Exam Schedule

Monday 13.01.2025			Tuesday 14.01.2025	
Time	Name		Time	Name
8:00	Noah Rotunno		8:00	Raphael Honoré
8:25	Caspar Gutsche		8:25	Alexis DELEVAUX
8:55	Jan Stanisław Piaskowy		8:50	Léa Collet
9:25	Robin Schubert		9:15	Pilar Suarez Gerona
9:55	Matteo Meneghini		9:40	Matteo Montano
	BREAK		10:05	Pierre Marty
10:35	Gianluca Gumirato			BREAK
11:00	Hippolyte Monroe		10:45	Edouard Sommer
11:25	Nicola Zanotti		11:10	Fabien Heiniger
11:50	Gabriel Palsson		11:35	Caterina Frau
	LUNCH		12:00	Simon de Launoit
13:10	Edward van Klaveren		12:25	Antoine Flanquart
13:35	Emilie Ruckebusch			
14:00	Victor Garbit			
14:25	Lucas Amiot			
14:50	Hugo Barthod			
15:15	Davide Simeone			
	BREAK			
15:55	Igor Morozov			
16:20	Nicolas Albiani			
16:45	Marcin Behrendt			
17:10	Jordan Whittaker			
17:35	Andrea Balán			
18:00	Alberto Morrone			

Exam:

- Exams Date: January 13th and 14th
- Room: CM 013
- Oral – 20 min (+5min to setup) without preparation. Closed book.
- Consists in a course related question and a short exercise
  - ✓ Random choice of 2 exam sheets, pick the sheet you like best

Example:

1. General Question

Diffusion theory for monoenergetic neutrons

(Present the topic, clearly bringing out the principal physical phenomena involved.)

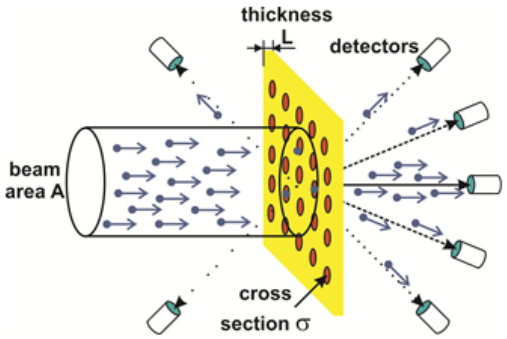
2. Exercise

A beam of 1 MeV neutrons, with an intensity I strikes a gold foil (≈100 % ^{197}Ag, density ρ_{Au}). The thickness of the target is L. The beam has a cross-sectional area A. For 1 MeV neutrons, the total cross-section of ^{197}Ag is σ_t.

(a) What is the interaction rate of the neutrons with the target?

(b) What is the probability that a neutron will suffer a collision while traversing the target?

Assume that the decrease of beam intensity in traversing the target is negligible.



LIST OF GENERAL QUESTIONS:

- Physics of the fission process: probability of interaction, fission products and delayed neutrons
- Neutron lifecycle in thermal and fast system. Use the six-factor formula to explain the key physical phenomena
- Neutron balance equation and diffusion approximation
- Diffusion theory in multiplying media for monoenergetic neutrons

LIST OF GENERAL QUESTIONS:

- Multigroup theory diffusion theory and application to LWR reactor modelling
- Neutron slowing down via elastic scattering and implications for LWR reactors
- Energy and space self-shielding; impact for reactor design / operation

LIST OF GENERAL QUESTIONS:

- Point reactor kinetics
- Role of delayed neutrons during normal reactor operation and accidents. Comments on reactivity feedbacks during accidents
- Short-term variations of reactivity in a power reactor (effects occurring within a time-scale of seconds to minutes) and their impact on safety
- Long-term reactivity variations in a power reactor and their impact on control system design
- Reactivity feedback in liquid metal cooled reactors

LIST OF GENERAL QUESTIONS:

- Design of a (PWR/BWR) and its components
- Design of a Liquid metal Fast Reactor and its components
- Breeding and transmutation in nuclear reactors
- Design of Gas Cooled Reactors and their components
- Design of Channel type Reactors and their components

- Skip exercise

- Two general questions:

1. Role of delayed neutrons during normal reactor operation and accidents. Comments on reactivity feedbacks during accidents

2. Design of a PWR and its components

Mock Up Exam 2

- Skip exercise

- Two general questions:

1. Design of a Sodium Fast Reactor and its components

2. Neutron slowing down via elastic scattering and implications for LWR reactors

Mock Up Exam 3

- Skip exercise

- Two general questions:

1. Breeding and transmutation in nuclear reactors

2. Neutron balance equation and diffusion approximation