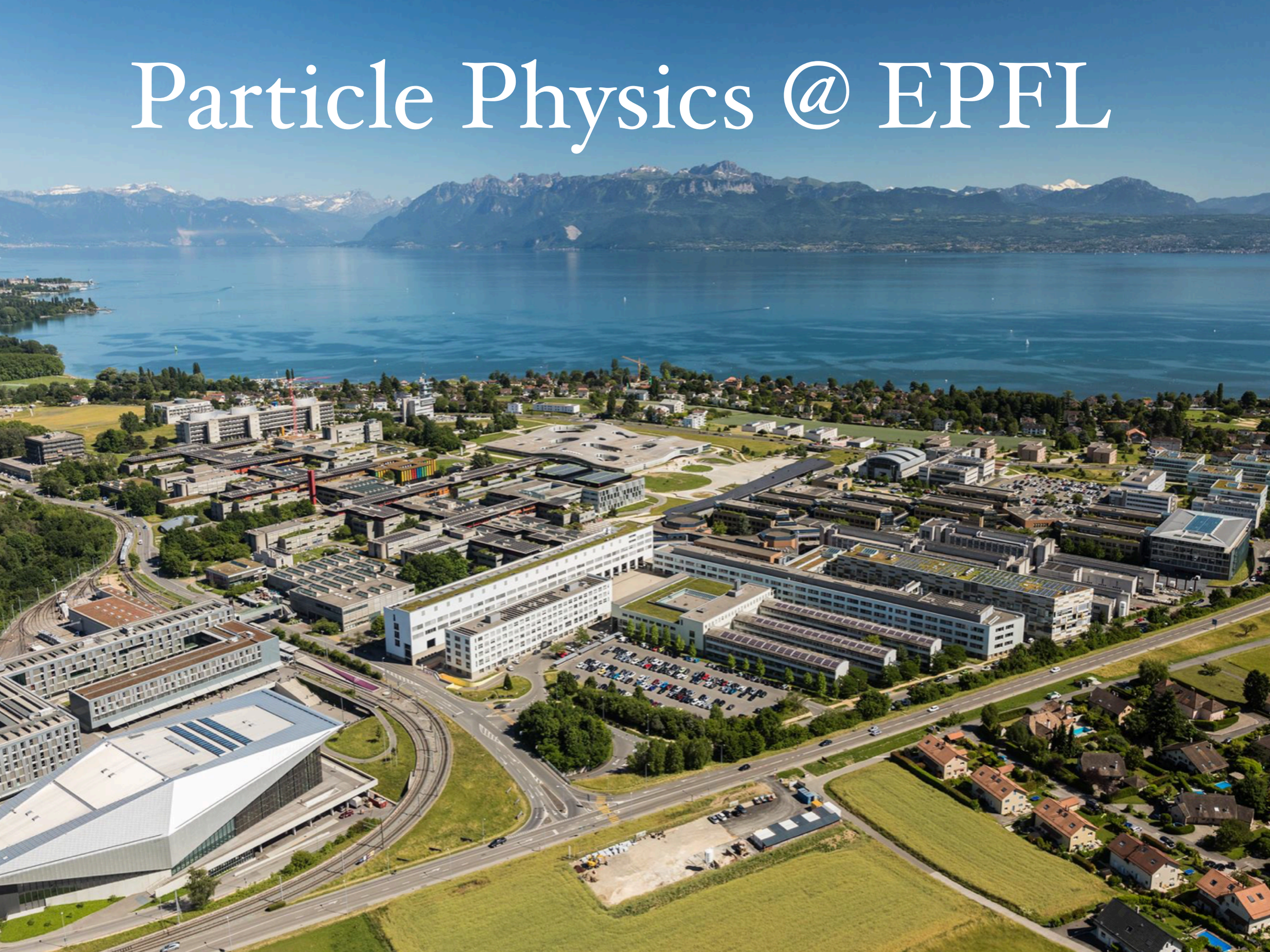
Particle Physics @ EPFL



Theory


Joao Penedones


Riccardo Rattazzi


Mikhail Shaposhnikov

- 15 scientists
- 11 PhD students

Experiment


Olivier Schneider


Lesya Shchutska

- 17 scientists
- 15 PhD students

Accelerator


Michael Seidel

- 6 scientists
- 5 PhD students

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Tatsuya Nakada

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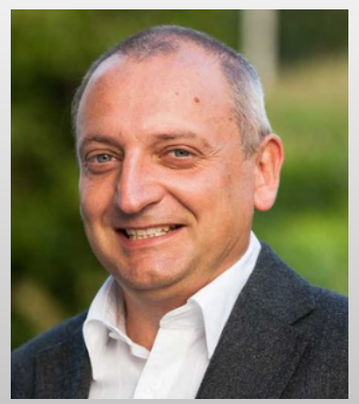
Accelerator


Michael Seidel

Emeritus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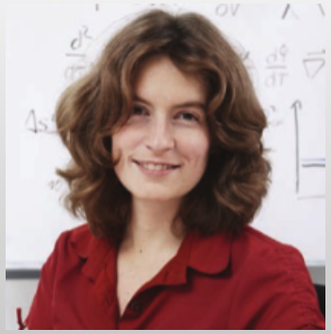
CERN/EPFL


Valerie Domcke


Andrea Wulzer

lents

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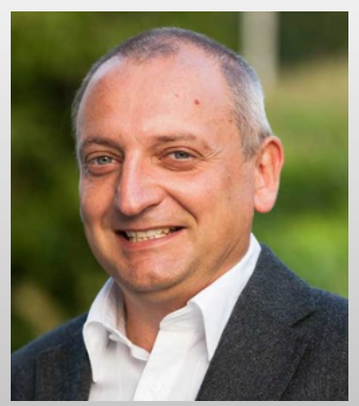
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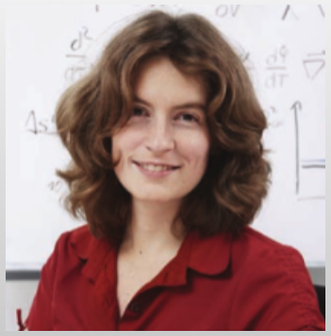
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Experiment


Olivier Schneider


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Emeriti


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Tatsuya Nakada

Permanent Staff


Frederic Blanc


Guido Haefeli

7

5

ts

Accelerator


Michael Seidel

Emeritus


Lenny Rivkin


Tatiana Pieloni

entists

D students

Future

Joao Penedones

Riccardo Rattazzi

New Hire

New Opening 2023

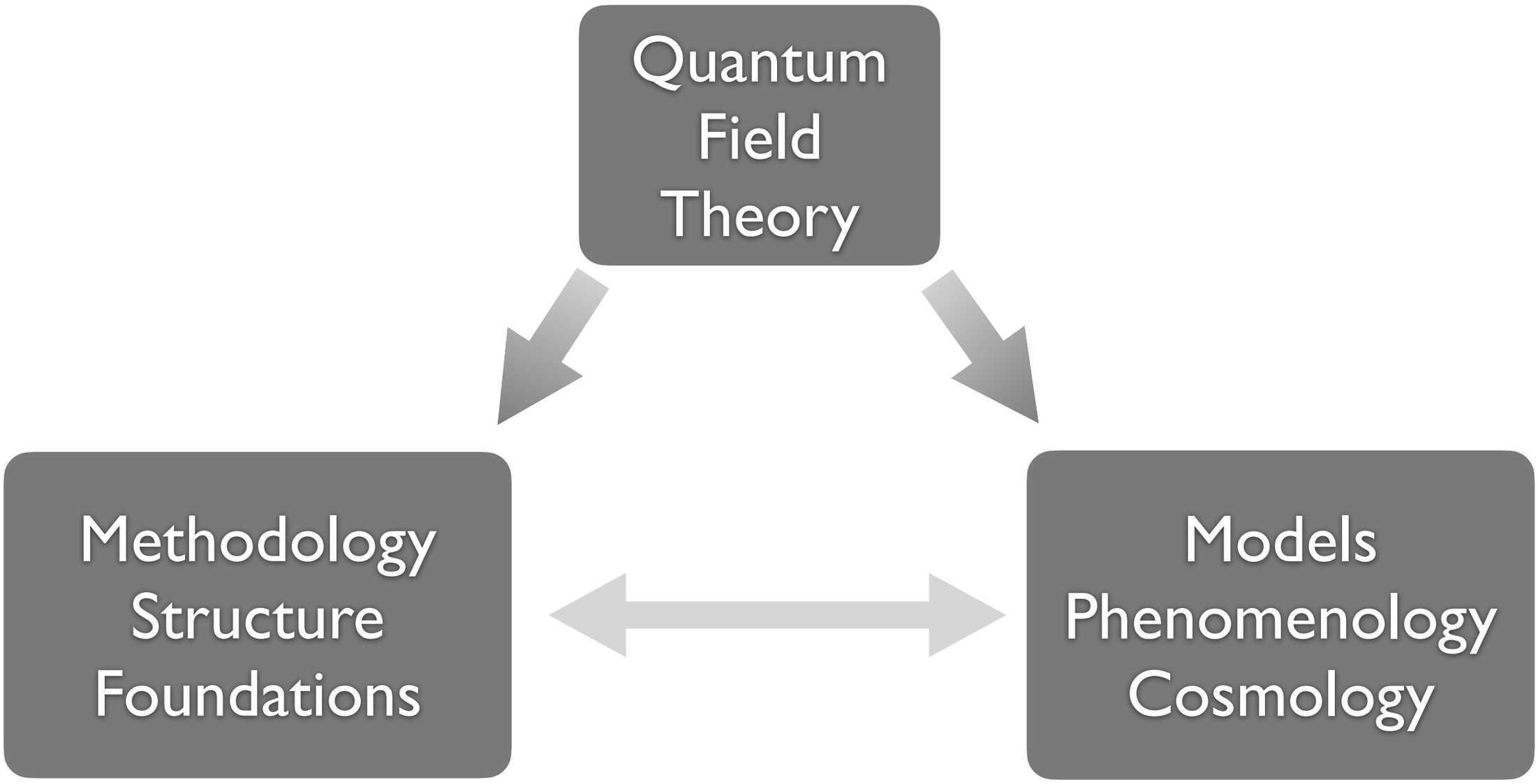
Olivier Schneider

Lesya Shchutska

New Opening 2021

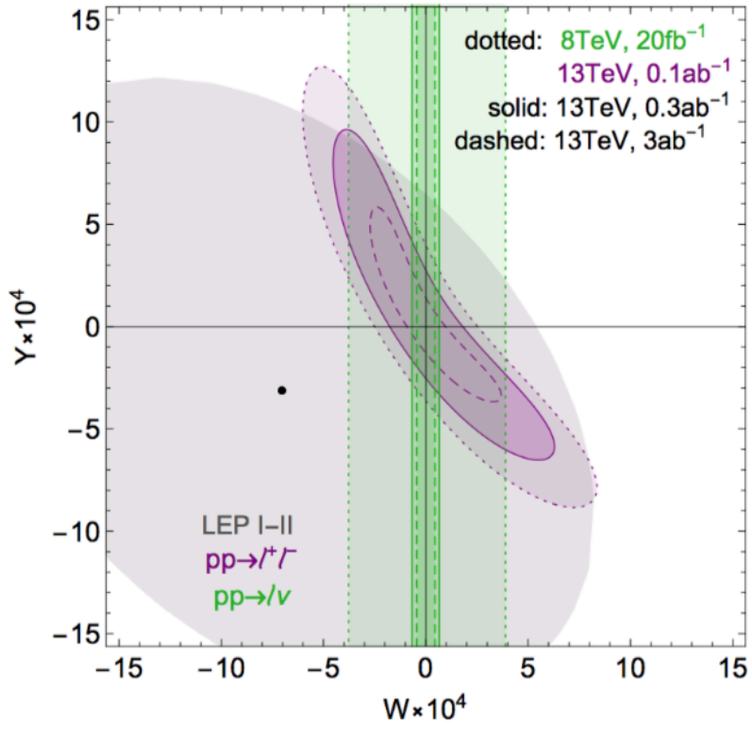
Michael Seidel

Particle Theory
HET-EPFL



Mapping the exploration of the energy frontier

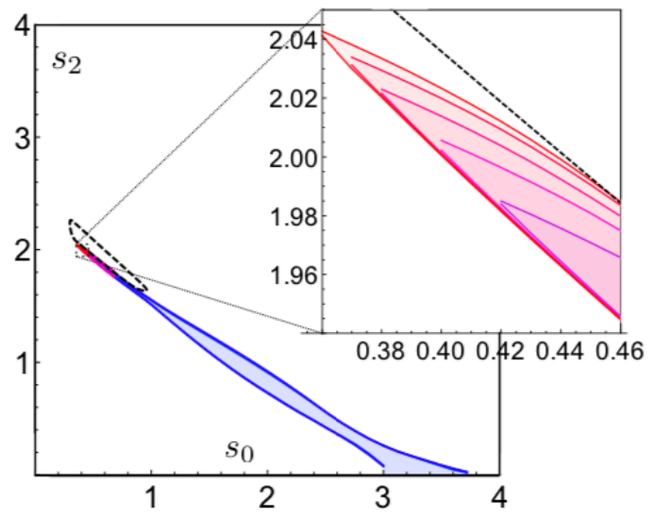
- Energy helps accuracy at HL-LHC
  - Farina, Panico, Pappadoulo, Ruderman, Torre, **Wulzer,** Phys Lett B772(2017)



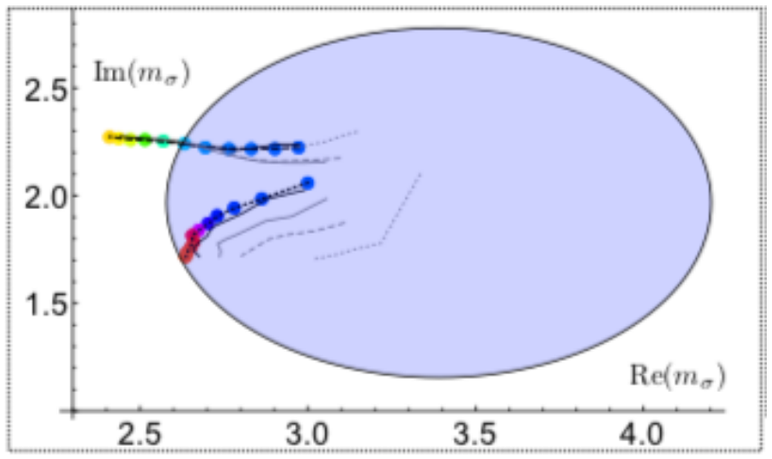
Bootstrapping QCD

- Guerrieri, **Penedones,** Vieira Phys Rev Lett 122(2019)

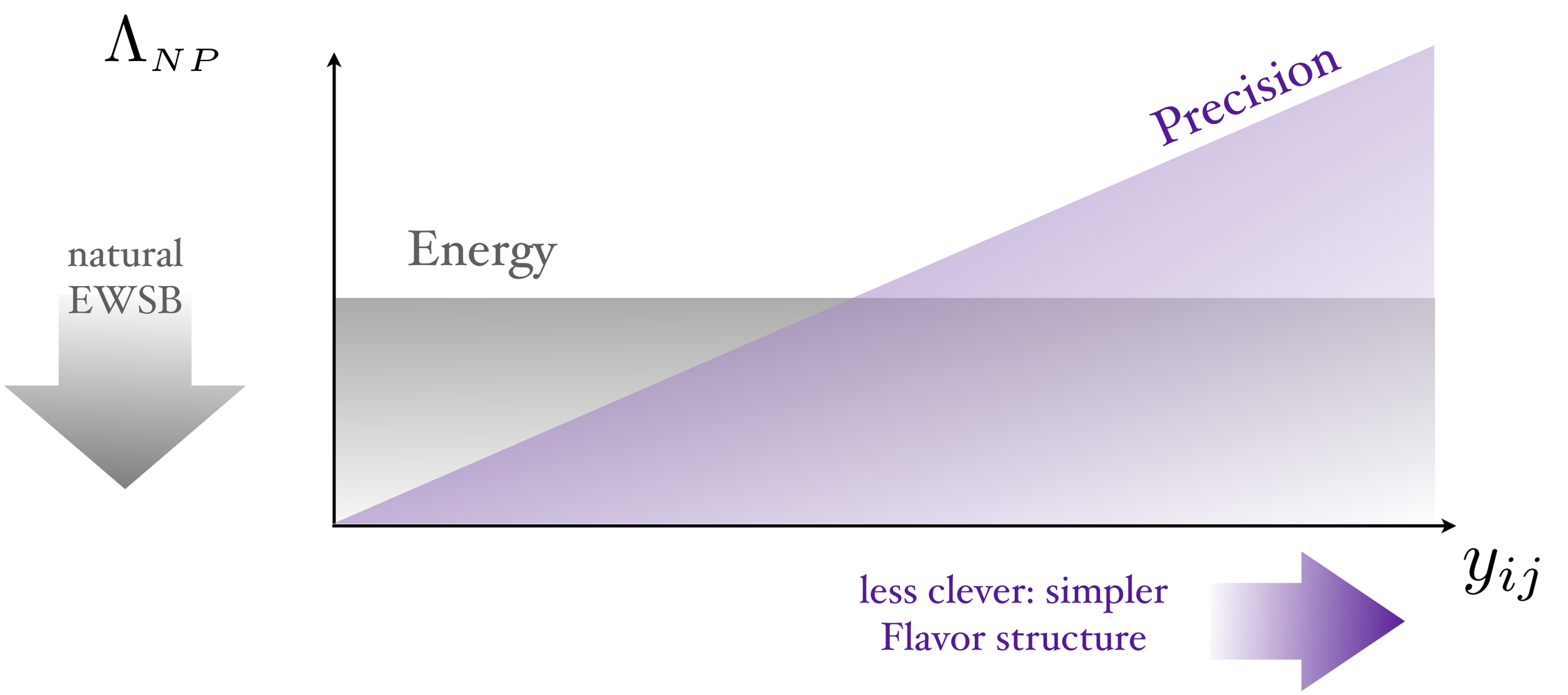
Input: ρ-mass, width & π-scattering lengths



Output σ-mass & width



Particle Experiment @ EPFL
… or The Precision Frontier



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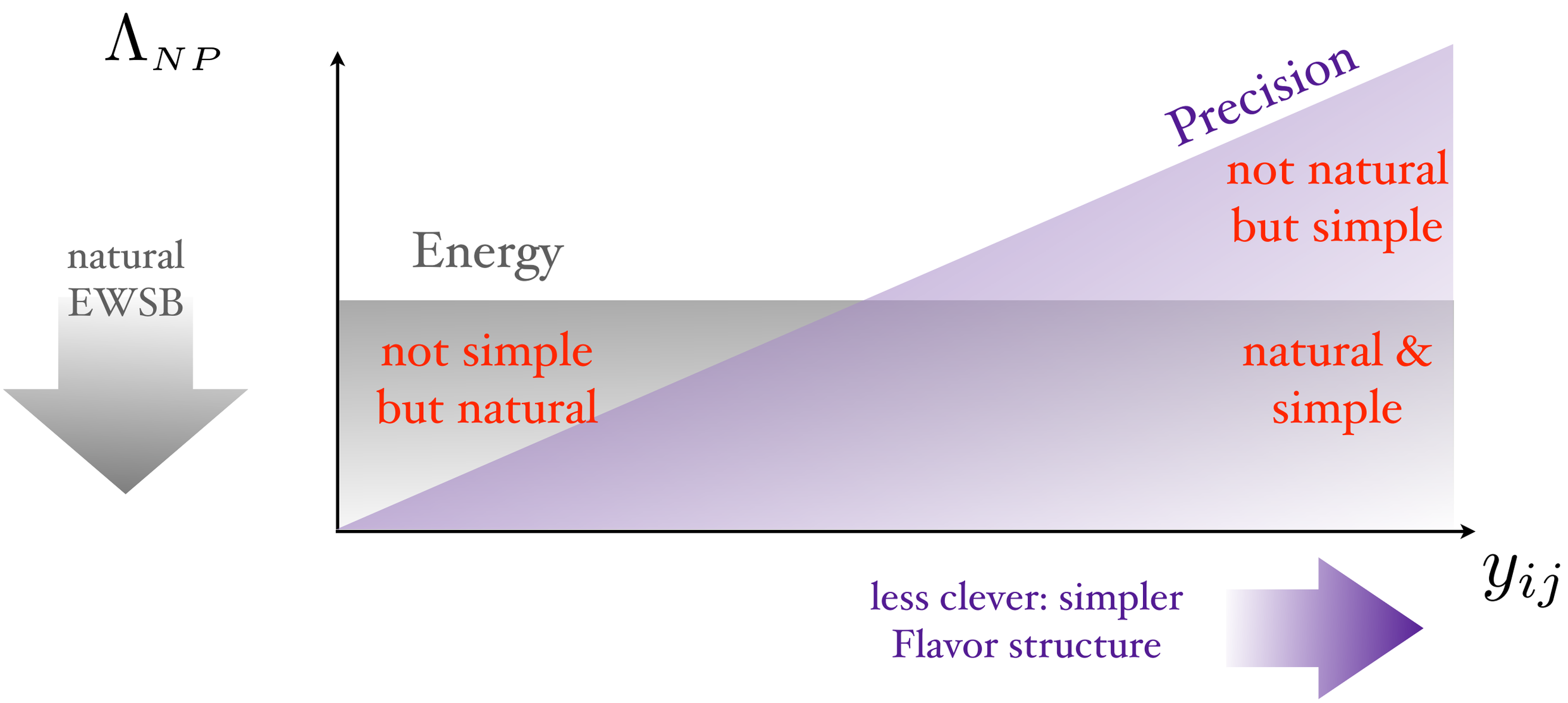

Particle Experiment @ EPFL
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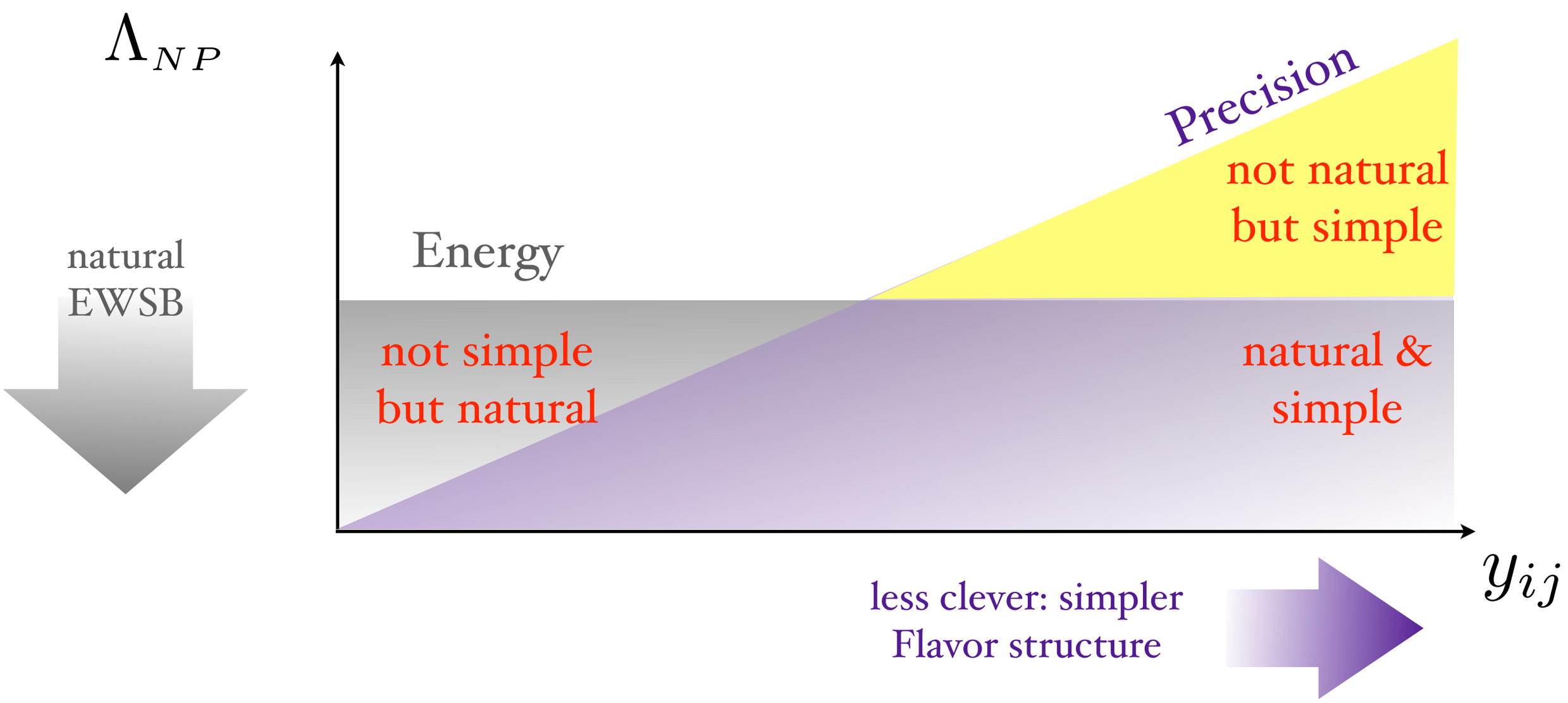
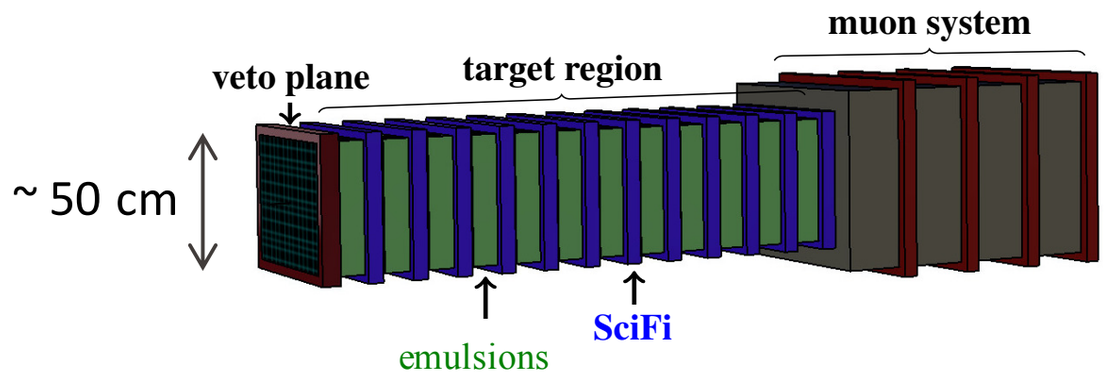


★ Detector Innovation



SciFi technology upgrading LHCb tracker:
scintillating fibres, read out with Silicon Photomultiplier arrays

use SciFi to search for neutral exotics in SND@LHC

★ LHCb data analyses

- CP violating in B_s mixing and decay
- Charm Physics: CP violation and mixing
- Search for Lepton-Flavor violation $B_s \to e^{\pm}\mu^{\mp}$ $B^+ \to K^+\tau^{\pm}\mu^{\mp}$
- Lepton universality in $B \to K\pi\pi\ell\ell$
- Direct searches for New Long Lived Particles in forward region

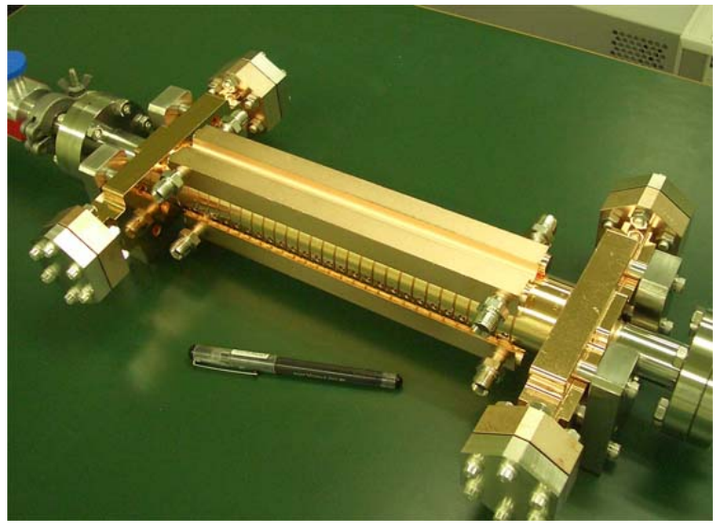
Accelerator Physics
LPAP

- Accelerator physics projects at world leading laboratories, CERN and PSI
- Swiss Accelerator Research and Technology Collaboration (CHART)

Swiss Accelerator Research and Technology

Future CERN projects

- Future Circular Collider Study (FCC): beam dynamics studies
- LHC and HL-LHC
- Machine Learning aided Accelerator design



High gradient acceleration

- CLIC structures with SwissFEL technology
- laser acceleration at SwissFEL
- Plasma acceleration

Compact accelerators

- light sources
- medical applications