

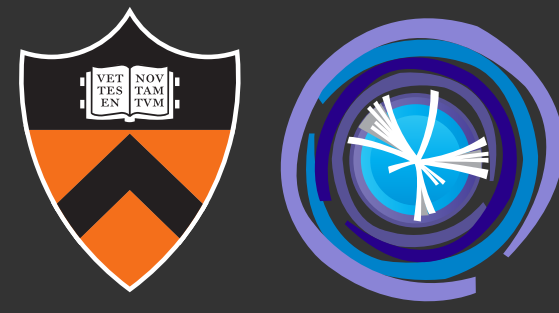


Status Overview:

Awkward Array, Uproot, dask-awkward

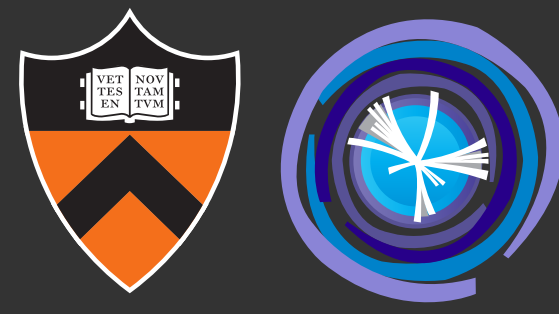
Peter Fackeldey for the Awkward team

2 Humanpower & Roles



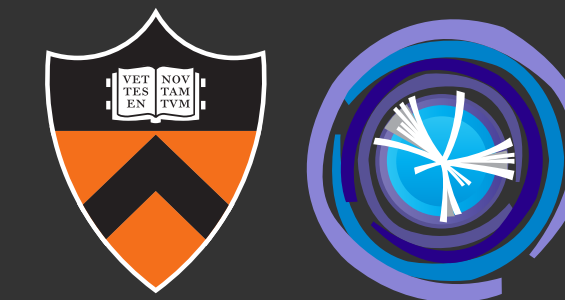
	Developers	Release Manager	“Advisors”
Awkward Array	Andres Rios-Tascon Iason Krommydas Peter Fackeldey Ianna Osborne	Ianna Osborne	Jim Pivarski Angus Hollands Henry Schreiner
Uproot	Andres Rios-Tascon Massimiliano Galli Frank Strug Peter Fackeldey	Ianna Osborne	Jim Pivarski Henry Schreiner
dask-awkward	Martin Durant (Anaconda) Lindsey Gray Peter Fackeldey	Peter Fackeldey	Angus Hollands

3 Packages Overview



	uproot	awkward	dask-awkward	ragged	vector	AwkwardArray.jl
Latest release	5.5.2rc2 (last week)	2.7.4 (last week)	2025.2.0 (4 days ago)	0.2.0 (2 weeks ago)	1.6.1 (2 weeks ago)	0.1.5
Stars	243	862	61	35	83	34
Issues:	62	114	37	17	21	5
bug (unverified)	25 (1 big project)	10			2	
bug	9 (1 big project)	19			3	
cleanup	1	12				
docs	4	9			3	
feature	21 (6 big projects)	50			10	
installation	1					
tests	1	2			1	
dependencies		1				
performance		11				
<u>IRIS-HEP fellow projects</u>	5	5+1 cross-project		1	1	

4 Awkward Array (1/2)



- Recent additions:

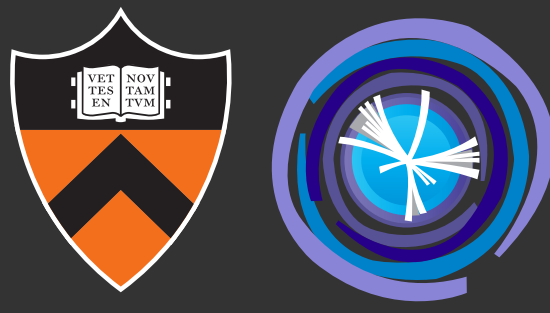
- We made noticeable performance improvements v2.7.3 (~25%), *~avg. 2x faster HEP analysis*
- Noticeable performance improvements in vector v1.6.1 (2x - >20x)
- More memory safety when using **.mask** in v2.7.3 (← Jim suspected this be a common “memory leak” in HEP analyses)
- Several bug fixes and better error messages
→ improved user experience

- Ongoing work:

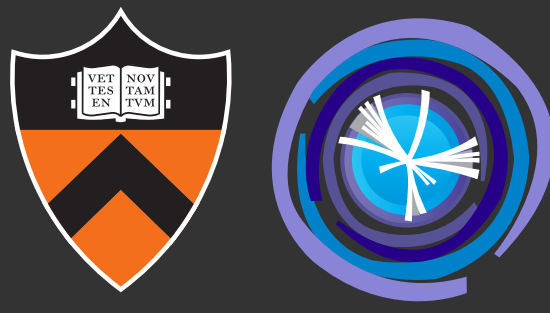
- Adding back VirtualArrays (Iason Krommydas & Peter Fackeldey)
- Adding a non-touching ak.zip for coffea to rearrange data structure without loading data *ready, waiting for coffea feedback*

*almost ready (~1 week),
next: tests with coffea*

5 Awkward Array (2/2)



- Awkward Array considered stable; no *significant* refactoring planned
- Some future changes are still planned:
 - Remove (broken) JAX backend *~end of March*
 - Improving CI for CUDA backend *~end of May*
 - Finalizing CUDA backend *~end of August*
 - Deployment and user-feedback driven fixes for typetracing *~end of August; cont.*
 - Introducing statistical functions (e.g. `ak.percentile`)
 - Further performance improvements (on the Python side)
...developments in Python itself play in our cards (JIT & 3.14 interpreter)



- Recent additions:

- Full reading support for RNTuple v1.0.0.0
- Stable memory consumption for consecutive reads of the same opened file since v5.4.2

- Ongoing/future work:

- One-pass dask graph optimization for uproot.dask

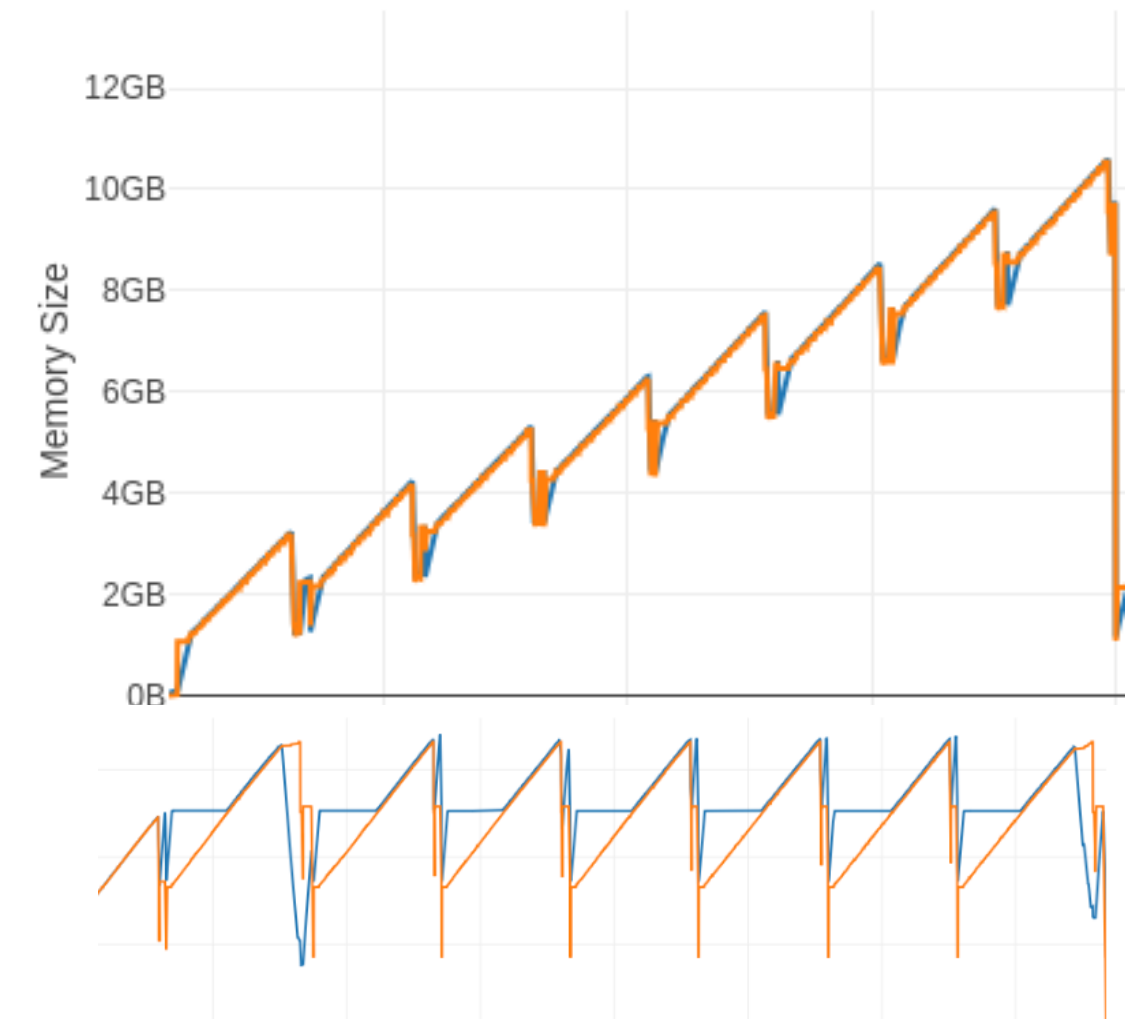
ready, waiting for coffea to move to non-touching ak.zip

- Fixing writing via XRootD

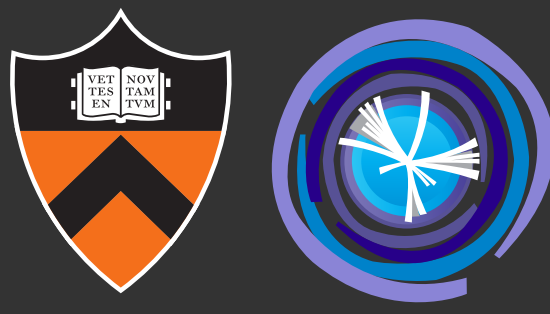
- Writing RNTuple *basic: ~end of March; full: April-May*

- Split Uproot into metadata reading and data reading (fellowship project)

Old

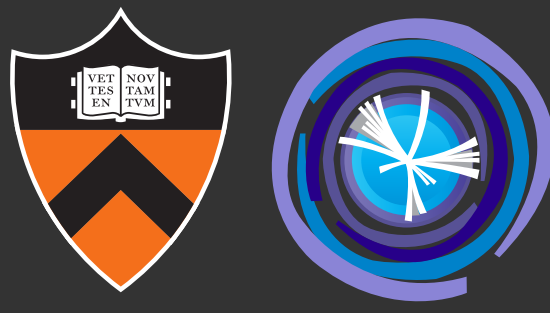


New



- Recent developments:
 - Adjusting (multiple) times to breaking changes in dask core
- Ongoing/future developments:
 - Adding a non-touching dak.zip for coffea to rearrange data structure without loading data *ready, waiting for coffea feedback*
 - One-pass dask graph optimization *ready, waiting for coffea to move to non-touching ak.zip*
 - Possibility for *manual* IO optimization *ready, blocked by one-pass opt.*
 - allows to reduce a lot of graph optimization time
 - allows to run use dask-awkward for IO optimization, but then continue with eager “jobs” (similar to coffea 0.7, columnflow, ...)
 - Daskify remaining ak operations (and add all options)

8 Final words



- Awkward team is working eagerly on:
 - Satisfying all HEP analyses needs
 - Improving robustness when scaling up
 - Trying to improve efficiency wherever possible
- We've set up CI integration-tests to ensure safe releases for awkward-array, uproot, vector, dask-awkward, and coffea (<https://github.com/scikit-hep/integration-tests>)
- We're working on two promising concepts that'll make HEP analyses more robust at scale:
 - VirtualArrays: allow for more interactive and “coffea 0.7”-like workflows
 - Manual IO optimization in dask-awkward
- We have 13 open fellow projects!

