

Assemblée générale ENIGMASS2

Accueil de visiteurs

Benoit Clément

Academic visitors

Academic visitors have been financed by Enigmass for short stay in one of our labs

- Total available financing within the ENIGMASS2 project : 15000€
- Typical visitor financing 1500 to 3000 euros per visitor
- No call for application, proposals are treated as they arrive

In 2022-2023 :

- Wolfgang Waltenberger (Sabine Kraml, LPSC) : 3000€
- Mathieu Guigue (Guillaume Pignol, LPSC) : 1500€
- Anton Kuncinas (Geneviève Bélanger, LAPth) : : 3000€
- Daysi Quinatoa Chuquitarco (Juan Macias-Perez, LPSC) : 1500€
- Antonio Riotto (Pasquale Serpico, LAPth) : visite annulée

No request from LAPP... but there is still some budget available

Wolfgang Waltenberger



Visiting professor, LPSC theory group, April-May 2022

→ 1 month financed by UGA, 1 month financed by ENIGMASS

Subject: new approaches to elucidating new physics at the LHC

- * Colloquium on “Statistically Learning the Next Standard Model from LHC Data”, 19 May 2022 [\[slides & recording available\]](#)
- * Visit gave rise to a month-long workshop-style meeting in the LPSC theory group

LPSC : Gaël Alguero, Sabine Kraml, Timothée Pascal, Ingo Schienbein

External: Mohammad Altakach, Jack Araz, Andy Buckley, Jon Butterworth, Johnathon Gargalionis, Andre Lessa, Humberto Reyes Gonzalez, Sezen Sekmen, WW, Jamie Yellen



Wolfgang Waltenberger



Visiting professor, LPSC theory group, April-May 2022

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Publications, grants, and other outcomes:

- ANR PRCI “Statistically learning dispersed new physics at the LHC” (SLDNP)
 - postdoc of M.M. Altakach (3 yrs, ANR)
 - thesis of T. Pascal (UGA, IDEX)
 - *Strength in numbers: optimal and scalable combination of LHC new-physics searches*, [arXiv:2209.00025](https://arxiv.org/abs/2209.00025), SciPost Phys. 14, 077 (2023)
 - *SModelS v2.3: enabling global likelihood analyses* [arXiv:2306.17676](https://arxiv.org/abs/2306.17676), to appear in SciPost Phys.
 - *Artificial Protomodelling v2* (in progress)
- New collaborations with J. Araz (IPPP), A. Buckley (Glasgow) and J. Butterworth (UCL)
 - Development of computational tools
 - Fully Open Science: all codes public on GitHub

Anton Kunčinas

PhD student, Lisbon



Topic : Dark matter production in models with S_3 symmetry

Genevieve Bélanger (LAPTh), Anton Kunčinas (Lisbon), Gui Rebelo (Lisbon), Per Osland (Bergen)

Goal: exploring DM phenomenology in models that go beyond simple WIMP dark matter

Three Higgs Doublet model offers many possibilities depending on the additional symmetry imposed and the nature of the vacua

- Determine which models can accommodate multi-component dark matter and/or semi-annihilation and/or link to baryogenesis.
- General classification of possible models done.

2 month visit of Anton in Annecy mid-january-mid march 2023

(1 month ENIGMASS, 1 Month Lisbon)

- ➔ allow to make significant progress on the project.
- ➔ work in progress

Mathieu Guigue

MCF Sorbonne Université







Context: basic studies of spin relaxation, related to the quantum co-magnetometer of the n2EDM experiment.

2 weeks in March and July 2022

Participation (data taking and analysis) of a dedicated experiment performed at the L4M (Laboratory for the Measurement of the Mercury-199 Magnetic Moment) at LPSC

PHYSICAL REVIEW A **106**, 062815 (2022)

Determination of diffusion coefficients of mercury atoms in various gases from longitudinal spin relaxation in magnetic gradients

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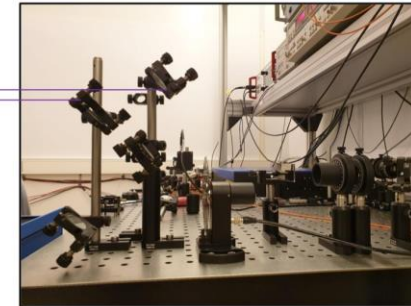


(Received 12 September 2022; accepted 5 December 2022; published 19 December 2022)

We present a method to measure the binary diffusion coefficient of mercury atoms in a gas at room temperature and low pressure. It is based on the measurement of the longitudinal spin relaxation of optically pumped mercury-199 atoms in a magnetic field gradient. We provide a consistent set of diffusion coefficients for helium-3, helium-4, argon, krypton, xenon, nitrogen, carbon dioxide, oxygen, and air.



Magnetometry tests: ^{199}Hg



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Daysi Quinatoa Chuquitarco

Phd Student, Valparaiso

Topic : development of the calibration pipeline and data analysis of galaxy clusters for the CONCERTO project

- Visit from mid-February to mid-March, 2023 (half paid by ENIGMASS)
- Production of tools useful for the collaboration : first version end-to-end calibration on planetary data, taken during observation whose Daysi was responsible.

