

# Journée Nouveaux Entrants

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# Academic Journey



4

Amsterdam,  
The Netherlands

3

Milan,  
Italy

5

Orsay, Paris,  
France

1

Antananarivo,  
Madagascar

2

Cape Town,  
South Africa



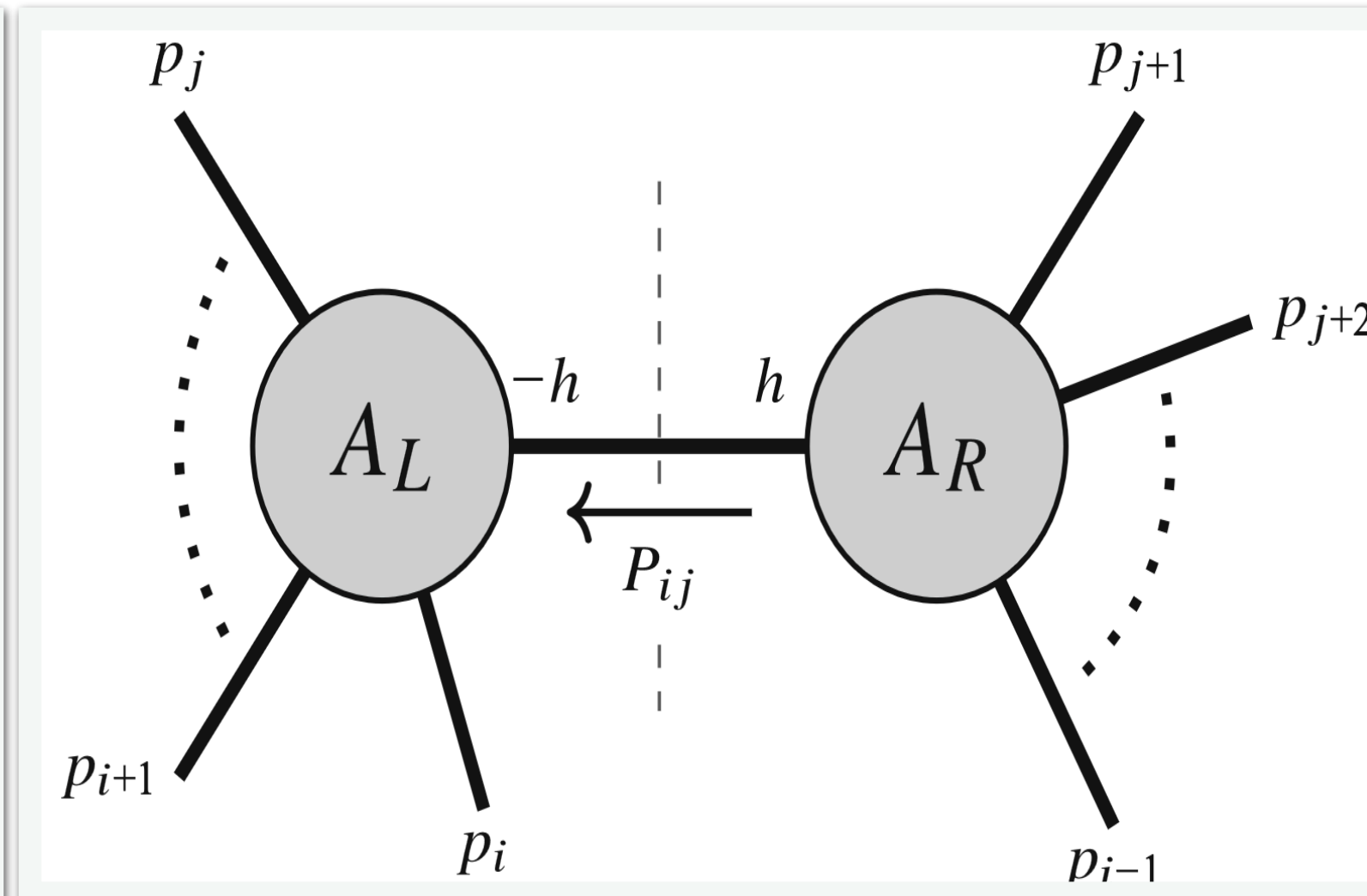
# Bachelor's degree in Antananarivo

Madagascar is **much**  
**More** than  
The **Cartoon...**

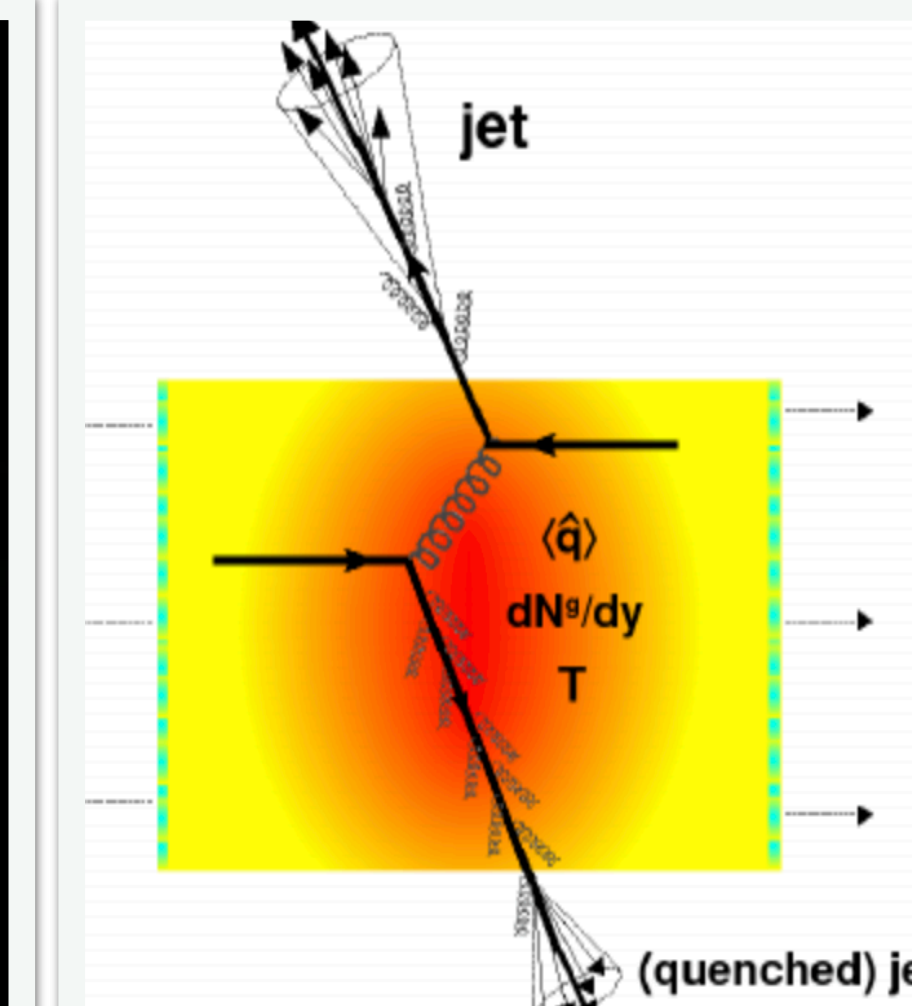
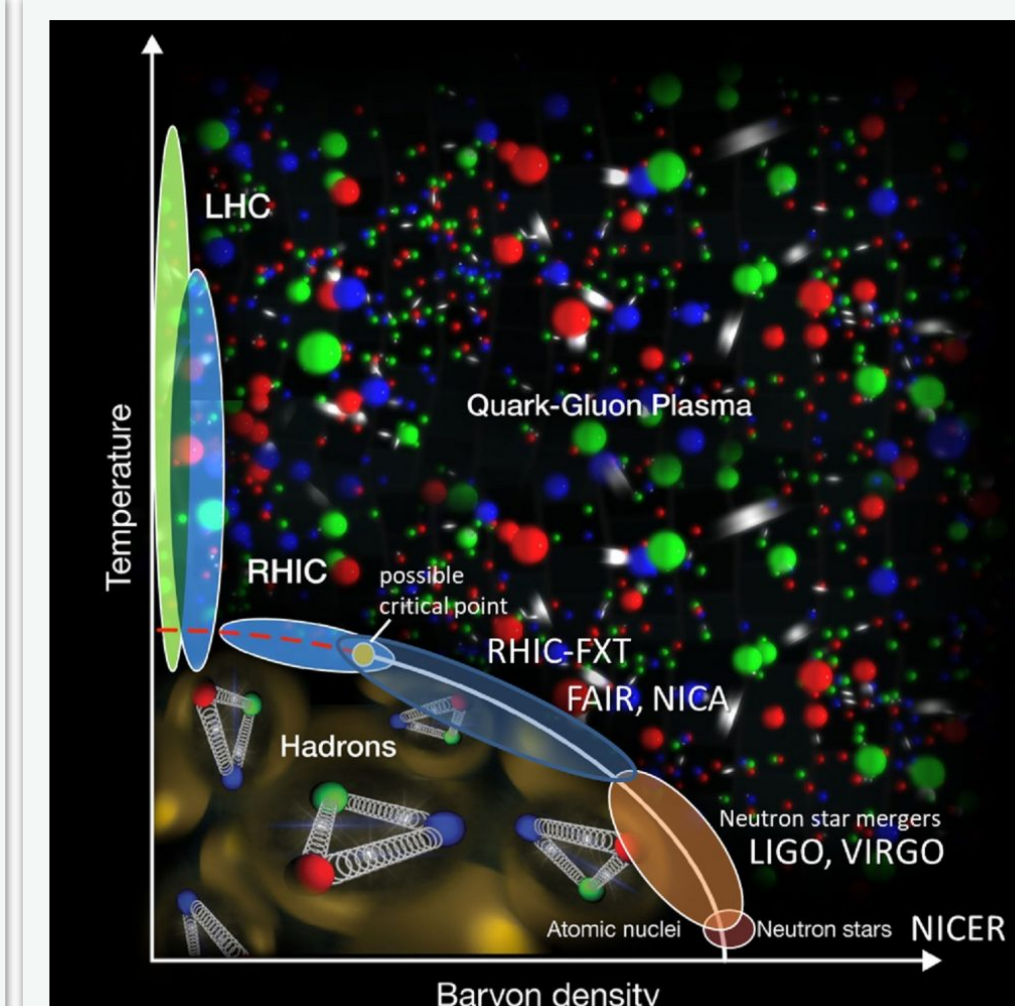
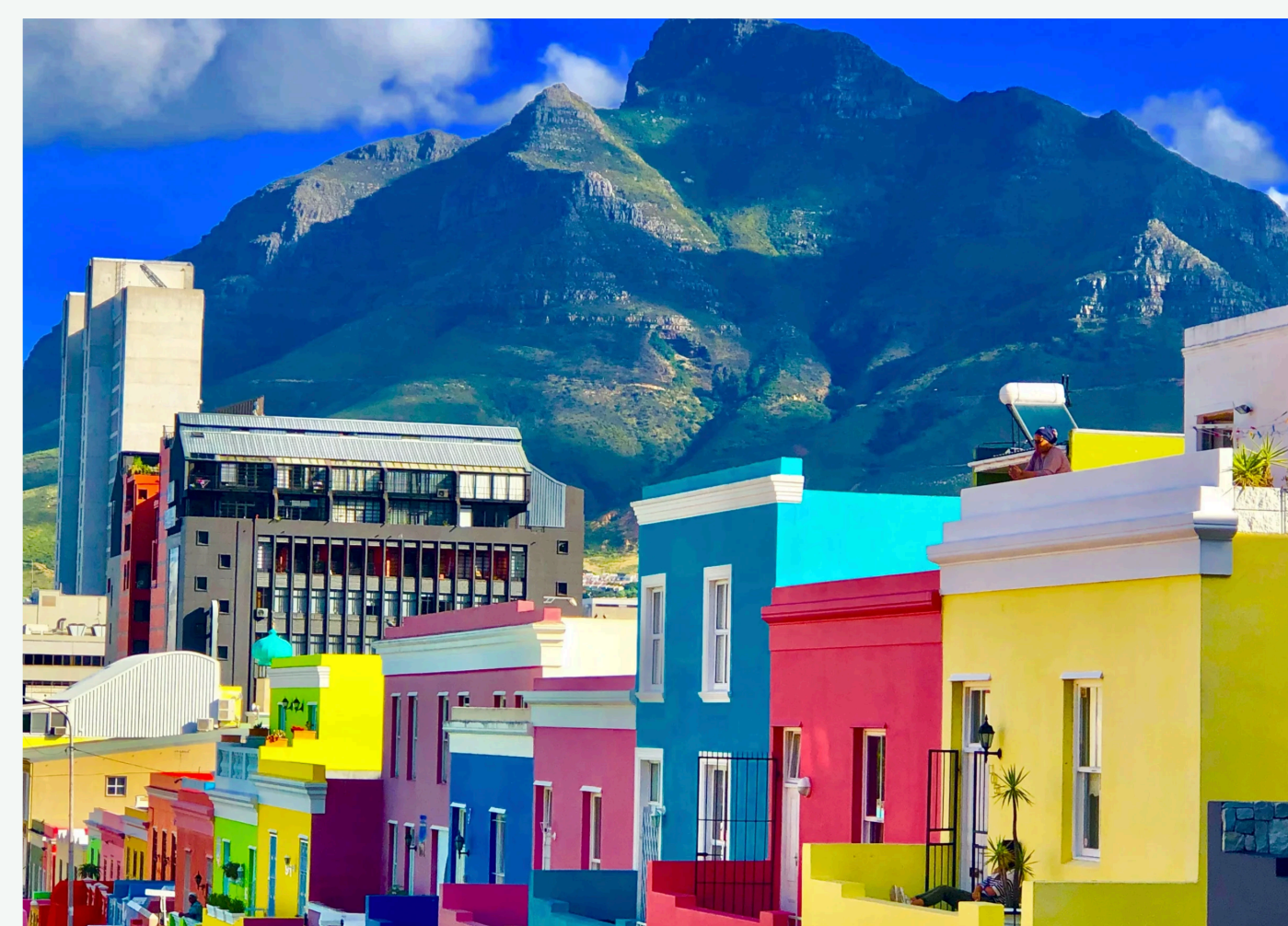


# (Two) Master's degree in Cape Town

## MSc in Mathematics (Stellenbosch University)



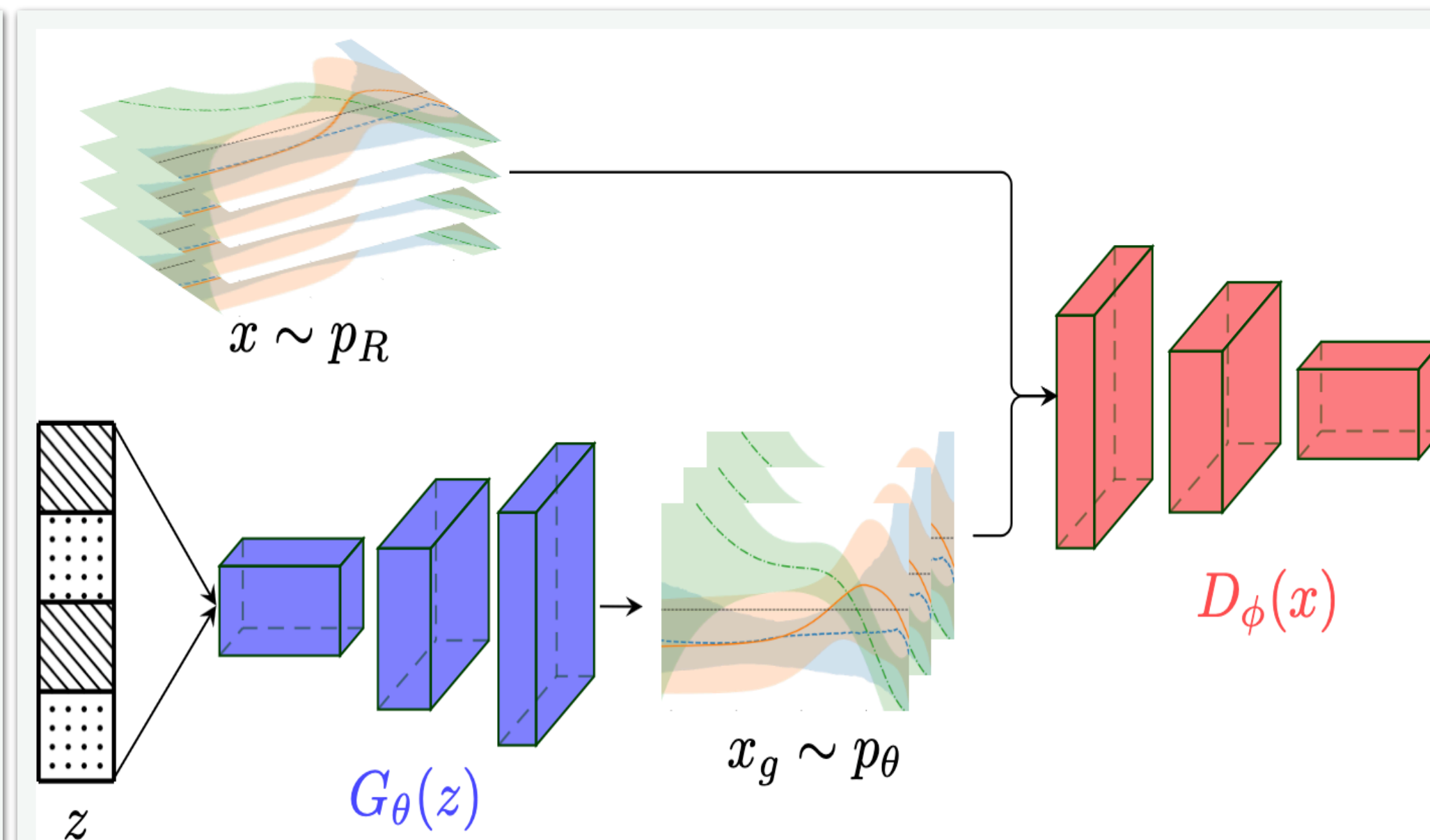
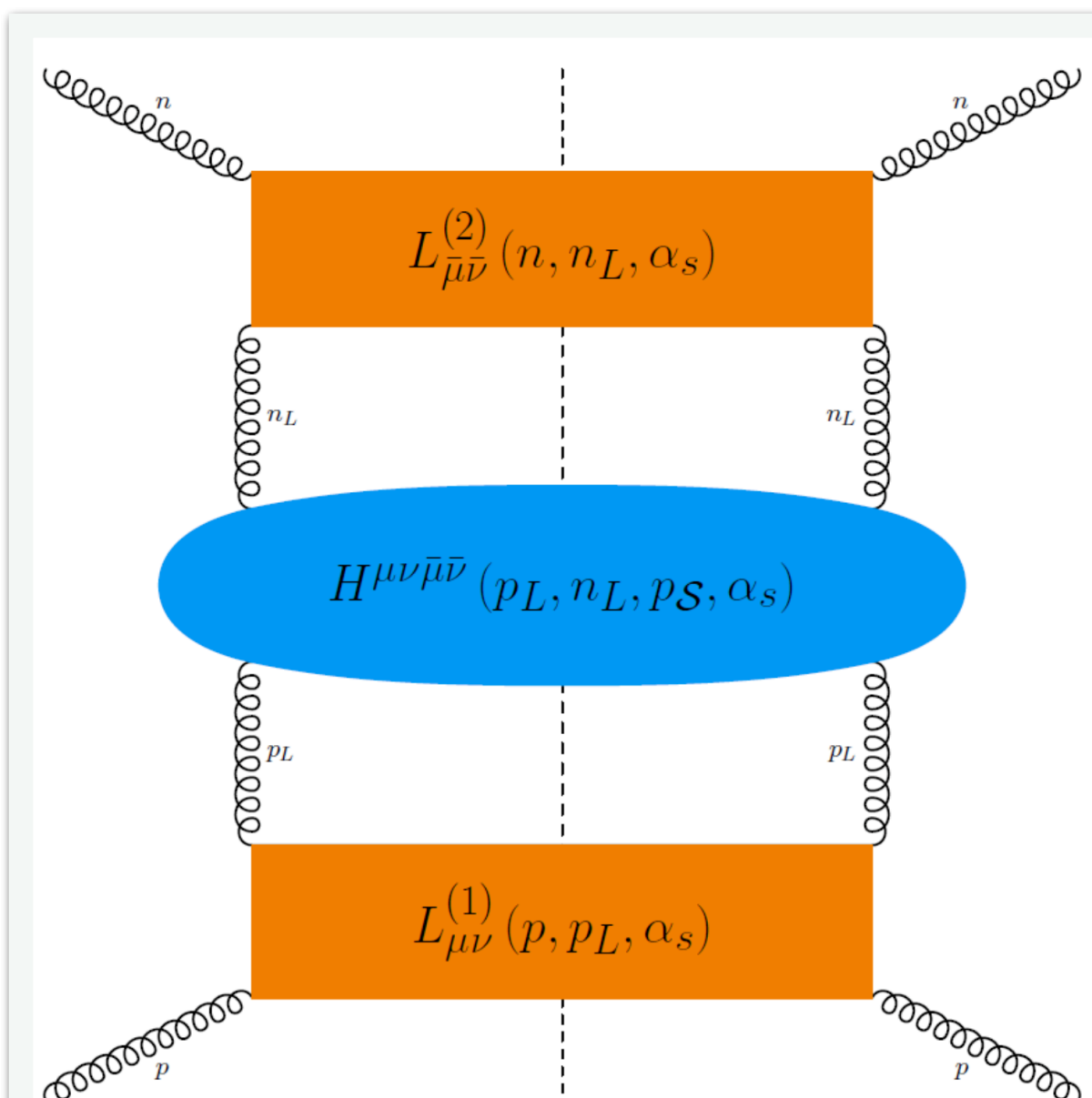
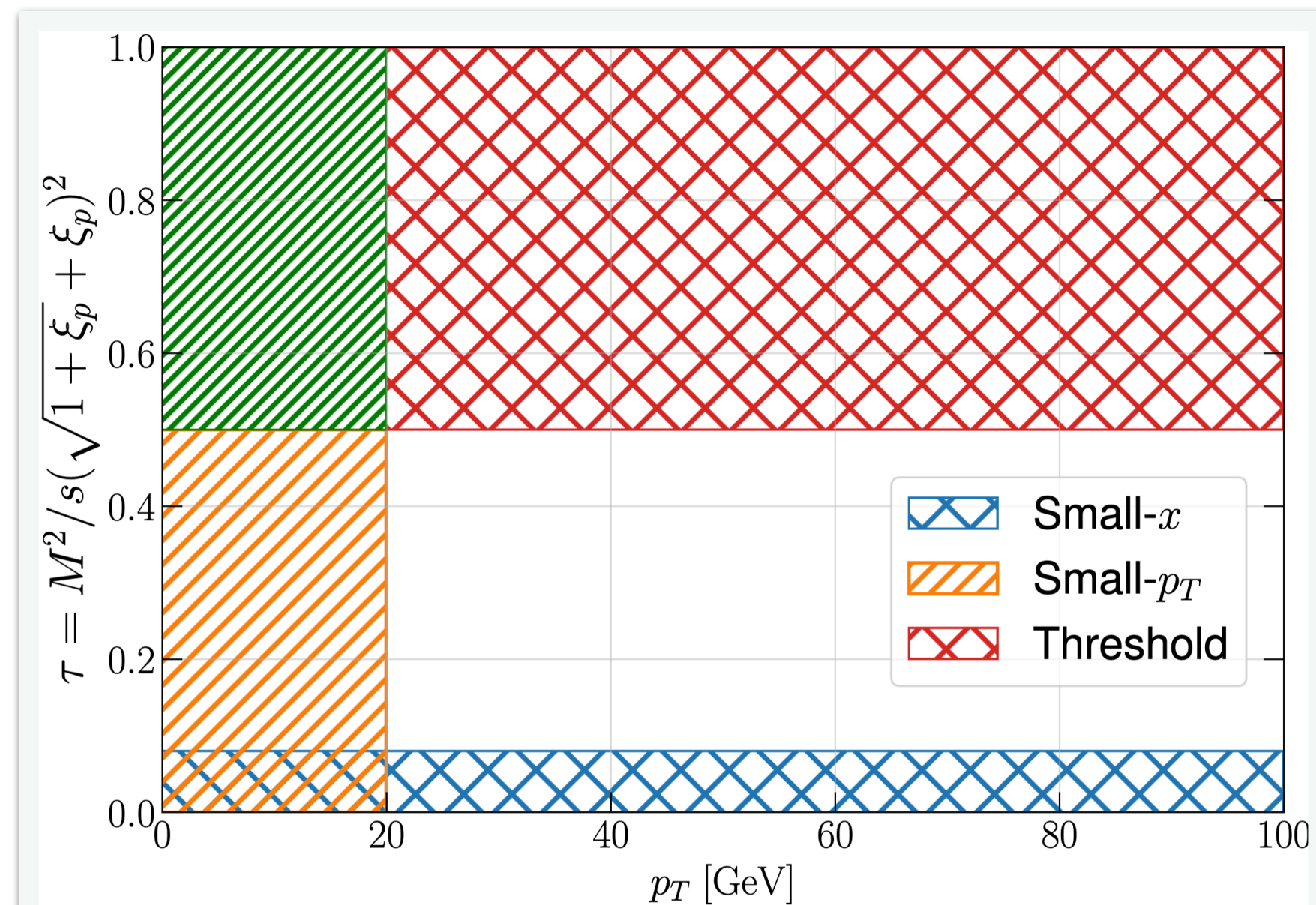
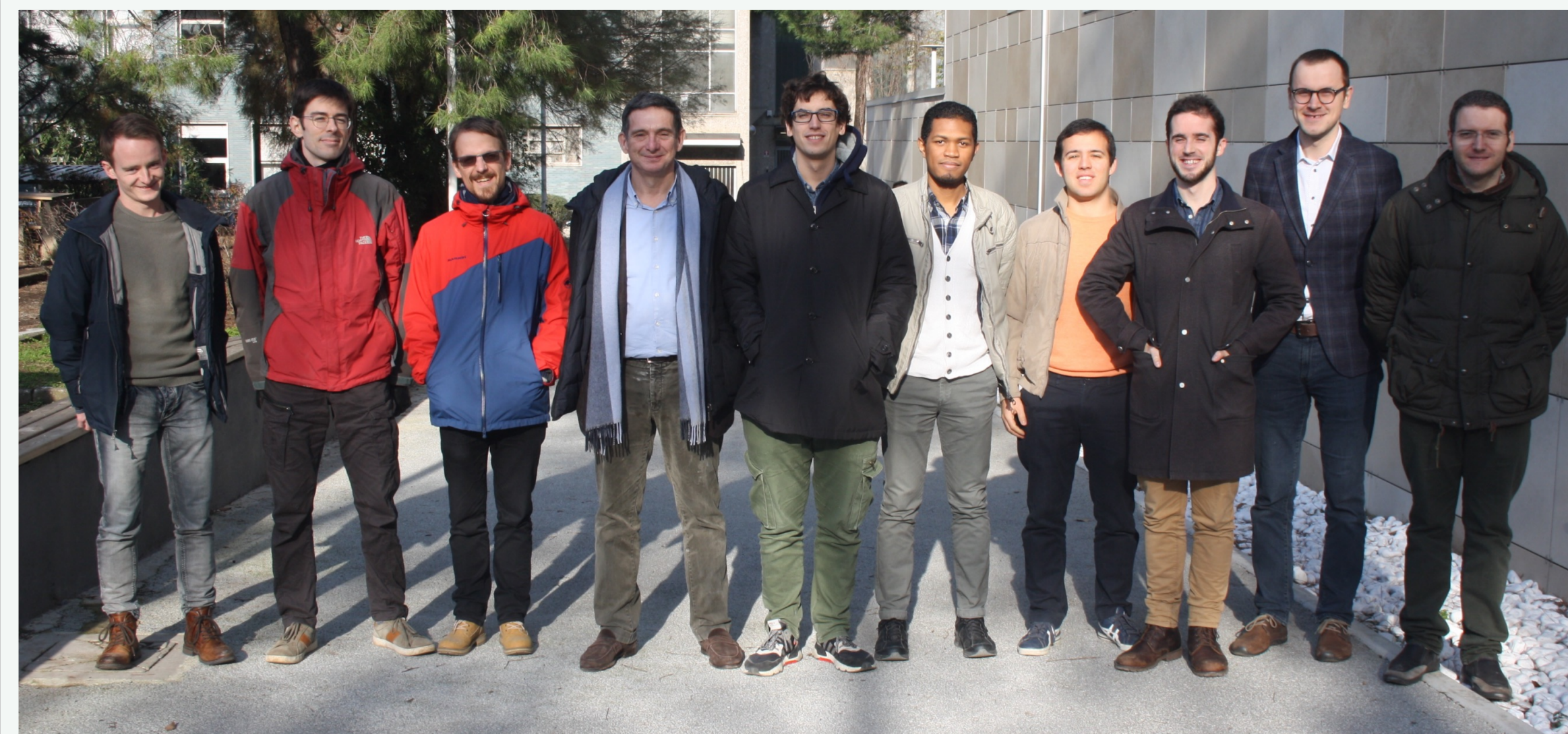
## MSc in Theoretical Physics (University of Cape Town)



# PhD degree in Milan & Postdoc in Amsterdam



UNIVERSITÀ  
DEGLI STUDI  
DI MILANO



# Hobbies & Interests

# Computers, Readings, Travels, Photography, Movies, ...

The image shows a Linux terminal window with several system monitoring tools running. At the top, there's a CPU temperature and usage summary. Below that, the 'top' command is running, showing a list of processes with columns for PID, Program, Command, Threads, User, MemB, and Cpu%. The 'df' command is also running, showing disk usage for various filesystems. At the bottom, the 'tree' command is running, displaying a directory tree structure for the current directory.



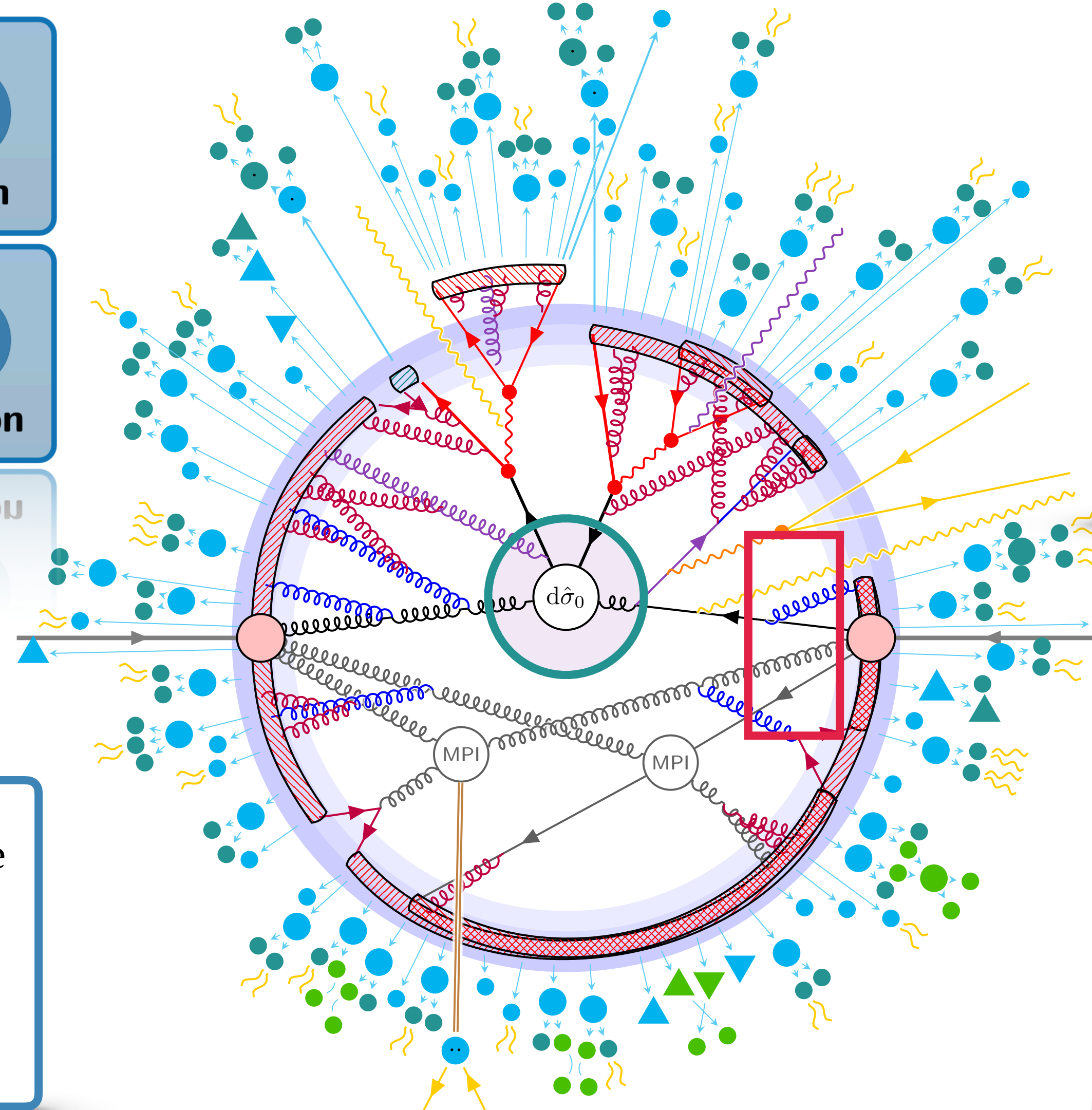
# Research Interests

# Theory of Strong Interactions in a Nutshell



$\simeq 2.2 \text{ MeV}$ $+\frac{2}{3}$ $\frac{1}{2}$ <b>u</b> up	$\simeq 1.3 \text{ GeV}$ $+\frac{2}{3}$ $\frac{1}{2}$ <b>c</b> charm	$\simeq 173 \text{ GeV}$ $+\frac{2}{3}$ $\frac{1}{2}$ <b>t</b> top	0 0 1 <b>g</b> gluon
$\simeq 4.7 \text{ MeV}$ $-\frac{1}{3}$ $\frac{1}{2}$ <b>d</b> down	$\simeq 96 \text{ MeV}$ $-\frac{1}{3}$ $\frac{1}{2}$ <b>s</b> strange	$\simeq 4.2 \text{ GeV}$ $-\frac{1}{3}$ $\frac{1}{2}$ <b>b</b> bottom	0 0 1 <b><math>\gamma</math></b> photon

quark	strange	bottom	photon
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**Hard scattering  $\hat{\sigma}_0$ :** encodes short-range interactions; computed from first principles.

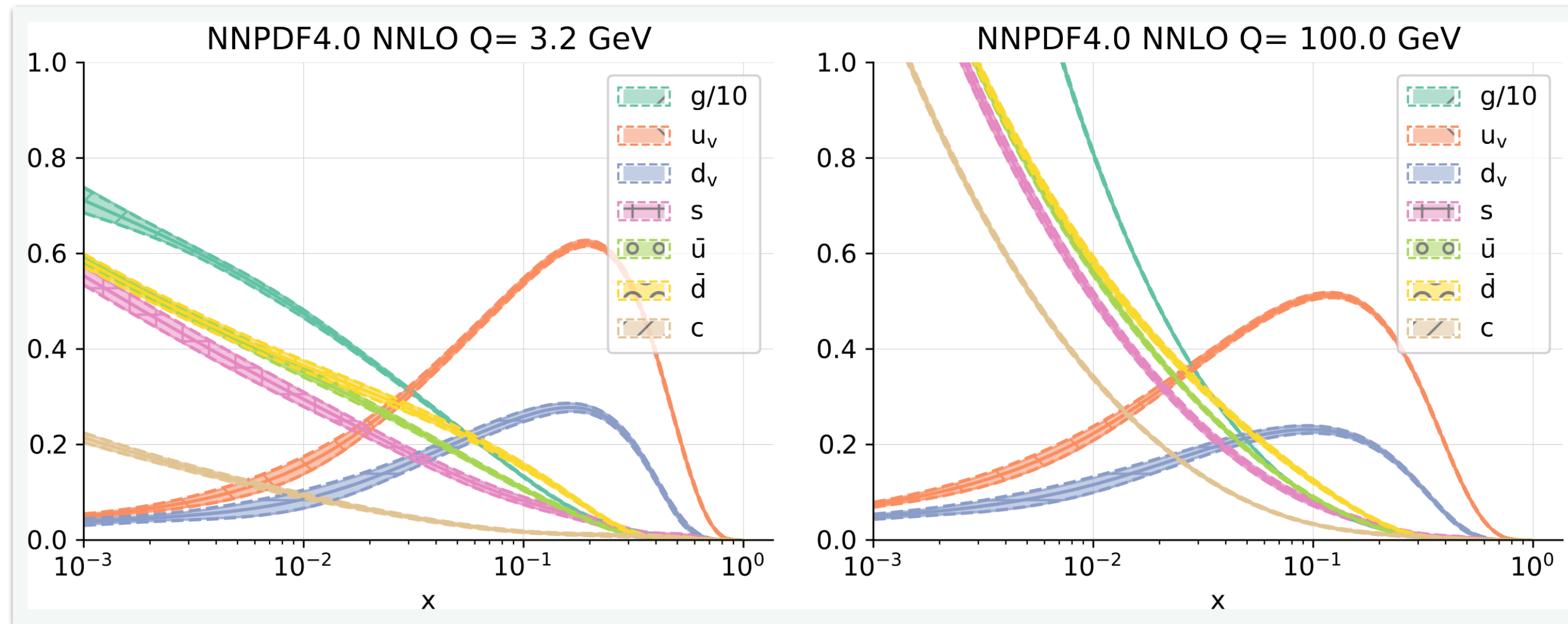
**Parton Distribution Functions (PDFs):** encodes long-range non-perturbative interactions; cannot be computed from first principle and have to be determined from experimental Data.

**PDFs are Universal**

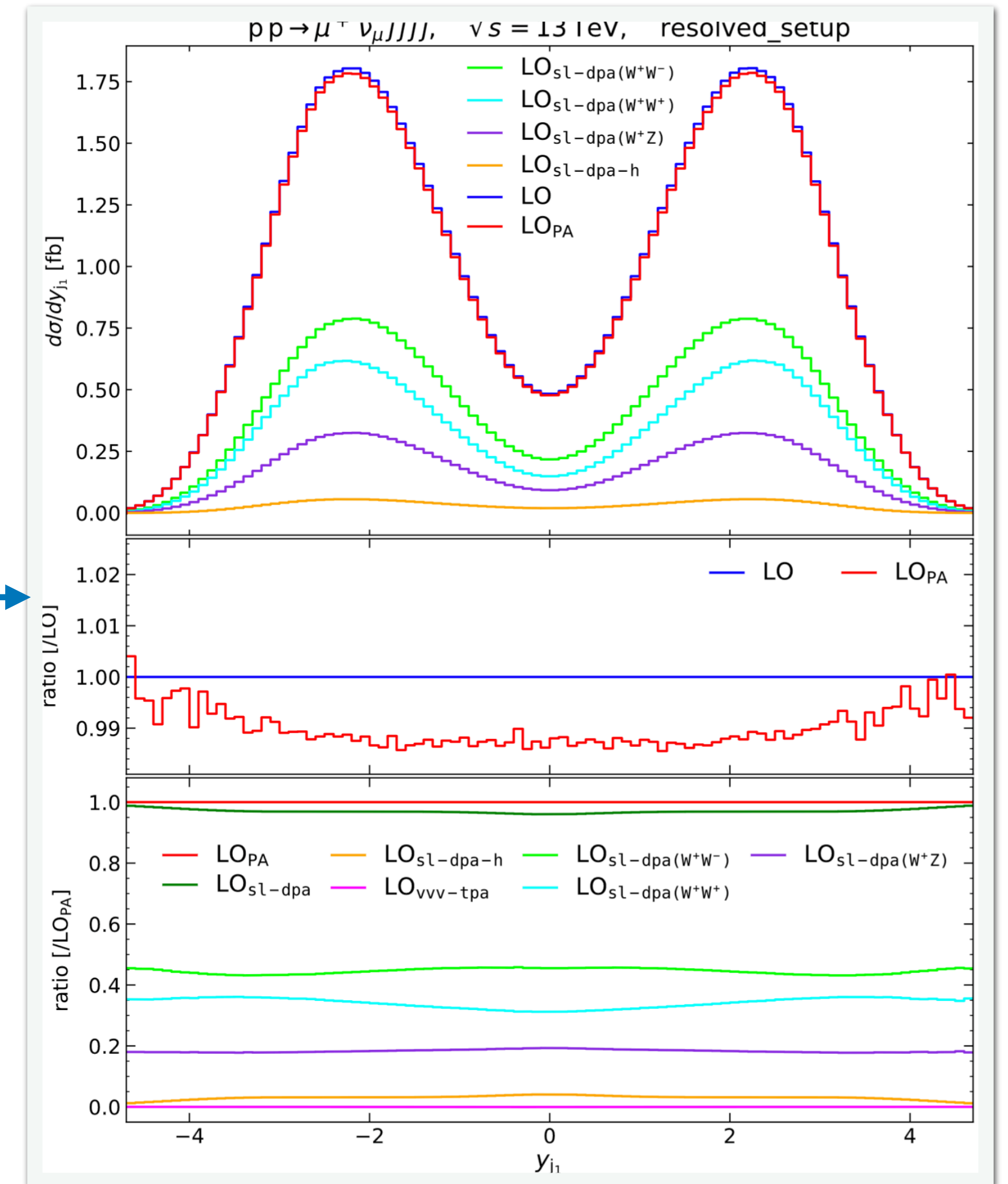
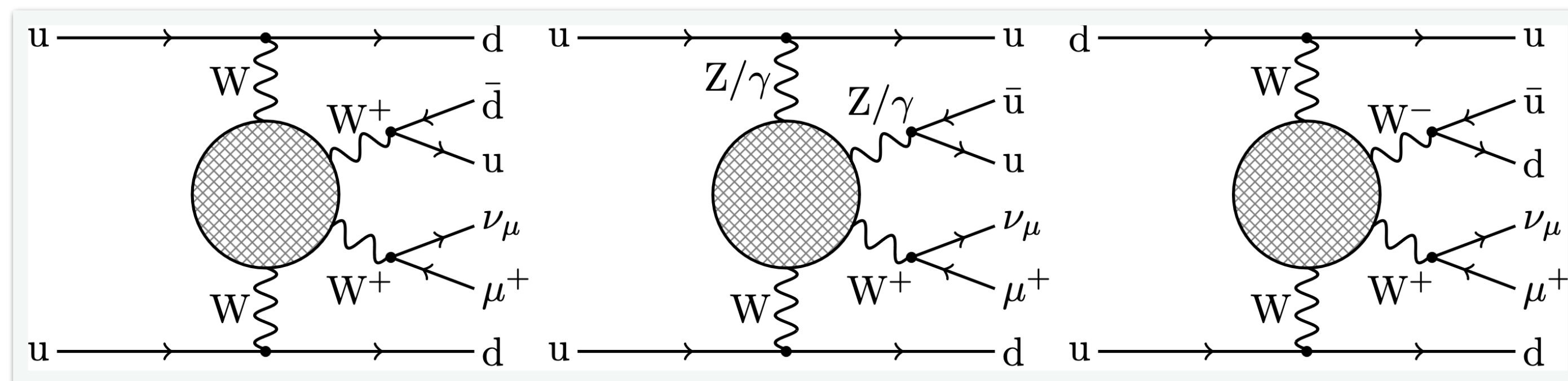
Experiments measure an Observable  $\mathcal{O}$  (cross-section, decay rates, etc.):

$$\mathcal{O} = \sum \hat{\sigma}_0 \otimes \text{PDF}$$

# How does my Research fits in the Big Picture?



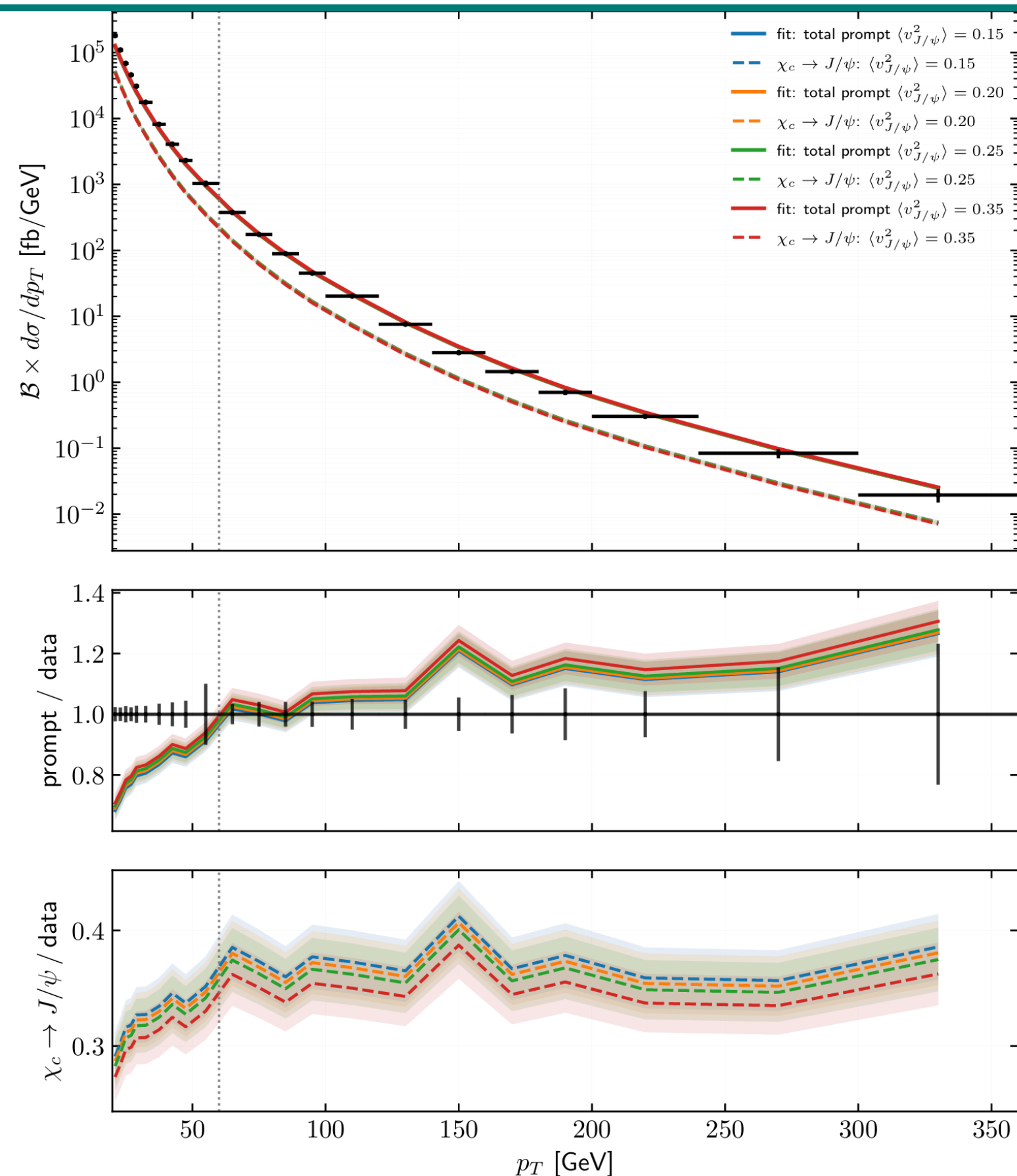
Encodes in Parton-level/General Purpose MC programs, ...



Theoretical Predictions that can be Compared to Experimental Data

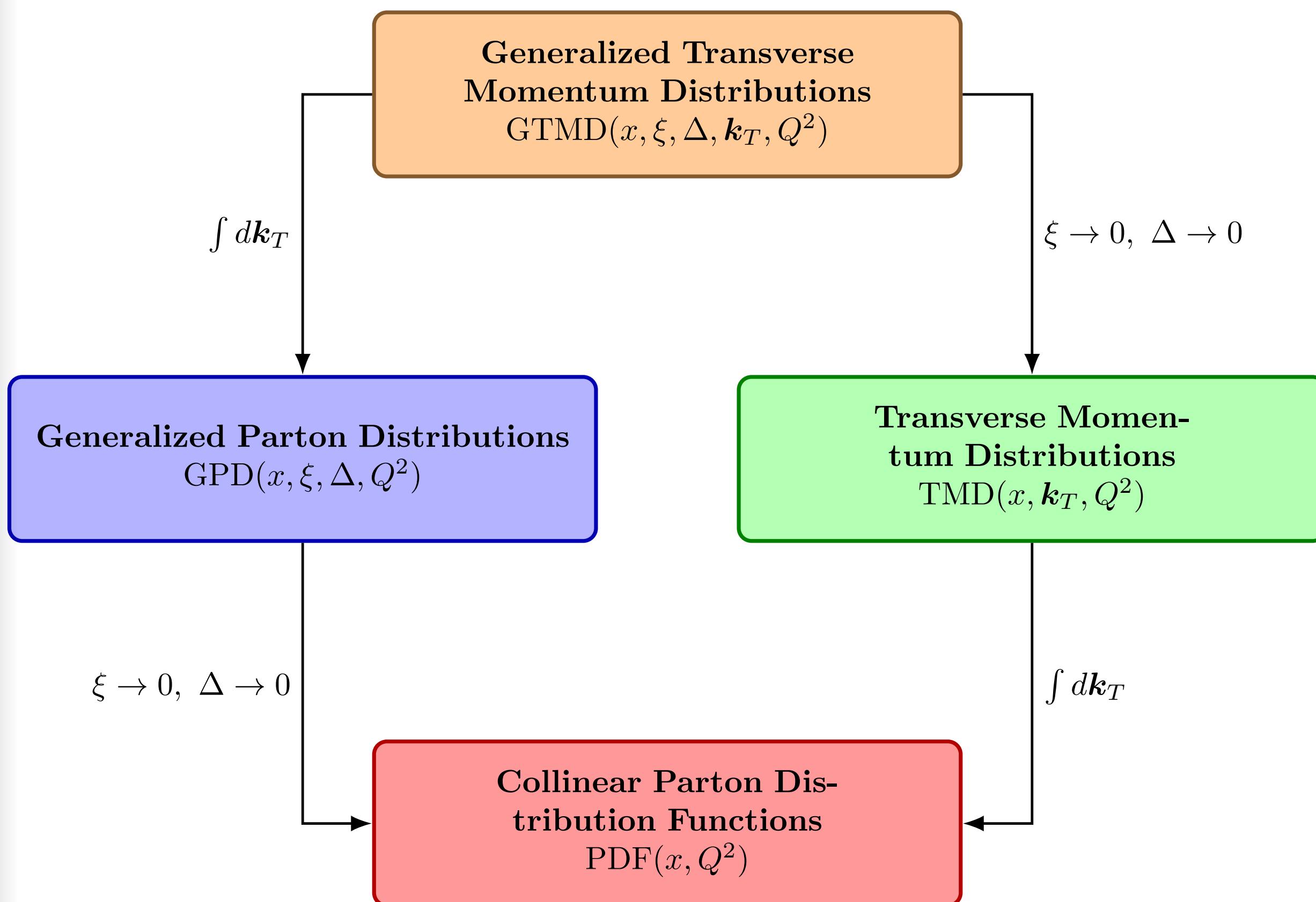
# Quarkonia, TMDs, GPDs, and more...

## Quarkonia Phenomenology & Extraction of Quarkonia Fragmentation Functions



## Looking Deeper into the Structure of Hadrons

(Longitudinal & transverse momentum, spatial distributions, etc.)





# Thank You

**“Wanderer above the Sea of Fog”  
by Caspar David Friedrich**