❖ 2025S-PHYS_0174: Physics 1 (Classical Mechanics)

Instructor : Jeungphill Hanne

❖ Agenda for today

1. SCUPI 2025 Spring Academic Calendar

- Academic Calendar : Midterms & Final etc.
- My Schedule : Office hours etc.

2. Course Introduction

- Course information
  - Subject, Text book, Lecture Hour, Office hour, Course website, etc.
- Course Objective & Scope, Course Learning Key Points
- Course Grading & Tentative Course Schedule

3. Call class rolls

4. Brief Introduction of Physics and Physics 1

- What is physics and Why need Physics
- Scope of Physics & What is **Classical Mechanics**

1. SCUPI 2025 Spring Academic Calendar

- **Academic Calendar : Midterms & Final etc.**

SCUPI Academic Calendar for 2024-2025 Spring

	Feb.	Mar.				Apr.				May					Jun.				Jul.					Aug.			
Monday	24	3	10	17	24	31	7	15	22	28	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25
Tuesday	25	4	11	18	25	1	8	16	23	29	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26
Wednesday	26	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	19	26	2	9	16	23	30	6	13	20	27
Thursday	27	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	20	27	3	10	17	24	31	7	14	21	28
Friday	28	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	21	28	4	11	18	25	1	8	15	22	29
Saturday	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30
Sunday	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31
SCU Week	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**
SCU Term	2025 Spring Teaching Weeks																		Final Week		Summer Recess						

1st Midterm

2nd Midterm

Final

This schedule is preliminary!!

1. SCUPI 2025 Spring Academic Calendar

- **My Schedule : Office hours etc.**

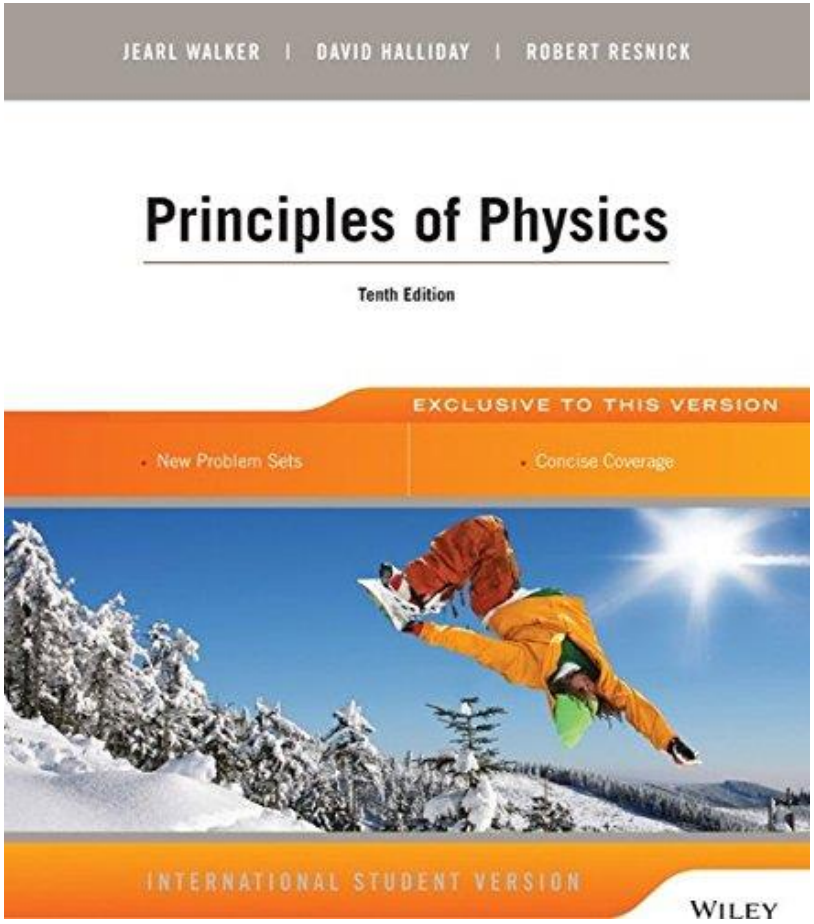
2024-2025 Spring Semester Course Schedule					
Class time	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
08:15-09:00	Physics 1 01 S-104		Physics 1 01 S-104		
09:10-09:55	Physics 1 01 S-104		Physics`1 01 S-104		
10:15-11:00	Office Hour Physics 1 N-412	Linear Control System S-507	Office Hour Power Engineering N-412	Linear Control System S-507	
11:10-11:55		Linear Control System S-507	Office Hour Linear Control N-412	Linear Control System S-507	
Lunch Break					
13:50-14:35	Funamentals of Electric Power Engineering S-104			Office Hour Physics 1 N-412	
14:45-15:30	Funamentals of Electric Power EngineeringS-104			Office Hour Power Engineering N-412	
15:40-16:25	Funamentals of Electric Power Engineering S-104			Office Hour Linear Control N-412	
16:45-17:30					
17:40-18:25					

*But, you can come to my office anytime when I am in my office ^^*

2. Course Introduction

• Course information

- **Physics for Science and Engineering 1**
  - Learn the basics of General Physics 1
    → **Mainly Classical Mechanics**
    : Fundamental to Engineering Research
- **Text Book**
  - Principle of Physics by David Halliday , Robert Resnick & Jearl Walker, 10th edition.:ISBN-13: 978-1118230749s
- **Lecture**
  - Instructor : Jeungphill Hanne, PhD
    jeungphill.hanne@scupi.cn
  - Time : please refer to my schedule
  - Office Hour: Mon.(10:15-11:00)/ Thur.(13:50-14:35)
  - Office : N412 @ SCUPI New Building
- **TA :** None
  - Office Hrs : To be announced.



- **Course Format**
  - Lecture, and Active Participation (i.e. Quiz, ***Presentation***, Question, Answers, etc.)
- **Course Grading**
  - Two Midterms, Final, Homework, Quiz, and Attitude (ex. Attendance, Focus, Engagement, Punctuality for HW, etc.)

2. Course Introduction

• Course Scope & Objective

- Objective : Understanding the basics of “Classical Mechanics”, Learning new Physical, or mathematical properties/theorem and eventually How to derive them from Newton’s Laws
- Scope : Motion, Newton’s Three Laws, Gravitation, new Physical, or Mathematical properties (i.e. Work, Momentum, Kinetic/Potential Energy, Center of Mass) , Specific Motion (i.e. Rotation), Rigid Body Motion, Equilibrium, OSCILLATIONS and Waves, etc.

→ Required : **Some mathematical Background ! (Vector, Derivative, Integral)**

All theorem & concepts will be derived from Newton’s Laws , except Gravitation!

• Course Grading

- Grading Components : HW& Attitude (15%), Quiz (10%), Midterm I (20%), Midterm II (20%), Final (25%) Attitude (10%, i.e Attendance, Engagement, Punctuality for HW, etc.).

< 60% attendance might be F.

Tests are not accumulative and
may include something taught in the class !
Policy is subjective to be changeable!

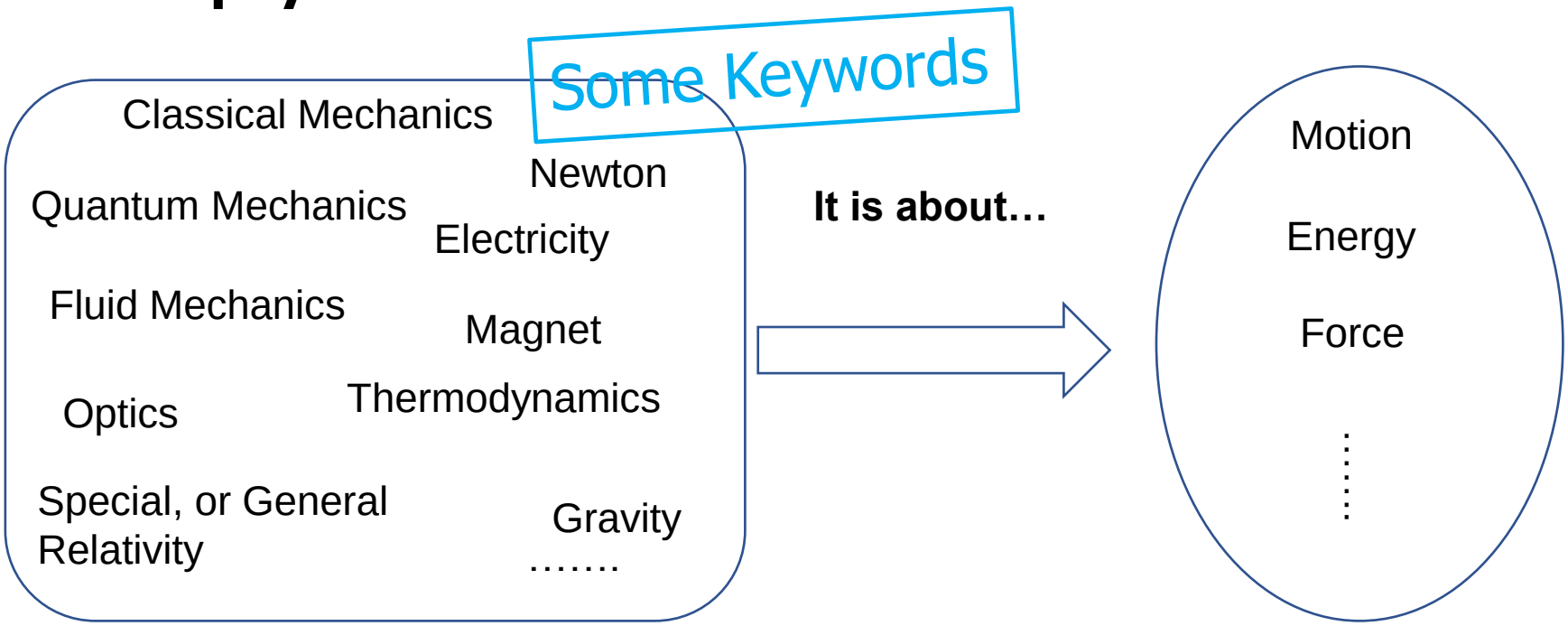
• Schedule of General Physics 1 : PHYS 0174 *Subjective to be Flexible!*

Week	Physics 1 (PHYS 0174)	Topics	Assignment
Week 1 (2/24-3/2)	Introduction & Chap 1	Syllabus & Measurement & Motion	
Week 2 (3/3-3/9)	Chap2 &Chap 3	Motion, Vectors	HW1
Week 3 (3/10-3/16)	Chap3 &Chap 4	Motion in Two and Three Dimensions	HW2
Week 4 (3/17-3/23)	Chap 4 &Chap 5	Force and Motion—I	HW3
Week 5 (3/24-3/30)	Chap 5 &Review		HW4
Week 6 (3/31-4/6)	Chap 6 & **Mid Term 1**	Force and Motion—II	
Week 7 (4/7-4/13)	Chap 6 &Chap 7	Kinetic Energy and Work	HW5
Week 8 (4/14-4/20)	Chap 7 & Chap 8	Potential Energy and Conservation of Energy	HW6
Week 9 (4/21-4/27)	Chap 8 & Chap 9	Center of Mass and Linear Momentum	HW7
Week 10 (4/28-5/4)	Chap 9 & Chap 10	Rotation	HW7
Week 11 (5/5-5/11)	Chap 10 & Review		HW8
Week 12 (5/12-5/18)	Chap11 &**Mid Term 2**	Rolling, Torque, and Angular Momentum	
Week 13 (5/19-5/25)	Chap11		HW9
Week 14 (5/26-6/1)	Chap 11 & Chap 12	Equilibrium and Elasticity	HW 10
Week 15 (6/2-6/8)	Chap 12 & Chap 13	Gravitation	HW11
Week 16 (6/9-6/15)	Chap 13& Chap 14	Fluid	HW12
Week 17 (6/16-6/22)	Chap 15	Wave and Oscillation I	HW13
Week 18 (6/23-6/29)	Chap 16	Wave and Oscillation II	HW14
Week 19 (6/30-7/6)	Chap 16&**Final review**		

4. Introduction of Physics

- What is physics and Why need Physics
- Scope of Physics & What is Classical Mechanics

- **What is physics ?**



"Physics" → ***"Study how the object moves, stops, stays, behaves, or interact…… "***

So, "Physics" is fundamental to Engineering ? also Science ?

4. Introduction of Physics

- **Why "Physics" is fundamental to Engineering ?**

→ **Because it describe fundamental interactions between objects and motion of objects in Engineering**

Interaction
→Forces!

- Mechanical Engineering : Massive objects
- Electrical Engineering : Charged objects
- Material Science and Engineering : i.e. Complicate, or newly formed objects
- Industrial Engineering : Application of basic engineering subjects
- …..

- So, "Physics" is Everything?,
But Why still study Engineering?

4. Introduction of Physics

- So, “Physics” is Everything?, But Why still study Engineering?

→ Yes, Physics is fundamental to Engineering,
However, we can not solve more than two-body problem completely
and in reality, the Nature is “Many-body problem”,
& Engineering is also Application of Physics !!

- What we can do ?

→ One way is to propose “Macroscopic ,or Microscopic Models” and confirmed by Experimental Results and Calculations → Suggest New Phenomena→ Discover them, or correct them by experiments→ New Models → Suggest New Phenomena….→……

➔This is also the “Physics Way of Thinking” and ask to learn this

Make sure : What you know, or don’t know !!,
Can explain to others!!

4. Introduction of Physics

By Elon Musk,
after a question of "How can you be such a creative person"
→ **Learn "Physics"**

"Physics" is basic for Engineering, and also for the way of thinking for….

4. Brief Introduction of Physics2

- **Scope of Physics & What is Electromagnetism?**
  - Elementary Particle in Nature and its basic property
  - Four Fundamental forces in Nature
  - Physics Theory (Classical, Modern)

- What is Classical Mechanics (Physics 1)?

→ “Physics” (‘Motion’) of the **Massive** particles/objects

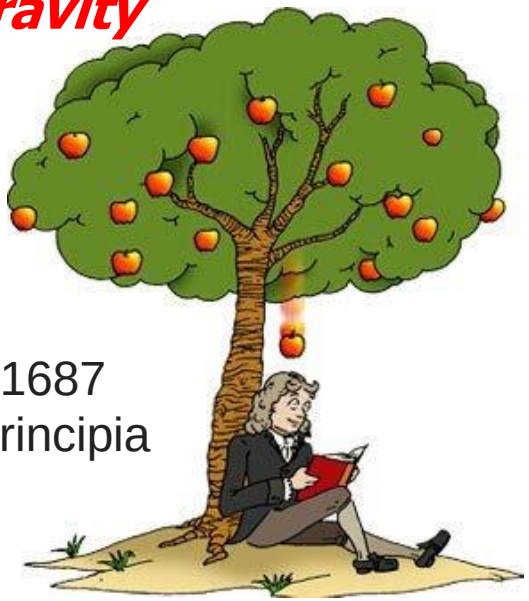
→ Followed by **Newtonian Laws**

→ Influenced by **Gravitational Force**

What is “mass”(property), “Newtonian”(Law) and “Gravitational”(Force) ?

❖ "Physics Showtime" : ~1850? →~1995?, ~150 years

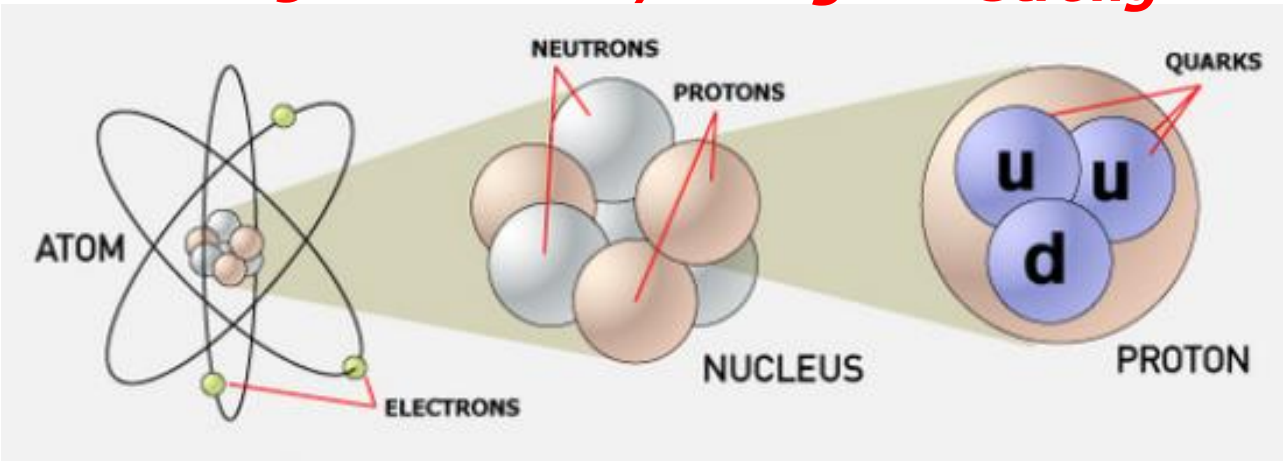
Gravity



1687
Principia

Isaac Newton

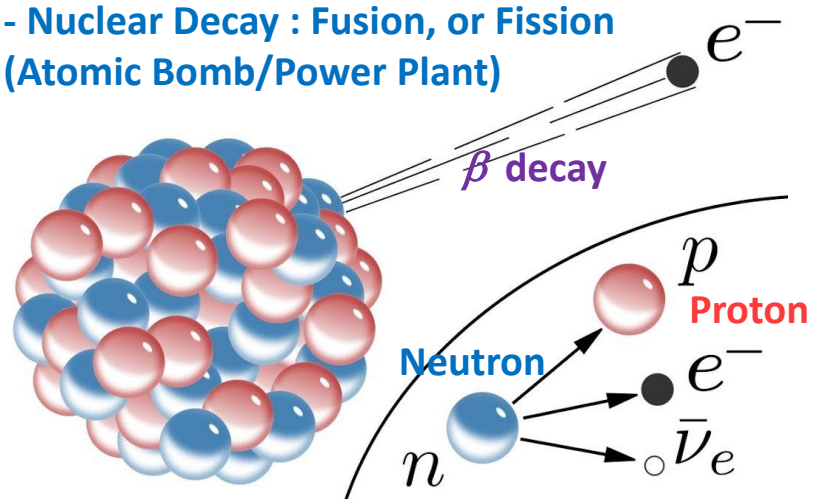
Electromagnetic ***Weak/Strong*** ***Strong***



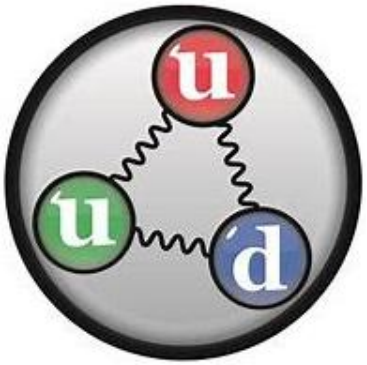
Strong (~Form the Nucleus glued between protons and neutrons)

Weak (Nuclear Decay process)

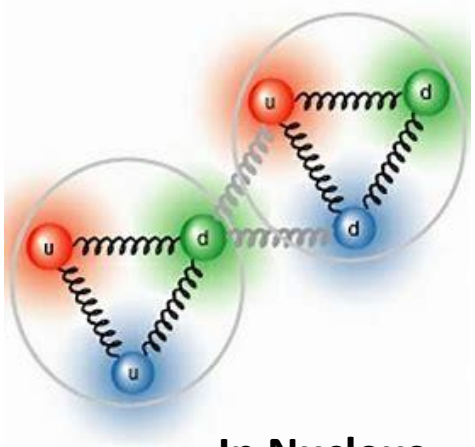
- Nuclear Decay : Fusion, or Fission (Atomic Bomb/Power Plant)



Quark-Quark interaction



In Proton, or Neutron



In Nucleus

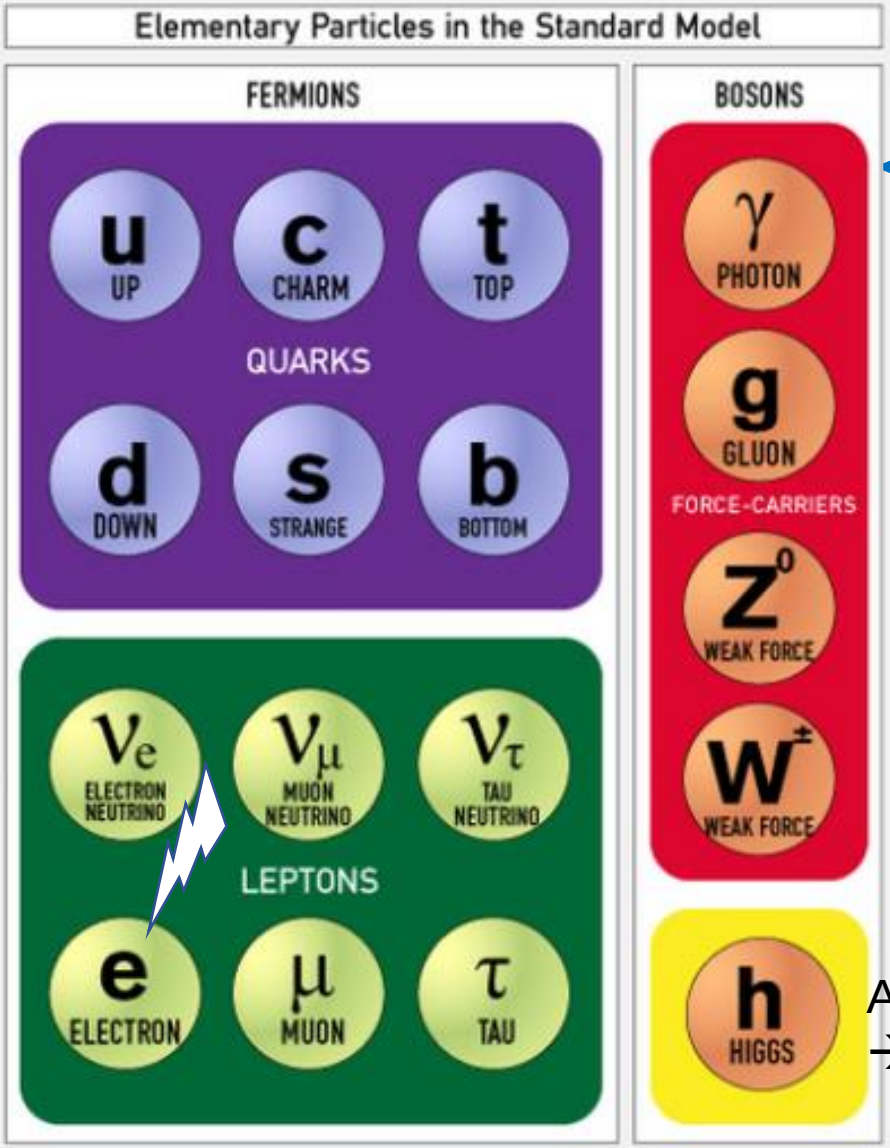
- "Elementary Particle in Nature" : no more break-down

Three categories of particles form the Standard Model. **Matter** is composed of quarks and leptons. The **fundamental bosons** provide three forces: electro-magnetism, the strong nuclear force and the weak nuclear force. **Gravity**, the fourth fundamental force, is not explained by the Standard Model.

The **Higgs boson**, discovered in 2012, provides an explanation for how the other particles get **mass**.

Currently, the Standard Model is incomplete and does not explain many important features of the known universe, such as:

- **gravity**
- **dark matter** (27 percent of the universe)
- **dark energy** (68 percent of the universe)



<Basic Properties>

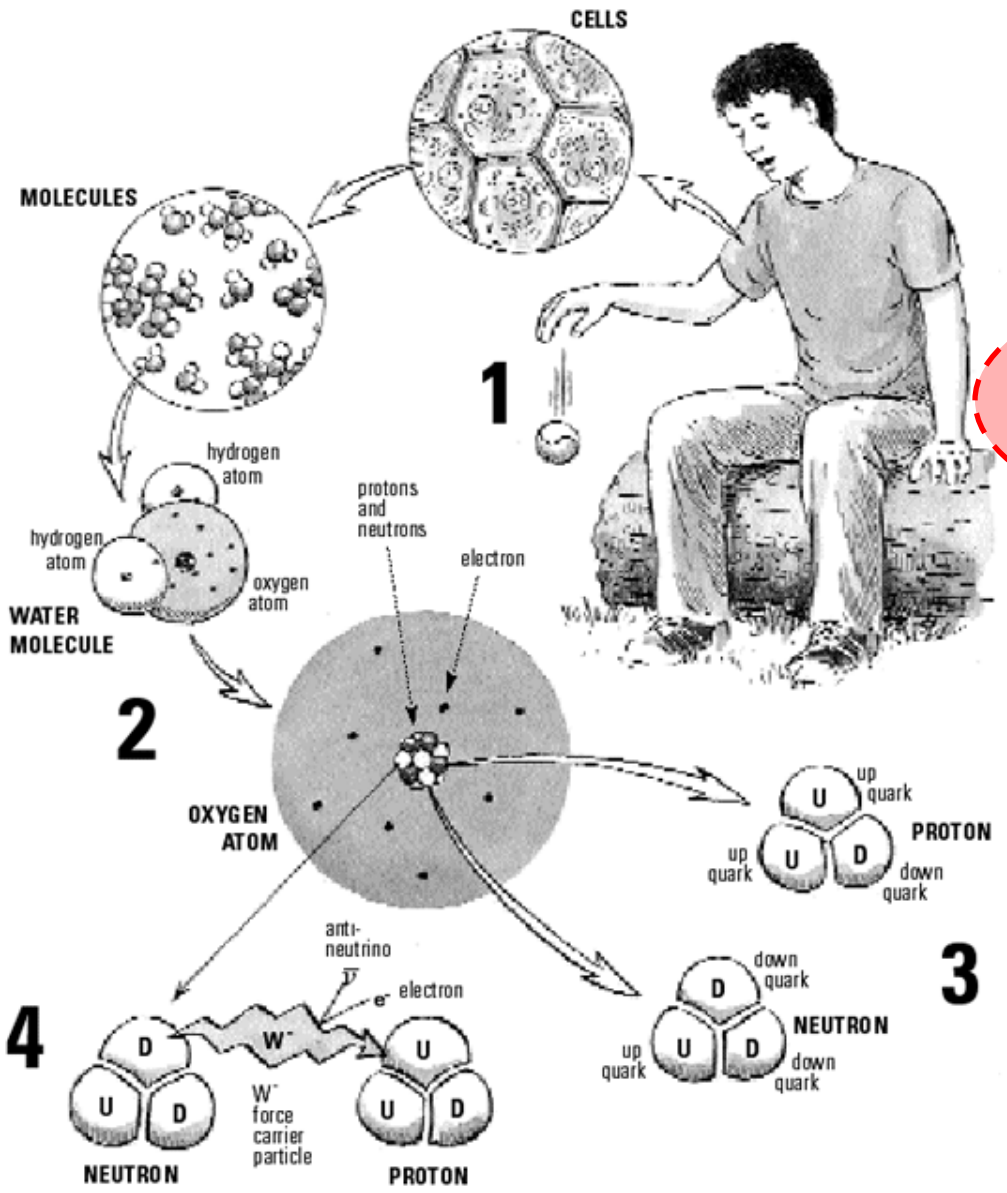
- ✓ **Mass**
- ✓ **Charge**
- ✓ **Spin** ~(Angular Momentum)
- ✓ **Parity**

All new elementary particles → Nobel Prize!!

HIGGS: 2015 Nobel Prize!!

"Standard Model"

- Four fundamental forces in Nature



1. Gravitational Force

Mass ←→ Mass

2. Electrical Force

Charge (+/-) ←→ Charge (+/-)

3. Weak Force

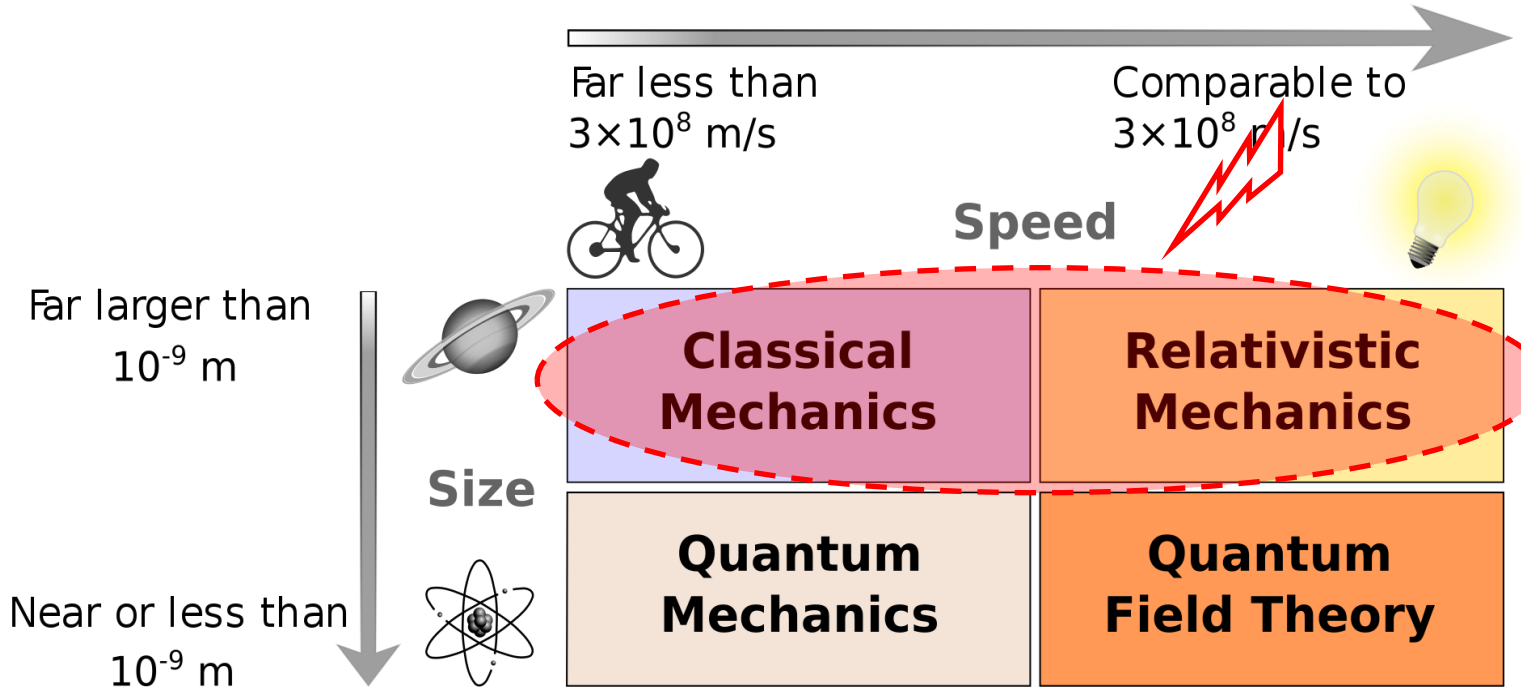
~ Nuclear decay

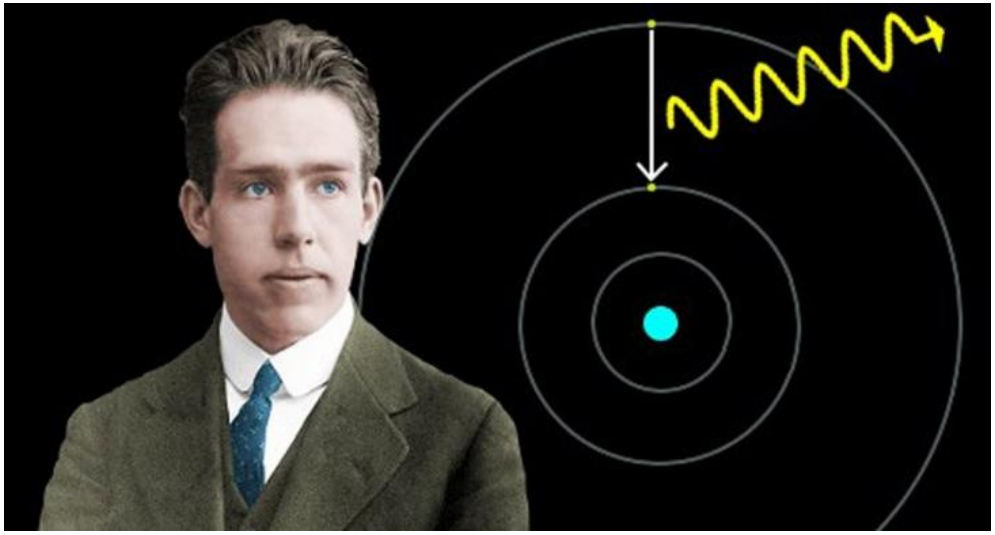
Nuclear → New Nucleus

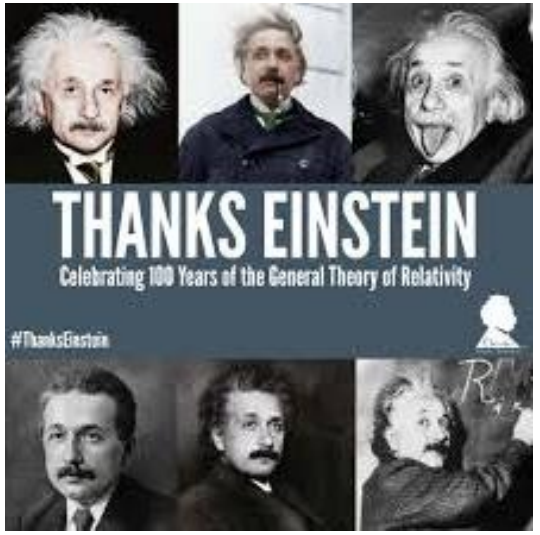
4. Strong Force

Quark ←→ Quark

- "Basic Physics Theory"







3. Introduction of Physics

-So, Classical Mechanics is

→ "Physics" ('Motion') of the **Massive** particles/objects

→ Followed by **Newtonian Laws**

→ Influenced by **Gravitational Force**

What is "Physics 1" ?

For your reference,

❖ Basics of Physics so far,

- Four Fundamental forces in Nature
- Elementary Particles in Nature containing basic properties (i.e. mass, charge, spin, and parity)
- Self-complete, but Not a unified theory(?)

, And Let’s move to Chap 2!