

# 18th Ampere Congress

Nottingham, UK, 9-14 September 1974

The Ampère Congresses, held every two years in a European city, provide the main international forum for the discussion of advances in magnetic resonance and radiospectroscopy in the context of Physics. Following the first fundamental discoveries thirty years ago interest in the subject rapidly gathered momentum and on the initiative of Professor Freymann the first Colloque Ampère was held in France in 1952. The initial letters of the descriptive phrase 'Atomes et Molecules Par Etudes Radio-Electriques' coined by Freymann furnished an excellent excuse to name the new group in honour of Ampère. Over the past twenty years interest in the Groupement Ampère has spread throughout Europe; recent Congresses have been held in Ljubljana (1966), Grenoble (1968), Bucharest (1970), Turku (1972). With the foundation of the European Physical Society, the Groupement Ampère became a constituent founding member, providing for the interests of physicists in its subject area.

Five hundred participants foregathered in Nottingham, 9-14 September for the 18th Ampère Congress.

They came from thirty-three countries, most European countries among them, representing all the continents of the world. The scientific programme included sixteen invited papers in areas of topical and growing interest given by speakers not recently seen in this role at Ampère Congresses. Professor Mössbauer (Munich and Grenoble) gave the proceedings a good send-off with an opening lecture on the application of resonance scattering of  $\gamma$ -rays to the solution of the famous phase problem in crystallography. Of the 300 contributed papers one of the most popular areas of activity was ordered magnetic materials whether studied by Mössbauer absorption, by NMR, by ferromagnetic resonance or by far infrared radiation. One invited paper in this area was given by Professor Stevens (Nottingham) on the theory of exchange interactions in rare earth insulators. Another was on NMR in antiferromagnets by Professor Borovik-Romanov (Moscow), who led a large group of participants from the Soviet Union, which included three other well-known invited speakers Professors Khutsishvili (Tbilisi), Ko-

chelavev (Kazan) and Provotorov (Moscow).

A second area of continuing high activity is that of magnetic resonance applied to metals, alloys, semiconductors and superconductors. Complementary invited papers on EPR in superconductors were given by Professors Kochelavev and Orbach (California). Breaking new ground for Ampère conferences Dr. Leggett (Sussex) discussed the role of broken spin-orbit symmetry in the probably unique type of ordering disclosed by NMR in the two new millidegree phases of liquid  $^3\text{He}$ .

One of the high-lights of the conference was the paper by Professor Lauterbur (New York) on NMR Zeugmatography. The name alone catches the imagination but his paper and the contributed papers in the sessions which followed showed that image formation by NMR is a fascinating new growth area with potentialities in physics, biology and medicine. Other applications of magnetic resonance in biophysics occupied three sessions, in one of which Dr. Edmonds (Oxford) described the successful application of nuclear double resonance to the

## INTERNATIONAL ADVANCED STUDY INSTITUTE ON LINEAR AND NONLINEAR ELECTRONIC TRANSPORT IN SOLIDS

July 21 - August 2, 1975

University of Antwerp (Rijksuniversitair Centrum) Belgium

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### *Preliminary list of lecturers :*

Prof. FRIEDEL Université Paris-Sud (France)  
Prof. NOZIERES Institut Max Von Laue-Paul Langevin,  
Grenoble (France)  
Prof. SINGWI Institute of Theoretical Physics,  
Göteborg (Sweden)  
Prof. LANGRETH University of California, La Jolla (U.S.A.)  
Prof. MARCH Imperial College, London (U.K.)  
Prof. COHEN University of Chicago (U.S.A.)  
Prof. TOSI Imperial College, London (U.K.)  
Prof. ZAWADZKI Groupe de Physique des Solides de  
l'Ecole Normale Supérieure, Paris  
(France)  
Prof. STRADLING Clarendon Laboratory, University of  
Oxford (U.K.)  
Prof. BOK Groupe de Physique des Solides de  
l'Ecole Normale Supérieure, Paris  
(France)  
Prof. THORNBUR Bell Laboratories, Murray Hill (U.S.A.)  
Prof. BUTCHER University of Calcutta (India)  
Prof. DEVREESE University of Antwerp (Belgium)  
Prof. AUSTIN University of Sheffield (U.K.)  
Prof. EMIN Sandia Lab., Albuquerque (U.S.A.)

## Formulae and Results in Weak Interactions

By Professor Dr. H. Pietschmann, Vienna

Acta Physica Austriaca / Supplementum 12

X, 64 pages. 1974. Soft cover DM 44,—  
Reduced price for subscribers to „Acta Physica Austriaca“ :  
Soft cover DM 39,60

*Kinematical analysis and important dynamical relations for all weak processes are collected together with the necessary mathematical tools. The book should serve as a reference work for physicists working in this field.*

*Contents: Introduction. — Some General Mathematical Equations. — The Dirac-Algebra. — Field Operators and Invariant Functions. — S-Matrix, Cross-Sections and Life-Times. — Phase Space Integrals. — Weak Interaction, Hamiltonian and S-Operator. — Discrete Transformations. — Muon Decay. — Semi-Leptonic Baryon Decay. — Semi-Leptonic Meson Decay. — Current-Algebra. — Hadronic Hyperon Decay. — Quasi-Elastic Neutrino Scattering. — Deep Inelastic Neutrino Scattering. — Decay of the W-Boson. — Appendix A: Other Forms of the Interaction. — Appendix B: Comparison between Different Metrics.*

Springer-Verlag Wien • New York



R.L. Mössbauer, who delivered the opening lecture at the Conference, A. Kastler, who gave the special lecture on the life and work of Ampère and E.R. Andrew, Chairman of Groupement Ampère.

detection of NQR of  $^2\text{D}$ ,  $^{14}\text{N}$  and  $^{17}\text{O}$  in a wide range of biomolecules. A late invited paper by Professor Hahn (California), nobly prepared at short notice to fill a last-minute vacancy in the programme, gave an account of the detection of naturally abundant deuterium NQR by the solid effect.

The optical detection and excitation of magnetic resonance is now a firmly established area of magnetic resonance to which Dr. Merle d'Aubigné (Grenoble) contributed an invited paper on the optical detection of triplet states of defects in ionic crystals. The study of paramagnetic ions, of pair interactions, of the Jahn-

Teller effect and of free radicals continues to attract the attention of many contributors.

One of the most striking developments in NMR in recent years has been the emergence of high-resolution NMR in solids using multiple pulse sequences, magic-angle rotation, high magnetic fields and double-resonance techniques. This work, occupying several sessions, was introduced by Professor Mehring (Dortmund). An important area of practical application of NMR is to the study of surfaces admirably surveyed by Professor Pfeifer (Leipzig).

One fundamentally important area of magnetic resonance and of radio-spectroscopy is that of atomic and molecular beam resonance, and yet few papers are offered in this corner of the subject at Ampère meetings. We were therefore fortunate to have a survey by Dr. Sandars (Oxford) of recent developments in this field of research to metastable states, to short-lived isotopes, to extremely high precision measurements and to the search for violations of parity and time-reversal invariance.

Two high points of the Congress occurred on the Friday. The Congress took the opportunity to celebrate the 200th anniversary of the birth of Ampère. Professor Kastler (Paris) gave an outstanding lecture of fascinating interest on the life and work of his great compatriot. In the evening the Congress Dinner was held, after which the guests enjoyed a witty and entertaining speech from Professor Abragam (Paris).

After the closing words of the President, Professor Lösche (Leipzig) and the Secretary-General, Professor Béné (Geneva), participants returned to their distant homes to tell their children they had met the present-day Sheriff of Nottingham, and that they had visited Nottingham Castle and Sherwood Forest, the old-time haunts of the mediaeval English hero, who became the natural symbol of the Nottingham Ampère Congress, namely Robin Hood.

E.R. Andrew, Nottingham

## Meetings

For a full list of events see the latest Meetings Issue of *Europhysics News* 5, 11 (November 1974). Notification of the meetings announced in this issue has been received recently.

The order of information is: date, title, venue, and contact for information.

## Conferences 1975

### 10 - 11 April

2nd International Conference on Ternary Semiconducting Compounds  
Strasbourg, France  
C. Schwab, Laboratoire de Spectroscopie et d'Optique du Corps Solide, F - 67084 Strasbourg Cedex

### 10 - 16 June

International Conference on Amorphous and Liquid Semiconductors  
Leningrad, USSR  
A.R. Regel, A.F. Ioffe Physico-Technical Institute, 194021 Leningrad

### 16 - 23 June

International Conference on Neutrino Physics, Balatonfüred, Hungary  
G. Marx, Department of Atomic Physics, Eötvös University, Puskin Str. 5, Budapest VII

### 11 - 15 August

European Conference on Astronomy  
Leicester, UK  
K.A. Pounds, Department of Physics, University Road, Leicester LE1 7RH

## 'Summer' Schools 1975

### 11 - 20 April 1975

Physics of Non-Equilibrium Systems : Fluctuations, Instabilities and Phase Transitions  
Geilo, Norway  
G. Jarrett, Institutt for Atomenergi, P.O.Box 40, 2007 Kjeller

### 14 - 28 July

Physics and Astrophysics of Neutron Stars and Black Holes  
Varenna, Italy  
R. Ruffini, School of Natural Sciences, The Institute for Advanced Study, Princeton, N.J. 08540, USA

### 3 - 12 September

Solid State Imaging  
Louvain-la-Neuve, Belgium  
P. Jaspers, Bâtiment Maxwell, Université Catholique de Louvain, B - 1348 Louvain-la-Neuve

### 10 - 14 November

Magnetism and Neutron Scattering — Strongly Correlated Electrons  
Gaussig, near Dresden, DDR  
K. Eik, Sektion Physik, Technische Universität, Mommsenstrasse 13, DDR - 8027 Dresden

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P.O. Box 39,  
CH - 1213 Petit-Lancy 2  
Phone: Geneva 93 11 32  
Switzerland.

Published by the European Physical Society  
Printed by: Ed. Cherix & Filanosa SA  
CH - 1260 Nyon, Switzerland.