Physics 403. Modern Physics Laboratory

Spring 2022

Eugene V. Colla, Virginia O. Lorenz
Outline

I. Goals of the course
II. Teamwork / grades / expectations from you
III. Syllabus and schedule
IV. Your working mode
   In class and “after hours” access
   Safety, Responsibility
   Home and away computing
V. Take a Lab tour (only video)!
VI. Let’s get started
   electronic logbooks (New advanced version
designed by Rebecca Wiltfong)
Course Goals. Primary goals:

• Learn how to “do” research

✓ Each lab experiment is a mini-research project

✓ How are experiments carried out?

    The procedures aren’t all written out

    The questions are not in the back of the chapter

    The answers are not in the back of the book

    You will have to learn to guide your own activities

✓ Use of modern tools and modern analysis and data-recording techniques
Course Goals. Primary goals:

• **Learn how to document your work**
  - Online - **electronic logbook** *
  - Online – saving data and projects in
    student area on server
  - Using traditional paper logbooks
  - Making an analysis report
  - Writing **formal reports** *
  - Presenting your findings **orally** *

* In red gradable assignments
Course Goals. Secondary goals:

• Learn some modern physics
  – Many experiments were once awarded by Nobel-prize
  – They touch on important themes in the development of modern physics
  – Some will provide additional insight to understand advanced courses you have taken
The Experiments. Three main groups

• **Nuclear / Particle (NP)**

• **Atomic / Molecular / Optics (AMO)**

• **Condensed Matter (CM)**

You will do the experiment from all these groups
The Experiments

- **Nuclear / Particle (NP)**
  - Alpha particle range in gasses
  - $\gamma-\gamma$ correlation experiment
  - $\gamma$ - spectroscopy
The Experiments

- **Nuclear / Particle (NP)**
  - Cosmic ray muons:
    - Lifetime, capture rate, magnetic moment
  - Angular distribution of cosmic rays
  - Mössbauer spectroscopy
The Experiments
Atomic/Molecular/Optics (AMO)

- Berry’s phase
- Quantum erasure
- Quantum Entanglement
The Experiments

Atomic/Molecular/Optics (AMO)

- Optical pumping of rubidium gas
- Fluorescence spectroscopy
The Experiments

- **Condensed Matter (CM)**
  - Superconductivity
  - Tunneling in superconductors
  - 2\textsuperscript{nd} sound in \(^4\text{He}\) superfluid state

![Graph of dI/dV vs. U\textsubscript{DC} for Al-Al\textsubscript{2}O\textsubscript{3}-Pb at T=1.4K](image1)

![Graph of R vs. T for Sn, 150nm](image2)

New: Superconductivity and magnetic field
The Experiments

• **Condensed Matter (CM)**
  - Ferroelectrics and ferroelectric phase transition
  - Pulsed NMR
  - Calibration of temperature sensors
The Experiments

- **Condensed Matter (CM)**

- **Special Tools:**
  - Vacuum film deposition
  - Atomic Force Microscope
  - Polarizing microscope
The “manuals”

• Many are just guides
• An only few purchased experiments have “real” manuals
• We serve as your guides … like real research …
• We have prepared materials explaining how to do the experiments and data analysis, and you can find all these materials and examples of data analysis on the common drive.
Outline

I. Goals of the course

II. Teamwork / grades / expectations from you

III. Syllabus and schedule

IV. Your working mode

   - In class and “after hours” access
   - Safety, Responsibility
   - Home and away computing

V. Take a Lab tour!

VI. Let’s get started

   - electronic logbooks
   - digital scopes
# Grading: Distribution of “740” points

<table>
<thead>
<tr>
<th>ASSIGNMENT</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expt. documentation</strong>: eolg reports, shift summaries, plot quality; paper logbooks</td>
<td>120 Total</td>
</tr>
<tr>
<td><strong>Formal reports</strong>: physics case, quality of results, depth of analysis, conclusions</td>
<td>400 Total</td>
</tr>
<tr>
<td><strong>1st Oral report</strong>: motivation, organization of presentation; fielding questions</td>
<td>100 Total</td>
</tr>
<tr>
<td><strong>Final Oral Presentation ≡ Final Exam</strong></td>
<td>120</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>740</td>
</tr>
</tbody>
</table>

**The grading scale will be a percentage out of “740”:**

- 97% = A+, 93% = A, 90% = A-, 87% = B+, 83% = B, 80% = B-, etc

You can **RESUBMIT one lab report** to improve your grade (deadline for resubmissions and for report #4 **May 7th 2022**)

Physics 403 Spring 2022
Grading: a piece of history and analysis of the results

Physics 403
2005-2021
611 students total
Submission of Lab Reports

- Due dates as on syllabus at midnight
- The reports should be uploaded to the server:
  - https://my.physics.illinois.edu/courses/upload/
  - Accepted formats: PDF* or MS-Word
  - For orals – MS-PowerPoint* or PDF

* preferable
Absences

• If you are sick, let Eugene know by email (kolla@Illinois.edu). Don’t come in and get others sick. We are working side-by-side in a close environment for many hours.

• **COVID19 comment**: if the student assigned to be “in person” can not attend the session he/she can be replaced by their partner and continue to work “online”.

• You can “make up” time by arranging with us and you can have access to the rooms. We will be accommodating.
Absences. Excuse Policy.

• You can be excused from only one missed assignment, and only if you provide medical or any other acceptable documentation¹.

• If the excused you have missed the oral presentation (oral #1), you have to discuss this with us, and we will arrange the date for your oral talk.

• The Final Oral cannot be excused, as it is equivalent to a final exam. You cannot pass the course without credit for this assignment².

1. Student Code: https://studentcode.illinois.edu/article1/part5/1-501/
2. Ibid: https://studentcode.illinois.edu/article3/part2/3-201/
Late Reports

- **Policy for late reports**

  - You can have **ONE “late ticket” for a “free” delay of up to 3 business days**, but you must tell us you are using the ticket.

  - Reports are due at midnight on the date shown on the syllabus. After that we will charge:
    - 5 points for up to 1 week late. 10 points for up to 2 weeks late.
    - After that, it’s too late.
Outline

I. Goals of the course
II. Teamwork / grades / expectations from you
III. Syllabus and schedule
IV. Your working mode
   In class and “after hours” access
   Safety, Responsibility
   Home and away computing
V. Take a Lab tour!
VI. Let’s get started
    electronic logbooks
digital scopes
<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Activity</th>
<th>Comment</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/18</td>
<td>Tues</td>
<td>Orientation</td>
<td>About Phy403</td>
<td></td>
</tr>
<tr>
<td>1/20</td>
<td>Thurs</td>
<td>Cycle 1-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/25</td>
<td>Tues</td>
<td>Cycle 1-2</td>
<td>OriginPro Intro/Root</td>
<td></td>
</tr>
<tr>
<td>1/27</td>
<td>Thurs</td>
<td>Cycle 1-3</td>
<td>Elog Comments</td>
<td></td>
</tr>
<tr>
<td>2/01</td>
<td>Tues</td>
<td>Cycle 1-4</td>
<td>Error analysis</td>
<td></td>
</tr>
<tr>
<td>2/03</td>
<td>Thurs</td>
<td>Cycle 1-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/08</td>
<td>Tues</td>
<td>Cycle 1-6</td>
<td>Written Reports</td>
<td></td>
</tr>
<tr>
<td>2/10</td>
<td>Thurs</td>
<td>Cycle 1-7</td>
<td>Optical Spectroscopy</td>
<td></td>
</tr>
<tr>
<td>2/15</td>
<td>Tues</td>
<td>Cycle 1-8</td>
<td>Ferroelectricity</td>
<td>C1-Ex1(2.16.22)</td>
</tr>
<tr>
<td>2/17</td>
<td>Thurs</td>
<td>Cycle 1-9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/22</td>
<td>Tues</td>
<td>Cycle 1-10</td>
<td>Oral report</td>
<td></td>
</tr>
<tr>
<td>2/24</td>
<td>Thurs</td>
<td>Cycle 1-11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/01</td>
<td>Tues</td>
<td>Cycle 1-12</td>
<td>Entanglement</td>
<td></td>
</tr>
<tr>
<td>3/08</td>
<td>Tues</td>
<td>Cycle 1-12</td>
<td>ORALS 1</td>
<td></td>
</tr>
<tr>
<td>3/10</td>
<td>Thurs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/14</td>
<td></td>
<td></td>
<td>Spring Break</td>
<td></td>
</tr>
<tr>
<td>3/22</td>
<td>Tues</td>
<td>Cycle 2-2</td>
<td>High Energy Physics</td>
<td>C1-Ex2 (3.23.22)</td>
</tr>
<tr>
<td>3/24</td>
<td>Thurs</td>
<td>Cycle 2-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/29</td>
<td>Tues</td>
<td>Cycle 2-4</td>
<td>Atomic Force Microscopy</td>
<td></td>
</tr>
<tr>
<td>3/31</td>
<td>Thurs</td>
<td>Cycle 2-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/05</td>
<td>Tues</td>
<td>Cycle 2-6</td>
<td>Superconductivity</td>
<td></td>
</tr>
<tr>
<td>4/07</td>
<td>Thurs</td>
<td>Cycle 2-7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/12</td>
<td>Tues</td>
<td>Cycle 2-8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/14</td>
<td>Thurs</td>
<td>Cycle 2-9</td>
<td>Fundamental Symmetry and Neutrino Physics</td>
<td>C2-Ex1 (4.13.22)</td>
</tr>
<tr>
<td>4/19</td>
<td>Tues</td>
<td>Cycle 2-10</td>
<td>Measuring Temp</td>
<td></td>
</tr>
<tr>
<td>4/21</td>
<td>Thurs</td>
<td>Cycle 3-11</td>
<td>Lock-in Amps and FT</td>
<td></td>
</tr>
<tr>
<td>4/26</td>
<td>Tues</td>
<td>Cycle 3-12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/28</td>
<td>Thurs</td>
<td></td>
<td>Final Orals #1</td>
<td></td>
</tr>
<tr>
<td>5/03</td>
<td>Tues</td>
<td></td>
<td>Final Orals #2</td>
<td></td>
</tr>
<tr>
<td>5/05</td>
<td></td>
<td></td>
<td>READING DAY</td>
<td></td>
</tr>
</tbody>
</table>

* Lecture topics are subject to change*
### NP
- A. Cosmic Muon Stand
  - i. Muon lifetime
  - ii. Capture rate
  - iii. Magnetic moment
- B. Alpha range
- C. Gamma Gamma
- D. Muon telescope
- E. Mössbauer spectroscopy

### CM
- A. Ferro 1
- B. Ferro 2 (imaging)
- C. 2nd sound of 4He
- D. Hysteresis loops
- E. Tunneling
- F. Superconductivity #2

### Atomic + CM
- A. Optical pumping
- B. Superconductivity
- C. Mutual inductance
- D. pNMR

### Optics
- A. Quantum Table
  - i. Berry’s phase
  - ii. Quantum erasure
  - iii. Entanglement
- B. Fluorescence spectroscopy
- C. AFM

<table>
<thead>
<tr>
<th></th>
<th>Virginia, ...</th>
<th>Eugene</th>
<th>Eugene, Vishal, Ivan</th>
<th>Abd, Donny, TAs from Kwiat Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1-1</td>
<td>5-16; 18-22; 9-17; 13-19</td>
<td>6-7; 1-8; 20</td>
<td>11-23; 12-14; 2-24</td>
<td>3-10; 15-21; 4-25</td>
</tr>
<tr>
<td>C1-2</td>
<td>15-21; 2; 8-20; 14-25</td>
<td>16-24; 7-18; 9-19</td>
<td>1-5; 10-23; 3-6</td>
<td>12-17; 5-13; 11-22</td>
</tr>
<tr>
<td>C2-1</td>
<td>4-11; 7-12; 1-23</td>
<td>5-17; 14-25; 22</td>
<td>15-21; 13-19; 10-18</td>
<td>2-20; 6-9; 9-16; 3-24</td>
</tr>
<tr>
<td>C2-2</td>
<td>22-24; 10; 5-21</td>
<td>2-20; 12-23; 15-18;</td>
<td>13-16; 4-9; 1-8</td>
<td>6-17; 3-14; 7-19; 11-25</td>
</tr>
<tr>
<td>Cycle</td>
<td>#</td>
<td>Experiment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>----------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1-1</td>
<td>6, 7</td>
<td>Second sound</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1, 8</td>
<td>Ferro1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>Ferro3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11, 23</td>
<td>NMR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12, 14</td>
<td>Superconductivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5, 16</td>
<td>Gamma-gamma</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>18, 22</td>
<td>Alpha range</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9, 17</td>
<td>Muons</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13, 19</td>
<td>Gamma spectroscopy</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3, 10</td>
<td>Fluorescence</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15, 21</td>
<td>Quantum optics-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4, 25</td>
<td>Quantum optics-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2, 24</td>
<td>Optical pumping</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Assignment of experiments

2 cycles with 2 experiments

➔ you will have different partners

➔ joint team reports and elogs but oral presentations will be done by each student individually
After 2 experiments (1 cycle) we will have an oral presentation session. The topic of the presentation will be chosen from the experiments done in that cycle.
IV. Your working mode

In class and “after hours” access

Safety, Responsibility

Home and away computing

V. Take a Lab tour!

VI. Let’s get started

electronic logbooks
digital scopes
Lab Access

Use Your ID Card to Access the Lab

You can access the Lab not only on “Lab days”

Late time rules:

You can stay in the Lab until 8pm but need to work with partner

After 8pm and on weekend days – you have to discuss this schedule with your instructor and in general it is preferable to avoid working after 8 pm and on weekends
Safety is your responsibility!

Hazards: **high voltage**, **radioactive sources**, **cryogens**, **chemical materials**, **high pressure**

In class work and "after-hours" access work requires responsible conduct with regards to

(I) safety/hazards and with

(II) equipment

Discuss potential hazards at the beginning of each experiment with an instructor or TA

When in doubt stop and ask
Follow Directly the Recommendations of Safety Working

https://www.drs.illinois.edu/

**NEWS AND ANNOUNCEMENTS**

Laser Registration and Management
9/25/2019
The Division of Research Safety has added a tool to their website to allow laser users to manage their laser registrations and inventory on-line.

New Tier 1 Select Agent
9/23/2019
As of 9/14/16, the CDC/tHHS has added Bacillus cereus Bacillus anthracis as a Tier 1 select agent under 42 CFR Part 73.

Laser Safety Eyewear Warning
7/5/2018
Filters not matching specifications on packaging.
Follow Directly the Recommendations of Safety Working

Chemical Waste Collection and Storage

Before generating chemical waste, the researcher should determine how it will be collected and stored and obtain the necessary equipment (containers, labels) in advance. The choice of procedures depends on the type of waste and its final disposition. This section explains how to determine the final disposition of waste, select the appropriate waste container, and store waste in the lab or work area. It also suggests waste minimization strategies.

Determining How to Dispose of a Chemical Waste

The final disposition of a chemical waste is determined by the answers to a series of questions:

Step 1. Is the waste Contaminated Debris (glassware, paper towels, clean-up materials), or is it a chemical or chemical mixture?  
   Yes: Go to Step 5.  
   No: Go to Step 2.

Step 2. Is the chemical a DEA (Drug Enforcement Agency) controlled substance? (Refer to the [DEA list of controlled substances](https://www.deadiversion.usdoj.gov/nal/controlled/) for disposal procedures.

   Yes: Refer to the [DEA Controlled Substances Guide](https://www.deadiversion.usdoj.gov/nal/csdg/) for disposal procedures.
   No: Go to Step 3.

Step 3. Is the chemical a solid (not liquid or gas)?

   Yes: Collect and store the waste as described in the waste container and storage guidelines listed below and dispose of it through the Division of Research Safety (DRS) chemical waste disposal program. See the section [Procedures for Requesting Chemical Waste Disposal](https://researchsafety.illinois.edu/services/chemical-waste-disposal) for the disposal procedures. (No solid chemical waste, hazardous or non-hazardous, should be placed in the regular trash.)
   No: Go to Step 4.

Step 4. Is the chemical a liquid non-hazardous waste as listed in the section [Liquid Non-Hazardous Chemical Waste Disposal](https://researchsafety.illinois.edu/services/chemical-waste-disposal/)?

   Yes: The chemical may be poured down the sanitary sewer (sink drain) with copious amounts of water.
   No: Collect and store the waste as described in the waste container and storage guidelines listed below, and dispose of it through the DRS chemical waste disposal program. See the section [Procedures for Requesting Chemical Waste Disposal](https://researchsafety.illinois.edu/services/chemical-waste-disposal) for the disposal procedures.

Step 5. Is the contaminated debris laboratory glassware (broken and unbroken)?

   Yes: See the [Laboratory Glassware Waste Disposal](https://researchsafety.illinois.edu/services/chemical-waste-disposal/) section.
   No: Go to Step 6.

Step 6. Is the debris contaminated with a substance listed in the section [Liquid Non-Hazardous Chemical Waste Disposal](https://researchsafety.illinois.edu/services/chemical-waste-disposal/)?

   Yes: The contaminated debris can be disposed of in the regular trash.
   No: Collect and store the contaminated debris as described in the waste container and storage guidelines listed below, dispose...
Laboratory Sharps

Definition

Materials that qualify as “sharps” are defined at the state level and shall be disposed of as Potentially Infectious Medical Waste (PIMW). In Illinois, the Illinois Environmental Protection Agency (IEPA) has designated the following material (used or unused) as sharps:

- Any medical needles,
- Syringe barrels (with or without needle),
- Pasteur pipettes (glass),
- Scalpel and razor blades,
- Blood vials,
- Microscope slides and coverslips,
- Glassware contaminated with infectious agents.

NEVER dispose of these items in SDCs:

- Plastic items (except for syringes),
- Beverage containers (no pop cans!),
- Non-biologically contaminated laboratory glassware,
- Solvent/chemical bottles,
- Light bulbs,
- Any paper materials,
- Pipette tips,
- Plastic pipettes,
- Aerosol cans or cans of any type,
- Scintillation vials,
- Any item with liquid (except for blood in vacutainer tubes).

Waste container for sharps
V. Take a Lab tour! For those online it will be a virtual tour.

VI. Let’s get started electronic logbooks digital scopes
Outline

I. Goals of the course

II. Teamwork / grades / expectations from you

III. Syllabus and schedule

IV. Your working mode
   In class and “after hours” access
   Safety, Responsibility
   Home and away computing

V. Take a Lab tour!

VI. Let’s get started
   electronic logbooks
digital scopes
How to record the data

• Work together

• Write down the equipment used

• Make a diagram of the setup

• Note the settings of dials, switches, gauges

• Take a digital photo if appropriate (we have prepared and will prepare more pictures of the setups equipment etc.)

• Use a software drawing program to make a detailed sketch (PowerPoint works for this very well)
How to record the data

- Use the eLog (see next).
- Write down what you did in real sentences.
- Provide enough detail that you can reconstruct later what you did!
- How will you look at the data later?
- Do you have enough information?
- Did the equipment perform as expected?
How to record the data

• Many experiments require you to “change and measure” something by hand
  – Make a table in a paper logbook or put the data directly into electronic worksheet (preferable).
  – Make a “quick sketch” of your by plotting the data using OriginPro or other software

Looking on the graph you can answer the questions:

• Do you have enough points?
• Do you have any obvious anomalies?
• You can repeat points but do not throw them out.
  Use other measurements to check reliability
How to record the data

- Many experiments have built-in, computer-based data acquisition (DAQ)
  - You will not have time to fully understand the DAQ, but
    - Be sure you know functionally what it is doing – ask
    - A good idea is to make test measurements of something you know
      - As before, anomalies? enough points? uncertainties?
Where to exchange, store and retrieve course information.

P403 Lab server

\grégr-ificio-03\PHYINST\APL Courses\PHYCS403
Connecting to the PHYS403 server

Connect to VPN following the instructions on the UIUC VPN website:
https://techservices.illinois.edu/services/virtual-private-networking-vpn/download-and-set-up-the-vpn-client

To connect to the PHYS403 Server:

• Connect to the VPN first, then enter the following as the share to connect to:
  – **Mac users:** Open Finder: Go: Connect to Server, type in address: smb://engr-file-03.engr.illinois.edu/PHYINST/APL Courses/PHYCS403
  – **Windows users:** Open Windows Explorer, type in address: \\engr-file-03.engr.illinois.edu\PHYINST\APL Courses\PHYCS403

• **When prompted for username and password, enter:**
  “UofI\[your netID]” and “[your netID password]”
Where to exchange, store and retrieve course information.

(i) Your data, projects, tables etc

`\engr-file-03\PHYINST\APL Courses\PHYCS403`

There is a lot **useful** and **not very useful** stuff in many folders you can find there.

“Useful” folders are shown in red frames.
Where to exchange, store and retrieve course information.

(i) Your data, projects, tables etc

\`\`\engr-file-03\ PHYINST\ APL Courses\ PHYCS403

Store all experiment related materials in corresponding folder.

Each student has a folder.
Where to exchange, store and retrieve course information. *(i)*

Your data, projects, tables etc

An example of the “smart” structure of folders containing the raw data and data analysis projects
Where to retrieve course information.

*Manuals, papers, setup diagrams and other useful materials*
Where to retrieve course information.

Manuals, papers, setup diagrams and other useful materials

α-range experiment setup diagram
Where to retrieve course information. Manuals, papers, **setup diagrams** and other useful materials in **Spring 2022 online folder**

These folders contain almost everything you need to work on experiment.
Where to retrieve course information.

**Setup diagrams – do not use cellphones to take the image of the setup from manual – for most setups we have PowerPoint projects with setups.**
“Journal club”

Lectures – Tuesdays 3pm
Journal Club – Thursdays 3pm

http://ajp.aapt.org/#mainWithRight
http://www.nature.com/nature/index.htm
http://www.scientificamerican.com/
http://www.sciencemag.org/journals
http://publish.aps.org or http://prola.aps.org/

illinois.edu
“Journal club”

Walking with Coffee: Why Does it Spill?

Growth of Diamond Films from Tequila

J. Morales$^{1,2}$, L. M. Apátiga$^2$, V. M. Castaño$^2$

1. Facultad de Ciencias Físico Matemáticas, Universidad Autónoma de Nuevo León
2. Centro de física Aplicada y Tecnología Avanzada, Universidad Nacional Autónoma de México

Fabrication and Characterization of Ultrathin Three-Dimensional Thermal Cloak

The Physics of Beer Tapping

PRESENTATION BY JOSEPH MIRABELLI
JAVIER RODRIGUEZ-RODRIGUEZ, J. ALMUDENA CASADO-CHACÓN, AND DANIEL PLÜSTER
1 FLUID MECHANICS GROUP, CARLOS III UNIVERSITY OF MADRID
2 CNRS, UNIVERSITÉ PIERRE ET MARIE CURIE
“Journal club”

Journal Access
If you cannot access journal papers using VPN, go to UIUC’s library proxy test site and enter the address of the paper you want to read:
http://www.library.illinois.edu/proxy/test/

Recommended journal websites

- American Physical Society Journals: https://journals.aps.org/about
- Nature: http://www.nature.com/nature/index.html
- Science: http://www.sciencemag.org/journals
- American Journal of Physics: http://scitation.aip.org/content/aapt/journal/ajp
Entering the e-Log ...

PHYS 403 Spring 2022
Home page

Link to e-Log
Entering the e-Log ...

Use your University Username and Password
Entering the e-Log ...

Spring 2021 eLog folder
Entering the e-Log ...

ELOG: VIEWING LOGS WITHIN PHYSICS 403 SPRING 2022

<table>
<thead>
<tr>
<th>ID</th>
<th>Date</th>
<th>Authors</th>
<th>Experiment</th>
<th>Post Type</th>
<th>Subject</th>
<th>Attachments</th>
</tr>
</thead>
<tbody>
<tr>
<td>868</td>
<td>1/5/2022 2:07:34 PM</td>
<td>Eugene Colla</td>
<td>General</td>
<td>Welcome (test)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Create new eLog record
## Entering the e-Log ...

### ELOG: Editing Log from Physics 403 Spring 2022: New Subject

| View Books | View Logs |

[View all Physics 403 Spring 2022 logs]

**Editing log: New subject**

- **Entry time**: 1/6/2022 4:38:06 PM
- **First author**: Eugene Colla
- **Second author**: Start typing name, select netID
- **Third author**: Start typing name, select netID
- **Experiment**: - please select -
- **Post type**: - please select -

**Use templates for preparing the post**

**The title of the experiment**

**The name of your partner**

**Post type**
Entering the e-Log ...

Choose a template
The template you chose will be inserted after any text you may already have in your log.

Available templates
- First day record

The main goal of the experiment:

Technique:

Subject of study:

Insert Template

Pop-up list of available templates

Add template to your log
How to use it

- Pause and summarize your work at natural stopping points in the action. This is useful for particular findings and measurement sequences.
- Along the way, save data, plots, scope shots to your folder on the server.
- Near the end of the class, add a summary/conclusion, indicate future directions, and make sure the e-log provides a rather complete overview of the highlights of your work. Upload your plots, scope shots, etc. and describe the data.
Goal: Be specific. Not, “Learn about experiment,” but, for example, “In helium below temperatures of 2.17K, a second sound due to thermal effects becomes measurable. We will measure second sound using a resonant cavity…”

Settings / Equipment Notes: Note important environmental and experimental parameters such as atmospheric pressure, settings on equipment, etc.

[Time Range 1]: Give time range, not just “before tea.”
- Note important steps and results
- Include plots, photos, or scope shots in attachments below
- Use bullet points to make it easy to read

[Time Range 2]: ...

Conclusions & Future Plans: What did you find and what is the next step? Be specific. Not, “We measured decay times,” but, for example, “Ruby #2 sample with higher concentration chromium was observed to decay with a form…”
Some General Physics 403 Rules.

No Food or Drinks in Lab!
Except ESB5105