

## Book reviews

### Imaging process and coherence in physics

Ed. EHLERS J., HEPP K., KIPPENHAHN R., WEIDENMÜLLER H. A., Springer-Verlag, Berlin, New York, Heidelberg 1980

[pp. i-xix + 577, 17 tab. 327 figs.]

Both the imaging processes and coherence have belonged to the widely studied problems in physics since many years. In spite of this they seem to be still far from being completely solved, though there is no doubt that the general understanding of the imaging mechanisms has been essentially improved. The importance of the imaging process as a powerful means of collecting information concerning incredible variety of physical objects has been fully recognized especially in the course of last years. However, the development of the respective methods and techniques was realized almost independently in the particular fields of imaging. The aim of the workshop, devoted to imaging processes and coherence in physics (held at, Les Hauches, France, in March 1979) and the edition of the reviewed proceedings (composed of about 60 papers) was to bring together the experts specializing in different imaging techniques and enabling them to present their achievements and to exchange their views and thus to create kind of a common pool of knowledge for the benefit of all.

Such an idea may be successful, provided two conditions are fulfilled: a sufficiently wide representation of all the fields is attained, and a sufficiently clear and communicative presentation of the main principles and achievements of the represented scientific disciplines is managed. The organizers of the workshop and, consequently, the editors of the book have successfully achieved this purpose in many respects.

Firstly, they took care that the subject matter be extensive enough including the imaging in visible light, acoustic waves, electron beams, X-rays, and neutrons. The whole material is presented in such a way that the eventual comparison of the respective principles, methods, techniques, or instrumentation are as convenient as possible. For instance, the first over 50 pages of the book are devoted to light (laser), electron thermal neutron and X-ray sources, the next almost 50 pages deal with the mechanisms of propagation of the respective beams, being followed by discussion of interaction and detection problems for the same beams. Next, the mechanisms of scattering, especially those expressible in terms of kinematic and dynamic diffraction, are studied relatively extensively, and the polarization phenomena in X-ray and electron beams are shortly discussed. The remainder part of the book is devoted to a review of special measuring and imaging techniques developed in all the fields mentioned at the beginning. The following of them seem to be worth mentioning:

- X-ray and neutron speckle and intensity interferometry,
- X-ray, neutron, cathodoluminescence topography,
- light, electron,
- X-ray holography,
- acoustical and electron imaging techniques including electron and acoustic microscopy,
- nuclear magnetic resonance imaging,
- nuclear scattering,
- radiography,
- computerized tomography,
- different image processing techniques, and the like.

Some attention is, moreover, paid to some special devices and recording materials.

Secondly, such arrangement of the presented material allows to find quickly and conveniently the needed problems from neighbouring fields and to make the desired comparisons. Independently, some general comparative studies are offered from time to time, like that by J. SIVARCHERA (*Matter-wave interaction. A general survey*). W. GRAEF (*X-ray and neutron interferometry*). M. HART (*Crystal diffraction, Optics for X-rays and neutrons*). Another convenience offered to those readers, who would like to widen their knowledge in the other fields, is that the book is provided with the table of contents by subject in addition to the table of contents and also with the alphabetic subject index, which facilitate the selection of the material to study.

Thirdly, the majority of contributors managed to present their fields in a concise but communicative way making them available also to the less advanced readers.

The book edited carefully and in reasonably short time after the workshop (about one year) is undoubtedly a useful publication.

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