

given topic fits into the whole and no exercises to develop a feeling for the abstract ideas in a concrete context. Even the introductory chapters 1 through 12, which survey the basic definitions and the results of group theory, are presented at a sophisticated level.

Altmann's thrust is toward being clear, coherent and concise. For the most part he succeeds. The theoretical development in chapters 1 through 16 occupy a little more than half the book. Altmann discusses generally applications to space groups (chapter 17) and selection rules in crystals (chapter 18) and exemplifies them by the hexagonal close-packed space group. The concluding chapters 19 and 20 reflect Altmann's research interest in nonrigid molecules. He lays the groundwork for treating molecular groups efficiently in chapter 19 with an extensive discussion leading to the reduction of semidirect products. For the physicist whose object is to apply group-theoretic methods to a particular system, this chapter is the most practically useful part of the book. Chapter 20 introduces the subject of symmetry in nonrigid molecules and uses the group of the boron-trimethyl molecule (a group of order 324) as an example.

Altmann does make a real effort to help his reader. A preliminary chapter 0 summarizes the notation used in the book.

Altmann precedes each chapter with a brief introductory remark stating its purpose and describing the organization of the material. I recommend you peruse these chapter headings before seriously attacking the book. Besides giving an overview of the content and organization of the book, it may save time by allowing a more selective reading. For example, if the objective is to learn about the applications of group theory to space groups (chapter 17), the introductory remarks reveal that the immediately preceding chapters are the crucial ones. A scan of chapter 17 will find that the Herring method of finding the irreducible representations of nonsymmorphic space groups for k-vectors on the Brillouin-zone face is the main calculational tool employed; the lengthy chapter 6 on projective representations finds no essential application here.

Another way in which Altmann helps his reader is to provide a compact and efficient referral system that helps one to follow the proofs of the theorems. At first glance one might conclude that someone had cleverly substituted Altmann's proofs with some random selections from an alien computer source language. In fact, Altmann precedes each equation in a proof with a little cluster of symbols that, upon decoding (see Chapter 0), tells from where the equation came or how to derive

it. For more subtle steps, a footnote elaborates on the subtlety or warns of possible pitfalls for the unwary. The system should be of enormous help to the reader who starts in the middle. Detailed examples, included in most chapters to illustrate the concepts introduced in the chapter, may also help the reader.

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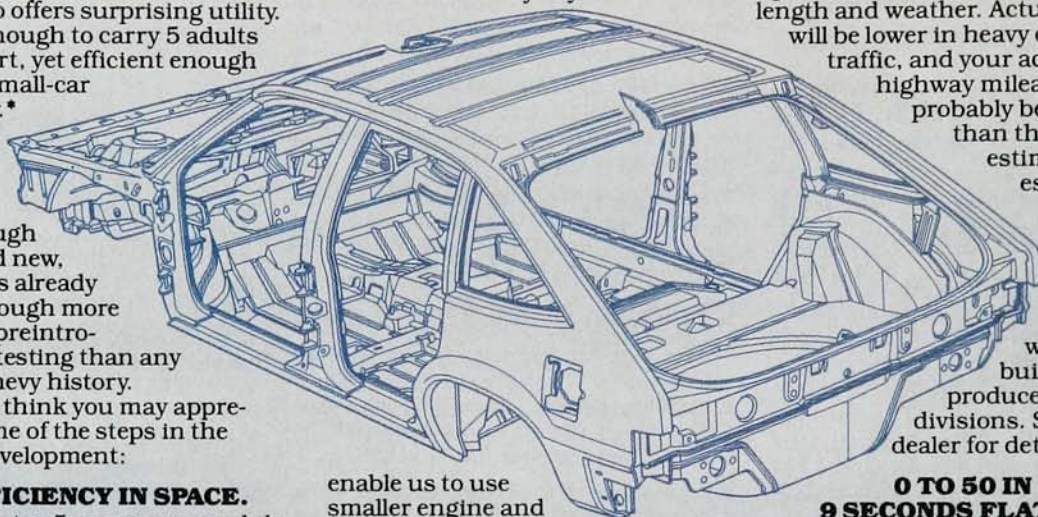
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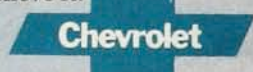
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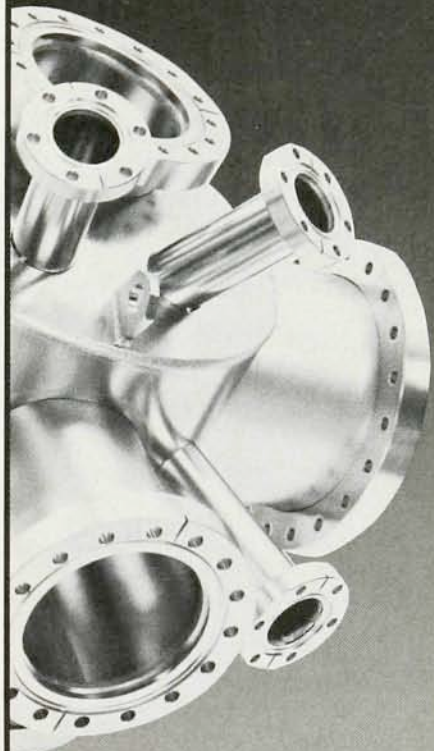
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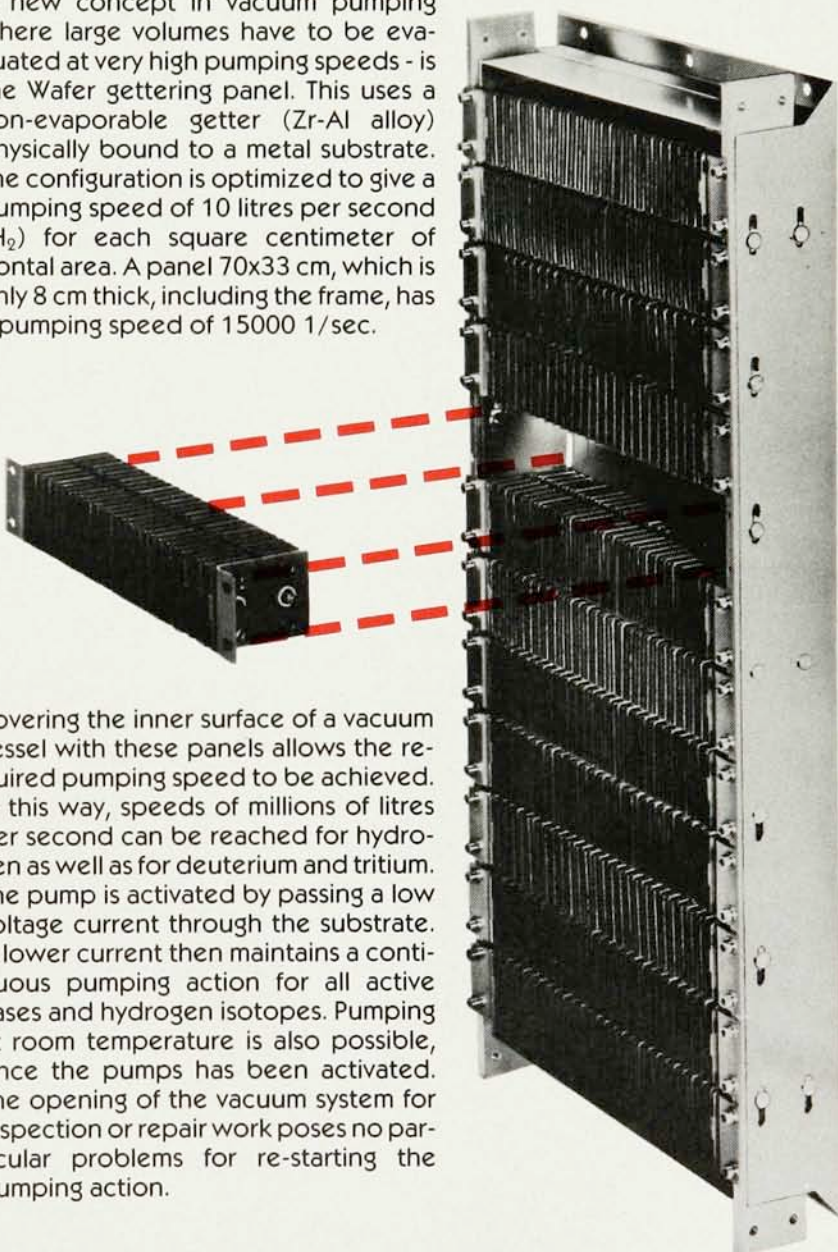
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