Preface

When synchrotron radiation research started in the 1960's as a small offshoot from high energy physics laboratories, few people would have predicted the rapid expansion we have witnessed over the past few years. The most visible evidence of this growth is the increasing number of synchrotrons dedicated largely or exclusively to the radiation particle physicists used to consider as an annoying by-product and a waste of energy. The advantages of synchrotron light become plain when considering its properties: high brightness, wide range of wavelengths, excellent collimation, polarization, and a pulsed time structure.

Physicists provided the driving force behind many of the new developments in synchrotron radiation research, but other fields are catching up rapidly. In fact biologists interested in the structure and contraction of muscle were among the early users of synchrotron X-rays because this enabled them to follow the scattering pattern in real time. Similarly, chemists noted quickly that interatomic distances could be determined to an unprecedented accuracy using X-ray spectroscopy. Scattering and spectroscopy techniques still represent the majority of synchrotron radiation experiments in biology and chemistry, and this is reflected in the articles in this book and its companion volume to follow shortly.

A variety of reviews on the uses of synchrotron radiation in chemistry and biology have appeared over the past few years. Many of these were published as books or in specialist journals that are often not easily accessible in an average library. It was therefore a timely decision by Springer Verlag to cover this area within the series of "Topics in Current Chemistry". The hope is to provide outsiders or newcomers to the field with an overview of current activities, written by scientists who are themselves engaged in synchrotron radiation projects. Their topics include theory, technical and methodological aspects, as well as the results that can be obtained. The first part of this book concerns applications in chemistry, most of which deal with X-ray spectroscopy (EXAFS, XANES); the second part covers biological aspects based mainly on X-ray scattering techniques.

The articles were written in late 1986 and in 1987 and thus represent the state of the art. During that time many of the authors were involved in the planning or construction of new synchrotron
radiation facilities; it was not easy for them to take time off for writing, and I am grateful for their willingness to contribute in spite of their busy schedules. Finally I would like to thank Dr. Stumpe from Springer Verlag for the smooth collaboration and my secretary, Ms. Elke Spader, whose organizational talent was invaluable in putting this book together.

Hamburg, August 1987

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