Physics 511
"Conceptual" Syllabus – Spring 2018
Professor David Hertzog

Date	Day	Physics Topic	Paper**	Lead	Additional Topic	Due*
3/26	T	Neutron lifetime, "τ_n", and the controversy	Pattie; Bottle	Hertzog +	Accuracy, Precision & Systematic Errors!	
3/28	Th	Neutron lifetime, "τ_n", beams/bottles compared	Yue; Beam			Sign up for leads
4/3	T	Gravitational constant, "Big G" (gravity)	Gundlach Torsion Balance Schlamminter Beam Balance		Writing abstracts	
4/5	Th	Fine-structure constant "α_{em}"(electromagnetism)	Odem 2006; Hanneke 2008 quantum jump spectroscopy			Write an abstract in PRL style
4/10	T	No Class / work on papers				
4/12	Th	Fermi constant "G_F" (weak interaction)	Webber 2011; pulsed beam		The importance of figures	Prepare 2 figures and complete captions
4/17	T	Weak Equivalence Principle	Schlamminger, Torsion Balance Touboul, MICROSCOPE (space)		The Physics Intro (what did you do)	
4/19	Th	Parity Violation (conjecture and proof)	Lee & Yang 1956 Wu 1957; Garwin 1957			Write a "methods" section
4/24	T	CP Violation T violation	Christenson 1964; Angelopoulos 1998		Presentation strategies	
4/26	Th	Neutrinos oscillation (SNO, KAMLAND)				Write up the principle findings
5/1	T	Neutrino mass (Project8)			Proposals	
5/3	Th	EDM 1: neutron old and new				Scientific intro with references

5/8	T	EDM 2: atoms / molecules				Student Talk
5/10	Th	WIMP Dark Matter				
5/15	T	Axion Dark Matter				Student Talk
5/17	Th	Muon g-2				
5/22	T	Proton charge radius H2 spec; e-p scattering, Muonic Lamb shift				Student Talk
5/24	Th	float				Student Talk
5/29	T	float				
5/31	Th	(possible reschedule)				Rest of Student Talks

*Assignments are meant to focus on your present work. Do not draw on anything already published. Make it new and personal.
** First author listed; most have multiple authors