

JOINT US/CERN SCHOOL ON PARTICLE ACCELERATORS
SOCIETA ITALIANA DI FISICA

Topical course on

NONLINEAR DYNAMICS

Santa Margherita di Pula, Sardinia
31 January - 5 February 1985

This is the first of a series of courses on specialized or advanced topics in accelerator physics organized jointly by the CERN Accelerator School and the U.S. School on High-Energy Particle Accelerators, receiving, in addition, the support of the Italian Physical Society.

Programme and invited lecturers

Nonlinear Problems in Accelerator Physics

Opening address	<i>K. Johnsen (CERN)</i>
Relevance of nonlinear problems to accelerator physics	<i>E. Picasso (CERN)</i>
Single beam resonances	<i>R. Ruth (SLAC)</i>
Resonances in colliding beams	<i>A. Chao (SLAC)</i>
Synchro-betatron resonances	<i>A. Piwinski (DESY)</i>
Review of beam-beam experiments	<i>J.T. Seeman (SLAC)</i>
Review of beam-beam models	<i>J. Schonfeld (FNAL)</i>
Review of beam-beam simulation	<i>S. Myers (CERN)</i>
Resonance overlap and Arnold diffusion in beam-beam interaction	<i>J. Tennyson (Texas)</i>
Tracking algorithms	<i>F.C. Iselin (CERN)</i>
Particle tracking and special purpose processors	<i>A. Wrulich (DESY)</i>
Dynamic aperture: analytic derivation and sextupole algorithms	<i>G. Guignard (CERN)</i>
Single-pass nonlinear optics	<i>K. Brown (SLAC)</i>

Dissipative phenomena in electron rings

	<i>J.M. Jowett (CERN)</i>
Nonlinear RF, noise and stochasticity	<i>G. Dome (CERN)</i>
Nonlinear collective equilibrium states of a relativistic electron beam	<i>C. Pellegrini (BNL)</i>
A personal perspective	<i>L.J. Laslett (LBL)</i>

Techniques from Nonlinear Dynamics

Integrable and non-integrable systems	<i>I. Percival (QMC, London)</i>
Perturbation methods: averaging and multiple scales	<i>A. Nayfeh (VPI, Virginia)</i>
Numerical studies, interpretation and diagnostics	<i>J. Crutchfield (Berkeley)</i>
The transition to chaos	<i>R.S. MacKay (Warwick)</i>
Conservative vs. dissipative systems	<i>R. Hellemann (Twente)</i>
Breakdown of stability in Hamiltonian systems with two degrees of freedom	<i>J. Moser (Zurich)</i>

General information

The course will be accessible to advanced graduate students, post-doctoral researchers and scientists interested in entering accelerator physics as well as experienced workers in the field. Some acquaintance with the theoretical problems posed in accelerator physics and standard graduate backgrounds in applied mathematics and theoretical dynamics will be desirable. Previous schools in general accelerator physics organized by CAS and the U.S. School on HEPA would provide suitable preparation. Persons wishing to attend the above course can obtain further information and application forms from the CERN Accelerator School, c/o Dr J.M. Jowett, LEP Division, CH-1211 Geneva 23, Switzerland. If so desired, American applicants may write to Dr M. Month, Brookhaven National Laboratory, Upton, Long Island, New York 11973. Applications must be returned as soon as possible but not later than 22 October 1984. A registration fee of SFR 300 or US\$ 140 (at the choice of the participant) will be charged. Participants will be accommodated in Is Molas Golf Hotel, Santa Margherita di Pula, 30 km distant from Cagliari, Sardinia. Accommodation, breakfast, lunch and dinner during the course will cost 55000 lire per day (8000 lire supplement for single room). Participants should arrive by the evening of 30 January and lectures will last till the evening of 5 February. All participants will receive a copy of the proceedings. The number of participants is limited to 100.

Administration

Head of CERN Accelerator School: K. Johnsen; Chairman of U.S. School on High Energy Particle Accelerators: M. Month; President of Italian Physical Society: R. Ricci; Programme Committee: B. Autin, R. Billings, P.J. Bryant, A.W. Chao, J. Gareyte, H. Grander, K. Johnsen, J.M. Jowett, P.M. Lapostolle, B.W. Montague, M. Month, J.H. Mulvey, C. Pellegrini, J. Schonfeld, M. Tigner, V.G. Vaccaro, W.T. Weng, B. Wik; Local Organizing Committee: P.J. Bryant, R. Hebel, K. Johnsen, J.M. Jowett, P. Poeth, S. Tazzari.