Holotrapathy, X-rays

Abstract (Continued on reverse side if necessary, and identify by sheet number)

v study was made of the possibility to produce x-ray holograms near 4400 A.

Holotrapathy, X-rays

Approved for public release

DISTRIBUTION STATEMENT A

DISTRIBUTION STATEMENT (of this report)

Unclassified

 Herbert Mar

Internal Tarac Laboratory of Atomic & Solid State Physics

X-ray holography with X-rays
The project "X-ray Holography with X-rays" was first supported as a travel grant. A cooperative effort was planned with a group in West Germany, Drs. Niebuhr and Schmahl at the Göttingen Observatory. The Göttingen group had developed methods of producing highly accurate Fresnel zone plates for use with x-rays and we had started preliminary experiments to use Fresnel zone plates for x-ray holography. The experiments were to be performed at the DESY-Germany synchrotron facility. Because of the enormous pressure by particle physicists to build PETRA almost no time could be given to a project like ours and the cooperation coupled with visits and trips was cancelled. In the meantime the Cornell electron-positron storage ring CESR was in the discussion stages and it was decided to spend the grant money on a feasibility study of eventually using Fresnel zone plates for x-ray holography with the Cornell synchrotron facility CHESS. This work was pursued last year and during last summer with two undergraduate research helpers and myself.

First it was established that in a continuation of a previous effort x-ray holograms could be produced with a novel double Fresnel zone plate arrangement near 44°. The CHESS source is, however, very unsuited as a source of soft x-rays. A radically different approach would have to be used to do x-ray holography in the range of 30KeV and up for which CHESS is dedicated as a national facility. Such a proposal would go far beyond the very limited objective of this grant. It was decided then to use the knowledge and experience gained by the present grant to develop a proposal particularly suited for CHESS. This proposal is in preparation.
In summary then, Grant N00014-77-C-0543 allowed us to positively explore the feasibility of a two-Fresnel zone plate scheme in the 40\AA{} range. As efforts to collaborate for such a source failed we then turned to efforts to match the much higher energy range of the new CHESS facility at Cornell with our objective. This endeavor has just started. We felt that this was a good point at which to terminate work on Grant N00014-77-C-0543 and to start afresh with a new proposal for future efforts.

Bibliography:


There were no publications or theses, nor was there any capital equipment purchased on this grant.
TO: Defense Contract Audit Agency - Day Hall  
FROM: Purchasing Department, Room 1005, E. HALL 120 Maple Ave.  
SUBJ: Contract W90514-77-C-0543; information concerning property accountability under Appendix C, ASPR., Cornell University Acct. No. 77-6-8364  

1. Work commenced on 1 July 1979  
2. Contract was physically completed on 31 March 1980  
3. Last Amendment Number A0299  
4. Value of residual material (exclusive of equipment) remaining under contract $None. (If none, state "None").  
   a. Inventory list prepared (x)Yes ( )No  
   b. List has been submitted to the Technical Inspector on 31 March 1980  
5. Contract-Acquired Property  
   
<table>
<thead>
<tr>
<th>Type</th>
<th>Amount</th>
<th>Transferred to</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Real Property</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Plant Equipment</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Minor Equipment</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Special Tooling</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. Government-Furnished Property  
   
<table>
<thead>
<tr>
<th>Type</th>
<th>Amount</th>
<th>Transferred to</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Real Property</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Plant Equipment</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Minor Equipment</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Special Tooling</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. Patent and royalty certificates executed on 7 April 1980  

Sponsored Programs  
Copies to: Accounting  
Research  
Project Director  
Ofc. of Sponsored Programs  

Sponsored Programs  

Mr. E.D. Birko  
Gov't. Property Control Officer  
Cornell University, Ithaca, N.Y.
Mr. Laurence Arra, Property Administrator  
Department of the Navy  
ONR-Eastern/Central Regional Office  
Building 114 Section D  
666 Summer Street  
Boston, MA 02210  

Subject: Final Inventory N00014-77-C-0543  

Dear Mr. Arra:

Enclosed are four copies of the final inventory of equipment acquired under the subject contract with the Materials, Supplies and Equipment Certificate attached.

We are reporting a negative inventory.

Sincerely yours,

(Mrs.) E.B. Pirko  
Government Property Control Officer

EBP:gc  
encls: 4 w/attach.  
cf: V.A. Morano, ONR-NY.  
Profs. H. Mahr, LASSP  
Mrs. B. Keib, Sponsored Programs Acctg.  
P.A. Curtiss, Office of Sponsored Programs
MATERIALS, SUPPLIES, EQUIPMENT CERTIFICATE

To: Director, Office of Naval Research, Boston Branch
666 Summer Street, Boston, Massachusetts 02210

From: Cornell University
Purchasing Department
120 Maple Avenue
Ithaca, NY 14850

The undersigned, as an authorized representative of the contractor, having completed the work called for by Contract No. N00014-77-C-0543, hereby certifies that all materials, supplies, and equipment which were furnished to the contractor by the Government for use on the contract, or for which the contractor has been or will be reimbursed by the Government under the terms of the contract, if not specifically included in the attached inventory listings, were expended in performing the work called for by the contract.

☐ Completed inventory listings attached
☒ No residual inventory
☐ All inventory accounted for under Facility Contract No. ____________

E. B. Pirko
Signature (Mrs.) E.B. Pirko

Government Property Control Officer
Title

31 March 1980
Date

APPROVED:
(ONR Branch Office Property Administrator)

Date: ____________________

LD-028-L330/7 (Rev 3-67)
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contractor Purchased Equip.</td>
<td>NEGATIVE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cornell Constructed Equip.</td>
<td>NEGATIVE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Government Furnished Equip.</td>
<td>NEGATIVE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*CP - Purchased by contractor
**Condition Code: Use a combination of letter N - New, E - Used-reconditioned, O - Used-usable w/o repair, R - Used-repairs required and number (e.g. E4 or N2) except X and S use letter only. S - Salvage, X - Scrap, 1 - Excellent, 2 - Good, 3 - Fair, 4 - Poor.