

STS.023J/SP.706 Historic Experimentation
General Information
Spring 2001

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**** Email to schedule appointments ****

Class: Mon 2:00 - 5:00 pm Room 4-402
 Wed 1:30 - 4:00 pm Room 4-402

Texts: Photocopies of assigned readings distributed in class
 Other readings and materials available at

<http://web.mit.edu/sts.023/www/>

The Experiments:

We will do four experiments, spending three to four weeks on each. The schedule is attached. You will work in groups of two and are responsible for building the experimental apparatus, working from the historical texts and with materials and methods that match as closely as possible what was available at the time the experiment was first done. Each group will present their results and summarize their experiences for the benefit of the whole class in the final week allotted to each experiment.

Your reports will be a mix of group and individual writing. As a group you are responsible for documenting the apparatus used, your experimental method, and summarizing the related theory. As individuals you will write up the results of your efforts, describing the difficulties you encountered in methods and measurement and analyzing the results you obtained. A more detailed definition of our expectations of report content will be provided in our introduction to each of the four experiments.

Grading:

Each experiment will be equally weighted in determining your grade in the subject. The finer details regarding credit to group and individual effort, and how your contribution to the group effort will be judged, will be described in our introduction to each of the four experiments. There will be no final exam.

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Schedule

Wed. 7 Feb. Introduction

Experiment #1: Huygens: *On the Strange Refraction of Iceland Crystal*

Mon. 12 Feb. - Wed. 28 Feb. Lab Work

(Note class on Tue. 20 Feb.)

Mon. 5 Mar. Presentations - Reports Due

Readings: (Selections from the following).

Huygens, "Treatise on Light..."

Shapiro, A., "Kinematic optics: A study of the wave theory of light in the 17th century",
Archive for History of Exact Sciences, 11 (1974):134-266.

Experiment #2: Wollaston: *A Method of examining refractive and dispersive Powers...*

Wed. 7 Mar. - Wed. 21 Mar. Lab Work

Mon. 2 Apr.

Presentations - Reports Due

Readings: (Selections from the following).

Wollaston, W. H., "A Method of examining refractive and dispersive Powers,
by prismatic Reflection."

Jackson, M.W., "Spectrum of Belief: Joseph vonFraunhofer and the Craft of
Precision Optics", MIT Press, 2000.

Experiment #3: Simon on The Law of Electrostatic Repulsion

Wed. 4 Apr. - Mon. 30 Apr.

Lab Work

Wed. 2 May.

Presentations - Reports Due

Readings: (Selections from the following).

Gillmor, C.S., *Coulomb and the Evolution of Physics and Engineering*
in Eighteenth-Century France.

Heilbron, J.L., *Electricity in the 17th and 18th Centuries; A Study of Early Modern Physics.*

Coulomb, *A First Memoir on Electricity and Magnetism.*

Simon, *Description of Apparatus.*

Experiment #4: Malus on Polarization by Reflection

Mon. 7 May - Mon. 14 May

Lab Work

Wed. 16 May

Presentations - Report Due

Readings: (Selections from the following).

Buchwald, J., "The Rise of the Wave Theory of Light" (Chicago: The University of Chicago Press,
1989)