Mini-Project 4: Literature Review in Nonlinear Optics **KSU PHYS953, NQO**

The purpose of this Mini-project is to expose you to a seminal or groundbreaking paper in nonlinear optics, and to see how this significant paper lead to new research and discoveries. There will be two parts to this Mini-project: Writing the Summary and Reviewing the Summary

1. Writing the Summary

You will need to write a short summary of two journal papers. This first paper you will have chosen (by random ballot) from the list below. You will need to pick the second paper, however the second paper must be a relatively recent paper that cites the first paper in its reference section. Example:

Paper 1: Franken, P.A. *et al*, "Generation of Optical Harmonics", Phys Rev Lett, Vol. 7, 4, 1961
Time Cited: 564

Paper 2 which references Paper 1: Deng L, Hagley EW, Wen J, *et al*., "Four-wave mixing with matter waves", Nature, Vol. 398, 6724 Pages: 218-220 Published: MAR 18 1999
Times Cited: 260

When writing this summary, your target audience will be your fellow classmates and not your instructor. The Summary will consist of a one or two page summary of Paper 1 and a one or two page summary of Paper 2. In the first summary, you must discuss the major results of Paper 1 and the importance of the paper. In the second summary you must discuss the major results Paper 2 and how the results of Paper 1 contributed to these results. The format of the paper should be as follows:

Summary Format
Page 1: Title page with your name
Pages 2-3: Summary of Paper 1 (summary may be one page only)
Pages 4-5: Summary of Paper 2 (summary may be one page only)
The Summary needs to be typed and turned in electronically as a PDF file to me at washburn@phys.ksu.edu. Use 10 or 12 pt font, Times New Roman Font, 1 inch margins. Only put your name on page 1.

Please pay attention to the Review Criteria before writing your Summary. See below.

2. Reviewing the Summary

For Part Two you will evaluate your classmate's summary in a similar fashion as for the review of a journal. The manuscript will be given to you in an anonymous fashion and you must complete your review in an anonymous fashion. You will judge the Summary using the criteria below.

Review Criteria
How well does the Summary cover the important results of Paper 1?
How well does the Summary cover the important results of Paper 2?
How well does the Summary show a connection (or show a lack of a connection) between the results of Paper 1 to the result of Paper 2?
Are there any significant formatting, spelling or grammatical errors?

Then make a final decision on the Summary:
____ Summary is excellent, accept as is with no revisions
____ Summary needs minor revision
____ Summary needs major revision
____ Summary is poor, reject

Complete your review by writing a brief statement answering the following questions and then make a final decision on the Summary. Email the review to me. To be a responsible referee, you will need to read (or at least skim) the papers that the Summary is reviewing. Do not put your name on the review since it will go back to the author. Grades will be given based on the result of the Summary Review and on the quality of your review.

3. Due dates

Summary Due: 11/09/07
Review Due: 11/16/07

Paper List

1. THEORY OF STIMULATED BRILLOUIN AND RAMAN SCATTERING
Author(s): SHEN YR, BLOEMBER.N
Source: PHYSICAL REVIEW Volume: 137 Issue: 6A Pages: 1787-& Published: 1965

2. Experimental evidence for supercontinuum generation by fission of higher-order solitons in photonic fibers
Author(s): Herrmann J, Griebner U, Zhavoronkov N, et al.
Source: PHYSICAL REVIEW LETTERS Volume: 88 Issue: 17 Article Number: 173901 Published: APR 29 2002

3. SUPERCONTINUUM GENERATION IN GASES
Author(s): CORKUM PB, ROLLAND C, SRINIVASANRAO T
Source: PHYSICAL REVIEW LETTERS Volume: 57 Issue: 18 Pages: 2268-2271 Published: NOV 3 1986

4. SURFACE-PROPERTIES PROBED BY 2ND-HARMONIC AND SUM-FREQUENCY GENERATION
Author(s): SHEN YR
Source: NATURE Volume: 337 Issue: 6207 Pages: 519-525 Published: FEB 9 1989

5. OBSERVATION OF SELF-PHASE MODULATION AND SMALL-SCALE FILAMENTS IN CRYSTALS AND GLASSES
Author(s): ALFANO RR, SHAPIRO SL
Source: PHYSICAL REVIEW LETTERS Volume: 24 Issue: 11 Pages: 592-& Published: 1970

6. OPTICAL INVESTIGATION OF BLOCH OSCILLATIONS IN A SEMICONDUCTOR SUPERLATTICE
Author(s): FELDMANN J, LEO K, SHAH J, et al.
Source: PHYSICAL REVIEW B Volume: 46 Issue: 11 Pages: 7252-7255 Published: SEP 15 1992

7. QUASI-PHASE-MATCHED OPTICAL PARAMETRIC OSCILLATORS IN BULK PERIODICALLY POLED LINBO3
Author(s): MYERS LE, ECKARDT RC, FEJER MM, et al.
Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS Volume: 12 Issue: 11 Pages: 2102-2116 Published: NOV 1995

8. Phase-matched generation of coherent soft X-rays
Author(s): Rundquist A, Durfee CG, Chang ZH, et al.
Source: SCIENCE Volume: 280 Issue: 5368 Pages: 1412-1415 Published: MAY 29 1998

9. DISCRETE SELF-FOCUSING IN NONLINEAR ARRAYS OF COUPLED WAVE-GUIDES
Author(s): CHRISTODOULIDES DN, JOSEPH RI
Source: OPTICS LETTERS Volume: 13 Issue: 9 Pages: 794-796 Published: SEP 1988

10. MODE-LOCKING OF TI-AL2O3 LASERS AND SELF-FOCUSING - A GAUSSIAN APPROXIMATION
Author(s): SALIN F, SQUIER J, PICHE M
Source: OPTICS LETTERS Volume: 16 Issue: 21 Pages: 1674-1676 Published: NOV 1 1991

11. EXPERIMENTAL-OBSERVATION OF PICOSECOND PULSE NARROWING AND SOLITONS IN OPTICAL FIBERS
Author(s): MOLLENAUER LF, STOLEN RH, GORDON JP
Source: PHYSICAL REVIEW LETTERS Volume: 45 Issue: 13 Pages: 1095-1098 Published: 1980

12. 2-PHOTON EXCITATION IN CAF2 - EU2+
Author(s): KAISER W, GARRETT CGB
Source: PHYSICAL REVIEW LETTERS Volume: 7 Issue: 6 Pages: 229-& Published: 1961

13. Bragg grating solitons
Author(s): Eggleton BJ, Slusher RE, deSterke CM, et al.
Source: PHYSICAL REVIEW LETTERS Volume: 76 Issue: 10 Pages: 1627-1630 Published: MAR 4 1996

14. Compression of high-energy laser pulses below 5 fs
Author(s): Nisoli M, DeSilvestri S, Svelto O, et al.
Source: OPTICS LETTERS Volume: 22 Issue: 8 Pages: 522-524 Published: APR 15 1997