8/26	8/27	8/28	8/29	8/30
CLASS: HMWK:	CLASS: HMWK:	Day 5	CLASS: HMWK:	CLASS: HMWK:
9/2	9/3	9/4	9/5	9/6
[illegible]	Day 2	CLASS: HMWK:	CLASS: HMWK:	Day 5
9/9	9/10	9/11	9/12	9/13
CLASS: HMWK:	CLASS: HMWK:	Day 2	CLASS: HMWK:	CLASS: HMWK:
9/16	9/17	9/18	9/19	9/20
Day 5	CLASS: HMWK:	CLASS: HMWK:	Day 2	CLASS: HMWK:
9/23	9/24	9/25	9/26	**9/27**
TRIPS WEEK:	TRIPS WEEK:	TRIPS WEEK:	TRIPS WEEK:	TRIPS WEEK:
9/30	10/1	10/2	10/3	10/4
[illegible]	CLASS: HMWK:	CLASS: HMWK:	[illegible]	Day 5
10/7	10/8	10/9	**10/10**	10/11
CLASS: HMWK:	CLASS: HMWK:	Day 2	CLASS: HMWK:	CLASS: HMWK:
10/14	10/15	10/16	10/17	10/18
Day 5	CLASS: HMWK:	CLASS: HMWK:	Day 2	[illegible]
10/21	10/22	10/23	10/24	10/25
CLASS: HMWK:	Day 5	CLASS: HMWK:	CLASS: HMWK:	FACULTY WRITING

Second Quarter, 2024-2025

SUN	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT
	10/28	10/29	10/30	10/31	11/1	
	Day 2	CLASS:	CLASS:	Day 5	CLASS:	
		HMWK:	HMWK:		HMWK:	
	11/4	11/5	11/6	11/7	11/8	
	CLASS:	Day 2	CLASS:	CLASS:	Day 5	
	HMWK:		HMWK:	HMWK:		
	11/11	11/12	11/13	11/14	11/15	
	CLASS:	CLASS:	Day 2	CLASS:	CLASS:	
	HMWK:	HMWK:		HMWK:	HMWK:	
	11/18	11/19	11/20	11/21	11/22	
	Day 5	CLASS:	CLASS:	Day 2	CLASS:	
		HMWK:	HMWK:		HMWK:	
	11/25	11/26	11/27	11/28	11/29	
	THANKSGIVING	THANKSGIVING	THANKSGIVING	THANKSGIVING	THANKSGIVING	
	12/2	12/3	12/4	12/5	12/6	
	CLASS:	Day 5	CLASS:	CLASS:	Day 2	
	HMWK:		HMWK:	HMWK:		
	12/9	12/10	12/11	12/12	12/13	
	CLASS:	CLASS:	Day 5	CLASS:	CLASS:	
	HMWK:	HMWK:		HMWK:	HMWK:	
	12/16	12/17	12/18	12/19	12/20	
	Day 2	Block Day	Block Day	Block Day	Block Day	
	12/23	12/24	12/25	12/26	12/27	
	Winter Break	Winter Break	Winter Break	Winter Break	Winter Break	
	12/30	12/31	1/1	1/2	1/3	
	Winter Break	Winter Break	Winter Break	Winter Break	Winter Break	
	1/6	1/7	1/8	1/9	1/10	
	CLASS:	Day 2	CLASS:	CLASS:	Day 5	
	HMWK:		HMWK:	HMWK:		

Third Quarter, 2024-2025

SUN	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT
	1/13	1/14	1/15	**1/16**	1/17	
		Day 1	**Day 2**	**PRE-CLASS NOTES:** 1.) On the first day of class you will be given a journal and a copy of 13 Things That Don't; (the journal is yours, the book you will return to me later) 2.) the class Website is found by going to **faculty.polytechnic.org/physics** and clicking on Cosmology, Astornomy and Relativity in the left-hand column**;** 3.) If you find a URL on this pdf and it spans only one line, the link should be active; if the link spans more than one line, you will have to copy and paste the link into a browser to go to the site (this bit of weirdness seems to be the case in general with pdfs made from Excel files); 4.) also, be aware that our daily progress is not necessarily set in stone, so expect the calendar to change pretty continuously to reflect updates . . .	**SECOND SEMESTER BEGINS:** **CLASS:** 1.) intro the course: (motiv. behind the course (old and new format emphasizing wonder); class Web site; journals; 2.) watch "relative size" "immensity of universe"; 3.) not only very large, but very small--talk about intricacies of atom (illusion, and you never really touch anything); 4.) this class will be devoted to introducing you to "stuff you didn't know existed;" to start out, a few words about mathematics (and the hole therein) at Veritasium https://www.youtube.com/channel/UCHnyfMqiRRG1u-2MsSQLbXA 5.) start first part of "The Elegant Universe" at 3:30 min mark . . . found at https://www.pbs.org/wgbh/nova/series/the-elegant-universe/ just let it run . . .	
					HMWK: 1.) Google "2019 OK" and briefly write up what you find there; 2.) Google "meteor crater;" let your curiosity get the better of you . . . 3.) Go on-line to class Web page and read both "About the Books" and "Course Information." 4.) make your first entry into your journal	
	1/20	1/21	1/22	1/23	1/24	

Test Wk?					
	MLK Jr Holiday	**Day 5**	**CLASS:** 1.) clarify what journal should be used for; 2.) talk about "2019 OK" and info about meteor craters (any wonder here?); 3.) at *unification* at 8:30 min mark: talk about trying to find equation that summarizes everything--how can that be (an equation summarizing stuff)--give theory behind springs as example . . . ; talk about Newton (Gmm/r^2 and inventing Calculus) and why he didn't like his theory; explain where Special Relativity came from (start with theory of e/m waves for light and Maxwell's equations, newton's theory of light)--note that the Elegant Universe's explanation of the problem comes from a different direction . . . 5.) note that when we get to Quantum Mechanics, we will segue and the weirdness will begin . . . (got to 12:30)	**CLASS:** 1.) so where are we? Gravity doesn't exist, but gravitational effects do exist due to the interaction of mass and the fabric of space/time; 2.) continue with the Elegant Universe--start at 5:21; 3.) back to unification--electricity and magetnism and Maxwell's equations (mentioned yesterday); 4.) note that the equations presented in the video are the differential forms of Maxwell's equations (you might name them--Gauss's Law, Gauss's Law for Magnetism, Ampere's Law and Faraday's Law); 5.) why couldn't Einstein create a Theory of Everything? (difference in strength outweighs similarities); 6.) when you get to how particles inside the atom interact with one another, stop the video and begin to look at Quantum Mechanics (stop at 30:20 min).	**Day 2**
			HMWK: 1.) make your second journal entry (you should have a ton of stuff to report by now . . .)	**HMWK:** 1.) journal	
	1/27	1/28	1/29	1/30	1/31
	CLASS: 1.) finish Elegant section--start at 27:27 2.)begin discussion of QM with video of creepy guy and double slit experiment; 3.) introduce Mithuna Yoganathan and Looking Glass Universe (Google LGU to see all of her videos); 4.) first video: introduction to quantum mechanics (USE MY ORIGINAL VERSION!!!) --newer version is intro but also talks about what it means to be measured https://www.youtube.com/watch?v=8Dso6Fv1FUw don't use 5.) take a quick look at the "newer version" if time permits 6.) look at "answers to questions" video (talks more about "what is a measurement?" at https://www.youtube.com/watch?v=YBcQ0PeFsx4;	**CLASS:** 0.) NOTE homework 1.) remind students about superposition rule and measurement rule, then look at LGU wave function video (use my original version); 2.) a secondary video on wave function (not LGU) at https://www.youtube.com/watch?v=EmNQuK-E0kI, don't use 3.) look at quantum randomness at https://www.youtube.com/watch?v=hGGb0nGTPLk&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=1 (this talks about the coefficients of the wave function--the probability functions), also, outcome random but probability not 4.) how likely are possible outcomes?--the Born Rule https://www.youtube.com/watch?v=VHlqY44fOg0&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=2 (got to 3:10) 5.) mention magn of complex numbers are called amplitudes n angles phases--	**Day 5**	**CLASS:** 1.) reiterate what-all we've covered (messed up and didn't show first video for Tuesday--go back and do that); 2.) noting that an eigenstate is just one of the possible states of a system and a wave function's "basis" is the parameter being measured, look at video on quantum interference at https://www.youtube.com/watch?v=tt8gVXDsh7Q&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=3--the follow-up to this video is at (didn't get done) https://www.youtube.com/watch?v=sTTgZQVtaPE&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=4 start at 2.45 (what is observable in double slit experiment); 3.)	**CLASS:** 1.) talk about Heisenberg Uncertainty principle using LGU video at https://www.youtube.com/watch?v=rciVgQm-F_U&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=9 2.) show video of laser beam spreading out as slit cuts beam off . . . "visualization of Heisenberg's Unc Prin.flv" 2.) look at the Schrodinger Equation from two authors, the first from LGU: https://www.youtube.com/watch?v=ZfKq3g3MHqE&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=10 (talks about measurement problem), the other at https://www.youtube.com/watch?v=QeUMFo8sODk; 3.) how to use Schrodinger equation (LGU) at https://www.youtube.com/watch?v=DEgWbrMv6-k&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=11

HMWK: 1.) journal; 2.) google "wave function" in quantum mechanics and see if you can find a video that explains what it is (put URL in your journal)	**HMWK:** 1.) journal; 2.) pretend you are taking your first ORAL EXAM. Write out the talking points you would hit in that exam. In other words, what have we talked about in the last two weeks THAT YOU HAVE FOUND REALLY INTERESTING		**HMWK:** 1.) Google Amy Noether--read about her life 2.) look at the video about Noether's Theorem at https://www.youtube.com/watch?v=CxlHLqJ9I0A&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=7 (note that she misspoke about gravitational potential energy at the 3:10 mark--don't be put off by this--it's easy to do when riffing) 3.) concerning the video, read and think about the first three comments (from Eric Vilas and 12tone)	**HMWK:** 1.) journal; 2.) if you find this interesting and want to look at quantum spin, look at the LGU video at https://www.youtube.com/watch?v=cd2Ua9dKEl8&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=5; and its extension covering angular momentum as spin at https://www.youtube.com/watch?v=z_6B2M12H9w&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=6
2/3	2/4	2/5	2/6	2/7
Day 2	**CLASS:** 0.) redo Friday as lots of absences 1.) talk about Heisenberg Uncertainty principle using LGU video at https://www.youtube.com/watch?v=rciVgQm-F_U&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=9 2.) show video of laser beam spreading out as slit cuts beam off . . . "visualization of Heisenberg's Unc Prin.flv" 2.) look at the Schrodinger Equation from two authors, the first from LGU: https://www.youtube.com/watch?v=ZfKq3g3MHqE&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=10 (talks about measurement problem), the other at https://www.youtube.com/watch?v=QeUMFo8sODk; 3.) how to use Schrodinger equation (LGU) at https://www.youtube.com/watch?v=DEgWbrMv6-k&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0	**CLASS:** 1.) look at the deBroglie wavelength video at (this gets way too far into the weeds for most, but it has bits and pieces of stuff I want to talk about: https://www.youtube.com/watch?v=eqTY6Cyb0do&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=8 good review for wave function and eigenstates along with converting from position basis to momentum basis--talks about how the phase of an eigenstate might change even though the probability not due to the imaginary nature of the probability functions--(mention that Taylor expansion of "e^i(theta)" is the same as that of "cos(theta) + i sin(theta)";	**Day 5**	**CLASS:** 1.) oral exams
	HMWK: 1.) journal; 2.) if you find this interesting and want to look at quantum spin, look at the LGU video at https://www.youtube.com/watch?v=cd2Ua9dKEl8&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=5; and its extension covering angular momentum as spin at https://www.youtube.com/watch?v=z_6B2M12H9w&list=PLg-OiIIbfPj3JrdQgqkdlPe_jxRC0mw35&index=6	**HMWK:** 1.) journal; 2.) if you are still interested and want to learn more, look at the video on quantum entanglement at https://www.youtube.com/watch?v=Xzmp7byh77E 2.) you and also learn about "spin" at the quantum level at https://www.youtube.com/watch?v=gh7xITmvgyU 3.) think about what you are going to say tomorrow during ORAL EXAM		**HMWK:** 1.) relax
2/10	2/11	2/12	2/13	2/14

CLASS: 1.) take a few minutes to show formal derivation of Schrodinger's Equation; 2.) finish up Quantum Mechanics--do anything not done to date**;** 3.) show "Heisenberg spectrum" and "Visualizing Heisenberg" flv videos from video pile	**Day 2**	**CLASS:** 1.) do something with quantum compuiting . . . how to make a qbit--https://www.youtube.com/watch?v=zNzzGgr2mhk--what quantum compters are https://www.youtube.com/watch?v=g_IaVepNDT4 2.) retroactively, look at https://www.youtube.com/watch?v=8ORLN_KwAgs&t about *delayed choice quantum eraser double slit* experiment (very freaky); 3.) then continue with The Elegant Universe--during video, talked about what strong force does (holds protons together in nucleus and weak force (creates new atoms after supernova via radioactive decay); talked about how forces in Standard Theory are assumed to be particle interactions; stop at precision of universe	**CLASS:** 1.) continue with Elegant Universe	**FACULTY PROFESSIONAL GROWTH DAY** (no school)
HMWK: 1.) journal; 2.) Google "Information Theory" to see what it is all about--see if you can find a connection between Information Theory and Quantum Mechanics;		**HMWK:** 1.) journal;	**HMWK:** 1.) journal;	
2/17	2/18	2/19	2/20	2/21
PRESIDENT'S DAY (no school--again, you lucky ducks)	**Day 5**	**CLASS:** 1.) continue with Elegant Universe	**CLASS:** 1) mention Mr. White's triple binary star system https://exoplanets.nasa.gov/news/1672/discovery-alert-first-six-star-system-where-all-six-stars-undergo-eclipses/; 2.) talk about the precision of the universe--show video The Fine Tuning of the Universe . .which has good info but is the religious one); 3.) run through discussion of alpha (use PowerPoint) 4.) show video Alpha Changing talk about the consequences of having fundamental constants changing in light of the previous video about the fine tuning of our universe;	**Day 2**
		HMWK: 1.) journal;	**HMWK:** 1.) journal; 2.) from 13 Things That Don't Make Sense, read the Prologue, pages 7-13	
2/24	2/25	2/26	2/27	2/28

CLASS: 1.) intro Standard Model https://www.youtube.com/watch?v=Unl1jXFnzgo - look over ppt on the Standard Model; 3.) Higgt's Boson video https://www.youtube.com/watch?v=joTKd5j3mzk 2.) video about " start and progression onward" at https://www.youtube.com/watch?v=wNDGgL73ihY "CLASS: 3.) look at ""Chronology of Universe"" https://www.youtube.com/watch?v=DB8651JE3xo kibitz: as you go (inflation, quark asymmetry, why 1 Tev is important, quark clumping; deuterium and He nuclei formation, 50-50 point for energy/radiation distribution, the first neutral atoms and light free streaming, first generation stars, second generation stars, etc.); 4.) look at preambles to Cosmological Timeline (temp/energy AND 2-sizes), then view timeline "	**CLASS:** 1.) go through the Fundamental Particles and Forces ppt; 2.) talk about quarks, look at ppt on quark charge; 3.) find video on fundamental particles**;** 4.) article on measuring the strong force--https://www.scientificamerican.com/article/physicists-finally-know-how-the-strong-force-gets-its-strength/	**Day 5**	**CLASS:** 1.) oral exams	**CLASS:** 1.) senior ditch day
HMWK: 1.) journal; 2.) from 13 Things That Don't Make Sense, read the Prologue, pages 13-19	**HMWK:** 1.) journal; 2.) from 13 Things That Don't Make Sense, read pgs 19-25;		**HMWK:** 1.) journal;	**HMWK:** 1.) nada
3/3	3/4	3/5	3/6	3/7
Day 2	**CLASS:** 1.) read science fiction stories about antimatter 2.) show quarks changing colors video; 3.) in preamble to talking about the Higgs field, give explanation of what mass is, then talked about how Higgs field replaces those ideas in the Standard Model; 4.) to animate Higg's field, show video https://www.youtube.com/watch?v=joTKd5j3mzk (the quaint explanation); 2.) show the more sophisticated explanation of Higgs at https://www.youtube.com/watch?v=kixAljyfdqU 3.) talk about how Higgs field isn't only source of mass--look at video at https://www.youtube.com/watch?v=Ztc6QPNUqls&t=4s	**CLASS:** 1.) read sci fi stories; 2.) talk about 13 Things; (Slipher and red-shift; Hubble graphs speed vs distance--farther out faster--universe expanding--so farther away implies higher relative speed--the prop. const is the Hubble constant; talk WIMPS and cosmic radiation (have students find video on Bubble Chmbr n Cosmic Radiation); 3.) talk about Zwicky's (spherical bastards) problem (stars at edge of galaxy moving too fast); 4.) talk about Vera Rubins fights for Zwicky's idea (answer: halo of dark matter explains high vel); 5.) look at atomic interactions video (first 30 seconds https://www.youtube.com/watch?v=gwl2lnl9ujc n all beta decay 6. mousetrap https://www.youtube.com/watch?v=vjqIJW_Qr3c 7.) how larger elements	**Day 5**	**end of third quarter** **CLASS:** 1.)
	HMWK: 1.) journal; 2.) write three-sentence science fiction story that utilizes the idea of anti-particles	**HMWK:** 1.) journal; 2.) go to the "Secret Stuff" folder on the class Website and read "Drinking Heavy Water'		**HMWK:** 1.)

Fourth Quarter, 2024-2025

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	S A T
3/10	3/11	3/12	3/13	3/14	

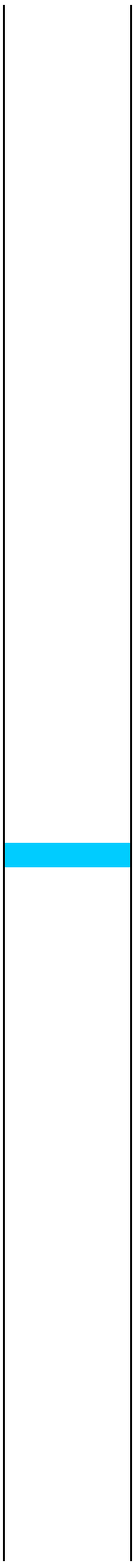
FACULTY WRITING DAY (NO SCHOOL)--	**CLASS:** 1.)	**Day 2**	**CLASS:** 1.)	**CLASS:** 1.)
	HMWK: 1.)		**HMWK:** 1.)	**HMWK:** 1.)
3/17	3/18	3/19	3/20	3/21
Day 5	**CLASS:** 1.)	**CLASS:** 1.)	**Day 2**	**CLASS:** 1.)
	HMWK: 1.)	**HMWK:** 1.)		**HMWK:** 1.) **HAVE A GREAT SPRING BREAK**
3/24	3/25	3/26	3/27	3/28
Spring Break	**Spring Break**	**Spring Break**	**Spring Break**	**Spring Break**
3/31	4/1	4/2	4/3	4/4
Spring Break	**Spring Break**	**Spring Break**	**Spring Break**	**Spring Break**
4/7	4/8	4/9	4/10	4/11
CLASS: 1.)	**Day 5**	**CLASS:** 1.)	**CLASS:** 1.) Magic Mountain day	**Day 2**
HMWK: 1.)		**HMWK:** 1.)	**HMWK:** 1.)	
4/14	4/15	4/16	4/17	4/18
CLASS: 1.)	**CLASS:** 1.)	**Day 5**	**CLASS:** 1.)	**CLASS:** 1.)

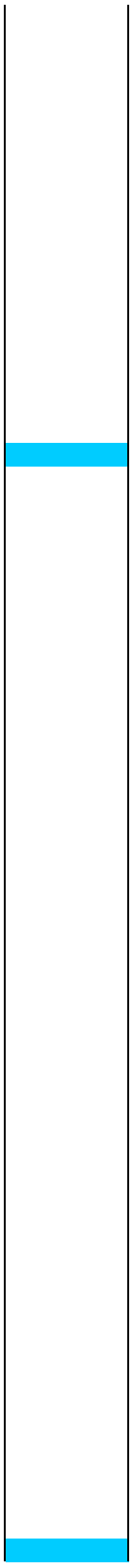
HMWK: 1.)	**HMWK:** 1.)		**HMWK:** 1.)	**HMWK:** 1.)
4/21	4/22	4/23	4/24	4/25
Day 2	**CLASS:** 1.)	**CLASS:** 1.)	**Day 5**	**CLASS:** 1.)
	HMWK: 1.)	**HMWK:** 1.)		**HMWK:** 1.)
4/28	4/29	4/30	5/1	5/2
CLASS: 1.)	**Day 2**	**CLASS:** 1.) Magic Mountain day	**CLASS:** 1.)	**Day 5**
HMWK: 1.)		**HMWK:** 1.)	**HMWK:** 1.)	
5/5	5/6	5/7	5/8	5/9
first AP test **Bio; Latin; MicroEcon** **CLASS:** 1.)	**CLASS:** **Chem** 1.)	**Day 2** **English Lit; Comp Sci A**	**CLASS:** **Statistics; Afr. Am Studies** 1.)	**CLASS:** **U.S. History; Chinese Lang; MacroEcon** 1.)
HMWK: 1.)	**HMWK:** 1.)		**HMWK:** 1.)	**HMWK:** 1.)
5/12	5/13	5/14	5/15	5/16
Day 5 **Calculus**	**CLASS:** **French Lang; Env. Sci** 1.)	**CLASS:** **English Lang; Phys Mech** 1.)	**Day 2** **Spanish Lang; Phy E&M**	**CLASS:** **Spanish Lit; Psych** 1.)
	HMWK: 1.)	**HMWK:** 1.)		**HMWK:** 1.)
5/19	5/20	5/21	5/22	5/23

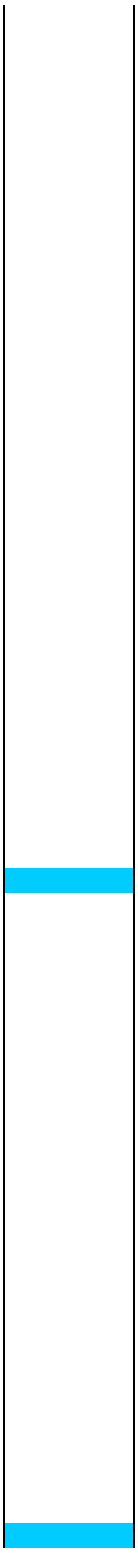
CLASS: 1.)	**Day 5** **Last day of senior classes**	**CLASS:** 1.)	**CLASS:** 1.)	**Day 2**
HMWK: 1.)		**HMWK:** 1.)	**HMWK:** 1.)	
5/26	5/27	5/28	5/29	5/30
Memorial Day Holiday	**BLOCK DAY/senior trip**	**BLOCK DAY/senior trip**	**BLOCK DAY/senior trip**	**BLOCK DAY/senior trip**

NOTES
Week 16

NOTES







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