

Welcome to EDMs2026

**WE-Heraeus International Workshop
Complementary Experiments and Theory Connections**



Guillaume Pignol, Stéphanie Roccia, Skyler Degenkolb

Ecole de physique des Houches



Created in 1951 by the French theoretical physicist Cécile DeWitt-Morette.

She was then a 28 years old postdoc at Princeton, US.

8 weeks summer course in physics for ~30 international students

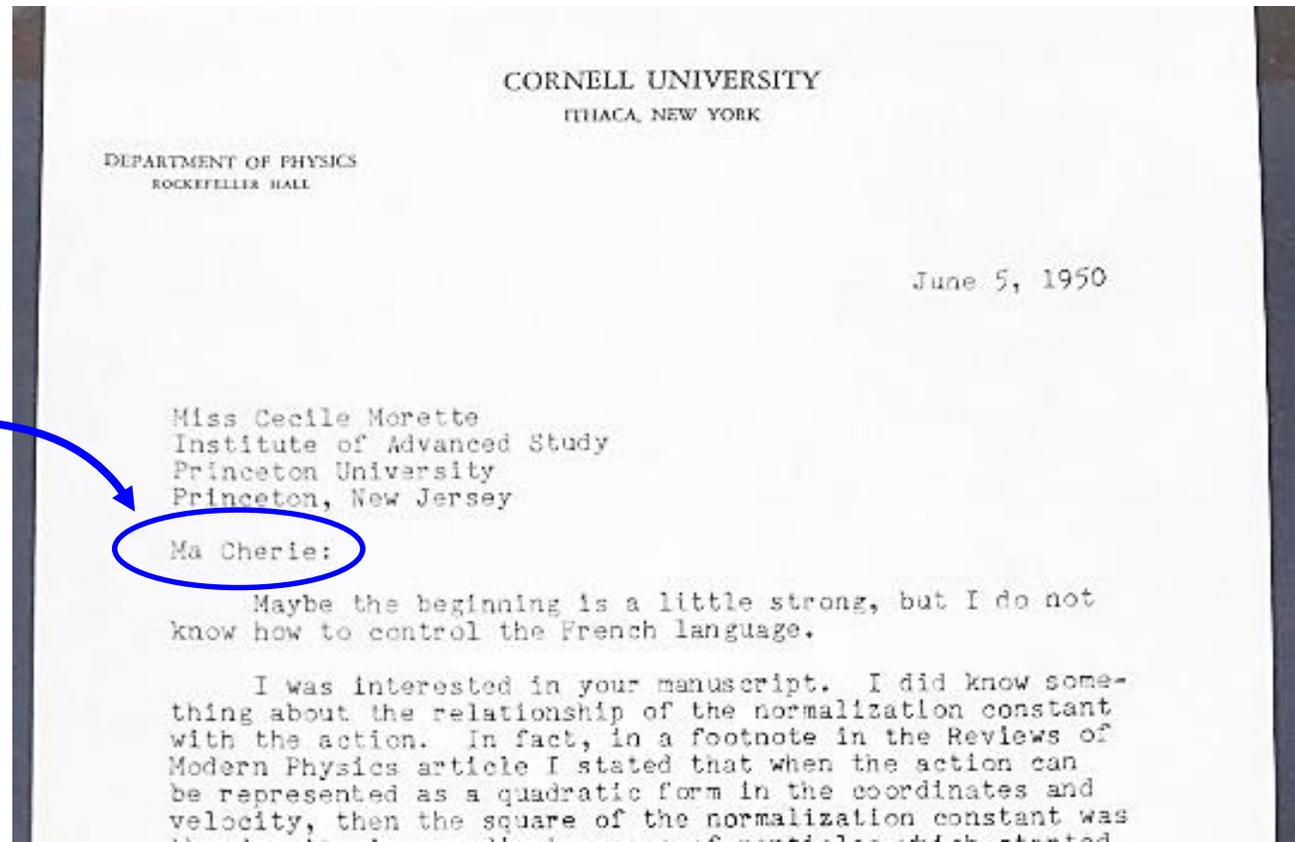


Cécile DeWitt-Morette



Mathematical physicist, she developed the path integral formalism invented by Richard Feynman

Feynman, faking to ignore the meaning of French in his correspondence with Cécile Morette



Famous lectures, early years

1951 – Quantum mechanics
L. Von Hove

1952 – Time reversal
W. Pauli

1953 – Quantum theory of solids
R. Peierls

1954 – Advanced quantum mechanics
F. Dyson

1955 – Quantum mechanics
J. Schwinger

1955 – Interaction of a nucleus with at. and mol. fields
N. Ramsey

1956 – Theory of low temperature physics
J. Bardeen

1957 – Strange particles
A. Salam



Recollection



Fermi and Von Hove in 1954



Cohen-Tannoudji in 1964



Feynman in 1976

WILHELM UND ELSE HERAEUS-STIFTUNG



This workshop is supported by the Wilhelm and Else Heraeus-Foundation.
Many of you are invited.

Some of you have to pay modest fees.

You have to go to the reception office before Wednesday noon.

Some information



- Rooms: we have to leave the rooms before Friday 9h00.
In case of emergency: (+33/0)6 789 852 40.
- For any mountain or touristic information, please contact Isabel or Patrick

In this building (Cécile DeWitt):

Coffee and tea are free. Please **wash your cup/glass/spoon**

Cold drinks cost 1€: please record what you take on the list by your name, and pay for them before leaving at the reception office.

No drinks in the lecture hall please.

Some important information



Breakfast 7h45 – 8h45

Lunch at 12h30 possible to have a picnic instead, registration needed

Dinner at 19h30

@ session chairs: make sure we are on time!

Welcome drink Today at 7pm at the restaurant

Sklyer

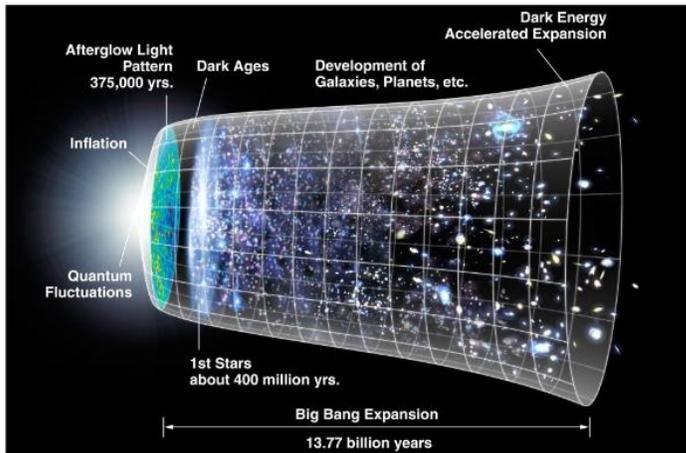
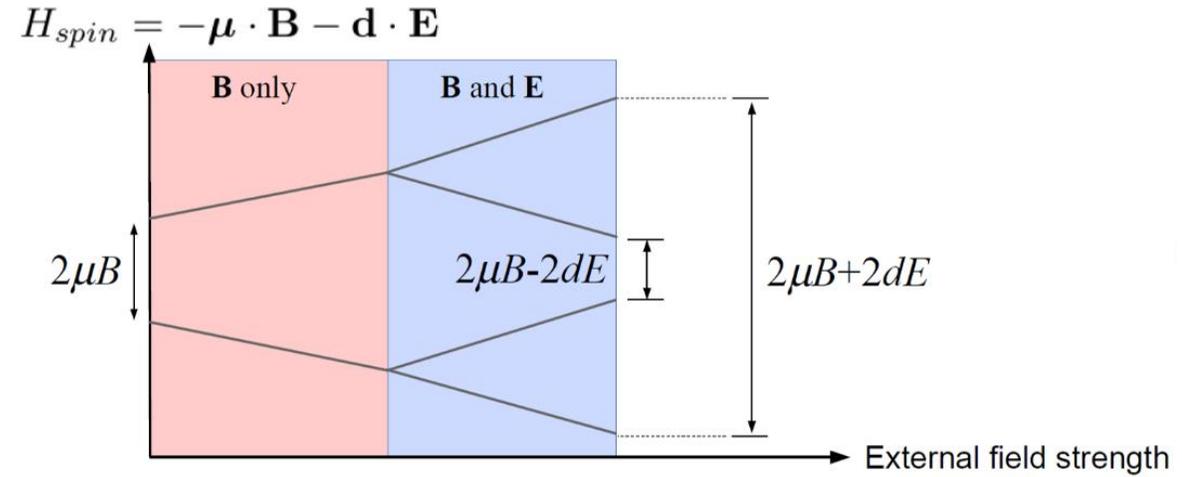
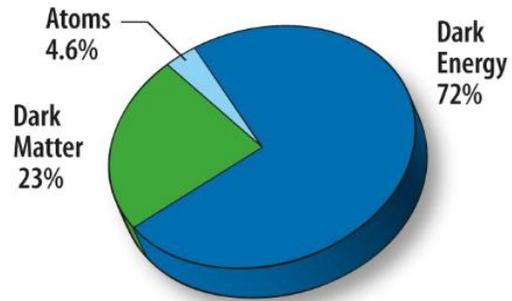


Stéphanie

Guillaume

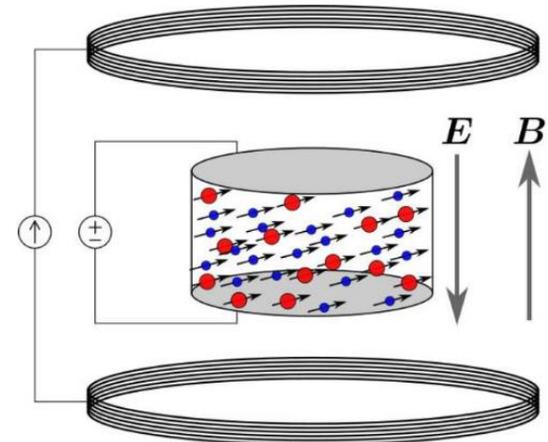
Skyler

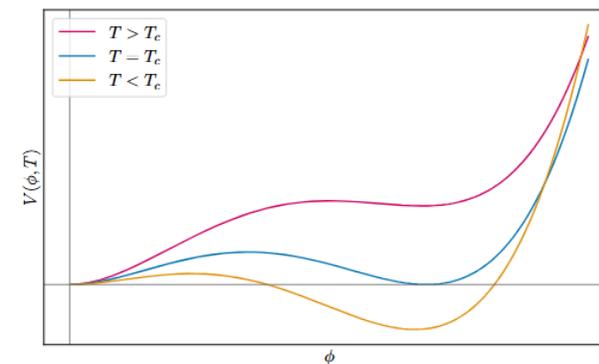
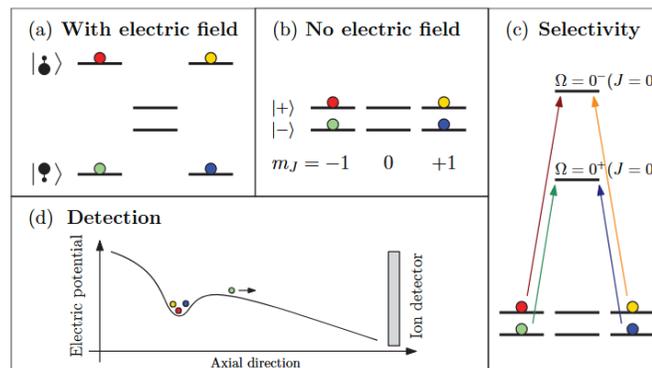
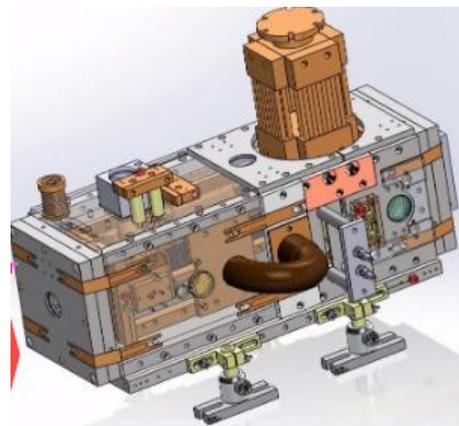
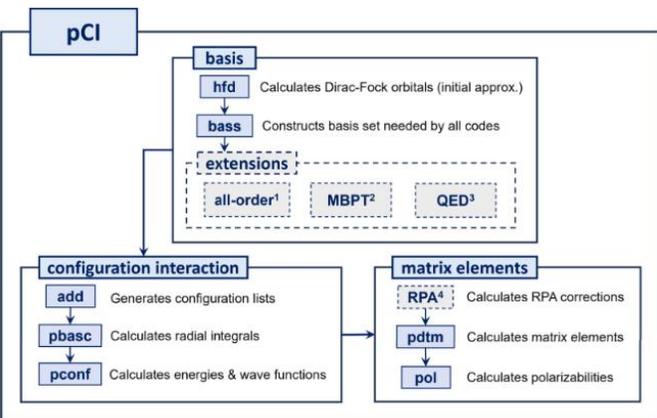
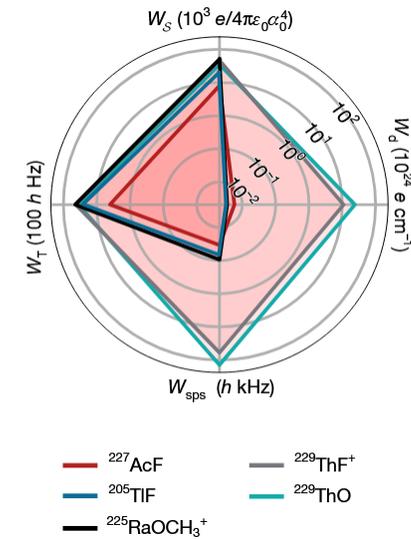
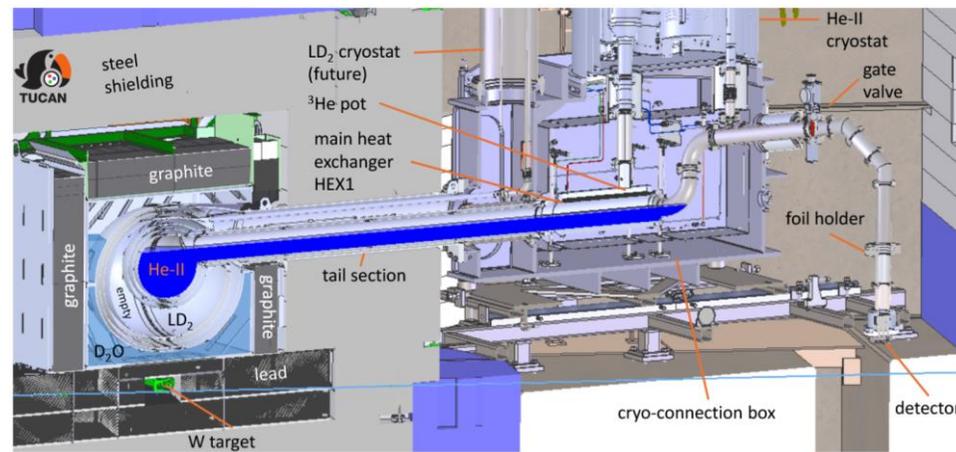
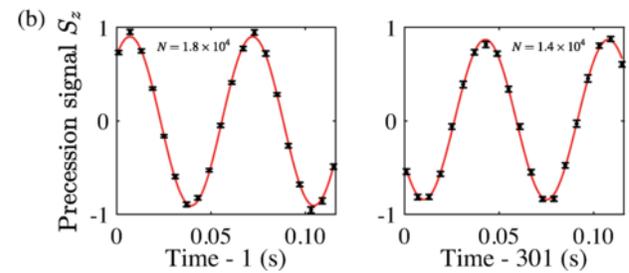
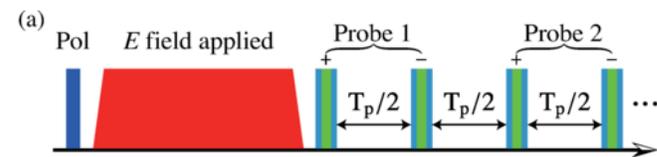
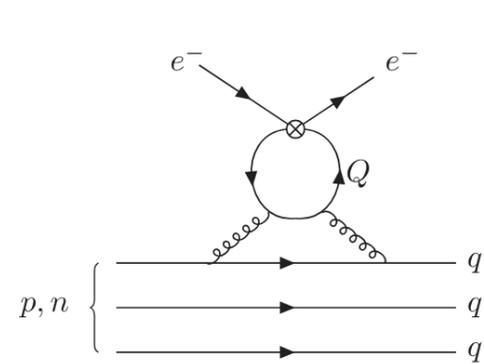
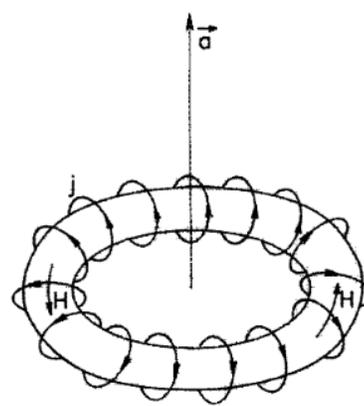
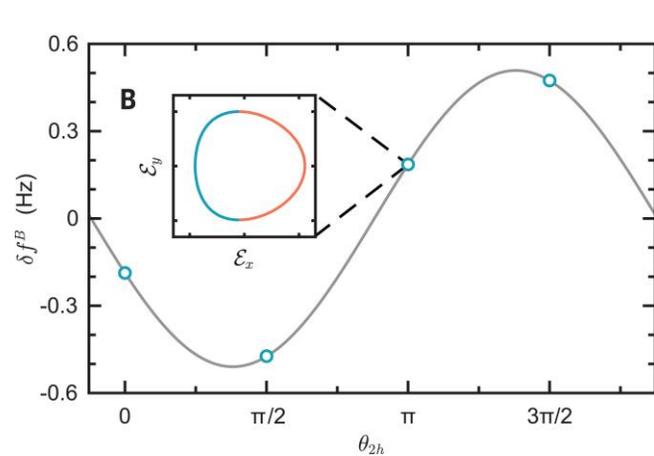
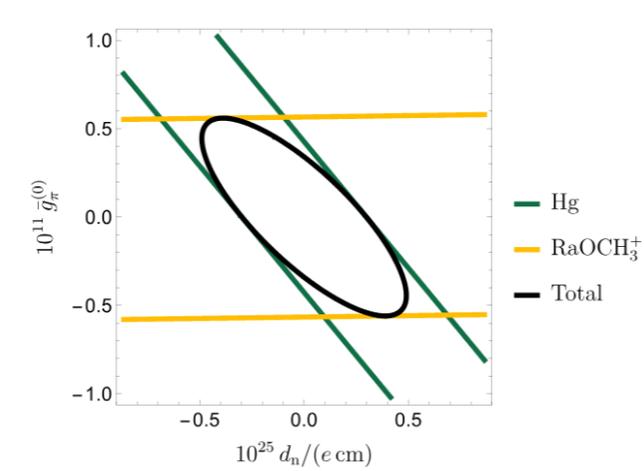
What we "know"

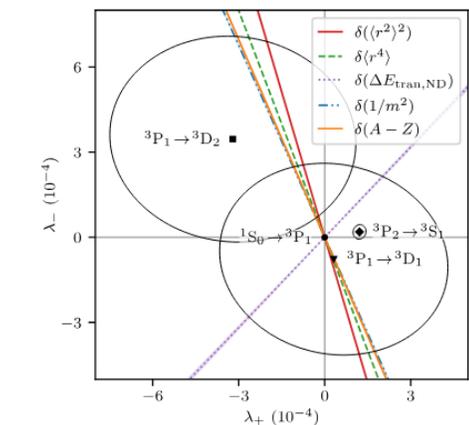
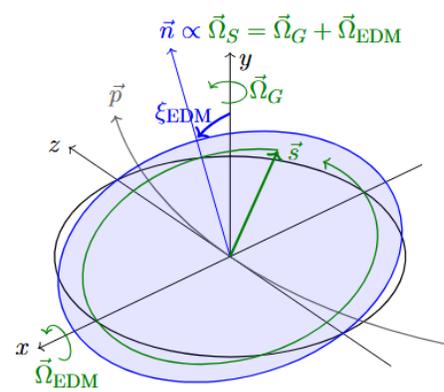
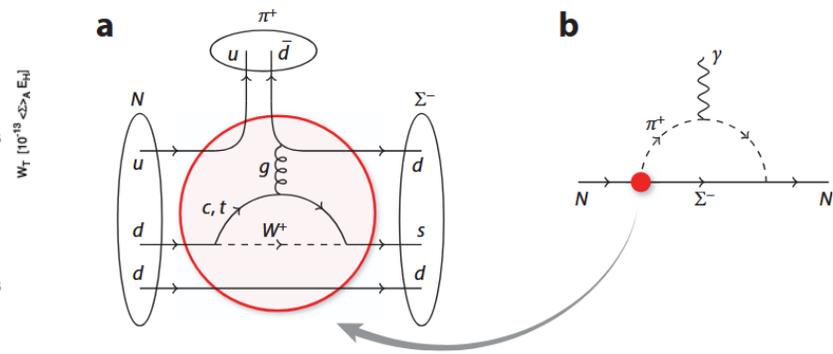
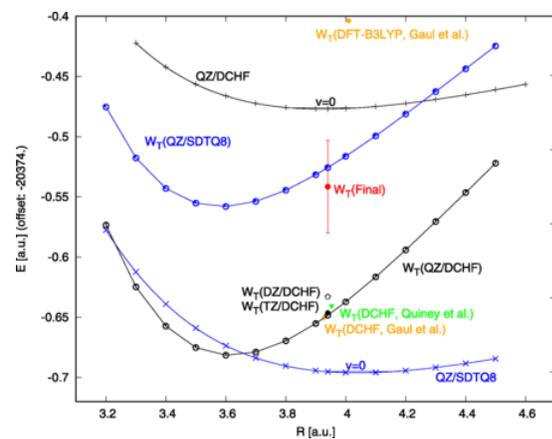
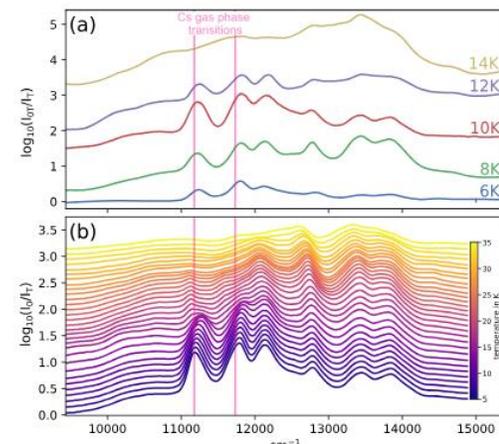
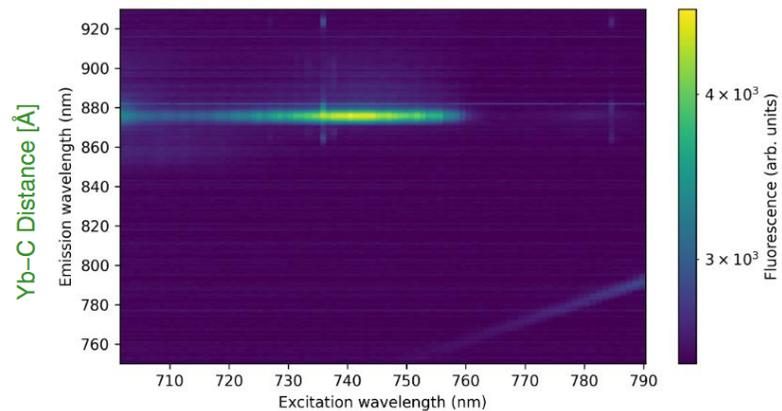
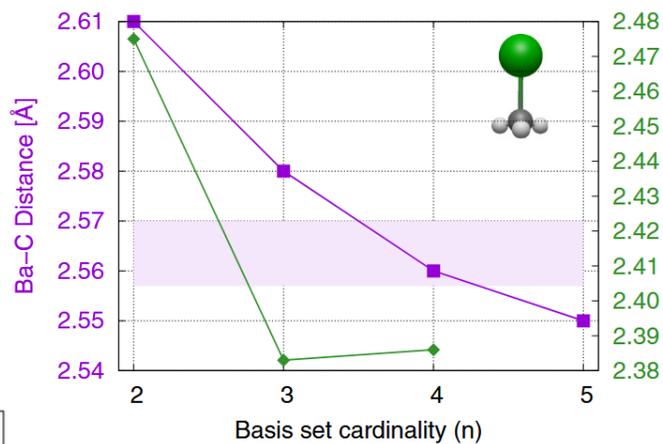
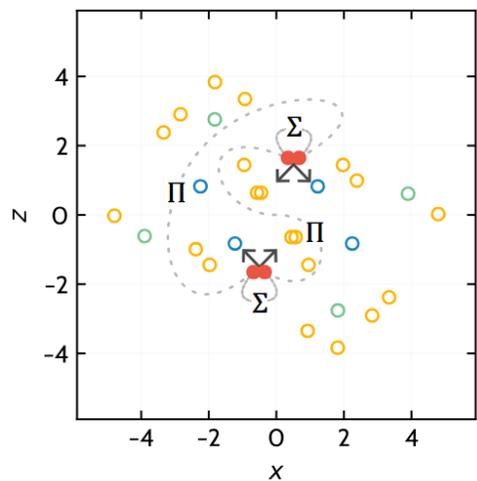
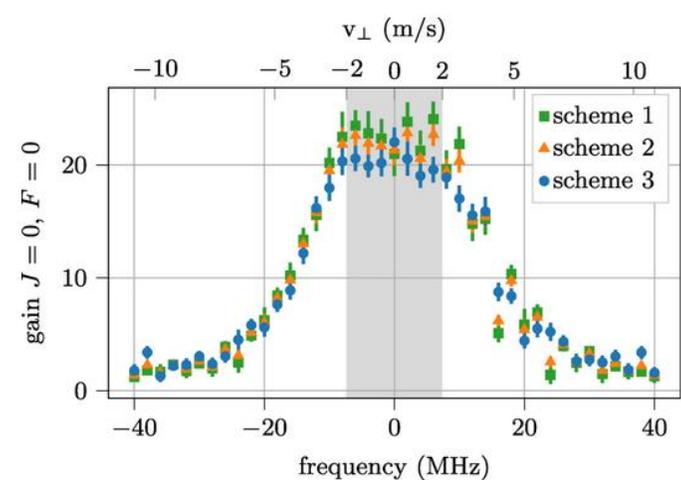
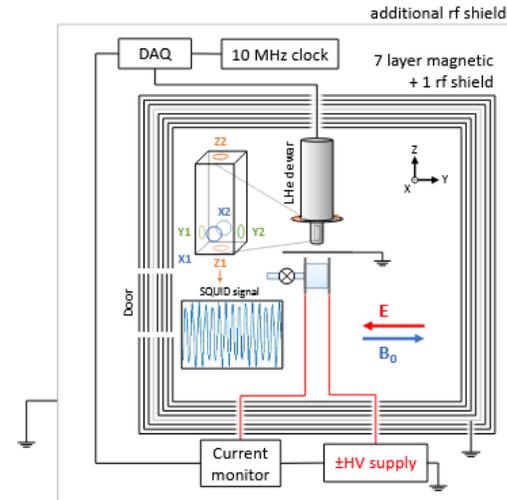
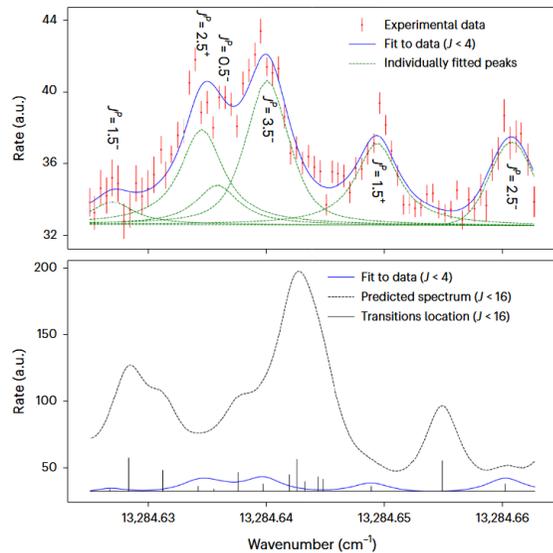
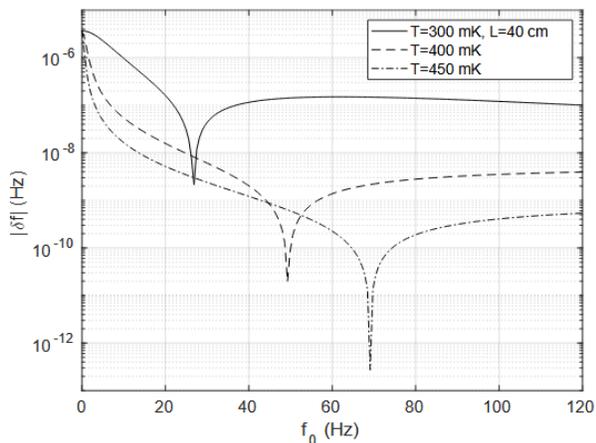


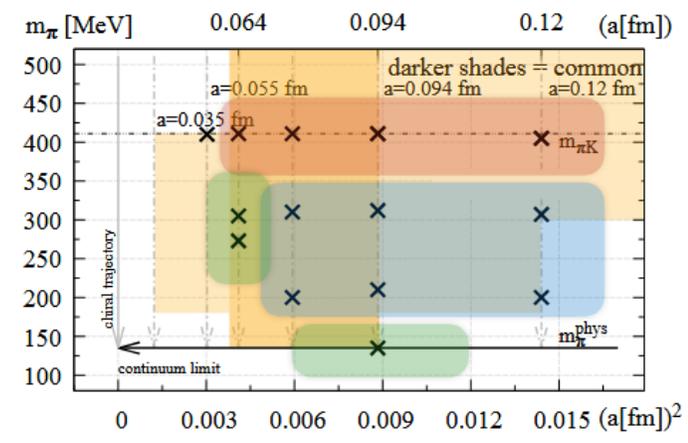
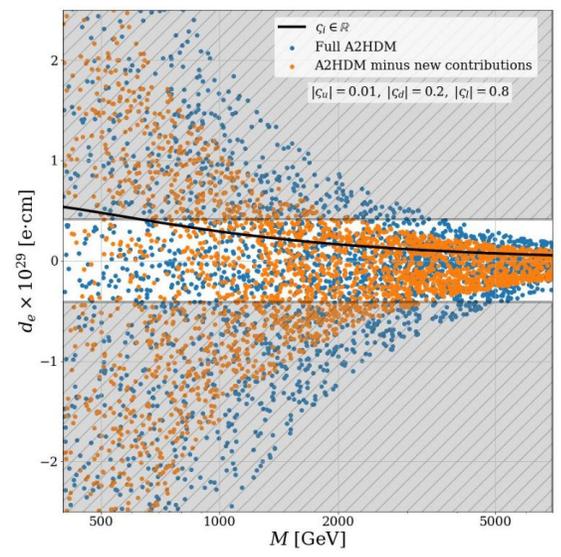
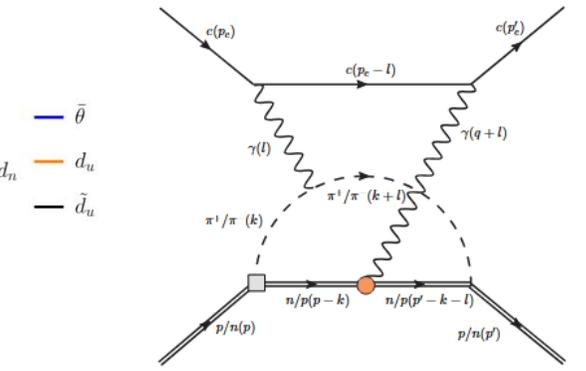
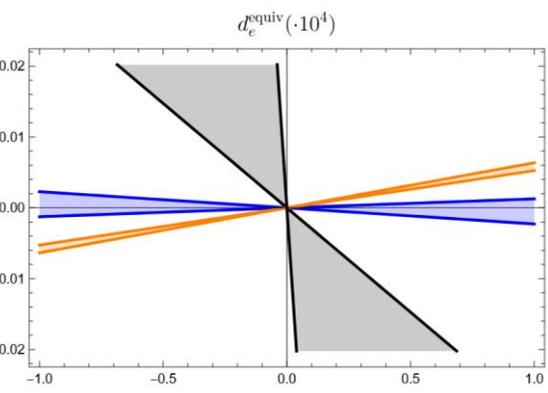
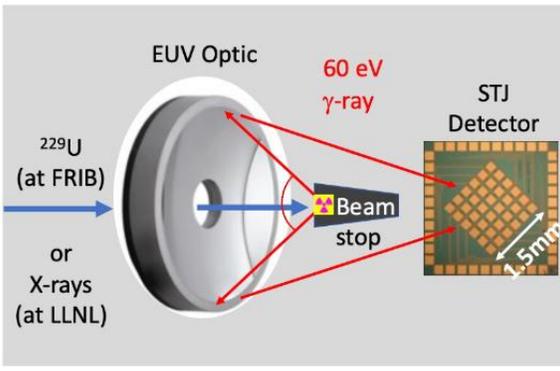
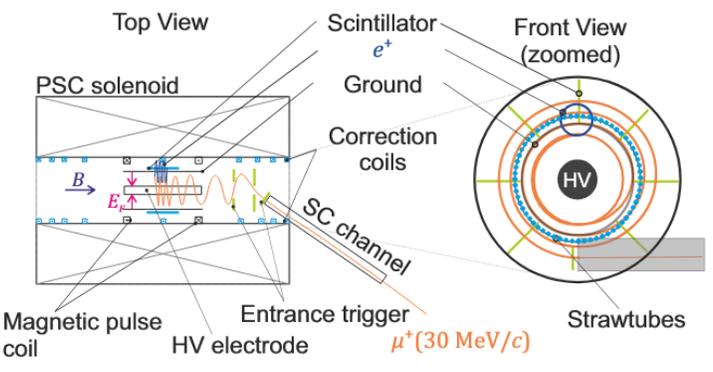
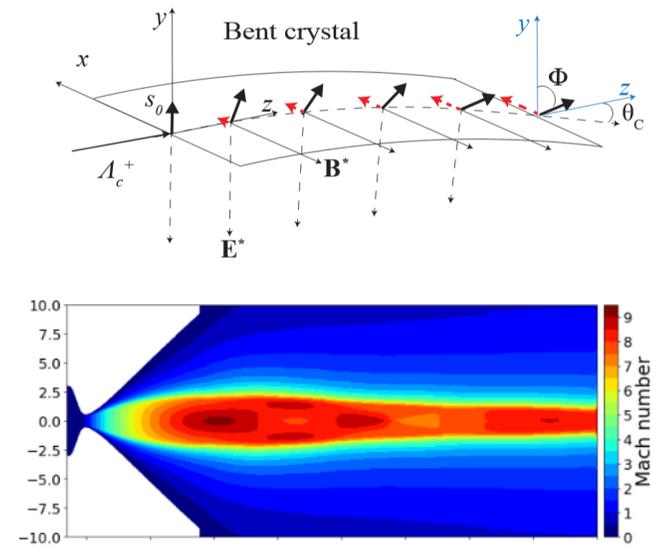
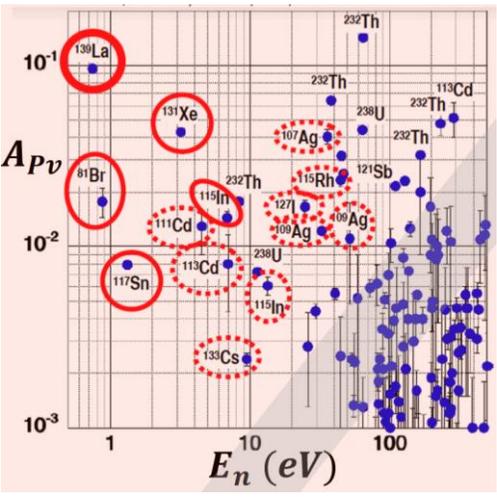
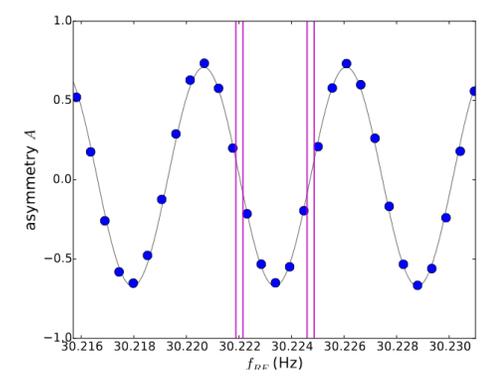
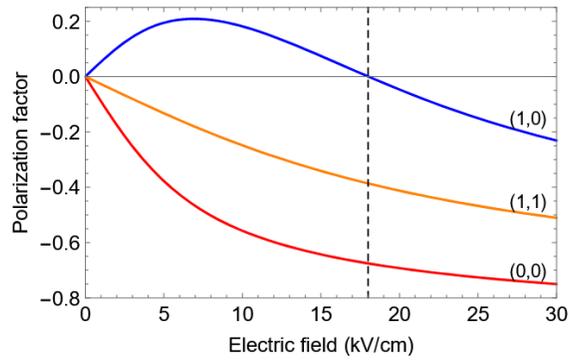
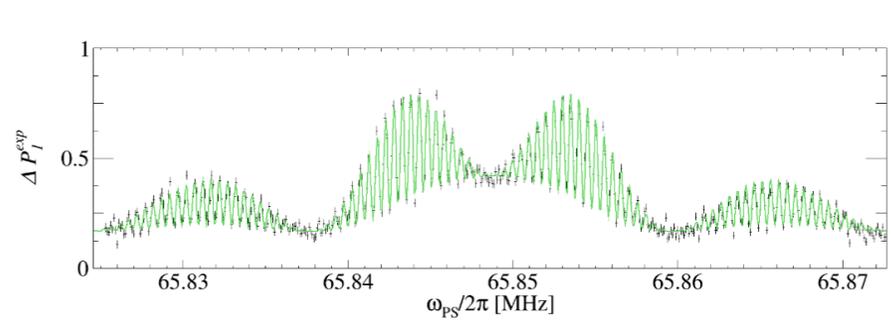
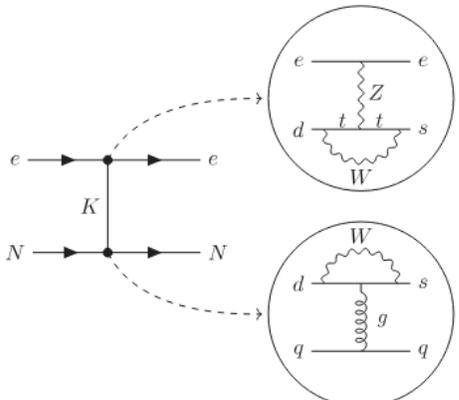
$$\hbar(\omega_+ - \omega_-) = 4dE$$

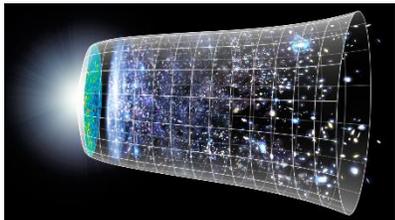
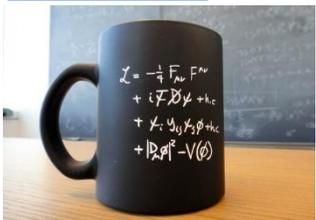
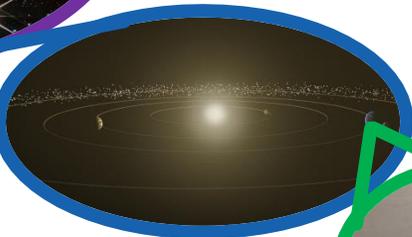
...up to drift, gradients, etc.











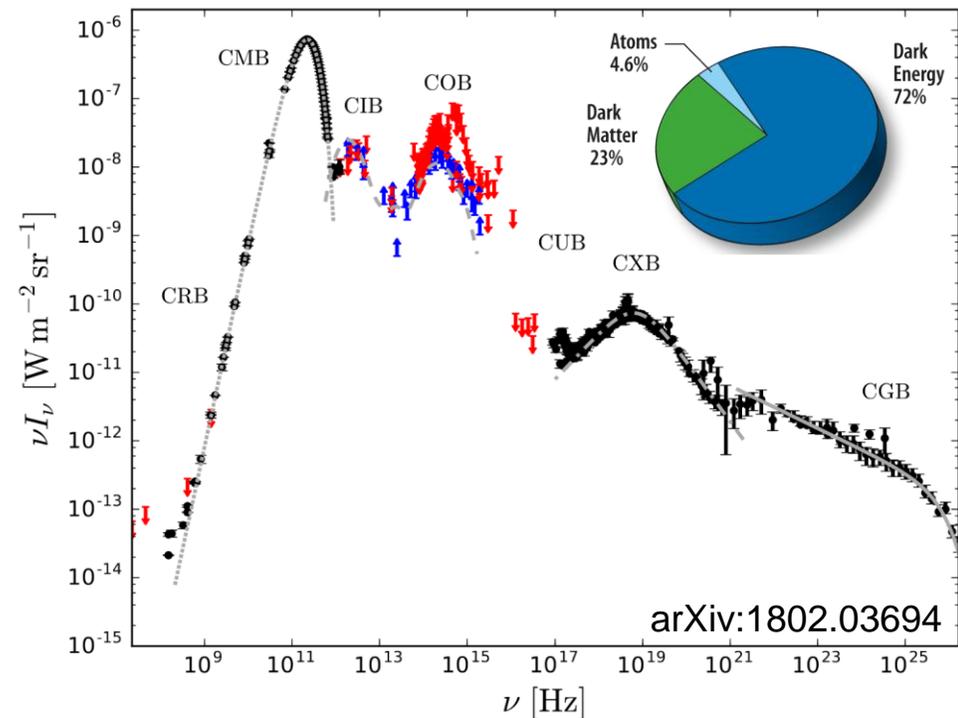
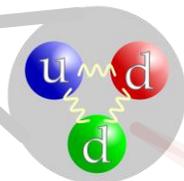
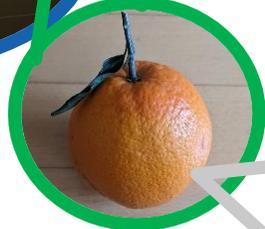
Observed photon density (CMB):

- $n_\gamma \approx 411 \text{ cm}^{-3}$

Baryon density and asymmetry:

- $n_B \approx 6 \times 10^{-10} n_\gamma$

More recently on
EWBG and related
issues: [arXiv:2508.09989](https://arxiv.org/abs/2508.09989)



Sakharov criteria for Baryogenesis:

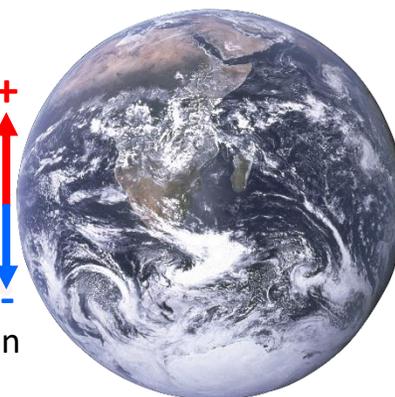
1. B non-conservation
2. **C and CP violation**
3. Far from thermal equilibrium

$$\mathcal{L}_{\text{fermion}} = -\frac{\mu}{2} \bar{\psi} \sigma^{\mu\nu} F_{\mu\nu} \psi - i \frac{d}{2} \bar{\psi} \sigma^{\mu\nu} \gamma^5 F_{\mu\nu} \psi$$

MDM

EDM

neutron (enlarged)



EDM separation
< 1 μm

Strong CP problem:

- $|d_n| < 10^{-26} \text{ e}\cdot\text{cm}$ (measured)
- implies $|\theta_{\text{QCD}}| < 10^{-10}$ (too small)

$$H_{\text{spin}} = -\boldsymbol{\mu} \cdot \mathbf{B} - \mathbf{d} \cdot \mathbf{E}$$

Exercise for the reader: does "dipolar" H_2O have an EDM?

Enjoy EDMs2026



Stéphanie

Guillaume

Skyler



Dimanche 01

APRÈS-MIDI Eclaircies	SOIRÉE Peu nuageux	NUIT Ciel clair
6°	3°	0°
↻ 0 km/h	↻ 5 km/h	↻ 5 km/h

DIMANCHE 01 3° / 11° ↻ 5 km/h	LUNDI 02 -1° / 11° ↻ 5 km/h	MARDI 03 -2° / 12° ↻ 5 km/h	MERCREDI 04 -2° / 13° ↻ 5 km/h	JEUDI 05 -3° / 18° ↻ 5 km/h	VENDREDI 06 2° / 15° ↻ 5 km/h	SAMEDI 07 0° / 14° ↻ 5 km/h
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