

A. P. Yutsis. (He spelled his name "Jucys" when writing in English). Other diagrammatic techniques such as those developed by nuclear physicist Michael Danos can complement the Yutsis graphs for tensor matrix algebra, but they are not mentioned. Applications of tensor algebra are given using directional correlation in an $A + BC \rightarrow AB + C$ reactive scattering experiment and in the study of spectroscopic orientation and alignment. These are both areas in which

Zare is an authority and he has made the discussion appropriate for graduate courses. Again, Zare makes effective use of semiclassical arguments in his discussion of tensor density operator matrices.

The final chapter of the text treats energy levels and transitions of small molecules that can be modeled by symmetric or asymmetric tops. The applications include a development of the Honl-London formulas and the Hund's coupling cases for diatomic or

near-symmetric top molecules, which make up the majority of the world's molecule population. Techniques for treating more complex polyatomic molecules are mentioned in references and footnotes.

In summary, Zare's text does a good job introducing the quantum mechanics of two's: two unitary dimensions of $U(2)$ or spinor rotation algebra, two-fold finite symmetry, two-electron configuration and diatomic molecules. To do more would have made the book much longer and more difficult. (There is an attempt to cram in a discussion of group character theory into a footnote, but it takes over two pages of fine print!) As it is, the book provides a necessary bridge between the high powered theory in Brian Judd's *Angular Momentum Theory for Diatomic Molecules* (Academic Press, Boston, 1975) and the state-of-the-art experimental methods outlined in J. L. Steinfield's *Molecules and Radiation* (Harper and Row, New York, 1974).

There is a small minority of physicists who love group representation theory for its own sake. However, most others have rued their rotational training from the first day they encountered the jabberwockian herpolohodes and polhodes in Goldstein's famous text. Zare's text goes a long way toward making the "gruppenpest" less of pest and more of an attractive tool. Students will appreciate having such a well balanced treatment of theory and experiment. And how many other texts discuss the Hanle effect?

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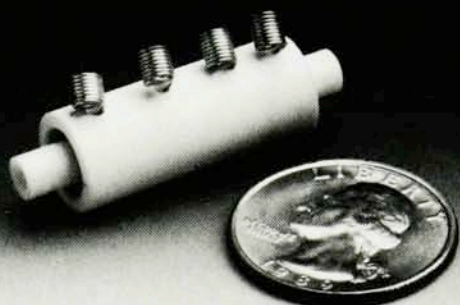
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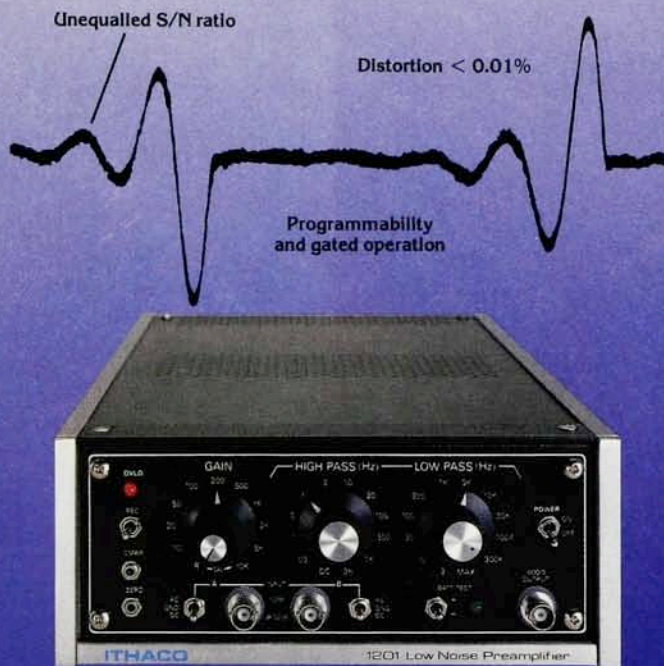
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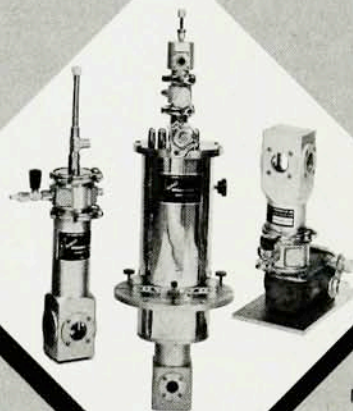
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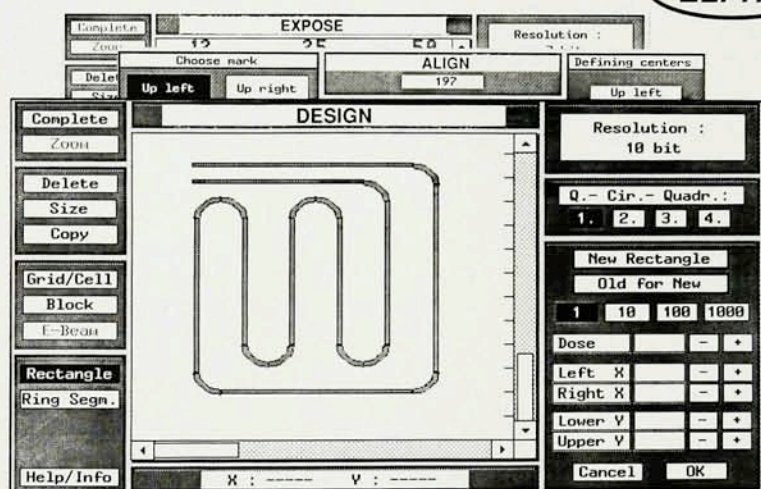
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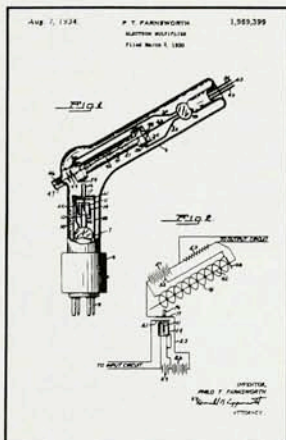
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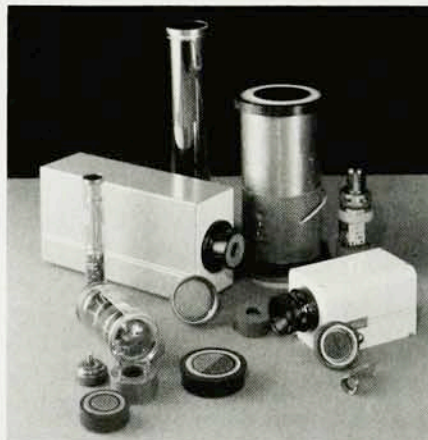
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