1991 Gordon Research Conference on Nonlinear Optics and Lasers

Prof. Hermann Haus

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Arlington, VA 22217-5000

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Summary of Conference Events

The Conference on Nonlinear Optics and Lasers, which is held traditionally every other year, was held again this year. The topics were chosen on the basis of their current interest and of significant advances within the past year: production of X-rays with high power lasers, generation of millimeter waves with femtosecond pulses, microcavities and microlasers, second harmonic generation in fibers and advances in photorefractivity and parallel optical processing. It is important to introduce Gordon conferees to ways of thinking and scientific methods in fields that are related, but would not generally appear in specialized conferences. We had three such examples: The methods of nonlinear optics as applied to electronic signal processing (Dave Bloom), the concept of squeezing (special quantum states of the electromagnetic field) as used to explain the generation of gravitational waves in the expanding universe (Leonid Grishchuk), and particle interferometers with particle-instead of wave-gratings (Dave Pritchard).

By asking Nobel laureate Bloembergen one year in advance to give the traditional after dinner speech, we were privileged to hear him speak of the history of optics over the centuries resulting in the various principles of linear optics, and the highly accelerated pace of discovery of the analogous principles in nonlinear optics. His presence was particularly gratifying, since there was a large contingent of graduate students participating in the conference.

We had two foreign cochairman: Profs. E. Hanamura and Prof. E. Göbel. Invited foreign speakers were:

- from France: Prof. Jean-Michel Raimond
- from Great Britain: Prof. Wilson Sibbett
- from the Soviet Union: Profs. Leonid Grishchuk and Boris Zeldovitch
- from Germany: Prof. Theo Tschudi
- from Austria: Prof. Arnold Schmidt
In order to air the work of graduate students, and to give the opportunity to present very recent work, we have had the tradition of a poster session. This year we expanded the poster session to two evenings. This was a very useful innovation. The number of posters each night was of the order of 15, giving plenty of time for extensive discussion with the presenters. This mode is highly recommended for future conference.

At the Thursday conference dinner votes were taken on the "best poster." The winner was "Optical Coherence Tomography," Paper 29 on the poster program. The runner up was "Time Domain Observation of Squeezing in a Nonlinear Fiber Ring Interferometer," Paper 18 on the poster program.

On Tuesday afternoon, the committee consisting of the chairman, vice-chairman, and discussion leaders selected two candidates for vice-chairman of the 1993 conference (and thus chairman of the 1995 conference). In the Tuesday evening session an announcement was made to the conferees that on Wednesday night a vote would be taken on the next vice-chairman and that they should consider presenting candidates. When nominations were made on Wednesday night, the nominee of the conferees was Yaron Silberberg. In the vote, Silberberg was the winner. As chairman of this conference I can express my satisfaction that a very good candidate was chosen and that the 1995 conference planning is in good hands.

At any time during the week, about 90 conferees were present.

The atmosphere in Wolfeboro is beyond compare. I attend many conferences myself, yet I have never found an equally informal and productive setting for the exchange of ideas and the spawning of new ideas. On the whole, it is my opinion that the conference was very successful and I am looking forward to the 1993 conference, hopefully at the Brewster Academy.
PROPOSED BUDGET
1991 GORDON RESEARCH CONFERENCE

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<td>Invited Speakers: 24 x 350</td>
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<td>Session Chairmen: 9 x 350</td>
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<td>Junior Faculty, 22 x 350 Students:</td>
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| **2. Travel**          |      |       |      |      |        |
| Invited Speakers, domestic airfare: 9 x 455 (avg) | 100   | 4,000 | -    | -    | 4,100  |
| Invited Speakers, foreign airfare: 6 x 1,000 (avg) | 6,000 | -      | -    | -    | 6,000  |
| Junior faculty, students, cochairmen: 10 x 300     | -     | 1,000 | 2,000 | -    | 3,000  |
| Local transportation, bus from Logan airport to Wolfeboro 28 x 25 | 1,000 | -      | -    | -    | 1,000  |
| **TOTALS**            | 12,000 | 10,000 | 6,000 | 5,000 | 33,000 |
GORDON RESEARCH CONFERENCE  
NONLINEAR OPTICS AND LASERS  
Brewster Academy, Wolfeboro, NH  
July 22-26, 1991

Chairman: Hermann A. Haus   Vice Chairman: Dana Z. Anderson  
Co-Chairmen: E. Göbel and E. Hanamura

Monday, July 22

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<tr>
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<td>8:30-9:15</td>
<td>D. Auston</td>
<td>Terahertz Radiation from Photoconducting Antennas</td>
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<td>9:15-10:00</td>
<td>D. Bloom</td>
<td>Nonlinear Electronics</td>
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<td>10:00-10:30</td>
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<td>10:30-11:15</td>
<td>Y. Silberberg</td>
<td>Photon Echoes in Er-doped Fibers</td>
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<td>11:15-12:00</td>
<td>C. Rhodes</td>
<td>Interaction of High Intensity Radiation with Molecules and Solids</td>
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<td>8:00-8:45</td>
<td>G. Mourou</td>
<td>Ultraintense Lasers and Nonlinear Optics of Free Electrons</td>
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<td>8:45-9:30</td>
<td>S. Szatmári</td>
<td>Up-scaling of TW-class KrF Lasers</td>
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Tuesday, July 23

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<tr>
<td>8:30-9:15</td>
<td>D. Steel</td>
<td>High Resolution Nonlinear Spectroscopy and Photon Echoes of Localized Excitons</td>
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<td>9:15-10:00</td>
<td>T. Fukuzawa</td>
<td>Luminescence of Type-II Excitons in Coupled Q.W.'s</td>
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<td>10:00-10:20</td>
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<td>11:05-11:50</td>
<td>J. Stark</td>
<td>Nonlinear Optical Response of Stro-gly Confined Excitons</td>
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<td>11:50-12:30</td>
<td>W. Knox</td>
<td>Femtosecond Quantum Well Opto-electronics</td>
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<td>7:30-8:15</td>
<td>M. Murnane</td>
<td>X-rays from Short-pulse Laser Produced Plasmas</td>
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POSTER SESSION TUESDAY EVENING
POSTER SESSION I
TUESDAY EVENING


12. "Near infrared dispersion of $\chi(3)(3\omega)$, $\Im[\chi(3)(-\omega;\omega,\omega)]$ and $\chi(3)(2\omega_1-\omega_2)$ of poly (4-BCMU) thin films," W. E. Torruellas, K. B. Rochford, R. Zanoni, S. Aramaki and G. I. Stegeman, University of Florida, CREOL.


POSTER SESSION II
WEDNESDAY EVENING


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<td>Dept. of Applied Physics</td>
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