

PHYS 575A/B/C

Autumn 2015

# Radiation and Radiation Detectors

Course home page:

<http://depts.washington.edu/phycert/radcert/575website/>

## 11: Student reports session 2

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# Course calendar (revised)

week	date	day	topic	text
1	10/1/15	Thurs	Introduction, review of basics, radioactivity, units for radiation and dosimetry	Ch. 1, notes
2	10/6/15	Tues	Radioactive sources; decay processes;	Ch. 1, notes
3	10/13/15	Tues	Photomultiplier tubes and scintillation counters; Counting statistics	Chs. 3, 8, 9 (I-V)
3	10/15/15	Thurs	<b>LAB: Room B248</b> Scopes, fast pulses; <u>PMTs</u> and scintillation counters; standard electronics modules	Chs. 4, 9, 16, 17
4	10/20/15	Tues	Overview of charged particle detectors	Ch. 4
4	10/22/15	Thurs	<b>LAB: Room B248</b> Coincidence techniques; <u>nanosec</u> time measurement, energy from pulse area	Chs. 17, 18
5	10/27/15	Tues	Interaction of charged particles and photons with matter; counting statistics; gas detectors; <i>Proposal for term paper must be emailed to JW by today</i>	Chs. 2, 3; Chs. 5, 6, 7
6	11/3/15	Tues	ionization chambers; solid-state detectors	Chs. 11, 12, 13
7	11/10/15	Tues	Statistics for data analysis; Case studies: classic visual detectors (cloud and bubble chambers, nuclear emulsion, spark chambers)	Ch. 19, notes
8	11/17/15	Tues	Case studies: Cosmic ray detectors (Auger, Fermi gamma ray observatory); Cherenkov detectors: atmospheric <u>Cherenkov</u> , triggering <u>Cherenkov</u>	Ch. 19, notes
9	11/24/15	Tues	Case studies: neutrino detectors ( <u>IceCube</u> , <u>Daya Bay</u> , <u>Majorana</u> ), Detecting neutrons; high energy accelerators;	Ch. 19, notes Ch. 14, 15, 18
10	12/1/15	Tues	Finish case studies; begin student presentations	Notes
11	12/8/15	Tues	Student presentations	-
11	12/10/15	Thurs	Student presentations <b>Term papers due by 6:30pm</b>	

Tonight

# Announcements

- Presentation dates: tonight AND this Thurs Dec 10
  - You MUST send me your presentation (pdf or ppt) no later than 5:30 pm on the day of your talk
    - I will upload all slides for each session so online attendance is possible
    - **Listening to other students' reports is an important part of this course!**
  - Final paper due Thurs 12/10 before class: email pdf or .doc to JW

## PHYS 575 Au-15: Report Presentations

Please send me your presentation ppt/pdf (or URL) at least 1 hour before class on your date

Day	Time	Name	Topic
12/1/2015	7:00 PM	Per Provencher	Low Background Laboratories
	7:20 PM	Rick McGann	Neutron Generation and Effects on Materials and Electronics
	7:40 PM	Chris Provencher	Electric Discharge Experiments
	8:00 PM	Charles Ko	Radiometric Dating
	8:20 PM	Ricky Blake	Fusion reactors
12/8/2015	6:40 PM	Diana Thompson	NORM
	7:00 PM	Shawn Apodaca	Fast Neutron Time of Flight and Spectroscopy
	7:20 PM	Erin Board	Cosmic Radiation and Shielding
	7:40 PM	Louie Cueva	Thermal Neutron Detection
	8:00 PM	Xavier Garcia	Silicon PMTs
12/10/2015	8:20 PM	Padmaja Vrudhula	Dosimetry
	6:40 PM	Nathan Hicks	Methods of Radionuclide Production for Medical Isotope Usability: Meeting the Demand
	7:00 PM	Farah Tan	QCD
	7:20 PM	Nicolas Michel-Hart	microXRF
	7:40 PM	Michael Esuabana	proton-Boron11 fusion
	8:00 PM	Kaifu Lam	Synchrotrons
	8:20 PM	Johnathan Slack	X-rays/Gamma rays of comets and asteroids

# Summer Opportunities

There are several 2016 LANL Summer Student Research Programs that will be taking applications until Jan/early Feb 2016. Here is the list:

- Parallel Computing Summer Research Internship (brochure) -- <http://tinyurl.com/ParallelComputingInternship>
- Cluster Institute (brochure) -- <http://tinyurl.com/ClusterInstitute>
- Co-Design Summer School (brochure) -- <http://tinyurl.com/CoDesignSchool>
- Data Science at Scale -- <https://datascience.lanl.gov/school.html>
- Computational Physics Workshop -- <http://compphysworkshop.lanl.gov/>

These target different educational levels ranging from sophomore undergraduate to PhD students. These are generally 10-week programs, paid at around the standard LANL student salary rates. All are competitive entry programs. I can highly recommend all of them and the excellent program directors and mentors that give their time to make these programs happen.

For more info:

Bob Robey, [brobey@lanl.gov](mailto:brobey@lanl.gov)

LANL Staff Scientist

Eulerian Applications Group

Co-PI Parallel Computing Summer Research Internship program

See also [www.lanl.gov/collaboration/internships/](http://www.lanl.gov/collaboration/internships/)

# Fellowship Opportunities

<http://sites.nationalacademies.org/PGA/RAP/>

## Research Associateship Programs

The mission of the NRC Research Associateship Programs (RAP) is to promote excellence in scientific and technological research conducted by the U.S. government through the administration of programs offering [graduate](#), postdoctoral, and senior level research opportunities at [sponsoring federal laboratories and affiliated institutions](#).

In these programs, prospective applicants select a research project or projects from among the large group of opportunities listed on this website. Prior to completing an application, prospective applicants should contact the proposed Research Adviser to assure that funding will be available if their application is recommended by NRC Research Associateship Program panels. Once mutual interest is established between a prospective applicant and a Research Adviser, an application is submitted through the NRC Research Associateship Programs WebRAP system. Reviews are conducted four times each year, and review results are available approximately six-eight weeks following the application deadline.

Prospective applicants should carefully read the details and eligibility of the program to which they are applying. Some laboratories have citizenship restrictions (open only to U.S. citizens and permanent residents), and some laboratories have research opportunities that are not open to senior applicants (more than 5 years beyond the Ph.D.). When searching for research opportunities, applicants may limit their search to only those laboratories which match their eligibility criteria. In addition, applicants should note application deadlines, as not all laboratories participate in all reviews.

Interested in the Research  
Associateship Programs?  
Check out the list of...

[\*\*PARTICIPATING AGENCIES\*\*](#)

# Tonight's speakers

*15 min + 5 discussion for each talk tonight! I'll wave a 5min warning sign*

12/8/2015	6:40 PM	Diana Thompson	NORM
	7:00 PM	<del>Shawn Apostol</del> JIASHENG XIE	<del>Fast Neutron Time of Flight and Spectroscopy</del>
	7:20 PM	Erin Board	Cosmic Radiation and Shielding
	7:40 PM	Louie Cueva	Thermal Neutron Detection
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