

FERMILAB NEWS

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April 30, 1981

SELF-QUENCHING STREAMERS PUT ON VIVID VISUAL DISPLAY

A new method for detecting charged particles has emerged from detector research and development and promises advances for high energy physics instrumentation.

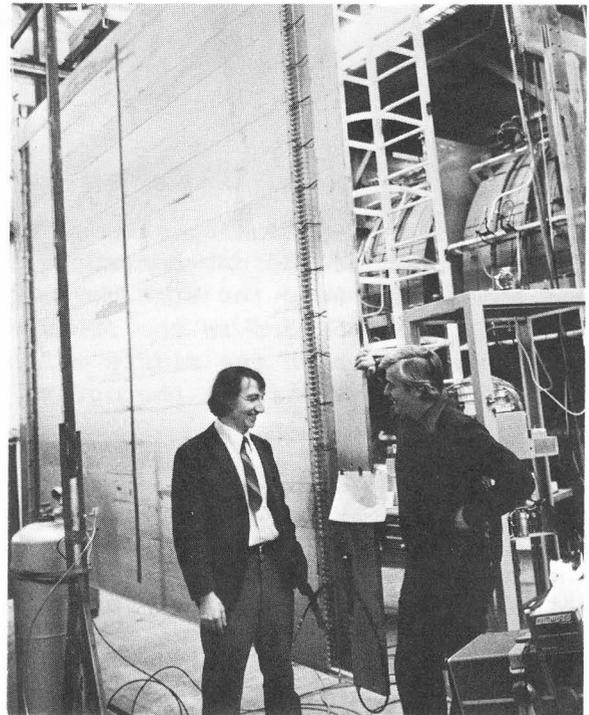
Muzaffer Atac, Fermilab physicist, developed the new method while working with a type of detector called a drift tube. This is a modern version of the Geiger tube used in the very early experiments in particle physics. A modern drift tube consists of a long metal tube, typically one inch in diameter, and a thin wire running down the center. The tube is filled with a special gas mixture, and a constant voltage of about 3,000 volts is applied between the wire and the tube.

Ions produced by a charged particle passing through the tube will drift to the wire, produce an avalanche of ions in the strong electric field near the wire, and thus induce a small voltage pulse on the wire. This pulse can be amplified and recorded. By using a 4-mil diameter wire and a gas mixture of argon-ethane and ethyl alcohol vapor, Atac was able to increase the voltage to 3,200 volts, at which point self-quenching streamers were produced.

Photographs of the streamers were recorded using a double image intensifier video camera. The streamers were 8 mils thick and were formed perpendicular to the wire, starting at a distance of one-eighth inch from the wire.

Atac explained that electronic signals obtained in this mode are so large that it improves precision in reading out positions of charged particle tracks. It simplifies readout systems because these detectors do not require amplifiers. Enthusiastically he said, "We are able to see every individual streamer as it develops. We are the first ones to see this."

Scientists with Experiment 594, which will run in the neutrino beam line, plan to use many layers of this detector. They



Jim Walker (Right), spokesman for Experiment 594, chats with Muzaffer Atac. Behind the two scientists is the first 14-foot by 14-foot limited streamer chamber that will be used in the experiment. (Additional photographs on page 2.)

already have built one that has an area of 14 by 14 feet.

Atac went on to talk about this first application of limited streamer detectors at Fermilab. "These detectors will immediately be able to tell the scientists the number of charged particles in the event they are looking at. They will be able to select the type of event they want and get rid of most of the unwanted background. Other possible applications are hadronic and electromagnetic calorimetry, where the total energy of a particle has to be determined. This may provide us with a new, important tool."

Atac has been with Fermilab for 13 years and is presently assigned to the Colliding Detector Facility.

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DOE LAND USE CONFERENCE
TO BE HELD AT FERMILAB

The Department of Energy will hold its Third Annual Site Development and Land Use Conference May 5-7 at Fermilab.

The conference is open to all DOE employees and contractor personnel. It is co-sponsored by DOE Headquarters and the Chicago Operations Regional Office and co-hosted by Fermilab and the Argonne National Laboratory.

The purpose of the conference is to discuss various DOE programs including energy impacts on site development, master plan presentation techniques, aerial photography, site mapping, models and their use in planning, in-house versus contract planning and planning information sources. Hank Hinterberger, head of Technical Services Section at Fermilab, is coordinator for logistics and arrangements.

The first day of the conference is reserved primarily for tours of Fermilab and Argonne. Technical sessions begin the next day, May 6. Speakers that morning include Leon Lederman, Fermilab director; Walter E. Massey, director of the Argonne National Laboratory; and Robert H. Bauer, manager and regional representative, CORO. William S. Heffelfinger, assistant secretary for management and administration for DOE, will give the keynote address. His talk is scheduled to begin at noon.

Prof. Hans Heinrich will speak on "Energy, Environment and Economics" at the banquet the evening of May 6.

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NEXT COLLOQUIUM SPEAKER

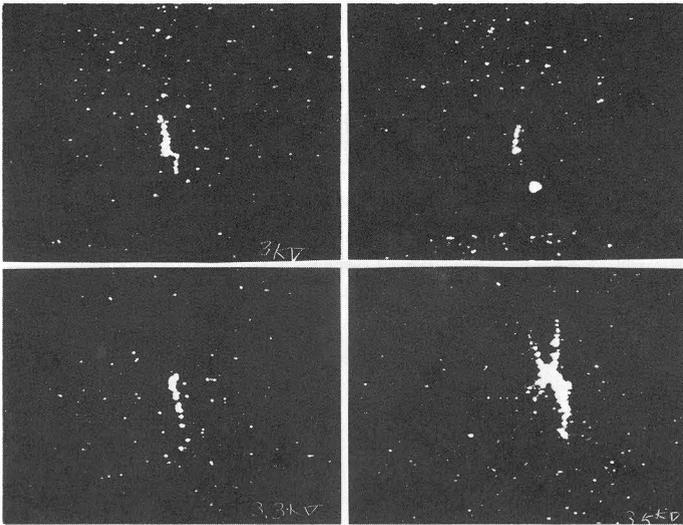
Dr. Harold Masursky of the U. S. Geological Survey will speak at the Physics Colloquium May 6. His talk on Voyager's visit to Saturn will begin at 4 p.m. in Wilson Hall auditorium. His host will be Petros Rapidis.

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ANNUAL REPORTS ARE AVAILABLE

Fermilab employees may each obtain a copy of the 1980 annual report. The 214-page reports are available in the Publications Office, southeast sector of the library.

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Photographs of self-quenching streamers. The wire in each photograph runs horizontally and through the point where the streamer begins (the top of the streamers in the first three photographs and through the middle of the streamers in the lower right photograph).

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PRAIRIE PROJECT PUBLISHES NEWSLETTER

The Fermilab Prairie Restoration Committee has begun publishing a newsletter.

Called the Fermilab Prairie Project Newsletter, it will be published once each two months. "The Newsletter will contain information concerning the restoration project and prairies in general, and will help keep volunteers current on approaching needs for their help," said editor Mark Thompson. The first issue was published in March.

The committee would like to expand its mailing list with the names and addresses of people who would like to receive the Newsletter and who might want to work with the project as volunteers. Names should be sent to the Public Information Office, Ext. 3351, MS 206.

The first issue contains a variety of articles on volunteer activities, recent progress and future plans. The first of a two-part feature on the history of the prairie project is one of the issue's highlights. It was written by Dr. Robert F. Betz, professor of biology at Northeastern Illinois University and nationally-known prairie expert. In introducing Betz's excellent article, editor Thompson sums in a few sentences the overall mission of the prairie restoration project and the many volunteers dedicated to it.

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ABSOLUTELY FANTASTIC--DON'T MISS IT

Graphics, that bright new domain claimed by computers, or rather those talented programmers who create the software that makes computers click, has considerably enhanced Fermilab's latest exhibit--salt water shells.

Perhaps the work that John Ingebretsen and Jeanne Krause of the Computing Department have done even overshadows the exhibit itself, for it is mightily tempting to stand nearly hypnotized in front of the terminal that's to one side of the exhibit and watch complicated mathematical formulas change themselves into growing shells. What John and Jeanne have done is to come up with a software program that generates on the terminal's screen the following shells:

--A cross-section of a chambered nautilus. This is based on an exponential spiral with ellipses drawn to represent the chambers. The sealed-off, gas-filled chambers serve as a balancing apparatus. The nautilus, octopus and squid are members of the same family.

--The side and head-on views of a sundial and a turritella. These shells normally live about seven years, and the patient observer can watch the fractions of a year tick by on the screen as the shells grow. These shells were generated by rotating a circle around its axis as the circle grew exponentially. The two shells have basically the same program, but with different parameters.

"The whole idea is to show that a seashell grows in a way that can be represented by mathematical formulas," said John.

"This also shows the symmetry of nature," added Jeanne.

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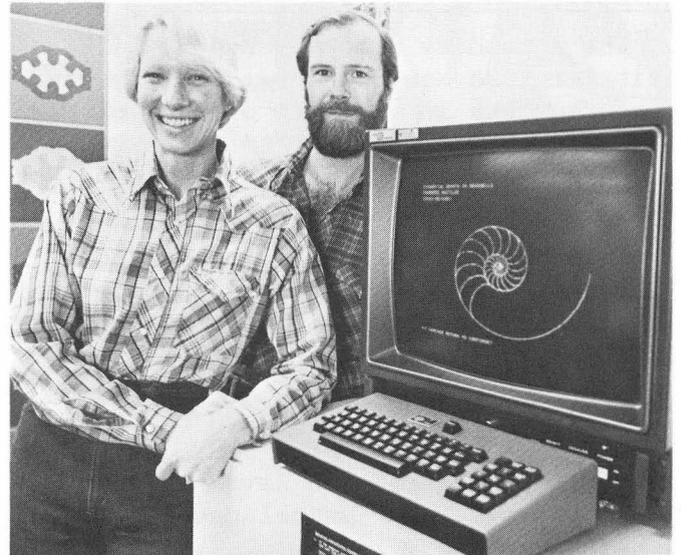
SIGMA XI TO TAKE GAMBLE

"Connections Between Optimal Gambling and Differentiation of Functions" will be the subject of the Sigma Xi lecture May 5.

The talk by Patrick Billingsley will begin at 8 p.m. in Wilson Hall auditorium. He is professor of statistics and mathematics at the University of Chicago. The lecture is open to the public and admission is free.

His presentation is sponsored by the Sigma Xi chapters at Fermilab and the Amoco Research Center.

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Jeanne Krause and John Ingebretsen with a cross-section of a chambered nautilus generated by their software.

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THREE SESSIONS TO BE HELD ON FAMILIES IN THE WORK PLACE

A series of three sessions, together called "Families in the Work Place," will be held at Fermilab May 13.

Admission is free. The three will be conducted one after another from 11 a.m. to 1 p.m. in Wilson Hall auditorium. They are presented by the Laboratory Services Section as a service to employees. Each session will last 35 minutes, followed by a five minute question and answer period. The sessions are:

1 - "Work and All That Jazz" will focus on the importance of work, work and stress, and work and the family.

2 - "Family Life and Change Patterns" will examine the family life cycle, symptoms of problems, divorce, single parenting, step-families and two paycheck families.

3 - "Minority and Foreign Families" will deal with specific problems, adjustment and community resources.

All of the speakers are associated with the DuPage County Health Department. Leading the first session will be Dr. David Jachim, a clinical psychologist. The second session will be conducted by Dr. John Farella, a family therapist, and Stephen Christian-Michaels, social worker and family therapist. Giving the third session will be Ellie Chapman, a community mental health worker.

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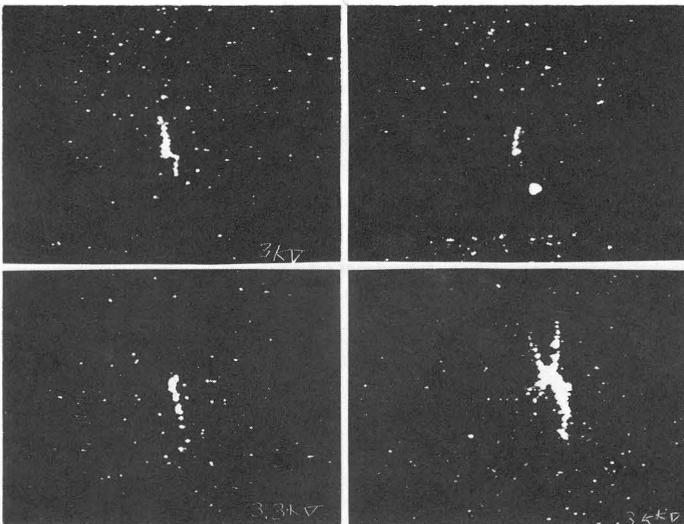
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HUMPHREY BOGART TO VISIT FERMILAB

The legendary Humphrey Bogart will visit Fermilab May 8 and 9. Not the man, of course, but in the form of four of his most outstanding movies: "Beat the Devil," "The African Queen," "To Have and Have Not" and "Casablanca."

This Bogart festival is presented by the Fermilab International Film Society. Admission for adults is \$2 per movie; for children age 12 and younger, each ticket costs 50 cents. All films will be shown in Wilson Hall auditorium. On May 8, "Devil" will be shown at 7 p.m. and "Queen" at 9 p.m. On May 9, "To Have" will be shown at 7 p.m. and "Casablanca" at 9 p.m.

These are some of the films that made Bogart a legend, particularly "Queen" and "Casablanca," which have earned a permanent place in the moviegoers mythical hall of fame. Some of the costars in these four movies have themselves become outstanding stars, and even legends: remember performers like Jennifer Jones, Gina Lollobrigida, Robert Morely, Peter Lorre, Katherine Hepburn, Lauren Bacall, Walter Brennan, Hoagy Carmichael, Ingrid Bergman, Paul Henreid, Claude Rains, Sidney Greenstreet?

And then there are the directors, some of Hollywood's finest John Huston, Howard Hawks, and Michael Curtiz. Put all of this together and the stew bubbles with excitement and outstanding entertainment.

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CHEZ LEON MENUS

Wednesday, May 6 - 12:30 p.m. - \$6.00

Hot beer soup
Beef ala Deutsch
Buttered noodles
Sauteed zucchini squash
Apple crisp w/cream

Thursday, May 7, 7:00 p.m. \$10.00

Fried chicken, Japanese style w/
ginger sauce
Japanese onion soup
Kushimono w/teriyaki sauce
(skewers of tenderloin/chicken)
Rice Pilaf
Sauteed Japanese style vegetables
Tozai pineapple w/sherbet

For reservations, call Ext. 3082, only.

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BIG TWIST TO PLAY AT BARN

Big Twist and the Mellow Fellows, one of the nation's top rhythm and blues groups, will play at the Village Barn May 14.

They are coming here to anchor NALREC's rhythm and blues concert that will run from 5:15 to 9:30 p.m. Big Twist will give two shows: 6:30 to 7:30 and 8:30 to 9:30 p.m. Another band, this one local - Mark Brant - will perform between the other concerts. Tickets are available from the ticket sales desk in Wilson Hall atrium, Ext. 3353. Only a limited number are available. Any not purchased by concert time will be sold at the door. They are \$4 each.

The NALREC committee organizing the concert includes Ed Justice as chairman, Jesse Guerra, Ed LaVallie, Ginny Ritchie, Walter Coleman, Sharon Koteles and Kim Chans.

Big Twist and the Mellow Fellows have paid their dues. They have climbed to the top of the rhythm and blues dynasty with concerts that have pulled a steady outpouring of praise from critics. Writers from the Washington Post, Chicago Sun-Times, Buffalo Evening News and many more have told their readers about the qualities of this band. "Twist is an exceptionally powerful blues singer. His richly shaded baritone is as broad and supple as an eagle's wing, and he uses it to propel expressive shouts that hit home standing up," writes Neil Tesser in the Sun-Times.

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WHERE DO YOU WANT THEM DELIVERED?

Now that they're here, what does the Laboratory do with them? It's not funny, rather it's an annoyance that has caused delays in receiving ordered material and in material being delivered to the wrong place--possibly even lost.

And it's so simple to keep all of that from happening. When you fill out a requisition, please put down where you want the Receiving Department to deliver the goods. Just like that, a few words can make sure that your ordered items get to you quickly and safely.

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