

4 Jul 2012	First new elementary particle discovery, a new boson observed that is "consistent with" the theorized Higgs boson. (This has now been confirmed as the Higgs boson itself. <sup>[119]</sup> )
8 Nov 2012	First observation of the very rare decay of the $B_s$ meson into two muons ( $B_s^0 \rightarrow \mu^+\mu^-$ ), a major test of supersymmetry theories, <sup>[120]</sup> shows results at 3.5 sigma that match the Standard Model rather than many of its supersymmetrical variants.
20 Jan 2013	Start of the first run colliding protons with lead ions.
11 Feb 2013	End of the first run colliding protons with lead ions.
14 Feb 2013	Beginning of the first long shutdown to prepare the collider for a higher energy and luminosity. <sup>[121]</sup>
7 Mar 2015	Injection tests for Run 2 send protons towards LHCb & ALICE
5 Apr 2015	Both beams circulated in the collider. <sup>[6]</sup> Four days later, a new record energy of 6.5 TeV per proton was achieved. <sup>[122]</sup>
20 May 2015	Protons collided in the LHC at the record-breaking collision energy of 13 TeV. <sup>[104]</sup>
3 Jun 2015	Start of delivering the physics data after almost two years offline for recommissioning. <sup>[105]</sup>
4 Nov 2015	End of proton collisions in 2015, start of preparations for ion collisions.
25 Nov 2015	First ion collisions at a record-breaking energy of more than 1 PeV ( $10^{15}$ eV) <sup>[123]</sup>
13 Dec 2015	End of ion collisions in 2015
23 Apr 2016	Data-taking in 2016 begins
29 June 2016	The LHC achieves a luminosity of $1.0 \cdot 10^{34} \text{ cm}^{-2}\text{s}^{-1}$ , its design value. <sup>[39]</sup> Further improvements over the year increased the luminosity to 40% above the design value. <sup>[106]</sup>
26 Oct 2016	End of 2016 proton-proton collisions
10 Nov 2016	Beginning of 2016 proton-lead collisions
3 Dec 2016	End of 2016 proton-lead collisions
24 May 2017	Start of 2017 proton-proton collisions. During 2017, the luminosity increased to twice its design value. <sup>[40]</sup>
10 Nov 2017	End of regular 2017 proton-proton collision mode. <sup>[40]</sup>
17 Apr 2018	Start of 2018 proton-proton collisions.
12 Nov 2018	End of 2018 proton operations at CERN. <sup>[124]</sup>
3 Dec 2018	End of 2018 lead-ion run. <sup>[124]</sup>
10 Dec 2018	End of 2018 physics operation and start of Long Shutdown 2. <sup>[124]</sup>

## Findings and discoveries