# Dr. Rita Sadek Finot

## Researcher

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Date of birth : 23/08/1996
Spoken languages : french (*native*), arabic (*native*), english (*fluent)*

## Education

*2019 – 2022* **Ph.D., Physics,** Subatech (Laboratoire de physique subatomique et des technologies associées), France

*2017 – 2019* **M.S., Subatomic Physics and Cosmology,** Grenoble Alpes University, France *(graduated with high honours)*

*2014 – 2017* **B.S., Physics,** Lebanese University, Lebanon *(graduated with highest honours)*

## Awards

*2023* **ALICE thesis award,** granted by the ALICE collaboration (LHC, CERN)

*2017* **Excellence award,** granted by the Lebanese University
Head of class throughout entire physics degree

## Experience

*12.2022 – present* **Postdoctoral researcher, LHCb group, LLR, École Polytechnique, Palaiseau (France)**
**Luminosity measurement for Run 3 with LHCb (LHC, CERN)**

- Preparation of all analysis machinery to provide offline luminosity measurement in ongoing data-taking period (Run 3), required for ~ 15 % of LHCb publications.
- Developer of automatized data-processing algorithm for Run 3.
- Shift Leader for the LHCb (responsible for operations and good data-taking conditions).
- Data analysis performed for van der Meer fills, cross-sections per counters provided.

*11.2019 – 10.2022* **Ph.D. student, ALICE group, Subatech, Nantes (France)**
**Installation, commissioning, and preparation of the Muon Forward Tracker toward Run 3 data analysis with ALICE (LHC, CERN)**

**I) Slow control of the Muon Forward Tracker (MFT) detector:**

- Developer of the MFT detector slow control (powering, monitoring and safety procedures) software for the commissioning.
- Developer of the official Run 3 software to fully monitor, power and control the MFT detector: running throughout the whole Run 3 period at ALICE cavern (24h/7).

**II) Track reconstruction with machine learning for ALICE muon analysis in Pb-Pb collisions:**

- Pioneer and developer of machine learning algorithms to improve the track matching between the MFT and MCH: best performance achieved compared to other methods.
- Responsible for machine learning applications and integration in the official ALICE framework.

**III) Muons vertex reconstruction for ALICE muon analysis:**

- Developer of the muon tracks vertexing algorithm in the forward rapidity region: approved by the collaboration and officially integrated in the ALICE Online-Offline computing farm.

**IV) Quality assessment of Run 3 simulations and analysis tools preparation:**

- Analysis of the impact of fake matching and detector resolutions on physics observables.
- First separation of prompt and non-prompt J/ψ contributions performed in official Run 3 simulations of proton-proton (pp) collisions at 13 TeV.

In addition, prepared and commissioned the MFT detector on-site (about 2 months at CERN), and participated in shifts (LHC data-taking period) with the role of MFT expert.

*03.2019 – 07.2019*

**Laboratory internship, ALICE group, LPSC, Grenoble (France)**
**Charmed hadrons reconstruction in jets with ALICE in pp collisions (LHC, CERN)**

- Investigation of the hadronization process of charmed quarks in pp collisions at the LHC through the study of Monte-Carlo generators.
- Analysis of baryon-to-meson ($\Lambda_c/D^0$) production in jets, underlying events and inclusive particles.

*05.2018 – 07.2018*

**Laboratory internship, ALICE group, LPSC, Grenoble (France)**
**Charmed baryons study in the ALICE experiment (LHC, CERN)**

- Work on single particle measurements (charmed bayon $\Lambda_c$) in pp collisions at 13 TeV.
- Signal extraction of reconstructed charmed hadrons and improvement of its significance, followed by a study to find the best Particle Identification strategy.

*2014 – 2017*

**Private tutoring for high school students, Lebanon**

- Physics, mathematics, and chemistry subjects.

# Computer skills

*Programming languages*

**C, C++ (ROOT), Python, R, SQL, Octave, Matlab, LaTeX**

*Software engineering*

**Version control (Git), unit testing, continuous integration**

# Research activity

*Presentations*

Numerous presentations in weekly collaboration meetings, plenaries, and talks

*Conferences*

**Strangeness in Quark Matter** (International conference – 2022)
- Presentation in parallel session: *Quarkonia production and elliptic flow in small systems measured with ALICE*

**GDR-QCD** (*National workshop* – 2021)
- Invited presentation: *High mass dilepton measurements with ALICE at the LHC*

**Seminar at Subatech** (2021)

- Presentation: *Commissioning of the Muon Forward Tracker and preparation of Run 3 data analysis (LHC, CERN)*
**QGP France** (National conference – 2023,2021,2020)
- Invited presentations: *Luminosity measurement at the LHCb (2023), Commissioning of the Muon Forward Tracker and preparation of Run 3 data analysis (2021-2020)*
**JED 3M Le Mans** (2020)
- Presentation: *Installation and commissioning of the Muon Forward Tracker detector*

*Lectures* Teaching courses for engineering students in IMT Atlantique (3 semesters)

*Supervision* Bachelor internship co-supervisor, Probability-Generating Function for luminosity measurement in LHCb (6 months)
Master internship co-supervisor, performance study for matching with machine learning with ALICE experiment (2 months)

*Outreach* Scientific outreach at Le Before du Congrès Général des 150 ans de la SFP, Scientific presentation for the 50 years of IN2P3, organization of hands-on hackathon for ALICE muon matching with machine learning, chair of plenary session for ALICE week, co-organization of CERN Masterclass at IMT Atlantique

*Publications* **Muon Forward Tracker commissioning and preparation for Run 3 data analysis with ALICE (LHC, CERN) –** (https://theses.hal.science/tel-04008085)

**ALICE Long Shutdown 2 Upgrade paper –** (arXiv:2302.01238)

**Exploring the non-universality of charm hadronisation through the measurement of the fraction of jet longitudinal momentum carried by $\Lambda_c$ baryons in pp collisions –** (arXiv:2301.13798)

*Proceedings* **Quarkonia production and elliptic flow in small systems measured with ALICE –** SQM 2022 proceeding (https://doi.org/10.1051/epjconf/202327602010)

*Internal notes* **The MFT Power Supply Unit –** ALICE internal note

**ALICE MFT Detector Control System –** MFT internal communication

**Manual for Power Supply Unit control –** MFT internal communication

# References

**Gines Martinez [ gines.martinez@subatech.in2p3.fr ]**
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