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REPORT ON THE "SEVENTH EXPERIMENTAL WORKSHOP ON HIGH TEMPERATURE SUPERCONDUCTORS AND RELATED MATERIALS"

(Advanced Activities)

11th - 29th January 1993

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FINAL REPORT

Introduction

The Seventh Experimental Workshop on High T_c Superconductors and Related Materials (Advanced Activities) has taken place at the Comisión Nacional de Energía Atómica (CNEA)-Centro Atomico Bariloche (CAB) , San Carlos de Bariloche, Argentina from the 11th to the 29th of January 1993. The activity was attended by 69 participants of which 40 were local, 15 Latin-Americans, 14 from other TWC and East-European countries, and 8 invited lecturers. Given the advanced character of the activity the participants were chosen, among the many applicants, following the criterion that they had to show a proven working experience in the specific fields listed in the workshop announcement.

The workshop programme was divided in two parts: during the first week it mainly consisted of a series of specialized lectures given by a very selected faculty. About half of the talks have been centered on the problem of the magnetic phase diagram of the HTS materials. A large part of the remaining time has been spent in informal talks between the lecturers and participants which turned to be very stimulating because of the common ground of experience. A series of seminars on the many activities on HTS at the CAB was given by senior CAB scientists. This section of the programme was aimed at introducing the foreign participants to the research activities of the second part of the course. In this second part the participants joined four of the research groups at the CAB: Solid State Theory, Low Temperature Physics, Magnetic Resonances and Thermodynamics to take part in the research work already in progress.

Some participants gave a 20-minute evening seminar on the research activities and a poster session was also organized to allow more people to present their recent results.
The poster session proved to be more interesting and efficient in promoting information exchange.
The intensive work performed during the last two weeks permitted to obtain original results that were intensively discussed in a four-hour poster session at the end of the workshop. The titles and the authors of the posters presented give a good idea of the areas covered by the participants:

Application of Lanczos method to diagonalize a generalized one dimensional Hubbard model.
Arrachea*, K. Hallberg**, A. Aligia**, and C. Balseiro**
* Universidad Nacional de La Plata, Argentina. **CNEA-CAB, Argentina.

Spectral density of the extended Hubbard model.
M. Di Stasio*, C. Balseiro**, and J. Lorenzana*
*SISSA, Trieste, Italy. **CNEA-CAB, Argentina

Characterization of the carbocuprates $Ba_{2-x}Sr_xCuO_2CO_3$ and $Ba_{2-x}Ca_{3x}Cu_{1-2x}O_2CO_3$
C. Acha*, P. Guptasarma**, and F. Matacotta†
* CNEA, Div. Fis. Sol., Buenos Aires, Argentina. ** Tata Institute of Fundamental Research, Bombay, India. †ICTP, Trieste, Italy.

MaMMa in NdCeCuO cpmpounds.
C. Ramos*, A. Fernandes**, J. Briático*, V.V. Srinivasu†, A. Caneiro*, and F. Prado*
*CNEA-CAB, Argentina. **Instituto Militar da Engenharia, Rio de Janiero, Brazil. †Indian Institute of Science, Bangalore, India.

Magnetic defects in $Nd_{2-x}Sr_xNiO_y$: an EPR study
A. Elzubair*, G. Goya**, M.T. Causa†, R. Sánchez†, J. Alonso‡, M. Vallet Regi‡, and J. M. González Calbet‡.
*CBPQ, Rio de Janeiro, Brazil. **Universidad Nacional de La Plata, Argentina. †CNEA-CAB, Argentina. ‡Universidad Complutense de Madrid, Spain.

Preparation and properties of SmGdCeCuO
G. Nieva*, H. Simanjuntak**, V. Skumryev†, A. Butera*, H. Salva*, M. Servin*, and J. Briático*.
*CNEA-CAB, Argentina. **University of Indonesia, Indonesia. †University of Sofia, Bulgaria.

Relationship between microstructure, oxygen content, and ac susceptibility of $La_{1.84}Sr_{0.16}CuO_y$
H. Ferrari*, A. Jimenez**, A. Caneiro†, F. Prado†, J. Abriata†, and D. Serafini†.
*Universidad de Buenos Aires, Argentina. **Universidad Nacional de Colombia, Colombia. †CNEA-CAB, Argentina.

Determination of the intergranular magnetic field in $Ga_1Ba_2Cu_3O_{7-\delta}$ using I-V characteristics.
J. Barroso*, N. Ayoub**, F. Pardo†, and D. López†.
*University of Havana, Cuba, **Yarmouk University, Irbid, Jordan. †CNEA-CAB, Argentina.

Dissipation and stiffness of the vortex lattice in NbZr: mechanical oscillator studies.
L. Miu*, J. L. Zhang**, J. Luzuriaga, E. Rodriguez†, and D. Rodriguez†.
*Institutte of Physics, Bucharest, Romania. **Chinese Academy of Sciences, Beijing, China. †CNEA-CAB, Argentina.

Determination of $H_{c1}(T)$ in $Bi_2Sr_2Ca_1Cu_2O_8$ single crystal with H parallel to c.
K. Abbes*, J. Ossandon**, G. Panaitov†, E. Fernández Righi‡, and H. Pastoriza‡.
*University of Annaba, Algeria. **Universidad de Talca, Chile. †Institute of Applied Physics, Kishinev, Moldavia. ‡CNEA-CAB, Argentina.

Decoration of the flux lattice in the superconducting compound $NbSe_2$.
M. Prester* and C. Bolle**.
*University of Zagreb, Croatia. **CNEA-CAB, Argentina.

Excitation field dependence of the susceptibility in $Bi_2Sr_2Ca_1Cu_2O_8$ single crystal with an applied dc field.
R. Andrade*, E. Altshuler**, A. Bellorin†, M. Goffman‡ and A. Arribere‡.
*UNICAMP, Campinas, Brazil. ** University of Havana, Cuba. †IVIC, Caracas, Venezuela. ‡CNEA-CAB, Argentina.

Specific heat measurements in $ZrNb_{9\%}$ alloys.
A. Castellanos*, P. Levy**, O. Trovarelli†, and J. Sereni†
*.CIF, Colombia. **CNEA Div. Fis. Sol. Buenos Aires, Argentina. †CNEA-CAB, Argentina.

Final remarks

1) The organization of an experimental workshop outside Trieste has been sucessful and paid back the extra effort required by the preliminary work. In fact the benefits of such a training activity went to foreign and local participants thus, in a way, doubling the efficiency of the course.
2) The experiments were carried on using an impressive number of good quality facilities normally used for state-of-the-art-research and having the continuous assitance of expert personnel. This turned out in an immediate possibility for the foreign participants to get to work on real scientific problems.

3) The participants lived in campus and had access to all the facilities present. They had also the opportunity to interact with the local scientists on a true "24 hours a day" cooperation.
4) The local students had a chance to meet and interact with foreign specialists and colleagues, overcoming some obvious problems related to the remoteness of the CAB with respect to the usual streams of scientific exchange.
5) Despite the high cost of life in Argentina, the costs of this activity, compared to the similar ones organized in Trieste, turned out to be very convenient for the availability of ad-hoc experimental infrastructures and, especially, because many Argentinean and Latin-American Institutions were generously interested in fostering our programme. The sum of the funds not coming from Trieste sources amounted in fact to about one third of the total budget.

Dr. F. de la Cruz

Dr. F. C. Matacotta