**PHY4523 FINAL PAPER**

**DUE DATE: April 29, 2013.**

The final paper should be a comprehensive review of one of the topics listed below or one approved by the instructor. Students are required to work on their own and submit only their own work. The paper should include a clear description of the topic or problem under consideration and review the theoretical underpinnings of the subject with a clear description of experimental evidence relevant to the topic with clear citations of the references used.

The paper will be graded in terms of the accuracy and depth of the scientific coverage and the quality of the writing.

The paper should be 8-10 pages in length using a standard word processing format with 1.5 line spacing and a standard font (11 or 12 point, Arial, Times Roman, Calibri …)

Students are required to use iThenticate to screen their work before submission by visiting [www.ithenticate.com](http://www.ithenticate.com). A help page at <https://lss.at.ufl.edu/help/IThenticate> is available for students.

**Examples of Topics.**

1. Statistical Properties of Systems at Negative Spin temperatures.
2. Orientational Ordering of Molecules in Solid Hydrogen
3. The Underling Physics of Superconductivity.
4. Statistical Physics and Black Holes.
5. Nuclear Magnetism
6. Applications of Bragg-Williams Theory to Alloys
7. Statistical Models of Spin Glasses.
8. Frustrated Magnetic Systems
9. Superfluidity in Two-Dimensions.
10. Order/Disorder in Liquid Crystals
11. The Scientific Contributions of Willard Gibbs
12. Entropy and the Arrow of Time.
13. The Maxwell Demon and Reality
14. Statistical Theories and Two-Level Systems
15. Statistical Models of Fragile Glasses.
16. Statistical Physics in Biology.
17. Black holes and Entropy
18. The Statistical Physics of White Dwarfs
19. The Statistical Physics of Neutron Stars
20. Statistical Mechanics in Biology
21. Statistical Physics and Global Warming