

Book Review

Spectroscopy of the Excited State, NATO Advanced Study Institute Series, Vol. B12, edited by B. di Bartolo, published by Plenum Press, New York, 1976; xiv + 416 pp.; price \$ 39.00

This volume brings together lectures and seminar abstracts from the NATO Advanced Study Institute held at Erice, Italy, in July 1975. There are 16 lectures and 19 seminar abstracts included; clearly all cannot be mentioned and the reviewer's own interests are reflected somewhat in the following discussion.

The opening contribution by the editor presents a formal description of the interaction of radiation with atomic and molecular systems. D. A. Ramsay gives a brief introduction to molecular spectroscopy which contains a catalogue of results from electronic spectra of triatomic molecules, with a particular emphasis on correlation with a molecular orbital description. This section provides a useful updating of the equivalent section of Herzberg's "Electronic Spectra of Polyatomic Molecules". Ramsay also presents a brief and far from comprehensive review of laser excitation of optical spectra. The lecture by S. Claesson on techniques of flash photolysis includes several photographs of superbly engineered flash-photolysis systems, together with recipes for successful construction of discharges with energies between 500 and 60 000 J. B. A. Thrush gives an illuminating discussion of emission following two and three body association reactions and includes detailed analyses of NO, N₂ and the halogens. He also treats chemiluminescence in atom transfer reactions, although at a somewhat less detailed level. There are two contributions from E. W. Schlag on two-photon and lifetime spectroscopy in the gas phase. The former emphasizes the application of observing states which have hitherto been inaccessible directly and is illustrated by the author's recent work on benzene. The latter is largely given over to a discussion of high resolution single-shot laser-induced fluorescence using tuneable dye lasers, with particular emphasis on combined measurement of the lifetime and the fluorescence quantum yield. M. Kosha discusses molecular excitations in small aggregates in a conventional manner, restricting himself to the tight-binding limit and to the point-dipole approximation. He includes an interesting discussion of the effects of extensive aggregation (linear and helical polymers, lamellae and spherical arrays). Further contributions include those by R. G. W. Norrish, which is a reprint of his 1967 Nobel lecture, B. A. Thrush (Electronic and vibrational energy transfer), D. S. McClure (Electronic spectra in crystalline solid solutions) and S. Sugano (Core excitation and electron correlation in crystals).

Overall the book shows a rather uneven level of presentation. Some lectures are in the form of general introductions to a particular field, whilst

others detail the authors' latest contributions. The former suffer in comparison with normal review articles in that they are not generally so comprehensive or well referenced. Indeed a recurring and frustrating feature is the frequent use of results without reference. The lectures that concentrate on the authors' research refer, in all cases, to published material.

Despite these shortcomings, the book is worthy of consultation and contains a large number of lively articles by the leading protagonists of a wide field of study. A particularly pleasing feature is its rapid publication.

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