

# INTERNATIONAL SCHOOL OF SUBNUCLEAR PHYSICS

**ERICE - TRAPANI - SICILY: 6 - 25 JULY 1973**

**Sponsored by: The Italian Ministry of Public Education  
The Italian Ministry of Scientific and Technological Research  
The North Atlantic Treaty Organization - Alliance for Peace  
The Regional Sicilian Government  
The Weizmann Institute of Science**

## XI Course on: LAWS OF HADRONIC MATTER

### LECTURERS AND PROGRAMME

#### OPENING LECTURE

- « Twenty-five Years of Quantum Electrodynamics ».  
V. F. WEISSKOPF, Massachusetts Inst. of Technology, Cambridge, Mass., U.S.A.

#### THEORETICAL LECTURES

- « Exact Results of Mathematical Physics on the Structure of Matter ».  
W. THIRRING, University of Wien, Wien, Austria.  
« Renormalizable Unified Theories of the Weak and Electromagnetic Interactions ».  
S. COLEMAN, Harvard University, Cambridge, Mass., U.S.A.  
« New Approach to Field Theory ».  
R. JACKIW, Massachusetts Institute of Technology, Cambridge, Mass., U.S.A.  
« The Physical Interpretation of Dual Models ».  
C. REBBI, CERN, Geneva, Switzerland.  
« Vector Meson Dominance and Related Topics ».  
J. J. SAKURAI, University of California, Los Angeles, Calif., U.S.A.  
« Theory and Phenomenology of Multiparticle Production Processes at ISR Energies (Multiplicity Distributions, Scaling, Correlations) ».  
E. L. BERGER, Argonne National Lab., Ill., U.S.A. and CERN, Geneva, Switzerland.

#### SEMINARS ON SPECIALIZED TOPICS

- « Rising Total Cross Sections ».  
U. AMALDI, Istituto Superiore di Sanità, Rome, Italy.  
« Physics with Mirabelle ».  
A. BERTHELOT, Centre d'Etudes Nucleaires - Saclay, Gif-sur-Yvette, France.  
« Symmetry Breaking ».  
N. CABIBBO, University of Rome, Rome, Italy.  
« Algebraization of Regge Couplings ».  
H. KLEINERT, Freie Universität, Berlin, Germany.  
« Muon Proton and Muon Nucleus Deep Inelastic Scattering ».  
A. C. MELISSINOS, University of Rochester, Rochester, N.Y., U.S.A.  
« Tagging Multiple Secondaries Interactions at High Energy with Nuclear Excited Levels: Results and Plans ».  
O. PICCIONI, University of California, San Diego, La Jolla, Calif., U.S.A.

\* \* \*

#### ROUND TABLE DISCUSSIONS

- « European Collaboration for New Laboratories »:  
« e<sup>+</sup>e<sup>-</sup> Colliding Beams ».  
Chairman: E. AMALDI, University of Rome, Rome, Italy.  
Introductory Speaker: G. H. STAFFORD, RHEL, Berks, U.K.  
« e<sup>+</sup>e<sup>-</sup> Colliding Beams at High Energy ».  
Chairman: W. PAUL, University of Bonn, Bonn, Germany.  
Introductory Speaker: G. SALVINI, University of Rome, Rome, Italy.  
« Personnel Policy in Research Laboratories ».  
Chairman: I. I. RABI, Columbia University, New York, N.Y., U.S.A.  
Introductory Speaker: G. ULLMANN, CERN, Geneva, Switzerland.

#### REVIEW LECTURES

- « Models for the Renormalized Weak Interactions ».  
S. L. GLASHOW, Harvard University, Cambridge, Mass., U.S.A.  
« Theoretical Interpretation of Neutrino Experiments ».  
E. PASCHOS, NAL, Batavia, Ill., U.S.A.  
« Electromagnetic Interactions ».  
S. C. C. TING, DESY, Hamburg, Germany and MIT, Cambridge, Mass., U.S.A.  
« Meson Resonances ».  
D. H. MILLER, Purdue University, Lafayette, Indiana, U.S.A.  
« Daughter Trajectories - Facts and Fiction ».  
L. MONTANET, CERN, Geneva, Switzerland.  
« Almost Everything about Baryon Resonances ».  
A. H. ROSENFELD, Lawrence Berkeley Laboratory, Berkeley, Calif., U.S.A.  
« Physics with the CERN Proton-Proton Colliding Beams ».  
U. AMALDI, Istituto Superiore di Sanità, Rome, Italy.  
« Beams of Molecules, Atoms and Nucleons ».  
N. RAMSEY, Harvard University, Cambridge, Mass., U.S.A. and Universities Research Association.  
« If the Quark Model works so well why we do not see the Quarks? ».  
B. FELD, Massachusetts Institute of Technology, Cambridge, Mass., U.S.A.  
« Recent Developments in Dual Models ».  
P. H. FRAMPTON, University of Bielefeld, Bielefeld, Germany.  
« Spin and Statistics ».  
E. P. WIGNER, Princeton University, Princeton, New Jersey, U.S.A.

#### HIGHLIGHTS IN OTHER FIELDS

- « Atomic Physics ».  
U. FANO, University of Chicago, Chicago, Ill., U.S.A.  
« Nuclear Physics ».  
H. FESHBACH, Massachusetts Inst. of Technology, Cambridge, Mass., U.S.A.  
« Computer Frontiers ».  
R. L. GARWIN, IBM Thomas Watson Research Center, Yorktown Heights, N.Y., U.S.A.

#### CLOSING LECTURE

- « Fifty Years of Symmetry Operators ».  
E. P. WIGNER, Princeton University, Princeton, New Jersey, U.S.A.

\* \* \*

#### THE FUTURE OF HIGH ENERGY PHYSICS

- « Status of the American Project ».  
R. R. WILSON, NAL, Batavia, Ill., U.S.A.  
« Status of the European Project ».  
J. B. ADAMS, CERN, Geneva, Switzerland.  
« New Frontiers ».  
K. JOHNSEN, CERN, Geneva, Switzerland.

#### GENERAL INFORMATION

- Persons wishing to attend the Course should write to the Secretary of the School:  
• Miss MARIA ZAINI - International School of Subnuclear Physics  
via Imerio, 46 - 40126 BOLOGNA, Italy.

They should specify:

- date and place of birth together with their present nationality;
  - degree and other academic qualifications;
  - list of publications;
  - present position and place of work;
- and include:
- a letter of recommendation from their research group leader or from a professor of physics.

The subscription fee is 1,000 Swiss francs. Thanks to the generosity of the sponsoring Institutions, partial support can be given to some deserving students, who need financial help. This must be specified and justified in the application letter.

#### — SPECIAL SCHOLARSHIPS —

Four special Scholarships have been established in honour of and named after the late Physicists

AMOS DESHALIT GUNNAR KÄLLEN PETER PREISWERK GIULIO RACAH  
These Scholarships cover travel expenses, registration fees, and full board and lodging in Erice.

Scholarships as well as any other form of financial support will be attributed in consultation with the Board of Lecturers at the end of the Course, in order to allow a more direct judgement of all the applicants.

Closing date for application: May 20, 1973

No special application-form is required

A letter will be sent to successful applicants by June 5. Students having difficulties with travel documentation and who need to know before June 5 whether or not their applications have been accepted, may get an earlier special decision by submitting a justified request.

Admission to the School will be decided by a committee consisting of Professors: G. Bernardini, N. Cabibbo, R. H. Dalitz, M. Gell-Mann, T. D. Lee, A. Martin, L. A. Radicati, V. F. Weisskopf and A. Zichichi.

Students must be in Erice on July 6 no later than 5 p.m. Please note that the Calendar Holidays and the School Holidays are totally uncorrelated. More detailed information, including the timetable of the lectures, will be sent to successful applicants together with the acceptance letter.

#### PURPOSE OF THE SCHOOL

The school is devoted to those physicists who are interested in having a much deeper theoretical understanding of the field of physics in which they are working. The emphasis of the programme will be on the elucidation and discussion of the progress achieved in the theoretical and experimental understanding of particle physics during the last year. Students will be selected from the applicants according to their scientific qualifications. In this selection, the geographical distribution of the students will be taken into account.

In order to exploit to the fullest extent the material presented at the school, three lectures will be given in the morning and at least two hours of the afternoon will be dedicated to clearing up in free, informal discussions, the topics of the morning lectures. Seminars will be given in afternoon or evening sessions.

#### ERICE

Legend tells that Erice, son of Venus, was the founder, more than three thousand years ago, of a small town on top of a mountain (750 metres above sea level).

Homer (~ 1,000 B.C.), Theocritus (~ 300 B.C.), Polybius (~ 200 B.C.), Horace (~ 70 B.C.), Virgil (~ 20 B.C.), and others have celebrated in their Poems this magnificent spot in Sicily. There you can admire among other beauties the Castle of Venus and the Cyclopean Walls. Other masterpieces of ancient Greek civilization are found in the neighbourhood, such as Motya, Segesta and Selinunte. In the Aegadian Islands (which can be reached by cable car plus hydrofoil boat in about two hours) there are: — prehistoric mural figures in the famous grotto of Levanzo — the Grotte Marine of Marettimo — the recently discovered paleolithic grottoes of Favignana. Finally, splendid beaches (the farthest one at about 40 minutes driving from Erice) are those of San Vito Lo Capo, Scopello, Cornino and the wild ones around Monte Cofano.

Please note:

- We regret that, owing to the limited number of places available in the lecture hall, it will not be possible to allow any person, not selected by the Committee of the School, to follow the courses.
- NSF travel grants are restricted to U.S.A. citizens. Applications for these should be made as soon as possible through the Director of the School.
- Enquiries for publication of the proceedings:  
EDITRICE COMPOSITORI, Viale XII Giugno 1, 40124 Bologna, Italy.