

TeachSpin's CMP Dewar system

To provide an arena of variable temperature and pressure for experiments in condensed-matter physics, TeachSpin has partnered with Janis to produce a Dewar system with a set of features appropriate to advanced-lab instruction of students.

We have chosen **liquid nitrogen** as a coolant, and resistive heating above LN2's base temperature, to make accessible, economically, the temperature range 80 to 400 K. Our Dewar stores about 2 liters of LN2, and reaches operating temperatures in under an hour from a warm start.

We have made provision for an interior **working space** with independent gas plumbing, so the experimental arena can be held at vacuum, or at one atmosphere of nitrogen gas, or filled with any chosen gas at any pressure, 0-1 atmosphere. Our Dewar system includes **thermocouple gauges** for both the main, and the interior, gas spaces.

We provide a uniquely convenient method for Dewar preparation and -interfacing. Our Dewar is mounted on a base permitting the **easy inversion** of the Dewar, making access to its working spaces safe and comfortable.

Our Dewar comes with a total of 30 electrical leads brought through hermetic seals, and we have a **Cryostat Interface** box permitting easy (and soldering-free!) interconnections of all these leads to the external world.

We have developed a set of Dewar **support electronics**, to measure and maintain temperatures. Our experimental -baseplate is linked to the LN2 reservoir by interchangeable heat leaks, and is equipped with two sets of heaters. The reservoir and the baseplate are equipped with transdiode temperature transducers for simple temperature measurement.

The resistive heater systems interface respectively with a TeachSpin **temperature servocontroller**, and with general-purpose servocontrollers, to permit precise temperature control. Our electronics, based in an SRS mainframe, or -crate for Small Instrument Modules (SIMs), will support these temperature servomechanisms, and the constant-current **temperature transducers**, to permit trouble-free operation.