



# Quantum

S T A T E S

## QUANTUM DESIGN:

### MESSAGE FROM THE PRESIDENT

As we move through the final months of this century, Quantum Design is actively preparing to enter the next millennium with enthusiasm and confidence. We are introducing some exciting options for our existing systems and several new products are on the drawing board. In addition, we have recently placed key people in new positions throughout the company. We plan to introduce you to several of these new faces during the coming months.

Of special interest to those of you who have already enjoyed working with Chris Gardner, I am happy to announce that he has returned from our East Coast office to Corporate headquarters where he has assumed his new position as Director of Sales and

Marketing. Chris, who received his MBA from Georgetown University in April, has a unique knowledge of QD systems, acquired during his years in customer service and sales. You can continue to rely upon his expertise and understanding of you and your particular research needs as he directs our marketing and customer service programs.

In this issue of *Quantum States*, you will meet Teresa Neal and Dinesh Martien, applications scientists who recently joined Quantum Design. The chemists among you will be interested to know that Dr. Neal comes to us from the prestigious group at the University of Notre Dame led by W. Robert Scheidt. The QD website has been expanded and now offers our users more information than ever before. You can download software, browse through our latest brochures, and even order small parts directly from the website. If you haven't

visited it recently, please take a look. And finally, be sure to check our show schedule so you know where we will be during the next few months, waiting to introduce you to QD's latest instrumentation.

As always, please feel free to contact us regarding anything you read in *Quantum States* or the website. We appreciate hearing from you. In many cases new product development has been a direct result of customer requests. Lastly, to those of you who've asked, we are publishing this shortened issue of *Quantum States* in the hope that we can bring you QD news more frequently with an abbreviated format. Thanks for letting us know you enjoy our efforts.

Best regards,

Jerry Daviss  
President



[www.qdusa.com](http://www.qdusa.com)

## Introducing QD's EXPANDED Website!

Most of you have probably already visited the Quantum Design Internet Web Site ([www.qdusa.com](http://www.qdusa.com)). You are encouraged to revisit this site on a periodic basis. To provide you with the most current product information, the site is continually updated with new product announcements and our latest literature. By the time you read this, the new PPMS Brochure and its accompanying three Application Notes will be available as PDF downloads.

We are also happy to announce that there is now a special section of this site dedicated to the needs of QD system users. This Users' section contains a variety of technical Bulletins and Service Notes for both the MPMS and PPMS. Also available are downloadable versions of the latest software releases. Here are some examples of

the types of documents you will find:

**For our PPMS users -**

- Using the Horizontal Rotator with the AC Transport Property System
- Using the Tables Utility
- Tests for Internal Flow Sensor
- Cleaning the ACMS Sample Transport

**For our MPMS users -**

- Setting Small DC Fields using the AC or ULF Electronics
- Sample Mounting Considerations
- Hardware Config EPROM Replacement

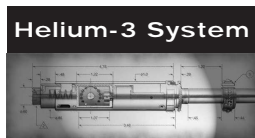
*-Checking Voltage Levels on the 1822*

**Request a Parts Quote On-Line:**

Many of you also wanted to be able to order small parts and consumable items with a minimum of effort. We've added an on-line form so you can easily request a quote for these system accessories. Many of the items listed are linked to drawings and photographs of the actual component. This will help in making the correct product selection. After you have submitted your request, you will receive a quote via

email or fax from your local Quantum Design distributor for the items you have selected.

Any Quantum Design MPMS or PPMS user can gain access to this section by accessing the following URL: [www.qdusa.com/user](http://www.qdusa.com/user) and then entering a special "User Name" and "Password". The user name and password will be changed occasionally, but for the next several months, you can access this area with the user name **intl** and password **src72i**.



## HELIUM-3 SYSTEM

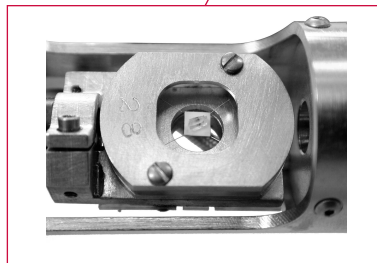
Quantum Design announces the release to market of their Helium-3 System, another new option for the popular Physical Property Measurement System (PPMS). The He-3 System allows for continuous operation below 500 milliKelvin and is capable of measuring:

- Heat Capacity
- I - V curves
- Hall Effect
- 4 point resistivity
- A variety of AC transport measurements

Using a simple, yet elegant design which allows scientists to mount samples easily on the Helium-3 cold finger, samples can be cooled from room temperature to 0.4 Kelvin in less than 3 hours. And, the design eliminates the need to manually operate any valves. Fully automated measurements are made possible using the software pack-

age (MultiVu) which accompanies each shipment.

Most importantly for our users, the PPMS Helium-3 System allows for unprecedented ease of use. Working seamlessly with the PPMS heat capacity and transport property systems, measurements may be performed without the need for a scientist to build any additional hardware. And, with the Helium-3 System installed, your measurements are not limited to lower temperatures. Without any user intervention, other than setting a sequence to higher temperatures, the system will perform measurements up to 350K.



**Mounted sample on Helium-3 probe**



With any sized magnet available on the PPMS (2, 7, 9, or 14 Tesla) the new Helium-3 System for the PPMS allows every scientist the ability to perform a variety of highly sensitive measurements through an unprecedented range of fields and temperatures.

Contact your Quantum Design representative for more information on the Helium-3 System for PPMS today.



## MPMS EVERCOOL SYSTEM

If a lack of liquid helium has been limiting your research or consuming your budget, you will welcome news of Quantum Design's EverCool dewar. Recently released to the market, and designed specifically for our Magnetic Property Measurement System

(MPMS), the EverCool will automatically reliquify all liquid helium lost during the normal operation of the MPMS system. The liquefaction process occurs inside the new cryocooler-

based EverCool dewar. This fully integrated system minimizes the need for additional laboratory floor space because it is a continuous, dynamic process and does not require a helium gas storage device.

What this means to users is that you never have to transfer liquid helium again! The EverCool is so efficient it can condense helium from gas cylinders into a warm dewar. The EverCool system circulates the helium gas until the specially designed dewar is cold enough that the gas begins to liquefy. Now Quantum Design provides you with the ability to operate an MPMS even if an ongoing supply of liquid helium is unavailable.

If you are worried about your sensitive measurements, don't be. The vibration from the EverCool dewar is so low that only measurements below  $1e-7$  emu

( $1e-10$  A·m<sup>2</sup>) are affected. And for these ultra sensitive measurements, you can use simple, automated commands, which are built into the user-friendly software, to pause the EverCool cycle. EverCool features include:

- Based on cryocooler technology
- Automatically maintains the proper operating liquid helium level
- Availability of liquid helium is not required
- On-site upgrades available for all MPMS and MPMS-XL systems



Please contact Quantum Design for more information on this exciting option which was developed directly as a result of user

requests. We want to hear about you and your research needs today.

## EMPLOYEE PROFILES

Quantum Design is pleased to announce that *Dr. Teresa J. Neal* has joined their team as an Applications Scientist. Dr. Neal

earned a B.S. in chemistry from Saint Mary's College in 1994 and recently received her Ph.D. in inorganic chemistry from the University of Notre Dame. Her graduate work, under the direction of W. Robert Scheidt, focused on the application of magnetic susceptibility techniques in understanding the magnetochemical properties of metalloporphyrin  $\pi$ -cation radical complexes. "The first few years of my Ph.D. work



mainly involved organic and inorganic synthesis," Dr. Neal explains.

Dr. Neal developed various techniques for collecting magnetic susceptibility data on powdered, air-sensitive metalloporphyrin complexes using a Quantum Design MPMS system. More specifically, she developed various methods of sample preparation, data collection, and data interpretation that allow the chemist to better utilize magnetic susceptibility techniques as a means of characterizing magnetic interactions in inorganic compounds.

At Quantum Design, Dr. Neal will be actively involved in implementing magnetic susceptibility techniques to chemical systems as well as developing chemical applications for the PPMS system. She will work very closely with customers from all physical scientific disciplines, with her emphasis being the adaptation of instrumentation, data collection, and data interpretation to better accommodate the needs of chemists.



Quantum Design is happy to have *Dinesh Martien* joining the company in the Applications Physicist position. Dinesh earned

a B.S. in physics from Harvey Mudd College and an M.S. in physics from the University of California, San Diego. While at Harvey Mudd, Dinesh worked with Quantum Design on testing of the PPMS and initial development of the PPMS heat capacity option.

At UCSD, Dinesh worked under Ami Berkowitz at the Center for Magnetic Recording Research.



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He worked in the area of exchange-bias, an effect in which the hysteresis loop of a ferromagnetic material is shifted along the field axis due to contact with an antiferromagnetic material. Dinesh worked with the antiferromagnetic monoxides CoO, NiO, and their alloys, focusing on the effect of microstructure on the strength of the exchange-bias effect. (Dinesh indicates that he "used the MPMS extensively during this work. The magnetic data were the core results of our research").

Dinesh will be working with both the PPMS and MPMS in his current position, focusing on applications for the PPMS. He looks forward to finding solutions to satisfy customer needs.

## SCIENTIFIC MEETINGS 1999/2000

The following is a list of scientific meetings where Quantum Design's products will be exhibited:

**MRS '99** Nov 29 - Dec 3, 1999  
Boston, MA  
1999 Fall Meeting of the Materials Research Society at the Hynes Convention Center and Boston Marriott Copley Place  
URL: <http://www.mrs.org/meetings/fall99/>

**CMMP '99** Dec 20 - 21, 1999  
Leicester, England  
Condensed Matter and Materials Physics at the University of Leicester  
E-mail: [conferences@iop.org](mailto:conferences@iop.org)  
QD will be represented by Elliot Scientific

**APS 2000** Mar 20 - 24, 2000  
Minneapolis, MN  
March Meeting of the American Physical Society at the Minneapolis Convention Center  
URL: <http://www.aps.org/meet/MAR00/>

**DPG 2000** Mar 26 - 31, 2000  
Regensburg, Germany  
Spring Meeting of the Condensed Matter Division of the DPG  
URL: <http://www.physik.uni-regensburg.de/akf2000/>  
QD will be represented by L.O.T.-Oriol

**JPS 2000** Mar 22 - 25, 2000  
Osaka, Japan  
Spring Meeting of the Japanese Physical Society at Kansai University  
URL: <http://wwwsoc.nacsis.ac.jp/jps>  
QD will be represented by Quantum Design Japan

**JSAP 2000** Mar 28 - 31, 2000  
Tokyo, Japan  
Meeting of the Japanese Society of Applied Physics at Aoyama University  
URL: <http://www.jsap.or.jp/english/index.html>  
QD will be represented by Quantum Design Japan

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