

# The Village Critic



fermi national accelerator laboratory

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## BENJAMIN LEE COMMENTS ON HEP DISCOVERIES

*Benjamin Lee as head of Fermilab's Theoretical Physics Department, is frequently asked what the new discoveries in high energy physics mean, where is the field headed, what is going to happen next? Dr. Lee comments on these matters in the following remarks prepared for a seminar for science writers at the recent meeting of the American Physical Society:*

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There is an exhilaration in the air wherever particle physics is discussed these days, excitement about the rapid progress that has taken place in the last few years. On the theoretical side, we have glimpsed the unity of all forces that act among particles; we have constructed a theoretical framework in which to unify three forces in nature -- the so-called electromagnetic and weak forces, and perhaps even the strong force which is responsible for binding quarks to form hadrons (the strongly interacting particles which include the proton, neutron, pi mesons and strange particles). The unified understanding of these forces in nature demands that there be at least one more quark -- the "charmed" quark -- and perhaps other quarks and even heavier forms of electrons and muons, of the family of weakly interacting particles we call leptons.

If there is a charmed quark, there ought to be "charmed" hadrons made up of charmed quarks and ordinary quarks. On the experimental side, there have been a number of indications that we might already have seen such particles. It is likely that we have discovered charmed particles and a heavy lepton, although profusion of the new events clouds our vision at the moment.

When I explain to my family and friends what I do and how we go about it, I often liken the process of physics research to solving a jigsaw puzzle (Jackson Pollock's "Convergence," for example). As we put together pieces to form patches, a certain image of the overall picture emerges, but until the game is sufficiently progressed, we are not quite sure. I feel much the same way about the wealth of signs for new particles. We have patches that have been put together, but we are not quite sure how all pieces will fit together into a coherent whole. There are also certain pieces which do not seem to fit into any patches at all. For the most part, the experimental findings have not been completely unexpected, but there have been certain surprises that I, for one, had not foreseen. This is what makes particle physics exciting and tantalizing. At moments of despair and frustration, I feel as though somebody has scrambled two boxes of jigsaw puzzles for me to put together. But I believe in what Einstein once said: "God is subtle but He is not malicious."

Aside from the new particles we have spoken of so far, there are several new objects we must discover. Can quarks be liberated from the confines of a hadron? Prevailing theoretical prejudice says otherwise, but nobody is absolutely certain of this. We know that the electromagnetic force and the quantum of light (photon) are two aspects of the same mathematical construct, called quantum electrodynamics. It has long been speculated that there are quanta, or particles, which bear the same relationship to the weak force as the photon does to the electromagnetic force. Furthermore, these particles, called intermediate vector bosons, are required in any unified description of fundamental forces. Currently popular theories predict the masses of these particles to be very large, so large that even the most powerful of existing accelerators cannot produce them.

These observations do not exhaust all the possibilities as we see them now, but they indicate the range of exciting opportunities that may be expected. More exciting still is the certain knowledge that nature's possibilities are not limited by our imagination. We must remember that the knowledge and arts we gain today are our legacy to posterity. This is what civilization is all about. Individual names may soon be forgotten, but the aspiration and achievements of an age, and of a nation, will forever be remembered.

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*FERMILAB'S ARTS AND CRAFTS SHOW opens Monday, May 17 in the Atrium of the Central Laboratory. Many diverse talents are found in the Fermilab community. Some of the talented people will exhibit in next week's show. But other projects -- like Dick Lundy's Rolls Royce -- must remain conversation pieces...*



...Myrtle  
water



...Tony Frelo (photography) - model airplanes...



...Wayne Nestander  
(Neutrino)  
jewelry box...



...Sue Po  
Facili



...Marilyn Kasules (Safety)  
ceramic wall piece...



...Dick Lundy (Neutrino) - classic  
car restoration...





...S. Martin (CTF)  
...color painting...



...Elton Anderson  
(Accelerator Div.)  
...jewelry...



...Dave Cosgrove (Accelerator Division)  
...metal sculpture of "Beowulf"...



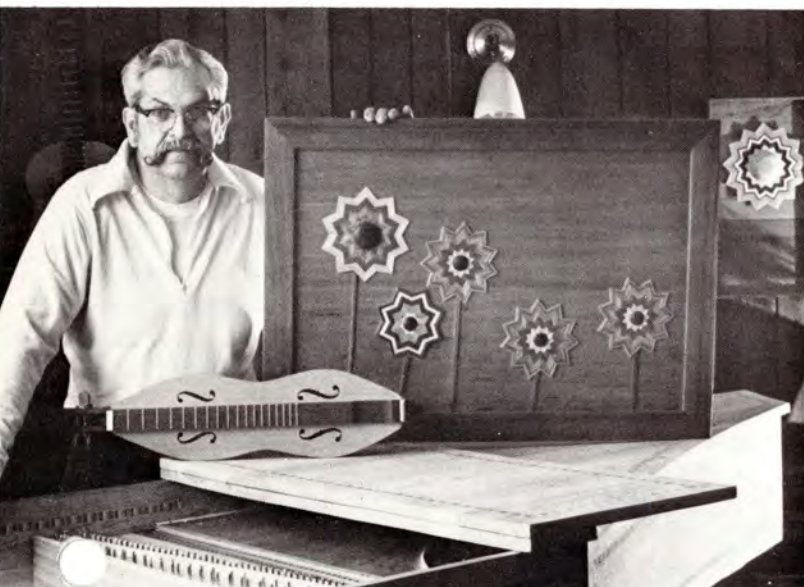
...Bill (Scanning  
...ty) - macramé...



...Ginny Lindquist (Site  
Services) - knitting  
specialties...



...Sandra Cox (Administrative Div.)  
...pottery...



...Jim Buffenmyer (Magnet Facility) - wall  
plaques, musical instruments...



...Elsie Renaud (Superconductor)  
...decorated eggs...

DARRELL DRICKEY MEMORIAL LECTURE

Friday, May 14 - 8:30 p.m.

Auditorium

Luis Alvarez, Nobel Laureate

"Ernest Lawrence's Laboratory -- Where the Big Machines Began"

Admission free - tickets required

Tickets available at Guest Office - CL-1W

TALENT NIGHT SCHEDULED FOR JUNE 18

Fermilab's Auditorium Arts Series is looking for all Fermilab performers for a grand "Talent Night" in the Auditorium on Friday, June 18, as a program of the Auditorium Art Series. Registration forms are enclosed with this issue of The Village Crier, and auditions will be held Saturday, May 22. All Fermilab-related people and members of their families are welcome to participate. For further information contact Jane Theis, Ext. 3126; Denise Augustine, Ext. 3091; Sandra Cox, Ext. 3648; Larry Jackson, Ext. 4070.

Fermilab Inter/National Film Society

presents

*FORBIDDEN GAMES*

Saturday, May 15 - 8 p.m. - Auditorium

\$1.50 adults

...HAPPY HOUR - Village Barn - Wednesday, May 19 - 5-7 p.m.

NALREC'S MONTE CARLO NIGHT

Users Center

Saturday - May 15

Dinner 7-8 p.m. -- Games 8 p.m. to midnight

Buffet Dinner - \$3.00

(Tickets must be purchased in advance)

Cash bar

\$5,000 play money

Auction at midnight,

assorted merchandise

Tickets and information from Jo Baaske, Payroll, CL-4E; Carolyn Longland, Purchasing, CL-4W; Barb Schluchter, Research Division, CL-2W; Chuck Grozis, Research Services, 35 Shabbona.

CLASSIFIED ADS

FOR SALE - Lake Havasu City, Arizona properties. Contact Harold Minster, 598-4163 after 4 p.m.

FOR SALE - 1972 Opel 1900, clean, AC, FM, exc. mpg, good tires, new exhaust system, \$1500, Dan Rubino 690-8492.

FOR SALE - 1975 Opel Manta, 2 dr., Rallye, gold, 4 spd. fwd., purchase price \$4120.65, will sell for \$3300, or best offer. Ernie, Ext. 3210.

FOR SALE - 1969 Mustang, 302 V-8, AT/PS, 2 snow tires w/rims. J. D. Hogan, Ext. 3701.

FOR RENT - 1 bedroom apt., AC, swimming pool, tennis, close to lab, \$210/mo. R. Florian, Ext. 3734 or 355-4127.

FOR SALE - 1968 Apache, pop-up camper, call Tom, Ext. 3575 or 898-2595 after p.m.

COME BY BUS FOR ERA! - Come any way. Mammoth rally in Springfield for equal rights. Sunday, May 16, 10 a.m. - 4 p.m. Contact Judy Mueller, Ext. 3936.

FOR SALE - Tennis equipment - racquets, balls, bags, and shoes. Racquet stringing and re-gripping. Call Mike May, Ext. 3977 or 896-3467.

RECEIVE FOREIGN MAIL? - Please save the postage stamps. Graciela Finstrom, 6W, Ext. 3447.

FOR SALE - 17' boat w/125 Merc. & homemade trailer, \$1800; 3.5 h.p. Rototiller. Call Bob, Ext. 3076 or 879-2465.