Building a Global HEP Software Training Community

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This should be a *community* effort!
Why not leave everything to the experiments?

- General software skills matter as much as experiment-specific training
- Experiments share a lot of software topics
- Software topics are vast & evolving! (e.g., ML, GPUs, FPGAs, ...)
- We can cover more ground together instead of reinventing the wheel...

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<table>
<thead>
<tr>
<th>O(6k)</th>
<th>O(3k)</th>
<th>O(1k)</th>
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</thead>
<tbody>
<tr>
<td>Undergrads</td>
<td>Ph.D. students</td>
<td>Postdocs</td>
</tr>
<tr>
<td>Teach prerequisites &amp; Democratize science</td>
<td>Impart best practices</td>
<td>Put in touch with most recent developments</td>
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We need a unified, scalable, and sustainable software training framework
We need a **unified**, **scalable**, and **sustainable** software training framework

**Unified**
- Material and events should be **centrally listed & discoverable**
- Concentrate efforts by developing **cross-experiment** content
- A **community** must guide, support, and coordinate

**Scalable**
- Material must be teachable by **multiple instructors**
- **Self-study** must not be an afterthought

**Sustainable**
- Material must be **open source** and **maintained collaboratively**
- **Incentives & recognition** important motivators

The **IRIS-HEP/HSF Training** group is building a community around these principles
A unified Training Center for HEP

- **HSF Training Center** currently lists **21 training modules** (including material developed by IRIS-HEP/HSF, The Carpentries, and individual authors)

- **Goal:** Training Center as a focal point for all HEP Training activities
  → Needs to list more
  → Add filters & dynamic sorting

- **Central list of training events** (everyone can add)

Mockup by Aniket Rana, (aniumbott @ github)
Inspired by [learn.astropy.org](http://learn.astropy.org)
Training Modules

Most of our modules embrace the framework of [The Carpentries](https://the-carpentries.org)

- Built from **markdown** files
- Rendered as a **webpage** with [Jekyll](https://jekyllrb.com) (interesting discussion topic: The Carpentries have changed their framework recently)
- Verbose and **self-study ready**

Other training material written with LaTeX, sphinx, JupyterBook.
Example Workshop: Analysis Preservation

- Teaching Docker, Singularity/Apptainer, CI/CD with github/gitlab, REANA (soon)
- Emphasis on self study with videos + live lectures
- Small-group virtual mentoring sessions
- 24h support on slack
Example Workshop: C++ Training

- Has been taught **in-person, virtual and hybrid**
- **Life lectures and exercise sessions**
- Full videos available
- Next events:
  - 7th: May 15-19 @ JLAB
  - 8th: Aug 28 - Sep 1 @ Manchester
  - ...

542 slides, 688 pages, > 1k commits

- HEP C++ course

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CERN

March 10, 2023

6 events till now

- 6th HEP C++ Course and Hands-on Training (2023 March - essentials)
- 5th HEP C++ Course and Hands-on Training (2022 October - advanced)
- 4nd HEP C++ Course and Hands-on Training (2022 March - essentials)
- 3rd HEP C++ Course and Hands-on Training (2021 August)
- 2nd HEP C++ Course and Hands-on Training (2021 January)
- 1st HEP C++ Course and Hands-on Training (2020 October)

Originally developed by **S. Ponce**, now community effort
Building a community

Weekly meetings

HSF Training – Kilian Lieret for HSF Training

Monthly Hackathons

Platforms

Increasing our reach

Recognition

How-to guides

@hsftraining
We scale!

Registrations and material revisions

Cumulative statistics, excluding carpentries
- Registrations (total=1,637)
- Material additions/revisions (unique; total=2,302)

Educators

Cumulative statistics, excluding carpentries
- Registered educators (total=53)
- Commit authors (total=80)
Conclusion

- We have established a community of educators working on cross-experiment training material
- **Join us to**
  - Make your training discoverable
  - Avoid reinventing the wheel
  - Ensure sustainable maintenance
  - Get help with logistics & advertisement
- Covering most basics/intermediate needs, now aiming at expanding intermediate/advanced training
  - → Seeding small groups to develop it
Join us!


@hepsoftfound @hsf-training hepsoftwarefoundation.org