



CSU scientists receive \$2.3 million Norwegian petroleum industry grant to find sources of oil

Colorado State University scientists are studying how two relatively modest chemical elements can reveal a source rock's unique fingerprint, which is key information for expanding oil and gas exploration around the world.

The Norwegian Research Council recently awarded \$2.3 million to Colorado State's AIRIE Program, or Applied Isotope Research for Industry and the Environment, and the Geological Survey of Norway to work with the Norwegian petroleum industry to date black shales, the source of hydrocarbons that produce oil and gas.

Understanding geologic processes

"Whether oil, copper, silver or gold, understanding the geologic processes responsible for our natural resources gives science immediate value to the world economy" said senior research scientist Holly Stein, founder and director of the AIRIE Program.

AIRIE is a leading institution in producing state-of-the-art developmental and analytical work in Re-Os (rhenium-osmium) chronology. Re-Os dating allows scientists to better understand how metallic ore deposits form and their temporal relationship to regional geologic, metamorphic and tectonic processes. The AIRIE Program has now acquired the expertise to date hydrocarbons, so that the source of oil and the time that the oil migrated into distant geologic traps can aid petroleum exploration.

Providing age and source information to understand ore-forming processes

AIRIE scientists pioneered the process for successful Re-Os dating of molybdenite, a soft silver-colored mineral in abundance in Colorado at the Henderson and Climax mines. Re-Os dating is based on understanding of geology, separation of the molybdenite from its rock host, and refining the chemistry to extract Re and Os from the molybdenite. AIRIE scientists were the first in the world to precisely determine the lifespan of ore-forming systems for some of the world's most important deposits of copper, molybdenum and gold by dating molybdenite.

The Colorado State AIRIE scientists also work with other sulfide and oxide minerals to provide age and source information to understand ore-forming processes through Re-Os analysis.

For the past decade, AIRIE researchers worked extensively with the global mineral industry and have recently expanded to apply their research to the petroleum industry.

"Building on a decade of experience bringing new scientific insights to the mineral industry, we can now aid the petroleum industry with new methods for tracking and timing hydrocarbon migration" said Judy Hannah, Colorado State professor and AIRIE affiliate.



AIRIE working in 60 countries

AIRIE is currently working on projects in 60 countries. The AIRIE Program is funded by a variety of international grants and contracts, and recently the U.S. National Science Foundation funded AIRIE's new multi-collector Triton mass spectrometer, allowing scientists to work more efficiently with their mineral samples.

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