Le LHC : observatoire géant de l'infiniment petit

Yann Coadou

Centre de physique des particules de Marseille

Ajaccio, 16 avril 2019

cnrs dépasser les frontières
IN2P3 Les deux infinis
Aix*Marseille université Initiative d'excellence
CENTRE DE PHYSIQUE DES PARTICULES DE MARSEILLE CPPM

Access to the ATLAS collaboration public web site

ATLAS EXPERIMENT VIRTUAL VISITS

Discover
ATLAS visits on 6 continents, Visits shared with partners

Book a Visit

Next Events

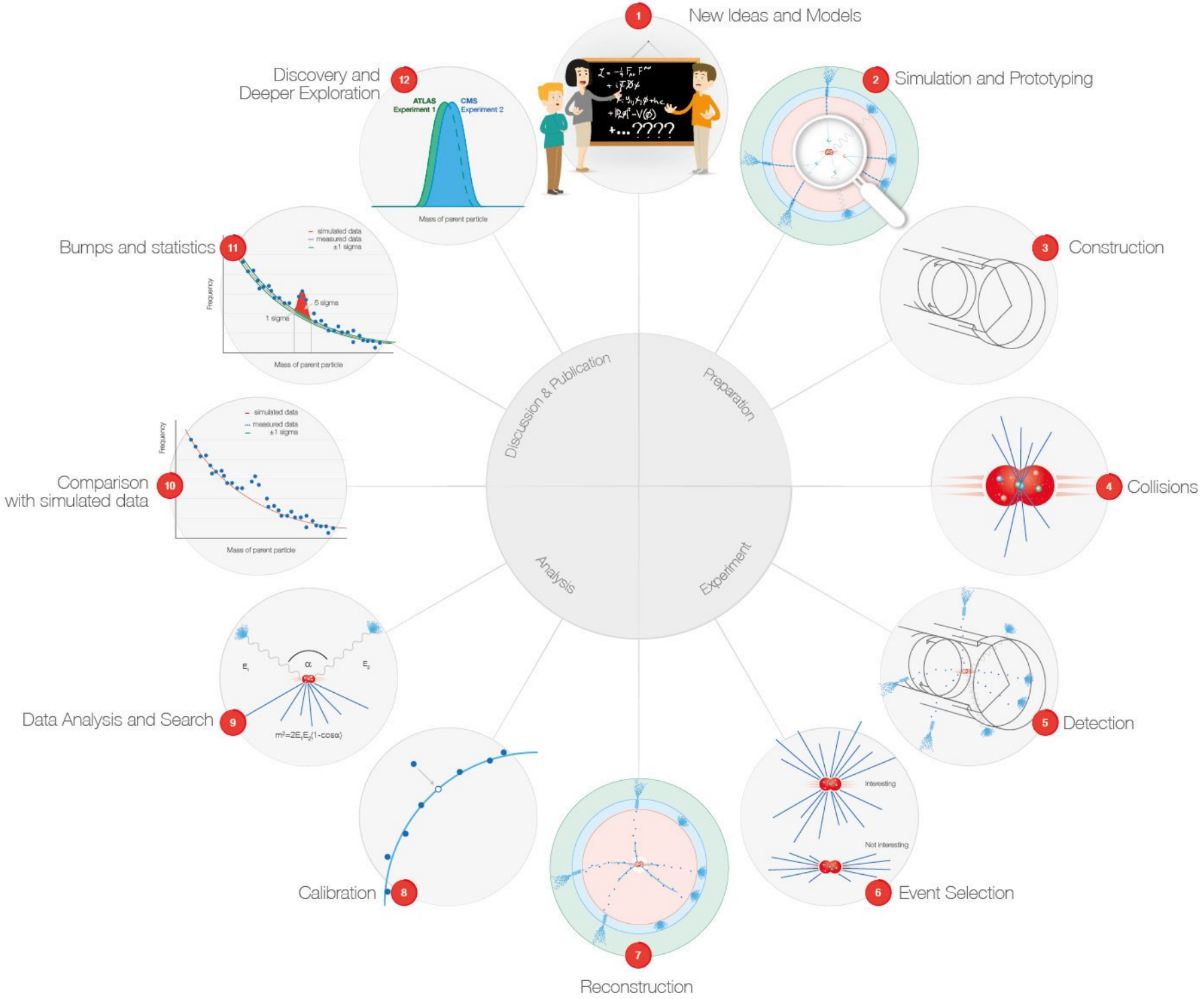
Lycée Lætitia Bonaparte

City: Ajaccio
Country: France
Cern date & time: Tuesday, April 16, 2019 - 18:30
Language: français

the framework of the local CNRS club and its regular conference and workshop programme, Yann Coadou will present the scientific context, past discoveries, ongoing studies and bright future of the Large hadron collider (LHC) at CERN. This is the continuation of a longstanding collaboration between the Centre de physique des particules de Marseille and the Lycée Lætitia Bonaparte. This conference, following a day-long particle physics masterclass for some of the students, will include a live connection with a scientist at CERN, leading us into a virtual visit of the ATLAS detector, the largest experiment at the LHC, while answering questions from the audience.

Operator: Claire Adam Bourdarios
ACR host: Claire Adam Bourdarios

http://atlasvirtualvisit.web.cern.ch/content/lycée-lætitia-bonaparte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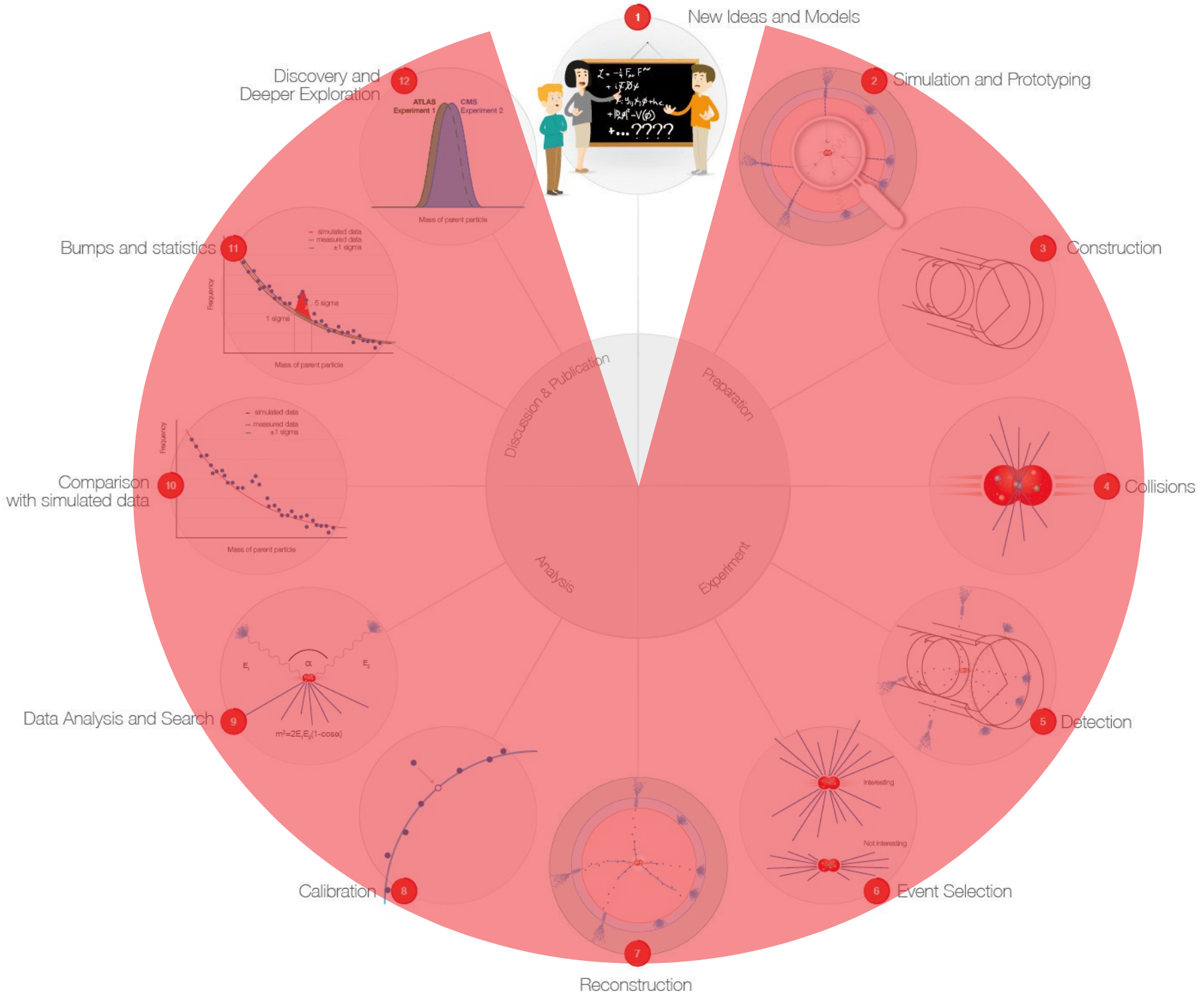
CMS Experiment 2
Mass of parent particle
simulated data
measured data
±1 sigma
Frequency
5 sigma
1 sigma
Interesting
Not interesting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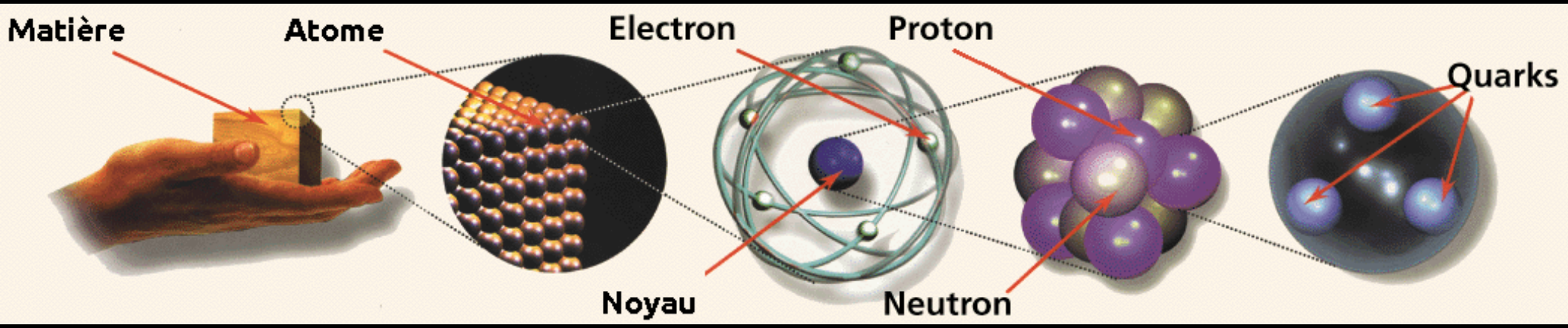
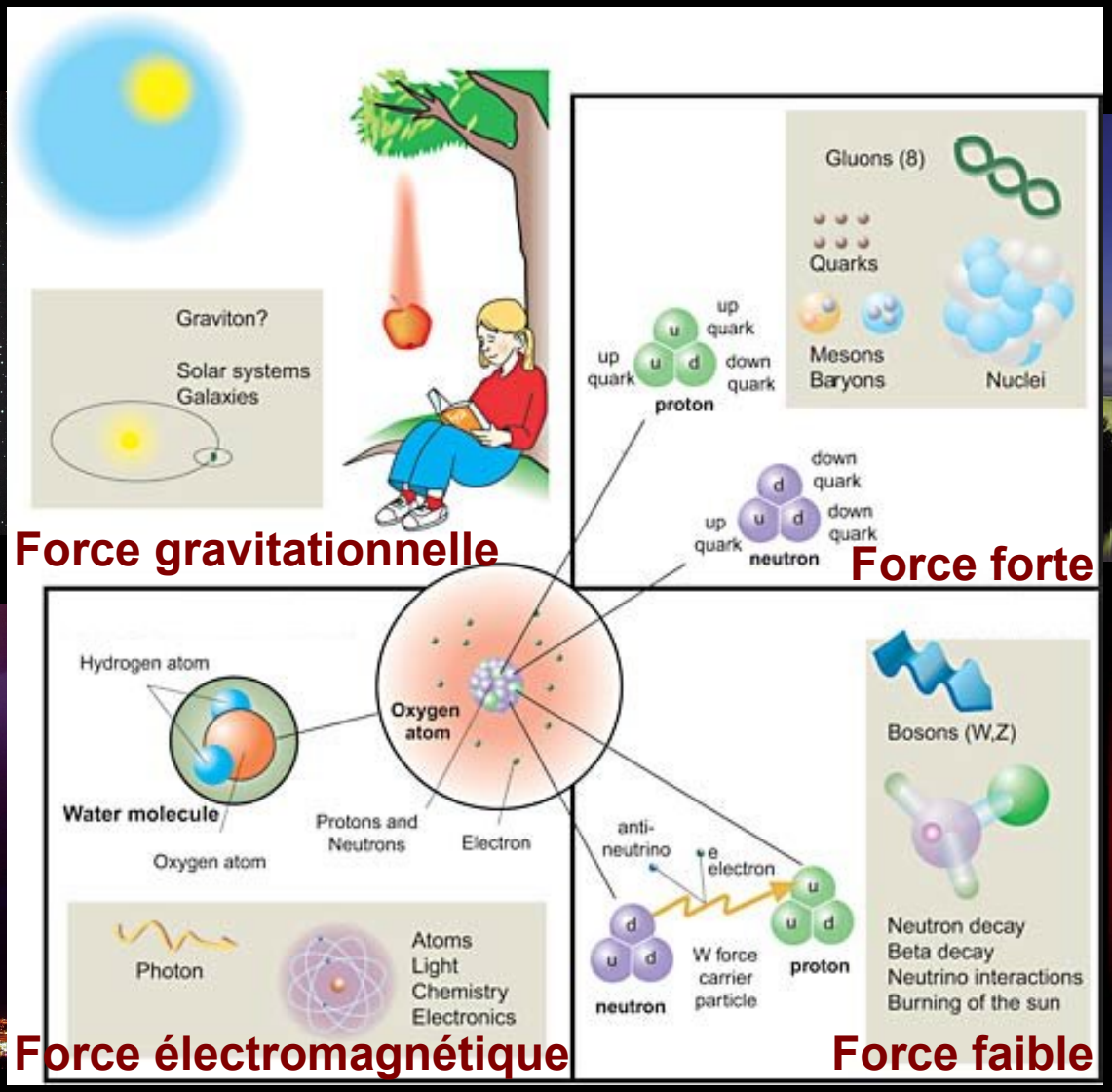
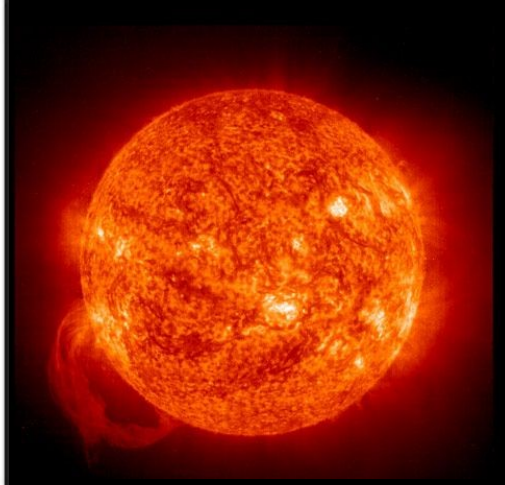
De quoi sommes-nous faits ?

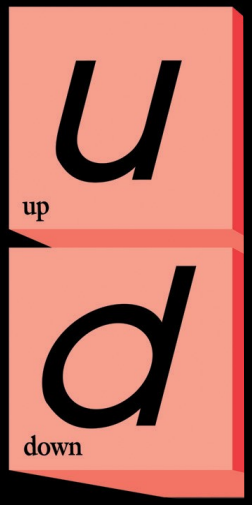



Graviton?
Solar systems
Galaxies
Force gravitationnelle
Gluons (8)
Quarks
Mesons
Baryons
Nuclei
up quark
down quark
proton
down quark
up quark
down quark
neutron
Force forte
Hydrogen atom
Oxygen atom
Water molecule
Oxygen atom
Protons and Neutrons
Electron
Photon
Atoms
Light
Chemistry
Electronics
Force électromagnétique
anti-neutrino
e electron
W force carrier particle
neutron
proton
Bosons (W,Z)
Neutron decay
Beta decay
Neutrino interactions
Burning of the sun
Force faible

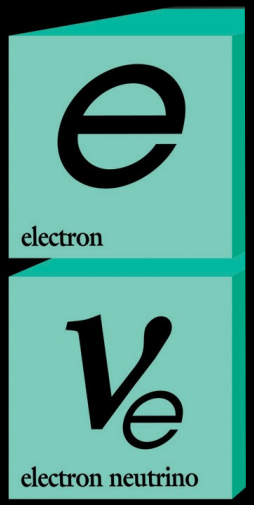


Le modèle standard

Quarks

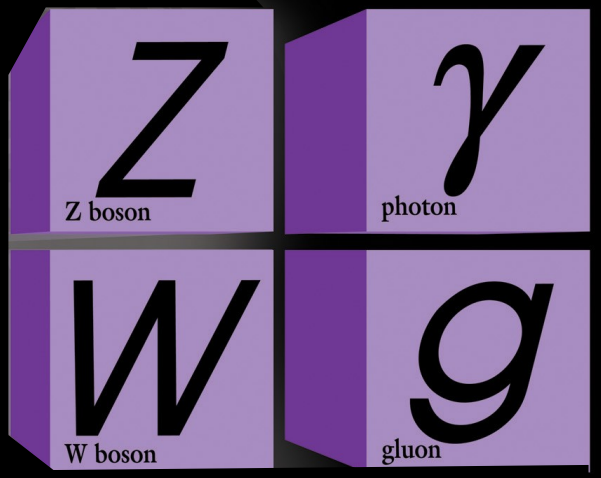


+ anti-matière



Leptons

Forces



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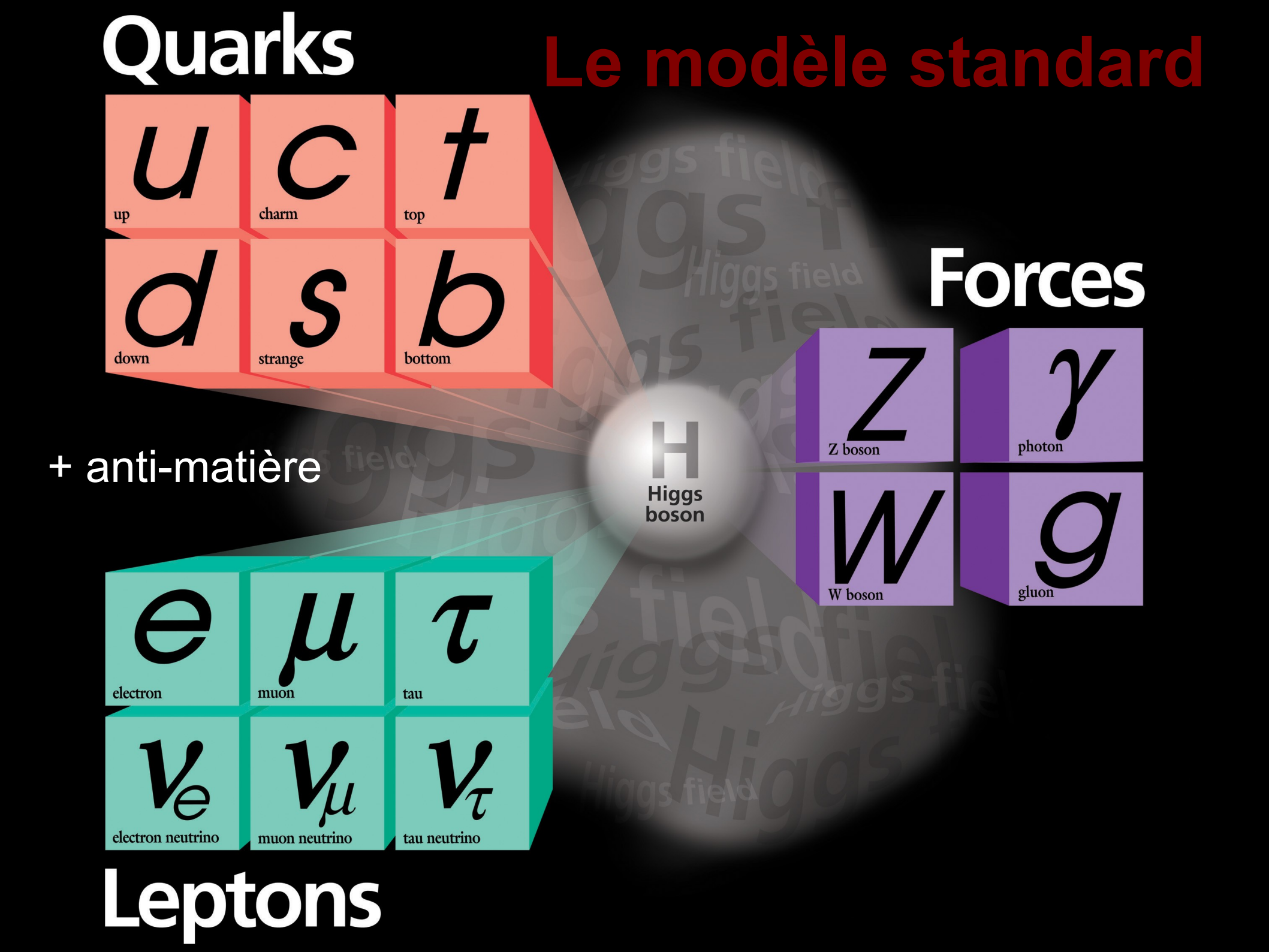

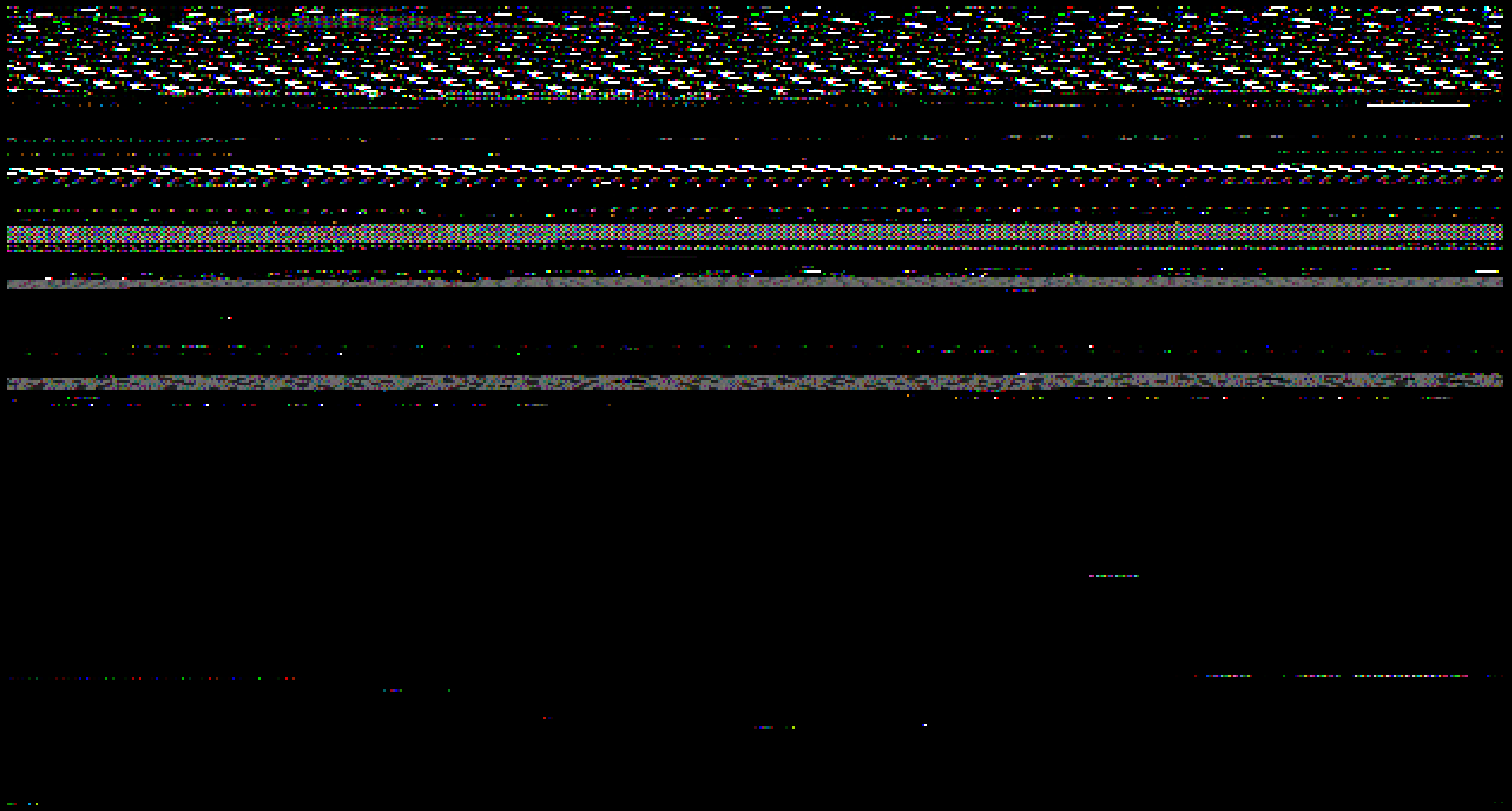

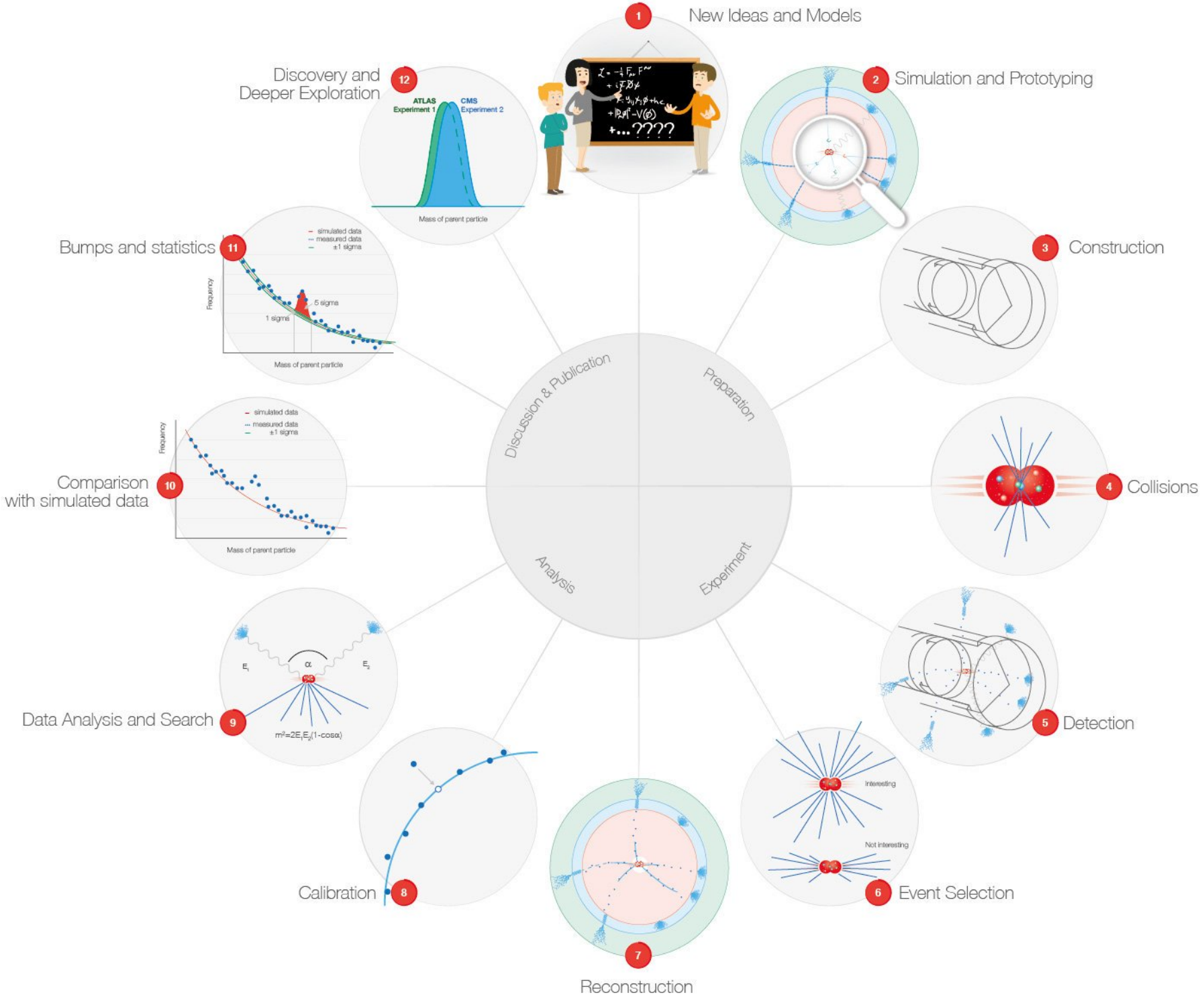
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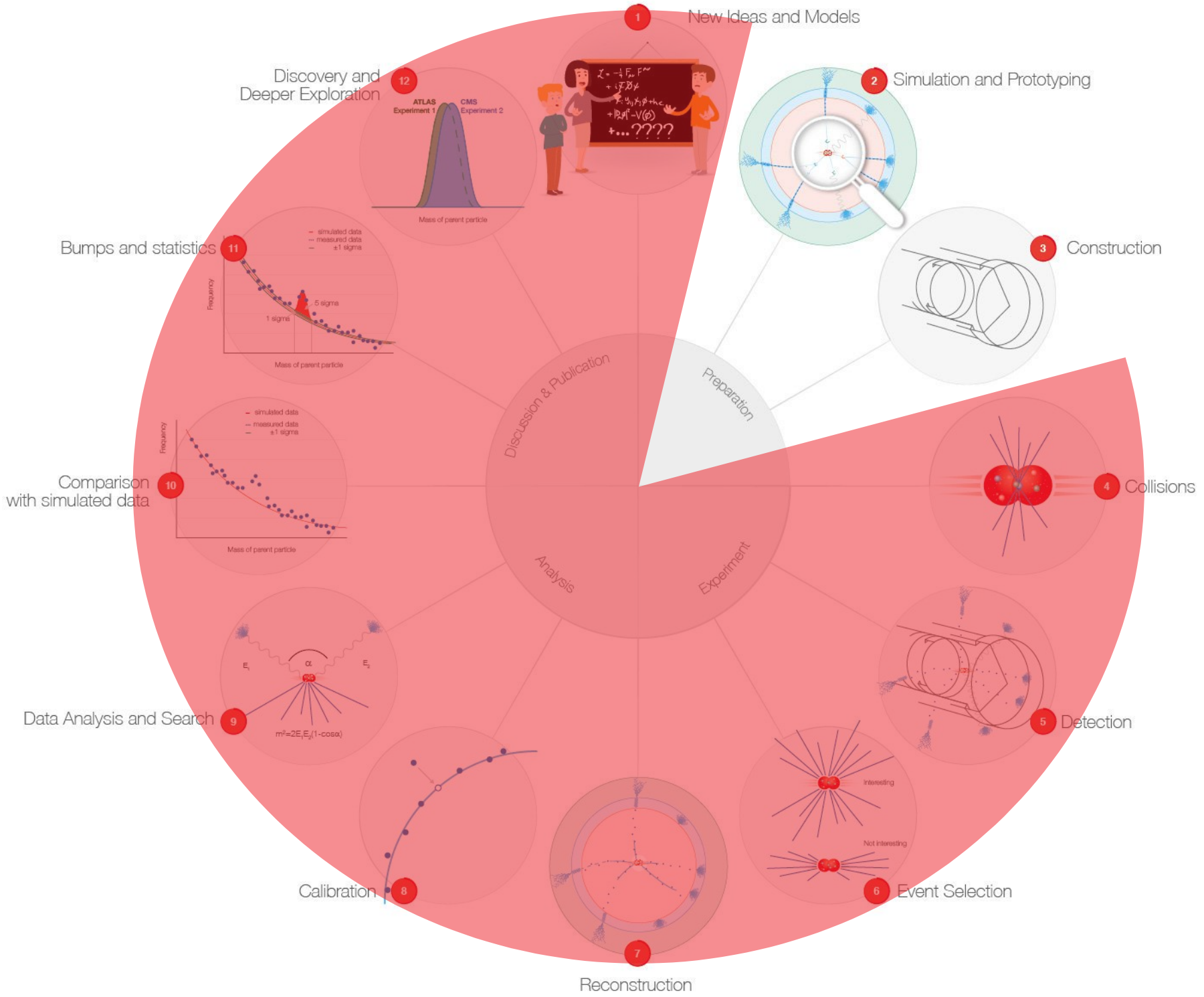
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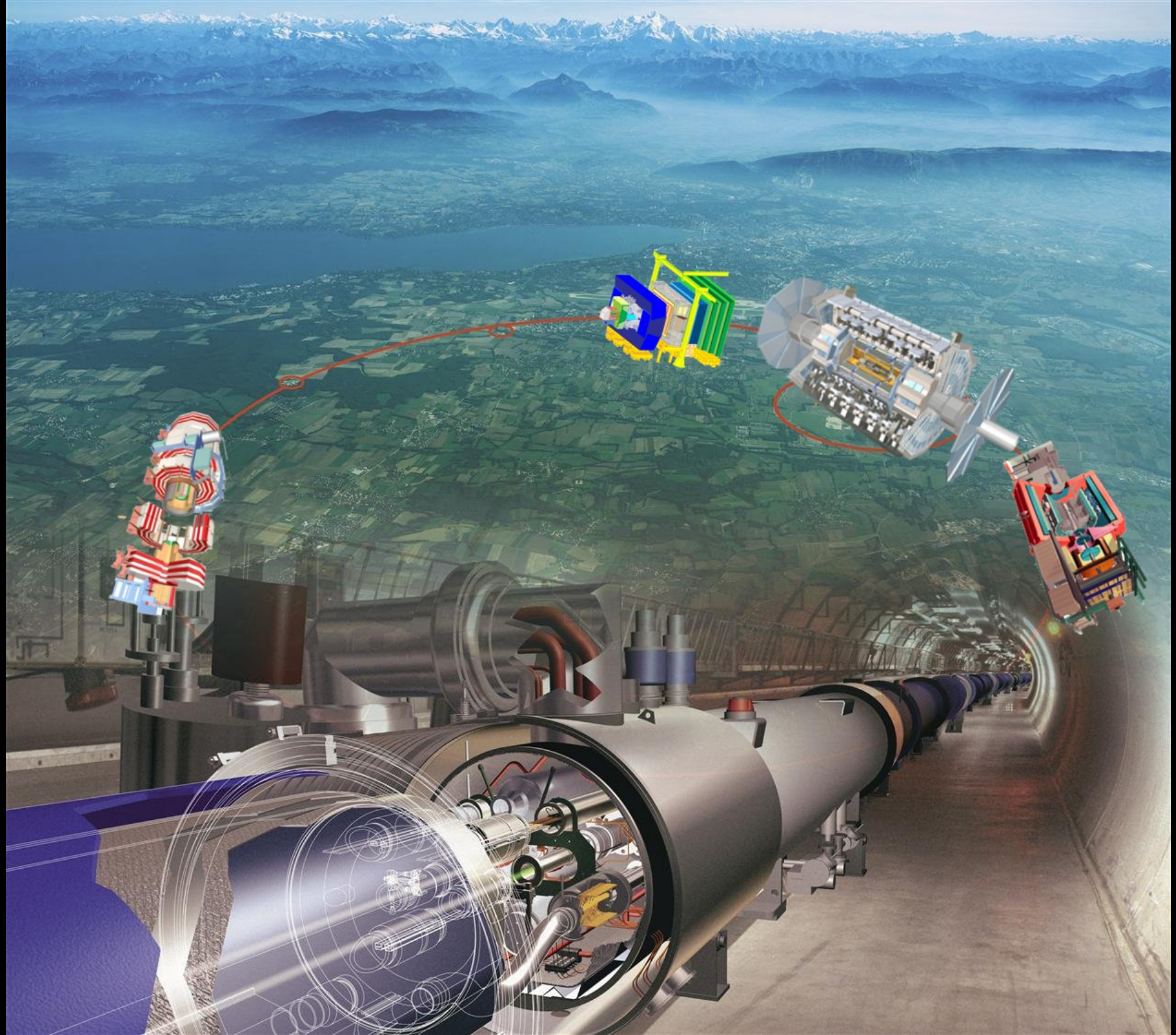

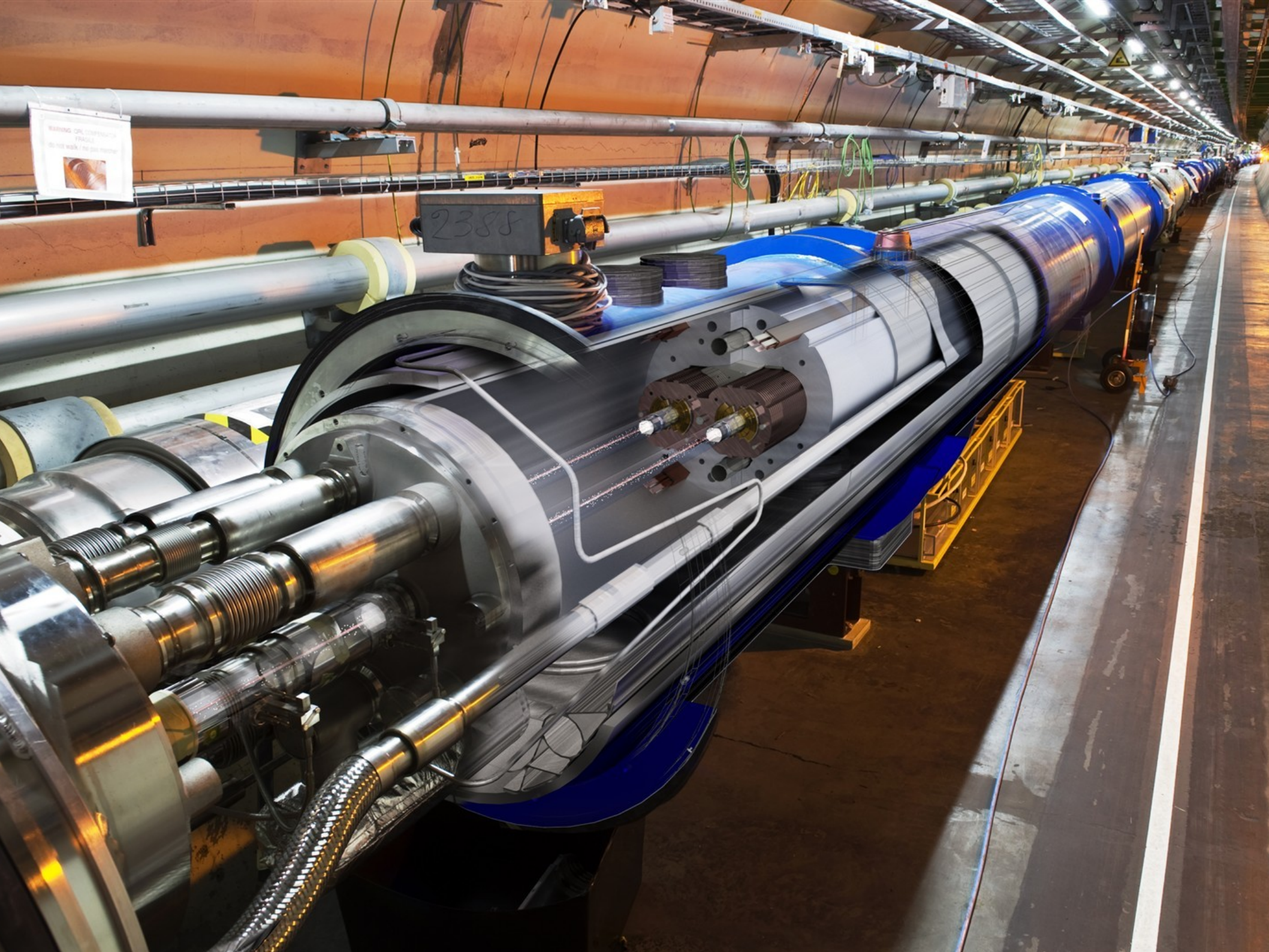
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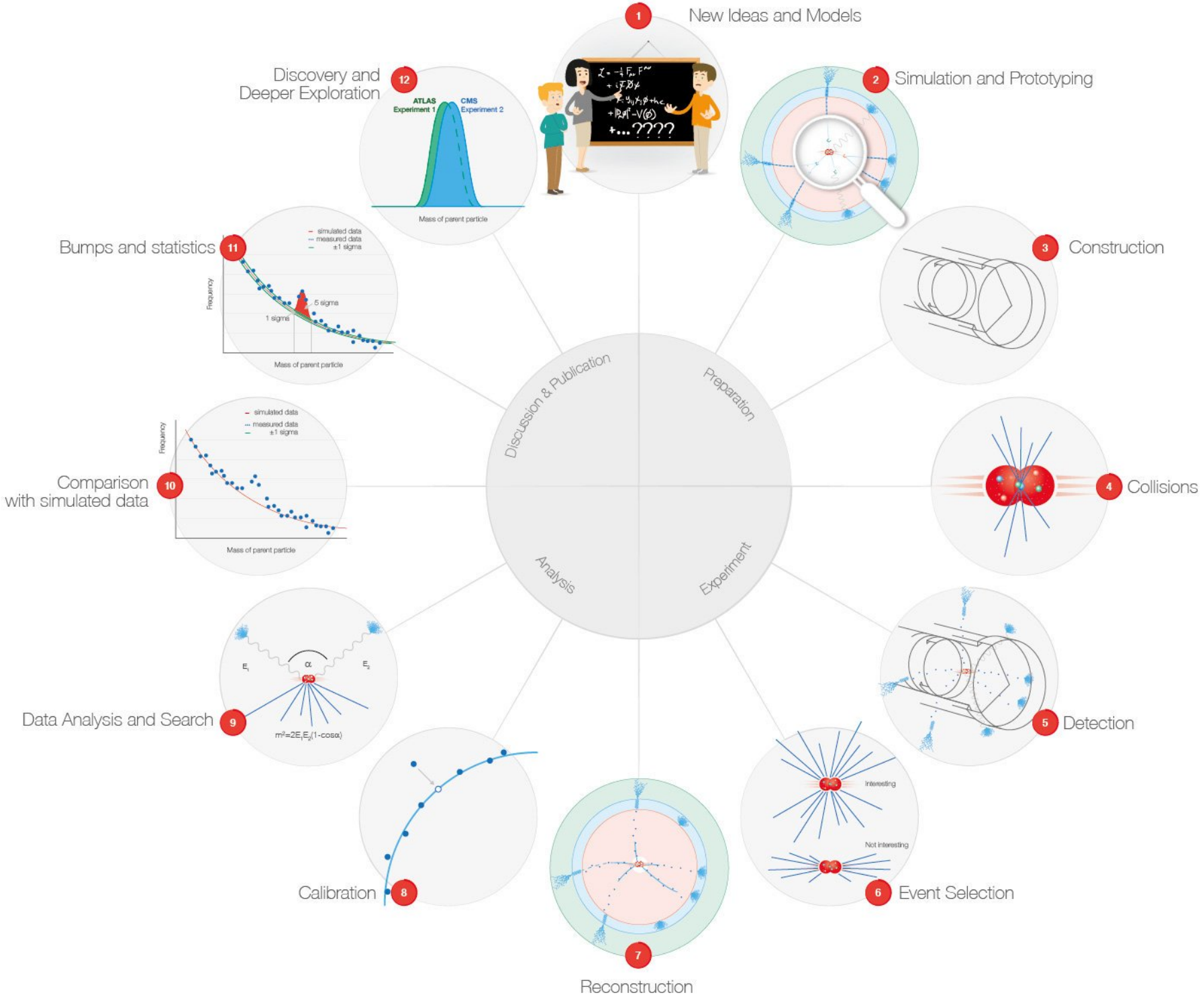
CERN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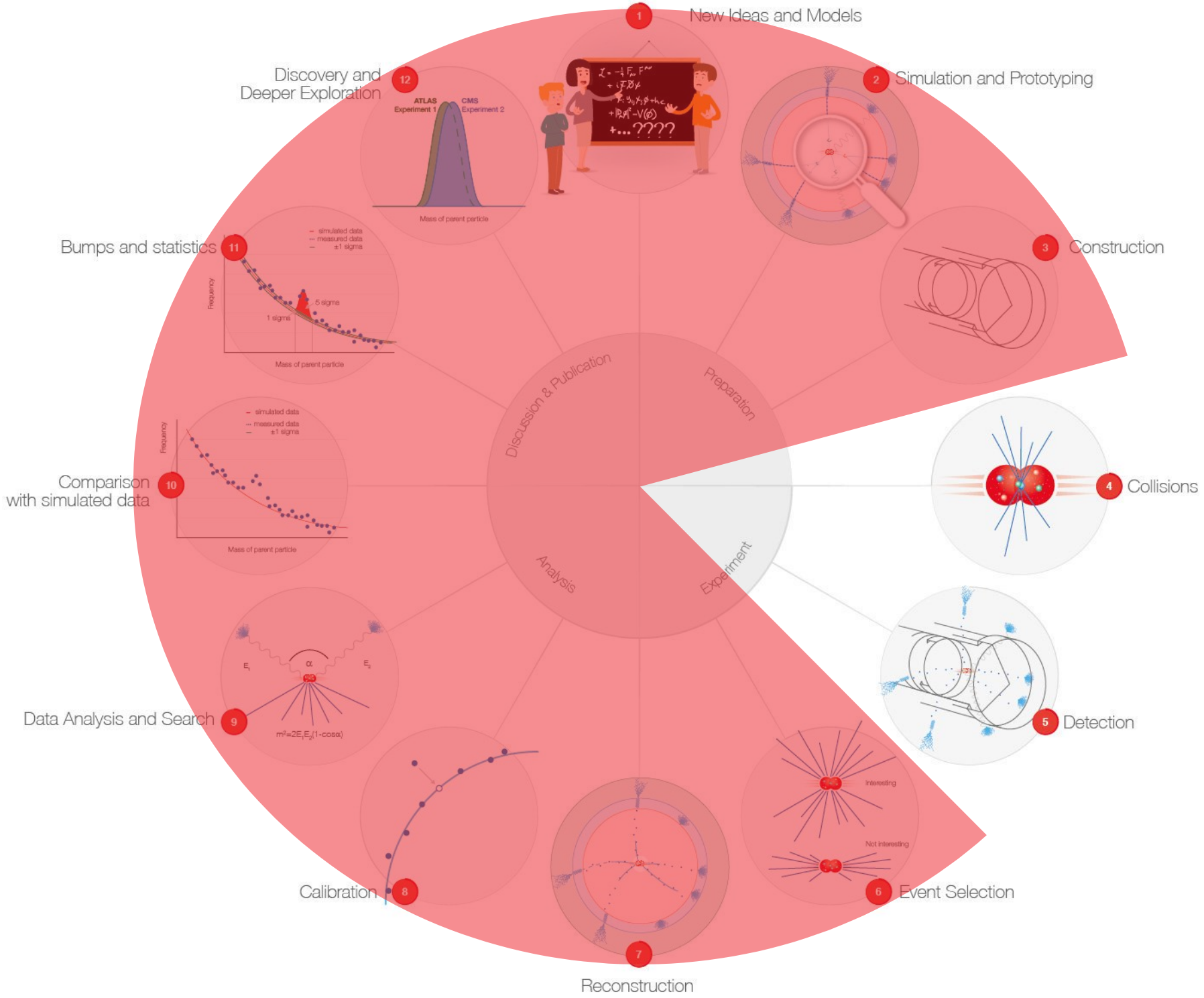
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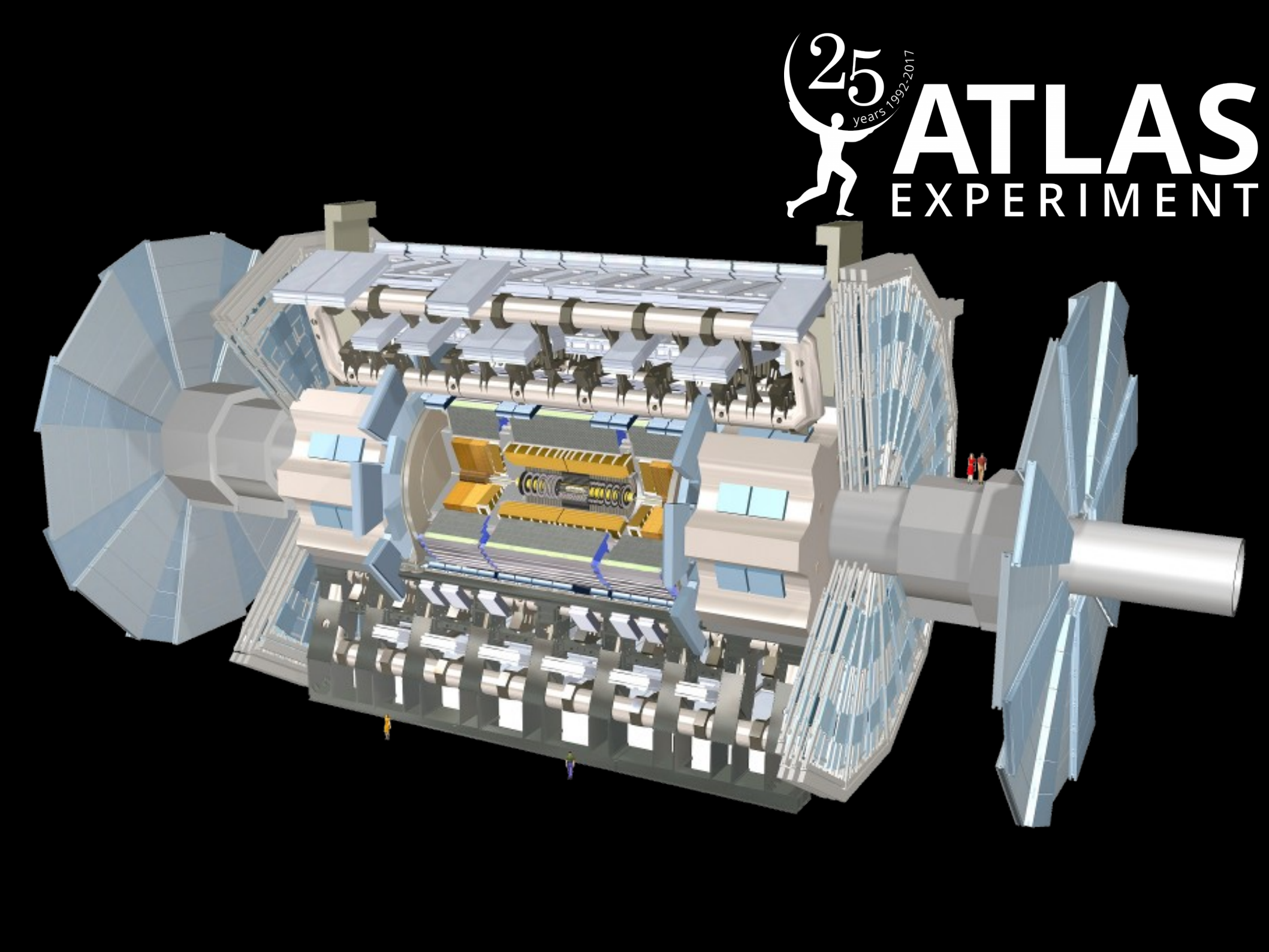
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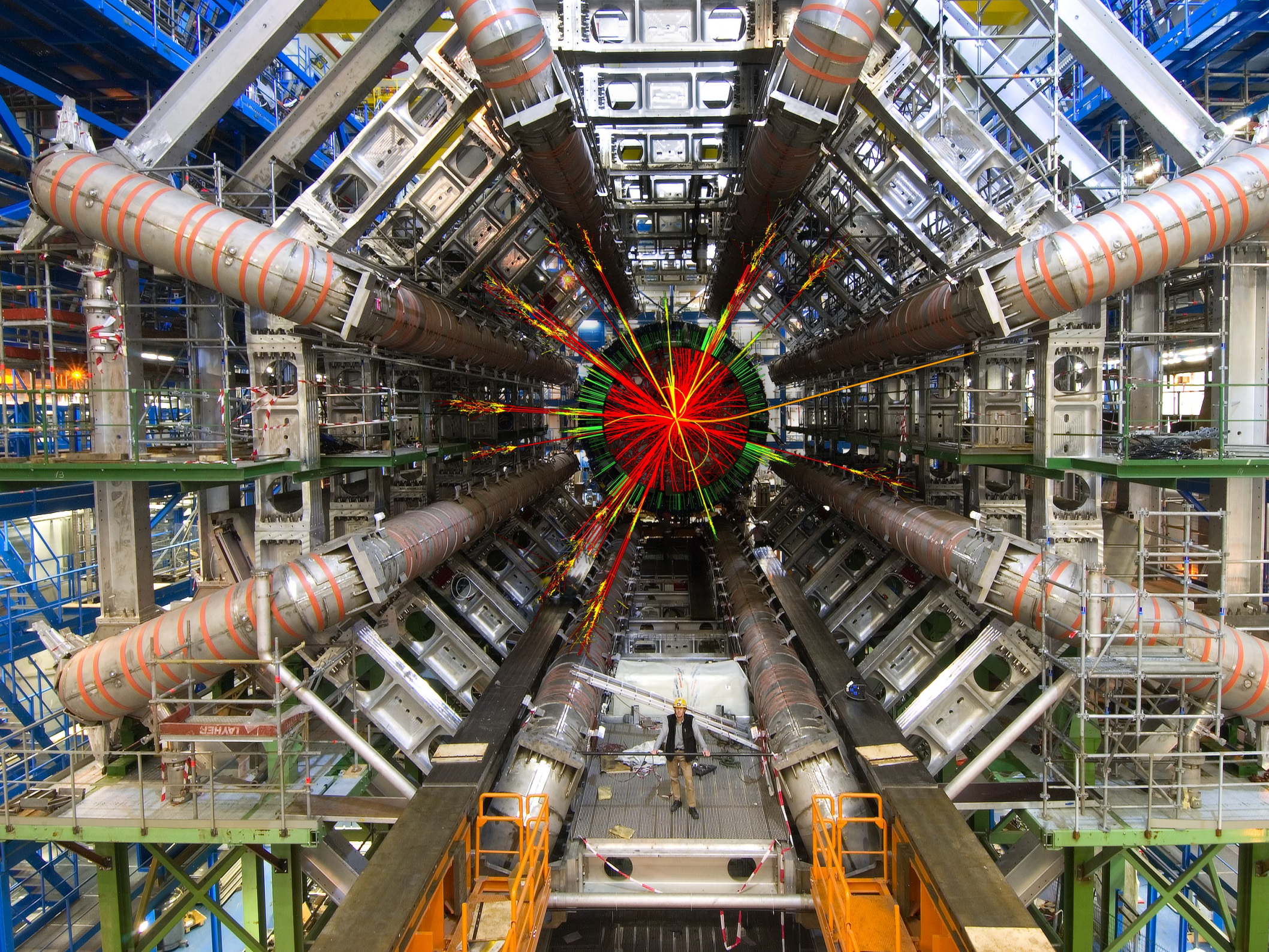
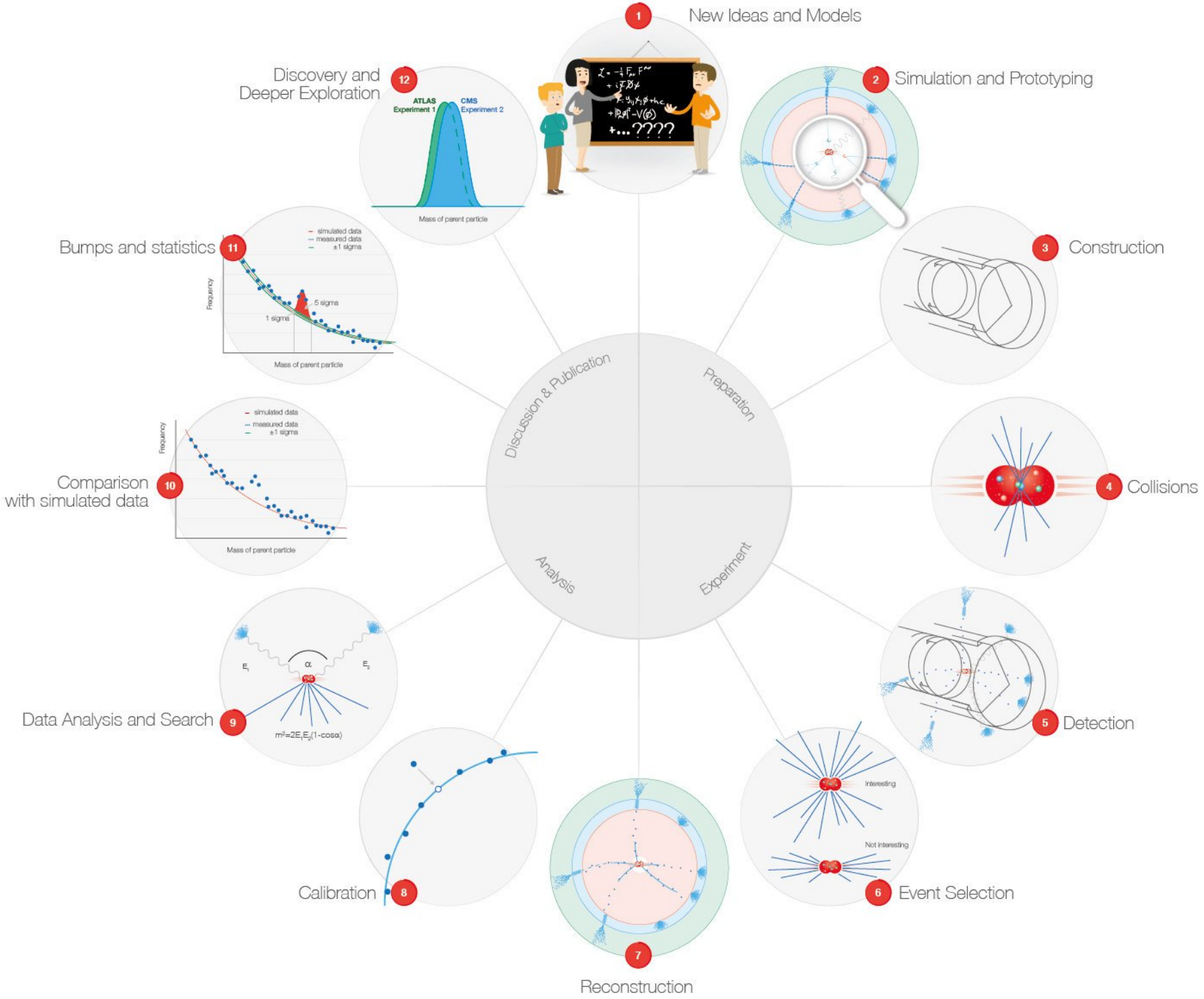
ATLAS
EXPERIMENT

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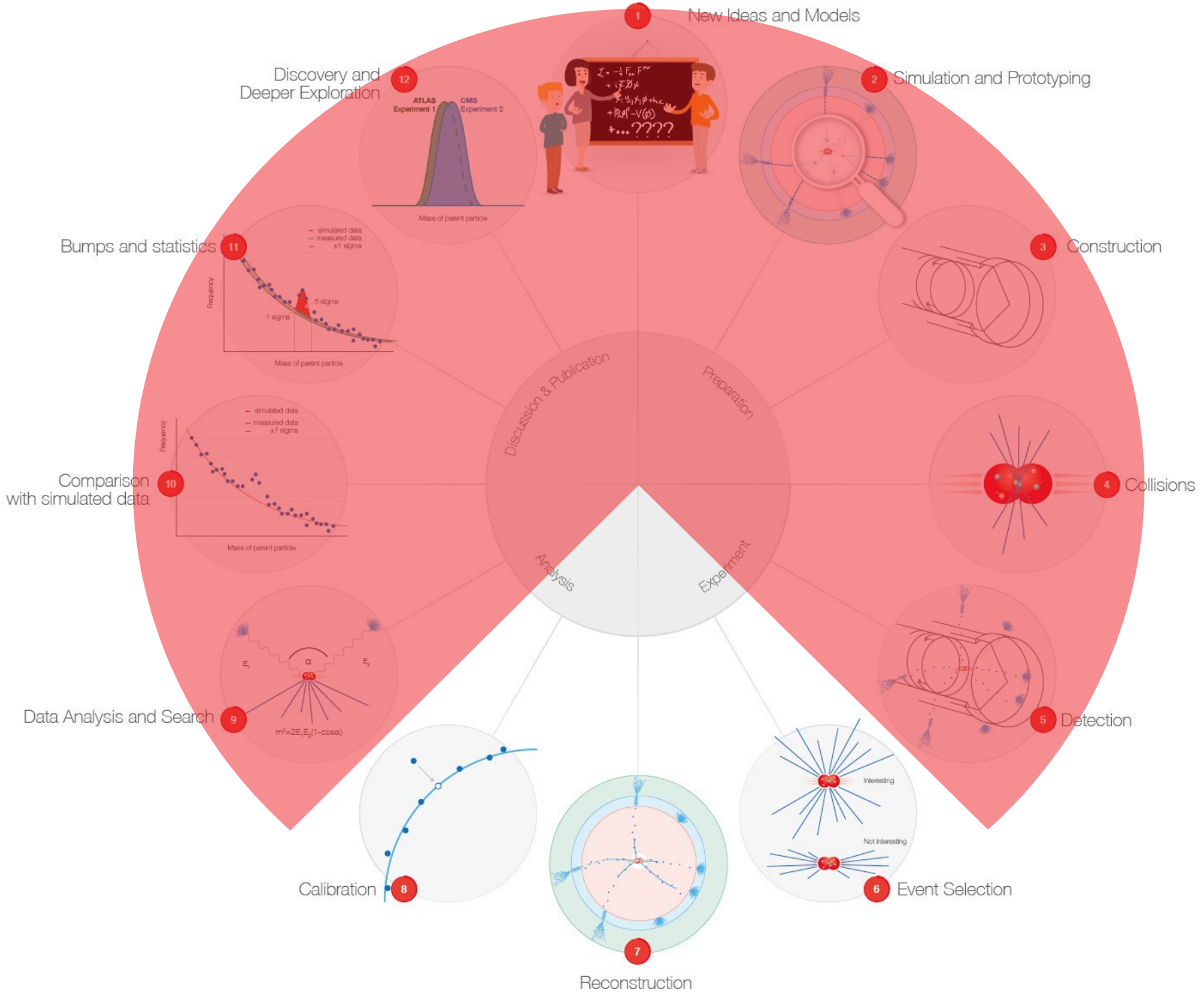
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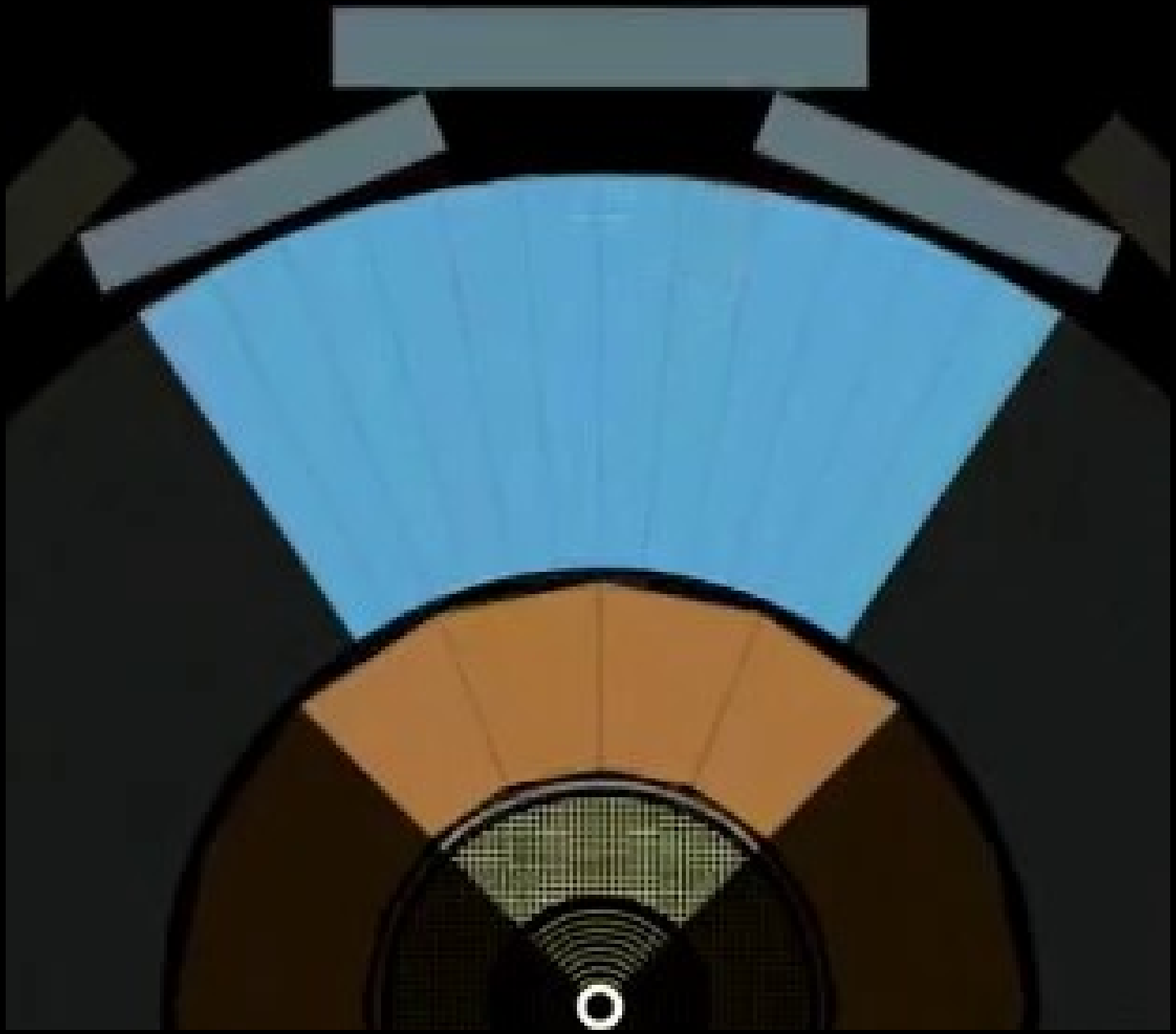

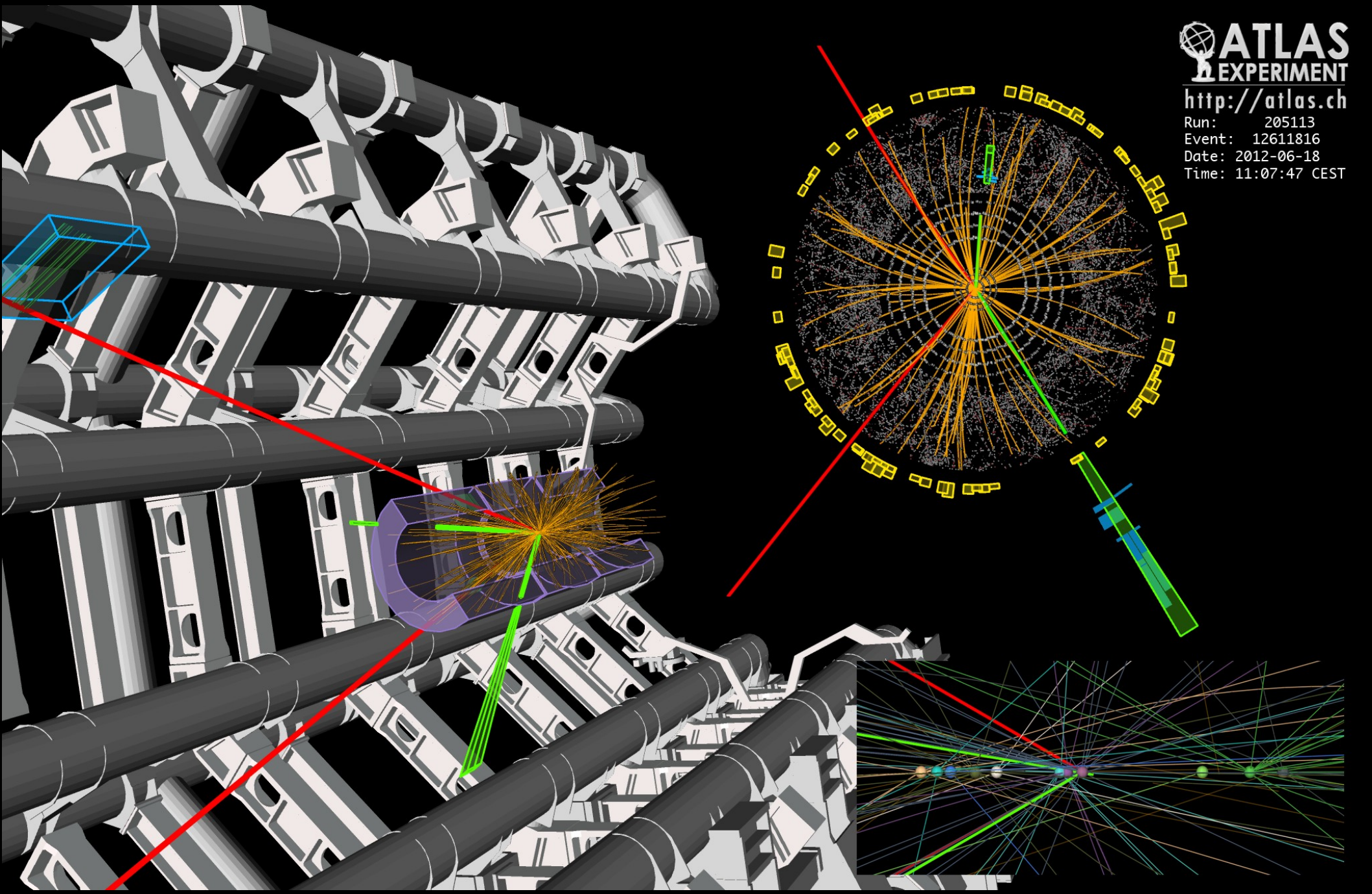
ATLAS
EXPERIMENT
http://atlas.ch
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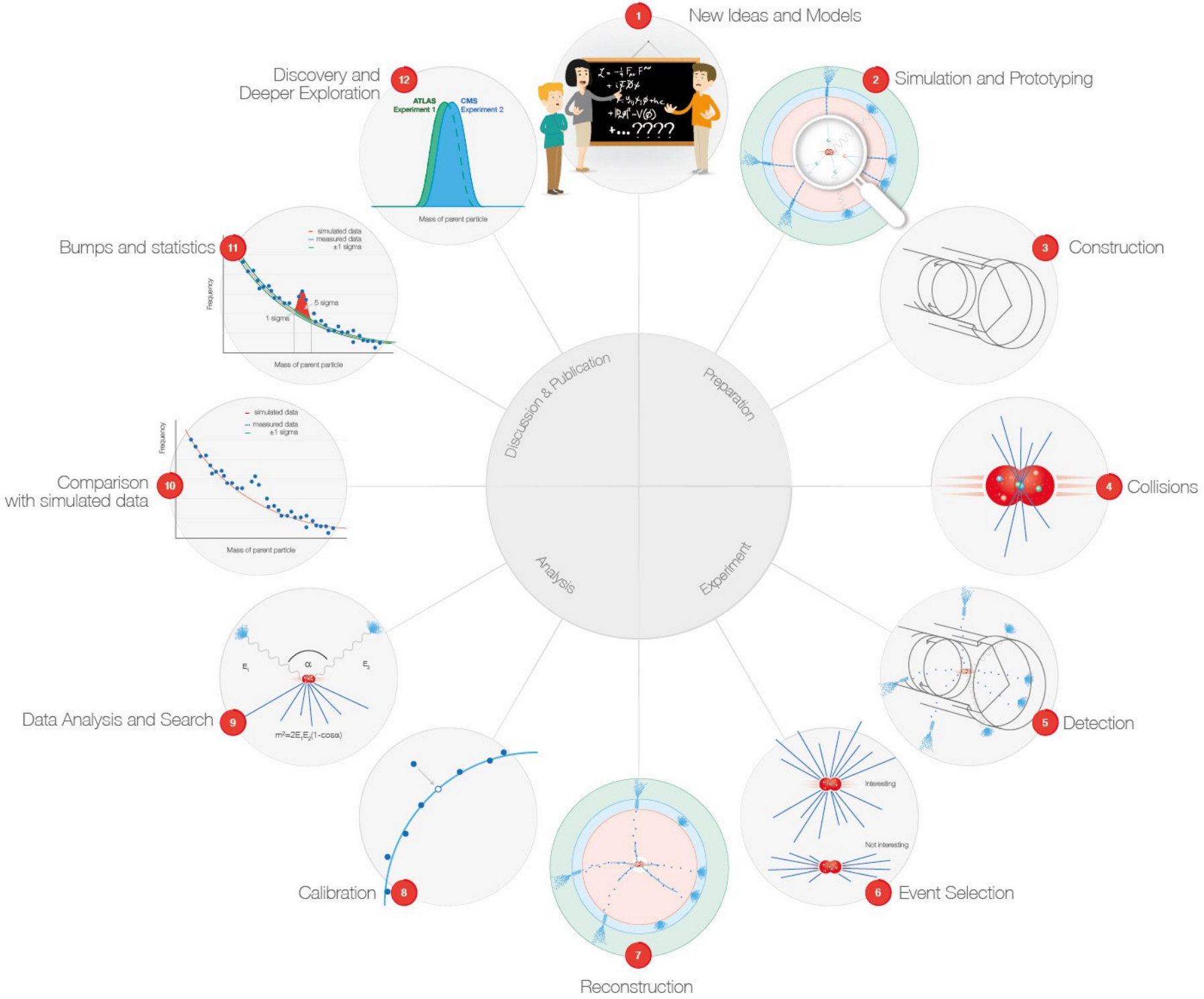
Date: 2012-06-18
Time: 11:07:47 CEST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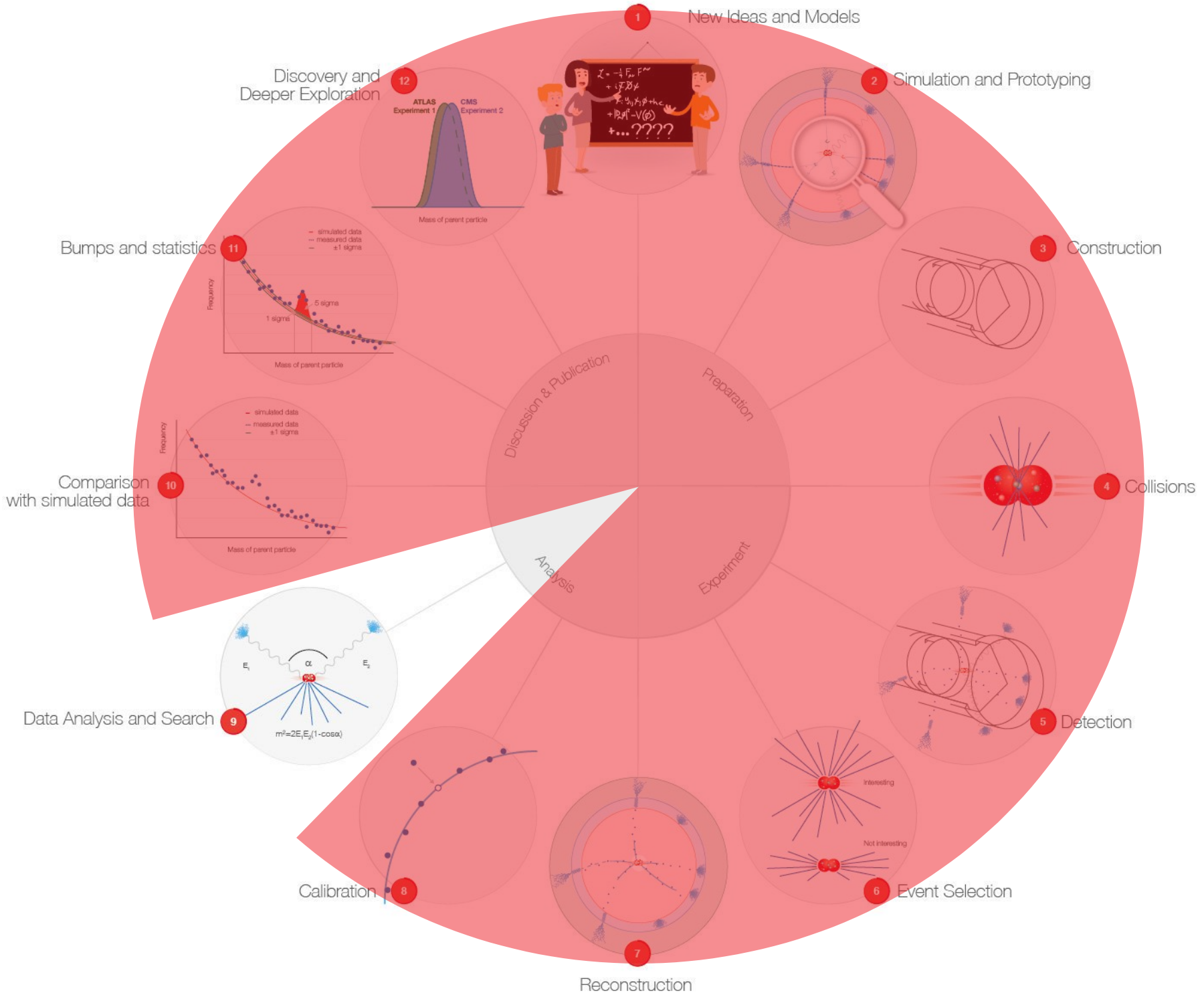
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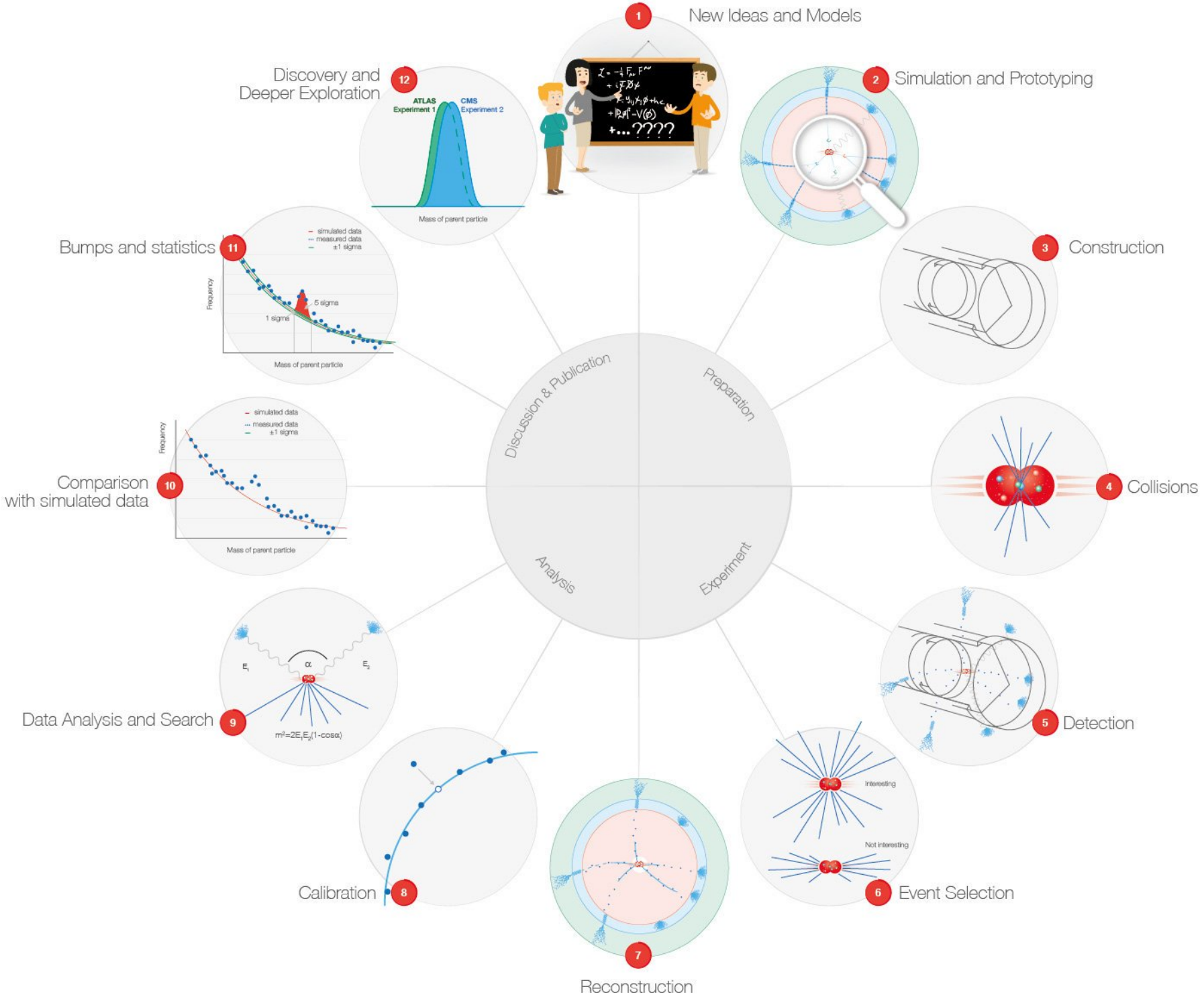
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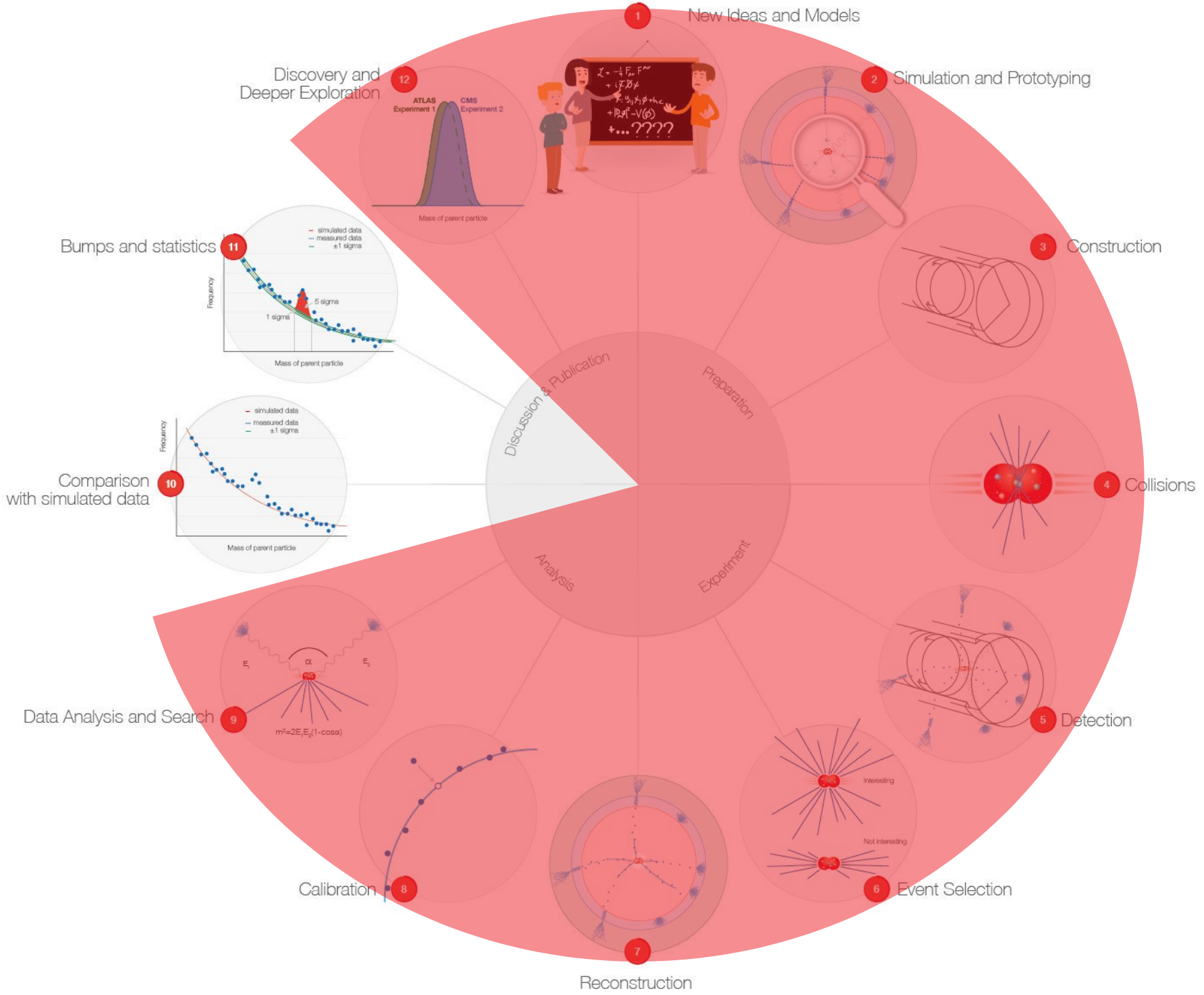
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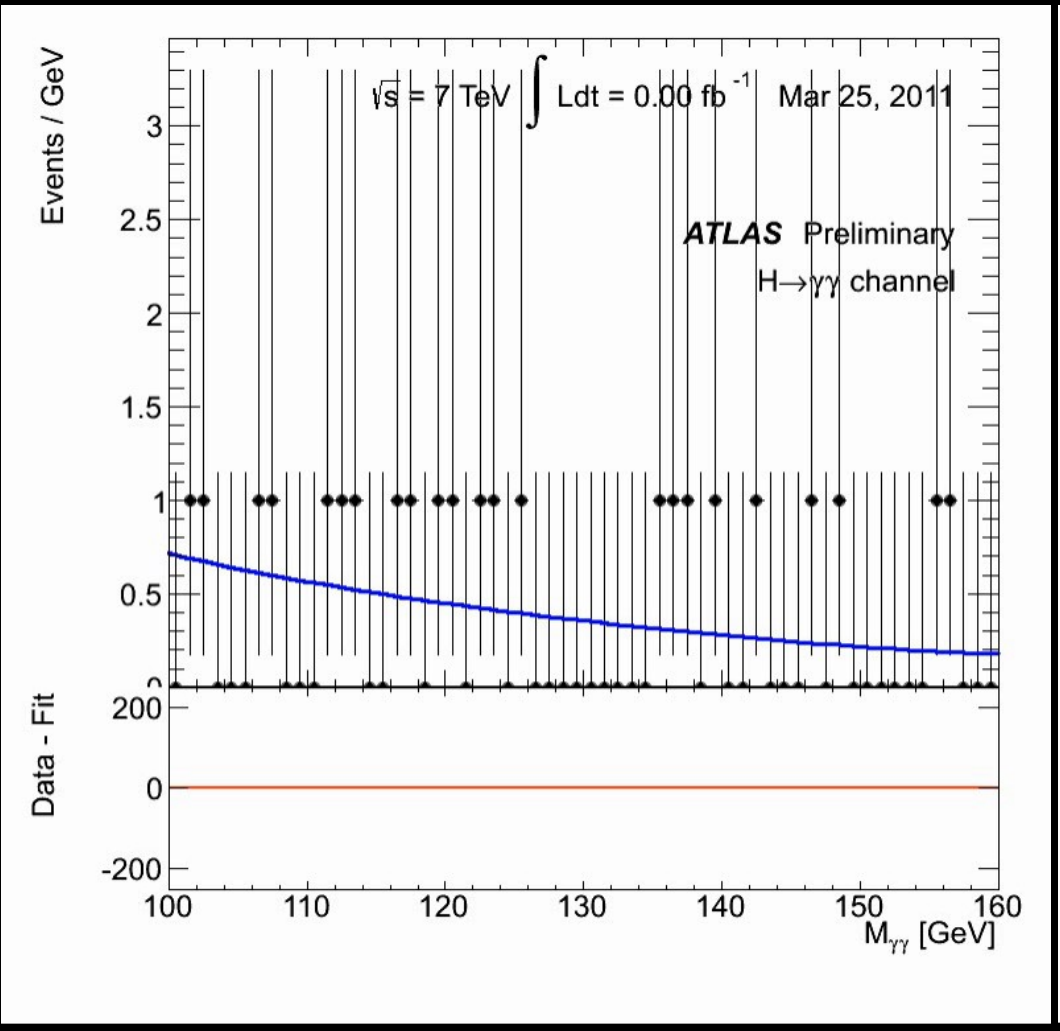
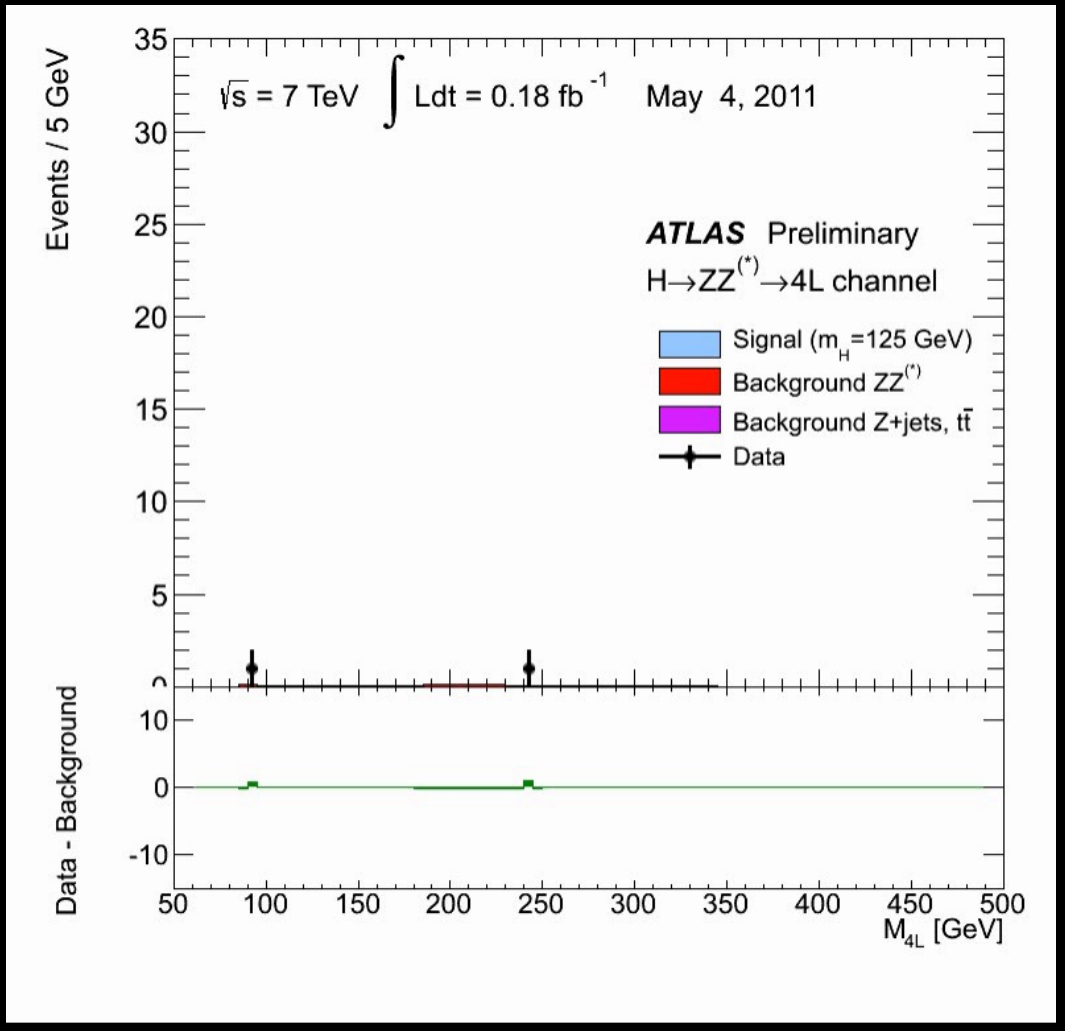
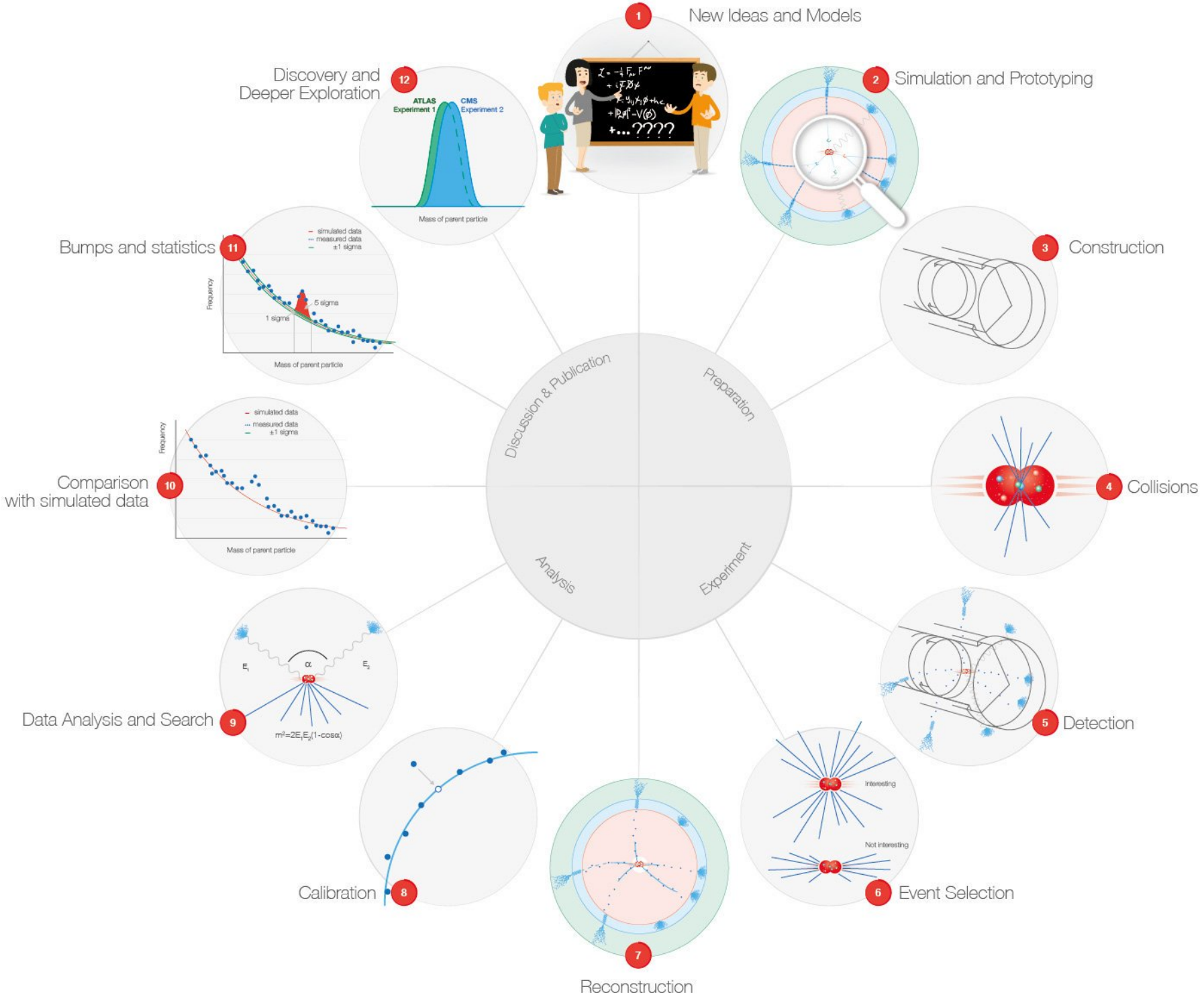

Events / GeV
√s = 7 TeV ∫ Ldt = 0.00 fb⁻¹ Mar 25, 2011
ATLAS Preliminary
H→γγ channel
Data - Fit
M_γγ [GeV]


Events / 5 GeV
√s = 7 TeV ∫ Ldt = 0.18 fb⁻¹ May 4, 2011
ATLAS Preliminary
H→ZZ(*)→4L channel
Signal (m_H=125 GeV)
Background ZZ(*)
Background Z+jets, tt̄
Data
Data - Background
M_4L [GeV]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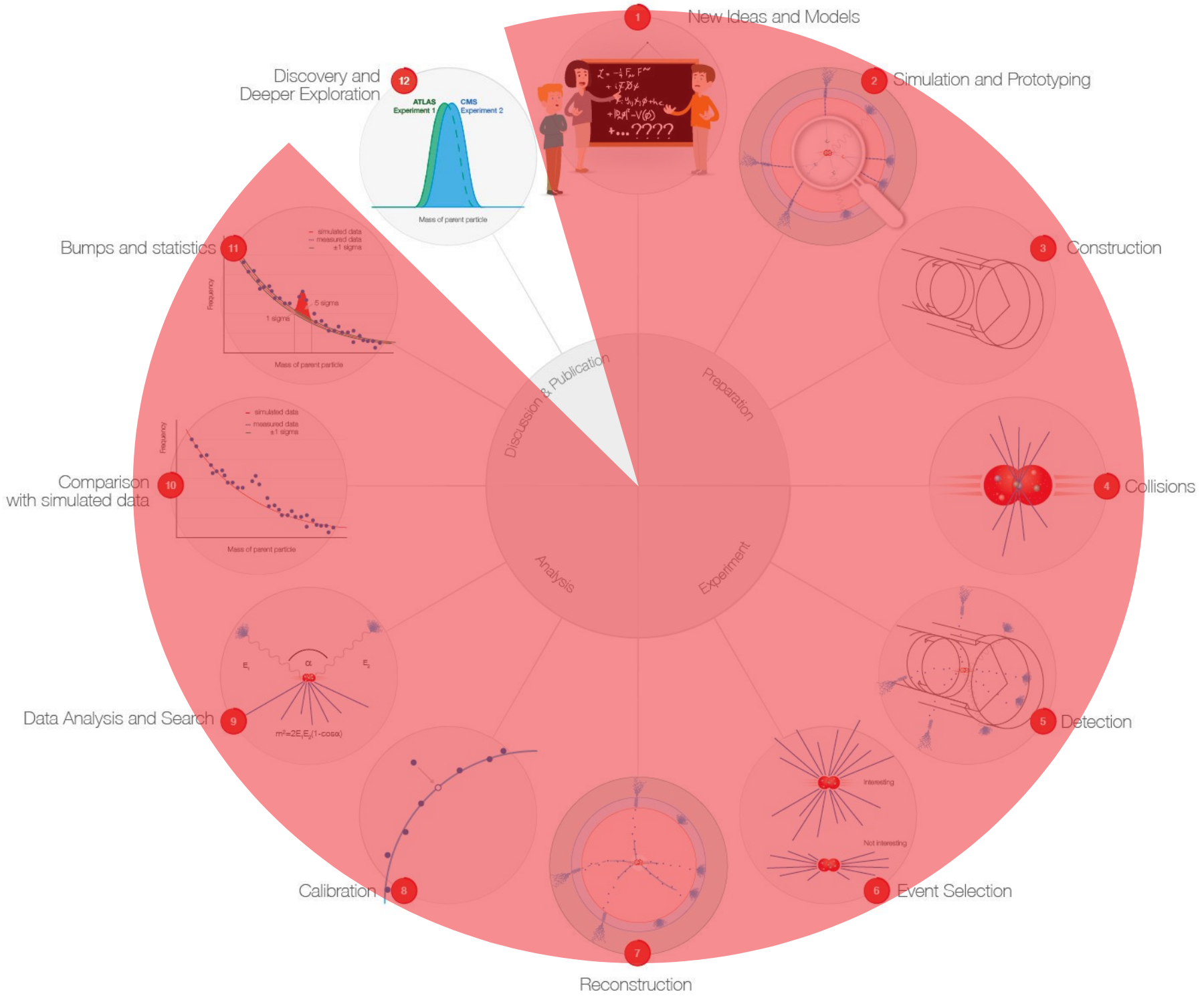
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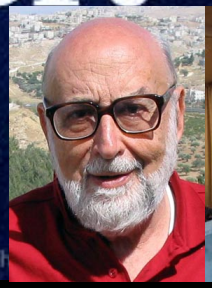
CHINA DAILY
Le Monde
LA DEPECHE
La «particule de Dieu» existe
le dauphine
L'Univers livre enfin ses secrets
Liberation
La masse est dite
L'ECHO
Découverte du boson de Higgs
Particule élémentaire!
la Nouvelle République
La particule qui fait accélérer notre histoire
CORRIERE DELLA SERA
The New York Times
THE TIMES
Tree inside
Diamond refuses to take blame for rate fix
Frankfurter Allgemeine
EL PAIS
Hallada la partícula clave para la comprensión del universo
International Herald Tribune
LA RAZON
Levante
LA VANGUARDIA
El juez imputa a Rato y 32 consejeros de Bankia
DIE WELT
Union will Überschüsse in Sozialkassen horten
LA STAMPA
la Repubblica
"Perché l'Italia deve farcela"
MK
THE HINDU
The Telegraph
It walks, it quacks but best to...
l'Unità
Rai, colpo di mano di Schifani
The Gazette
THE JERUSALEM POST
ALGEMEEN DAGBLAD
GULF NEWS
THE TIMES OF INDIA
Big bang moment: Scientists may have found 'God particle'
gazeta
BOSKA MASA
THE AUSTRALIAN
INDEPENDENT
Carbon dealing not over for Labor
Milhares de moradores de bairros sociais em risco de perderem RSI
The Japan Times
EUREKA!
Jornal de Notícias
The Sydney Morning Herald
Another year of pain for Blue
Il Messaggero
Patto tra Monti e Merkel
la Croix
Le boson de Higgs enfin cerné
Scientists prove existence of 'God particle'
IL GAZZETTINO
Cancellata metà delle Province
The Dallas Morning News
LA DEPECHE
La «particule de Dieu» existe
L'EST REPUBLICAIN
Le secret du Big Bang percé ?
LE BERRY REPUBLICAIN

2013 NOBEL PRIZE IN PHYSICS

François Englert
Peter W. Higgs



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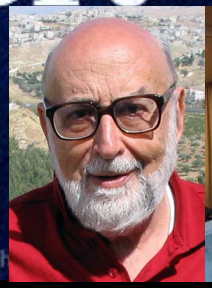
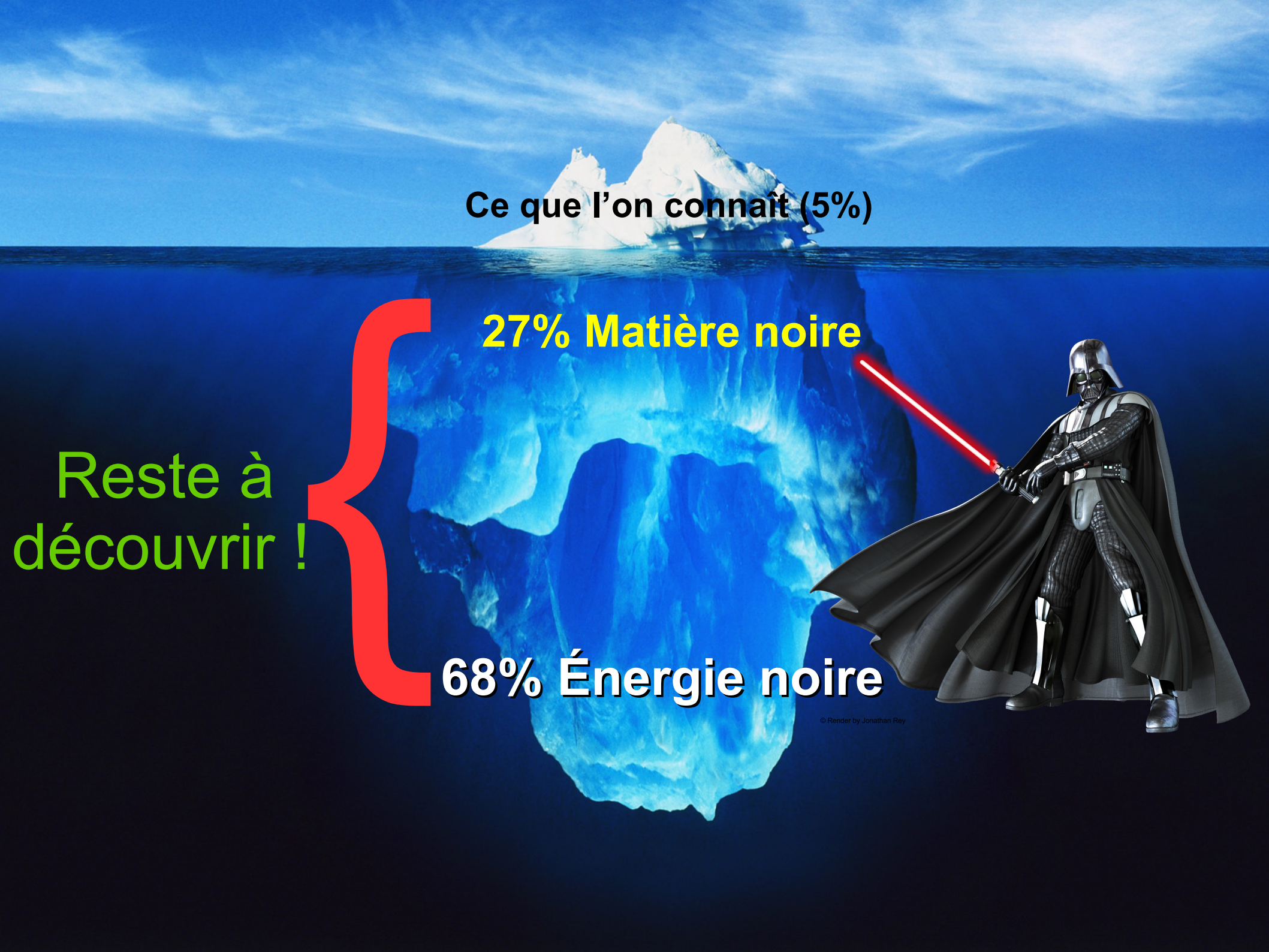
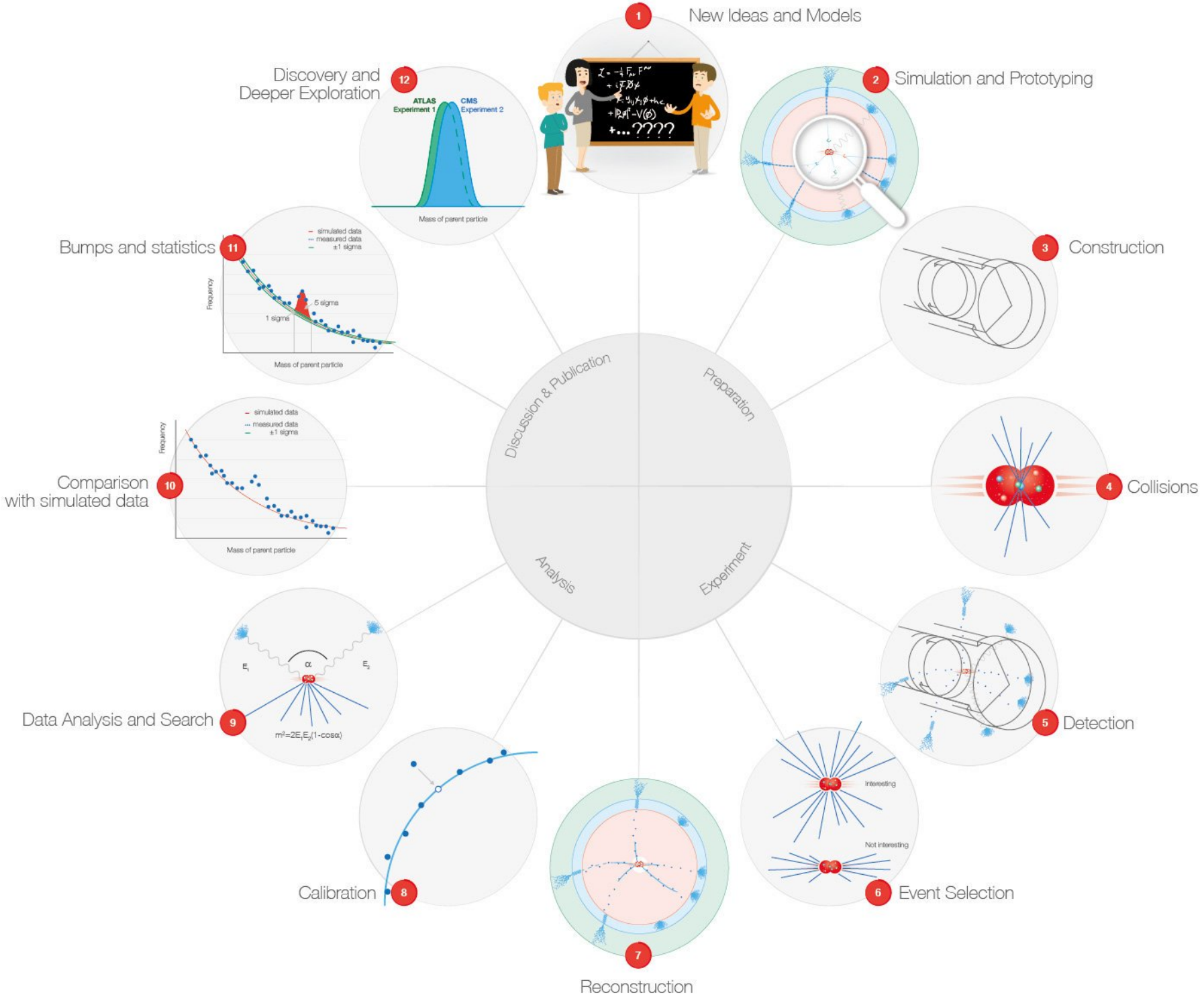


Le CERN et les expériences ATLAS & CMS


Ce que l’on connaît (5%)


Ce que l'on connaît (5%)
27% Matière noire
Reste à découvrir !
68% Énergie noire
© Render by Jonathan Rey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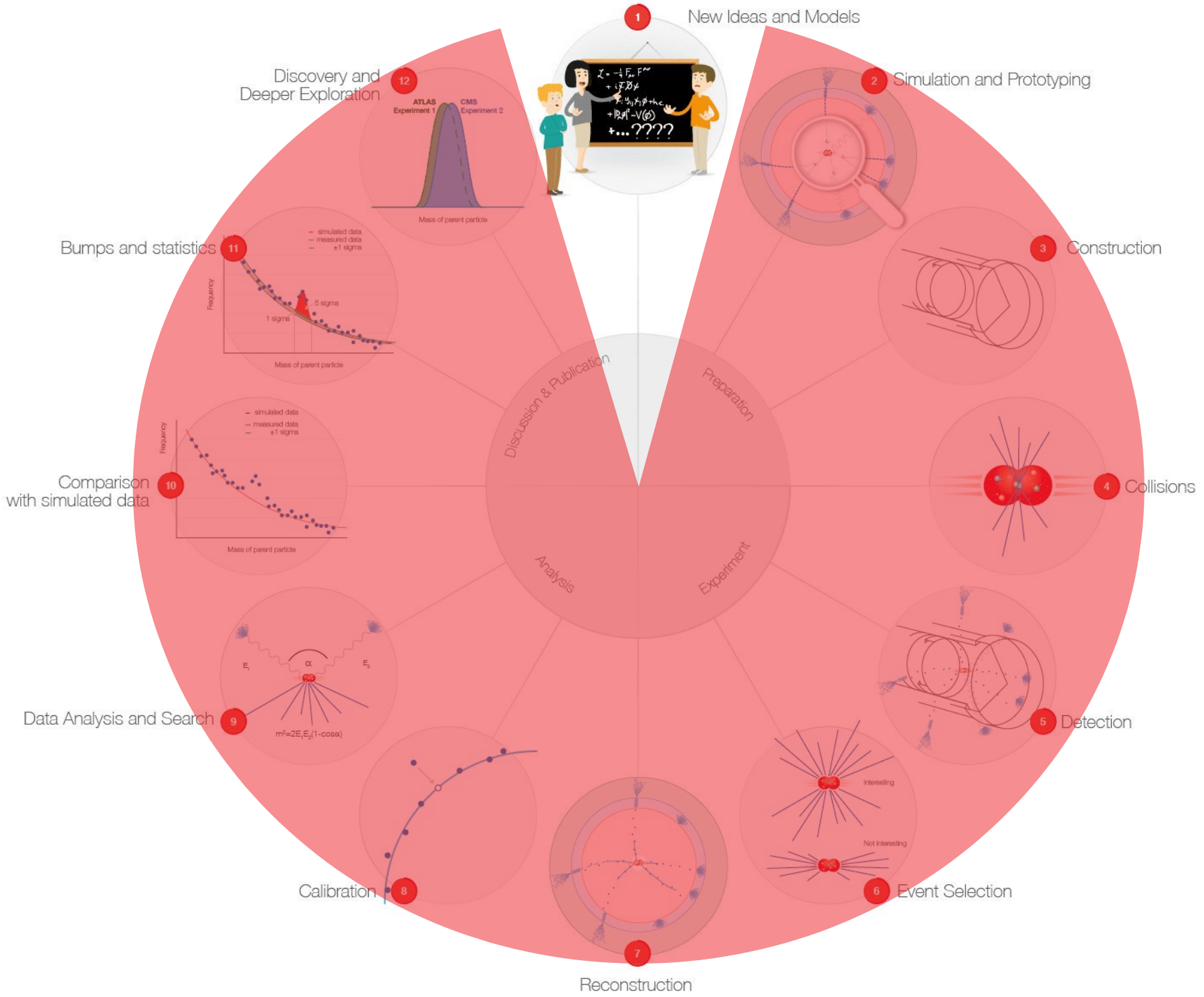
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5 Detection
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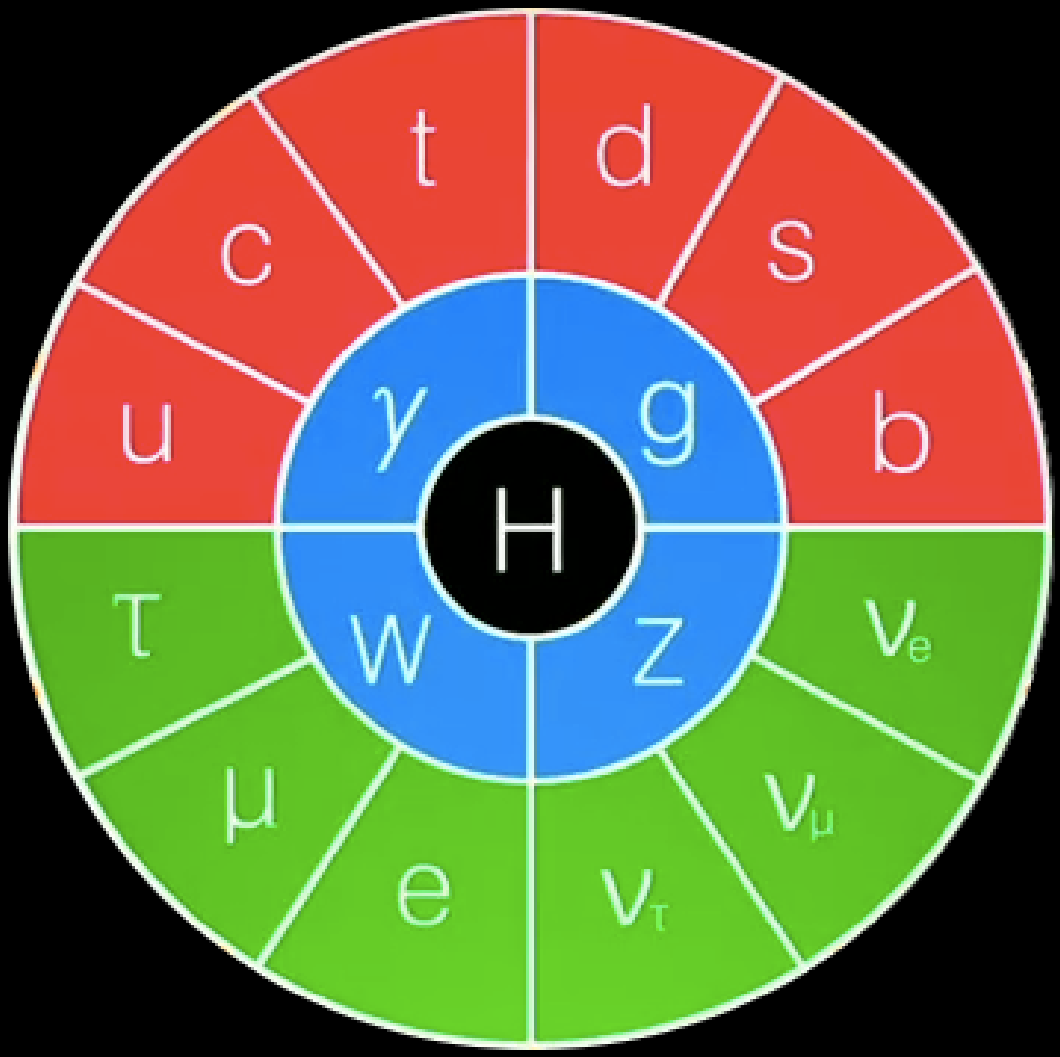
Preparation
Experiment
Analysis
Discussion & Publication
ATLAS
Experiment 1
CMS
Experiment 2
Mass of parent particle
simulated data
measured data
±1 sigma
Frequency
5 sigma
1 sigma
Interesting
Not interesting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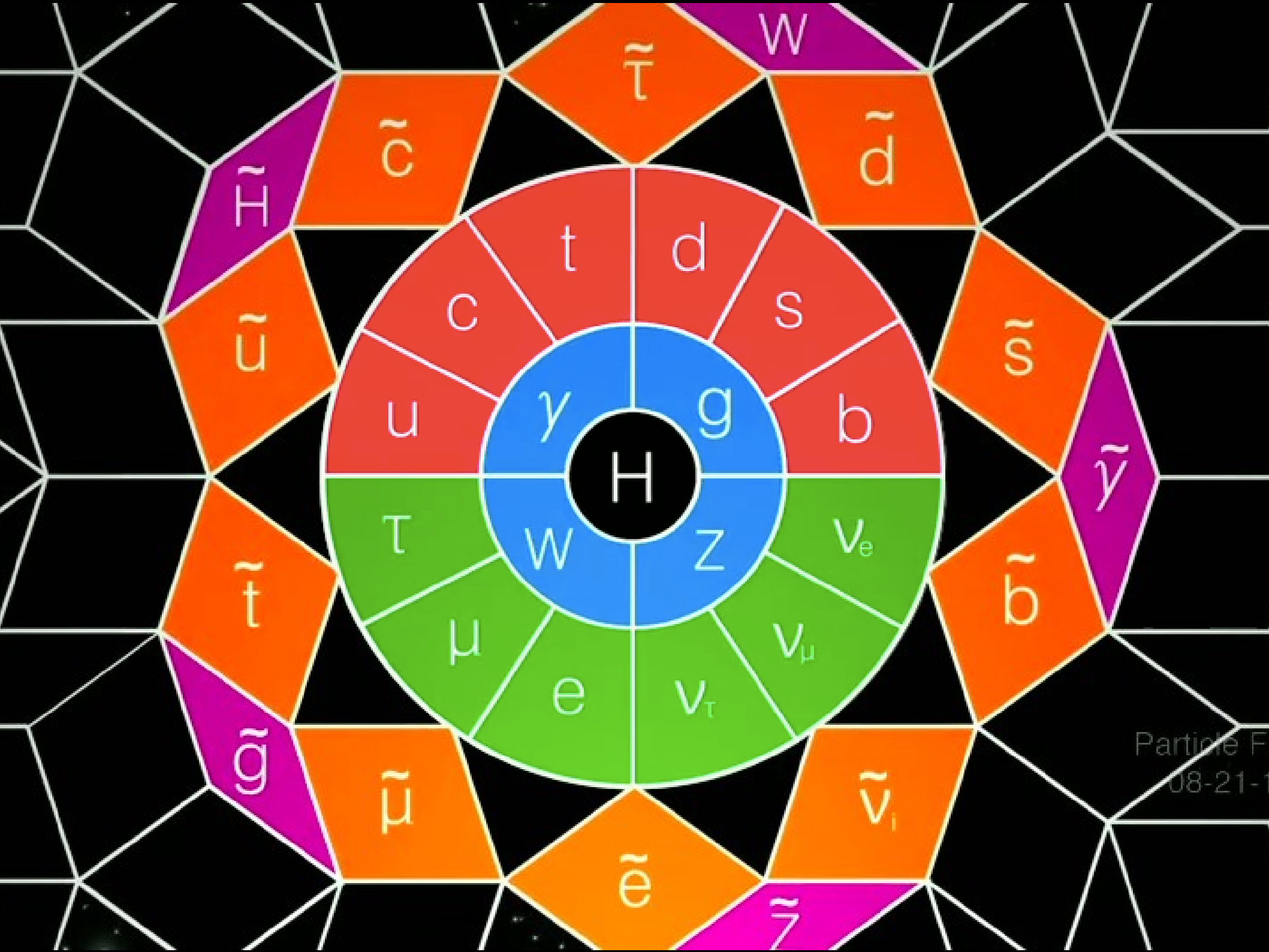
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