# Meson Summary Table

See also the table of suggested $q\overline{q}$ quark-model assignments in the Quark Model section.

• Indicates particles that appear in the preceding Meson Summary Table. We do not regard the other entries as being established.

† Indicates that the value of $J$ given is preferred, but needs confirmation.

## LIGHT UNFLAVORED ($S = C = B = 0$)

| | $I^G(J^{PC})$ |
|---|---|
| • $\pi^{\pm}$ | $1^-(0^-)$ |
| • $\pi^0$ | $1^-(0^{-+})$ |
| • $\eta$ | $0^+(0^{-+})$ |
| • $f_0(600)$ | $0^+(0^{++})$ |
| • $\rho(770)$ | $1^+(1^{--})$ |
| • $\omega(782)$ | $0^-(1^{--})$ |
| • $\eta'(958)$ | $0^+(0^{-+})$ |
| • $f_0(980)$ | $0^+(0^{++})$ |
| • $a_0(980)$ | $1^-(0^{++})$ |
| • $\phi(1020)$ | $0^-(1^{--})$ |
| • $h_1(1170)$ | $0^-(1^{+-})$ |
| • $b_1(1235)$ | $1^+(1^{+-})$ |
| • $a_1(1260)$ | $1^-(1^{++})$ |
| • $f_2(1270)$ | $0^+(2^{++})$ |
| • $f_1(1285)$ | $0^+(1^{++})$ |
| • $\eta(1295)$ | $0^+(0^{-+})$ |
| • $\pi(1300)$ | $1^-(0^{-+})$ |
| • $a_2(1320)$ | $1^-(2^{++})$ |
| • $f_0(1370)$ | $0^+(0^{++})$ |
| $h_1(1380)$ | $?^-(1^{+-})$ |
| • $\pi_1(1400)$ | $1^-(1^{-+})$ |
| • $\eta(1405)$ | $0^+(0^{-+})$ |
| • $f_1(1420)$ | $0^+(1^{++})$ |
| • $\omega(1420)$ | $0^-(1^{--})$ |
| $f_2(1430)$ | $0^+(2^{++})$ |
| • $a_0(1450)$ | $1^-(0^{++})$ |
| • $\rho(1450)$ | $1^+(1^{--})$ |
| • $\eta(1475)$ | $0^+(0^{-+})$ |
| • $f_0(1500)$ | $0^+(0^{++})$ |
| $f_1(1510)$ | $0^+(1^{++})$ |
| • $f_2'(1525)$ | $0^+(2^{++})$ |
| $f_2(1565)$ | $0^+(2^{++})$ |
| $h_1(1595)$ | $0^-(1^{+-})$ |
| • $\pi_1(1600)$ | $1^-(1^{-+})$ |
| $a_1(1640)$ | $1^-(1^{++})$ |
| $f_2(1640)$ | $0^+(2^{++})$ |
| • $\eta_2(1645)$ | $0^+(2^{-+})$ |
| • $\omega(1650)$ | $0^-(1^{--})$ |
| • $\omega_3(1670)$ | $0^-(3^{--})$ |
| • $\pi_2(1670)$ | $1^-(2^{-+})$ |
| • $\phi(1680)$ | $0^-(1^{--})$ |
| • $\rho_3(1690)$ | $1^+(3^{--})$ |
| • $\rho(1700)$ | $1^+(1^{--})$ |
| $a_2(1700)$ | $1^-(2^{++})$ |
| • $f_0(1710)$ | $0^+(0^{++})$ |
| $\eta(1760)$ | $0^+(0^{-+})$ |
| • $\pi(1800)$ | $1^-(0^{-+})$ |
| $f_2(1810)$ | $0^+(2^{++})$ |
| $X(1835)$ | $?^?(?^{-+})$ |
| • $\phi_3(1850)$ | $0^-(3^{--})$ |
| $\eta_2(1870)$ | $0^+(2^{-+})$ |
| $\rho(1900)$ | $1^+(1^{--})$ |
| $f_2(1910)$ | $0^+(2^{++})$ |
| • $f_2(1950)$ | $0^+(2^{++})$ |
| $\rho_3(1990)$ | $1^+(3^{--})$ |
| • $f_2(2010)$ | $0^+(2^{++})$ |
| $f_0(2020)$ | $0^+(0^{++})$ |
| • $a_4(2040)$ | $1^-(4^{++})$ |
| • $f_4(2050)$ | $0^+(4^{++})$ |
| $\pi_2(2100)$ | $1^-(2^{-+})$ |
| $f_0(2100)$ | $0^+(0^{++})$ |
| $f_2(2150)$ | $0^+(2^{++})$ |
| $\rho(2150)$ | $1^+(1^{--})$ |
| $f_0(2200)$ | $0^+(0^{++})$ |
| $f_J(2220)$ | $0^+(2 \text{ or } 4^{++})$ |
| $\eta(2225)$ | $0^+(0^{-+})$ |
| $\rho_3(2250)$ | $1^+(3^{--})$ |
| • $f_2(2300)$ | $0^+(2^{++})$ |
| $f_4(2300)$ | $0^+(4^{++})$ |
| • $f_2(2340)$ | $0^+(2^{++})$ |
| $\rho_5(2350)$ | $1^+(5^{--})$ |
| $a_6(2450)$ | $1^-(6^{++})$ |
| $f_6(2510)$ | $0^+(6^{++})$ |

### OTHER LIGHT

Further States

## STRANGE ($S = \pm 1$, $C = B = 0$)

| | $I(J^P)$ |
|---|---|
| • $K^{\pm}$ | $1/2(0^-)$ |
| • $K^0$ | $1/2(0^-)$ |
| • $K_S^0$ | $1/2(0^-)$ |
| • $K_L^0$ | $1/2(0^-)$ |
| $K_0^*(800)$ | $1/2(0^+)$ |
| • $K^*(892)$ | $1/2(1^-)$ |
| • $K_1(1270)$ | $1/2(1^+)$ |
| • $K_1(1400)$ | $1/2(1^+)$ |
| • $K^*(1410)$ | $1/2(1^-)$ |
| • $K_0^*(1430)$ | $1/2(0^+)$ |
| • $K_2^*(1430)$ | $1/2(2^+)$ |
| $K(1460)$ | $1/2(0^-)$ |
| $K_2(1580)$ | $1/2(2^-)$ |
| $K(1630)$ | $1/2(?^?)$ |
| $K_1(1650)$ | $1/2(1^+)$ |
| • $K^*(1680)$ | $1/2(1^-)$ |
| • $K_2(1770)$ | $1/2(2^-)$ |
| • $K_3^*(1780)$ | $1/2(3^-)$ |
| • $K_2(1820)$ | $1/2(2^-)$ |
| $K(1830)$ | $1/2(0^-)$ |
| $K_0^*(1950)$ | $1/2(0^+)$ |
| $K_2^*(1980)$ | $1/2(2^+)$ |
| • $K_4^*(2045)$ | $1/2(4^+)$ |
| $K_2(2250)$ | $1/2(2^-)$ |
| $K_3(2320)$ | $1/2(3^+)$ |
| $K_5^*(2380)$ | $1/2(5^-)$ |
| $K_4(2500)$ | $1/2(4^-)$ |
| $K(3100)$ | $?^?(?^{??})$ |

### CHARMED ($C = \pm 1$)

| | |
|---|---|
| • $D^{\pm}$ | $1/2(0^-)$ |
| • $D^0$ | $1/2(0^-)$ |
| • $D^*(2007)^0$ | $1/2(1^-)$ |
| • $D^*(2010)^{\pm}$ | $1/2(1^-)$ |
| $D_0^*(2400)^0$ | $1/2(0^+)$ |
| $D_0^*(2400)^{\pm}$ | $1/2(0^+)$ |
| • $D_1(2420)^0$ | $1/2(1^+)$ |
| $D_1(2420)^{\pm}$ | $1/2(?^?)$ |
| $D_1(2430)^0$ | $1/2(1^+)$ |
| • $D_2^*(2460)^0$ | $1/2(2^+)$ |
| • $D_2^*(2460)^{\pm}$ | $1/2(2^+)$ |
| $D^*(2640)^{\pm}$ | $1/2(?^?)$ |

### CHARMED, STRANGE ($C = S = \pm 1$)

| | |
|---|---|
| • $D_s^{\pm}$ | $0(0^-)$ |
| • $D_s^{*\pm}$ | $0(?^?)$ |
| • $D_{s0}^*(2317)^{\pm}$ | $0(0^+)$ |
| • $D_{s1}(2460)^{\pm}$ | $0(1^+)$ |
| • $D_{s1}(2536)^{\pm}$ | $0(1^+)$ |
| • $D_{s2}(2573)^{\pm}$ | $0(?^?)$ |

## BOTTOM ($B = \pm 1$)

| | $I^G(J^{PC})$ |
|---|---|
| • $B^{\pm}$ | $1/2(0^-)$ |
| • $B^0$ | $1/2(0^-)$ |
| • $B^{\pm}/B^0$ ADMIXTURE | |
| • $B^{\pm}/B^0/B_s^0/b$-baryon ADMIXTURE | |
| $V_{cb}$ and $V_{ub}$ CKM Matrix Elements | |
| • $B^*$ | $1/2(1^-)$ |
| $B_J^*(5732)$ | $?(?^?)$ |

### BOTTOM, STRANGE ($B = \pm 1$, $S = \mp 1$)

| | |
|---|---|
| • $B_s^0$ | $0(0^-)$ |
| $B_s^*$ | $0(1^-)$ |
| $B_{sJ}^*(5850)$ | $?(?^?)$ |

### BOTTOM, CHARMED ($B = C = \pm 1$)

| | |
|---|---|
| • $B_c^{\pm}$ | $0(0^-)$ |

### $c\overline{c}$

| | |
|---|---|
| • $\eta_c(1S)$ | $0^+(0^{-+})$ |
| • $J/\psi(1S)$ | $0^-(1^{--})$ |
| • $\chi_{c0}(1P)$ | $0^+(0^{++})$ |
| • $\chi_{c1}(1P)$ | $0^+(1^{++})$ |
| $h_c(1P)$ | $?^?(?^{??})$ |
| • $\chi_{c2}(1P)$ | $0^+(2^{++})$ |
| • $\eta_c(2S)$ | $0^+(0^{-+})$ |
| • $\psi(2S)$ | $0^-(1^{--})$ |
| • $\psi(3770)$ | $0^-(1^{--})$ |
| • $X(3872)$ | $0^?(?^{?+})$ |
| • $\chi_{c2}(2P)$ | $0^+(2^{++})$ |
| $Y(3940)$ | $?^?(?^{??})$ |
| • $\psi(4040)$ | $0^-(1^{--})$ |
| • $\psi(4160)$ | $0^-(1^{--})$ |
| $Y(4260)$ | $?^?(1^{--})$ |
| • $\psi(4415)$ | $0^-(1^{--})$ |

### $b\overline{b}$

| | |
|---|---|
| $\eta_b(1S)$ | $0^+(0^{-+})$ |
| • $\Upsilon(1S)$ | $0^-(1^{--})$ |
| • $\chi_{b0}(1P)$ | $0^+(0^{++})$ |
| • $\chi_{b1}(1P)$ | $0^+(1^{++})$ |
| • $\chi_{b2}(1P)$ | $0^+(2^{++})$ |
| • $\Upsilon(2S)$ | $0^-(1^{--})$ |
| $\Upsilon(1D)$ | $0^-(2^{--})$ |
| • $\chi_{b0}(2P)$ | $0^+(0^{++})$ |
| • $\chi_{b1}(2P)$ | $0^+(1^{++})$ |
| • $\chi_{b2}(2P)$ | $0^+(2^{++})$ |
| • $\Upsilon(3S)$ | $0^-(1^{--})$ |
| • $\Upsilon(4S)$ | $0^-(1^{--})$ |
| • $\Upsilon(10860)$ | $0^-(1^{--})$ |
| • $\Upsilon(11020)$ | $0^-(1^{--})$ |

### NON-$q\overline{q}$ CANDIDATES