15

0e
5280 MeV/c²
1.519×10⁻¹² s
1983

Anti B Meson

$\bar{B}^0$

The antiparticle of B^0, $\bar{B}^0$ participates in quantum mixing and CP violation studies, offering insights into why the universe favors matter over antimatter.

17

0e
5367 MeV/c²
1.509×10⁻¹² s
1983

Anti B_s Meson

$\bar{B}_s^0$

Flavor oscillations, transforming into B_s^0 and back, and its extremely rare decays into pairs of muons make it a sensitive probe for studying physics beyond the Standard Model.

13

+1e
5279 MeV/c²
1.638×10⁻¹² s
1983

B Meson

B^+

Its decay patterns provide crucial tests of the Standard Model and help refine our understanding of quark mixing.

13

-1e
5279 MeV/c²
1.638×10⁻¹² s
1983

B Meson

B^-

This B meson decays differently than its antimatter counterpart (a CP violation). This rare behaviour helps the investigation of why the universe contains more matter than antimatter.

15

0e
5280 MeV/c²
1.519×10⁻¹² s
1983

B Meson

B^0

B^0 is renowned for its ability to oscillate into its own antiparticle. This phenomenon, known as B^0–$\bar{B}^0$ mixing, is a key probe of CP violation in the universe.

17

0e
5367 MeV/c²
1.509×10⁻¹² s
1983

B_s Meson

B_s^0

the B_s^0 meson is a neutral particle whose ultra-rare decays-such as into two muons-are powerful tools for searching for new physics beyond the Standard Model.

19

+1e
6274 MeV/c²
0.507×10⁻¹² s
1998

Charmed Bottom Meson

B^+_c

A unique meson made of two different heavy quarks. It decays through both quarks, providing a rare testing ground for weak interaction dynamics across heavy flavours.

19

-1e
6274 MeV/c²
0.507×10⁻¹² s
1998

Charmed Bottom Meson

B^-_c

Its discovery confirmed predictions about heavy quark bound states and decay mechanisms.

13

-1e
1870 MeV/c²
1.040×10⁻¹² s
1976

Anti D Meson

D^-

The antiparticle of the D^+, mirroring its decay behavior but playing a crucial role in studying matter-antimatter asymmetry.

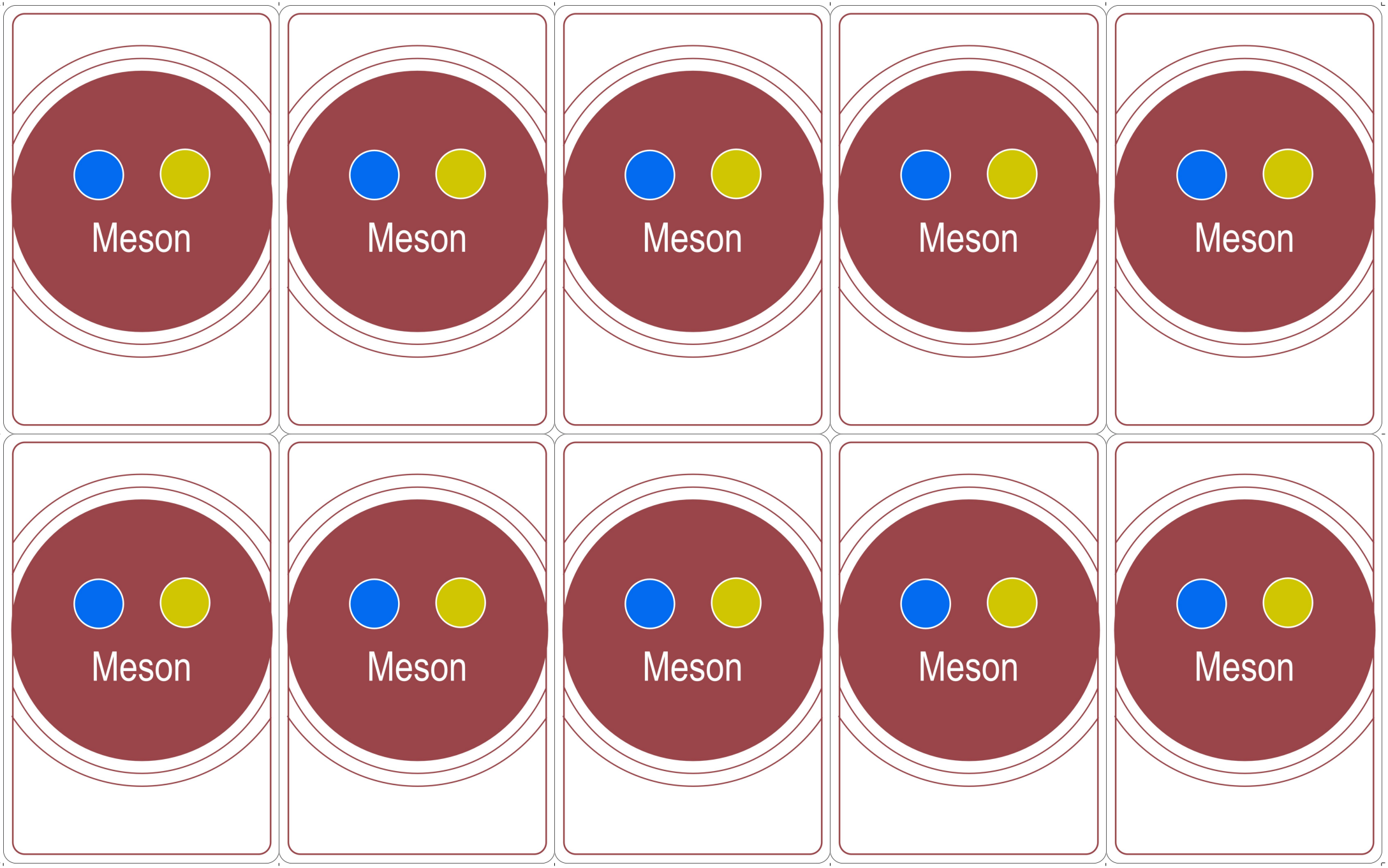
11

0e
1865 MeV/c²
4.101×10⁻¹³ s
1976

Anti D Meson

$\bar{D}^0$

The antiparticle of the D^0, it participates in quantum mixing phenomena and provides a window into the mechanisms behind charm quark transitions and CP violation.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13

+1e
1870 MeV/c²
1.040×10⁻¹² s
1976

D Meson

D^+

The first meson discovered containing a charm quark; Its relatively longer lifetime among charm mesons makes it a key player in precision decay studies.

11

0e
1865 MeV/c²
4.101×10⁻¹³ s
1976

D Meson

D^0

A neutral meson known for D^0–$\bar{D}^0$ mixing, offering a subtle window into CP violation beyond the Standard Model. Despite its charm, it decays weakly and swiftly.

15

+1e
1968 MeV/c²
5.00×10⁻¹³ s
1983

Strange D Meson

D_s^+

Combining charm and strangeness, the D_s^+ decays faster than its lighter cousins — a signature of the strong phase space it commands.

15

-1e
1968 MeV/c²
5.00×10⁻¹³ s
1983

Strange D Meson

D_s^-

The strange-charmed antiparticle of the D_s^+, often produced in high-energy collisions. Its decay channels probe the structure of weak interactions.

21

0e
9399 MeV/c²
~10⁻²¹ s
2008

Bottom Eta Meson

η_b

A low-energy, spin-0 particle, it helps physicists test how the strong force behaves between very heavy quarks.

17

0e
2983 MeV/c²
2.0×10⁻²⁰ s
1974

Charmed Eta Meson

η_c

The lightest bound state of charm and anticharm quarks, important for testing QCD predictions.

11

0e
497.611 MeV/c²
0.895×10⁻¹⁰ s (K_S),
1947

Anti Kaon

$\bar{K}^0$

Does not have an independent lifetime because neutral kaons (K^0 and $\bar{K}^0$) only exist as quantum mechanical mixtures of two weak eigenstates: the short-lived K_S^0 and long-lived K_L^0.

9

+1e
493.677 MeV/c²
1.238×10⁻⁸ s
1947

Kaon

K^+

The first particle to reveal the "strangeness" quantum number, leading to major advances in particle physics.

9

-1e
493.677 MeV/c²
1.238×10⁻⁸ s
1947

Kaon

K^-

Played a central role in the discovery of CP violation in the 1960s.

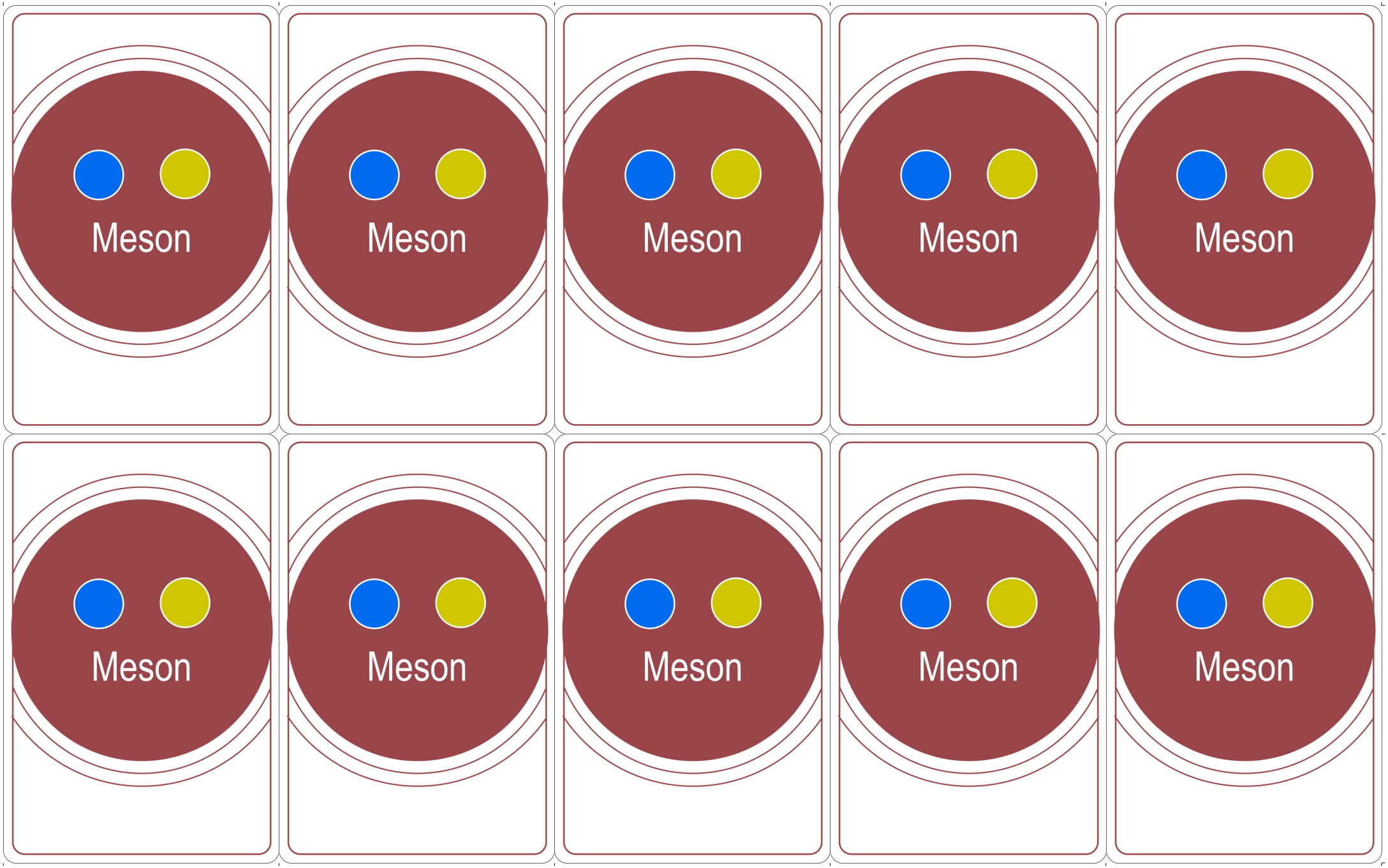
11

0e
497.611 MeV/c²
0.895×10⁻¹⁰ s (K_S),
1947

Kaon

K^0

The discovery that K_L^0 (long-lived state of the K^0 and $\bar{K}^0$ mixture) can decay into two pions revealed CP violation, a fundamental asymmetry between matter and antimatter.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13

0e
1019 MeV/c²
1.55×10⁻²² s
1962

Phi Meson

ϕ

A vector meson (with a spin of 1) that is long-lived for its mass class. With its clean decay into kaons, the ϕ is a key probe of the strong force and strange quark interactions.

7

+1e
139.57 MeV/c²
2.603×10⁻⁸ s
1947

Pion

π^+

A cornerstone of weak interactions. As the primary product of many decays, the π^+ plays a central role in tracing energy through particle cascades.

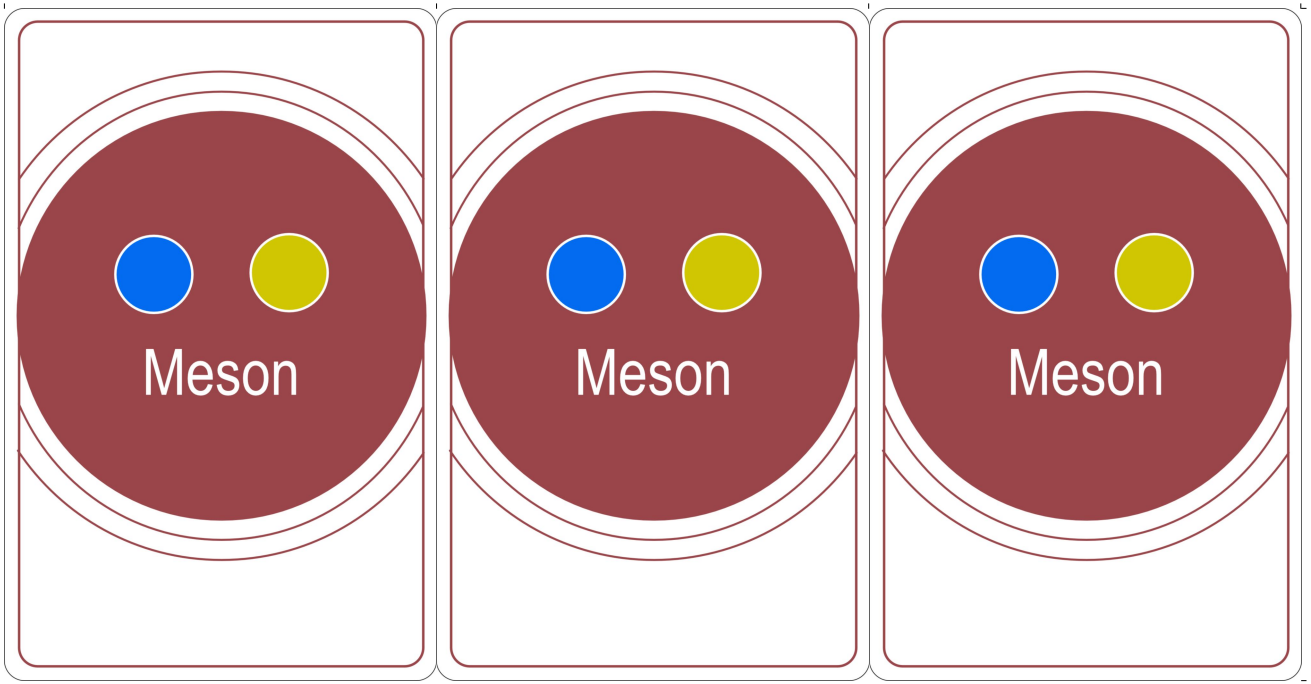
7

-1e
139.57 MeV/c²
2.603×10⁻⁸ s
1947

Pion

π^-

The π^+'s antimatter twin, with identical mass but opposite charge. Often captured by nuclei, its decays have shaped our understanding of weak forces.


Meson
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Meson