

INTERNATIONAL SCHOOL OF SUBNUCLEAR PHYSICS

21st Course: HOW FAR WE ARE FROM THE GAUGE FORCES

ERICE-TRAPANI-SICILY: 3-14 AUGUST 1983

Sponsored by the:

- European Physical Society • Italian Ministry of Education
- Italian Ministry of Scientific and Technological Research
- Sicilian Regional Government • Weizmann Institute of Science

PROGRAMME AND LECTURERS

OPENING LECTURE

Family and hierarchy: the great problems.

- S.L. GLASHOW, Harvard University, Cambridge, Mass., USA

THEORETICAL LECTURES: «The Gauge Forces and their Troubles»

Random lattice and discrete mechanics.

- T.D. LEE, Columbia University, New York, NY, USA

Lattice calculations in gauge theory.

- C. REBBI, Brookhaven National Lab., Upton, NY, USA

U(1) problem: instantons, axions, familons.

- F.A. WILCZEK, University of California, Santa Barbara, USA

Recent developments in supergravity.

- S. FERRARA, CERN, Geneva, Switzerland

Going beyond the Standard Electroweak Model.

- S.L. GLASHOW, Harvard University, Cambridge, Mass., USA

SEMINARS ON SPECIALIZED TOPICS

A new frontier in physics: relativistic heavy ion collisions.

- T.D. LEE, Columbia University, New York, NY, USA

Testing supersymmetry.

- G. KANE, University of Michigan, Ann Arbor, Mich., USA

The problems of constituents.

- H. FRITZSCH, MPI, Munich, FRG

The decay of heavy flavours.

- G. ALTARELLI, Istituto di Fisica dell'Università, Rome, Italy

Spin-dependent tests of QCD.

- E. LEADER, Westfield College, London, UK

REVIEW LECTURES

The CERN $p\bar{p}$ collider

Results on the intermediate vector bosons.

- C. RUBBIA, CERN, Geneva, Switzerland

Analysis of the hadronic final states.

- G. EKSPONG, University of Stockholm, Stockholm, Sweden

The problem of new heavy flavours: top and superbeauty.

- A. ZICHICHI, CERN, Geneva, Switzerland

QCD in hadronic interactions and DIS.

- G. ALTARELLI, Istituto di Fisica dell'Università, Rome, Italy

QCD in (e^+e^-) annihilation.

- M. CHEN, MIT, Cambridge, Mass., USA

The electroweak standard model in (e^+e^-) and DIS.

- H.B. NEWMAN, CalTech, Pasadena, Calif., USA

Status of the τ -lepton properties.

- M. POHL, Rhein-Westf. Tech. Hochschule, Aachen, FRG

Status of the Glue-Balls.

- S.J. LINDENBAUM, BNL, Upton, and City College, New York, NY, USA

Universality features in (pp) , (e^+e^-) , and DIS.

- A. ZICHICHI, CERN, Geneva, Switzerland

NEW PROJECTS FOR MULTI-TeV PHYSICS:

DESERTRON: The American Large Proton-Antiproton Collider.

- L. LEDERMAN, Fermilab, Chicago, Ill., USA

ELOISATRON: the European Long-Range Intersecting Storage Accelerator.

- A. ZICHICHI, CERN, Geneva, Switzerland

***** CELEBRATION OF E.P. WIGNER'S BIRTHDAY *****

Events, Laws of Nature, and Invariance Principles

- E.P. WIGNER, Princeton University, Princeton, NJ, USA

CLOSING LECTURE

35 years of Particle Physics

- T.D. LEE, Columbia University, New York, NY, USA

PURPOSE OF THE SCHOOL

In spite of the spectacular results obtained in recent times, subnuclear physics is still far from reaching the asymptotic limit of a field without a future. This is testified to by the large number of problems which open up at a rate at least comparable with that of new results.

This year's programme is devoted to a review of the most significant results, both in theory and experiment, obtained in the field of the "electroweak" and of the "colour" forces of nature. The outcome of the Course will be to present a clear picture of how far we are from the electronuclear formulation of these basic forces acting between quarks and leptons. And more generally, how far we are from the unification of all gauge forces of nature.

POETIC TOUCH

According to a legend, Erice, son of Venus, founded a small town on top of a mountain (750 metres above sea level) more than three thousand years ago.

Homer (~ 1,000 B.C.), Theocritus (~ 300 B.C.), Polybius (~ 200 B.C.), Virgil (~ 50 B.C.), Horace (~ 20 B.C.), and others, have celebrated this magnificent spot in Sicily in their poems. Among the sights there, the castle of Venus and the Cyclopean Walls can be admired. Other masterpieces of ancient Greek civilization, such as Motya, Segesta, and Selinunte, are to be found in the neighbourhood. On the Aegadian Islands, which can be reached by cable car plus hydrofoil boat in about two hours, there are prehistoric murals in the famous grotto of Levanzo, the Grotte Marine of Marettimo, and the recently discovered paleolithic grottoes of Favignana. There are splendid beaches, the farthest about 40 minutes' drive from Erice, at San Vito Lo Capo, Scopello, and Cornino, and wild beaches around Monte Cofano.

Participation by invitation only

SPECIAL SCHOLARSHIPS

The following special Scholarships have been established in honour of, and named after, the late physicists

PATRICK M.S. BLACKETT JAMES CHADWICK AMOS DE-SHALIT
GUNNAR KÄLLEN ANDRÉ LAGARRIGUE GIULIO RACAH JUN JOHN SAKURAI

These scholarships cover registration fees and full board and lodging in Erice.

• **PLEASE NOTE** that the special scholarships as well as any other form of financial support will be awarded 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.

Participants must be in Erice on 3 August, not later than 5 p.m.

A. ZICHICHI - DIRECTOR