

Marseille, EPS 2025

Young Experimental Physicist Prize

Laura Zani

*A Beauty quest for the unknown
at the Belle II experiment*



Start with why

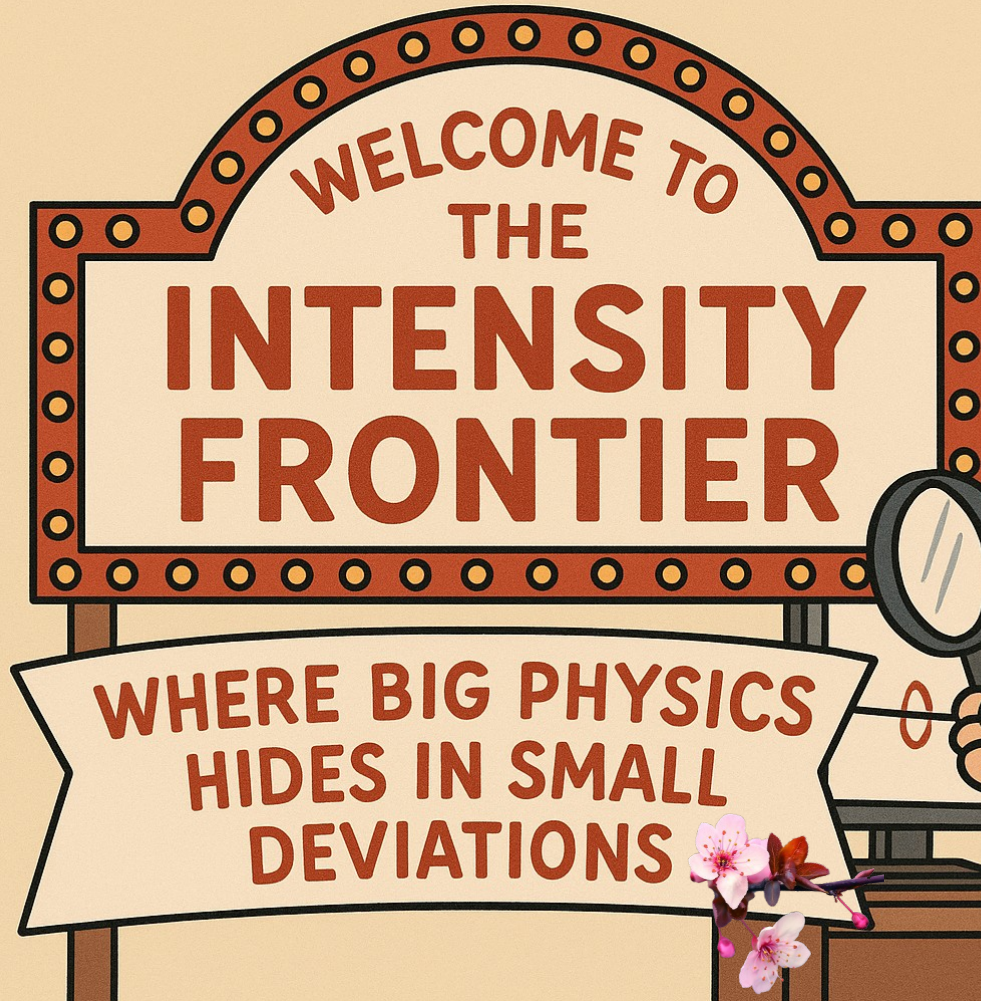


“Beauty will save the world”

*Enoshima,
November 2024*

The *B(eauty)* factories

Hundreds
1000000
of *B* mesons



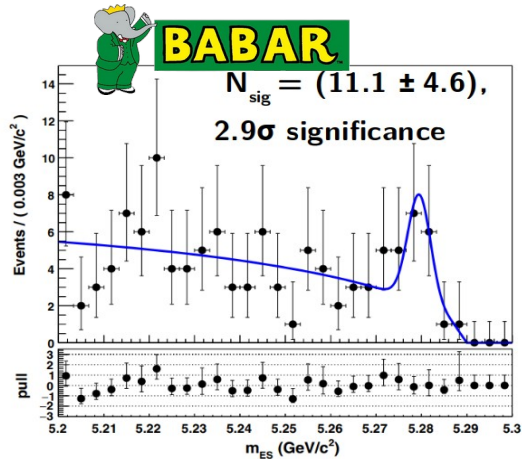
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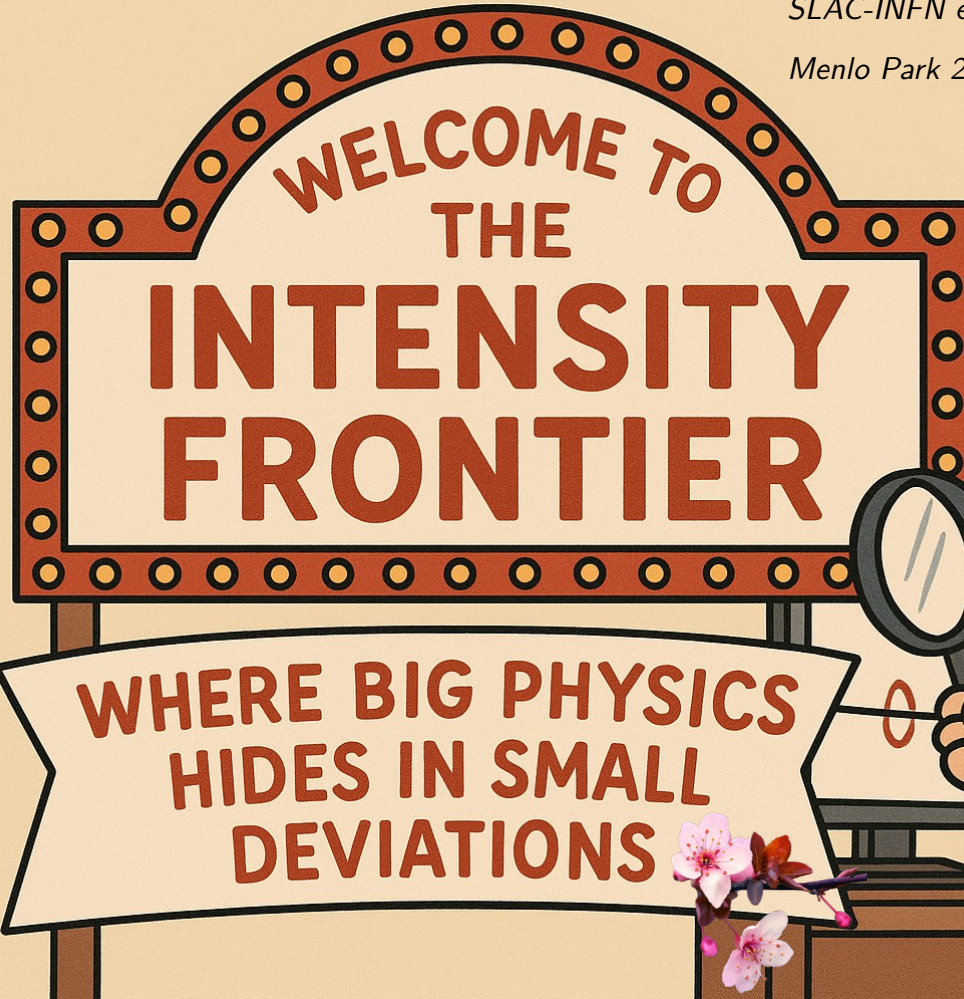
SLAC-INFN exchange,

Menlo Park 2015



$$BF^{UL}(B^0 \rightarrow pppp) < 2 \times 10^{-7}$$

PRD98 (2018) no.7, 071102 (2018)

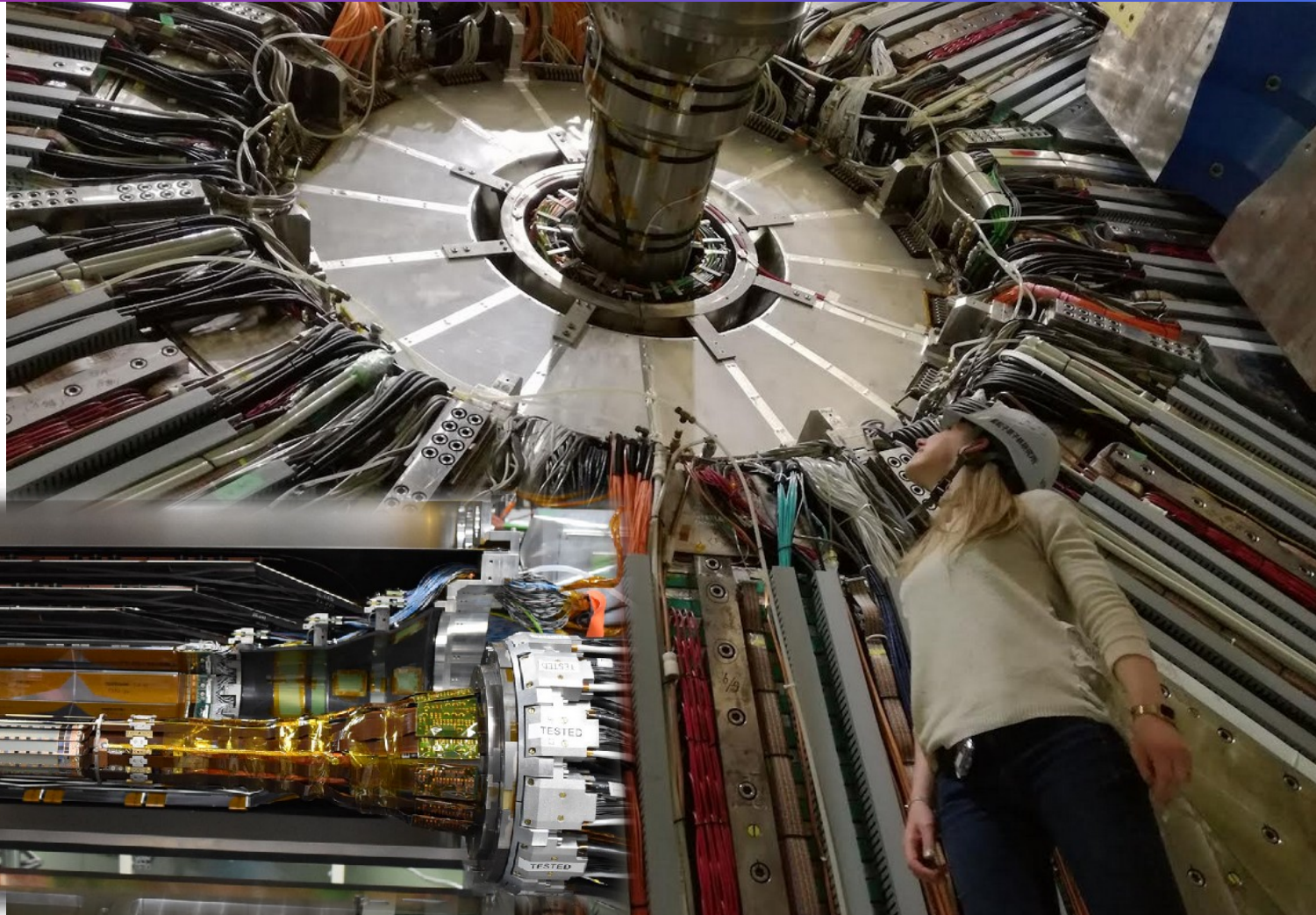
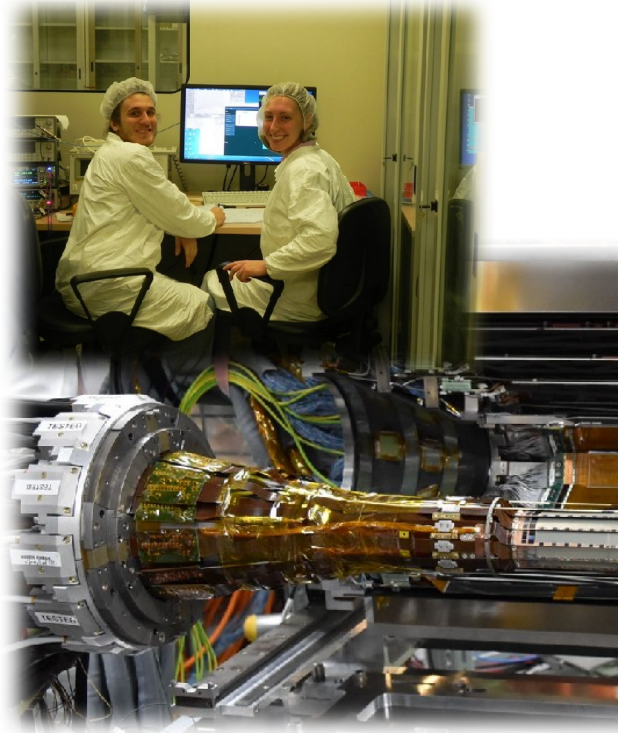


Touching the experiment...

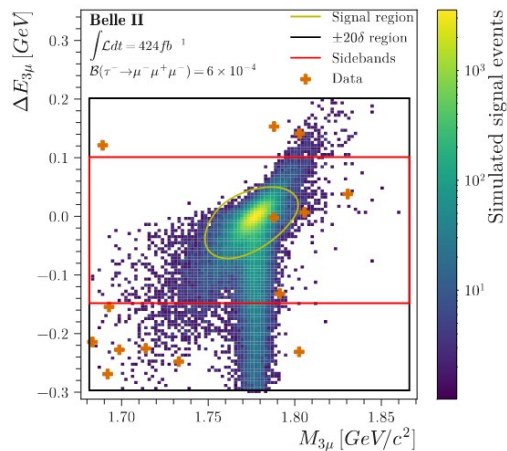
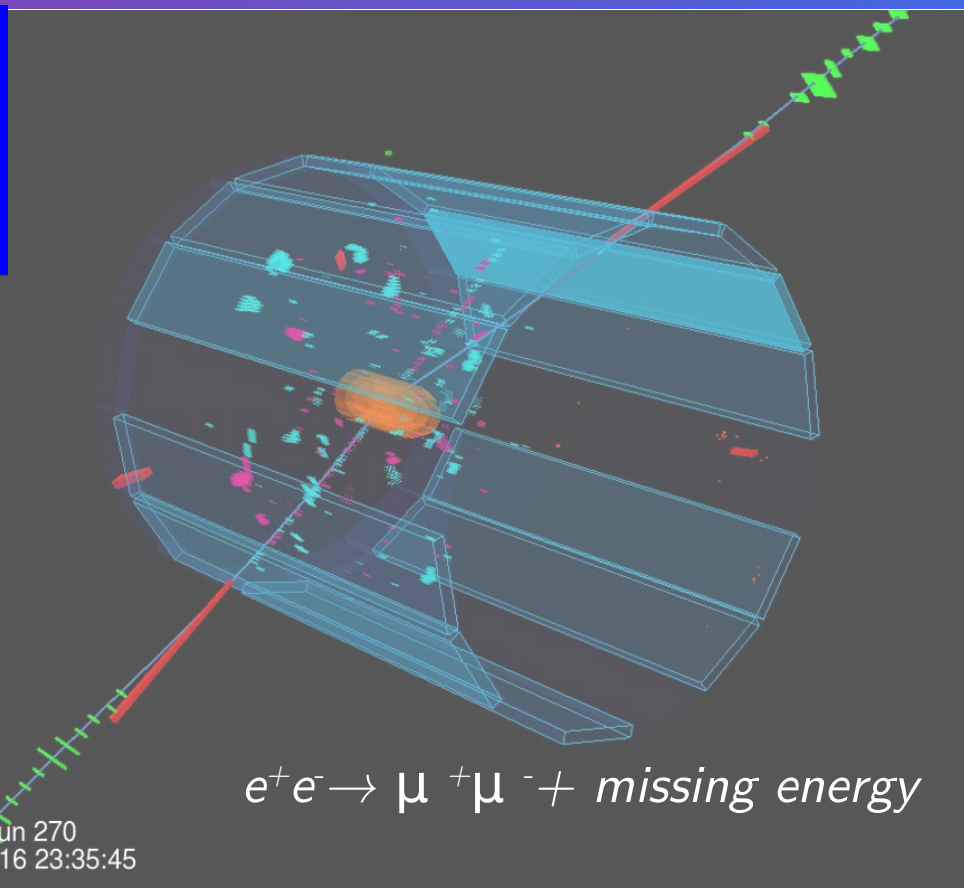
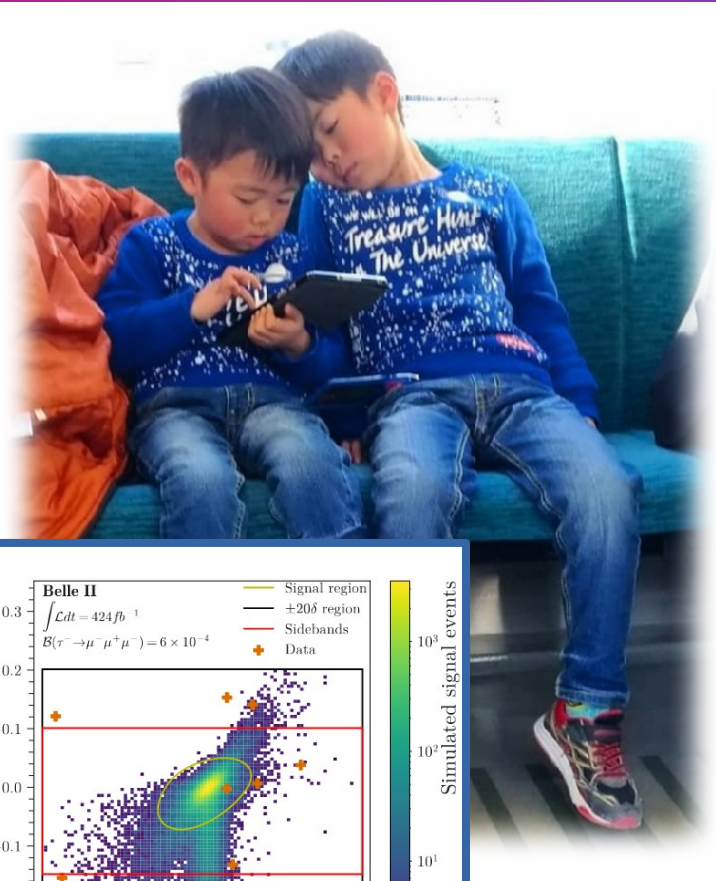
A hands-on journey at the heart of Belle II

Building, operating, and managing the
Silicon Vertex Detector

JINST 17 P11042



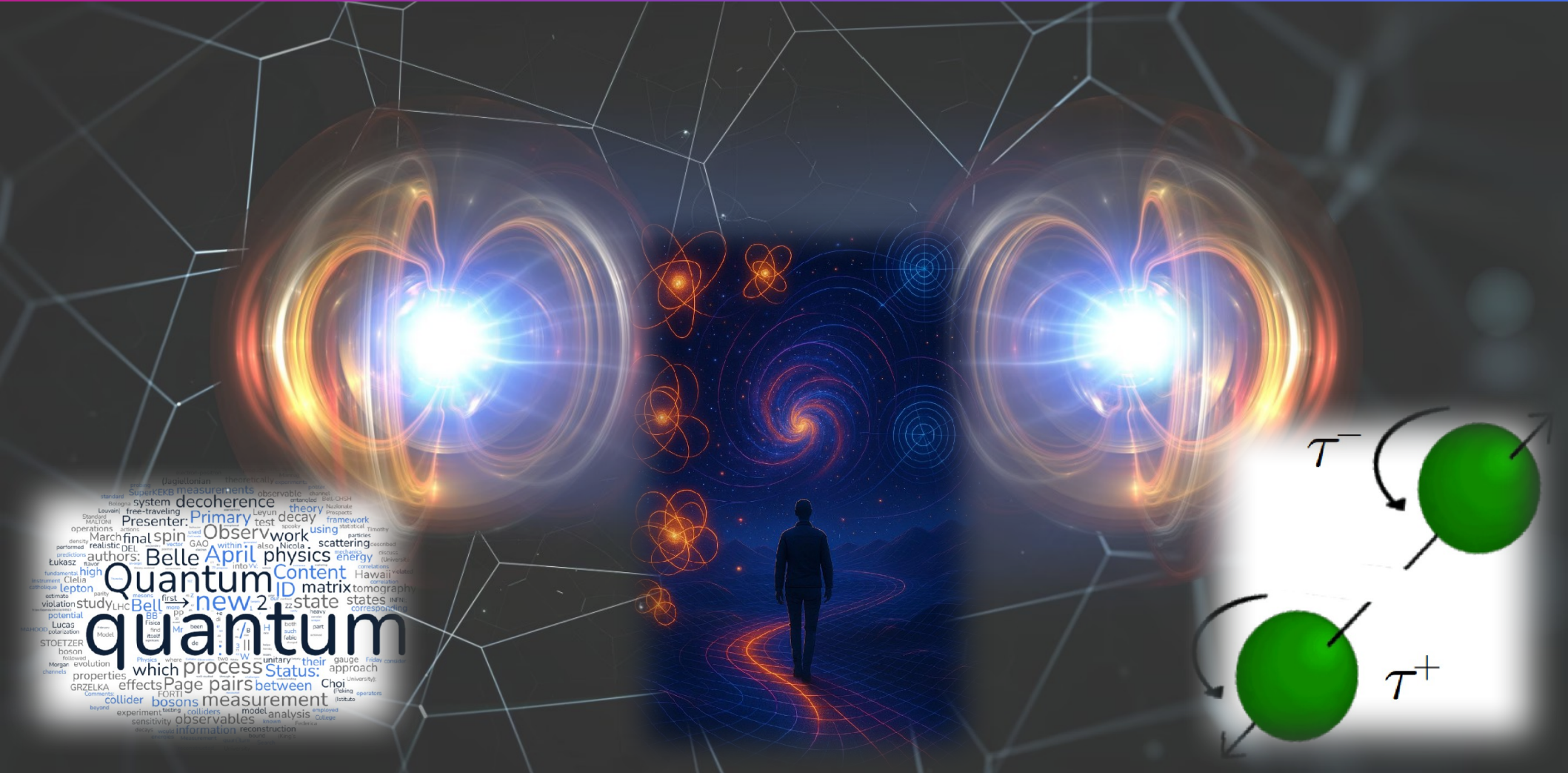
...Listening to whispers



$Z' \rightarrow \text{invisible}$, *Phys. Rev. Lett.* **124**, 141801 (2020)

$\tau \rightarrow \mu\mu\mu$, *JHEP*09(2024)062

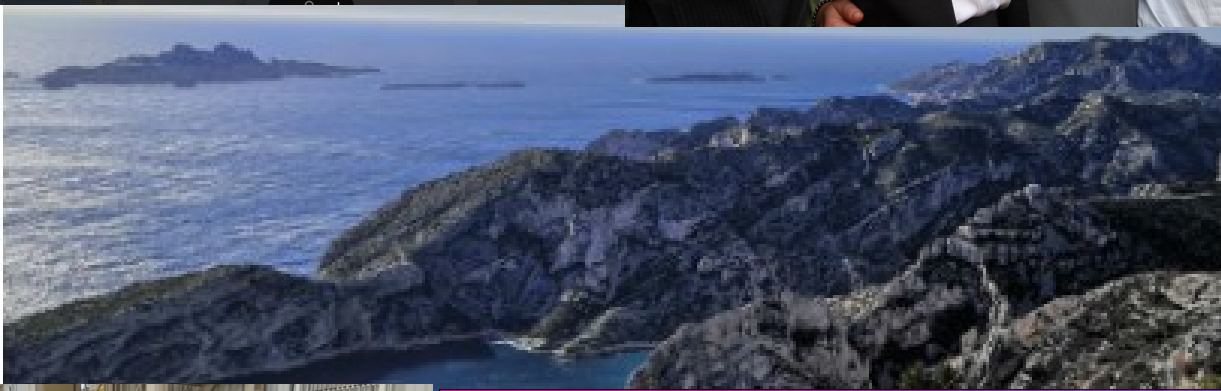
Beyond present limits



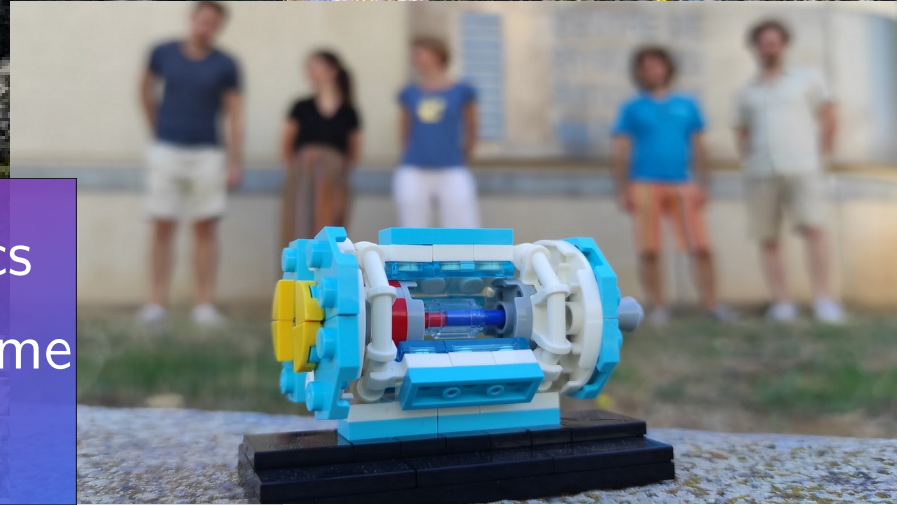
Bridging beauties



*Nikko,
October 2023*



Breakthroughs, good physics
results – and joy – only become
real when shared



Grazie!

Ai miei genitori, a mio fratello Matteo, alla mia famiglia e agli amici di sempre. Per avermi insegnato la determinazione attraverso la disciplina, per l'amore e la fiducia incondizionati.

To my mentor Francesco F. and all the Pisa group, through their example they made me believe that impossible is nothing.

À Justine S. et au groupe du CPPM, pour m'avoir toujours fait confiance et offert la liberté nécessaire au développement de ma recherche autonome.

To my institute of Roma Tre, to all my colleagues and friends of Belle II, for their restless support and the amazing work and life experience together.

To all my friends around the world met over these years. To who reminds me to follow the flame that keeps burning even in the darkest times: my call to unveil the *beauty* of the Universe through my research.



Ad Maiora Semper!