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Final Technical Report
(August 15, 1988)

Office of Naval Research

N00014-85-K-0098

New Directions in Conductive Polymers

Principal Investigators:

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Overview of Progress During the Period of the Contract

The broad based Program on Conducting Polymers was initiated as a Selected Research Opportunity (SRO) and designated for three year funding. During that period, the program developed into an interdisciplinary program with roots in chemistry, physics and polymer science. By the end of the SRO period, the program clearly involved a back and forth interplay between the various components. Within the Institute for Polymers and Organic Solids at UCSB we have assembled a large and high quality group of graduate research students, post-doctoral researchers, technicians and Visiting scientists working in close collaboration across these sub-areas. During the period of the SRO funding the Program on Conducting Polymers expanded by bringing in the following:

Theory: Professor P. Pincus

Processing: Professor P. Smith

Rheology: Professor Dale Pearson.

To our knowledge, we are the only academic research effort in the world which spans the full range required for continued progress in the science and technology of conducting polymers: --- **Synthesis** --- **Processing** --- **Physical Measurements**. Through the SRO funding, we have assembled the broad base of facilities, equipment and personnel needed to continue the research in this area.

As a measure of the longer time impact of the SRO funding and as a statement of the success of this funding, we note that the National Science Foundation has initiated a Materials Research Group within the Institute for Polymers and Organic Solids with the title: **Oriented Conducting Polymers: Solution Processing and Characterization.**



Scientific accomplishments during the period of this contract were reported in the form of published papers. More generally, we contributed in an important way to the development of the field with important contributions in all aspects of of current activity. To single out a few of these we note the following:

- Demonstration of the Generic Importance of Nonlinear Excitations in Conducting Polymers (Solitons, Polarons and Bipolarons)
- Demonstration of the Importance of Nonlinear Excitations in Conjugated Polymers to the Nonlinear Optical Properties of These Polymers
- Demonstration of the Control of the Band Gap Through Molecular Design
- Demonstration that the Concepts Developed For Solid State Materials Can Be Generalized to Conducting Polymers in Solution

A complete list of the Publications, Patents, Presentations, Honors, etc is included in the End-of-The-Year Reports which were submitted and are on file at ONR.

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REPORT OF INVENTIONS AND SUBCONTRACTS

(Pursuant to "Patent Rights" Contract Clause) (See Instructions on Reverse Side.)

FORM APPROVED
OMB NO. 0704-0076

1. NAME OF CONTRACTOR/ SUBCONTRACTOR California, Santa Barbara Polymer Institute Santa Barbara, CA 93106	2. NAME OF GOVERNMENT PRIME CONTRACTOR Office of Naval Research 800 N. Quincy St. Arlington, VA 22217-5000	3. TYPE OF REPORT (check one) <input type="checkbox"/> INTERIM <input checked="" type="checkbox"/> FINAL
c. CONTRACT NUMBER N00014-85-K-0098	c. CONTRACT NUMBER	4. REPORTING PERIOD (YYMMDD) FROM: 85-01-01 TO: 87-12-31
d. AWARD DATE (YYMMDD) 85-01-01	d. AWARD DATE (YYMMDD)	

SECTION I - SUBJECT INVENTIONS

b. NAME OF INVENTOR(S) (Last, First, M.I.)	TITLE OF INVENTION(S)	c. DISCLOSURE NO., PATENT APPLICATION SERIAL NO. OR PATENT NO.		d. ELECTION TO FILE PATENT APPLICATIONS				e. CONFIRMATORY INSTRUMENT OR ASSIGNMENT FORWARDED TO CONTRACTING OFFICER	
		UNITED STATES	FOREIGN	YES	NO	YES	NO	YES	NO
NONE									
 Alan J. Heeger Principal Investigator									

9. EMPLOYER OF INVENTOR(S) NOT EMPLOYED BY CONTRACTOR/SUBCONTRACTOR.	9. ELECTED FOREIGN COUNTRIES IN WHICH A PATENT APPLICATION WILL BE FILED.
i. NAME OF INVENTOR (Last, First, M.I.)	ii. FOREIGN COUNTRIES OF PATENT APPLICATION
ii. NAME OF EMPLOYER	
iii. ADDRESS OF EMPLOYER (include Zip Code)	

SECTION II - SUBCONTRACTS (Containing a "Patent Rights" clause)

SUBCONTRACTS AWARDED BY CONTRACTOR/SUBCONTRACTOR. (If "None", so state)		SUBCONTRACTS AWARDED BY CONTRACTOR/SUBCONTRACTOR. (If "None", so state)	
a. NAME OF SUBCONTRACTOR(S)	b. ADDRESS (include Zip Code)	c. SUBCONTRACT NO. (S)	d. "PATENT RIGHTS" CLAUSE NO. DATE (YYMM)

SECTION III - CERTIFICATION

e. CERTIFICATION OF REPORT BY CONTRACTOR/SUBCONTRACTOR (Not required if <input type="checkbox"/> Small Business or <input type="checkbox"/> Non-Profit organization) (Check appropriate box)		f. SUBCONTRACT DATES (YYMMDD)	
c. I certify that the reporting party has procedures for prompt identification and timely disclosure of "Subject Inventions," that such procedures have been followed and that all "Subject Inventions" have been reported.		AWARD	ESTIMATED COMPLETION
SIGNATURE OF AUTHORIZED CONTRACTOR/SUBCONTRACTOR OFFICIAL		DATE (YYMMDD)	