

letters

been considered by the authors. Worse than this, there is no arguing with the editors because, obviously, "right is on their side" since the present ideas must be good ones or they would not result in erudite mathematical papers and Nobel prizes.

I have no reasonable suggestion as to how the "Ice Age" can be thawed, apart from the obvious effort of individuals or small groups of scientists collaborating privately to produce better theories without any of the support from the science community provided by publications and complicated experimental facilities. This is one tall order in the present climate!

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2/83

Progress on Chinese universe

In July 1972 (page 15) PHYSICS TODAY published a short letter by me entitled "Chinese universes," in which I speculated that our observable universe might be a black hole in another universe and so on *ad infinitum*, thus forming an infinite tree-like or fractal structure in space-time. Roger Penrose informed me that he had independently made a similar speculation in his Adams Prize essay of about 1967, but he added "I don't think I really believe it though!" M. Ruderfer, in a private communication, suggested the name "Bubble-bath super-universe."

The speculation has recently received some support because Paul Birch, a radioastronomer at Manchester, England, reported evidence in July last year that the universe is rotating [*Nature* 298, 451 (1982).] This finding supports the speculation because it is believed that black holes would nearly always rotate.

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2/83

Laser acceleration

I would like to point out an error of fact in your news story on laser acceleration (February, page 19). In the "Plasma beat-wave accelerator" section, you state that experiments at the National Research Council in Ottawa have "succeeded in accelerating electrons to about 1 GeV by the BWA mechanism." The experiments at NRC were conducted using only a single-frequency beam, and electrons with a maximum energy of 1.4 MeV were observed and attributed to the forward Raman instability, which is a similar nonlinear process to the beat-wave generation process.

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