Bonne continuation, Geneviève

De beaux souvenirs à Annecy

My first postdoc was at LAPTh, with Geneviève and Fawzi. I came from a very different place, culturally, and somehow felt at home almost immediately.

I remember telling Geneviève once, "I'd work over the weekend and show you some preliminary results on Monday."

Geneviève replied, in her typical way: **"Shankha, you don't work on weekends. You hike on weekends."**

That small, simple sentence changed something in me. It made me realise what work-life balance looks like. Something so normal, yet something I had hardly seen before.

One of her comments that still makes me laugh: "Your female friends always seem to be cooking for you, whichever city you visit." 😄 (Not quite true, as those friends would testify! Please do, if you are in the audience. I can't defend myself as I am not around.)

Une petite phrase, de grandes randonnées

I started hiking in Europe and slowly fell in love with the mountains. One of the key inspirations was what Geneviève had said. I hiked so many trails, and it all started from that one small comment. A small inspiration that I never really told Geneviève about before.

I began with a small hike in Semnoz. Then a much more challenging one in Schladming, Austria, with my LAPTh buddies. After that, it just kept going.

I miss hiking a lot since I left Europe. In my last five months there, when most of my friends had already left the region, I still went hiking almost every weekend, often alone.

Geneviève, you have not only inspired me to do good physics, but also to find peace in the mountains.

Here's a photo from a hike near Les Houches, with Geneviève, looking out for the novice hikers.

Oh, and I finally made it to **Geneviève's Wall of Fame!**

Quelques travaux avec Geneviève: *Dark Matter via Pseudoscalars & Rich Dark Sectors*

- Explored dark matter models with **pseudoscalar mediators** and extended dark sectors.
- Showed how collider searches, cosmology, and indirect detection together carve out viable parameter space.
- Highlighted signatures beyond simple mono-jet: **mono-Higgs, mono-Z, multijet + MET**, etc.
- arXiv: 1705.02327, arXiv: 2110.15391

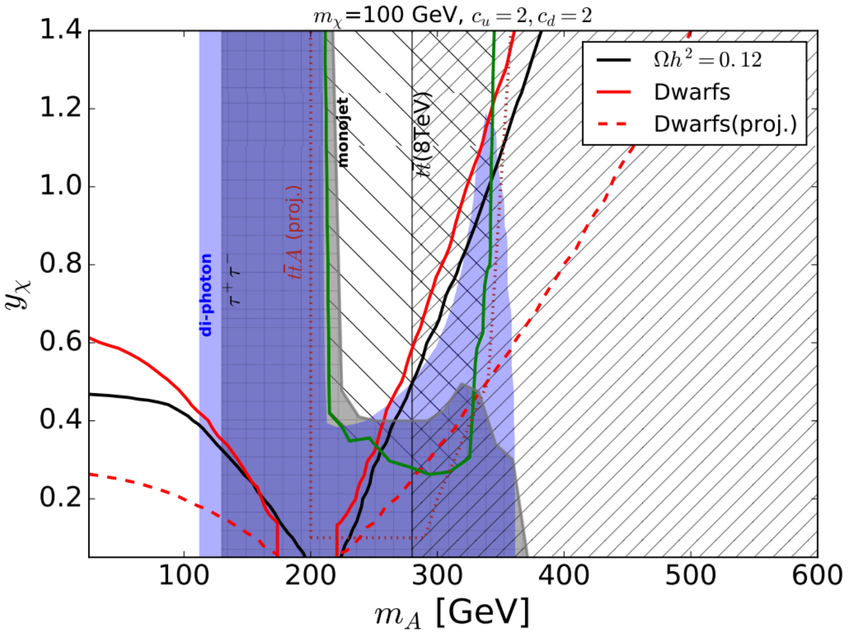

Figure 3. *Interplay of DM and collider constraints in the (m_A, y_χ) plane for m_χ = 100 GeV and $c_u = c_d = 2$ (scenario* **S1***). The region favoured by cosmology and astrophysics is located between the black and red line (see text for details). The shaded regions are excluded at the 95% CL by LHC searches for monojet (hatched green), $A \to \tau^+\tau^-$ systems (grey), diphoton resonances (blue), and deviations in $t\bar{t}$ events at 8 TeV (hatched grey). Projections for $t\bar{t}A$ probes for 300 fb^{-1} of proton-proton collisions at 14 TeV (dotted red) and after 15 years of Fermi-LAT running (dashed red) are also displayed.*

Quelques travaux avec Geneviève: *Long-Lived Particles & Unusual Collider Signatures*

- Studied scenarios where new particles are **long-lived** and leave unconventional detector footprints.
- From heavy charged tracks (SUSY sneutrino DM) to **backward-moving decay products** from LLPs.
- Proposed new ways experiments can look for what standard searches might miss.
- arXiv: 1706.07407, arXiv: 1806.04488, arXiv: 1603.08834
- Also touched heavy new states + extended scalar sectors → new decay modes and search strategies

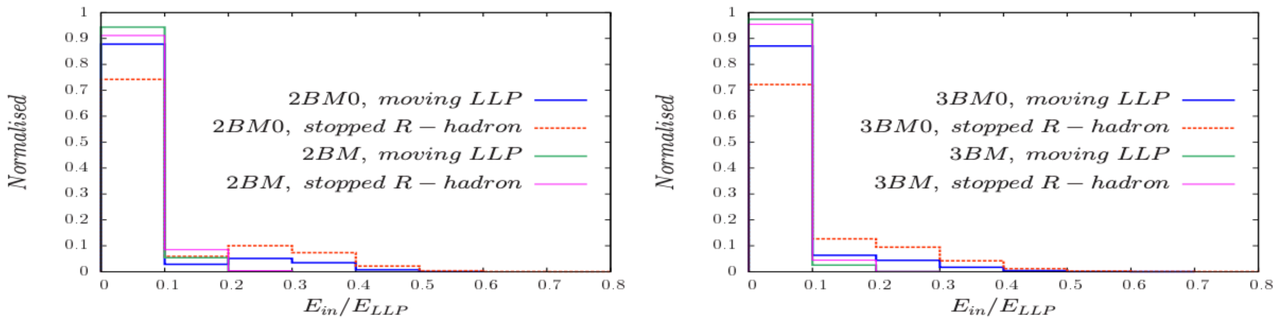

Figure 3. Normalised distribution of $E_{\rm in}/E_{\rm LLP}$, the energy fraction of visible daughter particles to the mother LLP shown for $M_{LLP} = 2$ TeV and $M_{\rm DM} = 0.75 \times M_{\rm LLP} = 1.5$ TeV. For the definition of the 2BM/3BM decays, see the text. In the first bin ($E_{\rm in}/E_{\rm LLP} < 0.1$) $E_{\rm in} = 0$. It should be interpreted as the case where no *BMO* has registered.

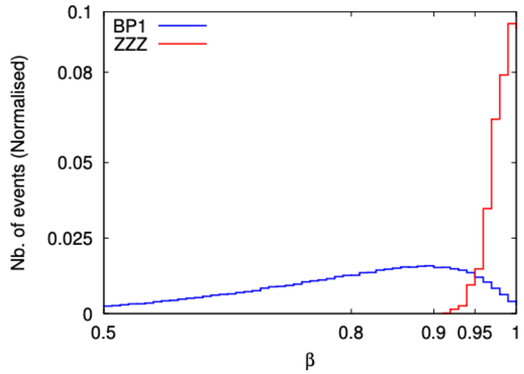

Figure 2. β-distribution for signals as well as background events are shown. The distribution clearly suggests that a negligible number of background events survives after the application of the β-cut as mentioned in the text.

Merci, Geneviève

Thank you for being a friend, an amazing collaborator, and someone I can always talk to about my career.

I did not cover everything here, but you know.

Wishing you a beautiful time ahead in physics, and many more hikes, skis, and travels.

I am sorry I could not be there in person or online. I heard about this very late.

Thank you to Manimala di for letting me know, and to whoever is reading this out.