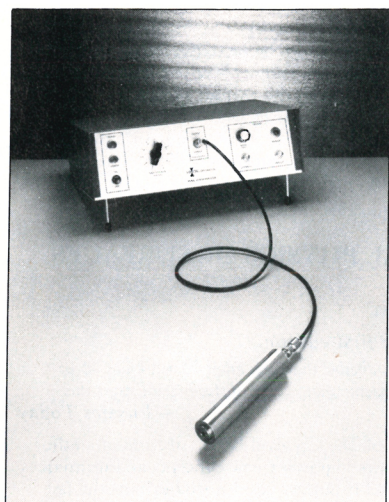


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LETTERS

continued from page 15

Undergrad Research: A Missed Opportunity

The "News from APS" section of the February issue (page 109) listed US physics departments that are accepting applications from undergraduates for research positions this summer. I was surprised to find no mention of the department of physics at North Carolina State University. Our department is accepting applications for the fourth year of its NSF-sponsored Research Experiences for Undergraduates program. The application deadline is 1 May.

MICHAEL PAESLER
Department of Physics
North Carolina State University
Raleigh NC 27695-8202

2/91

Transparencies Made Opaque

It is gratifying that John Rigden's Opinion column regarding overhead projectors (March 1990, page 73) is being examined with approximately the seriousness that it deserves (September 1990, page 132).

I like overhead projectors and disagree with Rigden's basic premise. However, a good tool that is used badly can get a poor reputation. Therefore I wrote a set of guidelines to help students use transparencies properly. At the urging of colleagues, and in spite of my usual modesty, I am publishing these guidelines so that others may benefit:

▷ Write to within 1 mm of the edge so that it is easy to let either the screen or the projector cut off some material. The audience will pay more attention if it is forced to guess.

▷ Use pale, transparent colors. Pale green is particularly good; it can seldom be read from beyond the second row.

▷ Color that is used consistently makes things too easy to follow and causes somnolence. Change color erratically within each equation. The audience may be inspired to credit you with lines of reasoning that never occurred to you.

▷ Data points in graphs must be indistinguishable from flyspecks. You can then decide on the spot, so to speak, whether to claim agreement or disagreement with theory. Such decisions should be made after one senses the mood of the audience.

▷ Before the talk, project your transparencies in a room similar to the one that will be used. If anything can be deciphered with the aid of opera

glasses from the middle of the room, write smaller.

▷ Plan the time for each transparency. A useful formula is

$$\frac{4\pi \text{ seconds}}{\exp(\text{number of eqs. on transparency})}$$

▷ If you are offered the insult of being scheduled in a small room, have the projector placed low so that it must be angled upward toward the screen. The importance of your talk is then made manifest by the key-stone-shaped illuminated region, and some of the area will necessarily be out of focus.

▷ Obscure. You may try to stand so as to block the view of the screen, but there will usually be some who can see. It is more effective to stand very close to the projector and intercept about a third of the light with your shoulder. Point to things directly on the transparency with as blunt an instrument as is available. Your finger can be effective, but a blackboard eraser is superior.

▷ Make it clear that you are a perpetually jet-setting speaker who doesn't think that the present audience is worth much preparation. Your transparencies should be smudged and scratched, and some should be out of order. Emphasize that they have been written at 30 000 feet. "Let's see what's on the next one" is always a useful insult. Mumble something about having used this stuff for the principal talk at the Belgrade summary of the Tokyo Conference, and about having been too busy to sort it out since.

▷ Bring a very large stack of transparencies, on any subject, that you do not show during the talk itself. If anyone asks a question at the end, further impertinence can be headed off by showing 17 of them.

It is a pleasure to acknowledge the help of the many colleagues who, by their example, contributed to these guidelines.

ROLF G. WINTER
College of William and Mary
Williamsburg, Virginia

10/90

Corrections

January, page 17—The photograph of the 1990 Nobel laureates in physics was taken by Tom Nakashima.

January, page 63—The page count, price and ISBN number given for part I of the book *Analysis, Manifolds, and Physics* should have been listed as belonging to part II, and vice versa. ■