

**Testimony Before
The House Natural Resources Committee
Energy & Mineral Resources Subcommittee**

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Chairman Lamborn, Ranking Member Lowenthal and members of the Subcommittee, thank you for inviting me to testify today on the importance of helium to the scientific community and the community's concerns about its future availability.

I am a Professor of Physics at Northwestern University focusing on low temperature physics, and I currently serve as the chair-elect of the American Physical Society's Division of Condensed Matter Physics.

LIQUID HELIUM IS UNIQUE, AND VITAL TO RESEARCH

For many scientists, including me, liquid helium is our professional lifeblood. Helium is the only ultra-cold liquid. It has unique, important properties like superfluidity and there is NO substitute. Our work has enabled critical discoveries in medicine, national security, computer technology and fundamental science. In some cases our breakthroughs have spawned billion-dollar industries.

CONSTRAINTS ON AVAILABILITY THREATEN THE NATION'S RESEARCH ENTERPRISE

Researchers who depend on liquid helium are now facing severe problems. Over the course of the last few years liquid helium has become less available and much more expensive, causing a crisis in the scientific community – *as the price has gone up, we have been forced to choose between abandoning a research project or laying off employees and students*. Scientists at national labs, like Argonne National Laboratory, face a similar situation. Helium shortages, and consequential price spikes, are resulting in more lay-offs. It is a widespread national issue.

ALLEVIATING THE LIQUID HELIUM CRISIS

The scientific community recognizes that challenges with liquid helium procurement are not going away. So, our professional societies are taking steps to help alleviate the problem.

1) A HELIUM BROKERAGE FOR ACADEMIC USERS

The American Physical Society has partnered with the American Chemical Society and the Defense Logistics Agency (DLA) to launch a pilot program enabling DLA to serve as a liquid helium “broker” for researchers, now at seven universities that are diverse in both location and need.

This year the DLA began negotiating price and delivery terms with vendors on behalf of the researchers and benefits are already clear – enrollees are averaging 15%, and in some cases more than 20%, savings. For some, the brokerage has kept them in business. For example, one program enrollee, Professor Catherine Clewett of West Texas A&M University, recently received an NSF grant to purchase state-of-the-art magnetic resonance instrumentation that requires liquid helium to operate and Prof. Clewett risked being priced-out of operation. DLA, as a broker, negotiated a competitive price, and the Clewett lab is now up and running.

The success of the DLA procurement program for scientific research depends on reasonable pricing. For the government end-user base pricing is set by the Bureau of Land Management. However, the recent increases in this rate threaten the program. Consequently the APS is concerned with stability of the helium supply in the longer-term.

With the federal helium reserve set to close in six years, the price of helium will rise to unmanageable levels for low temperature physics and other scientific research. So, the APS is taking a second step.

2) INFRASTRUCTURE INVESTMENT IN RECYCLERS

To reduce helium demand, APS is partnering with The American Chemical Society and the Materials Research Society to determine the best path forward for *transitioning as many academic researchers as possible to systems that recycle and reliquefy helium.*

The benefit of helium recycling is clear. Reduction in helium purchases over three years can pay for the cost of a recycler. Unfortunately, for many researchers today federal agencies have been unwilling or unable to provide the necessary one-time funding. For example, Chemistry Professor Michael Hendrich of Carnegie Mellon University submitted an NSF proposal a few years ago that included a small scale helium liquefier. While the proposal received outstanding reviews, the helium liquefier component of the grant was denied. To facilitate a program for recycling the APS is currently conducting a study to determine best practices. But to encourage agency investment in this infrastructure, congressional support may be needed.

While the scientific community is taking the two steps I just described, I also urge Congress to take action.

3) CONGRESS REVIEWS LEGISLATIVE OPTIONS

This Subcommittee should consider possible legislative fixes to keep the helium reserve open beyond 2021. The benefits to the research community could be immeasurable. The helium reserve administered by the BLM is a unique resource. It can protect scientific research from the extreme volatility of the helium market that has been abundantly manifest in the past five years. Stability and affordability of the helium supply chain for government sponsored scientific research can be achieved, if the federal helium reserve is maintained.

Thank you for the opportunity to testify. I look forward to working with the Subcommittee to manage the helium challenges and maintain the world-class research enterprise that continues to contribute to the nation's economic competitiveness and its security.