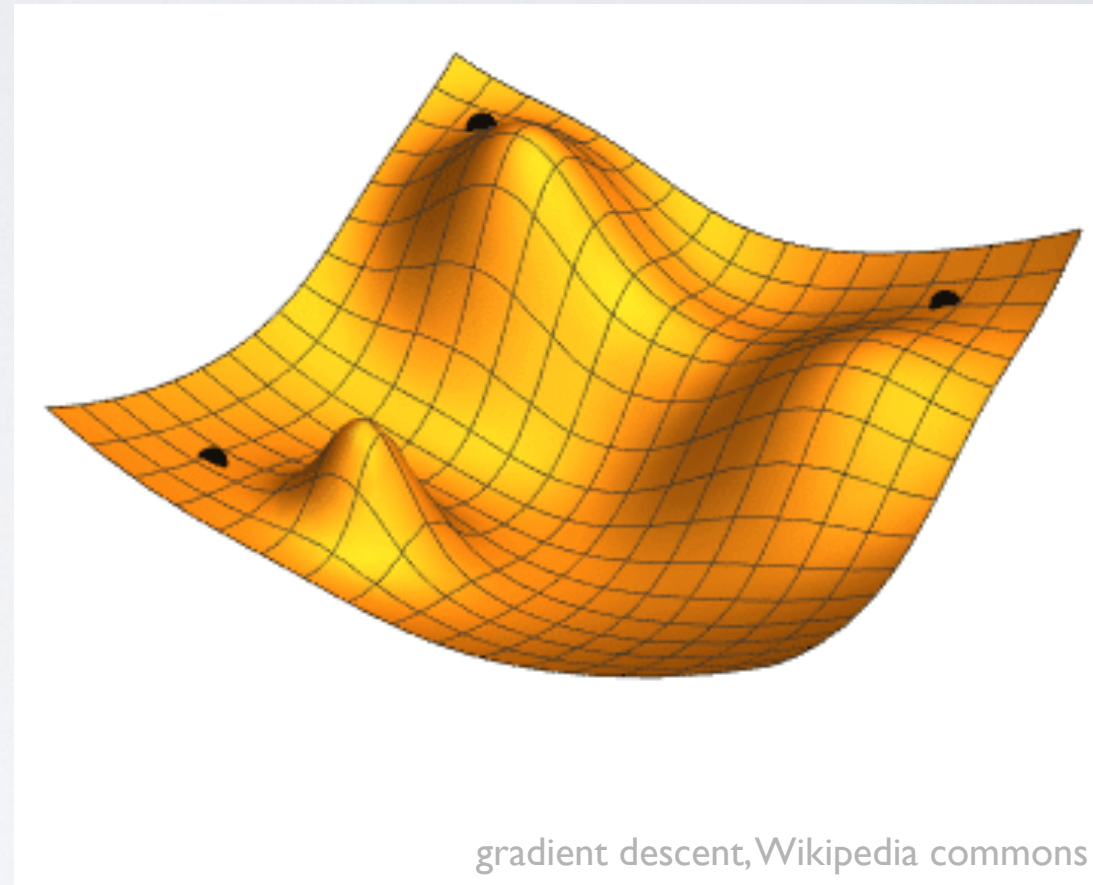
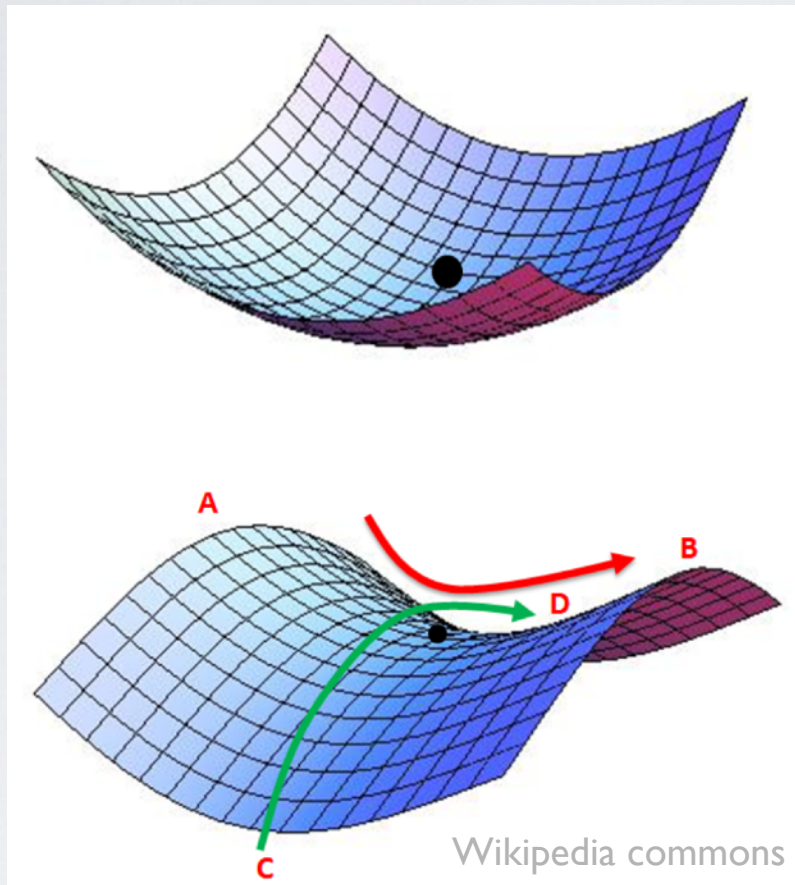


Week 7 - #1

Vector Analysis (I)



Today: Ch 6

Next Class: Ch 6

Ji-hoon Kim (Seoul National University)

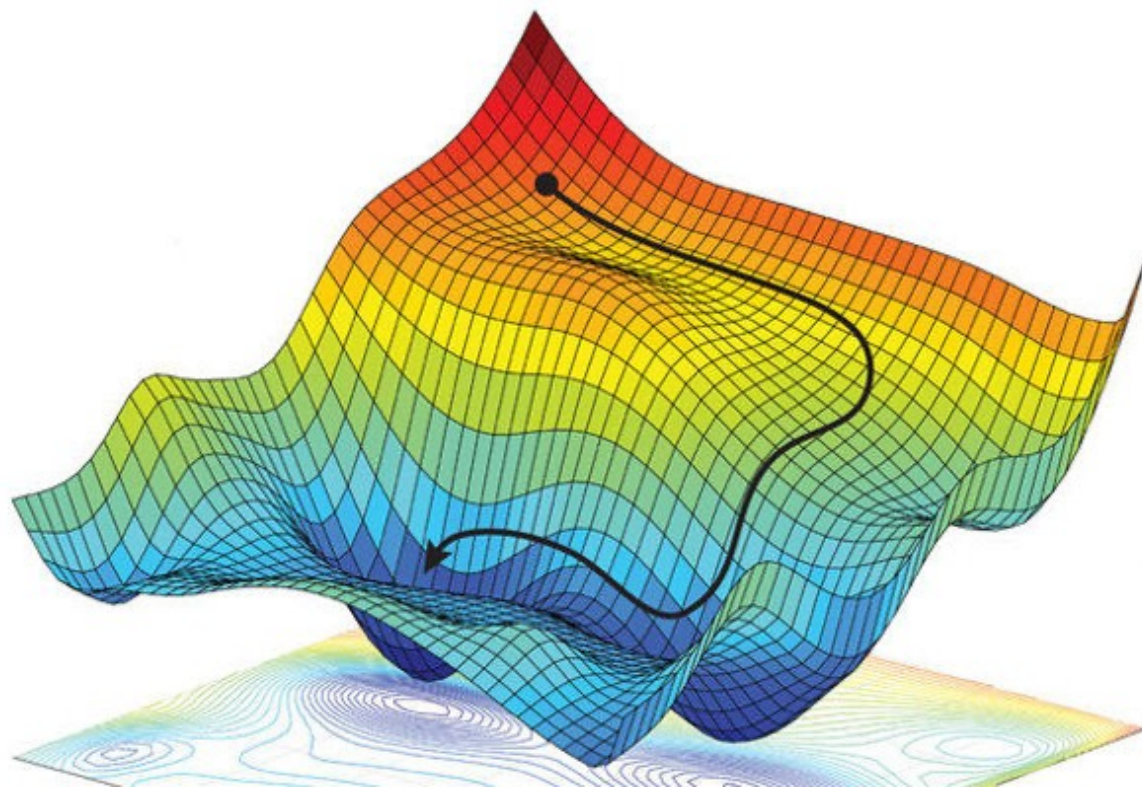
Rudimentary Mathematical Methods of Physics (Fall 2025): Quiz #9

— [open book and open note, “and” cellphone or laptop, drop it off as you leave the class] —

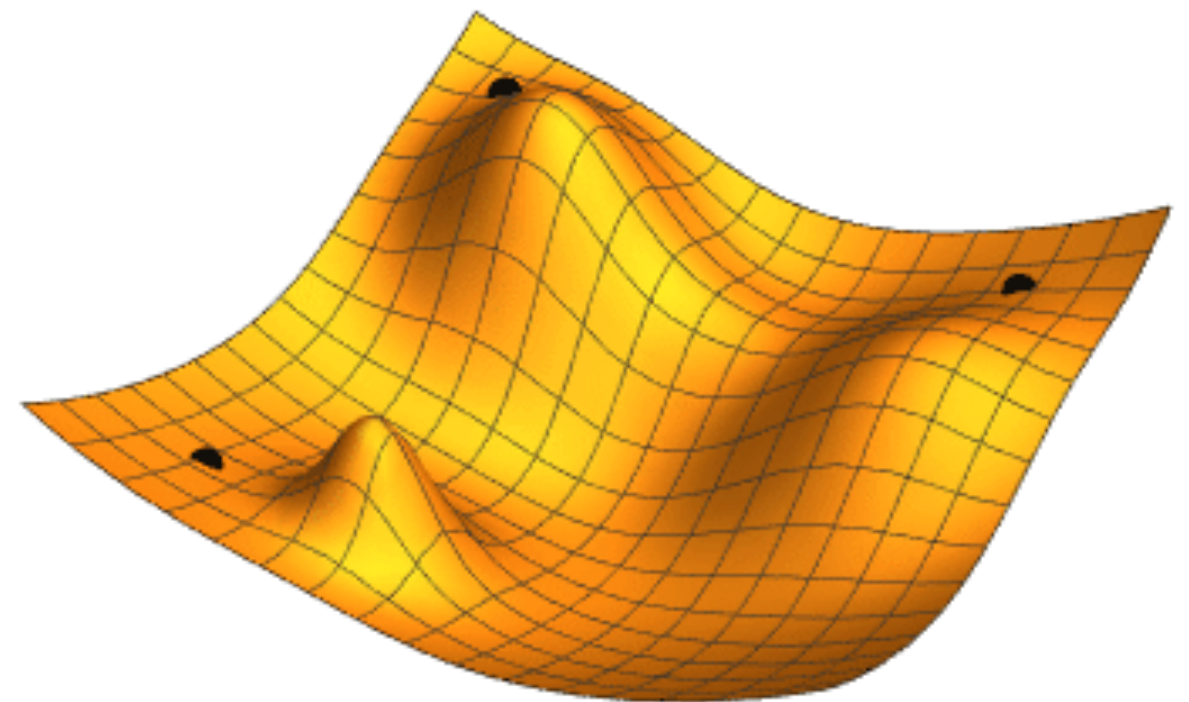
Please write down your name and student ID in the top right corner. (0.0 pt: no paper found with your name / 0.5 pt: paper found with your name and some answers / 1.0 pt: good answers)

1. Boas, Chapter 5, Section 3, Problem 24

2. Explain in layman’s terms what the figure/movie below are trying to visualize — by using the term “gradient”. On a related note, study and explain briefly how the concept of “gradient” is used in machine learning and artificial intelligence.



Amini et al. (2018)



gradient descent, Wikipedia commons

Rudimentary Mathematical Methods of Physics (Fall 2025): Suggested Problems in Chapter 6, Boas, 3rd ed.

The problems I suggest you to take a deeper look into include, but are not limited to, the following.
The class homework assignments will mainly be from this list.

- Section 03: Problems 12, 13, 14, 16, 17
- Section 04: Problems 6, 9
- Section 06: Problems 8, 13, 14, 16
- Section 07: Problems 6, 7, 15, 16, 17
- Section 08: Problems 6, 14, 18, 19, 20
- Section 09: Problems 3, 4, 7, 8
- Section 10: Problems 6, 10, 12, 15, 16
- Section 11: Problems 8, 10, 12, 16, 17(b)(d)(e), 18
- Section 12: Problems 3, 16, 19

Chapter 10, Sections 5 & 7-9

- Section 05: Problems 5, 7, 10
- Section 08: Problems 6
- Section 09: Problems 2, 5

39 problems / 173 total
(Ch.10) 13 problems / 138 total

Physics Program Open Lab



서울대 물리

Open Lab

LABORATORY

2025.10.27.(월)~11.7.(금)

주요일정

“학부생, 대학원생 누구나 신청 가능”

» 10.02~10.20. 오픈랩 참가신청



» 10.22~10.23. 참가학생들 랩 방문 시간 안내
(각 연구실별)

» 10.27~11.07. 오픈랩 진행

11.7. 오픈랩 이후 “간담회 및 진로 교류 행사”
(시간 및 장소 미정)

※문의 | 서울대학교 물리·천문학부 Tel 02.880.6619

물리천문학부 OPEN LAB 참가 신청 (2025)

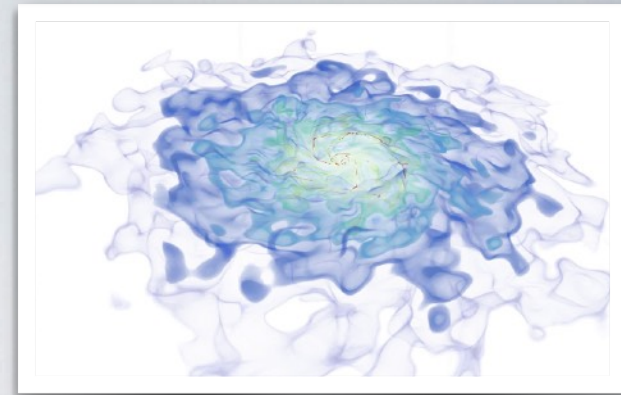
[Sign in to Google](#) to save your progress. [Learn more](#)

연구실 선택

연구실 선택

- ☐ (강민구 교수) 응집물질물리실험
- ☐ (김은종 교수) 양자 소자 연구실
- ☐ (김지훈 교수) Computational Cosmology Lab
- ☐ (민홍기 교수) 응집물질물리 이론
- ☐ (박제근 교수) Center for Quantum Materials -Emergent Phenomena Group-
- ☐ (백용주 교수) 비평형 통계물리 연구실
- ☐ (신용일 교수) 양자기체연구실
- ☐ (양범정 교수) 응집물질물리이론
- ☐ (이규철 교수) 신개념 에피성장 양자신소재 연구센터
- ☐ (이승섭 교수) CQMT (Computational Quantum Many-body Theory)
- ☐ (최석봉 교수) 응집물질물리실험
- ☐ (최현용 교수) Ultrafast Quantum Photonics Laboratory
- ☐ 선택완료

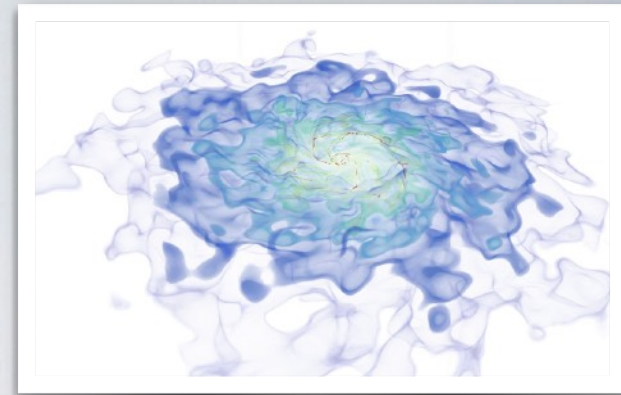




HW #3 has been posted!

(Posted on jihoonkim.org, Due: **Oct. 17 (Fri), 23:00pm**,

Grader TA this time: 정은우, cewgenius@snu.ac.kr)



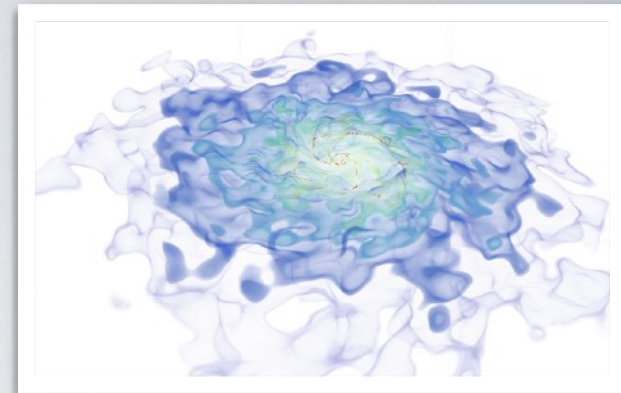
**HW #2 score and the grading
criteria will be posted!**

(Grader TA this time: 서현우, hyeonu@snu.ac.kr)

Midterm Examination: October 25

- Oct. 25 (Sat), 19:30-21:00 pm
- More details in the next lecture.
- Covers everything discussed in the class before the exam including Boas Chapters 1-6 and parts of Chapter 10.

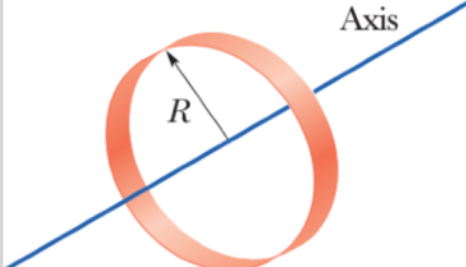
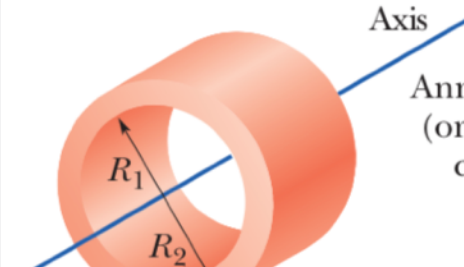
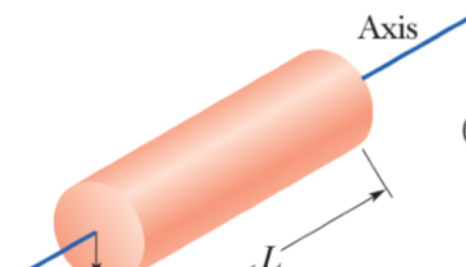
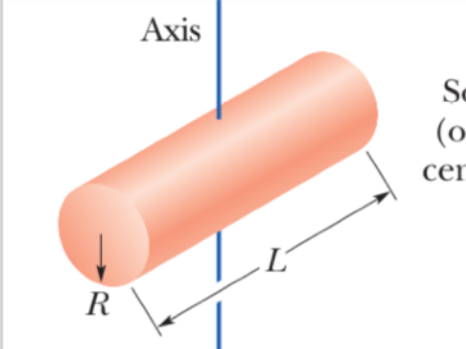
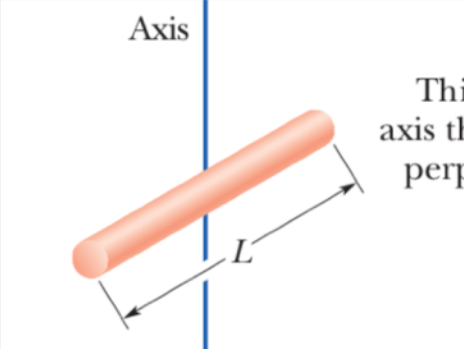
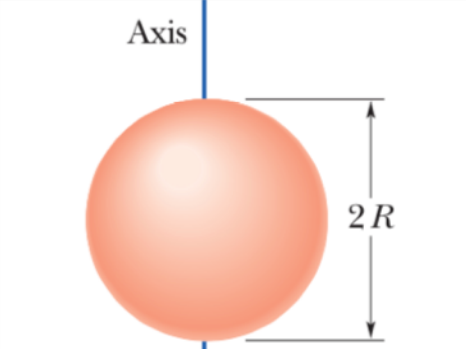
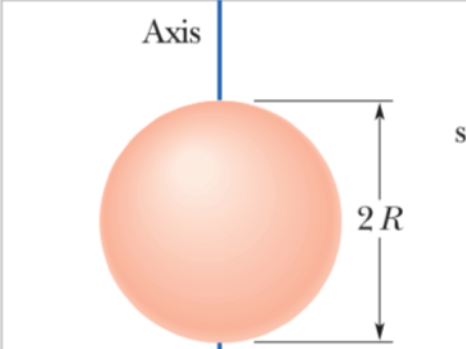
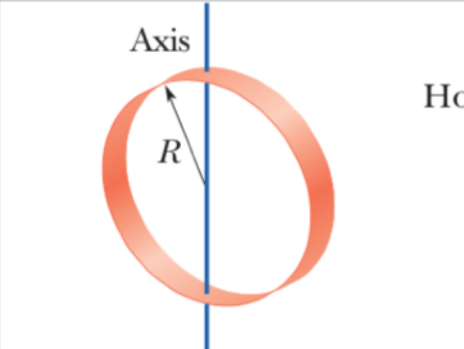
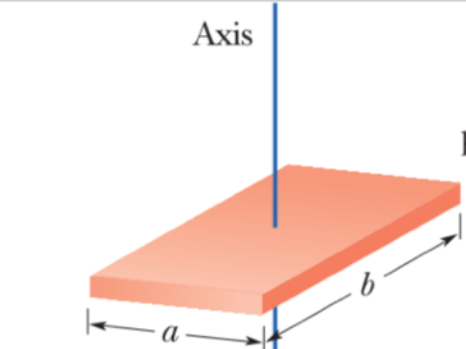




Rotational Inertias

Rotations In Elementary Physics

Table 10-2 Some Rotational Inertias

 Hoop about central axis $I = MR^2$ (a)	 Annular cylinder (or ring) about central axis $I = \frac{1}{2}M(R_1^2 + R_2^2)$ (b)	 Solid cylinder (or disk) about central axis $I = \frac{1}{2}MR^2$ (c)
 Solid cylinder (or disk) about central diameter $I = \frac{1}{4}MR^2 + \frac{1}{12}ML^2$ (d)	 Thin rod about axis through center perpendicular to length $I = \frac{1}{12}ML^2$ (e)	 Solid sphere about any diameter $I = \frac{2}{5}MR^2$ (f)
 Thin spherical shell about any diameter $I = \frac{2}{3}MR^2$ (g)	 Hoop about any diameter $I = \frac{1}{2}MR^2$ (h)	 Slab about perpendicular axis through center $I = \frac{1}{12}M(a^2 + b^2)$ (i)