

Chapter 2: Chasing success: the ATLAS and CMS experiments

You may wish to change ...?

- In short, what is our Chapter about?
 - Point 1 : **Introductory case studies (for this book) of the long journeys of the conception and construction of the two main general-purpose LHC experiments (for which the collider was built)**
 - Point 2 : **Brief historical setting of the physics landscape leading to a global consensus for a hadron collider at the energy frontier, some 35 years ago**
 - Point 3 : **Considerations leading to the two complementary detector concepts**
 - Point 4 : **Conception, evolution and construction of the ATLAS and CMS detectors, with their specific technologies and their internal organizations for managing the world-wide collaborative effort over 15-20 years, from first R&D to first operation**
 - Point 5 : **Few example stories of successes or failures, and lessons learned**
 - Point 6 : **The human factor, world-wide collaborative effort**
 - Point 7 : **Concluding remarks by Shantha**

Chapter 2: Summary Status

- ▶ Our estimate of current level of completion: **near 100% (pending discussions)**
- ▶ The following additions/revisions will be completed by July 31st
 - ▶ Point 1 : **We need to discuss the scope of the nice concluding remarks by Shantha**
 - ▶ Point 2
 - ▶ Point 3...
- ▶ (if) our chapter includes direct quotes or images/figures used from other sources, permission needs to be asked from them as follows (examples!):
 - ▶ **We have used several sections with only little changes from a variety of our own open access articles about ATLAS, CMS and LHC, which are complementing our new text. The figures are all in the public domain of CERN, and have been used generally in the literature many times.**

Chapter 2: Key messages, insights (possible input for other chapters)

- ▶ Key message 1 **Showcase the technical, human, and managerial challenges of the two mega-science projects ATLAS and CMS**
- ▶ Key message 2 **Specifically, we give examples of the timeline for bringing the projects from conception to science delivery, spanning over more than two decades, which implied also evolving focal points for managing the experiment**
- ▶ Key message 3 **Creative partnership with universities, national laboratories, and industries, and involving scientists, engineers and technicians**
- ▶ Key message 4 **The two instruments (detectors) are each a unique realization, their own prototype so to speak**