LNS NEWS

LAB. FOR NUCLEAR SCIENCE

M.I.T. CAMBRIDGE, MA.

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Promotions

Stephen Ciacera was promoted to Project Technician - Mechanical at the Bates Accelerator Center.

Masaki Fukushima of the Electromagnetic Interactions Group at L3 in Geneva, Switzerland was promoted to Principal Research Scientist.

Daniel R. Tieger was promoted from postdoctoral to Staff Physicist with the Spectrometer Systems Group at the Bates Accelerator Center.

Marion White of the Electromagnetic Interactions Groups at L3 in Geneva, Switzerland was promoted to Principal Research Scientist.

New Appointments

Erminia Bavaro joined the Laboratory's Headquarters Office as a Clerical Assistant. Erminia is a 1987 graduate of Medford High School, and is currently attending Newbury College.

Marie Gay is a Coop student at Northeastern University in Electrical Engineering, and is a computer operator at the Computer Center.

Stephen P. Holmberg, a Technician C - Mechanical, transferred to Bates from the Lab. for Manufacturing and Productivity. Steve is currently attending Lowell Institute.

Scott Ottaway is a Technician A (E-M) at Bates where he is working in the target facility. Scott was formerly at the Plasma Fusion Laboratory.

Alfred E. Talbot is a Machinist A at the LNS Machine Shop.

Howard Trottier is visiting the Center for Theoretical Physics from McGill University.

Gerard van der Steenhoven joined the Laboratory from NIKHEF, the Netherlands. Dr. van der Steenhoven is a member of the Medium Energy Physics group and will work with Prof. Redwine on the photoproduction program.

Karl von Reden is a member of the Medium Energy Physics group and is working at Bates on the photo-pion program. Karl received his Ph.D. at the University of Hamburg, W. Germany.

John D. Zumbro joined the Bates Center as a Staff Physicist. Dr. Zumbro is working with the Spectrometer Systems group. After receiving his Ph.D. at Notre Dame, John held appointments at Princeton and U. Penn.

Transfers

Nicole Adams, Secretary Headquarters Office, transferred to the Center For Cancer Research effective January 13, 1988.

In the last issue of LNS News we misspelled the name of Anne MacInnis. Anne was promoted to Secretary. Sorry for the error Anne.

Personality Profile -- Cristiano Gomes

Cristiano Gomes joined the Laboratory as a Technician B in the Electronics Design Shop in July of 1987. He is a graduate of Wentworth Institute where he majored in Computer Engineering Technology. He lives in Dorchester with his wife Deborah and their two young children. His wife, until their last child was born, was a curriculum coordinator for the Boston Public Schools for English as a Second Language. Cristiano met Deborah while taking an English course that she taught at a local high school.

Cristiano was born in the Cape Verde Islands. Economically life was difficult on Cape Verde for Cristiano's father. His father thought it would be better to move to Angola because there was more opportunity for their family, and so he went ahead and eventually sent for them. Angola is in south west Africa and its boundaries are the Atlantic Ocean, Zaire, Zambia and Namibia. Angola is rich in natural resources such as oil, diamonds, timber, copper, silver and gold. In addition there are two growing seasons for crops.

His father started a coffee farm and for a number of years their life on the farm went well and the family prospered. Cristiano says he still thinks of Angola especially when it rains in August. After a rain the coffee had a wonderful fresh perfume from the flower and it looked like the coffee fields were covered with snow.

When Cristiano got older he worked eighteen miles off-shore on a Gulf Oil rig. His schedule was that he worked twelve hours a day for two weeks and then had a week off. He had no plans to leave a country that was so rich in natural resources and with so much potential for growth.

But soon there was strife in Angola. Primarily three factions developed to overthrow the Portuguese colonial government -- the FNLA which was the National Front for the Liberation of Angola. Its support came basically from Western powers and Zaire. The MPLA was the Popular Movement for the Liberation of Angola which was supported by the Soviet Union and Cuba. And the UNITA which was the National Union for the Total Independence of Angola which was supported by the Western powers, including the U.S., and South Africa. As various factions in the country fought for power people were being killed in the vicinity of Christiano's home. He even lost contact with his sister because she was trapped in a city where communication was cutoff. For a year he did not know if his sister was dead or alive. Luckily he did find her alive.

Despite the richness of resources in Angola, eventually Cristiano followed his father to the U.S. leaving the coffee plantation which they had worked so hard to build. Many of the plantations are now state farms and the smaller farms have been transformed into smaller units and cooperatives that are mainly run by Cubans.

Although conditions are not as bad now as in some African countries like Ethiopia and Mozambique, strife still continues. Cristiano says that his two sisters and many of his friends who still live there find it difficult to buy products like car parts and even bread.

Cristiano has been in the U.S. for ten years and finds life here different from Angola. "In Angola, he says, "you always knew your neighbor and could go to anyone's house for a meal or to sleep. Here, at least in the city, I feel we have lost touch with our neighbors. You can live in a neighborhood for years and not know your next door neighbor."

He left a country that was rich in culture, one where many people are artistic and find great joy in carving and painting. Angolians are also a spiritual people in tune with their environment. Cristiano found that many of the medicine men, who work with herbs do cure people. The people are also interested in education and learning.

Cristiano likes taking risks -- playing soccer and white water canoeing. He also enjoys reading biographies and science fiction. His favorite author is Isaac Asimov. He especially enjoyed reading Out of Africa because he felt he could relate so well to the book.

Cristiano is an eager learner and is trying to master everything he can in the Electronics Design Shop. He says it's funny that he has become so interested in electronics, because the first time he watched television was 1976. He adds that he doesn't think he has missed much by not watching television.

He is a welcome addition to the Laboratory.

News from Bates

by William Lobar

The traditional Christmas-New Year Party was held at Bates on December 31. The Committee was composed of Kelly Farley, Joe Grande, Audrey Iarocci, Dick Keating, John Mumley and Coles Sibley. The meal was cooked and catered by Scott Patch, a senior at Harvard University and summer employee at Bates. All those involved are to be congratulated for an excellent and conscientious job.

Bates T-shirts were distributed by the Soda Fund Committee (John Bavineau, Bill Lobar, and John Mumley) to all employees on December 16. The shirts are blue with a Bates logo in white on the front.

Congratulations to Peter Bonneau on the birth of a son and to Ernie Ihloff on the birth of a daughter.

A talk and tour of the Bates facilities for MIT Freshmen was conducted on January 19th by Wade Sapp. This was part of the LNS participation in IAP.

Thomas Provost, Group Leader for Data Acquisition at Bates, was elected to the DECUS Board of Directors and chosen to be Vice-President of the organization. DECUS is the Digital Equipment Users Society. Tom's term on the Board of Directors runs for two years and his Vice Presidency runs for one year, both were effective July 1, 1987.

Noteworthy Notes

Phil Zlochiver, a former employee of the Lab., is recuperating at home from a lung operation. If you would like to send him your get well wishes, his address is 63 Highland Street, Canton, Ma. 02021.

Prof. W. Carl Barber is at Fairlawn, 265 Lowell Street, Lexington, Ma. We understand he plays a mean game of chess and would like to hear from you.

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TO ALL NEW EMPLOYEES (EXCEPT BATES) AND GRADUATE STUDENTS WHO DID NOT ATTEND THE LAST SAFETY SEMINAR. A SAFETY SEMINAR IS PLANNED FOR FRIDAY, MARCH 4, 1988 FROM 10:00 A.M. TO NOON IN E25-111. YOU ARE REQUIRED TO ATTEND. ATTENDANCE WILL BE TAKEN.

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Social Security Rate Hits 7.51%

Beginning January 1, 1988, the Social Security tax rate for both employers and employees is 7.51 percent. The tax rate increases from last year's rate of 7.15 percent.

Other changes include:

--Cost-of-living increases in benefits is 4.2 percent, payable January 1988. The increases reflect changes in the Consumer Price Index from the third quarter of 1986 to the same period in 1987.

--The maximum monthly benefit for workers retiring at age 65 this month is $838.

--submitted by Dick Adams

We are saddened to report that Eddie Griffith died of cancer. Eddie was a long-time employee of the LNS Drafting Department.

We now have available the following items for your use.

Videos

The L3 Detector, prepared by Hans Rykaczewski of the L3 Administration and Communications Group at CERN (June 1987).

The UA1 experiment at CERN, prepared by the BBC.

The Superconducting Super Collider, prepared by Boston University.

Interviews

E.J. Moniz interviewed by William Osborne of WNSH, North Shore News, October 5, 1986.

We also have an SSC Speaker Packet available. At the suggestion of Prof. L. Osborne, we have made copies of slides from the packet into transparencies for your convenience. This will make it easier for presentation.

The LNS Graduate Student brochure and the SSC brochure are also available if you would like to have a copy.

Thanks to all who have contributed to LNS News, especially to Dick Adams for his contribution to the personnel news.

Please send submissions to LNS News, 26-505 by April 15, 1988.

--J. Flanagan, Editor

LNS PHYSICS NEWS

March 1, 1988

Prof. Samuel C.C. Ting has been awarded the DeGasperi Prize by the Italian Republic. The DeGasperi Prize is the highest award given by the Italian Republic. This is the first time the prize has been given to a non-Italian. The ceremony will take place in Rome on March 22 and the prize will be given by the President of Italy. The prize is in recognition of the L3 collaboration.

The Bates Linac recorded a new energy high of 503 MeV for a single-pass electron beam on December 23, 1987. This is enough to achieve a recirculated beam energy of over 950 MeV. The transmitters were run at 90 Amps to reach 503 MeV and, as a result of the upgrade finished in the fall of 1987, we anticipate reaching 100 Amps and a recirculated energy of 1 GeV during the next physics accelerator run period.

--W. Lobar

Comments on The Hunting of the Quark by Michael Riordan

After carefully reading this book, I would like to comment on two of the chapters, i.e. on the discovery of the J particle and of the 3-jet events, with which I was personally involved.

The chapter on the J particle discovery completely missed the important physics questions, such as the motivation and the difficulties in spending four years designing and building the precision spectrometer to look for narrow states. At that time, most physicists did not believe in the existence of such particles. Instead, the chapter is full of trivialities often based on statements from unknown origins.

The chapter on the discovery of three-jet events centers on the original discovery papers by MARKJ "Discovery of the Three Jets" and by TASSO "Observation of Planar Events" in 1979. The author did not even raise a single question with the MARKJ physicists on this topic when he interviewed me at DESY, where the discoveries were made. This explains why this chapter is completely one sided and often false.

As a physicist himself, Dr. Riordan should know that physics is based on well defined notions. We cannot claim the discovery of ghosts so long as we fail to define what a ghost is. "Three Jets" were well defined by the MARKJ 1979 data on energy flow distribution which showed that the energy is concentrated in three lobes in one plane, with the means angular width of each lobe to be much smaller than the mean separation between the lobes. TASSO's data did define the "Planar Events" but since they measured neither the mean width nor the mean separation of the lobes (and not even the lobes themselves), they simply could not define three-jets, and therefore cannot possibly claim discovery of it. This reasoning was presented by me in 1985 both orally and in writing to Dr. P. Soeding, the then spokesperson of TASSO, and copied to Dr. M. Jocob (editor of Physics Report) and V. Soergel (director of DESY) and later to Dr. Riordan long before the publication of this book.

The priority of the discovery of the 3-jet events was clearly stated by Prof. H. Schopper, the then Director General of DESY, published in Physics Today (p. 18, Feb. 1980 and DESY 79/79, 1979) that the MARKJ group is the first one to show statistically significant evidence for the gluon jet discovery. It is regrettable that none of the MARKJ physicists nor Prof. Schopper were interviewed. I suggest that Dr. Riordan consult these and other scientific publications on the significance and history of the discovery of "Three Jets" such as "In Search of Gluons" by D. Luckey and P. Duinker in Comments of Nuclear and Particle Physics 9, 123 (1980) and correct these mistakes as soon as possible.

--Prof. Min Chen

A Review of The Hunting of the Quark A True Story of Modern Physics, by Michael Riordan. Published by Simon and Shuster, Inc. Touchstone Book, N.Y., 1987, 399p.

The author of The Hunting of the Quark, Michael Riordan, a former graduate student and research staff member in LNS-Physics, worked under Profs. Jerome Friedman and Henry Kendall. He felt that something important was going on in their research and he had the foresight to keep a journal figuring at some point in his life that he would write about the important work that was indeed done by the Counter Spark Chamber Group. Friedman, Kendall, and Richard Taylor of SLAC, not only were the first to see quarks, but their experiment marked the beginning of a new era of high energy physics -- the large collaboration.

A reader should keep in mind that this book is one person's interpretation of events. Even though Riordan gathered the information from many sources and interviews, ultimately he interpreted these events in his own way to further advance the purposes of his book. However, I think he would have done an even better job if he had interviewed Prof. Peter Demos, former director of LNS, and Dr. Frederic Eppling. To me, it is a gap in his research to have missed two such bulwarks of the Laboratory. The Laboratory for Nuclear Science has been the seed ground for support of many experiments and has helped to bring new faculty members to the Physics Department.

Riordan threads a history of particle physics which helps to inform the non-physicist about the importance of various experiments. It enables one to note that discoveries are built on ideas and that ideas progress from one physicist or group of physicists to the next. The book also shows that physicists are not always popular for their ideas, and that credit is not always given where credit is due, events and circumstances sometimes give rewards to individuals, when many people were actually involved.

One significant event around the quark discovery was that Prof. Victor Weisskopf tipped Walter Sullivan, a science reporter for the New York Times about the M.I.T. - SLAC discovery. However, when Sullivan talked to Taylor, Taylor only told the SLAC side because he assumed when Sullivan said he was talking to his "colleagues at M.I.T." that he meant Friedman and Kendall and not Weisskopf, and that Friedman and Kendall had already told the M.I.T. side of the story. As a result of this error Friedman and Kendall were not acknowledged as the discovers of the quark. On the contrary, a page 1 article on April 25, 1971 in the New York Times by Walter Sullivan did not mention Kendall and Friedman or even M.I.T., just Weisskopf as a "knowledgeable observer."

Riordan describes people in a quick fashion which immediately evokes an image of them with touches of humor and humanness. It is particularly interesting when you know the person. For example he describes Friedman as "A warm, almost grandfatherly scientist, he [Friedman] is constantly concerned about everybody's welfare on and off the job." I'm sure most of us would agree that this statement is true, but in some other cases Riordan's accuracy is questionable.

However, Riordan writes a literate book beginning each chapter with an adage significant to the contents of the chapter. He often uses passages from logbooks and passages from Lewis Carroll's Alice in Wonderland comparing the history of particle physics with Alice's adventures. Although using Alice in Wonderland compared with particle physics is nothing new, Riordan uses the excerpts well to present his material.

The book gives the non-physicist a different perspective on physicists and their work. It also brings to mind that not all good work is rewarded with a Nobel Prize and that it takes many ideas and experiments to find the secrets that the atom holds. As Rutherford said, and it applies here, "Scientists are not dependent on the ideas of a single person, but on the combined wisdom of thousands of people, all thinking the same problem and each doing a little bit to add to the great structure of knowledge which is gradually erected."* The book, because it is so accessible, gives us an exciting, interesting view of physics past and present.

The Hunting of the Quark by Michael Riordan is available in paperback ($9.95) at the Tech Coop. We also have one copy available in LNS HQ if you would like to borrow it.

--J. Flanagan

*Truth and Beauty, by S. Chandrasekhar, University of Chicago Press, 1987 p. 14.

A major experimental initiative, construction of a storage ring intersecting the South Experimental Hall, has begun at Bates under the project management of Prof. Stanley Kowalski.

The South Hall Ring (SHR) will operate in an internal target mode for research programs requiring the detection of heavily ionizing reaction products and programs of electro-nuclear studies with polarized beams and targets. This full spin capability will be unique in the world. Also, the beam may be extracted and fed to the existing South Hall coincidence spectrometers. The extracted beam will have a high duty factor (>80%) permitting an extensive experimental program involving the simultaneous detection of two or more particles.

The SHR will be fed by the low-duty factor, 300 to 1000 MeV electron beam now available in the hall. It will operate at peak circulating currents of up to 80 milliamperes and average extracted currents up to 50 microamperes. An energy compressor will reduce the electron beam energy spread from 0.3% to 0.04%. Solenoids are included to provide longitudinally polarized beams for internal target experiments and for the extracted beam.

--W. Lobar

The Bates Users Group Annual Meeting was held on January 13, 1988. About 100 users were in attendance to hear updates on the laboratory by the Bates staff. A minisymposium of five talks on (e,e'N) by Donald Geesaman (ANL), Gerard Van der Steenhoven (NIKHEF), William Van Orden (U. Maryland/CEBAF), Robert Lourie (MIT), and Takashi Takaki (MIT) was given. The newly-elected officers are: President, J. Michael Finn (W&M); Vice President, Jochen Heisenberg (UNH), and Treasurer-Clerk, Christopher Maher (MIT).

William A. Wallenmeyer, who directed the Department of Energy's high energy physics program for the past ten years, recently became president of the Southeastern Universities Research Association (SURA).

Prof. Carlo Rubbia, 1984 Nobel Prizewinner for Physics, was appointed as the future Director-General of CERN. He will begin his five-year term of office on 1 January 1989.

The annual Peter T. Demos Award for outstanding graduate work and contribution to the Bates Center was presented by the Users Group to Robert Lourie of MIT. His thesis, "The Measurement of the $^{12}C(ee')$ Reaction in the Dip Region" was done under the supervision of Professor William Bertozzi (MIT).

Recent Publications

"Comment on 'Nuclear-Density Dependence of the Electron-Proton Coupling,'" by R.W. Lourie and P.E. Ulmer, Physical Review Letters, Vol. 59, no. 12, 21 September 1987, p. 1375 - 1376.

"Self-Dual Fields as Charge-Density Solitons," by R. Floreanini and R. Jackiw, Physical Review Letters, Vol. 59, no. 17, 26 October 1987, p. 1873 - 1987.

"Comment on 'What is the Most General Abelian Gauge Theory in Two-Spatial Dimensions?'" by S. Deser and R. Jackiw, Physical Review Letters, Vol. 59, no. 17, 26 October 1987, p. 1981 - 1982.

"Leading Particle Distribution in 200 GeV/c p+A Interactions," by K. Abe, et al, Physics Letters B, Vol. 200, no. 3, 14 January 1988, p. 266 - 271.

"Representations of the Two-Dimensional Conformal Group," by Roman Jackiw, from Super Field Theories, edited by H.C. Lee, V. Elias, G. Kunstatter, R.B. Mann and K.S. Viswanathan, Plenum Publishing Corporation, 1987, p. 191 - 208.

To submit information for the next LNS Physics News, send information to LNS Physics News, 26-505 by April 15, 1988.