

financial crisis of the late 1990s, it was happy to join the US as a major partner in the collider. Following Europe's example, the US government and the science community agreed that the US research labs should be centralized at one facility, even though the technical breakthroughs that had lowered the cost of the collider so that it was affordable had been made at the Stanford Linear Accelerator Center. And that is how the collider ended up at the Fermilab site, with the enthusiastic support of the lab director. Winstein will not have far to go to visit it.

GORDON L. KANE
(gkane@umich.edu)
University of Michigan
Ann Arbor, Michigan

Seventy-Plus Years in Physics: Bethe Finds His Match—in Family

I believe one can take exception to Kurt Gottfried's remark, in his review of Hans A. Bethe's new book (PHYSICS TODAY, July, page 65), that no other physicist of this or any other era could have written Bethe's opening sentence: "This book contains a selection of my publications of the 70 years during which I have been active."

In fact, Bethe's own father-in-law, Paul P. Ewald, could have written the same sentence. Ewald's doctoral research on crystal optics (completed in 1912 under Arnold Sommerfeld) was the impetus for Max von Laue's famous investigations that launched the field of x-ray diffraction. Ewald continued his research in optical and x-ray phenomena (including the development of both the reciprocal-lattice theory and the dynamical theory of x-ray diffraction) for over 70 years, until he passed away in 1985 at the age of 97. His last paper was published posthumously in *Acta Crystallographica* (volume 42, page 411, 1986).

REUBEN RUDMAN
(rudman@panther.adelphi.edu)
Adelphi University
Garden City, New York

Physics Update: 'Fractional' Flux Quanta May Be Random

With regard to your "Physics Update" story on quantum boxes for Cooper pairs (February, page 9), I want to point out that the "fractional" flux quanta in Andrey Geim and company's measurement of magnetization

as a function of flux are basically random portions, not rational fractions, of the quantum. There are, however, other examples of fractional quanta that are neatly determined and have recently appeared in the literature.

In an array of wires containing Josephson junctions at a temperature of 0.3 K, the resistivity as a function of flux clearly shows that fractional flux occurs. The values of $\frac{1}{2}$, $\frac{2}{5}$, $\frac{1}{3}$ and $\frac{1}{4}$ are clearly seen,¹ and the theory can perfectly explain fractions of less than $\frac{1}{2}$.

For a single Josephson junction with various phase shifts, the smallest value of the flux permitted by the present theories is $\frac{1}{2}$ of $hc/2e$. However, my colleagues and I have found that $\frac{1}{4}$ flux quantum is the minimum.² Our result is deduced from the turning point in the magnetization as a function of temperature in the paramagnetic Meissner effect.

Thus, the smallest commensurate value of the flux reported to date is $\frac{1}{4}$, according to us.² Arguments have been put forward in support of the elementary flux being $hc/2e$, but other, smaller values have not been contradicted.³

References

1. H. R. Shea, M. Tinkham, *Phys. Rev. Lett.* **79**, 2324 (1997).
2. N. Krishna, L. Lingam, P. Ghosh, K. N. Shrivastava, *Physica C* **294**, 243 (1998). (Our paper was received by the journal in January 1997, but subsequently there were delays in the publication process.)
3. N. Byers, C. N. Yang, *Phys. Rev. Lett.* **7**, 46 (1961).

KESHAV N. SHRIVASTAVA
(knssp@uohyd.ernet.in)
University of Hyderabad
Hyderabad, India

Lawsuit Update: More on APS/AIP's Dispute with Gordon & Breach

Irwin Goodwin took the time to speak with me at length about the case he covered in "Court Rules for APS and AIP in Dispute with Gordon & Breach over Survey of Journals" (PHYSICS TODAY, October 1997, page 93). In addition to correcting one misquotation, I would here like to mention a few brief points that are pivotal, but unfortunately were omitted from Goodwin's story. Since my letter is appearing 11 months after it was submitted, I also want to take this opportunity to update your readers on the status of the case.

Fundamentally, G&B objects to the

continued on page 92

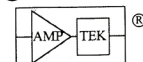
World's Smallest MCA



Size: 6.5" x 2.8" x 0.8"
(165mm x 71mm x 20mm)
Weight: <300 grams (including batteries)

The **MCA8000A** is a full featured, low power **Multichannel Analyzer** intended to be used with a wide variety of detector systems.

- ⊙ 16k data channels
- ⊙ Storage of up to 128 different spectra
- ⊙ 24 hours of continuous data acquisition from two 1.5V AA batteries
- ⊙ Successive-approximation ADC: Conversion time $\leq 5 \mu s$ ($\geq 200,000$ cps)
Two stage input analog pipeline
Sliding-scale linearization
- ⊙ Maximum counts per channel 4.29 billion
- ⊙ 115.2 kbps serial interface
- ⊙ Selectable real/live timer preset up to 1.7×10^6 seconds
- ⊙ Differential nonlinearity $\pm 0.6\%$
- ⊙ Integral nonlinearity $\pm 0.02\%$
- ⊙ Gain stability ± 10 ppm/ $^{\circ}C$, Zero drift ± 3 ppm/ $^{\circ}C$
- ⊙ Two TTL compatible gates
- ⊙ Serial ID number via software
- ⊙ Password data protection
- ⊙ Free Windows & DOS software



AMPTEK INC.

6 De Angelo Drive, Bedford, MA 01730-2204 U.S.A.
Tel: +1 (781) 275-2242 Fax: +1 (781) 275-3470
e-mail: sales@amptek.com www.amptek.com

Circle number 13 on Reader Service Card