

ANNUAL REPORT
of the
MICHIGAN STATE UNIVERSITY
CYCLOTRON LABORATORY*
for the period
July 1, 1971 to July 1, 1972

By
Project Staff

November 1972
East Lansing, Michigan

*Supported jointly by National Science Foundation, Atomic Energy Commission, Office of Naval Research and Michigan State University (see Preface for details).

As initiated last year, this Annual Report is a combined report submitted to all of the funding agencies supporting programs at the MSU Cyclotron Laboratory. The National Science Foundation was responsible for construction of the Laboratory and supplies the major grant that supports the experimental nuclear physics program. The other research programs, in making use of the NSF-supplied facilities, are by this fact also supported substantially by the NSF. These other agencies and contracts include the following: (a) the Atomic Energy Commission supports the nuclear chemistry group, (b) theoretical nuclear physics was shifted from AEC to NSF support midway through the year and is now supported under a separate NSF grant, and (c) the Office of Naval Research has provided funds for neutron research. The specific grants or contracts and their relative contributions to the financial support of the Laboratory are listed in Table I. In Table II we list the faculty, research associates, and graduate students in the Laboratory together with the grants or contracts to which they are attached.

The primary motivation for a combined annual report comes from the close collaboration of the various groups. Indeed, the interplay between and among these groups, be they physics or chemistry, experimental or theoretical, is in our view one of the real strong points of the Laboratory; complex problems can be attacked from many sides and the understanding and progress which results is almost always greatly enhanced by the collaboration.

In our annual report this year, we continue with the brief writeups on Current Research in Progress, which we initiated in last year's Annual Report. These writeups, although often incomplete, give an up-to-date presentation of latest scientific information. We also include abstracts of papers delivered at meetings and of papers submitted to journals but not yet in print. Regretfully, it is necessary this year to discontinue our past practice of including reprints of papers published during the year. (This would have led to an Annual Report of more than 650 pages.) As a partial measure we include the first page of each journal article, which gives at least part of the introduction and indicates the reference. Readers interested in the full article can then refer to the appropriate journal or contact the authors for reprints. We would appreciate comments from readers as to the usefulness of this new arrangement. Finally I will repeat the annual reminder that we welcome collaborators from other laboratories—if you have an experiment for which our facilities would be particularly appropriate please let us know.

Henry Blosser

slb

Table I. Sources of support for the MSU Cyclotron Laboratory for the fiscal year 1971-72

Institution or Agency		Per Cent of Total
National Science Foundation	Grant GP 27483 (experimental nuclear physics)	60.0
Atomic Energy Commission	Contract AT(11-1)-1779 (nuclear chemistry)	8.8
National Science Foundation	Grant GP 31265X (theoretical nuclear physics)	3.2
Atomic Energy Commission	Contract AT(11-1)-1051 (theoretical nuclear physics)	2.6
Office of Naval Research	Contract N00014-68-A-0109-0008	3.4
Michigan State University		22.0

Table II. List of faculty, research associates, and graduate students working at the MSU Cyclotron Laboratory during 1971-72 and principal sources of support.

<u>Professors</u>	supported by	present address
Sam M. Austin	NSF-exp, MSU	
Henry G. Blosser	NSF-exp, MSU	
Aaron I. Galonsky	NSF-exp, ONR, MSU	
Morton M. Gordon	NSF-exp, NASA, MSU	
Edwin Kashy	NSF-exp, MSU	(on sabbatical leave to CERN, Geneva, 1971-72)
Wm. H. Kelly	NSF-exp, MSU	(on sabbatical leave to Lawrence Berkeley Lab., 1971-72)
Wm. C. McHarris	AEC-chem, MSU	
Hugh McManus	NSF-theor, AEC-theor, MSU	
B.H. Wildenthal	NSF-exp, MSU	
<u>Associate Professors</u>		
Walter Benenson	NSF-exp, MSU	
George F. Bertsch	NSF-theor, MSU	
Jerzy R. Borysowicz	NSF-theor, AEC-theor, MSU	
Gerard M. Crawley	NSF-exp, MSU	
Sven Maripuu	NSF-exp, MSU	
Jerry A. Nolen, Jr.	NSF-exp, MSU	(visiting Associate Professor, 1972)
<u>Assistant Professors</u>		
Thelma Arnette	NSF-exp, MSU	
Fred M. Bernthal	AEC-chem, MSU	
Ray Warner	AEC-chem, MSU	(research assistant professor)
<u>Research Associates</u>		
John S. Boyno	NSF-exp, AEC-chem	
Maria Dworzecka	AEC-theor	University of Mass.
Ronald W. Goles	AEC-chem, MSU	Battelle Northwest Lab
Paul S. Hauge	NSF-theor	
Roger A. Hinrichs	NSF-exp	SUNY, Oswego
Teng Lek Khoo	NSF-exp, AEC-chem	
Wm.A. Lanford	NSF-exp	
Peter S. Miller	NSF-exp	
Donald Patterson	ONR	
Fred Petrovich	NSF-theor	Lawrence Berkeley Lab.
R.G.H. Robertson	NSF-exp	
Richard R. Todd	NAS-NIRA	Western Michigan Univ.
<u>Graduate Students</u>		
Thomas Amos	NSF-exp, ONR	
Jerry N. Black	AEC-chem, NSF-exp	
Paul Brinza	NSF-exp	Mound Laboratories
Wm.B. Chaffee	MSU, NSF-exp	
Wilton Chung	NSF-exp	
John C. Collins	NSF-exp, ONR	
Robert R. Doering	NSF-exp	
Carol L. Dors	AEC-chem, NSF-exp	
Steven C. Ewald	NSF-exp, ONR	
Richard B. Firestone	AEC-chem, NSF-exp	
Stanley H. Fox	NSF-exp	Children's Hospital Cincinnati
Greg. C. Giesler	AEC-chem, NSF-exp	Los Alamos Scientific Laboratories
Jean Guile	NSF-exp	
Greg Hamilton	NSF-exp	
G. Richard Hammerstein	AEC-theor, NSF-theor	
Robert Howard (Computer Sci.)	AEC-chem	
Richard Howell	NSF-exp, ONR	Lawrence Livermore Laboratories
Kenneth L. Kosanke	AEC-chem, NSF-exp	
Duane C. Larson	NSF-exp	
Nancy Larson	NSF-theor	Oak Ridge Natl. Lab.
Clare B. Morgan	NSF-exp	Oak Ridge Natl. Lab.
Leroy B.C. Moy	NSF-exp	
Lolo M. Pannagabean	NSF-exp	
David Perry	NSF-theor, AEC-theor	
Ivan D. Proctor	NSF-exp	Lawrence Livermore Laboratory
James A. Rice	NSF-exp	
Lawrence Samuelson	NSF-exp	Nuclear Information Reserach Associate, MSU
David L. Show	NSF-exp	
Wm.F. Steele	NSF-exp	
Richard Trilling	AEC-theor	University of Abidjan Ivory Coast
Wm. Wagner	NSF-exp	
Herman White	NSF-exp	

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