Application Title: Core Facilities for Helium Recovery and Liquefaction

Lead Contact for RDF Application:

Peter McIntyre
Department of Physics and Astronomy,
mcintyre@physics.tamu.edu
979-458-0349, 979-255-5531

Key Participating Units:

Biochemistry and Biophysics Dept.[1], COALS; Biomedical Engineering Dept.[2], COE;
Chemistry Dept.[3], COS; Electrical and Computer Engineering Dept.[4],COE;
Materials Science and Engineering Dept.[5], COE; Physics and Astronomy Dept.[6], COS.

Key Team Members or Co-Investigators:

Glenn Agnolet[6], Kim Dunbar[3], Rusty Harris[4], Phillip Hemmer[4], Christian Hilty[3], Ibrahim Karaman[5], David Lee[6], Igor Lyuksyutov[6], Rupak Mahapatra[6], Mary McDougall[2], Nader Mirabolfathi[6], Donald Naugle[6], Gregory Reinhart[1], Joseph Ross[6], Patrick Shamberger[5], Daniel Singleton[3], Steven Wright[4], Gregory Wylie[3]

Anticipated Request Amount ($): 1,180,000

Executive Summary:

Purchase of a cluster of three Helium Liquefiers (one each in BIO/BIO, CHEM and PHYS) to meet the liquid helium needs of TAMU users (approximately 25,000 liters per year) is proposed. Helium is a depleting resource and its availability has decreased rapidly in the last few years, greatly increasing its cost. Conservation by major users in the US will be expected, if not mandated. Liquid Helium (LHe) is essential to the operation of NMR spectrometers (3 user facilities), SQUID magnetometers (2) and many individual research programs at TAMU.

Presently, TAMU is part of an American Physical Society program to allow us to purchase LHe below open market prices through the federal Defense Logistics Agency. Although the cost per liter during this first year of the program was good, delivery has been unreliable. The failure to deliver on schedule can result in serious damage to key instrumentation costing a few thousand to hundred thousand dollars together with long repair times. These problems impact programs in six departments residing in three colleges.

Each proposed liquefier will have its own He gas recovery system to service local users. One remote site will recover and return its gas by truck to be liquefied at one of the cluster sites. Establishment of the He Liquefier Cluster with the gas recovery systems will greatly improve reliability and simultaneously reduce direct costs to critical research programs. Once established, all three facilities will be managed to be mutually supportive and self-sustaining. Rice University and University of Texas (Austin) have long ago implemented similar plans.