

age of the capital outlay, lower indirect cost rates result for start-up periods. Furthermore, the depreciation does not recover the capital outlays during later years since replacement costs are almost always higher than original purchase costs and the government mandates a linear depreciation. If, in addition, the institution treats depreciation as a pure accounting procedure without setting aside the corresponding monies in a special replacement fund, then the institution is in real trouble later on. In our 9-year-old institution, depreciation alone amounts to 38 percent of the allocable indirect costs. Finally, the cost of public relations and fund-raising has to be treated as a direct cost which is thus not recoverable. At my institution, the non-recoverable fraction of the indirect costs is about 10 percent—even if all of our research and teaching programs could be funded solely through direct and indirect costs from external grants and contracts and even if there were no inflation, we would still be 10 percent short of revenues. In addition, we cannot recover the amounts used for cost sharing.

There are various ways an administrator can try to make ends meet under these circumstances and in most cases the help of faculty is needed. Best, of course, would be to have an unrestricted (and even better—an unlimited) endowment fund, which is a daydream. Second best would be to get a lot of money through unrestricted gifts or through state allocations. In the absence of such unrestricted funds, the only alternative under current regulations is to charge as much as possible (if it is allowable, reasonable, and allocable) to direct costs instead of indirect costs, whether it be within a given grant or whether personnel can be moved from unrestricted funds to restricted external funds. A better solution to this problem would be a change of federal policy such as the removal of the cost-sharing requirement or the recognition of research as a legitimate and necessary obligation of academic institutions. This would imply a governmental base funding of research which could eliminate the charging of indirect costs altogether. Many European countries have adopted this model and the results are not bad. Until such policy changes are instituted by the federal government, institutions have to insist on a full recovery of indirect costs. However, I must admit that I did not realize all financial implications of academic financing during my professorial days either. As an administrator still engaged in research, I do see both sides of the coin, however.

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Authors' names

The editors of the journals published by the American Institute of Physics urge authors to use the same form for their names on all their papers. The reader who tries to locate a paper usually turns first to an author index. If the same author spells out the first name on some papers, uses initials on others, is inconsistent in adding a Jr, the reader may miss the paper, or the copy editor who prepares an "author collapse" for an index is likely to make a mistake. Authors who submit manuscripts should check with their coauthors to ascertain what form of their names the coauthors prefer.

H. H. BARSCHALL
Chairman, Publication Board
American Institute of Physics

4/81

Electric guns

Your December Search and Discovery story on Electromagnetic Guns and Launchers (page 19) failed to mention a device that has launched intact projectiles at more than twice the quoted "world speed record" of 10 km/s. This device, which was first described by D.V. Keller and R.J. Penning Jr¹ and A.H. Guenther and his collaborators twenty years ago, uses electrically-exploded metal foils to accelerate thin plates to hypervelocities. At Livermore we have made extensive use of this device, which we call an "electric gun," in studies of shock initiation of high explosives.³⁻⁵ Recently, we have become interested in the potential of the electric gun for high-pressure equation-of-state studies and have constructed a gun that is powered by a 100 kJ, low-inductance capacitor bank. In its present configuration, this electric gun has accelerated a 6.35-mm-diameter, 0.25-mm-thick Kapton foil to a velocity of 22 km/s. For our initial high-pressure studies we are using composite, plastic/tantalum projectiles in the velocity range 7-13 km/s which will generate pressures from 0.44 to 1.21 TPa in symmetric impact experiments. The principles and applications of the electric gun are discussed in a recent paper in *Review of Scientific Instruments*.⁶

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3/81

Corrections

May 1981, "Wiggler and undulator magnets" by Herman Winick, George Brown, Klaus Halbach and John Harris appeared with the following misprints:

page 52, caption of figure 3 should read "with polarization parallel (σ)."

page 54, legend of figure 6 for black curves should read "(in operation)" instead of "(under construction)."

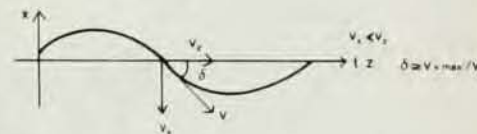
page 56, caption of figure 7 should read "Program by Y. Zambre."

page 57, first column " $\langle B \rangle^2$ " should read " $\langle B^2 \rangle$."

caption of figure 8, should read "(typically 2 microns)."

page 58, third column, fourth line, should read "The undulator radiation retains the intrinsic brightness of synchrotron radiation because..."

first figure in box revised as follows:



page 60, first column, starting 14 lines from bottom should read "the transverse beam size (σ_x, σ_y) should satisfy the condition $\sigma/L < \gamma^{-1} N^{-1/2}$, where L is the distance from the undulator to the detector; the electron beam divergence angles (σ'_x, σ'_y) should satisfy $\sigma' < \gamma^{-1} N^{-1/2}$."

page 62, equation 8 should read

$$B_0 = 2B_e \exp(-\pi g/\lambda_u) \times \frac{\sin \pi/M}{\pi/M} [1 - \exp(2\pi h/\lambda_u)]$$

middle column, line end of first paragraph should read "... from 3-7 keV are shown in figure 9".

May 1981, "Facilities in the United States" by Ednor M. Rowe: table, page 36, "A. I. Bienstock" should read "A. I. Bienenstock"; "Standford, CT" should read "Stanford, CA." □