

GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
RESEARCH PROJECT INITIATION

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posted
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CWH

Date: January 22, 1976

Project Title: Research Equipment for Biophysics & Solid State Programs

Project No: G-41-645

Principal Investigator Dr. R. M. Wartell

Sponsor: National Science Foundation

Agreement Period: From 12-15-75 Until 5-31-77*

*12 months budget period plus 6 months for submission of required reports, etc.
Type Agreement: Grant No. DMR74-13254

Amount: \$14,000 NSF(G-41-645)
14,110 GIT(G-41-335)
\$28,110 Total

Reports Required: Final Technical Report

Sponsor Contact Person (s):

Administrative Matters
(thru OCA)

Mr. F. G. Naughten
Grants Manager - Area 4
National Science Foundation
Washington, D. C. 20550
(202) 632-5965

Assigned to: School of Physics

COPIES TO:

Principal Investigator

Library

School Director

Rich Electronic Computer Center

Dean of the College

Photographic Laboratory

Director, Research Administration

Project File

Director, Financial Affairs (2)

Security Reports-Property Office ✓

Patent Coordinator

Other

GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
SPONSORED PROJECT TERMINATION

Date: 9/15/77

Project Title: Research Equipment for Biophysics & Solid State Programs

Project No: G-41-645

Project Director: Dr. R. M. Wartell

Sponsor: National Science Foundation

Effective Termination Date: 5/31/77 (Grant Expiration)

Clearance of Accounting Charges: by 5/31/77

Grant/Contract Closeout Actions Remaining: none

- ☐ Final Invoice and Closing Documents
- ☐ Final Fiscal Report
- ☐ Final Report of Inventions
- ☐ Govt. Property Inventory & Related Certificate
- ☐ Classified Material Certificate
- ☐ Other _____

Assigned to: Physics (School/Laboratory)

COPIES TO:

Project Director
Division Chief (EES)
School/Laboratory Director
Dean/Director-EES
Accounting Office
Procurement Office
☒ Security Coordinator (OCA)
Reports Coordinator (OCA)

Library, Technical Reports Section
Office of Computing Services
Director, Physical Plant
EES Information Office
Project File (OCA)
Project Code (GTRI)
Other _____

G-41-645

GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA 30332

OFFICE OF
THE DIRECTOR OF
FINANCIAL AFFAIRS

January 26, 1977

Grants and Contracts Office
National Science Foundation
Washington, D. C. 20550

Gentlemen:

Enclosed is the original and two copies of the final fiscal report for grant number DMR-74-13254.

If you have any questions or desire additional information, please let me know.

Sincerely yours,

C. Evan Crosby,
Associate Director of
Financial Affairs

CEC/bs
enclosures:

cc: Dr. R. M. Wartell
Mr. E. E. Renfro
Mr. A. H. Becker
File G-41-645/G-41-219

RESEARCH GRANT
BUDGET & FISCAL REPORT

Please read instructions on reverse side carefully before completing this form.

INSTITUTION AND ADDRESS Georgia Institute of Technology Atlanta, Georgia 30332		NSF PROGRAM Solid State Physics	GRANT PERIOD from 12/15/75 to 5/31/77 REPORTING PERIOD from 12/15/75 to 1/13/77*
GRANT NUMBER DMR74-13254	BUDGET DUR. (MOs.) 17 1/2	PRINCIPAL INVESTIGATOR(S) R. M. Wartell	GRANTEE ACCOUNT NUMBER G-41-645

A. SALARIES AND WAGES			NSF Award Budget	CUMULATIVE GRANT EXPENDITURES <i>Do Not Round</i>
1. Senior Personnel				
	Cal.	Acad.		
a. (Co)Principal Investigator(s)			\$	
b. Faculty Associates				
Sub-Total			\$	\$ -
2. Other Personnel (Non-Faculty)				
a. Research Associates—Postdoctoral				
b. Non-Faculty Professionals				
c. Graduate Students				
d. Pre-Baccalaureate Students				
e. Secretarial—Clerical				
f. Technical, Shop, and Other				
TOTAL SALARIES AND WAGES			\$	\$ -
B. STAFF BENEFITS IF CHARGED AS DIRECT COST				
C. TOTAL SALARIES, WAGES, AND STAFF BENEFITS (A + B)			\$	\$ -
D. PERMANENT EQUIPMENT				14,000.00
E. EXPENDABLE EQUIPMENT AND SUPPLIES				-
F. TRAVEL 1. DOMESTIC (INCLUDING CANADA) 2. FOREIGN				-
G. PUBLICATION COSTS				-
H. COMPUTER COSTS IF CHARGED AS DIRECT COST				-
I. OTHER DIRECT COSTS				-
J. TOTAL DIRECT COSTS (C through I)			\$	\$ 14,000.00
K. INDIRECT COSTS				-
L. TOTAL COSTS (J plus K)			\$	\$ 14,000.00
M. AMOUNT OF THIS AWARD (ROUNDED)			\$	
N. CUMULATIVE GRANT AMOUNT			\$	
O. UNEXPENDED BALANCE (N. BUDGET MINUS L. EXPENDITURE)				\$ -

REMARKS: Use extra sheet if necessary

*No obligations were incurred outside the grant period of 12/15/75 through 5/31/77

SIGNATURE OF PRINCIPAL INVESTIGATOR	TYPED OR PRINTED NAME R. M. Wartell	DATE 1/25/77
I CERTIFY THAT ALL EXPENDITURES REPORTED ARE FOR APPROPRIATE PURPOSES AND IN ACCORDANCE WITH THE AGREEMENTS SET FORTH IN THE APPLICATION AND AWARD DOCUMENTS		
SIGNATURE OF AUTHORIZED OFFICIAL	TYPED OR PRINTED NAME & TITLE C. Evan Crosby, Associate Director of Financial Affairs	DATE January 26, 1977

FOR NSF USE ONLY

Organ. Code	F.Y.	Fund ID	Prog. Code	Ob. Class	O/Dres.	Award No.	Amd.	Inst. Code	Unexpended Balance	Trans.	Lot
									\$		

SUMMARY OF COMPLETED PROJECT

Form Approved
OMB No. 99R0013

Please read instructions on reverse carefully before completing this form.

1. INSTITUTION AND ADDRESS: Georgia Institute of Technology School of Physics Atlanta, Georgia 30332		2. NSF PROGRAM Solid State Physics Biophysics	3. GRANT PERIOD from 12/15/73 to 5/31/77
4. GRANT NUMBER DMR74-13254	5. BUDGET DUR. (MO) 12	6. PRINCIPAL INVESTIGATOR(S) R. M. Wartell	7. GRANTEE ACCOUNT NUMBER G-41-645

8. SUMMARY (Attach list of publications to form)

The equipment grant was used to purchase two major pieces of equipment. A Beckman Instruments, Inc. Ultraviolet-Visible Acta M VI spectrophotometer, and a Coherent Radiation, Inc. 9.0 watt argon ion laser were obtained to support research programs in biophysics and solid state surfaces. The laser is being employed as part of a Raman spectroscopy system.

Investigations were carried out on the interactions between four antibiotic molecules with DNA. These molecules-ruticulomycin nogalomycin, distamycin and netropsin, show specificities for certain nucleotide sequences of DNA. They are of interest as simple models for large regulatory proteins which exhibit binding specificity for particular DNA nucleotide sequences. Absorption spectroscopy has been used to characterize the interactions between nogalomycin and ruticulomycin and six synthetic DNA polymers. Both molecules show virtually no binding to d(A)_n. d(T)_n. Other A.T (adenine.thymine) and G.C (guanine. cytosine) base paired sequences bind the molecules.

Laser Raman spectroscopy has been employed to obtain information on the binding of distamycin and netropsin to DNA. These molecules do not bind to G.C sequences of DNA. Raman vibrational spectra of these molecules in the unbound state and bound to DNA have been obtained. Interpretation this data is in progress. Raman studies on the helix-coil transitions of synthetic DNA polymers are also underway.

The spectrophotometer is being employed to characterize the physico-chemical state of metalloporphyrins being studied by Resonance Raman spectroscopy. Additionally, the specular reflectance accessory of this instrument is being used in the research program on the optical properties of titanium solid surfaces.

9. SIGNATURE OF PRINCIPAL INVESTIGATOR/ PROJECT DIRECTOR	TYPED OR PRINTED NAME Roger M. Wartell	DATE 8/24/77
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FINAL TECHNICAL LETTER REPORT

TO THE

NATIONAL SCIENCE FOUNDATION

from:

Institution:

Georgia Institute of Technology
School of Physics
Atlanta, Georgia 30332

Principal Investigator: R. M. Wartell

Grant No.: DMR74-13254

Starting Date/Completion Date: December 15, 1975/May 31, 1977

Grant Title: Purchase of a Recording Spectrophotometer and Accessories

Description of Research & Results:

The funds of the grant were combined with Institute matching funds to purchase a Beckman Instruments Inc. uv-visible spectrophotometer, and an argon ion 9 watt laser from Coherent Radiation Inc. These two instruments are in almost daily use in research programs in the areas of biophysics and solid state surfaces. Studies of the binding specificities of antibiotics to DNA polymers, and conformational properties of DNAs are nearing completion. Further studies on the DNA conformational properties of different nucleotide sequences are underway.

Publications Planned:

Conformational Features of the binding of Netropsin and Distamycin to A.T DNA Sequences determined by Raman Spectroscopy by J. Martin, D. O'Shea and R. M. Wartell.

The Binding specificities of Nogalomicin and Ruticulomicin to periodic DNA polymers. by H. Gastfriend, C. Fordyce & R. M. Wartell.

Thesis: Raman Spectroscopy studies on the Binding of Netropsin and Distramycin to DNA. by James C. Martin (in preparation)

Scientific Collaborators:

Professor James R. Stevenson, Professor
Professor Donald O'Shea, Assoc. Prof.
Mr. James C. Martin, Grad. Student
Mr. Dennis Howell, Grad. Student
Ms. Cynthia Fordyce, Undergrad. Student
Mr. Hyman Gastfriend, Undergrad. Student

Aug 24, 1977
Date

Principal Investigator