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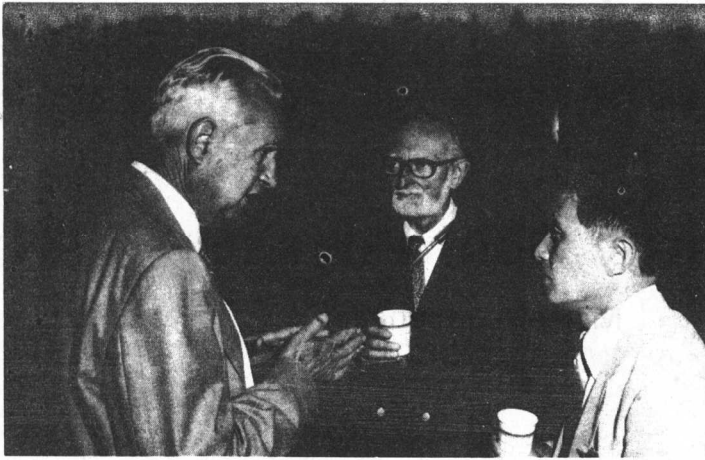
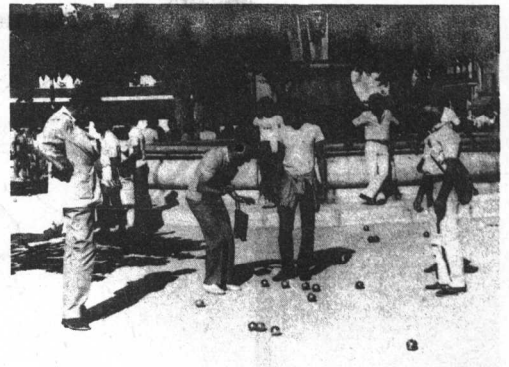


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FOREWORD

The 6th International Symposium on High Energy Spin Physics was held at Marseille from 12 to 19 September 1984. This biennial meeting which began in 1974 has now reached the status of a major event for the physics community because it gathers specialists in polarization physics from all over the world who conjugate their efforts to achieve significant progress in this field. The topics covered in the Symposium included spin effects at large transverse momentum, hyperon polarization in inclusive reactions, analyzing power in elastic processes and experiments at intermediate energies. There were reports on new polarized beam developments at many laboratories including Saturne II, SIN, AGS, Novosibirsk, KEK, PETRA, HERA and FNAL and on perspectives, plans and theoretical predictions for spin physics in future machines such as HERA, LEP and SLC. Two major highlights of the Symposium were the successful acceleration of polarized protons to 17 GeV at the AGS and the increasing interest for spin among the electron physicists. The tone of the Symposium was very optimistic about the future of spin physics which was discussed at a round table that examined in particular the possibilities offered by the CERN collider.

Now the Symposium is over and the most pleasant part of the editor's task is to take a few lines to express his gratitude to all people who have made it a real success. First to the very distinguished members of the International Advisory Committee and in particular to their chairman Prof. A.D. Krisch who was always anxious to help. I would like to thank my colleagues of the Local Organizing Committee for spending time and effort in working hard to set up the programme of the Symposium. The Symposium Secretary Miss M. Cohen-Solal has done an outstanding job at all stages and she handled carefully so many unexpected problems. I would like to especially thank her as well as Mrs. D. Escalier for her invaluable work and energetic help and Mrs. O. Lebey for taking care of several mailings and for running the preprint library during the Symposium. Thanks are due to all the speakers who made the scientific programme so successful and for providing their manuscript almost on time avoiding too many headaches to the editor ! The session chairmen who had the difficult task to keep the schedule and to preserve exciting discussions are deeply acknowledged. I would like to thank the following organizations for providing the necessary financial support : le Commissariat à l'Energie Atomique, le Centre National de la Recherche Scientifique, le Ministère de l'Education Nationale, l'Université de Provence, l'Université d'Aix-Marseille II et l'Université de Michigan. I would also like to thank the local authorities for helping us to provide a pleasant stay to the participants, in particular Mrs. M.P. Louiset, adjoint au maire, who arranged the warm reception at the Town Hall on Monday where we were honoured by the presence of Mr. G. Defferre, Maire de Marseille and Ministre d'Etat. We also had a very enjoyable welcome on Saturday at Cassis and on Sunday at Les Baux de Provence, and to all who gave generously of their time my sincere thanks. The smooth running of the Symposium was mainly due to the good cooperation of the staff of the Faculté de Pharmacie, in particular Prof. J. Barbe and I am thankful to the Dean, Prof. J.P. Cano who made these nice facilities available.

Finally, I wish all the best of luck to the organizers of the next Symposium to be held at Serpukhov in 1986 with the hope that it will bring us again new exciting and unexpected results in High Energy Spin Physics.

Jacques Soffer
February 1985

PREFACE

Le 6ème Symposium International sur la Physique du Spin à Haute Energie s'est tenu à Marseille du 12 au 19 Septembre 1984. Cette rencontre biennale, qui débuta en 1974, a maintenant atteint le statut d'événement majeur pour la Communauté des Physiciens, car elle rassemble des spécialistes du monde entier en Physique de la Polarisation, spécialistes qui conjuguent leurs efforts pour réaliser des progrès significatifs dans ce domaine. Les sujets couverts par le Symposium comprenaient les effets de spin à grand moment transverse, la polarisation des hyperons dans les réactions inclusives, le pouvoir d'analyse des processus élastiques, et les expériences aux énergies moyennes. Il y a eu des rapports sur les nouveaux développements des faisceaux polarisés dans divers laboratoires, tels que Saturne II, SIN, AGS, Novosibirsk, KEK, PETRA, HERA et FNAL, ainsi que sur les perspectives, les projets et les prédictions théoriques pour la physique du spin dans de futures machines, comme HERA, LEP et SLC. Deux points majeurs du Symposium furent l'annonce de l'accélération réussie des protons polarisés à 17 GeV à l'AGS, et l'intérêt croissant, de la part des physiciens des électrons, pour le spin. Le ton du Symposium a été très optimiste en ce qui concerne l'avenir de la physique du spin, objet d'une table ronde qui examina plus particulièrement les possibilités offertes par le collisionneur du CERN.

Maintenant, le Symposium est terminé, et reste le rôle le plus agréable pour l'Editeur, celui d'exprimer en quelques lignes sa gratitude à tous ceux qui en ont fait un réel succès. Tout d'abord, aux membres très imminents du Comité International Consultatif, et plus particulièrement à son Président, le Professeur A.D. Krisch, toujours soucieux de pouvoir aider. J'aimerais remercier mes collègues du Comité Local d'Organisation, pour leur temps et les efforts fournis pour mettre sur pied le programme scientifique. La Secrétaire du Symposium, Mlle M. Cohen-Solal a réalisé un travail important à toutes les étapes et a su traiter avec beaucoup de soin tant de problèmes inattendus. Je voudrais spécialement remercier Mme D. Escalier pour son travail inappréciable et son aide énergique, ainsi que Mme O. Lebey pour avoir pris soin de différents envois de documents, et pour s'être occupée des prêtirages pendant le Symposium. Mes remerciements vont aussi à tous les conférenciers qui ont permis au programme scientifique d'être un vrai succès, et pour avoir donné leur manuscrit presque à temps, évitant ainsi à l'Editeur de nombreux maux de tête ! Les Présidents de session, qui eurent la tâche difficile de faire respecter l'horaire, tout en permettant des discussions animées, sont aussi profondément remerciés. J'aimerais remercier les organismes suivants pour l'aide financière nécessaire au déroulement de la rencontre : le Centre d'Energie Atomique, le Centre National de la Recherche Scientifique, le Ministère de l'Education Nationale, l'Université de Provence, l'Université d'Aix-Marseille II, et l'Université du Michigan. Je remercie aussi les autorités locales d'avoir permis un séjour aussi agréable que possible aux participants, et particulièrement Mme M.P. Louiset, adjoint au maire, qui organisa une réception à l'Hôtel de Ville le Lundi, où M. G. Defferre, Maire de Marseille et Ministre d'Etat, nous honora de sa présence. Nous fûmes aussi très bien accueillis le Samedi à Cassis et le Dimanche aux Baux de Provence, et j'adresse mes sincères remerciements à tous ceux qui, généreusement, nous ont accordé un peu de leur temps. La bonne marche du Symposium a été rendue possible grâce à la coopération du personnel de la Faculté de Pharmacie, en particulier celle du Professeur J. Barbe, et je remercie son doyen, le Professeur J.P. Cano, de nous avoir permis d'utiliser ces installations.

En dernier, je voudrais souhaiter bonne chance aux organisateurs du prochain Symposium qui aura lieu à Serpukhov en 1986, avec l'espoir qu'il nous apportera encore de nouveaux résultats inattendus et passionnants dans la Physique du Spin à Haute Energie.

Jacques Soffer, Février 1985

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XIV

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SYMPOSIUM PROGRAMME

Wednesday 12 September, 1984

The first day of the Symposium was devoted to the following

Workshops :

1. ACCELERATION AND STORAGE OF POLARIZED PROTONS OR ELECTRONS IN VERY LARGE MACHINES.

Convener : D. RUTH (SLAC)

2. INTERMEDIATE ENERGY : NUCLEON-NUCLEON AND RELATED PROBLEMS.

Conveners : C. LECHANOINE-LELUC (DPNC, Université de Genève)
R.R. SILBAR (LASL)

3. THEORY AND EXPERIMENT ON SPIN EFFECTS AT HIGH ENERGIES.

Conveners : D.G. CRABB (BNL)
E. LEADER (Birbeck College)

Thursday 13 September, 1984

9.00- 9.20 OPENING ADDRESS

Session Chairman : J. THIRION, LNS Saclay

9.20-10.00 Polarized protons at SATURNE II.

J.L. LACLARE (Saturne)

10.10-10.50 Polarized protons at the AGS.

A. KRISCH (Michigan)

Session Chairman : G.J. IGO, UCLA

11.30-12.00 The spinning weak boson : helicity bases and rules.

R.W. BROWN (Case Western Reserve University)

12.05-12.35 Elastic and Inelastic d-p scattering with polarized particles.

A. BOUDARD (Saturne)

12.40-13.10 Few body problems with a polarized deuteron beam.

C. WILKIN
(University College)

Session Chairman : D.I. LOWENSTEIN, Brookhaven National Laboratory

14.30-14.55 Preliminary results on single spin asymmetry in inclusive polarized proton reactions at 16.5 GeV/c and high p_1 .

Y. MAKDISI
(BNL)

15.00-15.25 Hard quark-quark scattering with exclusive reactions.

G. BUNCE
(BNL)

15.30-16.00 Spin and flavor at large angles.

G. PREPARATA (Univ. Bari)

Session Chairman : L. TYURIN, Serpukhov
 16.30-17.10 Spin and monopoles. N. CRAIGIE (Trieste)

Friday 14 September, 1984

Session Chairman : L. MADANSKY, The Johns Hopkins University
 9.20-10.00 Spin effects in the upsilon family. A. FRIDMAN (Saclay)
 10.10-10.50 General perspective of spin dependent J. ROSNER
 forces in quark models. (Chicago/CERN)

Session Chairman : G. FIDECARO, CERN
 11.30-12.00 Workshop report on polarized proton ion P.W. SCHMOR (TRIUMF)
 source (Workshop, Vancouver 1983).
 12.05-12.35 The HERA project : General review of V. SOERGEL (DESY)
 physics goals, machine layout, present
 status.
 12.40-13.10 Experiments with polarized electron P. SCHMÜSER
 beams at HERA. (Universität Hamburg)

Session Chairman : J. BUON, Orsay
 Polarization at DESY :
 14.30-15.00 i) Polarization at PETRA and DORIS. D. BARBER (DESY)
 15.05-15.25 ii) Perspectives and plans for HERA. K. STEFFEN (DESY)
 15.30-15.50 Polarization effects in charge-exchange N. TYURIN
 reactions at 40 GeV/c. (Serpukhov)
 16.15-17.45 Poster Session (Room ED5)

Saturday 15 September, 1984

Session Chairman : E. GABATHULER, University of Liverpool
 9.20-10.00 New results and future experiments with A. MASAIKE (KEK)
 polarized beams and targets at KEK.
 10.10-10.50 Spin effects from quark and lepton R. RÜCKL
 substructure for future machines. (CERN/Münich)

Session Chairman : W. HAEBERLI, University of Wisconsin
 11.30-12.00 Workshop report on polarized electron Ch. SINCLAIR (SLAC)
 ion source (Workshop, SLAC 1983).
 12.05-12.35 Spin dependent N-N and $\bar{N}$ -N interactions B. LOISEAU
 from the Paris potential. (Université de Paris VI)

Monday 17 September, 1984

Session Chairman : A. PENZO, Trieste
 9.20-10.00 Photoproduction and deep inelastic B. PIRE (CERN)
 scattering.
 10.10-10.50 Asymmetries in deep inelastic E. GABATHULER
 scattering. (Univ. Liverpool)

Session Chairman : T. NIINIKOSKI, CERN

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| 11.30-12.20 | Report on the Bad Honnef polarized target Workshop (Bonn, 1984). | G. COURT (Liverpool)
W. MEYER (Bonn) |
| 12.35-12.55 | Tests of dynamics through polarization experiments : the case of the dibaryon. | G. GOLDSTEIN
(Tufts University) |
| 13.00-13.20 | Plans for polarized beams in LEP. | B. MONTAGUE (CERN) |

Session Chairman : W. HUGHES, Yale University

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| 14.30-15.20 | Workshop report on Theory and Experiment on spin effects at high energies. | D. CRABB (BNL)
E. LEADER (Birkbeck Coll.) |
| 15.35-16.05 | Spin effects in $pp \rightarrow d\pi^+$ reaction in the intermediate energy region. | T. BHATIA (LAMPF) |

Session Chairman : F. LEHAR, Saclay

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| 16.30-17.10 | Transverse polarization in QCD and related problems. | P. RATCLIFFE
(Cambridge) |
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Tuesday 18 September, 1984Session Chairman : D. MOEHL, CERN

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| 9.20-10.00 | Workshop report on Acceleration and Storage. | D. RUTH (SLAC) |
| 10.10-10.50 | Spin Physics and QCD sum rules. | H. RUBINSTEIN
(Weizmann/CERN) |

Session Chairman : A. YOKOSAWA, Argonne

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| 11.30-12.00 | Review of hyperon polarization measurements in inclusive reactions. | K. HELLER
(Minnesota) |
| 12.05-12.30 | Λ and $\bar{\Lambda}$ polarizations at the ISR. | P. SCHLEIN (UCLA) |
| 12.35-13.05 | π -d Reactions at intermediate energies. | M. LOCHER (SIN) |
| 14.30-16.30 | Round Table : Polarized protons for the CERN $\bar{p}p$ collider ? | |
| Introductory Talk : R. COOL (Rockefeller) | | D. CLINE (Wisconsin)
E. COURANT (BNL)
L. EVANS (CERN)
G. SAUVAGE (Orsay)
T.L. TRUEMAN (BNL)
A. MARTIN (CERN) |
| Scientific Secretaries : | | |
| - P. CHIAPPETTA, CPT, CNRS, Marseille | | |
| - G. D'AGOSTINI, CPPM, Marseille | | |

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| 17.30-18.30 | Poster Session (Room ED5) | |
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Wednesday 19 September, 1984Session Chairman : C. JOSEPH, Lausanne

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| 9.20-10.10 | Workshop report on intermediate energy : nucleon-nucleon and related problems. | C. LECHANOINE-LELUC
(Geneva),
R.R. SILBAR (LASL) |
| 10.25-10.55 | Polarized collisions as a tool to reveal SUSY particles. | F. RENARD
(Montpellier) |