NALREP

Monthly Report of the Fermi National Accelerator Laboratory

October 1976

Fermi National Accelerator Laboratory

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THE COVER: The Meson Laboratory looking north.
(Photograph by Rick Fenner)

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THE FERMILAB SUMMER PROGRAM FOR MINORITY STUDENTS

The Equal Employment Opportunities Staff
and
The Summer Program Committee

Introduction

For the past six years, Fermilab has carried out a summer program for minority students in science. The program has evolved considerably in this time and the purpose of this report is to tell the development of the program and to acquaint the reader with its successes and failures. The program is operated by the Fermilab EEO Office with a Summer Program Committee of technical staff members choosing students and work assignments, advising on the operation of the program, and acting as liaison to the rest of Fermilab.

The underrepresentation of minorities in science and engineering is well documented (for example, in Ref. 1). Although minority races are 17% of our population, they account for less than 2% of scientific and technical personnel. The primary objective of the Fermilab program is to stimulate minority students' interest in pursuing a career in science in order to attempt to reduce this great disparity in representation. We bring approximately twenty students to Fermilab for some ten or eleven weeks to bring them in contact with technical work and technical workers, so that they will learn for themselves the attractions of a scientific career.

Assignments

The key to our entire program is in the nature of the students' job assignments. When the program began, it was thought that students would

gain most by working as active technicians in a large group. For a student from a large university with its own research programs, assignment as a technician might be ideal, for it would complement his academic-year work and would teach him how to solder, drill, order from the stockroom, and all the many other things all of us do, but are never taught. But such a student from a large institution probably doesn't need the stimulation of our program at all.

On the other hand, there are many smaller minority institutions that do not have large research programs and cannot offer their students any contact with technical work outside their courses. It is these students we can help, by showing them that there are possibilities for interesting and rewarding careers in science. They need to have close contact with a technical adviser who can show them how the work they do on a project is related to the total purposes of the project and can serve as an example of how a scientist or engineer works at his profession.

Our feedback from students reinforces this lesson. At the end of every summer, we have solicited comments from the student participants concerning the program and their assignments. There has been an overwhelming consensus, and these comments have been instrumental in the evolution of the program away from "technician" assignments toward "student-participant" assignments.

To create these assignments, every winter the Summer Program Committee asks for proposals for assignments from Fermilab staff members. We ask the proposers to describe the work and any special qualifications

needed and to name a supervisor who will be available to the student for consultation and discussion. We receive more proposals than we have student places, so we attempt to choose those assignments that we judge will be of the largest educational benefit to the individual students. Good past experience with particular supervisors is a guide, but is not the whole story. There has always been room for new proposals. We will be happy to consider proposals from users for work here at Fermilab.

It may be noted that the nature of most assignments has changed. In earlier times, most students were involved in construction-related projects, whereas now most are involved in experiments or activities closely related to them. The number of assignments involving some computer work has also risen dramatically as more students are involved in experiments.

Recruiting of Students

We said above that students from large universities probably do not need our program. In addition, approximately three-fourths of the bachelor's degrees awarded to minority students in physics come from predominantly minority institutions. These institutions are therefore a good source of students for us. Over the years, we have established good relations with a number of these institutions, primarily in the South and Southwest. In the last year, we have also begun to take a few students from large institutions (URA universities). We believe that this mix of students will enhance their mutual educational opportunities. We are interested in receiving recommendations of worthwhile students from university faculty members.

Members of the EEO staff and the Summer Program Committee visit each campus and interview interested students. After consultation with faculty members, they choose two students from each institution to invite to our program. We have found the advice of faculty to be important, because they know their students' capabilities very well.

This technique of interviews at students' institutions may seem complicated and expensive, but we have found that it is all too possible without interviews to choose students who do not do well in our program. Our visits have the additional advantage that they open a window to a larger world even to those students who are not yet advanced enough to be chosen for our program.

The best time for a student to be in our program is between his junior and senior years. We take a few graduating seniors, but their career decisions have usually been made by graduation. It is more difficult to find good assignments for sophomores-juniors because they have not taken as many physics or mathematics courses. We take a few sophomore-juniors and work to find the right assignment.

This summer was a rarity in that we had no students returning for a second summer in the program. We have encouraged returning, but have found recently that the program's utility to a student decreases significantly after two years. We therefore discourage students from returning for a third year.

The pay we offer the students is adequate, but not sensational, because it is not our objective to provide them with a merely lucrative summer. We

also subsidize their housing and provide transportation. Almost all of our students depend to some extent on their summer earnings during the school year. But if a student's primary goal is to earn money, he will probably do better working and living at home. We hope that our students will be able to save some money, but will get even more in educational benefits of value in the longer range.

We are not the only summer program extant, and we find that there is some competition for the better students among the several programs. Our recruiting has been forced to move somewhat earlier in order to offer our program to the students as one of their possible alternatives. Recruiting is now usually finished by the end of January. When the students have been matched to assignments by the Committee, we inform each student of his prospective assignment and supervisor. The supervisor frequently also communicates directly with his student in the spring with information on how to prepare for the summer.

Summer Operation

We arrange for transportation of the students from their home to Fermilab, and return at the end of the program. We have housed them in dormitories at Aurora College, on the far west side of Aurora 15 miles from Fermilab. We would prefer to house the students at the Laboratory, but the shortage of on-site housing in the summer has made that impossible. The students need some way of getting from Aurora College to Fermilab and back. In past years we had bussed them, but this year we have been able to alleviate the difficulties of busing by providing several leased automobiles.

The students have worked out the sharing of these cars among them and have not abused the use of the cars.

When the students arrive, we orient them to the Laboratory and to Chicago (the largest city that many of them have ever seen), then take them to their supervisors. We continue to gather the students all together through the summer, first for a series of introductory talks by staff members on technical topics (electronics, high-energy physics, programming, statistics), then for reports by the students themselves on their works. These student reports have become an important part of the educational process, very much like an undergraduate seminar at a university. We also provide some electronic equipment for the students to experiment with.

Up to this point, this report may sound as if the summer program runs like a well-oiled machine. Any smoothness we now have has come after some years of trial and error. But even with our experience there are still problems that inevitably arise, of assignments that are wrong or misunderstood, of communications problems, and so on. The solution of these problems is usually worked out by the Program Coordinator. Professor James Davenport, Chairman of the Physics Department of Virginia State College has spent several summers at Fermilab in this capacity. Having someone available to handle these problems is important, because it means that they do not grow to the point where they ruin a students' entire summer.

Conclusion

Most of our recent students are still in school. Of the earlier summer-program participants (through 1974), a remarkable 40% are in graduate

school, and one fourth are still undergraduates. Another quarter have become scientists, engineers, or teachers. The Laboratory has hired three for its own staff. The remaining 10% have entered other careers. We consider this a good record of success in meeting our primary objective.

It is undoubtedly true that much more needs to be done in this field. But within the framework of Fermilab's commitment to physics, we have managed to help some minority students towards careers in science to alleviate the disparity in numbers cited in the introduction.

This report is a summary of the work of Kennard Williams, Joyce Downs, Robert Sykes, Warren Cannon, Roel Rodriguez, and Joyce Curry of the Fermilab EEO office, Richard Carrigan, Francis Cole, Eugene Fisk, E. L. Goldwasser, James Griffin, Fred Hornstra, Shirley Jackson, Cordon Kerns, Ernest Malamud, Frank Nezrick, Raymond Stefanski, Dennis Theriot, Timothy Toohig, and Herman White of the Summer Program Committee, and James Davenport of Virginia State College.

Reference

1. A. Wilburn, Science 184, 1148 (1974).

NOTES AND ANNOUNCEMENTS

DEADLINE FOR THE MULTIPARTICLE SPECTROMETER WORKSHOP. . .

We call to the attention of our readers that the deadline for the receipt of material to be considered at the Multiparticle Spectrometer (MPS) Workshop is November 15. This workshop is scheduled to be held December 9-10 and is intended to provide an opportunity to discuss the future experimental program for the MPS facility. Tentative plans call for a review of what has been learned to date during the course of Hadron Jets #260 with regard to both operating experience and the physics potential of the facility. A review of the future plans of the Meson Laboratory as they relate to the MPS will also be included. Groups having an interest in next-generation experiments for the use of this facility should submit proposals in advance of the November 15 deadline. Additional information pertaining to the arrangements for this workshop will be announced in the next issue of NALREP. Any questions about this meeting should be addressed to T. Groves in the Director's Office.

HISTORY OF SCIENCE ROOM. . .

A room in the Fermilab library is to be used to collect materials related to the history of nuclear and particle physics, with emphasis on particle accelerators. We believe that the Fermi National Accelerator Laboratory will be a good location for such a collection because of its relevance to our work and because of the interest of many Laboratory

people. It is intended that our work in this area will be coordinated with the History of Physics Center of the American Institute of Physics.

We plan to collect material both from the history of these sciences in general and from the story of the beginnings of Fermilab. We also hope to collect selected equipment of historical interest from Fermilab experiments as they are completed.

Any suggestions are welcome.

The Library Committee

(R. A. Carrigan, F. T. Cole,
R. A. Lundy, J. A. MacLachlan,
R. E. Shafer, and R. E. Shrock)

STORAGE AT FERMILAB. . .

Warehouse storage space at Fermilab is very limited. Recognizing, however, that there may be occasion to store experimental apparatus, shipping crates, skids, and the like locally rather than returning them to the home institutions, arrangements have been made for storage at a leased, off-site warehouse. Users wishing to take advantage of this service should contact F. Assell, Extension 3575, to have material placed in, or retrieved from, storage. There is a nominal charge for warehouse storage based on a pallet-sized module of 4 ft × 4 ft × 4 ft requiring a 16 square foot area. The charge is $1.50 per square foot per year, or a minimum of $24.00 per year ($12/6 months).

Charges for material in warehouse storage will be billed semiannually to the requestor's budget code. There will be no charge for material stored out in the weather, for example, at the railhead. Also, material released as surplus or excess will not be charged.

RESEARCH ACTIVITIES DURING SEPTEMBER 1976

Halsey Allen

The September operating schedule for high energy physics research was once again greatly curtailed by the tight operating budget which limited the scheduled beam time to less than 400 hours during the month. For the first 14 days, the experimental research program and accelerator operating mode were essentially a continuation of August's running, using a two-second slow-extracted beam along with "pinged" beam for the 30-inch bubble chamber during part of the time and, in addition, some periods when a fast slow-spill pulse of one-millisecond duration was delivered at the end of the flattop for tests in the Neutrino Area. Throughout this two-week period, the accelerator continued the spotty performance (62% reliability) that had characterized the August operating record, with linac, booster, and main-ring component and vacuum failures all contributing to the major periods of unscheduled down time. A significant milestone was achieved on September 7, however, when the first patient received treatment in the neutron beam of the Cancer Therapy Facility.

At mid-month there was a one-day period of accelerator studies and repairs when the operating cycle was changed to a 200-GeV flattop with a 100-GeV front porch, both of two-seconds duration. Slow spill at 100 GeV was delivered to the Proton Laboratory only, while 200-GeV slow-spilled beam was sent to all three external experimental areas. This mode of running occurred during four days at the end of the running period, proceeding smoothly and with essentially no downtime. Although it was short, the

period provided an opportunity to complete several commitments to user groups for data-taking with lower energy incident beam and at the same time allowed continued facility operation at reduced power demand levels, thereby conserving both energy and financial resources.

Early on September 20 the accelerator and experimental areas were shut down for the remainder of the month in order to conserve funds and meet the Transition Quarter operating budget. During the first week of the shutdown, major cleaning and maintenance work was performed on almost all of the 345 and 13.8 kV equipment in the main site master substation, including a long delayed repainting of poles and support structures. Basic power needs for the site including the Cancer Therapy Facility were provided at reduced levels from the backup system except on September 25, when a 12-hour sitewide outage was necessary for switchgear maintenance. Maintenance and development work proceeded in the accelerator and experimental areas at a reduced pace, consistent with the budgetary limitations. Noteworthy accomplishments included replacement and testing of the one-turn fast extraction kicker in the Main Ring, the upgrading of the M1 beam line to 400 GeV and preliminary work on conversion of the M4 line to a charged particle beam capability in the Meson Area, the installation and debugging of a new interlock system and beam monitoring and instrumentation in the bypass hadron beam lines in the Neutrino Area and the installation of a new helium transfer line for cryogenic magnets in the P-West Area. By the end of the month startup of the injector was well underway in preparation for what is hoped will be an extended period of running for high

energy physics, with no planned major interruptions for several months.

The primary high-energy physics emphasis, with 400-GeV beam, continued to be on the Muon #319 experiment in the Neutrino Area. The group completed data-taking work in the N1 muon beam line by mid-September and then used available 200-GeV beam time for calibration studies and tests. It had also been hoped to complete the commitment of 100K pictures in the deuterium-filled 30-inch bubble chamber for 30" $\bar{p}$-d @ 100 GeV #345 but the effort was thwarted on September 7 when a piston rod in the chamber failed about 40K pictures short of the goal. Repairs could not be completed before the start of the facility shutdown. Other Neutrino-Area accomplishments included some startup and testing work by Neutrino #310 in Lab C, using muons from the slow spill that leaked through the earth shield, and, later, neutrinos produced by a one-millisecond fast spill pulse on the target train. Particle Search #379 used slow spill in the bypass beam to do tests and take preliminary data with their Lab E apparatus after the bubble-chamber failure occurred. Both groups made use of the beam at both 400 and at 200 GeV. The Neutrino Department also carried out several "beam plug" tests for a future antineutrino run.

The same three main experiments continued to work in the Proton Area during September as had been the case in August. Photon Total Cross Section #25A took data at the Tagged Photon Laboratory in the Proton-East line, working on their run plan with a 135-GeV incident electron beam and subsequently collecting data with the electron beam tuned at 40 GeV when 200-GeV beam was available from the accelerator. Di-Hadron #494 used

the 400- and later 200-GeV incident proton beam in Proton-Center for their data-taking activities on di-hadron and di-electron production in high mass regions. In the Proton-West Area, Particle Production #284 completed their experiment except for some short SEM calibration runs. Data were collected over a broad range of momenta, first with 400-GeV protons incident on their liquid hydrogen target and later using both 100- and 200-GeV incident beam in order to investigate the dependence of energy on their results. Nuclear Fragments #466 also parasitically exposed one foil to the pre-target beam in Proton-East during the month.

The Meson Area program was carried out by six primary user groups. Inclusive Scattering #324 finished collecting data at ±75 and ±30 GeV in the M1 West beam, making good use of the 200-GeV run to get data for the low energy point. In the M2 and M3 beams, Particle Search #472 and Neutron Elastic Scattering #248 were both in a steady data-taking mode during 400-GeV operation while only the particle search experiment continued to run at 200 GeV. K^{o} Regeneration #'s 226/486 continued to perform tuneup, equipment testing and preliminary data collection work in the M4 beam when 400-GeV protons were available on target but only did rough tuning with the 200-GeV incident beam. Hadron Jets #260, using the multiparticle spectrometer in the M6 West line, completed the data-taking phase of their experiment before mid-September and then spent the rest of the available running time during both 400- and 200-GeV operation doing calibration checks and tests related to planned future running for a future Multiparticle #110A experiment. During the period that 400-GeV beam was being delivered on the Meson

Area target train, Hadron Dissociation #396 also used the M6 beam line parasitically to take data for their experiment. The M5 test beam was also used by several experimenters under the usual informal arrangements.

Internal Target Area research activities were centered around three major user groups. p-p Inelastic #321 was able to run whenever the accelerator was operational and used their upstream 3-mil warm gas jet to collect data at various circulating beam energies between 8 and 400 GeV. By the start of the facility shutdown, the group's data-taking work for this experiment except for possible future 500-GeV running, had been completed. p-N Scattering #198A was the prime user of the spectrometer facility during the period of 400-GeV accelerator operation, but the accumulated number of hours of data taking was relatively small because of non-concurrent failures of the accelerator and the helium liquifier for the spectrometer magnets. p-p Polarization #313 had control of the spectrometer during the four-day 100/200 GeV running interval and was able to take data during more than half of that time.

FACILITY UTILIZATION SUMMARY -- SEPTEMBER 1976

I. Summary of Accelerator Operations

		Hours	
A.	Accelerator use for physics research		
	Accelerator physics research	38.6	
	High energy physics research	263.6	
	Research during other use	(20.1)	
	Subtotal		302.2
B.	Other activities		
	Accelerator setup and tuning to experimental areas	7.0	
	Scheduled interruption	277.3	
	Unscheduled interruption	133.5	
	Subtotal		417.8
C.	Unmanned time		
	Total		720.0

II. Summaries of High Energy Physics Research Use

		# of Expts.	Hours	Results
A.	Counter experiments	15	2560.5	
B.	Bubble chamber experiments	1	26.5	29,007 pictures
C.	Emulsion experiments			
D.	Special target experiments	1	158.0	1 foil irradiation
E.	Test experiments			
F.	Engineering studies and tests	1	1.1	$\bar{\nu}$ plug tests
G.	Other beam use	-	16.8	
		8	2763.8	4 expts. completed

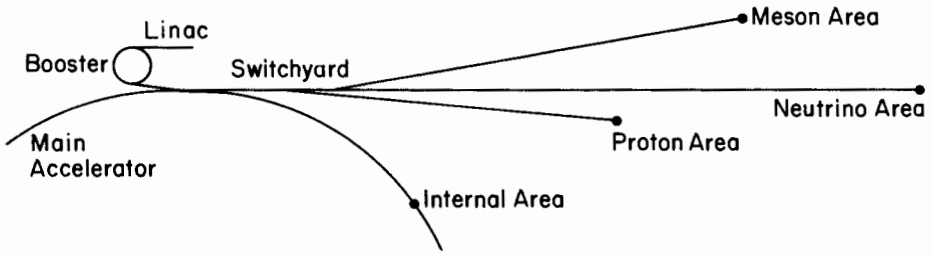
III. Number of Protons Accelerated and Delivered ($\times 10^{18}$)

A.	Beam accelerated in Main Ring	@ 400 GeV	0.673		
		@ 200 GeV	0.468		
					1.141
B.	Beam delivered to experimental areas				
	Meson Area	@ 400 GeV	0.108		
		@ 200 GeV	0.071		
				0.179	
	Neutrino Area				
	Slow Spill	@ 400 GeV	0.313		
		@ 200 GeV	0.051		
	Fast Spill	@ 400 GeV	0.019		
		@ 200 GeV	0.130		
				0.513	
	Proton Area	@ 400 GeV	0.145		
		@ 200 GeV	0.130		
		@ 100 GeV	0.009		
				0.284	
	Total				0.976

IV. Beam Utilization by Experiment

	Hours	Results
A. Meson Area		
K^{o} Regeneration #226/#486	123.9	Setup and tests
n-Elastic Scattering #248	146.4	Data
Hadron Jets #260	207.3	Data; complete
Inclusive Scattering #324	177.2	Data
Hadron Dissociation #396	169.5	Parasitic tests
Particle Search #472	249.9	Data
B. Neutrino Area		
Neutrino #310	89.5	Setup and tests
Muon #319	209.3	Data; complete
30" $\bar{p}$-d @ 100 GeV #345	26.5	29K pictures
Particle Search #379	163.0	Data
C. Proton Area		
Photon Total Cross Section #25A	235.8	Data
Particle Production #284	215.8	Data; complete
Nuclear Fragments #466	158.9	1 foil irradiation
Di-Hadron #494	213.5	Data
D. Internal Target Area		
p-N Scattering #198A	68.5	Data
p-p Polarization #313	46.5	Data
p-p Inelastic #321	244.4	Data; complete
Total	2745.9	

Fermi National Accelerator Laboratory



Experiments in the Research Areas

OCTOBER 1976 - JANUARY 1977

Internal Area	Proton Area	Neutrino Area	Meson Area
PROTON-NUCLEON SCATT. #198A	PROTON EAST: PHOTON CROSS SECTION #25A PARTICLE SEARCH #325	HADRON BEAM: 30-IN. B.C. PARTICLE SEARCH #379	M1 BEAM: POLARIZED SCATTERING #61 INCLUSIVE SCATTERING #324 FORM FACTOR #456
P-P POLARIZATION #313	PROTON CENTER: DI-HADRON #494	NEUTRINO AREA: 15-FT. B.C. NEUTRINO #310	M2 BEAM: INCLUSIVE NEUTRAL MESON #350 PARTICLE PRODUCTION #415 PARTICLE SEARCH #472
PROTON-NUCLEON SCATT. #381	PROTON WEST: P-P ELASTIC #177A	MUON/HADRON BEAM: MUON #398	M3 BEAM: NEUTRON ELASTIC SCATTERING #248
NUCLEAR FRAGMENTS #442			M4 BEAM: K^0 REGENERATION #226 K^0 CROSS SECTION #486
			M6 BEAM: INCLUSIVE SCATTERING #118A BACKWARD SCATTERING #290

SITUATION REPORT - OCTOBER 1976

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1 OCT 1976

EXPERIMENTAL PROGRAM SITUATION REPORT

THE EXPERIMENTAL PROGRAM SITUATION AT FERMILAB IS SUMMARIZED BELOW. THE EXPERIMENTS ARE LISTED SEPARATED BY EXPERIMENTAL AREA UNDER CATEGORIES THAT BEST DESCRIBE THEIR CIRCUMSTANCE AS OF OCTOBER 1, 1976. FOR EXPERIMENTS WHICH HAVE BEEN COMPLETED OR HAVE RECEIVED BEAM THERE IS INDICATION OF THE AMOUNT OF RUNNING TIME OR EXPOSURE. THE EXPERIMENTAL AREA NAMES ARE ABBREVIATED AS FOLLOWS: INTERNAL TARGET AREA (ITA), MESON AREA (MA), NEUTRINO AREA (NA), PROTON AREA (PA).

TOTAL NUMBER OF APPROVED EXPERIMENTS - 260

AREA-BEAM		SPOKESPERSON	EXTENT OF RUN TO DATE	DATE COMPLETED
A. EXPERIMENTS THAT HAVE COMPLETED DATA TAKING (163):				
MA -M1	ELASTIC SCATTERING #7	MEYER	2,350 HOURS	28 JAN 75
	PION DISSOCIATION #86A	LUBATTI	800 HOURS	22 MAR 76
	FORM FACTOR #216	STORK	900 HOURS	1 OCT 75
	DETECTOR DEVELOPMENT #229	YUAN	300 HOURS	16 NOV 74
	DETECTOR DEVELOPMENT #261	WANG	600 HOURS	20 NOV 74
	MUON SEARCH #335	PACKLER	300 HOURS	6 JAN 75
	PARTICLE SEARCH #416	LUBATTI	400 HOURS	1 JUL 75
-M2	NEUTRAL HYPERON #8	PONDROM	2,450 HOURS	22 MAR 76
	MULTIGAMMA #22	COLLINS	350 HOURS	26 JUN 74
	MISSING MASS #51A	VON GOELER	800 HOURS	23 OCT 74
	QUARK #75	YAMANOUCHI	1,050 HOURS	8 SEP 73
	BEAM DUMP #108	AVSCHALOM	350 HOURS	2 JAN 75
	PION CHARGE EXCHANGE #111	TOLLESTRUP	1,800 HOURS	19 SEP 74
	INCLUSIVE PHOTON #268	MELLEMA	1,850 HOURS	11 FEB 76
	PARTICLE SEARCH #357	MEYER	1,700 HOURS	7 JUN 76
	PARTICLE SEARCH #365	GARELICK	200 HOURS	5 FEB 75
-M3	NEUTRON CROSS SECTION #9	LONGO	1,450 HOURS	20 MAR 74
	NEUTRON BACKWARD SCATTERING #12	REAY	1,300 HOURS	2 DEC 74
	NEUTRON DISSOCIATION #27A	ROSEN	850 HOURS	24 APR 74
	MULTIGAMMA #230	LONGO	50 HOURS	24 APR 74
	NEUTRON DISSOCIATION #305	GOBBI	1,400 HOURS	14 APR 75
	PARTICLE SEARCH #366	ABOLINS	2,500 HOURS	2 JUL 76
	PARTICLE SEARCH #397	ROSEN	1,150 HOURS	18 AUG 76
-M4	QUARK #72	LEIPUNER	500 HOURS	11 JUN 73
	K ZERO REGENERATION #82	TELEGDI	3,500 HOURS	5 JUL 75
	PARTICLE SEARCH #330	GUSTAFSON	150 HOURS	7 JUL 75
	K ZERO REGENERATION #425	TELEGDI	1,400 HOURS	17 MAY 76
-M6	ELASTIC SCATTERING #69A	LACH	2,800 HOURS	3 MAR 76
	ELASTIC SCATTERING #96	RITSON	2,550 HOURS	17 FEB 75
	MULTIPLICITIES #178	BUSZA	800 HOURS	14 AUG 75
	HADRON JETS #260	MCLEOD	2,300 HOURS	20 SEP 76
-OTHER	EMULSION/PROTONS @ 200 #90	WOLTER	4 STACKS	20 SEP 72
	EMULSION/PROTONS @ 200 #103	KING	1 STACK	20 SEP 72
	EMULSION/PROTONS @ 200 #105	MALHOTRA	1 STACK	20 SEP 72
	EMULSION/PROTONS @ 200 #114	JAIN	1 STACK	20 SEP 72
	EMULSION/PROTONS @ 200 #116	HEBERT	5 STACKS	20 SEP 72
	EMULSION/PROTONS @ 200 #117A	KUSUMOTO	11 STACKS	20 SEP 72
	EMULSION/PROTONS @ 200 #156	NTU	13 STACKS	20 SEP 72
	EMULSION/PROTONS @ 200 #171	LORD	6 STACKS	20 SEP 72
	EMULSION/PROTONS @ 200 #183	TRETJAKOVA	3 STACKS	20 SEP 72
	EMULSION/PROTONS @ 200 #189	RITSON	2 PLATES	20 SEP 72
	SUPER-HEAVY ELEMENTS #147	DEBEAUVAIS	4 EXPOSURES	11 JUN 75
	DI-MUON #337	BARTLY	5 HOURS	7 FEB 75
	SUPER-HEAVY ELEMENTS #371	JORIC	2 STACKS	20 DEC 75
	FRAGMENTATION PARTICLES #426	FUKUI	16 STACKS	20 MAR 76
NA -NEUTRINO	NEUTRINO #1A	CLINE	2,850 HOURS	30 JUN 75
	15-FOOT NEUTRINO/H2BWE #28A	FRY	97K PIX	11 JUN 75
	NEUTRINO #21A	BARISH	2,450 HOURS	2 NOV 75
	15-FOOT EMI TEST #155	PETERSON	14K PIX	30 NOV 74
	15-FOOT ANTI-NEUTRINO/H2BWE#172	BINGHAM	49K PIX	25 MAY 76
	15-FOOT ANTI-NEUTRINO/H2BWE#180	ERMOLOV	76K PIX	2 JUN 75
	PARTICLE SEARCH #247	BURNOP	350 HOURS	18 MAY 76
	NEUTRINO #254	KALBFLEISCH	550 HOURS	15 OCT 75
	NEUTRINO #262	BARISH	400 HOURS	20 MAR 74
	NEUTRINO #320	SCIULLI	500 HOURS	1 OCT 74
	NEUTRINO #370	CLINE	400 HOURS	19 MAR 75
-MUON/HADRON	MUON #26	HAND	900 HOURS	16 APR 74
	MUON #98	ANDERSON	1,800 HOURS	17 FEB 75
	MUON #319	CHEN	900 HOURS	20 SEP 76
	DI-MUON #331	PITCHER	1,400 HOURS	22 MAR 76
	PARTICLE SEARCH #382	HAND	200 HOURS	19 DEC 75
-15-FT	15-FOOT ENGINEERING RUN #234	HUSON	57K PIX	5 NOV 74
	15-FOOT P - P @ 400 #341	KO	34K PIX	21 DEC 75
	15-FOOT P - P @ 300 #343	ENGELMANN	27K PIX	13 JAN 76
-30-IN	30-INCH HYBRID #28	SMITH	479K PIX	22 APR 74
	30-INCH P-P @ 300 #37A	MALAMUD	51K PIX	1 JAN 73
	30-INCH PI+ & P - P @ 100 #121A	LANDER	104K PIX	23 JAN 74
	30-INCH PI- - P @ 100 #125	MORRISON	53K PIX	28 AUG 73
	30-INCH PI- - P @ 200 #137	HUSON	48K PIX	10 MAR 73
	30-INCH P-P @ 400 #138	VANDER VELDE	52K PIX	26 AUG 75
	30-INCH P-P @ 200 #141A	FIELDS	67K PIX	27 NOV 72
	30-INCH PI- - P @ 300 #143A	KALBFLEISCH	51K PIX	10 APR 74
	30-INCH HYBRID #154	PLESS	105K PIX	13 MAR 74
	30-INCH P - P&WE @ 300 #161	HAPP	51K PIX	25 JUN 74
	30-INCH PI- - P&WE @ 200 #163A	WALKER	52K PIX	18 JUN 74
	30-INCH P - D @ 100 #194	MURPHY	92K PIX	20 AUG 76
	30-INCH P - D @ 400 #196	ENGELMANN	109K PIX	29 OCT 75
	30-INCH P - D @ 300 #209	DAO	106K PIX	7 OCT 75
	30-INCH PI+ & P - P @ 200 #217	LANDER	85K PIX	15 MAY 74
	30-INCH PI- - D @ 200 #218	YAGER	72K PIX	18 SEP 74
	30-INCH PI+ & P - P @ 60 #228	FERBEL	37K PIX	15 APR 74
	30-INCH P-P @ 100 #252	FERBEL	33K PIX	6 DEC 72
	30-INCH P - D @ 200 #280	FIELDS	103K PIX	11 OCT 75
	30-INCH HYBRID #281	SMITH	301K PIX	28 SEP 75
	30-INCH PI+ & P - D @ 200 #295	YEKUTIELI	156K PIX	2 NOV 75
	30-INCH PBAR - P @ 100 #311	NEALE	99K PIX	27 JAN 75
	30-INCH PI- - D @ 360 #338	MORITASU	53K PIX	28 AUG 76
-OTHER	MONOPOLE #3	EBERHARD	4 TARGETS EXPOSED	4 SEP 74
	PROTON-PROTON INELASTIC #14A	FRANZINI	140 HOURS	21 JUN 73
	MONOPOLE #76	CARRIGAN	5 TARGETS EXPOSED	1 DEC 74
	LONG-LIVED PARTICLES #115	STEVENSON	6 HOURS	23 NOV 74
	SUPER-HEAVY ELEMENTS #142	STOUGHTON	1 TARGET	4 JUN 75
	MASSIVE PARTICLE SEARCH #199	FRANKEL	2 TARGETS EXPOSED	22 AUG 73
	BEAM DUMP #211	GOEBEL	2 HOURS	14 NOV 73
	LONG-LIVED PARTICLES #239	FRATI	350 HOURS	3 FEB 74
	QUARK #276	VAN GINNEKIN	3 TARGETS EXPOSED	2 NOV 75
	SUPER-HEAVY ELEMENTS #285	LEDERMAN	3 TARGET EXPOSURES	2 AUG 76
	DETECTOR DEVELOPMENT #34	HUGGETT	50 HOURS	26 JUN 74
	QUARK #297	LEIPUNER	50 HOURS	10 JUL 74
	DETECTOR DEVELOPMENT #327	ALLISON	50 HOURS	7 FEB 75
	PLASTIC DETECTORS #275	ENGE	4 STACKS	20 OCT 73
	EMULSION/PROTONS @ 300 #181	CART	3 STACKS	20 OCT 73

PAGE 2 EXPERIMENTAL PROGRAM SITUATION REPORT (CONT'D)

AREA-BEAM		SPOKESPERSON	EXTENT OF RUN TO DATE	DATE COMPLETED
	EMULSION/PROTONS @ 300 #195	LIM	3 STACKS	10 JUN 75
	EMULSION/PROTONS @ 300 #232	KING	2 STACKS	20 OCT 73
	EMULSION/PROTONS @ 300 #233	HEBERT	8 STACKS	20 OCT 73
	EMULSION/PROTONS @ 300 #237	LORD	5 STACKS	10 JUN 75
	EMULSION/PROTONS @ 300 #242	NIU	2 STACKS	20 OCT 73
	EMULSION/PROTONS @ 300 #244	JAIN	1 STACK	20 OCT 73
	EMULSION/PROTONS @ 300 #250	KUSUMOTO	1 STACK	20 OCT 73
	EMULSION/PROTONS @ 300 #329	TRETJAKOVA	2 STACKS	10 JUN 75
	EMULSION/PROTONS @ 300 #374	DAVIS	1 STACK	10 JUN 75
	EMULSION/PROTONS @ 300 #419	GIACOMELLI	1 STACK	10 JUN 75
	EMULSION/PROTONS @ 300 #421	DZHELEPOV	1 STACK	24 JUN 75
	EMULSION/PROTONS @ 200 #271	GOTTFRIED	10 STACKS	10 JUN 75
	EMULSION/MUONS @ 150 #255	JAIN	1 STACK	16 OCT 73
	EMULSION/MUONS @ 150 #205A	KUSUMOTO	2 STACKS	16 OCT 73
	EMULSION/PI- @ 200 #264	YOUNG	2 STACKS	7 OCT 74
	EMULSION/PI- @ 200 #328	TRETJAKOVA	5 STACKS	7 OCT 74
	EMULSION/PI- @ 200 #339	WOLTER	4 STACKS	9 JUN 75
	EMULSION/PI- @ 200 #362	JAIN	1 STACK	9 JUN 75
	EMULSION/PI- @ 200 #387	WILKES	4 STACKS	9 JUN 75
	EMULSION/PROTONS @ 400 #238	LORD	9 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #243	NIU	7 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #245	JAIN	1 STACK	9 DEC 75
	EMULSION/PROTONS @ 400 #249	WOLTER	3 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #251	KUSUMOTO	3 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #265	YOUNG	3 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #279	KING	3 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #292	GOTTFRIED	12 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #336	OGATA	2 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #346	EKSPONG	1 STACK	9 DEC 75
	EMULSION/PROTONS @ 400 #385	PRAKASH	1 STACK	9 DEC 75
	EMULSION/PROTONS @ 400 #423	SUGIMOTO	4 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #428	HEBERT	14 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #434	DAKE	3 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #461	LORD	6 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #462	GIACOMELLI	1 STACK	9 DEC 75
	EMULSION/PROTONS @ 400 #463	TRETJAKOVA	2 STACKS	9 DEC 75
	TACHYON MONOPOLE #202	BARTLETT	COSMIC RAY RUNNING	19 MAY 76
PA -PE	PHOTOPRODUCTION #87A	LEE	2,500 HOURS	21 DEC 75
	PARTICLE SEARCH #100A	PIROUE	1,150 HOURS	4 APR 74
	PARTICLE SEARCH #300	CRONIN	750 HOURS	24 APR 76
	DI-MUON #358	LEE	400 HOURS	1 OCT 75
	DETECTOR DEVELOPMENT #498	GRUHN	50 HOURS	18 AUG 76
-PC	MUON SEARCH #48	ADAIR	500 HOURS	1 DEC 75
	LEPTON #70	LEDERMAN	2,800 HOURS	1 DEC 74
	PARTICLE SEARCH #187	LEDERMAN	200 HOURS	6 NOV 73
	MUON SEARCH #435	ADAIR	250 HOURS	2 JUL 76
	DI-MUON #436	ADAIR	200 HOURS	29 OCT 75
-PH	PHOTON SEARCH #95A	COX	1,850 HOURS	12 JUL 76
	PARTICLE PRODUCTION #284	WALKER	1,150 HOURS	20 SEP 76
ITA-C-0	PROTON-PROTON SCATTERING #36A	COOL	700 HOURS	24 JUN 73
	PHOTON SEARCH #63A	WALKER	2,600 HOURS	13 MAR 75
	PROTON-PROTON MISSING MASS #67A	SANNES	600 HOURS	8 AUG 73
	PHOTON SEARCH #120	CLINE	1,200 HOURS	29 MAY 73
	PARTICLE SEARCH #184	WANDERER	800 HOURS	29 MAY 74
	PROTON-DEUTERON SCATTERING #186	MELISSINOS	450 HOURS	19 AUG 74
	PROTON-NUCLEON INCLUSIVE #188	SANNES	1,050 HOURS	9 MAY 73
	PROTON-PROTON INELASTIC #221	FRANZINI	950 HOURS	5 SEP 74
	PROTON-NUCLEON INELASTIC #317	COOL	1,400 HOURS	1 NOV 75
	PROTON-PROTON INELASTIC #321	LEE-FRANZINI	1,900 HOURS	20 SEP 76
	PARTICLE SEARCH #363	OLSEN	650 HOURS	9 APR 75
	PARTICLE PRODUCTION #418	SANNES	900 HOURS	22 OCT 75

B. EXPERIMENTS THAT ARE IN PROGRESS (28):

			EXTENT OF RUN TO DATE	DATE OF RECENT RUN
NA -M1	TOTAL CROSS SECTION #104	KYCIA	1,400 HOURS	1 JAN 75
	INCLUSIVE SCATTERING #324	WEISBERG	600 HOURS	1 OCT 76
	HADRON JETS #236A	MOCKETT	1,200 HOURS	1 OCT 76
	POLARIZED SCATTERING #61	CHAMBERLAIN	700 HOURS	1 JUL 76
-M2	INCLUSIVE NEUTRAL MESON #350	KENNEY	400 HOURS	1 OCT 76
	PARTICLE SEARCH #472	STAMFIELD	550 HOURS	1 OCT 76
-M3	NEUTRON ELASTIC SCATTERING #248	LONGO	1,450 HOURS	1 OCT 76
-M6	INCLUSIVE SCATTERING #118A	FRIEDMAN	1,200 HOURS	1 JUL 76
-OTHER	NUCLEAR CHEMISTRY #81A	KAUFMAN	143 BOMBARDMENTS	1 OCT 76
NA -NEUTRINO	15-FOOT NEUTRINO/H2 #45A	ROE	162K PIX	1 APR 76
	15-FOOT ANTI-NEUTRINO/H2 #31A	DERRICK	64K PIX	1 APR 76
	15-FOOT NEUTRINO/H2 & NE #53A	BALTAY	64K PIX	1 JUL 76
-MUON/HADRON	TEST MUON IRRADIATION #467	FREEDMAN	2 TARGET EXPOSURES	1 OCT 76
-15-FT	15-FOOT PI- - P @ 100 #83A	KITAGAKI	11K PIX	1 APR 75
	15-FOOT PI- - P@NE @ 200 #89	FRETTER	4K PIX	1 JUL 75
	15-FOOT PI- - P @ 360 #384	HUSON	20K PIX	1 APR 76
-30-IN	30-INCH HYBRID #299	BLESS	158K PIX	1 APR 75
	30-INCH PBAR - D @ 100 #345	EKSPONG	61K PIX	1 OCT 76
PA -PE	PHOTON TOTAL CROSS SECTION #25A	CALDWELL	1,200 HOURS	1 OCT 76
	PARTICLE SEARCH #325	CRONIN	700 HOURS	1 JUL 76
	NUCLEAR FRAGMENTS #466	KAUFMAN	2 TARGETS EXPOSED	1 OCT 76
-PC	DI-LEPTON #288	LEDERMAN	2,900 HOURS	1 OCT 76
	DI-HADRON #494	GOOD	550 HOURS	1 OCT 76
-PH	PROTON-PROTON ELASTIC #177A	OREAR	750 HOURS	1 APR 76
ITA-C-0	PROTON-NUCLEON SCATTERING #198A	OLSEN	1,400 HOURS	1 OCT 76
	PROTON-PROTON POLARIZATION #313	NEAL	1,150 HOURS	1 OCT 76
	PROTON-NUCLEON SCATTERING #381	HALAMUD	50 HOURS	1 OCT 76
	NUCLEAR FRAGMENTS #442	TURKOT	100 HOURS	1 OCT 76

C. EXPERIMENTS THAT ARE IN TEST STAGE (9):

NA -M1	FORM FACTOR #456	STORK	150 HOURS	1 OCT 76
-M2	PARTICLE PRODUCTION #415	PONDROM	5 HOURS	1 OCT 76
-M4	K ZERO REGENERATION #226	TELEGDI	400 HOURS	1 OCT 76
	K ZERO CROSS SECTION #486	WINSTEIN		1 OCT 76
-M6	HADRON DISSOCIATION #396	GOULIANOS	300 HOURS	1 OCT 76
	MULTIPARTICLE #110A	MCLEOD	50 HOURS	1 OCT 76
NA -NEUTRINO	NEUTRINO #310	CLINE	550 HOURS	1 OCT 76
-MUON/HADRON	MUON #398	WILSON	300 HOURS	1 OCT 76
-15-FT	PARTICLE SEARCH #379	WOJCICKI	300 HOURS	1 OCT 76

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D. EXPERIMENTS BEING INSTALLED (2):		SPOKESPERSON	EXTENT OF APPROVAL
MA -M6	BACKWARD SCATTERING #290	BAKER	900 HOURS
MA -MPUTRINO	NEUTRINO #482	BARISH	PARASITIC RUNNING

E. EXPERIMENTS TO BE SET UP WITHIN A YEAR (29):				
MA -M1	PARTICLE SEARCH #350	BAKER	PARASITIC RUNNING	
	HADRON DISSOCIATION #272	FERBEL	600 HOURS	
-M2	LAMBDA MAGNETIC MOMENT #440	BUNCE	160 HOURS	
	HADRON JETS #395	SELOVE	450 HOURS	
	LAMBDA POLARIZATION #441	POMEROY	150 HOURS	
	INCLUSIVE NEUTRON #404	JONES	PARASITIC RUNNING	
	PARTICLE SEARCH #439	GARELICK	400 HOURS	
	MUON SEARCH #453	FRISCH	600 HOURS	NOTES: THE ABILITY TO SET UP THESE EXPERIMENTS DURING THE NEXT YEAR IS CONTINGENT ON THE AVAILABILITY OF FUNDS.
-M3	NEUTRON-NUCLEUS INELASTIC #438	JONES	200 HOURS	
-M4	INCLUSIVE K-SHORT #383	KOBRAK	500 HOURS	
-M6	ASSOCIATED PRODUCTION #99	DIEBOLD	500 HOURS	
	PARTICLE SEARCH #490	SANDWEISS	TEST RUNNING	
MA -NEUTRINO	NEUTRINO #253	MO	PARASITIC RUNNING	DURING 1977 IT IS PLANNED FOR 30-INCH BUBBLE CHAMBER EXPOSURES TO TOTAL AT LEAST 500K PICTURES.
-MUON/HADRON	EMULSION/MUONS @ 50-100 #373	JAIN	EMULSION EXPOSURE	
	EMULSION/MUONS @ 200 #424	WADA	EMULSION EXPOSURE	
	EMULSION/MUONS @ 200 #509	SHIRAI	EMULSION EXPOSURE	
	PARTICLE SEARCH #369	KIRK	600 HOURS	
	DI-MUON #444	SMITH	400 HOURS	
	MUON #203A	KERTH	500 HOURS	
	MUON #391	KERTH	250 HOURS	
-30-IN	30-INCH PBAR - P @ 50 #344	GUTAY	100K PIX	
-OTHER	MONOPOLE #502	BARTLETT	COSMIC RAY RUNNING	
PA -PE	EMULSION/ELECTRONS @ HI E #340	DAKE	EMULSION EXPOSURE	
	EMULSION/ELECTRONS @ >100 #399	GOLDEN	5 STACKS	
	EMULSION/ELECTRONS @ HI E #510	MIO	EMULSION EXPOSURE	
	PHOTOPRODUCTION #152B	HEUSCH	350 HOURS	
	PHOTOPRODUCTION #401	GORMLEY	300 HOURS	
	PHOTOPRODUCTION #458	LEE	300 HOURS	
ITA-C-O	PROTON-HELIUM SCATTERING #289	MALAMUD	700 HOURS	

F. OTHER APPROVED EXPERIMENTS (29):			
MA -M2	PARTICLE SEARCH #411	GARELICK	250 HOURS
	PARTICLE SEARCH #413	GARELICK	150 HOURS
-M6	INCLUSIVE SCATTERING #451	BARTON	400 HOURS
	FORM FACTOR #446	AMRENBRANDT	500 HOURS
MA -NEUTRINO	15-FOOT NEUTRINO/D2 #151A	SNOW	100K PIX
	15-FOOT NEUTRINO/D2 #227	ENGELMANN	100K PIX
	15-FOOT ANTI-NEUTRINO/D2 #390	GARFINKEL	300K PIX
	NEUTRINO #356	BARISH	1,000 HOURS
	15-FOOT NEUTRINO/H2 & NE #380	BALTAY	200K PIX
	15-FOOT ANTI-NEUTRINO/H2&NE#383	STEVENSON	200K PIX
-15-FT	15-FOOT P - P & NE @ 400 #291	MANN	25K PIX
-30-IN	30-INCH PI+ & P - P @ 300 #277	BARNES	300K PIX
	30-INCH PBAR - P @ 200 #392	NEALE	100K PIX
	30-INCH PI- - P @ 150 #393	PLESS	400K PIX
	30-INCH PI- - HI Z @ 300 #304	WALKER	200K PIX
	30-INCH P - P @ 500 #207	ENGELMANN	50K PIX
-OTHER	EMULSION/NEW PARTICLES #386	LORD	EMULSION EXPOSURE
	DETECTOR DEVELOPMENT #206	YODH	200 HOURS
	EMULSION/PI- @ 200 #491	TAKAHASHI	EMULSION EXPOSURE
	EMULSION/PI- @ > OR = 200 #503	OGATA	EMULSION EXPOSURE
	EMULSION/PI- @ > OR = 200 #506	DAKE	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400-500 #493	IWAI	EMULSION EXPOSURE
	EMULSION/PROTONS @ 500 #508	WOLTER	EMULSION EXPOSURE
PA -PE	PARTICLE SEARCH #400	PEOPLES	400 HOURS
	PNI PHOTOPRODUCTION #263	CHEN	600 HOURS
-PC	CHARGED HYPERON #497	LACH	400 HOURS
-PY	PION INCLUSIVE #258	PIRUUE	800 HOURS
	C-TEST #302	CESTER-REGGE	400 HOURS
	MULTIGAMMA #192	GUIRAGOSSIAN	400 HOURS

G. PENDING PROPOSALS (43):			EXTENT OF REQUEST
MA -M1	DETECTOR DEVELOPMENT #427	YUAN	200 HOURS
	HIGH ENERGY CHANNELING #507	GIBSON	250 HOURS
	CHARGED HYPERON #512	SHEPARD	800 HOURS
	PARTICLE STUDY #515	ROSEN	1,000 HOURS
-M2	LAMBDA BETA DECAY #361	POMEROY	300 HOURS
	PARTICLE SEARCH #477	WEINSTEIN	500 HOURS
	LAMBDA-BAR PRODUCTION #495	HELLER	400 HOURS
	PROTON POLARIZATION #505	YAMIN	100 HOURS
-M3	K STAR PRODUCTION #449	ABOLINS	600 HOURS
	NEUTRON-DEUTERON ELASTIC #479	ROBERTS	300 HOURS
-M6	HADRON DISSOCIATION #312	EDELSTEIN	1,000 HOURS
	PARTICLE SEARCH #469	CUTTS	150 HOURS
	INCLUSIVE SCATTERING #513	BRANDENBERG	350 HOURS
MA -NEUTRINO	NEUTRINO #355	BARISH	1,400 HOURS
	15-FOOT NEUTRINO/H2 & NE #389	TENNER	100K PIX
	15-FOOT NEUTRINO/H2 & NE #455	PETERSON	200K PIX
	NEUTRINO #496	CHEN	1,000 HOURS
	NEUTRINO #517	READ	2,000 HOURS
-MUON/HADRON	PION DISSOCIATION #318	ASCOLI	400 HOURS
	MUON #348	WILSON	400 HOURS
	DI-MUON #443	PILCHER	400 HOURS
	MUON #448	WILSON	300 HOURS
	TEST PARTICLE SEARCH #457	BRANDENBURG	100 HOURS
	MUON #487	SESSOMS	800 HOURS
	TEST MUON IRRADIATION #501	LANDE	25 HOURS
-15-FT	15-FOOT P - P @ > OR = 300 #208	TAKIBAEV	75K PIX
-30-IN	30-INCH K+ - P @ 150 #375	RUBIN	400K PIX
	30-INCH PBAR - P @ 100 #394	WHITMORE	2,000K PIX
	30-INCH HYBRID #488	PLESS	2,500K PIX
	30-INCH PIGP - P&NE @ 100 #504	GULJAMOV	30K PIX
	30-INCH PBAR - D @ 200 #511	FRIDMAN	150K PIX
PA -PE	PHOTOPRODUCTION #450	CALDWELL	600 HOURS
	PHOTOPRODUCTION #516	NASH	1,000 HOURS
-PC	CHARGED HYPERON #353	ECKLUND	600 HOURS

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AREA-BEAM		SPOKESPERSON	EXTENT OF REQUEST
-PW	HADRON JETS #246	SELOVE	600 HOURS
	ELASTIC SCATTERING #301	GETTNER	1,000 HOURS
	DI-MUON #326	PIRONE	400 HOURS
	ELASTIC SCATTERING #347	WALKER	1,200 HOURS
	HADRON-NUCLEON SCATTERING #420	GUIRAGOSSIAN	1,100 HOURS
	ELECTROPRODUCTION #458	GUIRAGOSSIAN	1,500 HOURS
	PROTON-PROTON ELASTIC #514	WALKER	600 HOURS
	ELECTRON PRODUCTION #518	TAYLOR	500 HOURS
ITA-C-0	PROTON-PROTON SCATTERING #500D	FRANZINI	1,000 HOURS

MANUSCRIPTS AND NOTES PREPARED DURING SEPTEMBER AND OCTOBER 1976

Copies of preprints with Fermilab publication numbers can be obtained from the Publications Office of Theoretical Physics Department, 3rd floor east, Central Laboratory. Copies of some articles listed are on the reference shelf in the Fermilab Library.

Experimental Physics

S. K. Chang and N. Sugarman Experiment #81	Production of ^{24}Na and ^{18}F from ^{27}Al with 400-GeV Protons (Submitted to Phys. Rev. C)
D. S. Ayres et al. Experiment #96	Impact Parameter Analysis of Elastic Scattering from 50 to 175 GeV/c (FERMILAB-Pub-76/65-EXP; submitted to Phys. Rev.)
A. E. Brenner et al. Fermilab Single Arm Spectrometer Group Experiment #96	$\pi^{\pm}p$, $K^{\pm}p$, pp, and $\bar{p}p$ Elastic Scattering from 50 to 175 GeV/c (FERMILAB-Pub-76/66-EXP; submitted to Phys. Rev. D)
H. L. Anderson et al. Experiment #98	Diffractive Production of Rho Mesons by 150 GeV Muons (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
H. L. Anderson et al. Experiment #98	Measurements of the Nucleon Structure Function in Muon Deep Inelastic Scattering at 100 and 150 GeV/c (Submitted to Phys. Rev. Lett.)
H. L. Anderson et al. Experiment #98	New Results in Muon Production of Hadrons at High Energies (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
H. Areti et al. Experiment #'s 116 and 233	An Estimate of the Mass of the 'Slow Bodies' Emitted in p-Nucleus Interactions at 200 and 300 GeV (Submitted to Phys. Lett.)
J. Hébert et al. Experiment #'s 116 and 233	The A-Dependence of the Ratio R_A for Charged Particle Production in p-Nucleus Interactions (Submitted to Phys. Rev. Lett.)

D. Fong et al. Proportional Hybrid System Consortium Experiment #154	The Average Charged Multiplicity in $\pi^- + p \rightarrow \pi^-_{fast} + X$ at 147 GeV/c and Comparison with Other Reactions (Submitted to Phys. Rev.)
W. Busza et al. Experiment #178	Energy and Target Dependence of the Pseudo-Rapidity Distributions in Pion- and Proton- Nucleus Collisions at Fermilab Energies (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
F. A. Nezrick Experiment #180	Scaling Variable Distributions for Antineutrino-Nucleon Scattering in the 15-Ft Bubble Chamber at Fermilab (FERMILAB-Conf-76/68-EXP; presented at the Neutrino 1976 Conference, Aachen, Germany, June 8-13, 1976)
E. Dally et al. Experiment #216	Measurement of the Pion Form Factor (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
J. A. Appel et al. Experiment #288	Production of High Mass Muon Pairs in Hadron Collisions at 400 GeV (FERMILAB-Pub-76/75-EXP; submitted to Phys. Rev. Lett.)
R. Raja et al. Experiment #311	Neutral Particle Production in 100 GeV/c $\bar{p}p$ Interactions (FERMILAB-Pub-76/79-EXP; submitted to Phys. Rev. D)
S. W. Gray Experiment #313	Polarization in Elastic Scattering at High Energies (Submitted to the ZGS Summer Symposium on High Energy Physics with Polarized Beams and Targets, Argonne National Laboratory, August 23-27, 1976)
E. Malamud Experiment #317	Coherent Elastic and Inelastic Scattering from Deuterium and Helium (FERMILAB-Conf-76/67-EXP; talk presented at the Topical Meeting on Multiparticle Production on Nuclei at Very High Energy, Trieste, Italy, June 10-15, 1976)
K. J. Anderson et al. Experiment #331	Production of the J (3.1) and ψ' (3.7) by 225-GeV π^+, π^-, and Protons (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
K. J. Anderson et al. Experiment #331	High Sensitivity Search for Multi-Muon Events Produced by 225 GeV Hadrons (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)

K. J. Anderson et al. Experiment #331	Production of Continuum Muon Pairs at 225 GeV by Pions and Protons (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
R. Thun et al. Experiment #357	A Description of Drift Chambers Used in a Fermilab Experiment (Submitted to Nucl. Instrum. Methods)
G. J. Blanar et al. Experiment #365	Search for Forward Production of Massive States Which Decay with Muon Emission (Submitted to Phys. Rev. Lett.)
A. Roberts et al. General	Status and Aims of the DUMAND Neutrino Project. The Ocean as a Neutrino Detector (FERMILAB-Conf-76/59-EXP; submitted to the Neutrino 1976 Conference, Aachen, Germany, June 8-13, 1976)

Theoretical Physics

A. Halprin et al.	Second-Class Currents and Very Light Quarks (FERMILAB-Pub-76/53-THY; submitted to Phys. Rev. D)
K. Yamada	Possibilities of Unconventional Resonances in $\pi\Sigma$ and $\bar{K}\Delta$ Scattering (FERMILAB-76/55-THY)
A. N. Mitra	Quark Pair Creation, Electromagnetic Masses and G-Violating ω, η Decays (FERMILAB-Pub-76/57-THY; submitted to Phys. Lett. B)
E. Rabinovici et al.	SU(3) Content of the Pomeron at Very High Energies (FERMILAB-Pub-76/58-THY; submitted to Phys. Rev. Comments)
C. Quigg	Peripheral Models (FERMILAB-Pub-76/60-THY; contribution to Encyclopedia of Physics, edited by R. G. Lerner and G. L. Trigg, to be published by Dowden, Hutchinson, and Ross)
B. W. Lee	Summary Talk--Status of Accelerator Neutrino Physics (FERMILAB-Conf-76/61-THY; talk given at the Neutrino 1976 Conference, Aachen, Germany, June 8-13, 1976)
Wu-Ki Tung	The Longitudinal Structure Functions in High Energy Lepton-Hadron Scattering (FERMILAB-Pub-76/62-THY; submitted to Phys. Rev. Comments and Addenda)

B. W. Lee et al. — Tests for Weak Decays of Charmed Particle Candidates (FERMILAB-Pub-76/63-THY; submitted to Phys. Rev. Lett.)

B. W. Lee — Gauge Theories (FERMILAB-Pub-76/64-THY; contribution to Encyclopedia of Physics, edited by R. G. Lerner and G. L. Trigg, to be published by Dowden, Hutchinson, and Ross)

B. W. Lee et al. — Charmed Baryon Interpretation of $\Lambda\pi^-\pi^-\pi^+$ and $\Lambda\pi^-\pi^-\pi^+\pi^\pm$ Peaks (FERMILAB-Pub-76/71-THY; submitted to Phys. Rev.)

P. Sorba — SU(4) Breaking and the New Particles: Some Applications (FERMILAB-Conf-76/72-THY; talk presented at the Vth International Colloquium in Group Theoretical Methods in Physics, Montreal, July, 1976)

L. A. P. Balázs — A Planar Bootstrap Based on a Padé Approximation to the Dual Multiperipheral Model (FERMILAB-Pub-76/73-THY; submitted to Phys. Rev.)

General

H. Edwards et al. — Measurements of Magnet Quench Levels Induced by Proton Beam Spray (Submitted to the 1976 Applied Superconductivity Conference, Stanford University, August 17-20, 1976)

R. H. Flora et al. — Quench Development in Magnets Made with Multifilamentary NbTi Cable (Submitted to the 1976 Applied Superconductivity Conference, Stanford University, August 17-20, 1976)

B. P. Strauss et al. — Results of the Fermilab Wire Production Program (Submitted to the 1976 Applied Superconductivity Conference, Stanford University, August 17-20, 1976)

W. B. Fowler et al. — The Technology of Producing Reliable Superconducting Dipoles at Fermilab (Submitted to the 1976 Applied Superconductivity Conference, Stanford University, August 17-20, 1976)

E. N. Tsyganov — Some Aspects of the Mechanism of a Charge Particle Penetration Through a Monocrystal (Submitted to Phys. Rev. Lett.)

Physics Notes

H. B. White FN-295	Neutrino Event Rates at Fermilab
C.-H. Lai and C. Quigg FN-296	An Estimate of the Branching Ratios for Dalitz Pair Decays of the ω^0 Meson
J. E. Elias et al. FN-297	A Novel Design for a Hodoscope with 1 mm Granularity (Submitted to Nucl. Instrum. Methods)
R. R. Wilson FN-298	Very Big Accelerators as Energy Producers
D. E. Johnson and S. Ohnuma FN-299	MESSYMESH--An Improved Version

DATES TO REMEMBER

November 5, 1976	Fermilab Auditorium Bicentennial Lecture Series: Robert McC. Adams, "Cities in the Sand." Tickets available in Guest Office. Lecture at 8:30 p. m.
November 11-12, 1976	Autumn meeting of the Fermilab Program Advisory Committee.
November 15, 1976	Deadline for receipt of written materials to be considered at the Multiparticle Spectrometer Workshop.
December 9-10, 1976	Multiparticle Spectrometer Workshop.

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