

Engaging Youth: Education and outreach for ages 0-12 with the ATLAS Experiment

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Engaging children under the age of 12 in physics research is particularly challenging but offers unique educational potential. Outreach and engagement at an early age has been demonstrated to be key to increasing awareness of physics and to increasing diversity in the field in later years. We present a variety of activities and resources developed by the ATLAS Collaboration at the LHC targeting this demographic, including the ATLAS Baby Book, ATLAS Colouring Books, ATLAS Activity Sheets, Lego models and more. We discuss the motivation in the creation of these resources, details of their use, and future plans. We also discuss the status and impact of translating these documents into many languages for truly global engagement.

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1. Introduction

When considering different audiences for physics education and outreach, children are an important target group, as early engagement results in better scientific awareness and eventually a higher diversity in the field. Through carefully designed materials, children can be introduced to particle physics from a very young age, which helps their overall development. The ATLAS Experiment [1] at the LHC provides a wide variety of activities and resources targeting children.

2. Baby book

Created in 2020 by Dr Louie Corpe, a member of the ATLAS Collaboration, the “Particle Physics for Babies” book [2] features bold, high-contrast images designed to help babies develop focus and eyesight. Each image is inspired by particle physics, including event displays, Feynman diagrams, physics analysis plots, and more. Physical copies are available for purchase at the CERN Science Gateway gift shop as well as the ATLAS Secretariat. A PDF version is available for free online and also includes image captions to help parents and educators understand and talk about the images.

3. LEGO model

Designed in 2011 by Dr Sascha Melhase, the ATLAS LEGO model [3] is a 1:50 representation of the real detector, consisting of approximately 9500 pieces. It is about 1 m long and 0.5 m high. It has been reproduced in over 60 institutes located in 19 countries. It is often used in events and exhibitions as a visual tool to explain the detector design and convey the excitement of the ATLAS research program. In particular, it is displayed in the ATLAS Visitor Center adjacent to the ATLAS Control Room at CERN. Since its original creation, smaller versions requiring fewer resources have been developed.

4. Colouring books

The ATLAS colouring books [4] are aimed mainly at elementary school aged children to introduce them to particle physics through simple language and engaging characters. The “ATLAS Experiment Colouring Book”, created in 2016 and now available in 21 languages, covers topics such as detector structure, elementary particles, and what it is like to work in an international collaboration. The more recent “Particles of the Universe” book, created in 2020 and available in 11 languages, focuses on the particles that constitute the Standard Model. They are given personalities to help children remember some of their basic properties. PDF versions of these books are available for free on the ATLAS website and physical copies are sold at CERN.

5. Activity sheets

The activity sheets build upon the colouring books by using the same particle characters to introduce new concepts such as anti-particles or decays. Some examples of activities include “Follow particle decays through a maze!”, “Spot the differences”, and “Label the ATLAS detector”. They are available in 7 languages, both in colour and black and white, on the ATLAS website.

6. Summary

Members of the ATLAS Experiment at the LHC have developed a wide range of educational resources for children of all ages to help them gain scientific literacy and become excited about particle physics. These resources are made available to as many people as possible through free online downloads and translations.

References

- [1] ATLAS Collaboration, JINST **3**, S08003 (2008).
- [2] Baby book: <https://ippog.org/news/first-book-outreach-babies-particle-physics-babies-louie-corpe>
- [3] Lego model: <https://build-your-own-particle-detector.org/models/atlas-lego-model/>
- [4] ATLAS colouring books: <https://atlas.cern/Resources/Colouring-Books>