petroleum & Natural Gas



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Pennsylvania is the birthplace of the modern petroleum and natural industry. On August 27 1859, along the banks of Oil Creek near Titusville Pennsylvania, Edwin L. Drake completed a 69.5' deep oil well that quickly stimulated a boom for the industry. Today, society uses petroleum and natural gas to produce a myriad of products ranging from transportation fuels and petrochemicals, to heating fuel for homes and businesses, and electricity. Over 3,000 products are manufactured from petroleum.

The EMS Energy Institute brings together diverse expertise in the areas of reservoir characterization, petroleum and natural gas extraction, processing, and utilization. Penn State is a leader in petroleum and natural gas engineering. Penn State's petroleum and natural gas program is the longest running in the U.S. and is the only program in the northeast that offers a Ph.D. program in petroleum and natural gas engineering.

Research

- Gas flooding and surfactant flooding for enhanced oil recovery
- Microbe and CO₂-enhanced oil recovery
- New generation reservoir engineering analysis tools for performance prediction of unconventional natural gas reservoirs
- Well test analysis in ultra-tight and double porosity systems
- Performance prediction of shale gas and oil reservoirs using artificial expert systems (ANN)
- ANN-based field development tools
- Fluid flow modeling and experiments in coalbed methane reservoirs systems
- Trapping and leakage mechanisms during geologic carbon storage
- Digital rock physics and pore-scale transport mechanisms in reservoir environments
- Hydraulic fracturing technology
- Simulation of complex, multi-lateral well configurations
- Paradoxical behavior and maldistribution in natural gas transportation systems
- Salting/scale mechanisms, diagnosis and solutions
- Hydrocarbon recovery from mineral matter

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