



INTERNATIONAL ATOMIC ENERGY AGENCY
UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION



INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS
34100 TRIESTE (ITALY) - P.O.B. 586 - MIRAMARE - STRADA COSTIERA 11 - TELEPHONES: 224281/2/3/4/5-6
CABLE: CENTRATOM - TELEX 460392-I

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SPRING COLLEGE ON AMORPHOUS SOLIDS
AND THE LIQUID STATE

14 April - 18 June 1982

STRUCTURE AND DYNAMICS OF CHARGED FLUIDS

Summary of contents

J.P. HANSEN

Lab. de Physique Théorique
des Liquides
Univ. Pierre et Marie Curie
Tour 16 - 5^e étage
4, place Jussieu
75230 Paris Cedex 05
France

Lecture 1 : Generalities.

Classes of charged fluids ; common features and important physical parameters ; simple models ; some experimental and theoretical tools : neutron scattering and light scattering, transport measurements, computer simulations, the memory function formalism and Kinetic Theory.

Lecture 2 : Microscopic structure and thermodynamics. Distribution functions and structure factors ; sum rules ; relation to thermodynamics ; integral equations (HNC, MSA) and their extensions.

Lecture 3 : Microscopic dynamics and transport. The memory function formalism ; single particle motion ; dynamical structure factors and collective modes ; dielectric response ; electrical conductivity and other linear transport coefficients.

Lecture 4 : Selected applications (part 1). The one component plasma (OCP) model and its extensions ; simple liquid metals and alloys ; molten salts ; metal-salt solutions.

Lecture 5 : Selected application (part 2). Ionic solutions ; electrical double layers ; macromolecular ionic systems ; super-ionic conductors ; two-dimensional Coulomb fluids.

General references :

- "Microscopic Structure and Dynamics of Liquids", edited by J. Dupuy and A.J. Dianoux (Plenum Press, 1978)
- M. Parrinello and M.P. Tosi, Riv. Nuovo Cimento 2 (1979) N°6
- M. Baus and J.P. Hansen, Physics Reports 59 (1980) 1.