

International Workshop

Electronic Transport in Magnetic Nanogranular Systems

Torino, September 26-27, 2002

SCIENTIFIC REPORT

The International Workshop on Electronic Transport in Magnetic Nanogranular Systems, jointly sponsored by the European Science Foundation and by Italy's National Institute for the Physics of the Matter (INFM), has regularly taken place in the Sala Vallauri of the Istituto Elettrotecnico Nazionale Galileo Ferraris, Torino, on 26th and 27th September, 2002.

This exploratory workshop was intended to provide a natural forum for discussing novel experimental and theoretical facts gathered on the transport properties of nanogranular magnetic systems, a subject of relevance and interest from the viewpoint of both fundamental physics of magnetism and of perspective applications. A major aim of the meeting was to put together the contributions of distinguished scientists working since years in this area, and those of young researchers coming from different European regions. The workshop was finally intended to disseminate within the European community of magnetism the most relevant results obtained in Italy in the framework of a recently terminated joint research project supported by INFM (ELTMAG). The workshop was monitored by Professor Henryk Szimczak, acting as ESF delegate. The registered participants have been 53 (see attached list), with a good balance between people involved in the ELTMAG project since its beginning (about 20 persons were present here) and other contributors or keynote speakers. The number of actual attendees was almost equal to that of the scientists sending an expression of interest for the Workshop. Only one pre-registered researcher from Prague (Dr. Oleksandr Chayka) was not able to come, in spite of the efforts by the Organising Committee, owing to problems encountered in getting the Visum.

Technical Programme

Scientific contributions were given in the form of :

a) keynote talks (duration: 50 minutes) by:

Dr. Paolo Allia (Torino, Italy)

Dr. Ian Campbell (Montpellier, France)

Dr. Antonio Hernando (Madrid, Spain)

Dr. Andreas Hütten (Bielefeld, Germany)

Dr. Marcelo Knobel (Campinas, Brazil)

Dr. Henryk Lachowicz (Warsaw, Poland)

Dr. Kallipoi Trohidou (Athens, Greece)

Dr. Elisabeth Tronc (Paris, France) [substituting for Dr. Fiorani]

b) selected orals (duration: 30 minutes) by:

Dr. Marcello Baricco (Torino, Italy) [ELTMAG]

Dr. Ilaria Bergenti (Parma, Italy) [ELTMAG]

Dr. Maria Luisa Fernandez Gubieda (Bilbao, Spain)

Dr. Federico Spizzo (Ferrara, Italy) [ELTMAG]

Dr. Lorenzo Savini (Bologna, Italy) [ELTMAG]

Dr. Branko Stahl (Darmstadt, Germany)

Dr. Paola Tiberto (Torino, Italy) [ELTMAG]

c) posters

The overall number of displayed posters has been 27. These contributions were required to be posted for the whole duration of the Workshop and were attended by Authors during two specific sessions organized to facilitate the general discussion and the exchange of data. Poster sessions resulted particularly interesting, with many debates going on among authors and attendees; this was favoured by the features of the poster area.

Publications

The significant quality of the submitted contributions (both invited papers and posters) is attested by the fact that nearly all contributors have submitted one or more manuscripts for publication in the Workshop's proceedings, to appear in 2003 as a special issue of the Journal of Magnetism and Magnetic Materials published by Elsevier. I am acting as the guest editor for such an issue. The comments received so far from the international referees who are reviewing the manuscripts are good, so that a very high fraction of submitted contributions will be actually published, ensuring worldwide dissemination of the specific items discussed in the Workshop.

Assessment

All registered participants have attended all technical sessions with particular interest and attention. In particular, all scheduled posters were presented and thoroughly discussed; their technical quality and visual impact were remarkable. Talks (both keynote and selected) were judged by the audience as interesting and carefully prepared.

Speakers and authors of posters have done efforts to give a complete picture of the subjects treated; the ensuing scientific discussion has been deep and complete. The skills of the attendees ranged from the preparation of systems to their structural and physical characterisation; from absolute measurements of physical quantities to computer simulations; from a physico-chemical background to the mathematical approach. The blend of all this personal know-how resulted in a more realistic and multifaceted view of many open problems in this subject area; in particular, novel experimental and theoretical aspects of the magnetotransport properties of nanogranular magnetic systems were examined from different viewpoints.

The proceedings of the Workshop will be published in 2003 as a special issue of the Journal of Magnetism and Magnetic Materials. The submitted papers are presently under examination by the board of referees.

The success of an exploratory meeting of this size and aim is to be measured not only by its technical quality, but also by the number of contacts established among groups working on similar subjects. In fact, many new contacts have been established at an informal level. An issue of an exploratory workshop, apart from its scientific merits, is to create the conditions for a more formal co-operation at an European level, either in the form of a network, or in the form of a specific research programme supported by an European Institution such as the ESF. The informal contacts

established during the will be very important in helping attending groups to develop a more formal activity of scientific co-operation in the near future.

A detailed Technical Programme of the Workshop and the Financial Report (as of October 28, 2002) are attached.

Pictures

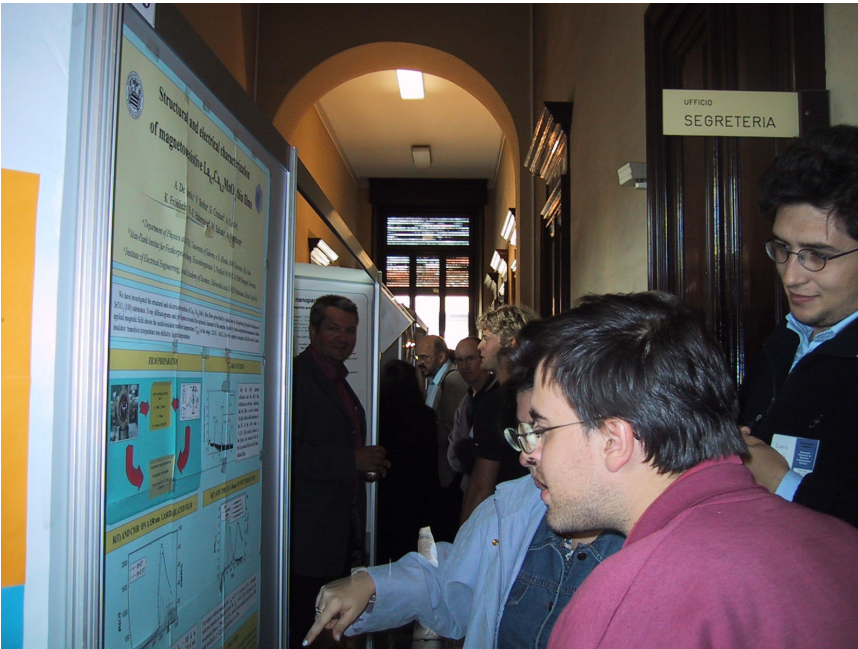
Some pictures taken during the Workshop follow:



Picture 1 - Participants to the Meeting



Picture 2 – The Vallauri Room at IEN Galileo Ferraris before an oral session. Professor Szymczak, ESF representative, sitting in front row.



Picture 3 – A poster session

INTERNATIONAL WORKSHOP

Electronic Transport in Magnetic Nanogranular Systems

Torino, September 26-27, 2002

List of Registered Participants

#	Surname	Name	Affiliation	Country	e-mail
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Programme

Thursday 26th September 2002

Morning	Chairman: <i>H.K. Lachowicz</i>
08.30 – 09.00	Registration
09.00 – 09.15	Welcome Address <i>P. Allia</i> , Convenor The European Science Foundation and the ESF Standing Committee for Physical and Engineering Sciences (PESC) <i>Henryk Szymczak</i> , ESF PESC representative
09.15 – 10.05	KEYNOTE - A. Hernando Electronic Transport in Nanocrystalline Iron: a Low-T Magnetoresistance Effect
10.05 – 10.30	Coffee Break
10.30 – 11.20	KEYNOTE - I.A. Campbell Magnetoresistance in Spin Glasses
11.20 – 11.45	PRA ELTMAG 5 - M. Baricco Granular materials obtained by rapid solidification of immiscible alloy systems
11.45 – 12.10	PRA ELTMAG 3 - I. Bergenti Small-Angle Scattering of Polarised Neutrons: a Powerful Tool for the Investigation of Nanostructured Magnetic Materials
12.10 – 14.10	Lunch
Afternoon	Chairman: <i>A. Hernando</i>
14.10 – 15.00	KEYNOTE - P. Allia Magnetotransport in Different Nanoscopic Magnetic Systems: a Review of the Research Activity done in the Framework of PRA ELTMAG
15.00 – 15.50	KEYNOTE - A. Hütten Giant Magnetoresistance and Magnetic Aspects in Granular Structures
15.50 - 17.40	Poster Session & Coffee Break (opens 16.45)
17.40 – 18.05	SELECTED - B. Stahl Hyperfine Interaction in Fe-Ag and Fe-Cu Nanostructured Materials and Fe-Pt Nanoparticles
18.05 – 18.30	PRA ELTMAG 4 - F. Spizzo Spin-Dependent Transport in Granular Films with Mixed Length-Scale Magnetic Coherence
18.30	End of the First Day Social dinner

Friday 27th September 2002

Morning

Chairman: *A. Hütten*

09.00 – 09.50

KEYNOTE - *E. Tronc*

Magnetic Properties of γ -Fe₂O₃ Nanoparticles:
Surface Anisotropy and Inter-Particle Interaction Effects

09.50 – 10.40

KEYNOTE - *K.N. Trohidou*

A Study of the Interaction Effects on the Magnetic
and Transport Properties of Granular Solids

10.40 – 11.20

Coffee Break

11.20 – 12.10

KEYNOTE - *M. Knobel*

Giant Hall Effect in Granular Nanocomposites

12.10 – 14.00

Lunch

Afternoon

Chairman: *I.A. Campbell*

14.00 – 15.00

Poster Session

15.00 – 15.50

KEYNOTE - *H.K. Lachowicz*

Unusual Nano-Granular Systems

15.50 – 16.15

SELECTED - *M.L. Fernandez Gubieda*

Direct Observation of the Redissolution of Co and Cu
and its Correlation with the Drop of the GMR
in CoCu Granular Alloys

16.15 – 16.40

PRA ELTMAG 2 - *L. Savini*

Structural, Magnetic and Magneto-Transport Characterization
of Core-Shell Fe-Fe Oxide Systems

16.40 – 17.05

PRA ELTMAG 1 - *P. Tiberto*

Novel Aspects of Magnetoresistance
in Nanogranular Magnetic Systems

17.05

End of the Workshop