The ATLAS Project Flowchart

Before you begin, please read this document!

As with all IRIS projects, the ATLAS Project offers training and an opportunity for students to apply that training to a research project of their choice. However, the ATLAS Project offers students multiple routes, depending upon their interests and experience.

Look at the flowchart below.

The **green boxes** show the training notebooks (Books 1 to 7) that students can complete – *these books must be completed in the order shown but students do not have to complete them all*. The books become more challenging as Python skills are progressively developed and applied to analysing and interpreting data.

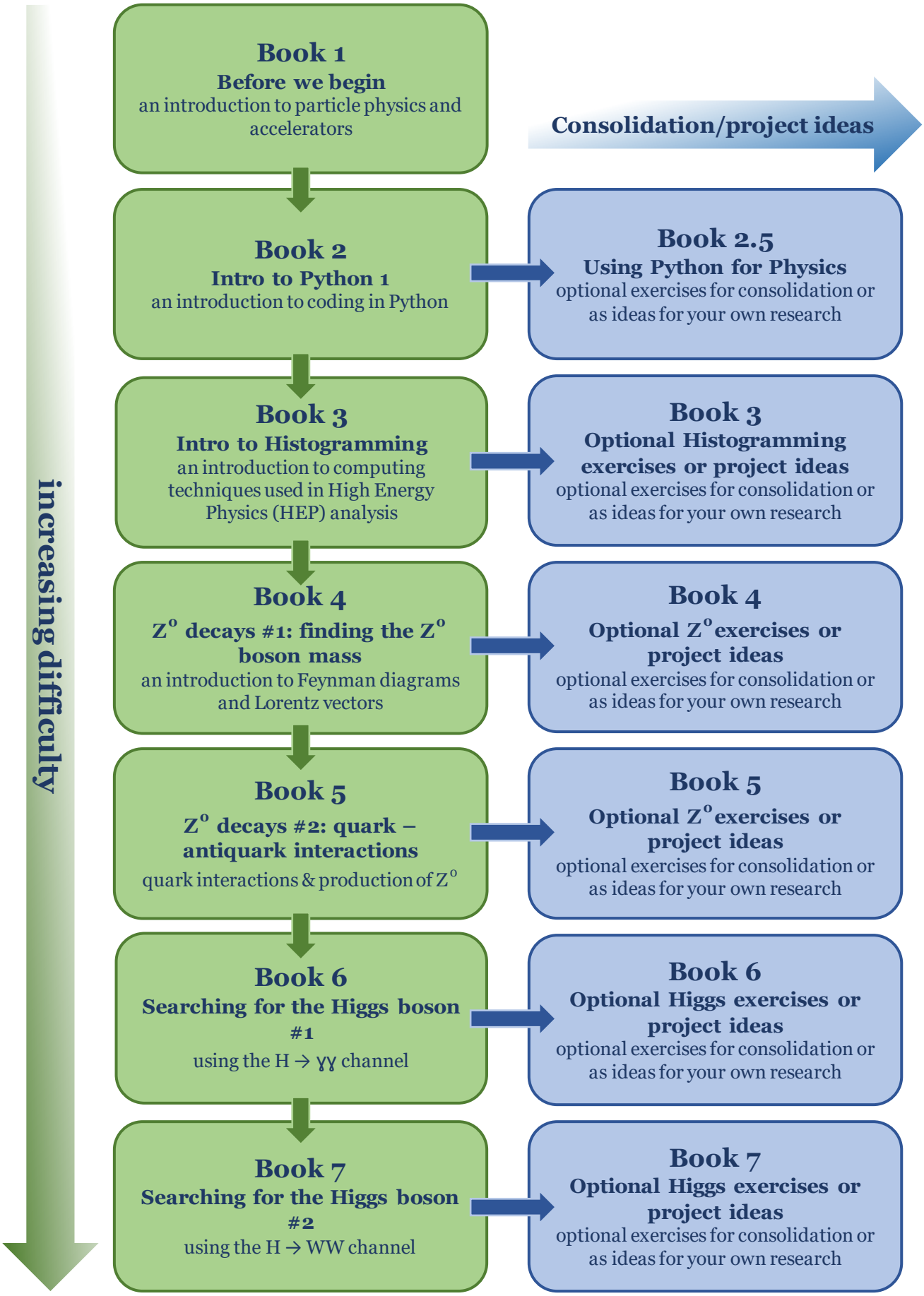
The **blue boxes** show opportunities to (a) complete the optional exercises to help consolidate student learning before moving on to the next book, or (b) to leave the training books and use the exercise/s as a student research project.

All students start at Book 1, which provides some background to the ATLAS Project. However, from Book 2 onwards it is up to the student how far they go before switching to their research project. For example, it would be acceptable to gain some Python training in Book 2 before switching to the optional Book 2.5 and use one or more of the exercises as their research project. Alternatively, the student could dip into to Book 2.5 to gain some consolidation, before proceeding to Book 3 and beyond.

Note that other than Book 2.5, all optional exercises/research opportunities are at the end of each book (for Books 3 to 7). You can choose to ignore these optional exercises, use them for consolidation or select an exercise for your research project.

In June, IRIS will be running three conferences for schools. We hope that you will be able to attend and show what you have achieved in the ATLAS Project! You can do this by creating a PowerPoint talk or by creating a poster. You can find out more about how to do this in the Phase 4 folder of the ATLAS Project on IRIS' dedicated resource centre (ask your teacher how to access this).

Happy coding!


Book 1
Before we begin
an introduction to particle physics and accelerators
Consolidation/project ideas
Book 2
Intro to Python 1
an introduction to coding in Python
Book 2.5
Using Python for Physics
optional exercises for consolidation or as ideas for your own research
Book 3
Intro to Histogramming
an introduction to computing techniques used in High Energy Physics (HEP) analysis
Book 3
Optional Histogramming exercises or project ideas
optional exercises for consolidation or as ideas for your own research
Book 4
Z° decays #1: finding the Z° boson mass
an introduction to Feynman diagrams and Lorentz vectors
Book 4
Optional Z° exercises or project ideas
optional exercises for consolidation or as ideas for your own research
Book 5
Z° decays #2: quark – antiquark interactions
quark interactions & production of Z°
Book 5
Optional Z° exercises or project ideas
optional exercises for consolidation or as ideas for your own research
Book 6
Searching for the Higgs boson #1
using the H → γγ channel
Book 6
Optional Higgs exercises or project ideas
optional exercises for consolidation or as ideas for your own research
Book 7
Searching for the Higgs boson #2
using the H → WW channel
Book 7
Optional Higgs exercises or project ideas
optional exercises for consolidation or as ideas for your own research
increasing difficulty