

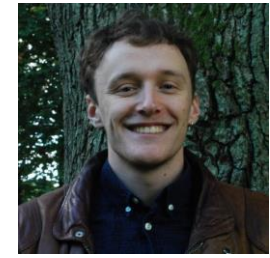
**Filip Agert**

Newcomer's day IJCLAB

# Who am I?

- From Lund in southern Sweden.
  - Got my master's degree at Lund University.
- Current interests:
  - Salsa
  - Volleyball
  - Rugby
  - Nuclear physics

Me

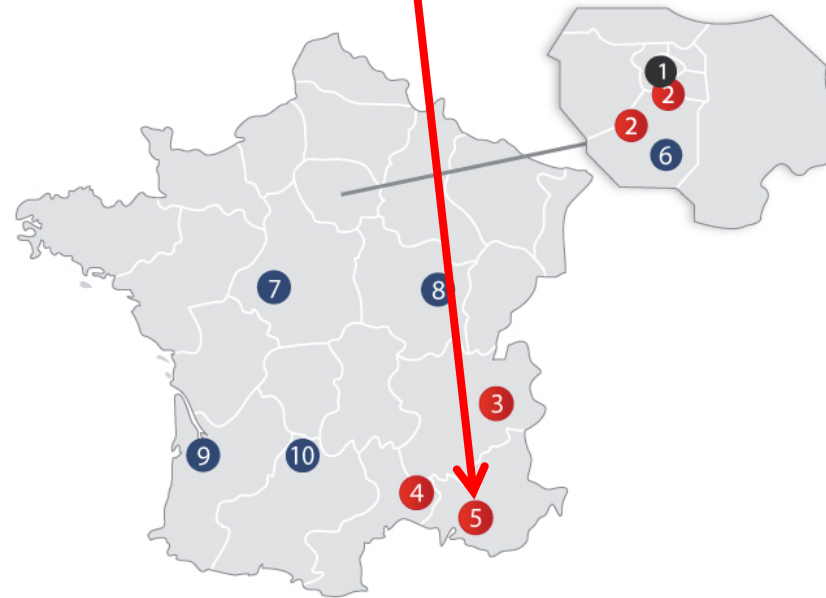


Lund



# Joint PhD project Cadarache & IJCLAB

- To spend my first 1.5 years at **CEA Cadarache**.
  - Started there in fall 2025.
  - To arrive at **IJCLAB** spring 2027.
  - PhD co-supervised by:
    - M. Frosini
    - G. Hupin
    - U. van Kolck



1 SIÈGE SOCIAL

#### CENTRES D'ÉTUDE CIVILS

- 2 Paris-Saclay établissements de Fontenay-aux-Roses et de Saclay
- 3 Grenoble
- 4 Marcoule
- 5 Cadarache

#### CENTRES POUR LES APPLICATIONS MILITAIRES

- 6 DAM Ile-de-France
- 7 Le Ripault
- 8 Valduc
- 9 Cesta
- 10 Gramat

# The PhD project

- Apply effective field theories (EFTs) to np scattering.
- Motivated due to large sensitivity of nuclear reactor observables (like  $\beta_{\text{eff}}$  or  $k_{\text{eff}}$ ) to neutron+proton elastic scattering observables.
- Predict observables and uncertainties (statistical and theoretical) using pionless EFT.

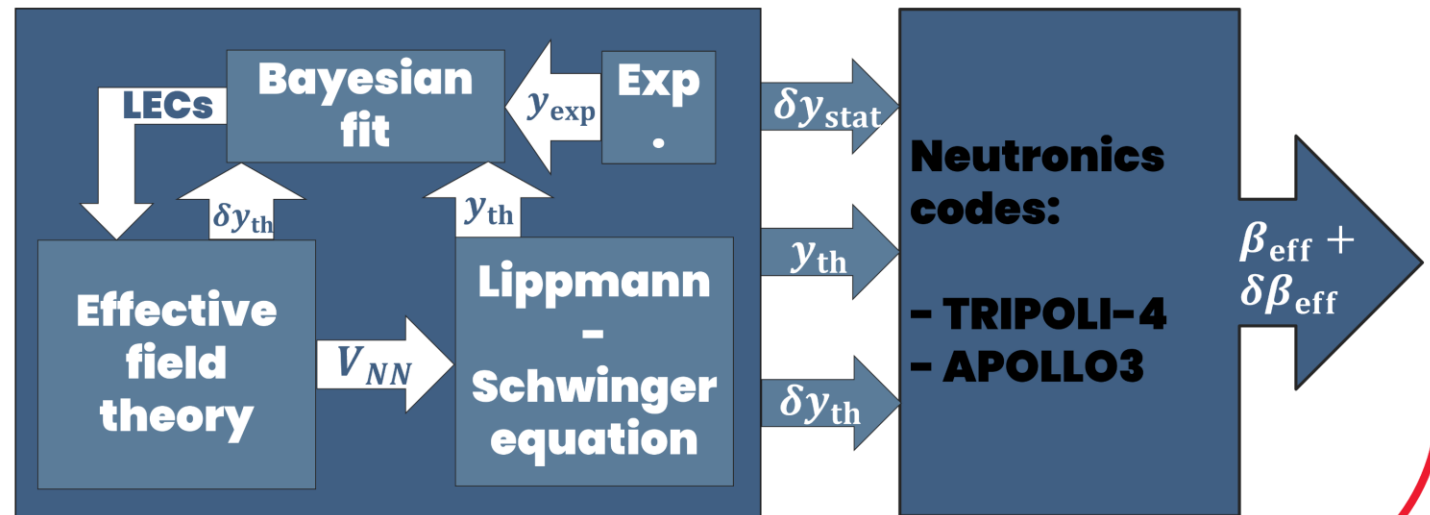
## FUTURE WORK:

- $n + {}^3\text{Li}$  ?
- $n + \alpha$  ?
- $n + p \rightarrow d\gamma$  ?
- $\chi$ -EFT in many-body systems.

## Motivation & workflow

Isotope	Capture	Elastic	...	TOTAL
${}^1\text{H}$	0.04	<b>0.14</b>	...	0.15
${}^{16}\text{O}$	0.05	0.08	...	0.10
⋮	⋮	⋮	⋮	⋮
${}^{235}\text{U}$	0.04	0.00	...	2.23
${}^{238}\text{U}$	0.01	0.00	...	0.60
TOTAL	0.16	0.16	...	2.39

**Uncertainty propagation (%) to  $\beta_{\text{eff}}$  for various  $n + {}^A\text{X}$  reactions [4].**



**THANK YOU!!**



**Looking forward to seeing you all upon my arrival :)**