BOOK REVIEWS

Research on Laser Theory (ed.) A. N. Orayerskiy, (Published by Nova Science Publishers, 283 Commack Road, Suite 300, Commack, NY 11725, USA), 1988, pp. 288, Price: not stated.

The book is a translation of the proceedings of the Lebedev Physics Institute, Academy of Sciences of the USSR, originally edited by A. N. Orayerskiy in the Russian language in 1986, and translated into English and published by Nova in 1988. As a consequence, in spite of being an informative review in a few of the topics covered, it requires updating in a few other areas to include stimulating developments of the post-1986 period.

The contents are essentially divided into five topics, viz.

(i) Dynamical stochasticity in lasers

(ii) Theoretical analysis of chemical-oxygen-iodine lasers (COIL)

(iii) Theory of active media in excimer lasers

(iv) Linear triatomic molecular lasers (gas)

(v) The theory of ring quantum-mechanical oscillator in a magnetic field of arbitrary directions.

The first topic surveys the literature of chaos in various kinds of laser, such as homogeneously and inhomogeneously broadened laser, modulated laser, etc. The authors have attempted to present a state-of-the-art survey of deterministic chaos and its relevance to lasers supplemented by a good discussion on the properties of the strange attractor and supported by adequate literature. Universality, routes to chaos, and bifurcation scenario have been elegantly discussed by representing the dynamical evolution in phase-space portraits. The simplicity of the use of the Poincaré diagram in analysing phase-space trajectories has been emphasized. Typical chaotic-dynamical behaviour has been appropriately illustrated with the help of examples from autonomous and non-autonomous laser systems. However, a brief discussion on other maps (Henon) and types of bifurcations, which have been observed in the chaotic dynamics of laser, are preferable, and crisis also should be included in an updated version.

In the discussion on chemical-oxygen-iodine lasers (COIL), supposed to be the only operational, purely chemical lasers, literature up to 1985 only has been covered. The difficulties that arise in the efficient and high-power operation of COIL have been well discussed. However, the prediction of COIL without a cold trap has already been realized (ref: T. Uchiyama *et al.* 1988 *J. Appl. Phys.* **63,** 1785). Minor misprints could have been avoided. For example: (i) table 1, page 39: units of various parameters should be clearly specified in English; (ii) the star sign '*' from page 41 onwards is expressed in at least two different ways; (iii) Page 65, 2nd line of last para: CL_2 should be Cl_2; (iv) Page 66, 4th line, first para: fluorine should be chlorine etc.

The review article " The theory of active media in excimer lasers" is a comprehensive presentation of theoretical principles dealing with various aspects of active media in excimer lasers. This includes theory of luminescence and light generation in condensed rare gas media, elementary processes in electric discharge fast electron-beam pump excimer lasers, ionization instability of electric discharge lasers and operation of electron-beam excited KrF lasers.

The review is good in style of presentation and adequate in coverage. First, the physical principles needed to formulate the equations describing the active medium are outlined, followed by procedures for solving the equations. The theory is applied to various situations in experiment, such as different active media, gas mixtures and pressures, and electric discharge parameters. The results presented in graphical form are useful. However, the follow-up discussion of the results is generally brief, except for the part on condensed rare gas crystals, where the author has made original contributions. A little more discussion is desirable, although the review contains an extensive bibliography (up to 1984) of sources containing details on the different aspects presented.

There are minor printing errors, arising mostly in translation. Examples are: (i) p. 112, fig. 3.1: x-axis has mks, should be μs; (ii) p. 112, fig. 3.2: y-axis has t_c in IIC, should be ns; also P_d^v should be W_d^v (which is used in the text); (iii) p. 117: fig. 32 should be fig. 3.2; (iv) p. 126: eq. 4.3 has cm^3/c, should be cm^3/s; (v) p. 118: W/cm should be W/cm^3; (vi) p. 130, fig. 4.3: x-axis has P in aIIIM, should be atm; (vii) p. 134, fig. 4.8: y-axis has W_{op}, should be $W_{Threshold}$.

In essence, the review is useful to both researchers in the field and beginners.

In conclusion, this book is definitely an excellent comprehensive review in the field of COIL and excimer lasers. However, updating the literature in the next edition will make it more significant.

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Processing and Presentation of Antigens, (eds) B. Perms, S. C. Silverstein and H. J. Vogel, (Published by Academic Press, 1250 Sixth Avenue, San Diego, California 92101, USA), 1988, pp. 324. Price $ 75.

The book appears to be aimed at bringing the immunologists up-to-date on the information available till 1988 on the processing and presentation of antigens.

The introductory chapter is sufficiently well written, giving a brief outline of the process of antigen presentation. The chapter on endosomes and recycling of molecules provides the reader with information on how we can study these processes. Chapter 3 has raised pH and the possible protein cleavage in the recycling of the ligands. Similar mechanisms are thought to play a role in the accumulation of certain drugs in parasitized cells, for example choloroquine in parasitized RBC. Chapter 5 outlines the recycling of T4 molecule. The authors have shown that the HIV binds to this receptor and has to be endocytosed to produce productive infection. The prevention of this endocytosis may be helpful in preventing AIDS.

Briciale *et al* (in chapter 6) presented evidence that there is not only the class-I MHC restricted antigenic presentation to CTL, but there is also a class-II MHC restricted antigenic presentation. This chapter and the work by Townsend *et al* outlined in chapter 7 clearly indicate that the same receptor gene pool is shared by the two classes of the T cells.

Part III deals with the interactions of antigens with class-II MHC molecules. This chapter helps us to understand the basic interactions at the molecular level between the antigen, antigen presenting cell and the T cell receptors. Part V deals with macrophages and dendritic cells. It is evident that the work shows that macrophages/dendritic cells/ langer-hans cells have almost similar pathways of presentation and similar functions.

Antigen presentation by B cells and T cells (parts VI and VII) has to me at least provided a wealth of information and will be an eye opener for immunologists. The cooperation between T cells and B cells at the molecular levels (chapter 21) with their humorous interpretation is worth reading.

The monograph ends with the part on "What T cells see?" and encompasses the whole gamut of molecular interactions which take place after the processing of antigens by the antigen processing cells.

On the whole the book is a must for persons who are involved in immunology research.

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A Textbook of Applied Entomology, Vol. 1, by K. P. Srivastava (Published by Kalyani Publishers, New Delhi and Ludhiana, India), 1988, pp. 323, Price Rs. 41.

This, the first volume of a concise but wide-ranging textbook deals comprehensively with the methods of insect pest control. As explained in the author's Preface, most of the entomology textbooks available to college students in India focus attention on insect anatomy, physiology and taxonomy, covering only inadequately the recent advances and developments in insect pest control. This volume is therefore intended to serve as a convenient single source of updated information on all pest control strategies. Its publication has been subsidized by the Government of India through the National Book Trust for the benefit of students.

The book is divided into 28 chapters and has a short bibliography and subject index. The introductory first chapter defines a pest and summarizes the causes of pest outbreaks. The second chapter briefly considers climatic factors, natural barriers and biotic control agents that regulate pest populations. Cultural, mechanical and physical methods of control are

listed in the next chapter, which also makes a passing reference to legislative measures to prevent and spread of pests. Chapters 4 to 13 provide a fairly detailed account of inorganic insecticides, natural and synthetic organic insecticides, including fumigants, the mode of action of insecticides, resistance to insecticides, and the merits and demerits of insecticides. The following two chapters explain the operational principles and details of various types of equipment for the application of insecticides from the ground and from the air. Insect antifeedants, attractants and repellants are discussed in chapters 16 to 18. Entomophagous insects and microbes as well as their role and practical value in biological control of pests are dealt with in the next three chapters. Chemicals that affect insect behaviour or that cause sterility in insects, insect hormones, and hormone mimics that can be exploited in pest suppression are considered in the three succeeding chapters. Chapter 25 outlines the basic facts and practical methods of genetic control of insects while the next one gives a similar treatment of radioisotopes and ionizing radiation. The penultimate chapter describes the techniques employed in pesticide residue analysis and the final chapter highlights the salient aspects of integrated pest management.

The textbook is adequately illustrated but unfortunately some of the photographic reproductions are not very clear.

Considering the wealth of information and the excellent manner of its presentation in it the textbook should prove to be immensely useful to graduate and post-graduate students and teachers of entomology.

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ANNOUNCEMENT

NATIONAL SYMPOSIUM ON PREVENTION AND MANAGEMENT OF DOWN'S SYNDROME AND NATIONAL CONFERENCE ON VOCATIONAL TRAINING AND REHABILITATION OF THE MENTALLY RETARDED

The two meetings will be organized by the National Down's Syndrome Association (NDSA) on 10 and 11 February 1990 at the Institute of Genetics, Hyderabad. Original papers in biomedical, psychosocial, educational, vocational training, employment and rehabilitation aspects are invited for presentation. Parents with mentally retarded children are also invited to participate and present papers. Abstracts not exceeding 200 words (in duplicate) must be sent before 15 November 1989. Participants must also send the full papers in duplicate by 30 November 1989 positively for inclusion in the proceedings. Papers received later will not be included in the proceedings volume. For further details contact Dr P. Usha Rani, Secretary-General, National Down's Syndrome Association, C/o Institute of Genetics, Hospital for Genetic Diseases, Begumpet, Hyderabad 500 016.