Spring 19 – Phys490: Modern physics

Course goal
Provide an introduction to nuclear and particle physics.

Instructor
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My last name is complicated to pronounce. It is an old German noble name of Dutch origin. Please do not worry about pronouncing my last name in the right way. **"von D"** is okay with me.

Lecture
1:30-2:45pm, Tuesday, Thursday in Watanabe 417

Office hours (Watanabe 430)
Just send me a quick email and we arrange a time.

Text
I will provide most of the materials or point to online resources.

Prerequisites
Phys480 (or concurrent)

Reading
Reading is assigned most weeks, and the assignment should be completed **before** the lecture so that you may ask questions and participate in class discussion.

Website: http://go.hawaii.edu/3nG
I am not going to use Laulima for the upload of materials and announcements, but will upload my lecture slides to this website. The website will also announce reading assignments, homework, important dates, and any other changes or updates.

Please comply to Student Conduct Code:
http://www.studentaffairs.manoa.hawaii.edu/policies/conduct_code

Homework
New problem sets will be given out nearly every week. The problem sets will indicate the due date.

Emailing me: philipvd@hawaii.edu
Preferably you come to my office hours to discuss questions. However, I will also try to email you back in a timely manner. Please keep in mind that sending me questions late in the evening before the due date of homework or in the night before exams will most likely not get a reply in time. Please always check the website first before asking organizational questions. I will not answer questions that are already answered on the website.

Midterms
There will be two exams during the regular course hours in WAT417 (*tentatively* **February 12th** & *tentatively* **April 11th**). They will consist of conceptual questions and problems similar to those occurring on the problem sets. Please bring your calculator and paper. You are allowed to also bring a formula sheet (letter size).

Final presentations
We will agree on time and date later on.

Each student will present on a topic of modern (astro)particle physics. Topics will be agreed on at a later time.

Make accommodations in your schedule for the exams well before. I will not arrange for make-up exams if you are traveling or have other non-emergency or health related obligations.

Grading

final presentations:	35%
midterm 1:	25%
midterm 2:	25%
homework:	15%

Final grades will be determined based on your scores in final, midterms, homework, and i>clicker.

The final score translates into the following final grade:

A+	95%≤score	C+	65%≤score<70%
A	90%≤score<95%	C	60%≤score<65%
A-	85%≤score<90%	C-	55%≤score<60%
B+	80%≤score<85%	D+	50%≤score<55%
B	75%≤score<80%	D	45%≤score<50%
B-	70%≤score<75%	D-	40%≤score<45%
		F	score<40%

Topics covered:

- History of atomic physics
- General properties of nuclei
- Nuclear models
- Nuclear transformations
- Review of special relativity
- Symmetries in particle physics
- Hadrons and the quark model
- Quantum electrodynamics
- Feynman diagrams
- Chromodynamics
- Weak interactions
- Standard model
- Experimental techniques
- Neutrino oscillations
- Dark matter
- Astroparticle physics
- ROOT

January 4, 2019