



**national accelerator laboratory**

TM-398  
2800

A LISTING OF THE RESEARCH PROPOSALS SUBMITTED TO NAL  
INCLUDING THE CURRENT STATUS OF THE PROPOSED  
AND APPROVED EXPERIMENTS

James R. Sanford

National Accelerator Laboratory

November 1, 1972



- 1A Neutrino - D. Cline; Harvard, Penn., Wisc.  
 NAL NEUTRINO PROPOSAL.  
 Approved 10-70.
- 2B 30" Hybrid - G. A. Smith; ANL, Duke, Iowa State, Md., Mich.  
 State, NAL, Notre Dame, Purdue, Toronto (Canada);  
 Wisc.  
 STUDY OF MULTIPARTICLE p-p INTERACTIONS FROM 100 GeV/c TO  
 400 GeV/c WITH A 30-INCH BUBBLE CHAMBER--OPTICAL SPARK CHAMBER  
 HYBRID SYSTEM.  
 Approved 5-71.      100K pix of p-p @ 200 GeV  
                          100K pix of p-p @ 300 or 400 GeV  
                          120K pix of  $\pi^-$ -p @ 200 GeV  
                          50K pix of  $\pi^-$ -p @ 100 GeV  
                          80K pix of  $\pi^+$ -p @ 100 GeV
- 3 Monopole - R. Ross; LBL, SLAC  
 PROPOSAL FOR A SEARCH FOR MAGNETIC MONOPOLES AT NAL.  
 Approved 8-70.
- 4-I Neutron Cross Section - M. Longo; ANL, Mich.  
 NEUTRON-PROTON DIFFRACTION SCATTERING AND NEUTRON TOTAL CROSS  
 SECTIONS UP TO 200 GeV.  
 Approved 8-70.
- 4-II Neutron Elastic Scattering - M. Longo; ANL, Mich.  
 NEUTRON-PROTON DIFFRACTION SCATTERING AND NEUTRON TOTAL CROSS  
 SECTIONS UP TO 200 GeV.  
 Approved 8-70.
- 5 Muon - M. Perl; SLAC  
 MUON-PROTON INELASTIC SCATTERING.  
 Withdrawn 10-70.
- 6 Proton-Proton Elastic - A. Krisch; ANL, Mich.  
 200-GeV PROTON-PROTON ELASTIC SCATTERING AT HIGH TRANSVERSE  
 MOMENTUM.  
 Approved 2-71.

- 7        Elastic Scattering - D. Meyer; ANL, Ind., Mich., NAL, Purdue  
A PROPOSAL TO MEASURE  $\pi^{\pm}$ p AND p-p DIFFERENTIAL ELASTIC SCATTER-  
ING CROSS SECTIONS FROM 50 TO 170 GeV/c. (In addition, data  
will be taken on  $K^{\pm}$ -p and  $\bar{p}$ -p simultaneously.)  
Approved 8-70.
- 8        Neutral Hyperon - L. Pondrom; Mich., Rutgers, Wisc.  
EXPERIMENTS IN A NEUTRAL HYPERON BEAM.  
Approved 8-70.
- 9B       15' Neutrino - M. Stevenson; Hawaii, LBL  
PROPOSAL TO STUDY NEUTRINO INTERACTIONS IN THE 30-m<sup>3</sup> NAL BUBBLE  
CHAMBER WITH EXTERNAL MUON IDENTIFIER.  
Defer 12-71. 2,000K pix of  $\nu$ -d with EMI.
- 10       Total Cross Section - W. Baker; NAL  
A PROPOSAL TO MEASURE TOTAL CROSS SECTIONS FOR  $\pi^{\pm}$ ,  $K^{\pm}$ , p,  $\bar{p}$ .  
Inactive 9-70 (see 104).
- 11A      Quark - Y. Kim; Ind. State, Kansas, NAL, Ohio State, Rose  
Polytechnic  
SEARCH FOR FAST PARTICLES PRODUCED AT LARGE LAB ANGLES AT NAL.  
(Search for tachyons, quarks.)  
Rejected 9-70.
- 12       Neutron Backward Scattering - N. Reay; Carleton (Canada);  
Mich. State, Ohio State  
A STUDY OF NEUTRON-PROTON CHARGE-EXCHANGE SCATTERING IN THE  
MOMENTUM RANGE 50-200 GeV/c.  
Approved 8-70.
- 13       Detector Development - T. Bowen; Ariz., LSU, Max-Planck  
(Germany); NASA  
IONIZATION SPECTROMETER DEVELOPMENT AND CALIBRATION.  
Inactive 12-70.
- 14A      Proton-Proton Inelastic - P. Franzini; Columbia, SUNY (Stony  
Brook)  
PROPOSAL TO STUDY INELASTIC HIGH-ENERGY PROTON-PROTON COLLI-  
SIONS IN THE DIFFRACTIVE REGION.  
Approved 3-71.

- 15A K<sup>0</sup> Regeneration - J. Steinberger; Calif. (Santa Cruz); CERN, Chicago, Columbia, Heidelberg (Germany)  
PROPOSAL FOR A MEASUREMENT OF THE MOMENTUM DEPENDENCE OF THE DIFFERENCE IN FORWARD SCATTERING AMPLITUDES OF K AND  $\bar{K}$ .  
Rejected 8-70.
- 16A Proton-Proton Inelastic - L. T. Kerth; LBL  
p-p ELASTIC AND INELASTIC SCATTERING AT SMALL MOMENTUM TRANSFER.  
Rejected 4-71.
- 17 30" Antiprotons - B. Reynolds; Ohio.  
 $\bar{p}d$  INTERACTIONS FROM 20 TO 60 GeV/c.  
Active. 1,000K pix of  $\bar{p}d$  at 20-60 GeV.
- 18A Proton Excitation - G. O'Neill; Pavia (Italy); Princeton  
PROPOSAL TO STUDY THE REACTIONS  $pp \rightarrow p(n\pi^+)$ ,  $p(p\pi^0)$  AND  $p(p\pi^+\pi^-)$  at 200 GeV.  
Defer 8-71.
- 19A Monopole - D. Tompkins; Wyoming  
A SEARCH FOR MONOPOLE PRODUCTION BY 200-500 GeV PROTONS.  
Defer 7-72.
- 20 15' Neutrino - M. Block; Northwestern  
A STUDY OF ELASTIC NEUTRINO SCATTERING USING A DEUTERIUM BUBBLE CHAMBER.  
Rejected 12-71. 250K pix of  $\nu$ -d.
- 21A Neutrino - B. Barish; Cal. Tech., NAL  
NEUTRINO PHYSICS AT VERY HIGH ENERGIES.  
Approved 10-70.
- 22 Monopole - G. Collins; BNL, VPI  
EXPERIMENTAL PROPOSAL TO THE NAL FOR A SEARCH FOR MULTIGAMMA EVENTS FROM MAGNETIC MONOPOLE PAIRS.  
Approved 8-70.
- 23A Inclusive Scattering - J. Rothberg; Wash.  
INCLUSIVE  $\pi p$  AND  $K p$  SCATTERING.  
Approved 7-72.
- 24A Photon Scattering - D. Caldwell; Calif. (Santa Barbara); NAL  
MEASUREMENT OF INELASTIC COMPTON SCATTERING.  
Inactive 10-72.

- 25A Photon Cross Section - D. Caldwell; Calif. (Berkeley)  
MEASUREMENT OF THE TOTAL PHOTOABSORPTION CROSS SECTION ON  
H, D, C, Cu, AND Pb FOR PHOTON ENERGIES FROM 14 TO 300 GeV,  
AND A SEARCH FOR THE PHOTOPRODUCED MONOPOLE.  
Approved 8-71.
- 26 Muon - K. W. Chen; Calif. (San Diego); Cornell, Mich. State  
HIGH MOMENTUM TRANSFER INELASTIC MUON SCATTERING AND TEST OF  
SCALE INVARIANCE AT NAL.  
Approved 8-70.
- 27A Neutron Dissociation - J. Rosen; NAL, Northwestern, Rochester  
PROPOSAL TO STUDY THE COHERENT DISSOCIATION OF NEUTRONS.  
Approved 3-71.
- 28A 15' Neutrino - W. Fry; CERN, Wisc.  
SEARCH FOR HEAVY LEPTONS AND HARD PENETRATING RADIATION IN THE  
NEUTRINO BEAM, STUDY OF DIFFRACTION SCATTERING OF NEUTRINOS;  
STUDY OF DEEP INELASTIC  $\nu_{\mu}$  SCATTERING IN A Ne BUBBLE CHAMBER  
AT NAL, AND TEST OF THE  $\Delta S = \Delta Q$  RULE AT HIGH MOMENTUM TRANSFER  
USING INCLUSIVE REACTIONS.  
Approved 12-71. 50K pix of  $\nu$ 's in neon ( $\geq 30\%$ ) yielding at  
least 10K events and 50K pix of  $\nu$ 's using  
special targeting.
- 29 Muon - R. Wilson; Harvard  
PROPOSAL FOR  $\mu p$  SCATTERING EXPERIMENT AT NAL.  
Inactive 10-70 (see 98).
- 30  $K^0$  Regeneration - T. Kirk; Harvard, NAL  
NEUTRAL KAON REGENERATION IN LIQUID HYDROGEN FROM 40 GeV TO  
200 GeV.  
Rejected 9-70.
- 31A 15' Neutrino - M. Derrick; ANL, Carnegie-Mellon  
PROPOSAL TO INVESTIGATE  $\bar{\nu}_{\mu}$  INTERACTIONS IN HYDROGEN AT NAL.  
Approved 12-71. 7,000 events in not more than 200K pix  
of  $\bar{\nu}$  in  $H_2$ .
- 32 TANC - R. Hofstadter; Stanford  
TEST AND CALIBRATE A LARGE  $N_{\text{AI}}$  (T1) TANC DETECTOR AND TO  
MEASURE NEUTRAL HADRON TOTAL CROSS SECTIONS.  
Approved 8-70.

- 33 Muon - L. Mo; Chicago, NAL, Oxford (England); Penn.  
PRELIMINARY PROPOSAL TO MEASURE THE HADRONS IN MUON-PROTON  
INELASTIC SCATTERING AT THE NATIONAL ACCELERATOR LABORATORY.  
Inactive 11-70 (see 98).
- 34 Detector Development - R. Huggett; LSU, Max-Planck (Germany);  
NASA  
NUCLEAR-ELECTROMAGNETIC CASCADE DEVELOPMENT STUDY. (Ioniza-  
tion spectrometer development.)  
Approved 8-70.
- 35A Multiparticle - D. McLeod; Ill. (Chicago Circle)  
A PROPOSAL TO STUDY RESONANCE PRODUCTION IN  $\pi^-p \rightarrow X^-p$  AT 40 TO  
80 GeV/c.  
Inactive 10-70.
- 36A Proton-Proton Elastic - R. L. Cool; Dubna (USSR); Rochester,  
Rockefeller, NAL  
A PROPOSAL TO STUDY SMALL ANGLE p-p SCATTERING AT VERY HIGH  
ENERGIES.  
Approved 2-71.
- 37 15' Proton - E. Malamud; Calif. (Los Angeles); NAL  
MULTIBODY FINAL STATES IN pp COLLISIONS UP TO 500 GeV.  
Active. 250K pix of p-p at several energies in 15'.
- 37A 30" Proton - E. Malamud; Calif. (Los Angeles); NAL  
MULTIBODY FINAL STATES IN pp COLLISIONS UP TO 500 GeV.  
Approved 8-71. 50K pix of p-p @ 300 GeV.
- 38 Neutrino - J. Walker; ANL, MIT, NAL, Northwestern, Pittsburgh  
PRODUCTION OF W's AND STUDY OF DEEP INELASTIC REACTIONS BY  
VERY HIGH ENERGY NEUTRINOS.  
Rejected 11-70.
- 39 Rapid Cycling Chamber - W. Walker; Duke, Toronto (Canada);  
Wisc.  
PROPOSAL FOR THE USE OF A RAPID CYCLING BUBBLE CHAMBER AT  
NAL. (Diffraction dissociation by 100, 200 GeV/c protons,  
pions; missing mass, new particle searches.)  
Withdrawn 5-71.
- 40 15' Pion - R. Willmann; Purdue  
DIFFRACTIVE PROCESSES IN  $\pi^-p$  INTERACTIONS AT 100 GeV/c.  
Active (see 126). 500K pix of  $\pi^-p$  at 100 GeV.

- 41      15' Proton - V. Barnes; Purdue  
VERY HIGH ENERGY PROTON PROTON INTERACTIONS: EXPLORATORY  
SURVEY IN A BUBBLE CHAMBER.  
Active (see 126). 100K pix of p-p in 15'.
- 42      15' Neutrino - A. Garfinkel; Purdue  
NEUTRINO INTERACTIONS IN THE DEUTERIUM-NEON 14-FOOT DOUBLE  
BUBBLE CHAMBER.  
Defer 12-71. 1,000K pix in D<sub>2</sub> TST surrounded by neon.
- 43      Diffraction Scattering - D. Miller; Purdue  
PROPOSAL TO STUDY SINGLE MESON PRODUCTION IN MESON NUCLEON  
INTERACTIONS AT 50 TO 100 GeV/c.  
Inactive 10-70.
- 44A     15' Neutrino - B. Roe; Mich., NAL  
PROPOSAL TO STUDY NEUTRINO INTERACTIONS WITH PROTONS AND  
NEUTRONS USING THE 14-FOOT BUBBLE CHAMBER AT NAL.  
Defer 12-71. 750K pix in D<sub>2</sub> TST surrounded by neon.
- 45A     15' Neutrino - F. Nezirick; Mich., NAL  
PROPOSAL TO STUDY NEUTRINO INTERACTIONS WITH PROTONS USING  
THE 14-FOOT BUBBLE CHAMBER AT NAL.  
Approved 12-71. Up to 15,000 events in not more than  
300K pix of  $\nu$  in H<sub>2</sub>.
- 46      15' Pion - F. Huson; NAL  
A STUDY OF HIGH ENERGY  $\pi^-$  PROTON INTERACTIONS WITH THE NAL  
14-FOOT BUBBLE CHAMBER.  
Active. 250K pix of  $\pi^-$ -p in H<sub>2</sub> TST surrounded by neon.
- 47      30" Hybrid - I. Pless; MIT  
DIFFRACTION DISSOCIATION AND ELASTIC SCATTERING PROCESSES  
WITH INCIDENT PROTONS AND NEGATIVE PIONS IN THE 200 GeV/c  
REGION.  
Withdrawn 5-71 (see 154). 1,000K expansions of a hybrid  
bubble chamber system.
- 48      Muon Search - R. Adair; BNL, NAL, Yale  
A MEASUREMENT OF THE INTENSITY AND POLARIZATION OF MUONS  
PRODUCED DIRECTLY BY THE INTERACTIONS OF PROTONS WITH NUCLEI.  
Approved 12-70.

- 49 Form Factor - J. Poirier; NAL, Notre Dame  
THE ELECTROMAGNETIC FORM FACTOR OF THE CHARGED PION FROM  
 $\pi^+e^-$  ELASTIC SCATTERING.  
Defer 8-71.
- 50A Elastic Scattering - J. Orear; BNL, Cornell, Lebedev Physical  
Institute (USSR)  
LARGE ANGLE  $\pi^\pm$ -P,  $K^\pm$ -P, AND  $P^\pm$ -P ELASTIC SCATTERING AT HIGH  
ENERGIES.  
Defer 8-71.
- 51 Multiparticle - E. von Goeler; Northeastern, Stanford  
MASS SPECTRUM DECAY MODES FOR BOSONS IN THE 2.0 TO 8.6 GeV/c<sup>2</sup>  
MASS RANGE.  
Approved 3-72.
- 52B Particle Production - H. Weisberg; Penn.  
A PROPOSAL TO STUDY PARTICLE PRODUCTION SPECTRA AND MULTI-  
PLICITIES IN HIGH ENERGY HADRON-HADRON COLLISIONS, AND FOR A  
BEAM SURVEY AND QUARK SEARCH.  
Defer 8-71.
- 53A 15' Neutrino - C. Baltay; BNL, Columbia  
SEARCH FOR THE INTERMEDIATE BOSON, LEPTON PAIR PRODUCTION,  
AND A STUDY OF DEEPLY INELASTIC REACTIONS UTILIZING HIGH  
ENERGY NEUTRINO INTERACTIONS IN LIQUID NEON.  
Approved 12-71. 100K pix of  $\nu$  in neon or plates yielding  
at least 20,000 events.
- 54 Multiparticle - J. Pine; Cal. Tech., Calif. (Los Angeles)  
QUASI-TWO-BODY REACTIONS AT 50-200 GeV.  
Inactive 10-70 (see 110B).
- 55 Pion Charge Exchange - A. Tollestrup; Cal. Tech.  
PROPOSAL TO STUDY  $\pi^-p \rightarrow \pi^0n$  AND  $\pi^-p \rightarrow \eta n$  AT HIGH ENERGY.  
Inactive 12-70.
- 56 Total Cross Section - R. Cool; BNL, Rockefeller  
MEASUREMENT OF TOTAL CROSS SECTIONS ON HYDROGEN AND DEUTERIUM.  
Inactive 9-70 (see 104).
- 57 Total Cross Section - S. Lindenbaum; BNL, NAL, Yale  
BEHAVIOR OF HIGH ENERGY ELASTIC SCATTERING AND TOTAL CROSS  
SECTIONS FOR  $\pi^\pm$ -p,  $K^\pm$ -p, p-p, AND  $\bar{p}$ -p.  
Rejected 3-71.



- 66        30" Hybrid - J. VanderVelde; Mich.  
STUDY OF LOW-MASS PERIPHERAL STATES IN A SMALL TRIGGERED  
BUBBLE CHAMBER. (A second round experiment with a downstream  
focusing spectrometer using scintillation counters.)  
Inactive 8-71. 200K expansions of  $\pi$ -p at >100 GeV.
- 67A       Proton-Proton Inelastic - B. Maglic; Ill. (Chicago Circle);  
Imperial College (London); Rutgers,  
Upsala  
SEARCH FOR BARYON RESONANCES UP TO 10 GeV MASS PRODUCED IN  
 $p + p \rightarrow p + \text{MM}$  WITH A RESOLUTION OF  $\pm 25$  MeV.  
Approved 2-71.
- 68        Multiparticle - H. Anderson; Chicago  
MULTIPARTICLE PRODUCTION IN  $\pi$ -p COLLISIONS AT 100 GeV.  
Inactive 11-70.
- 69A       Elastic Scattering - W. Willis; NAL, Yale  
ELASTIC SCATTERING OF THE LONG-LIVED HADRONS.  
Approved 9-70.
- 70        Lepton - L. Lederman; Columbia, NAL  
STUDY OF LEPTON PAIRS FROM PROTON-NUCLEAR INTERACTIONS;  
SEARCH FOR INTERMEDIATE BOSONS AND LEE-WICK STRUCTURE.  
Approved 12-70.
- 71B       Form Factor - D. Drickey; Calif. (Los Angeles); JINR (USSR)  
A MEASUREMENT OF THE PION FORM FACTOR.  
Defer 8-71.
- 72        Quark - L. Leipuner; BNL, Yale  
EXPERIMENTAL PROPOSAL TO NAL QUARK SEARCH.  
Approved 8-70.
- 73A       Elastic Scattering - R. Anderson; Northeastern, SLAC  
PROPOSAL TO MEASURE TWO BODY ELASTIC AND QUASI-ELASTIC SCATTER-  
ING AT HIGH ENERGIES.  
Inactive 10-70 (see 96).
- 74        Monopole - R. Fleischer; General Electric, NAL  
PROPOSAL TO NATIONAL ACCELERATOR LABORATORY FOR A SEARCH FOR  
MAGNETIC MONOPOLES.  
Approved 9-70.

- 75      Quark - T. Yamanouchi; NAL, NYU  
A PROPOSAL TO SEARCH FOR FRACTIONALLY CHARGED QUARKS.  
Approved 9-70.
- 76      Monopole - R. Carrigan; NAL  
SEARCH FOR MAGNETIC MONOPOLES PRODUCED AT NAL.  
Approved 9-70.
- 77      15' Hyperon - L. Libby; Colo.  
PROPOSAL TO STUDY HIGH ENERGY HYPERON PHYSICS AT NAL. (Protons  
onto plates in chamber to produce hyperons.)  
Inactive 7-71. 250K pix of protons into hydrogen with  
plates.
- 78A     30" Hadron - R. Burnstein; IIT  
PROPOSAL TO STUDY MULTIPARTICLE  $\pi^+$ -p AND p-p INTERACTIONS  
FROM 70 GeV/c AND ABOVE UTILIZING THE 30-INCH BUBBLE CHAMBER  
AND ASSOCIATED EQUIPMENT AT NAL.  
Inactive 8-71. 240K pix of  $\pi^+$ -p and p-p at  $\geq 70$  GeV.
- 79      K<sup>0</sup> Regeneration - H. Ticho; Calif. (Los Angeles)  
A MEASUREMENT OF THE REGENERATION PARAMETER IN THE 100 GeV/c  
RANGE.  
Rejected 8-70.
- 80A     30" Pion - T. Ferbel; Rochester  
PROPOSAL TO STUDY MULTIPARTICLE-PRODUCTION PROCESSES UTILIZING  
THE 30-INCH BUBBLE CHAMBER.  
Inactive 5-71 (see 138-I). 80K pix of  $\pi^-$ -p at 70 and  
 $\geq 250$  GeV/c.
- 81A     Nuclear Chemistry - M. W. Weisfield; ANL, BNL, Carnegie-Mellon,  
Chicago, LASL, Purdue, SUNY (Buffalo)  
PRELIMINARY SURVEY OF 200 GeV PROTON INTERACTIONS WITH COMPLEX  
NUCLEI.  
Approved 8-70.
- 82      K<sup>0</sup> Regeneration - V. Telegdi; Calif. (San Diego); Chicago,  
NAL, SLAC  
PROPOSAL TO INVESTIGATE REGENERATION OF NEUTRAL K-MESONS AT  
VERY HIGH ENERGIES.  
Approved 8-70.
- 83      15' Antiproton - T. Kitagaki; Tohoku (Japan)  
STUDY OF THE ANTIPROTON INTERACTIONS IN THE NAL HYDROGEN  
BUBBLE CHAMBER AT VERY HIGH ENERGIES, 40-140 GeV.  
Active. 200K of  $\bar{p}$ -p in 15' at 40, 70, 140 GeV.

- 84 Pion Charge Exchange - T. Jenkins; Case Western Reserve  
PROPOSAL FOR AN EXPERIMENT TO STUDY THE REACTION  $\pi^-p \rightarrow \pi^0n$  AT  
30 TO 150 GeV AT NAL.  
Inactive 12-70.
- 85 15' Pion - L. Gutay; Purdue  
PROPOSAL FOR AN EXPOSURE OF THE 15-FOOT DEUTERIUM FILLED BUBBLE  
CHAMBER TO A BEAM OF SEPARATED  $\pi^+$  MESONS AT 40 GeV/c AT NAL.  
Active. 600K pix of separated  $\pi^+d$  at 40 GeV.
- 86A Diffraction Dissociation - H. Lubatti; Orsay (France); Wash.  
A PROPOSAL TO STUDY INELASTIC DIFFRACTIVE PROCESSES BY OBSERV-  
ING COHERENT PRODUCTION OF MULTI-PION FINAL STATES FROM He  
NUCLEI.  
Approved 5-71.
- 87A Photoproduction - W. Lee; Columbia, Cornell, Hawaii, Ill., NAL  
PROPOSAL TO SEARCH FOR HEAVY LEPTONS AND INTERMEDIATE BOSONS  
FROM PHOTON-NUCLEON AND PHOTON-NUCLEI COLLISIONS.  
Approved 8-71.
- 88 30" Quark - V. Hagopian; Fla. State  
NAL BUBBLE CHAMBER PROPOSAL SEARCH FOR FRACTIONALLY CHARGED  
PARTICLES.  
Rejected 8-71. 20K pix in negative and positive "beam".
- 89 15' Pion - W. Fretter; Calif. (Berkeley)  
INTERACTIONS OF 150 GeV  $\pi^-$  MESONS IN A LARGE NAL BUBBLE  
CHAMBER FILLED WITH  $H_2$ -Ne.  
Active. 250K pix of  $\pi^-$  in  $H_2$ -Ne mixture.
- 90 Emulsion - J. Gierula; Cracow (Poland)  
CRACOW NUCLEAR EMULSION EXPOSURES.  
Completed 9-72.
- 91 Emulsion - C-Y Chien; Johns Hopkins, NAL  
PROPOSAL FOR AN EMULSION EXPERIMENT TO MEASURE THE ENERGY  
DEPENDENCE OF TOTAL CROSS SECTIONS AND MULTIPLICITIES UP TO  
500 GeV/c.  
Withdrawn 7-71.
- 92A 15' Neutrino - F. Sciulli; Cal. Tech.  
A NEUTRINO EXPERIMENT IN THE NAL  $30m^3$  BUBBLE CHAMBER USING  
"MONOENERGETIC" NEUTRINOS.  
Rejected 12-71. 750K with  $\nu, \bar{\nu}$  in  $H_2, D_2$  and Ne.

- 93      Pion Charge Exchange - M. Wahlig; LBL  
SMALL-ANGLE CHARGE EXCHANGE REACTIONS  $\pi^- + p \rightarrow \pi^0 + n$  AND  
 $\pi^- + p \rightarrow \eta + n$  FROM 50 TO 200 GeV/c.  
Inactive 12-70 (see 111).
- 94      Emulsion - E. Goza; LSU  
100 GeV PION INTERACTIONS IN PHOTOGRAPHIC EMULSION. (A  
PARASITIC EXPERIMENT.)  
Withdrawn 10-72.
- 95A     Photon Search - B. Cox; Johns Hopkins, NAL  
PROPOSAL FOR EXAMINATION OF WIDE ANGLE GAMMA RAYS AT NAL.  
Approved 6-71.
- 96      Elastic Scattering - D. Ritson; ANL, Bari (Italy); Brown,  
CERN, Cornell, MIT, NAL, Northeastern,  
Stanford  
FOCUSING SPECTROMETER FACILITY. (Measure elastic scattering  
and Quasi two-body elastic scattering of  $K^\pm$ ,  $p^\pm$  on  $H_2$  and  $D_2$   
up to 200 GeV/c.  
Approved 12-70.
- 97      Charged Hyperon - J. Lach; NAL, Yale  
ELASTIC SCATTERING OF THE HYPERONS. (Small angle scattering  
of negative hyperons  $\Sigma^-$ ,  $\Xi^-$ ,  $\Omega^-$ .)  
Approved 9-71.
- 98      Muon - L. Mo; Chicago, Harvard, NAL, Oxford (England)  
MUON-PROTON INELASTIC SCATTERING EXPERIMENT AT THE NATIONAL  
ACCELERATOR LABORATORY.  
Approved 1-71.
- 99      Associated Production - R. Diebold; ANL, Cornell, NAL  
A STUDY OF  $\pi^+ p \rightarrow K^+ \Sigma^+$  AND  $\pi^+ p \rightarrow K^+ Y^*$  USING THE FOCUSING SPEC-  
TROMETER FACILITY.  
Active.
- 100     Particle Search - P. Piroué; Chicago, Princeton  
A PROPOSAL TO STUDY PARTICLE PRODUCTION AT HIGH TRANSVERSE  
MOMENTA.  
Approved 2-71.
- 101     Form Factor - B. Gittelman; ANL, Cornell, NAL  
ELASTIC  $\pi^+ e^-$  SCATTERING. (Using Single Arm Spectrometer.)  
Defer 8-71.

- 102      K Charge Exchange - T. Jenkins; Case Western Reserve  
PROPOSAL FOR AN EXPERIMENT TO STUDY THE REACTION  $K^-p \rightarrow \bar{K}^0n$   
AT NAL ENERGIES.  
Inactive 4-71 (see 135).
- 103      Emulsion - D. King; Tenn.  
INTRA-NUCLEAR CASCADE PRODUCED BY 200 GeV PROTONS.  
Completed 9-72.
- 104      Total Cross Section - W. Baker; BNL, NAL, Rockefeller  
MEASUREMENT OF TOTAL CROSS SECTIONS ON HYDROGEN AND DEUTERIUM.  
Approved 8-70.
- 105      Emulsion - P. Malhotra; Tata Inst. (India)  
A PROPOSAL TO STUDY SOME CHARACTERISTICS OF PROTON-NUCLEON  
AND PROTON-NUCLEUS COLLISIONS AT 400 GeV USING NUCLEAR  
EMULSIONS.  
Completed 9-72.
- 106      Multiparticle - D. Miller; ANL, Mich. State, Northwestern  
PROPOSAL FOR A STUDY OF MULTIPARTICLE PRODUCTION AT NAL  
USING AN ARRAY OF WIDE-GAP TRIGGERABLE SPARK CHAMBERS.  
Rejected 5-71.
- 107A     Elastic Scattering - K-W Lai; BNL, Purdue  
MEASUREMENTS OF ELASTIC AND QUASI-ELASTIC SCATTERINGS OF pp  
AND  $\bar{p}p$  FROM ~20 TO 40 GeV/c.  
Rejected 8-71.
- 108      Beam Dump - M. Awschalom; NAL  
A BEAM DUMP EXPERIMENT. (Study of shielding including hadron  
cascade development, muon attenuation, radioactivity.)  
Approved 3-71.
- 109      Beam Survey - K. Pretzl; NAL  
A PROPOSAL FOR A PRELIMINARY BEAM SURVEY IN THE 3.5 MRAD BEAM.  
Inactive 3-71.
- 110B     Multiparticle - J. Pine; Cal. Tech., Calif. (Los Angeles);  
Ill. (Chicago Circle); NAL  
PROPOSAL TO STUDY MULTIPARTICLE PERIPHERAL PHYSICS AT NAL.  
Approved 4-72.
- 111      Pion Charge Exchange - A. Tollestrup; Cal. Tech., LBL, NAL  
PROPOSAL TO STUDY  $\pi^-p \rightarrow \pi^0n$  AND  $\pi^-p \rightarrow \eta n$ .  
Approved 2-71.

- 112 Neutron Dissociation - M. Kriesler; Mich., Princeton  
NEUTRON DIFFRACTION DISSOCIATION IN COULOMB DISSOCIATION  
FROM VARIOUS NUCLEI.  
Rejected 8-71.
- 113 K Charge Exchange - D. H. Miller; Northwestern  
PROPOSAL TO STUDY THE  $K^{\pm}$  CHARGE EXCHANGE REACTIONS AT HIGH  
ENERGIES.  
Inactive 4-71 (see 135).
- 114 Emulsion - P. L. Jain; SUNY (Buffalo)  
INTERACTION OF 200-500 GeV PROTON WITH EMULSION NUCLEI.  
Completed 9-72.
- 115 Short-Lived Particles - M. L. Stevenson; LBL  
SEARCH FOR LONG-LIVED PARTICLES ( $\tau \geq 0.1$  m sec).  
Approved 8-71.
- 116 Emulsion - J. Hebert; Barcelona (Spain); McGill (Canada);  
NAL, Ottawa (Canada); Strasbourg (France);  
Toronto (Canada)  
INTERACTION OF HIGH ENERGY PROTONS IN NUCLEAR EMULSIONS  
LOADED WITH  $B^{10}$  AND LiF.  
Completed 9-72.
- 117A Emulsion - O. Kusomoto; Hiroshima, INS Tokyo, Kinki, Osaka  
City (Japan)  
PHENOMENOLOGICAL STUDY OF 200 AND 500 GeV/c PROTON-PROTON  
COLLISIONS IN EMULSION.  
Completed 9-72.
- 118 Inclusive Scattering - J. I. Friedman; Bari (Italy); Brown,  
MIT, NAL  
HADRON SPECTRA FROM HIGH ENERGY INTERACTIONS. (Using Single  
Arm Spectrometer)  
Active.
- 119 Super-Heavy Elements - C. J. Batty; ANL, Hebrew (Israel);  
Manchester (England); RHEL  
PRODUCTION OF HEAVY AND SUPER-HEAVY NUCLEI IN TARGETS IRRADIATED  
BY VERY HIGH ENERGY PROTONS.  
Defer 8-71.
- 120 Photon Search - D. Cline; Chicago, Harvard, Wisc.  
EARLY  $\pi^0$  PARTICLE PRODUCTION SURVEY WITH THE GAS JET TARGET.  
Approved 6-71.

- 121A      30" Pion - R. Lander; Calif. (Davis)  
A PROPOSAL TO SEARCH FOR VERY HEAVY STRANGE PARTICLES USING  
A SMALL HYDROGEN BUBBLE CHAMBER.  
Approved 8-71. About 50K pix of  $\pi^+$ p at 100 GeV in 30".
- 122A      15' Neutrino - A. A. Volkov; Inst. High Energy Physics (USSR)  
ON INVESTIGATION OF NEUTRINO INTERACTION WITH THE 15-FOOT  
BUBBLE CHAMBER AT NAL.  
Inactive 9-72 (see 180). 3,000K pix of  $\bar{\nu}$ ,  $\bar{\nu}$  in H<sub>2</sub>, D<sub>2</sub> and Ne.
- 123      Quark - U. S. Kim; Ind. State, Ohio State, Rose Hulman Inst.  
PROPOSAL FOR A SEARCH FOR QUARK-MATTER AT NAL.  
Inactive 11-72.
- 124      Emulsion - H. H. Aly; Southern Ill.  
THE NATURE OF THE MOMENTUM SPECTRUM OF THE SECONDARY PARTICLES  
FROM HIGH-ENERGY COLLISION.  
Inactive 12-71.
- 125      30" Pion - D.R.O. Morrison; CERN  
PROPOSAL TO STUDY  $\pi^-$ p REACTIONS AT 60 AND 200 GeV/c IN THE  
30-INCH HYDROGEN BUBBLE CHAMBER AT NAL.  
Approved 8-71. 50K pix of  $\pi^-$ p at 100 GeV.
- 126      30" Hybrid - V. E. Barnes; Purdue  
MULTIPARTICLE  $\pi^-$ p INTERACTIONS AT 130 GeV/c AND AT THE  
HIGHEST ENERGY.  
Withdrawn 4-72. 400K pix of  $\pi^-$ -p at 130 and 300 GeV with  
hybrid 30".
- 127      30" Hadron - B. Eisenstein; Ill.  
A PROPOSAL TO STUDY SLOW SECONDARY PARTICLE DISTRIBUTIONS IN  
 $\pi^-$ p AND pp REACTIONS IN THE 30-INCH BUBBLE CHAMBER.  
Withdrawn 3-72. 200K pix of  $\pi^-$  and p at 50, 150 and 300 GeV.
- 128      30" Proton - A. Benvenntti; Wisc.  
SEARCH FOR MOSSBAUER TYPE NUCLEAR COLLISION WITH HIGH ENERGY  
PROTONS.  
Defer 8-71. 60K pix of P-N at 400 GeV.
- 129B      30" Neutral - W. F. Fry; Wisc.  
AN INVESTIGATION OF THE COMPONENTS OF THE NEUTRAL BEAM PRO-  
DUCED BY HIGH ENERGY PROTONS AT NAL USING THE 30" BUBBLE  
CHAMBER.  
Defer 7-72. 20K pix of neutral beam on H<sub>2</sub>.

- 130      30" Proton - R. Panvini; Vanderbilt  
PROPOSAL TO STUDY pp INTERACTIONS UP TO 500 GeV/c WITH THE  
30" BUBBLE CHAMBER.  
Rejected 8-71. 200K pix at 120 and 500 GeV.
- 131      30" Hybrid - D. H. Miller; Purdue  
K<sup>-</sup>p AND  $\bar{p}$ p INTERACTIONS AT 200 GeV/c.  
Inactive 4-72. 200K pix of K<sup>-</sup>p and  $\bar{p}$ p @ 200 GeV using  
Hybrid 2B System.
- 132      30" Hybrid - I. A. Pless; Brown, IIT, Ill., Ind., Johns  
Hopkins, MIT, NAL, Notre Dame, Rutgers, Stevens,  
Yale  
A GENERAL SURVEY OF PION-PROTON AND PROTON-PROTON COLLISIONS  
IN THE 100-500 GeV/c REGION.  
Inactive 6-71 (see 154). 2,000K pix of  $\pi^{\pm}$ , p on H<sub>2</sub> at 100,  
200 and 300 GeV.
- 133      30" Hybrid - W. D. Shephard; Notre Dame  
STUDY OF MULTIPIION PRODUCTION IN HIGH ENERGY  $\pi^-$ p INTERACTIONS  
AT NAL USING THE 30-INCH HYDROGEN BUBBLE CHAMBER AND A WIDE-  
GAP SPARK CHAMBER SPECTROMETER.  
Withdrawn 8-72 (see 2B). 300K pix of  $\pi^-$ -p @ 300 GeV using  
Hybrid 2B System.
- 134      30" Pion - V. P. Kenney; Notre Dame  
STUDY OF MULTIPIION PRODUCTION IN HIGH ENERGY  $\pi^-$ p INTERACTIONS  
AT NAL.  
Withdrawn 8-72 (see 2B). 400K pix of  $\pi^-$ -p at 50, 150 and  
300 GeV/c.
- 135      K Charge Exchange - T. Jenkins; Case Western Reserve, Mass.,  
Northwestern  
PROPOSAL FOR AN EXPERIMENT TO STUDY THE REACTION K<sup>-</sup>p →  $\bar{K}^0$ n  
AT NAL ENERGIES.  
Defer 11-71.
- 136      30" Hybrid - W. D. Walker; Duke, Toronto (Canada); Wisc.  
A STUDY OF HIGH ENERGY  $\pi^-$  NUCLEON COLLISIONS.  
Withdrawn 3-72 (see 2B). 600K pix of  $\pi^{\pm}$ p and  $\pi^+$ d at 200 GeV.
- 137      30" Pion - F. R. Huson; Calif. (Berkeley); LBL, NAL  
STUDY OF  $\pi^-$ +p INTERACTIONS AT HIGH ENERGY.  
Approved 8-71. 50K pix of  $\pi^-$ p at 200 GeV.
- 138-I      30" Proton - T. Ferbel; Mich., Rochester  
STUDY OF MULTIPARTICLE PRODUCTION IN A 30-INCH BUBBLE CHAMBER.  
Approved 8-71. 50K pix of p-p at 100 GeV.

- 138-II     30" Proton - J. VanderVelde; Mich., Rochester  
STUDY OF MULTIPARTICLE PRODUCTION IN A 30-INCH BUBBLE CHAMBER.  
Approved 8-71. 50K pix of p-p at 400 GeV.
- 139        Form Factor - E. Engels; Pittsburgh  
A MEASUREMENT OF THE ELECTROMAGNETIC RADIUS OF THE KAON AND  
THE DIFFERENCE BETWEEN THE PION AND KAON RADII.  
Defer 8-71.
- 140        Missing Mass - D. Garelick; Northeastern  
PROPOSAL TO STUDY HIGH MASS STATUS OF  $\pi^\pm$ ,  $K^\pm$ ,  $p^\pm$ , WITH MASSES  
UP TO 10 GeV.  
Rejected 11-71.
- 141A      30" Proton - T. H. Fields; ANL, NAL  
STUDY OF pp INTERACTIONS IN THE ANL 30-INCH HYDROGEN BUBBLE  
CHAMBER AT NAL.  
Approved 8-71. 67K pix of p-p at 200 GeV.
- 142        Super-Heavy Elements - R. W. Stoughton; ORNL  
PROPOSAL FOR A SEARCH FOR SUPER-HEAVY ELEMENTS BY IRRADIATIONS  
AT NAL.  
Defer 8-71.
- 143        30" Pion - G. Kalbfleisch; BNL  
PROPOSAL FOR A RAPID SYSTEMATIC STUDY OF ALL INTERACTIONS IN  
A  $\pi^-p$  EXPOSURE OF THE BARE 30-INCH CHAMBER AT 120 GeV/c.  
Approved 8-71. 50K pix of  $\pi^-p$  at 300 GeV.
- 144A      Photon Production - S. Ting; Carleton (Canada); McGill (Canada);  
MIT, Minn., NAL  
PROPOSAL TO SET UP A TAGGED PHOTON FACILITY AND TO SURVEY  
INDUCED REACTIONS IN 50-300 BeV REGION.  
Defer 7-72.
- 145        15' Photon - J. K. Walker; NAL  
A PROPOSAL TO STUDY PHOTON-PROTON INTERACTIONS BETWEEN 20 AND  
250 GeV.  
Defer 8-71. 250 K of  $\gamma$ -p in 30" and 15'.
- 146        Plastic Detectors - J. Hebert; Barcelona (Spain); Frankfurt  
(Germany); Miss. State, Montreal (Canada);  
Ottawa (Canada); Strasbourg (France)  
A STUDY OF PROTON-NUCLEI INTERACTIONS AT ENERGIES HIGHER THAN  
100 GeV WITH VISUAL SOLID DETECTORS.  
Defer 8-71.



- 156 Emulsion - K. Niu; Tokyo (Japan)  
STUDY OF SECONDARY PARTICLES PRODUCED BY 200 AND 500 GeV  
PROTONS IN EMULSION CHAMBERS.  
Completed 9-72.
- 157 30" Hybrid - A. R. Dzierba; Cal. Tech., LBL  
A PROPOSAL TO STUDY HIGH ENERGY DIFFRACTIVE N\* PRODUCTION.  
(30-inch chamber with a magnetic spectrometer.)  
Defer 7-72. 4,500K expansions of  $\pi^-p$  at 50 GeV.
- 158 30" Proton - R. Sosnowski; Warsaw (Poland)  
PROPOSAL TO STUDY HIGH ENERGY COLLISIONS IN THE 30-INCH  
HYDROGEN BUBBLE CHAMBER.  
Rejected 7-72. 50K pix of p-p at 100 GeV.
- 159 30" Proton - P. K. Malhotra; Tata Inst. (India)  
STUDY OF GENERAL FEATURES OF PARTICLE PRODUCTION IN p-p  
COLLISIONS AT 400 AND 100 GeV.  
Rejected 7-72. 100K of p-p at 100 and 400 GeV.
- 160 K<sup>0</sup> Decay - U. Nauenberg; Colo.  
PROPOSAL TO SEARCH FOR THE DECAY MODE  $K_S \rightarrow \mu^+ \mu^-$ .  
Defer 7-72.
- 161 30" Proton - W. F. Fry; Wisc.  
PROPOSAL TO SURVEY HIGH ENERGY PROTON COLLISIONS IN NEON AND  
TO SEARCH FOR ANOMALOUS PHOTON BUNDLES AT NAL.  
Defer 7-72. 50K pix of p in neon at high energy.
- 162 K<sup>0</sup> Decay - L. G. Pondrom; Wisc.  
NOTE ON  $K_S \rightarrow \mu^+ \mu^-$  SEARCH IN THE NEUTRON HYPERON BEAM.  
Defer 7-72.
- 163 30" Hybrid - W. D. Walker; Duke, N.C.  
PROPOSAL FOR A STUDY OF THE INTERACTION OF HIGH ENERGY  $\pi^-$   
WITH NEON.  
Defer 7-72. 50K pix of  $\pi^-$  - neon using Hybrid 2B System.
- 164-I Multi-Gamma - Z.G.T. Guiragossian; Houston, Rice, Stanford  
MULTI-GAMMA-RAY FINAL STATES USING A NEGATIVE BEAM ON HYDROGEN,  
Cu AND Pb TARGETS.  
Active.



- 173      30" Proton - J. C. VanderVelde; Mich.  
PROTON-DEUTERON INTERACTIONS IN THE 30-INCH BUBBLE CHAMBER.  
Active. 100K pix of p-d at 100 and 200 GeV.
- 174      Electroproduction - S.C.C. Ting; Carleton (Canada); MIT, Minn.,  
NAL, Toronto (Canada)  
PROPOSAL TO STUDY ELECTROPRODUCTION WITH COINCIDENCE TECHNIQUES  
AT HIGH ENERGIES.  
Defer 7-72.
- 175      Photoproduction - S.C.C. Ting; Carleton (Canada); McGill  
(Canada); MIT, Minn.  
STAGE I TO PROPOSAL #144. A SIMPLE SPECTROMETER TO MEASURE  
PHOTOPRODUCTION OF VECTOR MESONS AND PIONS AT HIGH ENERGY.  
Rejected 7-72.
- 176      Diffraction Scattering - O. Piccioni; Calif. (San Diego)  
PROPOSAL FOR AN EXPERIMENT AT THE NATIONAL ACCELERATOR LAB-  
ORATORY NUCLEAR LEVELS AS ANALYZERS OF HIGH ENERGY INTERACTIONS.  
Defer 7-72.
- 177A     Proton-Proton Elastic - J. Orear; Cornell, Lebedev Physical  
Inst. (USSR); McGill (Canada); North-  
eastern  
EARLY MEASUREMENT OF 200 AND 400 GeV pp LARGE ANGLE ELASTIC  
SCATTERING.  
Active.
- 178      Multiplicities - W. Busza; MIT  
A STUDY OF THE AVERAGE MULTIPLICITY AND MULTIPLICITY DISTRIBU-  
TIONS IN HADRON-NUCLEUS COLLISIONS AT HIGH ENERGIES.  
Defer 7-72.
- 179      30" Kaon - A. R. Erwin; Wisc.  
 $K^+p$  MULTIPARTICLE PRODUCTION IN THE 30-INCH NAL HYBRID CHAMBER  
AT THE HIGHEST POSSIBLE ENERGY.  
Defer 7-72. 300K pix of  $K^+p$  at >200 GeV using Hybrid  
2B System.
- 180      15' Neutrino - A. I. Mukhin; Mich., Moscow (USSR); NAL,  
Serpukhov (USSR)  
A STUDY OF ANTINEUTRINO INTERACTIONS IN THE NAL 15-FOOT BUBBLE  
CHAMBER, FILLED WITH HYDROGEN AND NEON.  
Approved 7-72. 50K pix of  $\bar{\nu}$  on  $H_2$ /neon.

- 181      Emulsion - A. S. Cary; Harvey Mudd College  
THE DIRECT PRODUCTION OF ELECTRON PAIRS IN NUCLEAR EMULSION  
BY 100 AND 200 GeV PROTONS.  
Active.
- 182      30" Proton - G. Gidal; Calif. (Davis); LBL  
A 30-INCH BUBBLE CHAMBER PROPOSAL.  
Active. 15K pix of p-p at 400 GeV.
- 183      Emulsion - M. I. Tretyakova; Lebedev Physical Inst. (USSR)  
A PROPOSAL OF THE PHOTOEMULSION EXPERIMENT AT THE NATIONAL  
ACCELERATOR LABORATORY (BATAVIA).  
Completed 9-72.
- 184      Particle Search - A. K. Mann; Chicago, Harvard, Penn., Wisc.  
SEARCH FOR A NEW CLASS OF PENETRATING MASSIVE PARTICLES AT C-O.  
Approved 10-72.
- 185      30" Proton - A. Fridman; Saclay (France); Strasbourg (France)  
PROPOSAL TO STUDY pn INTERACTIONS AT 205 GeV/c BY MEANS OF THE  
30-INCH DEUTERIUM FILLED BUBBLE CHAMBER.  
Active. 50K pix of p-d at 205 GeV.
- 186      Proton-Deuteron Elastic - A. C. Melissinos; NAL, Rochester,  
Rockefeller, State Committee (USSR)  
A PROPOSAL TO STUDY SMALL ANGLE PROTON-DEUTERON SCATTERING.  
Active.
- 187      Particle Search - L. Lederman; Columbia, Harvard, NAL  
PHASE 0.8 SEARCH FOR LONG-LIVED MASSIVE OBJECTS.  
Approved 10-72.
- 188      Proton Inclusive - F. Sannes, I. Siotis; Imperial College  
(England); Rutgers  
A PROPOSAL TO MEASURE CROSS SECTIONS FOR  $pp \rightarrow pX$ ,  $nX$  AS A  
FUNCTION OF  $S$  AND  $M_X^2$  USING THE INTERNAL TARGET FACILITY AT NAL.  
Active.
- 189      Emulsion - D. M. Ritson; Stanford  
NUCLEAR EMULSION EXPOSURES TO 400 GeV.  
Approved 10-72.