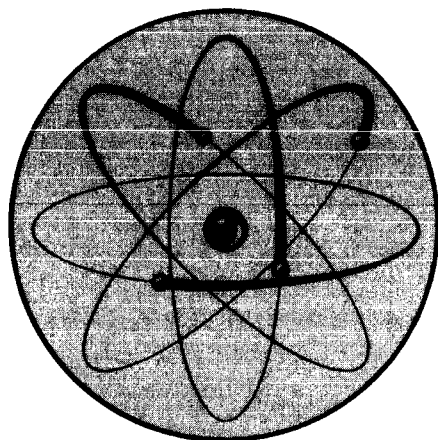


A STATISTICAL SUMMARY OF THE  
PHYSICAL RESEARCH PROGRAM

JUNE 30, 1969



DIVISION of RESEARCH

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UNITED STATES ATOMIC ENERGY COMMISSION

**UNITED STATES ATOMIC ENERGY COMMISSION**

**A STATISTICAL SUMMARY OF THE PHYSICAL RESEARCH PROGRAM  
AS OF JUNE 30, 1969**

**Prepared by:  
Reports and Statistics Branch  
Division of Research  
November 1969**

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## PREFACE

This report presents a statistical analysis of the physical research program administered by the Division of Research. Separate analyses are made for the physical research conducted at the Federally Funded Research and Development Centers (FFRDC's), at educational institutions, at non-profit research institutes, and at industrial laboratories. Included is information on funds budgeted for salaries and wages, materials and supplies, travel, communications, publications, indirect expenses, and equipment. Definitions used in this report are:

Equipment: Any item individually costing more than \$100 and that is expected to have an extended period of service, generally one year or more, in its original form.

Publications: Usually refer to journal publications but includes letters such as appear in Physical Review Letters, and notes such as appear in Journal of the American Chemical Society, and other journals. Contributions to books are included if they represent summaries and evaluations of a limited area, e.g., contributions to the Annual Review of Nuclear Science. Also included are papers not abstracts that appear in published proceedings of technical meetings including international meetings, and installation reports that are available for sale.

Personnel categories shown in the analyses are established according to information provided in the proposal or other material supplied by contractors. For educational institutions:

Principal Investigators: Usually are members of the academic staff and includes professors, chairman/heads of departments, associate professors, or assistant professors who direct the project.

Other Staff Members: Are generally professors, associate professors or assistant professors who work with the principal investigators. (The principal investigator and other professional staff usually divide their time between teaching and the research project.)

Visiting Scientists: Are generally at the faculty level but do not have a position on the faculty of the educational institution where they are temporarily working.

Research Associates: Are generally working full-time on the research investigation and usually are in the post-doctoral category.

Research Assistants: Usually are graduate students working for their doctorate or masters degree.

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## PHYSICAL RESEARCH PROGRAM

### Division of Research

The Physical Research Program is chiefly concerned with basic research investigations undertaken to discover new scientific knowledge and also includes some applied research investigations relevant to certain aspects of the practical utilization of nuclear energy. Research is conducted in the fields of high, medium, and low energy physics; mathematics and computers; chemistry; metallurgy and materials; and controlled thermonuclear reactions. Approximately three-fourths of the costs are associated with support of research conducted in AEC-owned, contractor-operated, Federally Funded Research and Development Centers (FFRDC's). A little less than one-fourth of the costs are associated with the contract support of research conducted in other laboratories. The major portion of the research at sites other than at FFRDC's is conducted at educational institutions.

### Federally Funded Research and Development Centers

There is no clear line of demarcation between Federally Funded Research and Development Centers and other laboratories. The AEC investment in facilities ranges from zero for some contractors to tens of millions of dollars for others, and the annual level of AEC support ranges from a few thousand dollars for some contractors, to tens of millions of dollars for others -- the spectrum is broad with no significant peaks or breaks. For purposes of this report, the following are considered Federally Funded Research and Development Centers operated for the AEC. The listing is consistent with Federally Funded Research and Development Centers as defined by the National Science Foundation and the Office of Science and Technology as of August 18, 1969:

<u>Laboratory</u>	<u>Contractor</u>
1. Ames Laboratory Ames, Iowa	Iowa State University
2. Argonne National Laboratory Argonne, Illinois	Argonne Universities Association - University of Chicago
3. Brookhaven National Laboratory Upton, Long Island, New York	Associated Universities, Inc.
4. Cambridge Electron Accelerator Cambridge, Massachusetts	Harvard University - Massachusetts Institute of Technology
5. Lawrence Radiation Laboratory Berkeley and Livermore, California	University of California
6. Los Alamos Scientific Laboratory Los Alamos, New Mexico	University of California

Laboratory

7. Mound Laboratory  
Miamisburg, Ohio
8. National Accelerator Laboratory  
DuPage and Kane Counties, Illinois
9. National Reactor Testing Station  
Idaho Falls, Idaho
10. Oak Ridge National Laboratory  
Oak Ridge, Tennessee
11. Pacific Northwest Laboratory  
Richland, Washington
12. Princeton-Pennsylvania Accelerator  
Princeton, New Jersey
13. Princeton Plasma Physics Laboratory  
Princeton, New Jersey
14. Stanford Linear Accelerator Center  
Stanford, California

Contractor

- Monsanto Chemical Laboratory
- Universities Research Association, Inc.
- Idaho Nuclear Corporation
- Union Carbide Nuclear Company
- Battelle Memorial Institute
- Princeton University
- Princeton University
- Stanford University

Some of the FFRDC's are multi-program laboratories engaged in other AEC programs such as nuclear materials production, weapons, biology and medicine, reactor development, etc. The Physical Research Program at these FFRDC's provides, in varying degrees, the basic investigations underlying the applied and development activities of such laboratories. Some of the FFRDC's, however, are engaged in research in a single, well defined area. All FFRDC's have the following common characteristics:

1. They are treated as national facilities.
2. They represent large investments (several millions of dollars) in AEC-owned capital facilities.
3. They have large annual levels (several millions of dollars) of AEC support.
4. It is implicit that they have continuing AEC support.
5. The guidance of smaller scientific efforts within each laboratory is usually vested in the laboratory management with only major overall research guidance supplied by the AEC.

## The Contract-Research Program

The AEC supports, by means of the contract-research program, research investigations at educational institutions, non-profit research institutes, and industrial laboratories. In this program, the Division of Research, in AEC Headquarters, is responsible for the approval of AEC support and for the review of the technical progress of research projects in the fields of high, medium, and low energy physics; mathematics and computers; chemistry; metallurgy and materials; and, controlled thermonuclear reactions. The AEC's operations offices in the field negotiate and administer the non-technical aspects of the contracts. Proposals for contracts in basic physical research usually are initiated by the scientist interested in performing the work.

The contract-research program affords a number of distinct benefits.

1. When funds provided by the AEC are added to other funds available to the contractor, the effectiveness of both the basic research program of the AEC and contractor's program increases.
2. The AEC receives the services, in fields of science fundamental to the AEC's future capabilities, of highly qualified scientists who prefer employment at outside laboratories or who prefer to teach and do research at educational institutions.
3. The contract-research program, by providing for the conduct of research at educational institutions, contributes to the training of scientists in fields relevant to the AEC's program.

In conducting this program, the AEC uses a special research support agreement (SRSA), a fixed-price contract, or cost-type contract. The total cost estimate is reflected in a budget, submitted by the prospective contractor, and includes such items as salaries, materials and supplies, equipment, communications, publications, travel, and indirect expenses.

Special Research Support Agreements and Fixed-Price Contracts: The SRSA's are generally used for basic research with educational institutions when the annual AEC support under the agreement does not exceed \$250,000. It provides for payment to the contractor of a specified amount, which is referred to as the Support Ceiling, and for adjustment of the amount if total costs are less than expected. Payments are made in consideration for the contractor's performance of research activities described in the contract and in accordance with the provisions of the contract. Costs are determined in accordance with Bureau of the Budget Circular No. A-21. When the special research support agreement is used for not-for-profit organizations other than educational institutions, AEC's commercial cost principles are used in determining actual cost, or the contract provisions may be revised to provide for a lump-sum payment, i.e., fixed-price contract to the contractor in consideration for its commitment to perform particular research at a specified level of effort.

Cost-type Contract: The cost-type is generally used when the annual AEC support under a contract exceeds \$250,000.



The total costs of the research may be shared by the contractor and the AEC under each of the aforementioned contractual arrangements.

#### Reporting Results of Research

Scientific reports on basic research investigations are usually published in the open literature. Special reporting of results in detail before they are ready for publication generally is not required of the contractors. AEC recognizes open publication as the normal and most desirable means for reporting the findings of fundamental research.

AEC annually publishes a special survey of selected significant developments during the previous year in the more basic areas of AEC's research and development activities. This annual report entitled "Fundamental Nuclear Energy Research--A Supplemental Report to the Annual Report to Congress of the U.S. Atomic Energy Commission," may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

SUMMARY OF PHYSICAL RESEARCH PROGRAM

SUMMARY OF PHYSICAL  
(Dollars in

Activity	TOTAL		Federally Funded Research and Development Centers		
	Scientific Man-Years <sup>a/</sup>	Publications	Amount	Man- Years	Publications
High Energy Physics .....	1,770	1,123	\$119,165	1,413	615
Medium Energy Physics .....	205	210	8,810	128	121
Low Energy Physics .....	657	882	17,607	326	300
Mathematics & Computer .....	135	244	2,679	74	158
Chemistry .....	1,140	1,486	45,141	841	783
Metallurgy & Materials .....	546	884	20,453	353	464
Controlled Thermonuclear .....	404	262	24,340	333	164
General Purpose Equipment .....	0	0	1,846	0	0
	4,857	5,091	\$240,041	3,468	2,605

<sup>a/</sup> Does not include part time employment of 3,672 graduate students engaged in performing research.

<sup>b/</sup> Represents amount of AEC estimated support ceiling included in the latest extension of contracts in effect as of 6/30/69. (Contracts are usually written for one year and extended annually if necessary.)

RESEARCH PROGRAM  
Thousands)

Educational Institutions			Research Institutes			Industrial Laboratories		
Amount <sup>b/</sup>	Man-Years	Publications	Amount <sup>b/</sup>	Man-Years	Publications	Amount <sup>b/</sup>	Man-Years	Publications
\$18,579	357	508	\$ 0	0	0	\$ 0	0	0
4,098	77	89	0	0	0	0	0	0
15,342	322	571	128	5	6	200	4	5
3,872	60	85	30	1	1	0	0	0
10,528	289	692	152	5	4	415	5	7
8,855	182	405	141	3	0	491	8	15
2,996	59	96	80	4	0	653	8	2
0	0	0	0	0	0	0	0	0
\$64,270	1,346	2,446	\$ 531	18	11	\$1,759	25	29

FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERSCosts and Manpower  
As of June 30, 1969

<u>Laboratory</u>	<u>Total Cost</u>	<u>Scientific Permanent</u>	<u>Man-Years Visiting</u>	<u>Number of Graduate Students Engaged in Research</u>	<u>Number of Publications</u>
Ames .....	\$ 7,837,000	112	2	255	283
Argonne National Laboratory .....	43,055,000	687	49	214	546
Brookhaven National Laboratory ...	40,186,000	438	44	161	330
Cambridge Electron Accelerator ...	9,743,000	169	4	79	62
Idaho Nuclear Corporation .....	176,000	2	0	0	7
Lawrence Radiation Laboratory ....	44,421,000	578	91	329	412
Los Alamos Scientific Laboratory .	7,798,000	91	5	16	101
Mound Laboratory .....	782,000	15	0	0	20
National Accelerator Laboratory ..	4,357,000	57	1	0	14
Oak Ridge National Laboratory ....	34,721,000	569	25	67	550
Pacific Northwest Laboratory .....	824,000	20	2	4	28
Plasma Physics Lab., Princeton U.	7,626,000	87	16	16	38
Princeton-Pennsylvania Accelerator	9,271,000	121	0	59	54
Stanford Linear Accelerator Center	29,244,000	272	11	39	160
TOTAL .....	\$240,041,000	3,218	250	1,239	2,605

FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS

AMES LABORATORY

<u>Activity</u>	<u>Total Cost</u>	<u>Scientific Man-Years</u>		<u>Number of Graduate Students Engaged in Research</u>	<u>Number of Publications</u>
		<u>Permanent</u>	<u>Visiting</u>		
High Energy Physics .....	\$ 453,000	7	0	10	14
Medium Energy Physics .....	363,000	5	0	20	7
Low Energy Physics .....	626,000	8	0	15	17
Mathematics & Computer .....	161,000	3	0	4	8
Chemistry .....	3,407,000	47	2	120	137
Metallurgy & Materials .....	2,754,000	42	0	86	100
General Purpose Equipment .....	73,000	0	0	0	0
TOTAL .....	\$7,837,000	112	2	255 <sup>a/</sup>	283 <sup>b/</sup>

<sup>a/</sup>Includes 55 students engaged in research activities but whose salaries are not paid by AMES.

<sup>b/</sup>Includes 10 publications that resulted from collaborative efforts with other universities.

FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS

ARGONNE NATIONAL LABORATORY

<u>Activity</u>	<u>Total Cost</u>	<u>Scientific Man-Years</u>		<u>Number of Graduate Students Engaged in Research</u>	<u>Number of Publications</u>
		<u>Permanent</u>	<u>Visiting</u>		
High Energy Physics .....	\$21,248,000	205	24	170	53
Medium Energy Physics .....	53,000	1	0	0	4
Low Energy Physics .....	4,900,000	92	1	31	93
Mathematics & Computer .....	1,324,000	35	1	3	79
Chemistry .....	9,417,000	228	11	8	178
Metallurgy & Materials .....	6,113,000	126	12	2	139
TOTAL .....	\$43,055,000	687	49	214 <sup>a/</sup>	546 <sup>b/</sup>

<sup>a/</sup> Includes 195 students engaged in research activities but whose salaries are not paid by ANL.

<sup>b/</sup> Includes 58 publications that resulted from collaborative efforts with universities.

FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS

BROOKHAVEN NATIONAL LABORATORY

<u>Activity</u>	<u>Total Cost</u>	<u>Scientific Man-Years</u>		<u>Number of Graduate Students Engaged in Research</u>	<u>Number of Publications</u>
		<u>Permanent</u>	<u>Visiting</u>		
High Energy Physics .....	\$24,090,000	215	21	123	102
Medium Energy Physics .....	98,000	2	0	0	3
Low Energy Physics .....	4,870,000	60	10	7	68
Mathematics & Computer .....	642,000	17	1	0	32
Chemistry .....	5,848,000	105	6	6	74
Metallurgy & Materials .....	3,095,000	39	6	25	51
General Purpose Equipment .....	1,543,000	0	0	0	0
TOTAL .....	\$40,186,000	438	44	161 <sup>a/</sup>	330 <sup>b/</sup>

<sup>a/</sup> Includes 144 students engaged in research activities  
but whose salaries are not paid by BNL.

<sup>b/</sup> Includes 134 publications that resulted from collaborative  
efforts with universities.



FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS

LAWRENCE RADIATION LABORATORY

<u>Activity</u>	<u>Total Cost</u>	<u>Scientific Man-Years</u>		<u>Number of Graduate Students Engaged in Research</u>	<u>Number of Publications</u>
		<u>Permanent</u>	<u>Visiting</u>		
High Energy Physics .....	20,355,000	241	55	92	123
Medium Energy Physics .....	1,953,000	25	6	10	14
Low Energy Physics .....	378,000	9	0	6	4
Mathematics & Computer .....	153,000	5	4	0	10
Chemistry .....	10,751,000	168	23	123	174
Metallurgy & Materials .....	2,142,000	25	2	79	39
Controlled Thermonuclear .....	8,459,000	105	1	19	48
General Purpose Equipment .....	230,000	0	0	0	0
TOTAL .....	44,421,000	578	91	329 <sup>a/</sup>	412 <sup>b/</sup>

<sup>a/</sup> Includes 50 students engaged in research activities but whose salaries are not paid by LRL.

<sup>b/</sup> Includes 35 publications that resulted from collaborative efforts with other universities.

FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS

OAK RIDGE NATIONAL LABORATORY

<u>Activity</u>	<u>Total Cost</u>	<u>Scientific Man-Years</u>		<u>Number of</u>	<u>Number of</u>
		<u>Permanent</u>	<u>Visiting</u>	<u>Graduate Students</u>	
High Energy Physics .....	\$ 404,000	10	0	1	33
Medium Energy Physics .....	2,038,000	41	1	7	37
Low Energy Physics .....	6,356,000	118	11	1	104
Mathematics & Computer .....	399,000	7	1	5	29
Chemistry .....	15,147,000	233	8	34	212
Metallurgy & Materials .....	5,615,000	86	3	16	102
Controlled Thermonuclear .....	4,762,000	74	1	3	33
<b>TOTAL</b> .....	<b>\$34,721,000</b>	<b>569</b>	<b>25</b>	<b>67<sup>a/</sup></b>	<b>550<sup>b/</sup></b>

<sup>a/</sup> Includes 34 students engaged in research activities but whose salaries are not paid by ORNL.

<sup>b/</sup> Includes 92 publications that resulted from collaborative efforts with universities.

FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS

	<u>Total Cost</u>	<u>Scientific Man-Years</u>		<u>No. of Grad.</u>	<u>Number of</u>
		<u>Permanent</u>	<u>Visiting</u>	<u>Res. Students</u>	<u>Publications</u>
<u>CAMBRIDGE ELECTRON ACCELERATOR</u>					
High Energy Physics .....	\$ 9,743,000	169	4	79	62
<u>IDAHO NUCLEAR CORPORATION</u>					
Metallurgy & Materials .....	176,000	2	0	0	7
<u>LOS ALAMOS SCIENTIFIC LABORATORY</u>					
Medium Energy Physics .....	4,305,000	45	2	11	56
Controlled Thermonuclear .....	3,493,000	46	3	5	45
<u>MOUND LABORATORY</u>					
Low Energy Physics .....	340,000	8	0	0	12
Chemistry .....	342,000	4	0	0	5
Metallurgy & Materials .....	100,000	3	0	0	3
<u>NATIONAL ACCELERATOR LABORATORY</u>					
High Energy Physics .....	4,357,000	57	1	0	14
<u>PACIFIC NORTHWEST LABORATORY</u>					
Low Energy Physics .....	137,000	8	1	1	2
Chemistry .....	229,000	5	1	3	3
Metallurgy & Materials .....	458,000	7	0	0	23
<u>PLASMA PHYSICS LABORATORY</u>					
Controlled Thermonuclear .....	7,626,000	87	16	12	38
<u>PRINCETON-PENNSYLVANIA ACCELERATOR</u>					
High Energy Physics .....	9,271,000	121	0	59	54
<u>STANFORD LINEAR ACCELERATOR CENTER</u>					
High Energy Physics .....	29,244,000	272	11	39	160

NUMBER OF AGREEMENTS, TOTAL COSTS, AND CONTRACTOR  
AND AEC CONTRIBUTIONS IN THE PROGRAM BY ACTIVITY  
As of June 30, 1969

<u>Activity</u>	<u>Number of Agreements</u>	<u>Total Project Cost</u>	<u>Contractor Contribution</u>	<u>Percent of Total</u>	<u>AEC Contribution</u>	<u>Percent of Total</u>
High Energy Physics .....	41	\$22,113,817	\$ 3,534,360	16	\$18,579,457	84
Medium Energy Physics .....	14	5,295,684	1,197,370	23	4,098,314	77
Low Energy Physics .....	65	18,439,307	3,097,333	17	15,341,974	83
Mathematics & Computer ....	23	4,189,844	317,852	8	3,871,992	92
Chemistry .....	219	12,168,799	1,640,530	13	10,528,269	87
Metallurgy & Materials ....	170	9,950,329	1,095,869	11	8,854,460	89
Controlled Thermonuclear ..	46	3,405,744	410,265	12	2,995,479	88
TOTAL .....	578	\$75,563,524	\$11,293,579	15	\$64,269,945	85

EDUCATIONAL INSTITUTIONS

CONSOLIDATED BUDGET  
INCLUDED IN THE  
As of  
(Dollars in

<u>Items of Expense</u>		<u>Total</u>		<u>High Energy</u>		<u>Medium Energy</u>	
<u>SRSA Projects</u>		<u>Amount</u>	<u>%</u>	<u>Physics</u>	<u>%</u>	<u>Physics</u>	<u>%</u>
(1)	Salaries and Wages .....	\$13,564	51.0	1,415	44.0	299	56.4
(2)	Equipment .....	2,282	9.1	363	11.5	15	3.1
(3)	Materials and Supplies .....	3,812	14.4	658	21.1	81	15.3
(4)	Travel .....	495	2.0	93	3.0	19	4.1
(5)	Communications .....	56	.2	9	.3	0	0
(6)	Publication Costs .....	337	1.3	36	1.1	6	1.1
(7)	Indirect Expenses .....	6,092	22.0	597	19.0	111	20.0
(8)	TOTAL .....	<u>\$26,638</u>	<u>100.0</u>	<u>3,171</u>	<u>100.0</u>	<u>531</u>	<u>100.0</u>
(9)	Contributed by Universities .....	4,794	18.0	1,140	36.0	153	29.0
(10)	Supported by AEC .....	21,844	82.0	2,031	64.0	378	71.0
(11)	Including Unexpended Balance of .	658		42		0	
<hr/>							
<u>Cost-Type Projects</u>							
(12)	Salaries and Wages .....	\$22,962	47.0	8,824	47.0	1,985	42.0
(13)	Equipment .....	5,218	11.0	1,607	8.4	805	17.1
(14)	Materials and Supplies .....	9,220	18.0	3,860	20.2	1,103	23.0
(15)	Travel .....	1,002	2.0	620	3.2	77	2.0
(16)	Communications .....	195	.4	77	.4	27	.5
(17)	Publication Costs .....	257	.5	110	.5	28	.4
(18)	Indirect Expenses .....	10,072	21.1	3,845	20.3	740	15.0
(19)	TOTAL .....	<u>\$48,926</u>	<u>100.0</u>	<u>18,943</u>	<u>100.0</u>	<u>4,765</u>	<u>100.0</u>
(20)	Contributed by Universities .....	6,501	13.3	2,394	13.0	1,045	22.0
(21)	Supported by AEC .....	42,425	86.7	16,549	87.0	3,720	78.0
(22)	Including Unexpended Balance of .	283		76		0	

OF THE 578 PROJECTS  
PHYSICAL RESEARCH PROGRAM

EDUCATIONAL INSTITUTIONS

June 30, 1969

(Thousands)

Low Energy Physics	%	Mathematics and Computer	%	Chemistry	%	Metallurgy and Materials	%	Controlled Thermonuclear	%	
1,665	49.0	623	57.1	4,605	51.1	3,987	53.0	970	52.0	(1)
444	13.0	75	6.9	737	8.2	453	5.9	195	10.3	(2)
435	12.8	91	8.3	1,281	14.2	1,093	14.3	173	9.2	(3)
61	2.0	18	1.6	171	2.0	93	1.2	40	2.1	(4)
10	.2	1	.1	18	.2	13	.2	5	.3	(5)
36	1.1	15	1.4	118	1.3	99	1.2	27	1.4	(6)
746	21.9	268	24.6	2,063	23.0	1,843	24.2	464	24.7	(7)
3,397	100.0	1,091	100.0	8,993	100.0	7,581	100.0	1,874	100.0	(8)
668	20.0	115	10.5	1,428	15.9	1,096	14.5	194	10.4	(9)
2,729	80.0	976	89.5	7,565	84.1	6,485	85.5	1,680	89.6	(10)
87		53		233		194		49		(11)
7,318	48.6	1,586	51.0	1,444	45.2	1,020	43.0	785	51.1	(12)
1,876	12.5	182	5.7	402	13.0	207	9.0	139	9.0	(13)
2,314	15.4	545	18.1	638	20.1	555	23.4	205	13.2	(14)
199	1.3	25	.7	33	1.0	19	.8	29	2.1	(15)
50	.3	9	.2	13	.3	16	.6	3	.2	(16)
53	.4	16	.3	15	.4	27	1.1	8	.4	(17)
3,232	21.5	736	24.0	631	20.0	525	22.1	363	24.0	(18)
15,042	100.0	3,099	100.0	3,176	100.0	2,369	100.0	1,532	100.0	(19)
2,430	16.2	203	6.6	212	6.7	0		217	14.2	(20)
12,612	83.8	2,896	93.4	2,964	93.3	2,369	100.0	1,315	85.8	(21)
181		25		1		0		0		(22)

EDUCATIONAL INSTITUTIONSNUMBER OF SCIENTIFIC EMPLOYEES, RESEARCH ASSISTANTS & PUBLICATIONS  
UNDER THE PHYSICAL RESEARCH PROGRAM

<u>Activity</u>	<u>Principal Investigators</u>		<u>Other Staff Members</u>		<u>Visiting Scientists</u>		<u>Research Associates</u>		<u>Research Assistants</u>	<u>Publications</u>
	<u>No.</u>	<u>MY's</u>	<u>No.</u>	<u>MY's</u>	<u>No.</u>	<u>MY's</u>	<u>No.</u>	<u>MY's</u>		
High Energy Physics .....	104	43	253	158	15	7	231	149	512	508
Medium Energy Physics .....	24	11	89	36	2	1	31	29	82	89
Low Energy Physics .....	113	48	195	95	41	16	200	163	581	571
Mathematics & Computer ....	25	9	65	41	1	1	14	9	80	85
Chemistry .....	242	85	36	17	56	8	221	179	531	692
Metallurgy & Materials ....	193	66	47	17	14	7	121	92	506	405
Controlled Thermonuclear ..	54	18	51	24	3	1	30	16	138	96
TOTAL .....	755	280	736	388	132	41	848	637	2,430	2,446

EDUCATIONAL INSTITUTIONS

TYPE OF ORGANIZATIONS

<u>Projects with:</u>	<u>Division Total</u>	<u>High Energy Physics</u>	<u>Medium Energy Physics</u>	<u>Low Energy Physics</u>	<u>Math and Computer</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermo- nuclear</u>
State Institutions .....	314	23	7	43	9	119	89	24
Private Institutions ...	261	18	7	22	13	98	81	22
Municipal Institutions .	3	0	0	0	1	2	0	0
<b>TOTAL .....</b>	<b>578</b>	<b>41</b>	<b>14</b>	<b>65</b>	<b>23</b>	<b>219</b>	<b>170</b>	<b>46</b>

OPERATIONS OFFICES ADMINISTERING  
THE BUSINESS ASPECTS OF THE AGREEMENTS

<u>Operations Office</u>	<u>Division Total</u>	<u>High Energy Physics</u>	<u>Medium Energy Physics</u>	<u>Low Energy Physics</u>	<u>Math and Computer</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermo- nuclear</u>
Chicago .....	166	12	1	23	5	71	49	5
Idaho .....	1	0	0	0	0	1	0	0
New York .....	193	16	5	16	5	67	68	16
Oak Ridge .....	127	4	6	8	5	52	36	16
Richland .....	23	1	0	7	1	9	4	1
San Francisco .....	67	8	2	10	7	19	13	8
Savannah River .....	1	0	0	1	0	0	0	0
<b>TOTAL .....</b>	<b>578</b>	<b>41</b>	<b>14</b>	<b>65</b>	<b>23</b>	<b>219</b>	<b>170</b>	<b>46</b>



EDUCATIONAL INSTITUTIONS

<u>Type</u>	<u>TYPE OF AGREEMENTS</u>							
	<u>Division Total</u>	<u>High Energy Physics</u>	<u>Medium Energy Physics</u>	<u>Low Energy Physics</u>	<u>Math and Computer</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermo- nuclear</u>
Cost Contracts .....	82	21	11	25	5	10	5	5
SRSA .....	496	20	3	40	18	209	165	41
TOTAL .....	578	41	14	65	23	219	170	46

<u>Dollar Level</u>	<u>AGREEMENTS BY AEC DOLLAR LEVEL</u>							
	<u>Division Total</u>	<u>High Energy Physics</u>	<u>Medium Energy Physics</u>	<u>Low Energy Physics</u>	<u>Math and Computer</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermo- nuclear</u>
0 .....	12	0	0	4	0	0	3	5
1 - 9,999 .....	11	0	0	0	0	8	1	2
10,000 - 19,999 .....	56	0	0	0	0	36	18	2
20,000 - 29,999 .....	99	1	1	3	1	51	37	5
30,000 - 39,999 .....	116	3	0	2	4	46	53	8
40,000 - 49,999 .....	53	0	0	8	2	21	19	3
50,000 - 59,999 .....	29	0	0	1	5	13	6	4
60,000 - 69,999 .....	28	1	1	5	0	7	5	9
70,000 - 79,999 .....	24	3	1	3	0	10	6	1
80,000 - 89,999 .....	15	1	0	6	1	3	3	1
90,000 - 99,999 .....	19	1	0	2	3	7	5	1
100,000 - 249,999 .....	46	9	4	9	3	10	10	1
250,000 - 499,999 .....	39	10	7	9	2	4	3	4
500,000 + .....	31	12	0	13	2	3	1	0
TOTAL .....	578	41	14	65	23	219	170	46

PERCENT OF AEC CONTRIBUTION TO THE TOTAL COST OF THE RESEARCH

<u>Percentage</u>	<u>Division Total</u>	<u>High Energy Physics</u>	<u>Medium Energy Physics</u>	<u>Low Energy Physics</u>	<u>Math and Computer</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermo- nuclear</u>
0 - 9 .....	12	0	0	4	0	0	3	5
10 - 19 .....	1	1	0	0	0	0	0	0
20 - 29 .....	1	0	1	0	0	0	0	0
30 - 39 .....	3	2	0	0	0	0	0	1
40 - 49 .....	7	1	2	0	0	2	2	0
50 - 59 .....	25	1	0	6	1	12	4	1
60 - 69 .....	43	3	0	5	1	26	6	2
70 - 79 .....	84	6	4	11	0	29	30	4
80 - 89 .....	144	6	0	11	5	63	50	9
90 - 99 .....	73	2	1	8	5	23	21	13
100* .....	185	19	6	20	11	64	54	11
TOTAL .....	578	41	14	65	23	219	170	46

\*Includes a large number of contracts where the universities contribute to the cost of the research but do not estimate a specified amount.

EDUCATIONAL INSTITUTIONS

NUMBER OF AGREEMENTS BY STATES AND CONTRACTORS

<u>State and Contractor</u>	<u>Division Total</u>	<u>High Energy Physics</u>	<u>Medium Energy Physics</u>	<u>Low Energy Physics</u>	<u>Math and Computer</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermo- nuclear</u>
<u>Alabama</u>	3	0	0	0	0	1	1	1
Auburn University .....	2	0	0	0	0	1	0	1
Tuskegee Institute .....	1	0	0	0	0	0	1	0
<u>Alaska</u>	3	0	0	3	0	0	0	0
Alaska, University of .....	3	0	0	3	0	0	0	0
<u>Arizona</u>	9	0	0	2	0	5	2	0
Arizona State University .....	1	0	0	0	0	1	0	0
Arizona, University of .....	8	0	0	2	0	4	2	0
<u>Arkansas</u>	2	0	0	0	0	2	0	0
Arkansas, University of .....	2	0	0	0	0	2	0	0
<u>California</u>	65	7	2	10	7	18	13	8
California Inst. of Technology .	9	1	0	1	0	4	2	1
California, University of .....	38	6	2	8	2	9	5	6
Harvey Mudd College .....	1	0	0	0	0	1	0	0
Southern California, U. of .....	6	0	0	1	1	2	2	0
Stanford University .....	11	0	0	0	4	2	4	1
<u>Colorado</u>	4	1	0	1	0	2	0	0
Colorado State University .....	1	0	0	0	0	1	0	0
Colorado, University of .....	3	1	0	1	0	1	0	0
<u>Connecticut</u>	11	1	1	2	0	3	3	1
Connecticut, University of .....	1	0	0	0	0	0	1	0
Yale University .....	10	1	1	2	0	3	2	1
<u>Delaware</u>	1	0	0	0	0	0	1	0
Delaware, University of .....	1	0	0	0	0	0	1	0
<u>District of Columbia</u>	5	0	0	1	0	3	1	0
Catholic University .....	2	0	0	1	0	1	0	0
Georgetown University .....	2	0	0	0	0	1	1	0
George Washington University ...	1	0	0	0	0	1	0	0

EDUCATIONAL INSTITUTIONS

NUMBER OF AGREEMENTS BY STATES AND CONTRACTORS

<u>State and Contractor</u>	<u>Division Total</u>	<u>High Energy Physics</u>	<u>Medium Energy Physics</u>	<u>Low Energy Physics</u>	<u>Math and Computer</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermo- nuclear</u>
<u>Florida</u>	14	1	0	0	0	9	1	3
Florida State University .....	6	1	0	0	0	5	0	0
Florida, University of .....	4	0	0	0	0	3	1	0
Miami, University of .....	4	0	0	0	0	1	0	3
<u>Georgia</u>	10	0	0	0	0	5	3	2
Georgia Inst. of Technology ....	7	0	0	0	0	2	3	2
Georgia, University of .....	3	0	0	0	0	3	0	0
<u>Hawaii</u>	1	1	0	0	0	0	0	0
Hawaii, University of .....	1	1	0	0	0	0	0	0
<u>Idaho</u>	1	0	0	0	0	1	0	0
Idaho State University .....	1	0	0	0	0	1	0	0
<u>Illinois</u>	28	3	0	1	3	12	9	0
Chicago, University of .....	8	2	0	0	1	4	1	0
Illinois Inst. of Technology ...	5	0	0	0	0	2	3	0
Illinois, University of .....	7	1	0	1	2	2	1	0
Northwestern University .....	8	0	0	0	0	4	4	0
<u>Indiana</u>	19	2	0	3	0	10	4	0
Indiana University .....	3	1	0	0	0	2	0	0
Notre Dame, University of .....	3	0	0	2	0	1	0	0
Purdue University .....	13	1	0	1	0	7	4	0
<u>Iowa</u>	4	0	0	0	0	3	0	1
Dordt College .....	1	0	0	0	0	1	0	0
Iowa, State University of .....	2	0	0	0	0	2	0	0
Iowa, University of .....	1	0	0	0	0	0	0	1
<u>Kansas</u>	10	0	0	5	0	4	1	0
Kansas State University .....	5	0	0	4	0	1	0	0
Kansas, University of .....	5	0	0	1	0	3	1	0

EDUCATIONAL INSTITUTIONS

NUMBER OF AGREEMENTS BY STATES AND CONTRACTORS

<u>State and Contractor</u>	<u>Division Total</u>	<u>High Energy Physics</u>	<u>Medium Energy Physics</u>	<u>Low Energy Physics</u>	<u>Math and Computer</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermo- nuclear</u>
<u>Kentucky</u>	5	0	0	0	0	3	2	0
Kentucky, University of .....	4	0	0	0	0	3	1	0
Murray State University .....	1	0	0	0	0	0	1	0
<u>Louisiana</u>	1	0	0	0	0	0	1	0
Louisiana State University .....	1	0	0	0	0	0	1	0
<u>Maryland</u>	24	2	3	3	2	5	6	3
Johns Hopkins University .....	6	1	0	2	0	2	1	0
Maryland, University of .....	18	1	3	1	2	3	5	3
<u>Massachusetts</u>	34	6	1	2	1	12	11	1
Boston University .....	1	0	0	0	0	0	1	0
Brandeis University .....	5	1	0	0	0	2	2	0
Clark University .....	1	0	0	0	0	1	0	0
Harvard University .....	4	1	0	0	1	2	0	0
Massachusetts Inst. of Tech. ...	13	1	1	2	0	3	5	1
Massachusetts, University of ...	2	1	0	0	0	0	1	0
Northeastern University .....	2	0	0	0	0	0	2	0
Southeastern Massachusetts Technological Institute .....	1	1	0	0	0	0	0	0
Tufts University .....	4	1	0	0	0	3	0	0
Worcester Polytechnic Inst. ....	1	0	0	0	0	1	0	0
<u>Michigan</u>	26	2	0	4	0	10	9	1
Michigan State University .....	11	1	0	2	0	5	3	0
Michigan Technological Univ. ...	3	0	0	0	0	1	2	0
Michigan, University of .....	9	1	0	2	0	3	2	1
Wayne State University .....	3	0	0	0	0	1	2	0

EDUCATIONAL INSTITUTIONS

NUMBER OF AGREEMENTS BY STATES AND CONTRACTORS

<u>State and Contractor</u>	<u>Division Total</u>	<u>High Energy Physics</u>	<u>Medium Energy Physics</u>	<u>Low Energy Physics</u>	<u>Math and Computer</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermo- nuclear</u>
<u>Minnesota</u>	11	1	1	1	0	2	6	0
Minnesota, University of .....	10	1	1	1	0	2	5	0
St. Mary's College .....	1	0	0	0	0	0	1	0
<u>Mississippi</u>	1	0	0	0	0	1	0	0
Mississippi, University of .....	1	0	0	0	0	1	0	0
<u>Missouri</u>	8	0	0	0	1	5	2	0
Missouri, University of .....	2	0	0	0	0	0	2	0
Washington University .....	6	0	0	0	1	5	0	0
<u>Montana</u>	2	0	0	0	0	1	1	0
Montana State University .....	2	0	0	0	0	1	1	0
<u>Nebraska</u>	2	0	0	0	0	1	1	0
Nebraska, University of .....	2	0	0	0	0	1	1	0
<u>Nevada</u>	1	0	0	0	0	1	0	0
Nevada, University of .....	1	0	0	0	0	1	0	0
<u>New Hampshire</u>	1	0	0	0	0	1	0	0
New Hampshire, University of ...	1	0	0	0	0	1	0	0
<u>New Jersey</u>	11	0	0	1	0	6	1	3
Princeton University .....	5	0	0	1	0	4	0	0
Rutgers University .....	3	0	0	0	0	2	1	0
Stevens Inst. of Technology ....	3	0	0	0	0	0	0	3
<u>New Mexico</u>	1	0	0	0	0	1	0	0
New Mexico Highlands University.	1	0	0	0	0	1	0	0

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<u>New York</u>	<u>88</u>	<u>5</u>	<u>2</u>	<u>6</u>	<u>4</u>	<u>29</u>	<u>32</u>	<u>10</u>
Brooklyn, Polytechnic Inst. of .	3	0	0	0	0	0	1	2
Clarkson College of Technology .	4	0	0	0	0	2	2	0
Columbia University .....	11	1	1	1	0	5	2	1
Cornell University .....	21	1	0	1	0	1	14	4
Fordham University .....	1	0	0	0	0	1	0	0
Long Island University .....	1	0	0	0	0	1	0	0
New York, City University of ...	3	0	0	0	1	2	0	0
New York, State University of ..	14	1	0	2	1	6	4	0
New York University .....	4	0	0	0	2	0	1	1
Rensselaer Polytechnic Inst. ...	9	0	0	0	0	4	5	0
Rochester, University of .....	9	1	1	1	0	3	1	2
Syracuse University .....	3	1	0	0	0	1	1	0
Yeshiva University .....	5	0	0	1	0	3	1	0
<u>North Carolina</u>	<u>18</u>	<u>1</u>	<u>0</u>	<u>4</u>	<u>2</u>	<u>3</u>	<u>8</u>	<u>0</u>
Duke University .....	4	1	0	2	1	0	0	0
North Carolina A&T State Univ. .	1	0	0	0	0	1	0	0
North Carolina State of the University of North Carolina ..	6	0	0	1	0	1	4	0
North Carolina, University of ..	6	0	0	1	1	1	3	0
Wake Forest College .....	1	0	0	0	0	0	1	0
<u>North Dakota</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>
North Dakota, University of ....	1	0	0	0	0	0	1	0
<u>Ohio</u>	<u>20</u>	<u>2</u>	<u>0</u>	<u>2</u>	<u>1</u>	<u>9</u>	<u>6</u>	<u>0</u>
Case Western Reserve .....	9	1	0	1	1	2	4	0
Ohio State University .....	7	1	0	0	0	4	2	0
Ohio University .....	2	0	0	1	0	1	0	0
Toledo, University of .....	2	0	0	0	0	2	0	0

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NUMBER OF AGREEMENTS BY STATES AND CONTRACTORS

<u>State and Contractor</u>	<u>Division Total</u>	<u>High Energy Physics</u>	<u>Medium Energy Physics</u>	<u>Low Energy Physics</u>	<u>Math and Computer</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermo- nuclear</u>
<u>Oklahoma</u>	3	0	0	0	0	1	2	0
Oklahoma State University .....	1	0	0	0	0	1	0	0
Oklahoma, University of .....	2	0	0	0	0	0	2	0
<u>Oregon</u>	9	1	0	2	1	4	1	0
Oregon State University .....	5	0	0	1	1	2	1	0
Oregon, University of .....	3	1	0	1	0	1	0	0
Reed College .....	1	0	0	0	0	1	0	0
<u>Pennsylvania</u>	32	2	1	2	0	12	14	1
Carnegie-Mellon University .....	10	1	1	1	0	4	3	0
Duquesne University .....	1	0	0	0	0	1	0	0
Lehigh University .....	4	0	0	0	0	2	2	0
Pennsylvania State University ..	7	0	0	0	0	1	5	1
Pennsylvania, University of ....	3	0	0	1	0	2	0	0
Pittsburgh, University of .....	5	1	0	0	0	1	3	0
Temple University .....	2	0	0	0	0	1	1	0
<u>Puerto Rico</u>	3	0	0	0	0	1	2	0
Puerto Rico, University of .....	3	0	0	0	0	1	2	0
<u>Rhode Island</u>	6	1	0	1	0	1	3	0
Brown University .....	5	1	0	1	0	1	2	0
Rhode Island, University of ....	1	0	0	0	0	0	1	0
<u>South Carolina</u>	3	0	0	1	0	1	1	0
Clemson University .....	1	0	0	0	0	0	1	0
South Carolina, University of ..	2	0	0	1	0	1	0	0



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<u>Tennessee</u>	8	1	0	0	0	4	2	1
Tennessee, University of .....	5	1	0	0	0	2	1	1
Vanderbilt University .....	3	0	0	0	0	2	1	0
<u>Texas</u>	28	0	3	2	1	15	2	5
Baylor University .....	1	0	0	0	0	1	0	0
Houston, University of .....	4	0	1	0	0	2	0	1
Rice University .....	6	0	1	1	1	3	0	0
Texas A&M University .....	9	0	1	0	0	8	0	0
Texas Christian University .....	1	0	0	0	0	0	1	0
Texas Technological College .....	1	0	0	0	0	0	0	1
Texas, University of .....	6	0	0	1	0	1	1	3
<u>Utah</u>	9	0	0	1	0	2	6	0
Brigham Young University .....	3	0	0	1	0	1	1	0
Utah, University of .....	6	0	0	0	0	1	5	0
<u>Vermont</u>	2	0	0	0	0	0	2	0
Vermont, University of .....	2	0	0	0	0	0	2	0
<u>Virginia</u>	8	0	0	0	0	2	5	1
Emory & Henry College .....	1	0	0	0	0	0	1	0
Roanoke College .....	1	0	0	0	0	0	0	1
Virginia Polytechnic Inst. ....	2	0	0	0	0	2	0	0
Virginia, University of .....	4	0	0	0	0	0	4	0
<u>Washington</u>	9	0	0	2	0	4	2	1
Washington State University ....	3	0	0	0	0	2	0	1
Washington, University of .....	5	0	0	2	0	1	2	0
Western Washington State C. ....	1	0	0	0	0	1	0	0

EDUCATIONAL INSTITUTIONS

NUMBER OF AGREEMENTS BY STATES AND CONTRACTORS

<u>State and Contractor</u>	<u>Division Total</u>	<u>High Energy Physics</u>	<u>Medium Energy Physics</u>	<u>Low Energy Physics</u>	<u>Math and Computer</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermo- nuclear</u>
Wisconsin	12	1	0	2	0	4	2	3
Marquette University .....	1	0	0	0	0	0	1	0
Wisconsin, University of .....	11	1	0	2	0	4	1	3
Wyoming	1	0	0	1	0	0	0	0
Wyoming, University of .....	1	0	0	1	0	0	0	0
<hr/>								
TOTAL .....	578	41	14	65	23	219	170	46

RESEARCH INSTITUTESNUMBER OF CONTRACTS, TOTAL COSTS, AND CONTRACTOR  
AND AEC CONTRIBUTION IN THE PROGRAM BY ACTIVITYAs of June 30, 1969

<u>Activity</u>	<u>Number of Contracts</u>	<u>Total Cost</u>	<u>Contractor Contribution</u>	<u>Percent of Total</u>	<u>AEC Contribution</u>	<u>Percent of Total</u>
Low Energy Physics .....	5	\$212,575	\$ 84,475	40	\$128,100	60
Mathematics & Computer ....	1	30,462	0	0	30,462	100
Chemistry .....	3	204,669	52,667	26	152,002	74
Metallurgy & Materials ....	2	141,185	0	0	141,185	100
Controlled Thermonuclear ..	1	117,890	37,800	32	80,090	68
TOTAL .....	12	\$706,781	\$174,942	25	\$531,839	75

RESEARCH INSTITUTES

CONSOLIDATED BUDGET OF THE 12 CONTRACTS  
INCLUDED IN THE PHYSICAL RESEARCH PROGRAM

As of June 30, 1969  
(Dollars in Thousands)

Items of Expense	Total		Low Energy		Math		Chemistry		Met. & Mat'ls		CTR	
	Amount	%	Physics	%		%		%		%		%
<u>Fixed-Price Contracts</u>												
Salaries and Wages .....	\$296	53.8	\$ 72	53.0	\$13	43.3	\$ 96	46.8	\$30	45.5	\$ 85	72.0
Equipment .....	18	3.2	0	.0	0	.0	18	8.8	0	.0	0	.0
Materials and Supplies ...	61	11.1	14	11.8	2	7.1	29	14.1	5	7.6	11	9.4
Travel .....	8	1.5	2	1.5	1	3.4	2	1.0	0	.0	3	2.5
Communications .....	1	.2	1	.8	0	.0	0	.0	0	.0	0	.0
Publication Costs .....	4	.7	1	.8	0	.0	1	.5	0	.0	2	1.7
Indirect Expenses .....	162	29.5	41	32.1	14	46.2	59	28.8	31	46.9	17	14.4
TOTAL .....	\$550	100.0	\$131	100.0	\$30	100.0	\$205	100.0	\$66	100.0	\$118	100.0
Contributed by Institutes.	131	23.8	41	31.3	0	.0	53	25.9	0	.0	38	32.2
Supported by AEC .....	419	76.2	90	68.7	30	100.0	152	74.1	66	100.0	80	67.8
Including Unexpended												
Balance of .....	19	.0	0	.0	0	.0	0	.0	0	.0	19	.0
<u>Cost-Type Contracts</u>												
Salaries and Wages .....	\$ 44	27.8	\$ 15	18.1	\$ 0	.0	\$ 0	.0	\$29	38.6	\$ 0	.0
Equipment .....	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0
Materials and Supplies ...	33	20.8	8	9.6	0	.0	0	.0	25	33.4	0	.0
Travel .....	35	22.3	35	42.2	0	.0	0	.0	0	.0	0	.0
Communications .....	2	1.3	2	2.4	0	.0	0	.0	0	.0	0	.0
Publication Costs .....	1	.6	1	1.2	0	.0	0	.0	0	.0	0	.0
Indirect Expenses .....	43	27.2	22	26.5	0	.0	0	.0	21	28.0	0	.0
TOTAL .....	\$158	100.0	\$ 83	100.0	\$ 0	.0	\$ 0	.0	\$75	100.0	\$ 0	.0
Contributed by Institutes.	45	28.5	45	54.2	0	.0	0	.0	0	.0	0	.0
Supported by AEC .....	113	71.5	38	45.8	0	.0	0	.0	75	100.0	0	.0
Including Unexpended												
Balance of .....	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0

RESEARCH INSTITUTES

NUMBER OF SCIENTIFIC EMPLOYEES, GRADUATE STUDENTS AND PUBLICATIONS  
UNDER THE PHYSICAL RESEARCH PROGRAM

<u>Activity</u>	<u>Scientific Employees</u>		<u>Graduate Students</u>	<u>Publications</u>
	<u>Number</u>	<u>Man-Years</u>		
Low Energy Physics .....	27	5	0	6
Mathematics & Computer .....	4	1	0	1
Chemistry .....	9	5	2	4
Metallurgy & Materials .....	43	3	0	0
Controlled Thermonuclear .....	6	4	0	0
TOTAL .....	89	18	2	11

RESEARCH INSTITUTES

OPERATIONS OFFICES ADMINISTERING  
THE BUSINESS ASPECTS OF THE CONTRACTS

<u>Operations Office</u>	<u>Division Total</u>	<u>Low Energy Physics</u>	<u>Math</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>CTR</u>
Chicago .....	2	0	1	0	1	0
New York .....	4	1	0	1	1	1
San Francisco .....	2	0	0	2	0	0
Oak Ridge .....	1	1	0	0	0	0
Washington .....	3	3	0	0	0	0
TOTAL .....	12	5	1	3	2	1

TYPE OF CONTRACTS

<u>Type</u>	<u>Division Total</u>	<u>Low Energy Physics</u>	<u>Math</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>CTR</u>
Cost .....	4	3	0	0	1	0
Lump-Sum .....	8	2	1	3	1	1
TOTAL .....	12	5	1	3	2	1

RESEARCH INSTITUTES

CONTRACTS BY AEC DOLLAR LEVEL

<u>Dollar Level</u>	<u>Division Total</u>	<u>Low Energy Physics</u>	<u>Math</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>CTR</u>
1 - 9,999 .....	3	3	0	0	0	0
10,000 - 19,999 .....	1	1	0	0	0	0
30,000 - 39,999 .....	2	0	1	1	0	0
40,000 - 49,999 .....	1	0	0	1	0	0
60,000 - 69,999 .....	1	0	0	0	1	0
70,000 - 79,999 .....	2	0	0	1	1	0
80,000 - 89,999 .....	1	0	0	0	0	1
90,000 - 99,999 .....	1	1	0	0	0	0
TOTAL .....	12	5	1	3	2	1

PERCENTAGE OF AEC CONTRIBUTION TO THE TOTAL COST OF THE RESEARCH

<u>Percentage</u>	<u>Division Total</u>	<u>Low Energy Physics</u>	<u>Math</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>CTR</u>
10 - 19 .....	1	1	0	0	0	0
30 - 39 .....	1	1	0	0	0	0
40 - 49 .....	1	0	0	1	0	0
60 - 69 .....	2	1	0	0	0	1
100 .....	7	2	1	2	2	0
TOTAL .....	12	5	1	3	2	1

RESEARCH INSTITUTESNUMBER OF CONTRACTS BY STATES AND CONTRACTORS

<u>State and Contractor</u>	<u>Division Total</u>	<u>Low Energy Physics</u>	<u>Math</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>CTR</u>
California	2	0	0	2	0	0
Stanford Research Institute ...	2	0	0	2	0	0
Connecticut	1	0	0	1	0	0
New England Institute for Medical Research .....	1	0	0	1	0	0
District of Columbia	3	3	0	0	0	0
National Academy of Sciences ..	3	3	0	0	0	0
Missouri	1	0	1	0	0	0
Midwest Research Institute ....	1	0	1	0	0	0
New Jersey	1	0	0	0	0	1
Inst. for Advanced Study .....	1	0	0	0	0	1
Ohio	1	0	0	0	1	0
Battelle Memorial Institute ...	1	0	0	0	1	0
Pennsylvania	2	1	0	0	1	0
Franklin Institute .....	2	1	0	0	1	0
Texas	1	1	0	0	0	0
Southwest Center for Advanced Studies .....	1	1	0	0	0	0
TOTAL .....	12	5	1	3	2	1



INDUSTRIAL LABORATORIES

NUMBER OF CONTRACTS, TOTAL COST, AND CONTRACTOR  
AND AEC CONTRIBUTION IN THE PROGRAM BY ACTIVITY  
As of June 30, 1969

<u>Activity</u>	<u>Number of Contracts</u>	<u>Total Cost</u>	<u>Contractor Contribution</u>	<u>Percent of Total</u>	<u>AEC Contribution</u>	<u>Percent of Total</u>
Low Energy Physics .....	2	\$ 328,901	\$128,750	39	\$ 200,151	61
Chemistry .....	2	414,771	0	0	414,771	100
Metallurgy & Materials ....	1	490,800	0	0	490,800	100
Controlled Thermonuclear ..	2	803,100	150,000	19	653,100	81
TOTAL .....	7	\$2,037,572	\$278,750	14	\$1,758,822	86

INDUSTRIAL LABORATORIES

CONSOLIDATED BUDGET OF THE 7 CONTRACTS  
INCLUDED IN THE PHYSICAL RESEARCH PROGRAM

As of June 30, 1969  
(Dollars in Thousands)

<u>Items of Expense</u>	<u>Total</u> <u>Amount</u>	<u>%</u>	<u>Low</u> <u>Energy</u> <u>Physics</u>	<u>%</u>	<u>Chemistry</u>	<u>%</u>	<u>Met. &amp;</u> <u>Mat'ls</u>	<u>%</u>	<u>CTR</u>	<u>%</u>
<u>Fixed-Price Contracts</u>										
Salaries and Wages .....	\$ 48	40.3	\$ 0	.0	\$ 0	.0	\$ 0	.0	\$ 48	40.3
Equipment .....	0	.0	0	.0	0	.0	0	.0	0	.0
Materials and Supplies ...	18	15.1	0	.0	0	.0	0	.0	18	15.1
Travel .....	0	.0	0	.0	0	.0	0	.0	0	.0
Communications .....	0	.0	0	.0	0	.0	0	.0	0	.0
Publication Costs .....	0	.0	0	.0	0	.0	0	.0	0	.0
Indirect Expenses .....	53	44.6	0	.0	0	.0	0	.0	53	44.6
TOTAL .....	\$119	100.0	\$ 0	.0	\$ 0	.0	\$ 0	.0	\$119	100.0
<hr/>										
Contributed by Laboratories	0	.0	0	.0	0	.0	0	.0	0	.0
Supported by AEC .....	119	100.0	0	.0	0	.0	0	.0	119	100.0
Including Unexpended										
Balance of .....	0	.0	0	.0	0	.0	0	.0	0	.0
<hr/>										
<u>Cost-Type Contracts</u>										
Salaries and Wages .....	\$613	31.9	\$ 58	17.6	\$160	38.5	\$211	42.9	\$184	26.9
Equipment .....	215	11.2	25	7.6	6	1.4	1	.2	183	26.8
Materials and Supplies ...	304	15.8	165	50.2	61	14.8	19	3.9	59	8.6
Travel .....	12	.6	2	.6	1	.2	4	.8	5	.7
Communications .....	2	.2	0	.0	0	.0	0	.0	2	.3
Publication Costs .....	5	.4	0	.0	1	.2	4	.8	0	.0
Indirect Expenses .....	767	39.9	79	24.0	186	44.9	252	51.4	250	36.7
TOTAL .....	\$1,918	100.0	\$329	100.0	\$415	100.0	\$491	100.0	\$683	100.0
<hr/>										
Contributed by Laboratories	279	14.5	129	39.2	0	.0	0	.0	150	21.9
Supported by AEC .....	1639	85.5	200	60.8	415	100.0	491	100.0	533	78.1
Including Unexpended										
Balance of .....	318	.0	318	.0	0	.0	0	.0	0	.0

INDUSTRIAL LABORATORIES

NUMBER OF SCIENTIFIC EMPLOYEES, GRADUATE STUDENTS AND PUBLICATIONS  
UNDER THE PHYSICAL RESEARCH PROGRAM

<u>Activity</u>	<u>Scientific Employees</u>		<u>Graduate Students</u>	<u>Publications</u>
	<u>Number</u>	<u>Man-Years</u>		
Low Energy Physics .....	9	4	1	5
Chemistry .....	8	5	0	7
Metallurgy & Materials .....	14	8	0	15
Controlled Thermonuclear .....	12	8	0	2
TOTAL .....	43	25	1	29

OPERATIONS OFFICES ADMINISTERING  
THE BUSINESS ASPECTS OF THE CONTRACTS

<u>Operations Office</u>	<u>Division Total</u>	<u>Low Energy Physics</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermonuclear</u>
New York .....	2	0	1	0	1
Oak Ridge .....	1	1	0	0	0
San Francisco .....	4	1	1	1	1
TOTAL .....	7	2	2	1	2

TYPE OF CONTRACTS

<u>Type</u>	<u>Division Total</u>	<u>Low Energy Physics</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermonuclear</u>
Cost .....	6	2	2	1	1
Lump-Sum .....	1	0	0	0	1
TOTAL .....	7	2	2	1	2

INDUSTRIAL LABORATORIES

CONTRACTS BY AEC DOLLAR LEVEL

<u>Dollar Level</u>	<u>Division Total</u>	<u>Low Energy Physics</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermonuclear</u>
90,000 - 99,999 .....	1	0	1	0	0
100,000 - 249,999 .....	5	2	1	0	2
250,000 - 499,999 .....	1	0	0	1	0
TOTAL .....	7	2	2	1	2

PERCENTAGE OF AEC CONTRIBUTION TO THE TOTAL COST OF THE RESEARCH

<u>Percentage</u>	<u>Division Total</u>	<u>Low Energy Physics</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermonuclear</u>
40 - 49 .....	1	1	0	0	0
70 - 79 .....	1	0	0	0	1
100 .....	5	1	2	1	1
TOTAL .....	7	2	2	1	2

NUMBER OF CONTRACTS BY STATES AND CONTRACTORS

<u>State and Contractor</u>	<u>Division Total</u>	<u>Low Energy Physics</u>	<u>Chemistry</u>	<u>Metallurgy &amp; Materials</u>	<u>Controlled Thermonuclear</u>
California	4	1	1	1	1
Atoms International .....	2	0	1	1	0
Gulf General Atomic .....	2	1	0	0	1
Connecticut	1	0	0	0	1
United Aircraft Corporation .	1	0	0	0	1
Massachusetts	1	0	1	0	0
Avco-Everett Research Lab ...	1	0	1	0	0
Texas	1	1	0	0	0
Texas Nuclear Corporation ...	1	1	0	0	0
TOTAL .....	7	2	2	1	2