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| Autore                  | Amsler Claude                                                                                                                                                                                                                                                                                                                                                                                               |
| Titolo                  | The Quark Structure of Hadrons [[electronic resource] ] : An Introduction to the Phenomenology and Spectroscopy / / by Claude Amsler                                                                                                                                                                                                                                                                        |
| Pubbl/distr/stampa      | Cham : , : Springer International Publishing : , : Imprint : Springer, , 2018                                                                                                                                                                                                                                                                                                                               |
| ISBN                    | 3-319-98527-2                                                                                                                                                                                                                                                                                                                                                                                               |
| Edizione                | [1st ed. 2018.]                                                                                                                                                                                                                                                                                                                                                                                             |
| Descrizione fisica      | 1 online resource (IX, 277 p. 157 illus., 117 illus. in color.)                                                                                                                                                                                                                                                                                                                                             |
| Collana                 | Lecture Notes in Physics, , 0075-8450 ; ; 949                                                                                                                                                                                                                                                                                                                                                               |
| Disciplina              | 539.7216                                                                                                                                                                                                                                                                                                                                                                                                    |
| Soggetti                | Elementary particles (Physics)<br>Quantum field theory<br>Nuclear physics<br>Heavy ions<br>Physical measurements<br>Measurement<br>Particle acceleration<br>Spectroscopy<br>Microscopy<br>Elementary Particles, Quantum Field Theory<br>Nuclear Physics, Heavy Ions, Hadrons<br>Measurement Science and Instrumentation<br>Particle Acceleration and Detection, Beam Physics<br>Spectroscopy and Microscopy |
| Lingua di pubblicazione | Inglese                                                                                                                                                                                                                                                                                                                                                                                                     |
| Formato                 | Materiale a stampa                                                                                                                                                                                                                                                                                                                                                                                          |
| Livello bibliografico   | Monografia                                                                                                                                                                                                                                                                                                                                                                                                  |
| Nota di contenuto       | Introduction -- Mesons -- Isospin multiplets -- C parity -- Meson nonets -- SU(2) -- SU(3) -- Heavy quarks -- SU(4) -- Quarkonium -- SU(3) color -- Intermezzo : parametrization of resonances -- Tetraquark -- Pentaquark -- Baryons -- Excitations of light baryons -- Heavy baryons -- Spin and decay angular distribution.                                                                              |
| Sommario/riassunto      | Novel forms of matter, such as states made of gluons (glueballs), multiquark mesons or baryons and hybrid mesons are predicted by low                                                                                                                                                                                                                                                                       |

energy QCD, for which several candidates have recently been identified. Searching for such exotic states of matter and studying their production and decay properties in detail has become a flourishing field at the experimental facilities now available or being built - e.g. BESIII in Beijing, BELLE II at SuperKEKB, GlueX at Jefferson Lab, PANDA at FAIR, J-PARC and in the upgraded LHC experiments, in particular LHCb. A modern primer in the field is required so as to both revive and update the teaching of a new generation of researchers in the field of QCD. These lectures on hadron spectroscopy are intended for Master and PhD students and have been originally developed for a course delivered at the Stefan Meyer Institute of the Austrian Academy of Sciences. They are phenomenologically oriented and intended as complementary material for basic courses in particle and nuclear physics. The book describes the spectra of light and heavy mesons and baryons, and introduces the fundamental properties based on symmetries. Further, it derives multiplet structures, mixing angle, decay coupling constants, magnetic moments of baryons, and predictions for multiquark states and compares these with suitable experimental data. Basic methods of calculating decay angular distributions and determining masses and widths of resonances are also presented. The appendices provide students and newcomers to the field with the necessary background information, and include a set of problems and solutions.

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