

CCP-TEPP Summer School

Report – Ed Bennett, September 2026

On 2026-06-29–2026-07-03, a summer school was held at Swansea University on software skills for researchers in particle physics.

Scope

While the school was identified as a key milestone event of CCP-TEPP in the original proposal to CoSeC, the scope of the school was defined as part of the CCP-TEPP roadmapping exercise during 2025. Specifically, points identified as skills gaps within the community were highlighted as topics for the school.

The areas identified in the roadmap and targeted in the school were:

- Automated testing and correctness checking of compiled software
- Documentation of software
- Reproducibility
- Open research
- Workflow management of analysis toolchains
- Gaining access to high-performance computing resources

Geographically, initially students from the UK were offered funded places, with students from further afield given the option to pay for participation. Once UK demand was saturated, invitations for funded places were opened to the wider European community¹.

Participation

In total there were 26 registrations for the school. Four were rejected due to being speculative registrations seeking free participation from outside of Europe or outside of particle physics. Seven withdrew due to double-booking or not receiving permission to travel, and one did not respond to requests for additional information and did not attend. 14 participants attended the school in person, along with six instructors (two of whom only attended for the final day).

Ten participants were based at UK institutions, three in Ireland, and one in Italy. Participants included theorists, experimentalists, and phenomenologists, and both students and postdoctoral researchers.

¹ Consistently with the project's approach to environmental sustainability, airfare was excluded from this support offer, but surface transportation was offered.

Environmental sustainability

Only a single participant travelled by air, at their own expense. All other participants used surface transport, primarily train, with the three participants from Ireland coming by ferry. Most participants stayed on campus, with those based in Swansea staying in their usual homes and commuting on foot or by bus; one participant stayed with local relatives, and commuted by private car.

Material

The following material was delivered:

- [Workflow management with Snakemake for particle physics](#): Ed Bennett and Gaurav Ray, Swansea University
- [Unit testing in C++](#): Ben Morgan, University of Warwick
- [Software documentation](#): Andrew Lister, CoSeC/STFC UKRI
- [Introduction to open science](#): Ed Bennett, Swansea University
- [Introduction to open data](#): Ed Bennett, Swansea University
- Open software development: Ben Morgan, University of Warwick
- [High-performance techniques](#): Andrew Lister, CoSeC/STFC UKRI
- Grid computing resources for particle physics: Alastair Dewhurst, CoSeC/STFC UKRI
- Applying for computing time with DiRAC: Chris Johnson, DiRAC/University of Edinburgh

The full timetable and slides are available from [Indico](#).

Feedback summary

Feedback was received from twelve participants. 92% of these described the school as “Extremely useful” or “Very useful”, and the same proportion described the topics covered as “Extremely relevant” or “Very relevant”. All respondents would recommend participation to other students in their discipline or research group; 83% of these would strongly recommend.

Lessons learned

From the narrative feedback, something particularly highlighted by participants was an appreciation for the use of the “live coding” method of teaching popularised by The Carpentries. Where instructors did not use the live coding methodology, learners called out that they found the material more difficult to follow. For future events, where pre-prepared Carpentries-style lesson material is not available, we would more strongly encourage

instructors to prepare material in the live coding format, making use of The Carpentries' templates.

To make best use of participants' limited time, we were relatively ambitious with the amount of content that we included in the workshop. While three in four respondents indicated that this was the correct amount, the remaining quarter indicated that the amount was too high, and narrative feedback indicated that this led to some participants becoming overwhelmed. Either trimming out half a day of content, or adding an additional day of event for the same content, would help with this.

The drop-out rate in the lead up to the event was relatively high, and in particular a number of participants dropped out with less than one week's notice. Other training providers have reported that introducing a nominal fee, refundable for those who attend, can help reduce this. If such an approach is adopted, care must be taken to ensure that this is not exclusionary of those without the resources to even temporarily place a deposit.

Summary

CCP-TEPP successfully delivered a five-day summer school to researchers from across particle physics, filling gaps in community knowledge identified during the CCP-TEPP roadmapping phase.

"This was by far the most practically useful workshop for my research that I have been to."
—CCP-TEPP Summer School Participant

