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MACRO COLUMN

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The macro column is off to a good start. Readers are commenting on published macros as well as sending in descriptions of problems they have encountered. However, no one has yet submitted solutions to posed questions ...

Errata

There are two minor corrections to macros published in TUGboat, Vol. 2, No. 2.

(1) Mike Spivak notes a subtle error in McKay's definitions for ↑ and ↓. Since the macros classify these characters as type 13, spaces after them are not ignored, even in math mode. As a result

```
2↑ x
```

gives

$$2x$$

because the superscript is the space. For $\mathcal{A}\mathcal{M}\mathcal{S}$-TEX, Mike has fixed this problem by having ↑ first check whether #1 is a space, using `\compare* {#1}`.

(2) When used in horizontal mode, Patrick Milligan's `\Apply` macro may cause extra space to be inserted. The carriage return after the opening left brace, and the space after #1 in the redefinition of `\Func` are significant.

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TUGBOAT MACRO INDEX

The following list catalogues macros that have appeared in earlier issues of TUGboat. Entries are listed by volume, number, and page as well as author's name. Items that could not be categorized by an obvious headword have been listed under "miscellaneous". Many items refer to parts of large macro packages; users of other packages may find them valuable models for macros of their own.

Readers' comments on the format as well as the contents of this index are welcome.

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BUBBLES: A TEXTENSION IN SEARCH OF A TEXPE

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Preamble

The bubble notation used in particle physi identical in format with a notation for tensors to the relativist Roger Penrose. This "langu is strictly formalised, with the possible diagr governed by a few simple rules. In effect, a diag consists of a number of "boxes", joined togethe lines. A TEX extension is proposed, in which Pen or bubble diagrams can be displayed in exactly same way as mathematical formulae.

Analysis of the notation

There are 2 elements in the diagrams.

First, there are the **tensors** or **bubbles**. Eac these consists of a "container" of some kind, usu a rectangle or a circle. Inside there may be an i tifying name or symbol.

Emerging from the perimeters of these contai are the second element of the diagrams, the a An arm may join 2 tensors; or it may extend to edge of the diagram.

The relative positions of the arms on a tensor significant, e.g. if the tensor T is represented b rectangle, with 2 upper arms and 1 lower, then left upper arm must be distinguished from the r upper arm; and both are quite different from lower arm.

(If only that sought-for TEXpert could tell me to replace this pedantic description of a box b magical control sequence ... !)

Meaning of the Penrose notation

Although not strictly necessary, it may hel I explain, very briefly, the interpretation of Penrose notation for tensors.

In the classical (Einstein) notation, a tensor type $(1, 2)$ (for example) is denoted by

$$T^i_{jk}$$

Here i, j and k are "dummy suffixes", so that e

$$T^a_{bc}$$

represents exactly the same tensor.

In the Penrose notation, T is incarcerated box, with 1 upper arm (corresponding to the u index i) rising from the top of the box, and 2 l arms (corresponding to the lower indices j an descending from the bottom of the box.

The joining of arms on 2 tensors (or on the s tensor) in a Penrose diagram corresponds to the **traction** of the corresponding indices—denote