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Special Issue: Symposium on  
Quantum Fluids and Solids,  
Part I

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**Tuesday, June 13**

**Session Chairman: Gary Williams, UCLA**

- |            |                           |   |
|------------|---------------------------|---|
| <b>I-1</b> | Richard Packard, Berkeley | The Creation of Vortices in Superfluid $^4\text{He}$                              |
| <b>I-2</b> | George Pickett, Lancaster | A Highly Sensitive Nuclear Recoil Detector<br>Based on Superfluid $^3\text{He-B}$ |

**Session Chairman: Seamus Davis, Berkeley**

- |            |                           |   |
|------------|---------------------------|---|
| <b>I-3</b> | Paul Richards, Berkeley   | Miniature Cryogenics for Space<br>Astrophysics                            |
| <b>I-4</b> | Antti Ahonen, Neuromag    | Whole Cortex Magnetoencephalography by<br>Means of a Large dc SQUID-Array |
| <b>I-5</b> | Mikko Paalanen, Jyvaskyla | Primary Thermometry with Nanoscale<br>Tunnel Junctions                    |

**Session Chairman: Don Candela, U. Mass**

- |            |                         |   |
|------------|-------------------------|---|
| <b>I-6</b> | Mark Ketchen, IBM       | Scanned SQUID Microprobe  |
| <b>I-7</b> | John Goodkind, UCSD     | Single Electron Tunneling from Bound<br>States on the Surface of L He |
| <b>I-8</b> | Milton Cole, Penn State | The Extraordinary Phenomena of Weak<br>Adsorption                     |
| <b>I-9</b> | Robert Hallock, U. Mass | A summary of Experiments with Helium on<br>Alkali Metal Substrates    |

**Workshop on Wetting Chairman: Milton Cole, Penn State**

**WW(1-6)** - Dupont-Roc, Mistura, Rutledge, Saam, Wyatt

Poster Session I - Topics: Wetting **SW(1-11)**, Porous Media **SP(1-12)**, Electrons **SE(1-9)**,  
Films **SF(1-13)**, Interfaces **SI(1-6)**.

Wednesday 14 June

Session Chairman: Neil Sullivan, U. Florida

- I-10** Pertti Hakonen, Helsinki                      Optical Interferometry at Ultra-Low  
Temperatures

Session Chairman: Reyer Jochemsen, Leiden

- I-12** Isaac Silvera, Harvard                      The Quest for Bose-Einstein Condensation  
in Atomic Hydrogen.
- CT-1** Chris Gould, USC                      High Slew Rate Large Bandwidth Integrated  
dc SQUID Amplifier for NMR  
Applications
- CT-2** Eric Swartz, RMC                      Efficient Cryogenic Design, a Systems  
Approach
- CT-3** Georg Eska, Bayreuth                      NMR Investigation on T1 Samples at High  
Spin Polarizations

Session Chairman: John Saunders, Royal Holloway Bedford New College

- I-14** Yasu Takano, U. Florida                      Cooling Powers of Dilution Refrigerators
- I-15** Lois Pollack, Cornell                      Low Temperature Order in CeCu<sub>6</sub>
- I-16** Hidehiko Ishimoto, Tokyo                      Nuclear Cooling of hcp Solid <sup>3</sup>He
- CT-4** Shaun Fisher, Grenoble/Lancaster                      Geometry Dependent Thermal Resistance  
between dilute <sup>3</sup>He-<sup>4</sup>He Solution  
and Sintered Silver

Workshop on Dilution Refrigerators and SQUIDs Chairman: Eric Varoquaux, Saclay  
Oxford Instruments, Conductus, Janis Research).

Poster Session II Topics: Techniques, IT(1-13), Metals, MM(1-11), Solids, QS(1-16).

Thursday 15 June

Session Chairman: John Hook, Manchester University

- I-17 Giorgio Frossati, Leiden      GRAIL: A 10 mK 100 ton Spherical  
Gravitational Wave Antenna
- I-18 Richard Parmley, Lockheed      State of the Art Cryogenic Technologies  
Available for Flight Dewars (and  
Other Applications)

Session Chairman: Glenn Agnolet, Texas A & M

- I-19 Norbert Mulders, Penn State U      Superfluidity and Phase Separation of  $^3\text{He}$ - $^4\text{He}$   
Mixtures in Aerogel
- I-20 Nihat Berker, MIT      Strong Violation of Universality Under  
Randomness and Helium Mixtures  
in Aerogel.
- CT-5 Minoru Kubota, ISSP      Thermal Conductivity Study of Thin Helium  
Films Adsorbed in Porous Glasses  
with Well Controlled Pore Sizes.
- CT-6 Sebastien Balibar, ENS      Quantum Cavitation in Superfluid  $^3\text{He}$ ?
- CT-7 Jan Nyeki Royal Holloway      Superfluidity of  $^4\text{He}$  films Adsorbed on  
Hydrogen Plated Graphite.
- CT-8 Stephen Steel, Leiden      Morphology of  $^3\text{He}$  Crystals grown from the  
Superfluid Phases

Session Chairman: David Lee, Cornell University

- I-21 Reinhard Koenig, Nottingham/Bayreuth      Heat Release, Refrigeration and  
Thermometry in  $^3\text{He}$ - $^3\text{He}$  Solutions  
at Very Low Temperatures
- I-22 Haruo Kojima, Rutgers      Magnetically Driven Superflow and  
Spin/Entropy Wave in  $^3\text{He}$ -A1
- I-23 Henry Hall, Manchester      Spin Dynamics at the Dipole Unlocking  
Transition in  $^3\text{He}$ -A
- CT-9 Mike Enrico, Lancaster      Measuring the Andreev Reflection of a  
Beam of Ballistic Quasiparticles  
Incident on a B-A Phase Interface

Workshop on Closed Cycle Circulation Systems Chairman: - William Halperin,  
Northwestern University Advanced Research Systems, Eric Smith, and Oxford  
Instruments

**Friday June 16**

**Session Chairman: Igor Fomin, Kapitza Institute**

- I-24** Yuriy Bunkov, Grenoble, Lancaster, Kapitza Inst. NMR in Superfluid  $^3\text{He}$  at  $\mu\text{K}$  Temperatures  
**I-25** Erkki Thuneberg, Helsinki Vortex Sheet in Superfluid  $^3\text{He}$  - A

**Session Chairman: David Edwards, The Ohio State University**

- I-26** Vladimir Dmitriev, Kapitza Inst Experiments on Fermi Liquid Domains in Normal and Superfluid  $^3\text{He}$   
**I-27** Gerard Vermeulen, Grenoble Polarized Liquid  $^3\text{He}$  in a  $^4\text{He}$  circulating Dilution Refrigerator  
**CT-10** Luciano Reatto, Milano Study of Rotons in Superfluid  $^4\text{He}$  by Raman Scattering  
**CT-11** Dwight Adams, Univ of Florida  $^3\text{He}$  Melting Pressure - Temperature Scale  
**CT-12** Pierre-Jean Nacher, ENS NMR studies of Highly Polarized Liquid  $^3\text{He}$ - $^4\text{He}$  Mixtures.

**Session Chairman: Moses Chan, Penn State University**

- I-28** Henri Godfrin, Grenoble 2D liquid  $^3\text{He}$  near solidification: a highly correlated Fermi Liquid  
**I-29** Jizhong He, Ohio State The Diffusion of  $^4\text{He}$  in  $^3\text{He}$  in the Fermi Liquid Region  
**I-30** Emil Polturak, Technion NMR, Optical and Plastic Flow Experiments in bcc  $^3\text{He}$ - $^4\text{He}$  Mixture Crystals - in Pursuit of a Vacancy Fluid  
**CT-13** Horst Meyer, Duke Transport Properties of Dilute Superfluid Mixtures of  $^3\text{He}$  in  $^4\text{He}$ .

Poster Session III Topics: Quantum Liquids QL(1-31), Mixtures M(1-6).

**Saturday 17 June**

**Session Chairman: T.L. (Jason) Ho, The Ohio State University**

- I-31** Don Sprague, Northwestern U      NMR of  $^3\text{He}$  Superfluid Confined in High Porosity Aerogel
- I-32** Jim Sauls, Northwestern U.      Impurity Model for Superfluid  $^3\text{He}$  in Aerogel

**Session Chairman: Robert C. Richardson, Cornell University**

- I-33** Yasushi Kondo, Bayreuth      Hydrogen in an Oscillating Porous Vycor Glass
- CT-14** Douglas Brewer, Sussex      Thermal Anomalies in Molecular Hydrogen Supercooled in Vycor Glass.
- I-34** Anthony Leggett, Illinois      Nucleation Mechanisms for  $^3\text{He B}$ : The Current State of Play
- I-35** John Harrison, Queens Univ.      Summary

## PREFACE

This Symposium is in a series of triennial symposia to be conducted in North America, which concentrate on aspects of low temperature physics related to the general area of quantum fluids and solids. This symposium placed special emphasis on new techniques used in the exploration and creation of novel systems for the study of quantum fluids and solids.

The meeting was held on the Campus of Cornell University in upstate New York between the 12th and the 17th of June, 1995. The meeting was organized by members of the local committee with advice taken from members of the international advisory board.

Several of the speakers did not want to write a new paper for these proceedings since they had similar articles in press. We have organized the papers in the following manner: we first list the invited talks, followed by the workshop on wetting, and a summary on the technical workshops. Contributed talks follow and finally the poster presentations in order of their presentation.

The symposium was organized with a definite emphasis toward techniques and experimental results. The agenda was also focussed on quantum fluids and solids with a few excursions into metals. Thus the meeting was kept manageably small and fulfilled the intent of maximizing interactions among the quantum fluids and solids community. The topic of nuclear order was specifically excluded due to the upcoming meeting on this topic in Bayreuth.

The formal program of the meeting is included as part of this preface. The local committee would like to acknowledge the untiring assistance and support of Ms. Cindy LeFever, and the Symposium Chairman would like to formally acknowledge the expertise, dedication and responsibility that Dr. Lois Pollack took on while managing to continue research in the micro-Kelvin lab at Cornell. The graduate students in the Low Temperature Physics Group are also due acknowledgment for their organization and good humor. Finally members of the Research Services Shop of LASSP helped enormously with the physical layout of the conference room as well as logistics involved with the various services offered during the conference. The proceedings were edited jointly by Lois Pollack and myself.

Support for the conference was obtained from the Laboratory of Atomic & Solid State Physics, the Cornell Materials Science Center, the Cornell Office of Sponsored Research and the National Science Foundation. Corporate sponsorship was provided by Advanced Research Systems, Andeen-Hagerling, Conductus, Isotec, Janis Research, Oxford Instruments and Quantum Design.

On behalf of the Local Committee

Jeevak M. Parpia



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