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NATIONAL BUREAU OF STANDARDS 1965 A
The field of Holography and Optical Information Processing is an important and active one with many significant advances during the past twenty years. This conference had 19 formal talks describing the most recent areas of interest. A complete list of speakers is included in Appendix A.

The conference contained a carefully selected mixture of talks including optical computing, components and architectures; optical processors; holography; and applications of coherent light.
AFOSR-TR-87-0551

FINAL REPORT

1987 GORDON RESEARCH CONFERENCE

ON

HOLOGRAPHY AND OPTICAL INFORMATION PROCESSING

Prepared for:

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Submitted by

Dr. Steven K. Case
Chairman
1984 Gordon Research Conference
Holography & Optical Information Processing

Dr. Alexander Cruickshank
Director
Gordon Research Conferences

February 1987

AFOSR Office of Scientific Research (AFOSR)

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1. Technical Statement

The field of Holography and Optical Information Processing is an important and active one with many significant advances during the past twenty years. This conference had 19 formal talks describing the most recent areas of interest. A complete list of speakers is included in Appendix A.

The conference contained a carefully selected mixture of talks including optical computing, components and architectures; optical processors; holography; and applications of coherent light.

In addition, 11 contributed poster papers were presented on Tuesday evening. The papers were posted early in the conference dining room and they remained for two days so it was relatively easy to have a short or lengthy session with a given author. Thursday evening was reserved for informal presentations which generated numerous discussions. Many of the discussions continued well into the night.

2. Funding

The purpose of this document is to report on the expenditures of funds received from the AFOSR and DARPA in response to an unsolicited proposal. In the proposal it was indicated that these funds would be spent to promote attendance of scholars who would otherwise be hampered from attending. The awardees are listed in the following table:
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<td>Xiaoping Lu</td>
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<td>Kasra Rastani</td>
<td>USC</td>
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</table>

$15,000
3. Conference Attendance

There were approximately 90 people attending this conference. A partial address list is included in Appendix B. The breakdown of attendees is approximately as follows:

- 56% from Universities
- 11% from Government
- 33% from Industry

Participants came from every geographic area of the United States and several foreign counties.
Monday Morning - John Neff, Discussion Leader

8:45 a.m.  Steven Case  Welcome
9:00 a.m.  Keith Jenkins  "Parallel Computation and Optical Computing"
           USC
9:50 a.m.  Oliver McBryan  "State of the Art for Digital Electronic Parallel
           Courant Institute  Computers"
           NYU
10:40 a.m. --Break--
11:10 a.m. John Hopfield  "Neural Networks and Optical Computing"
           Cal Tech
           Bell Labs
           
Monday Evening - Keith Bromley, Discussion Leader

7:30 p.m.  Henry Taylor  "Fiber and Integrated Optics for Signal Processing"
           Texas A&M
8:20 p.m.  Armand Tanguay  "Optical Information Processing Components"
           USC
Tuesday Morning - Lee Giles, Discussion Leader

9:00 a.m. Alan Huang
          Bell Labs
          "Optical-Digital Computers"

9:50 a.m. Tony Ticknor
          H. H. Barrett
          Optical Sciences Center
          "Optical Acceleration of Digital Computation"

10:40 a.m. --Break--

11:10 a.m. Desmond Smith
           Heriot-Watt University
           "Restoring Optical Logic and a Simple Finite
           State Machine with the Consequences for Parallel
           Digital Computation"

Tuesday Evening - Organized by Stephen Benton

7:30 p.m. -
10:00 p.m. Poster Session

Wednesday Morning - Emmett Leith, Discussion Leader

9:00 a.m. G. Michael Morris
           U of Rochester
           "Monte Carlo Optical Processing"

9:50 a.m. Don Sweeney
           George Shils
           Sandia-Livermore
           "Holographic Correlator for Distortion-Invariant
           Recognition"

10:40 a.m. --Break--

11:10 a.m. Nicholas George
           U of Rochester
           "Hybrid Processors with Natural Illumination"

Wednesday Evening - Tom Cathey, Discussion Leader

7:30 p.m. Yuri Owechko
           Gilmore J. Dunning
           Bernard H. Soffer
           Emanuel Marom
           "Holographic Association Memory with Non-
           Linearities in the Correlation Domain"

8:20 p.m. Gerd Weigelt
           U Erlangen
           "Image Reconstruction from Astronomical Speckle
           Interferograms"
Thursday Morning - Steve Benton, Discussion Leader

9:00 a.m.  James Leger  
MIT-Lincoln Lab  
"Combining Laser Beams with Holography"

9:50 a.m.  Akira Tonomura  
Hitachi  
"Electron Holography"

10:40 a.m.  --Break--

11:10 a.m.  James Cowan  
Polaroid  
"Fabrication of Optical Microstructures"

Thursday Evening - Neal Gallagher, Discussion Leader

7:30 p.m.  Open Presentation

Friday Morning - Poohsan Tamura, Discussion Leader

9:00 a.m.  Jeffrey Jalkio  
U of Minnesota  
"Coherent Optics for 3-D Metrology"

9:50 a.m.  Ole Lokberg  
Norwegian Institute of Technology  
"What are the Limits of ESPI"

10:40 a.m.  --Break--

11:10 a.m.  Robert A. Sprague  
Xerox Corporation  
"Optical Addressing Schemes"

The conference ends after lunch on Friday.
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<thead>
<tr>
<th>Name</th>
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<td>Schils, George</td>
<td>329</td>
<td>Sandia National Laboratories 1900 E. Arrow Highway 92000 E. Arrow Highway Livermore, CA 94550</td>
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<td>Scott, Miles L.</td>
<td>329</td>
<td>MIT-Lincoln Lab, Room L-244, 244 Wood Street, Lexington, MA 02173</td>
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<td>Shamir, Joseph</td>
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<td>Smith, S. D.</td>
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<td>Heriot-Watt University, Department of Physics, Edinburgh, Scotland EH14 4AS</td>
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<td>Tanguay, Armand R. Jr.</td>
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Registration List - Holography, 1987
Page 5

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University Park, PA 16802
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