

Physics 108 Homework Assignment#3 (due on 4/19/2021 except for Problem#6)

Reading materials:

Pedrotti 3rd Edition: **Chapter 4:** 4-1 through 4-8
 Chapter 5: 5-1; 5-2; 5-4; 5-5
Lecture Notes: pp. 37-48

Homework: (Pedrotti 3rd Edition)

1. 4-11 (Math review)
2. 4-12 (Math review)
3. 4-13 (Math review)
4. 5-4 (Math review)
5. ***Phase differences in soap bubble and Michelson interferometer:*** A light beam with wavelength λ_0 is incident from a semi-infinite medium with refractive index n' at angle θ' onto a slab with refractive index n and thickness d . The refracting angle inside the slab is θ . The other side of the slab is also a semi-infinite medium with n' . The two surfaces of the slab are parallel. Derive the *total* phase difference between the reflected beam from the front surface and the reflected beam from the rear surface of the slab.
6. **(Due 5/10/21) Landscape Lens:** Perform the Introductory Exercise on Landscape Lens using OSLOEDU software. Show YOUR results by (1) displaying the starting “Surface Data” and “Lens Drawing” for paraxial rays and non-paraxial rays; and (2) displaying your optimized “Surface Data” and “Lens Drawing” for paraxial rays and non-paraxial rays. (You may also try the following condition for start: and “draw off”).

SRF OBJ	RADIUS	THICKNESS	APERTURE RADIUS	GLASS	SPE
	--	1.6000e+03	582.352375	AIR	*
1	21.807957 V	4.000000	11.666830 S	BK7	C
2	27.777778	12.647480 V	9.997114 S	AIR	
AST	--	155.058604 S	4.341641 AS	AIR	*
IMS	--	--	67.000000		*