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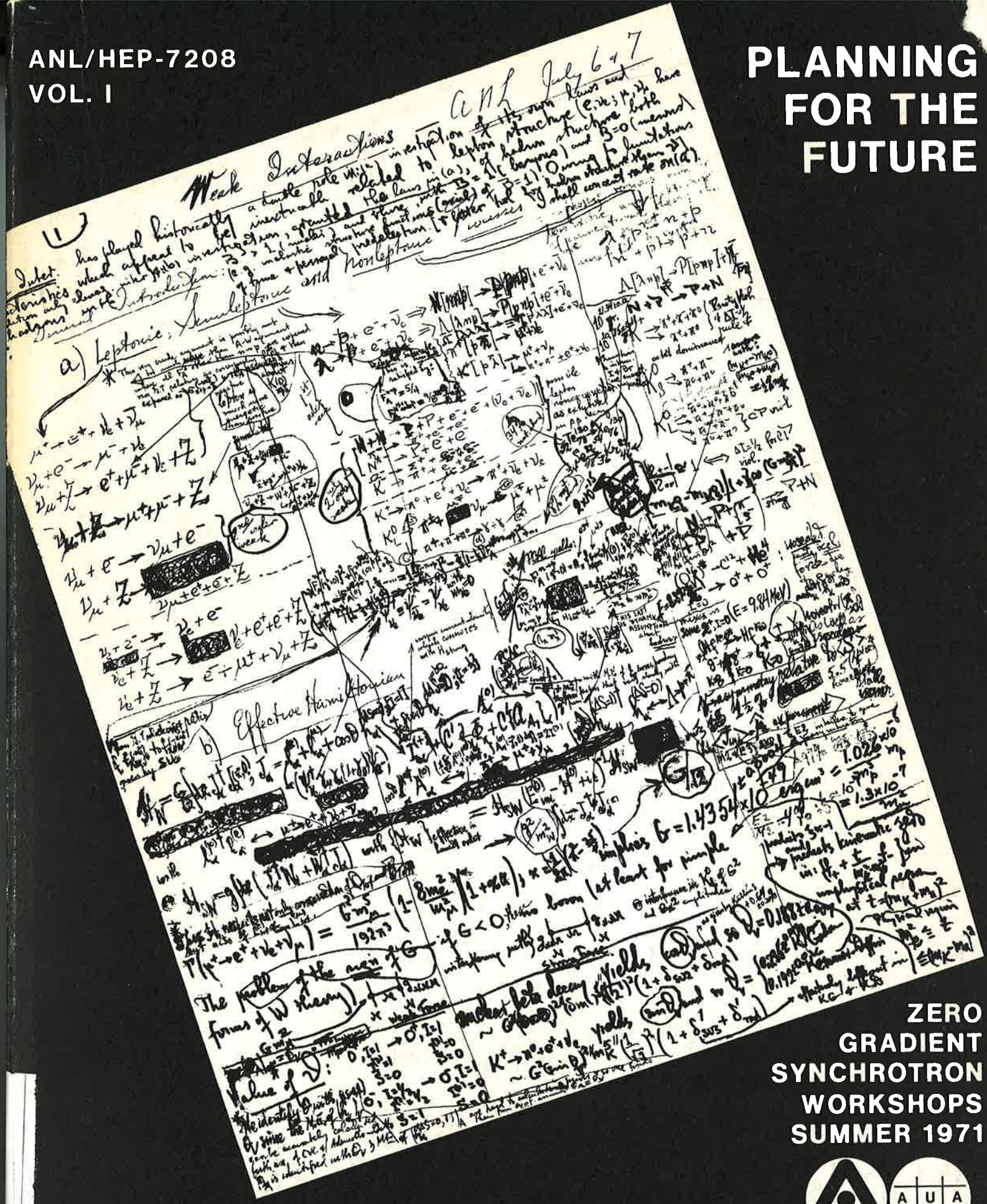
PLANNING FOR THE FUTURE



ZERO GRADIENT SYNCHROTRON WORKSHOPS SUMMER 1971

ARGONNE NATIONAL LABORATORY • ARGONNE UNIVERSITIES ASSOCIATION

FRONT COVER:

FIRST PAGE FROM LECTURE NOTES
OF PROFESSOR H. PRIMAKOFF
ON WEAK INTERACTIONS

ANL/HEP-7208
VOL. I

ARGONNE NATIONAL LABORATORY
9700 South Cass Avenue
Argonne, Illinois 60439

PLANNING FOR THE FUTURE

Zero Gradient Synchrotron Workshops
Summer 1971

Proceedings of a series of seven workshops
held at Argonne National Laboratory
June 3 through August 5, 1971

Organized by

Thomas A. Romanowski

Cosponsored by

ARGONNE NATIONAL LABORATORY
High Energy Physics Division

and

ARGONNE UNIVERSITIES ASSOCIATION

PREFACE

Development of imaginative high-energy physics programs at the ZGS requires a strong input from the User community and for that purpose in the summer of 1971 Argonne Universities Association jointly with the High Energy Physics Division sponsored a series of summer workshops on experimental programs at the ZGS.

In the near future, the internal beam intensity of the ZGS will be increased and, with the new titanium vacuum chamber, two external proton beams will be extracted simultaneously with RF techniques. Acceleration of polarized protons in the ZGS seems feasible and will be attempted soon. The 12-ft. hydrogen bubble chamber and the streamer chamber are the two major visual detectors at the ZGS. Other available facilities include polarized targets and a counter-spark-chamber spectrometer.

Because development of new facilities is a costly and lengthy process, the efficient use of resources requires early identification of future needs for both facilities and existing hardware for experiments to come. These decisions must be dictated by the best possible experiments which can be performed at the ZGS and the development of new plans should be a combined effort by theorists and experimenters.

In the time interval June through the first part of August, seven workshops were held: $\pi\pi$ and $K\pi$ Interactions; Two-body Scattering at High Energy; Experiments with Nuclei at the ZGS; Weak Interactions; Meson Spectroscopy; Physics in the 12-ft. Hydrogen Bubble Chamber; and Experiments with Polarized Targets and Beams. Workshop leaders and scientific secretaries were responsible for organizing these sessions, provided invaluable help in preparing written summaries of discussed subjects, and editing of the written contributions from the speakers.

Thanks for creating a conducive atmosphere for the exchange of ideas and "talking up" experiments are due to all participants; approximately 280 attended!

I believe that the sessions were lively--many good ideas were exchanged and discussed. Some of these have already taken form as proposals, which have been submitted to the ZGS Program Committee.

I hope you will find these collected contributions to the workshops a convenient reference and a reminder of ideas for experiments that can be done well at the ZGS.

I would like to acknowledge help in the initial planning and organizing of the workshops to many of our colleagues from the ZGS Complex, particularly Ed Berger and Frank von Hippel. Acknowledgments are also due to many secretaries of the High Energy Physics Division for diligent typing of manuscripts; to Mrs. Joyce Kopta, Technical Publications Department, who was responsible for organizing these proceedings--her help was invaluable; to the Graphic Arts Department, for preparing these proceedings for printing; and to the AUA staff, for their help in publication.

T. A. Romanowski

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