ZOOlogy of lockfree concurrent data structures

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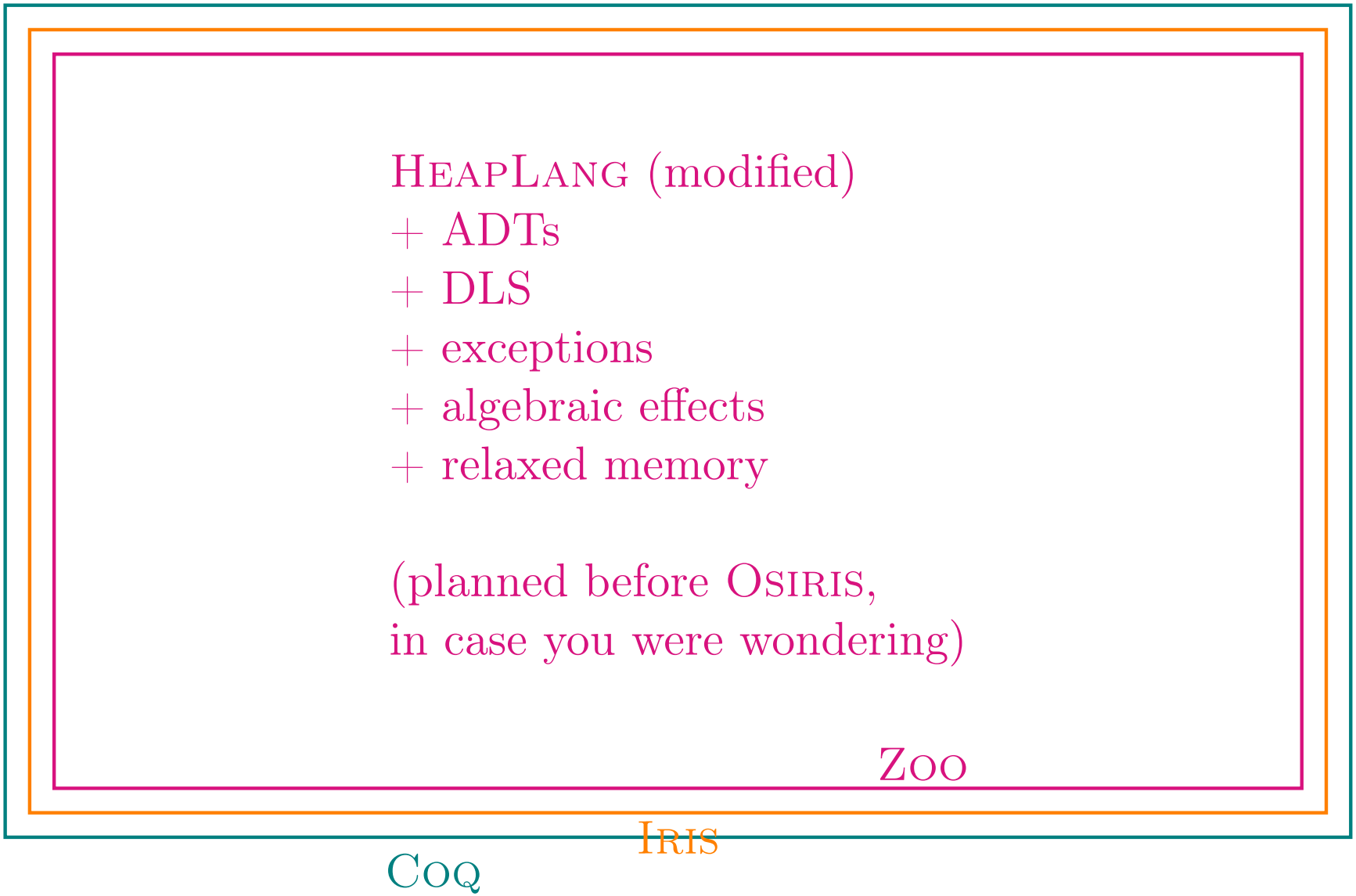
Zoology

Specimen ① : Michael-Scott queue

Specimen ② : Kcas

ZOOlogy: what is it?



ZOOlogy: what is it?

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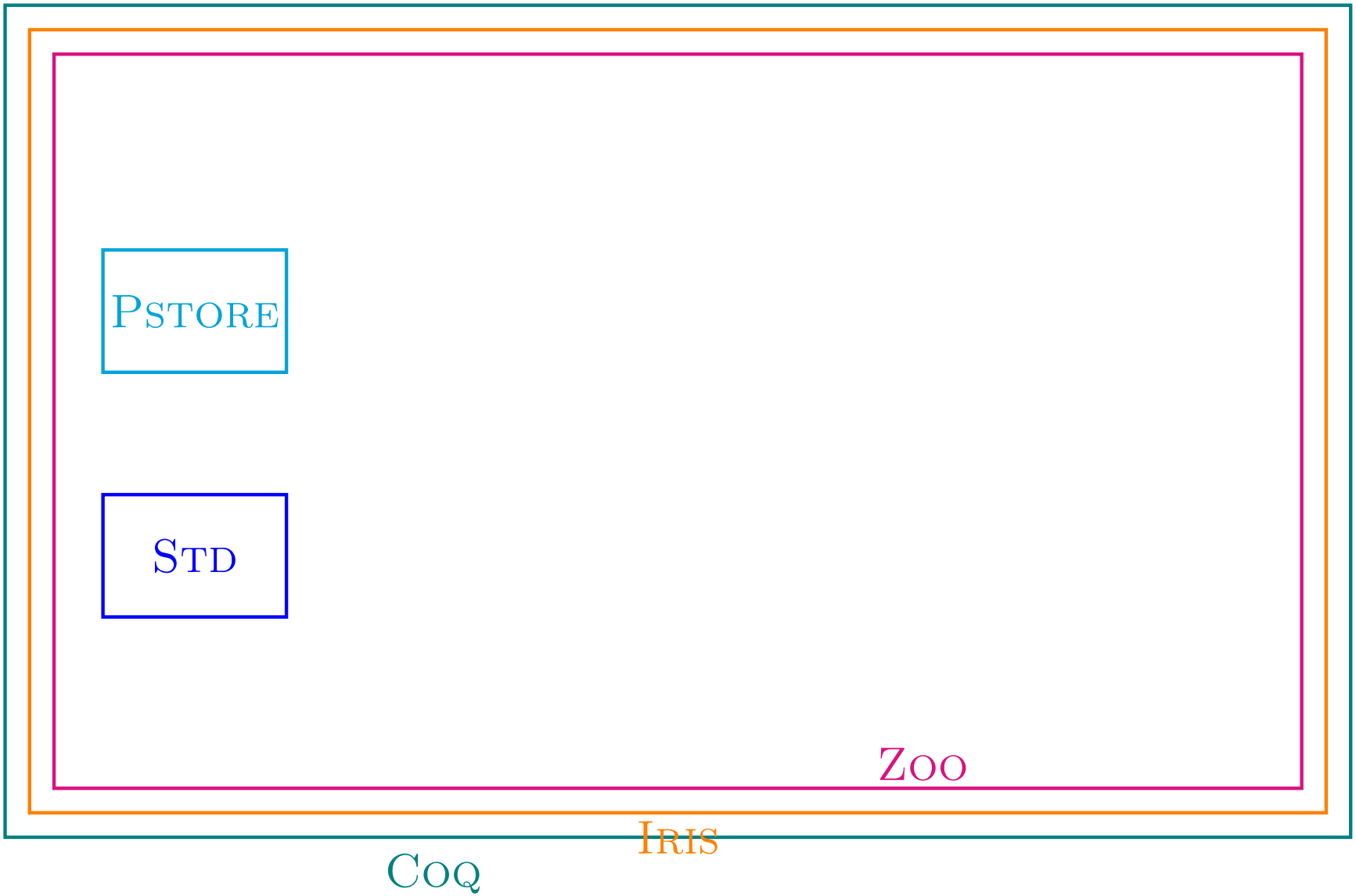


Zoology: what is it?

Basile Clément

Alexandre Moine

Gabriel Scherer

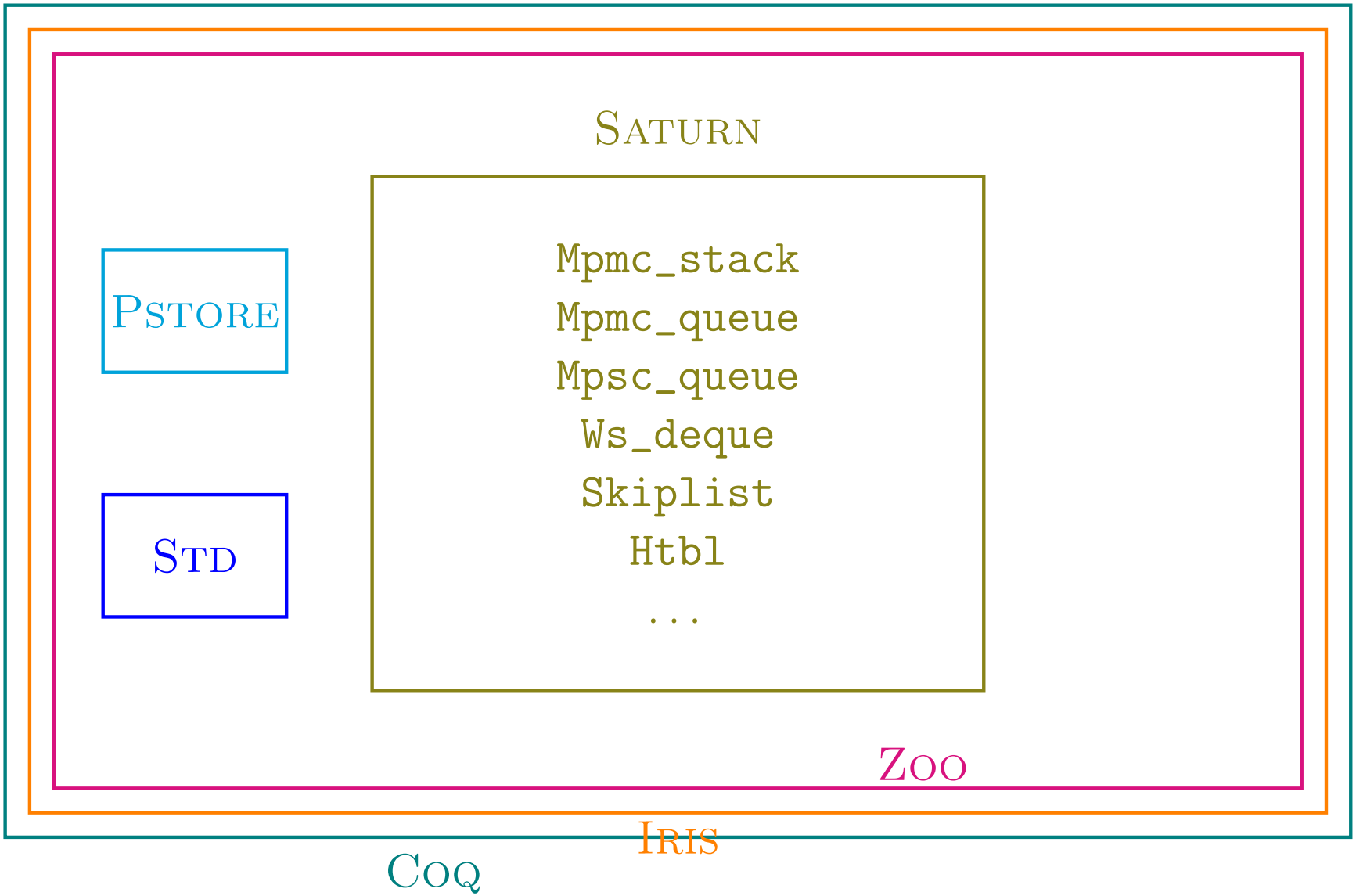
The Pstore team!

Zoo

Iris

Coq

Zoology: what is it?



ZOOlogy: what is it?

Vesa Karvonen

Carine Morel

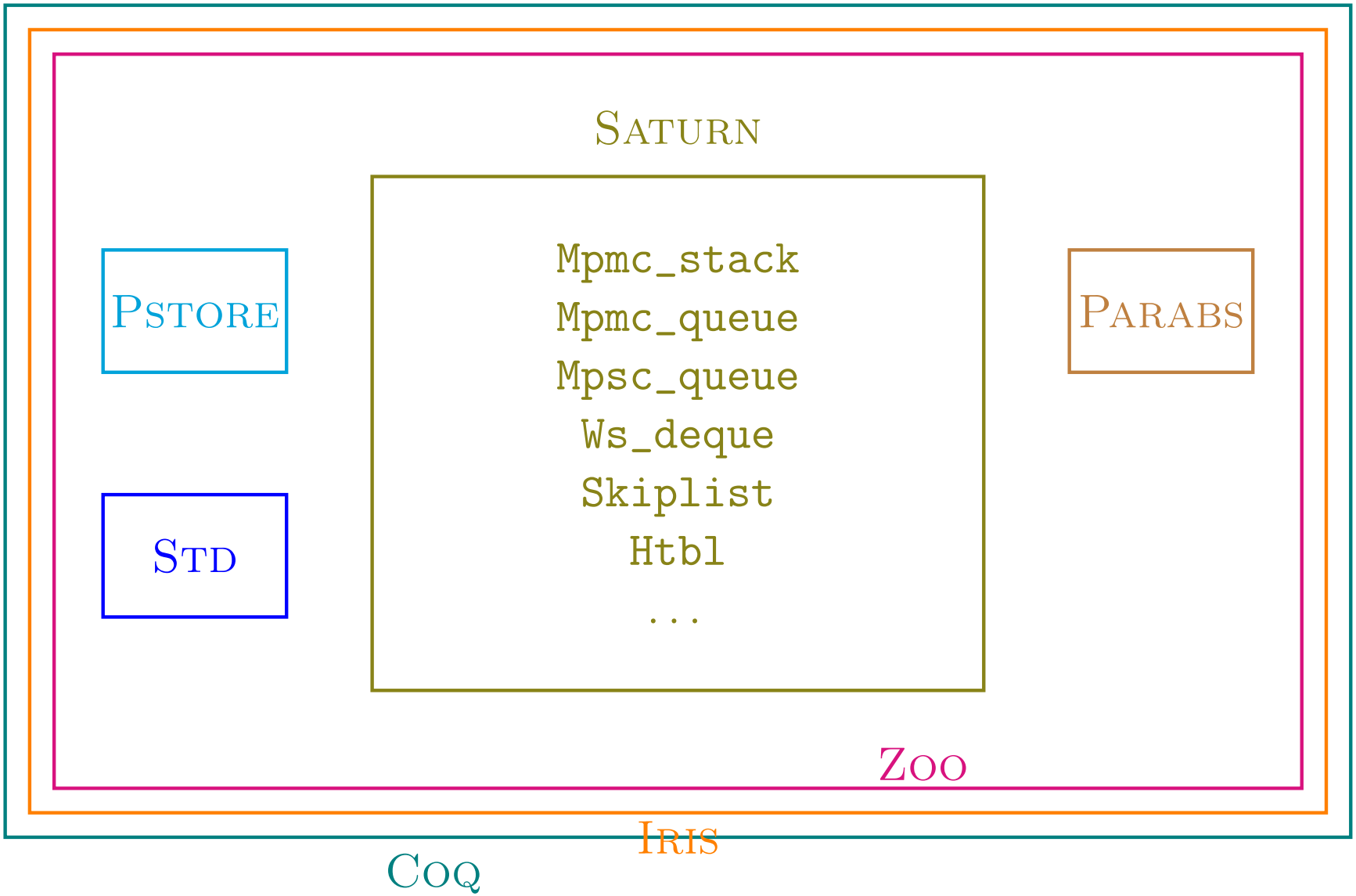
The SATURN team!

ZOO

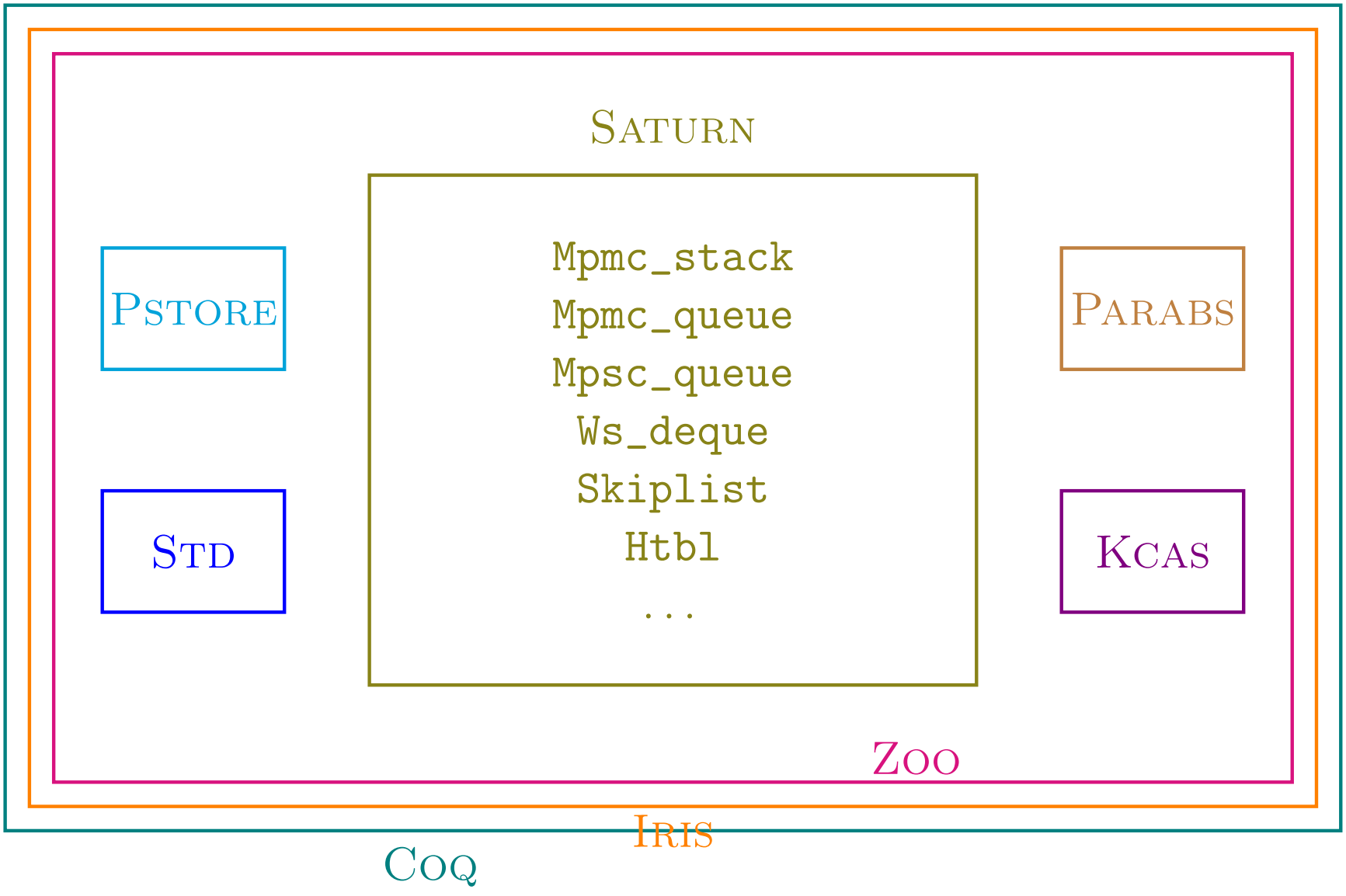
IRIS

COQ

ZOOlogy: what is it?



ZOOlogy: what is it?



ZOOlogy: what is it?

Vesa Karvonen

The main author of KCAS!

ZOO

IRIS

COQ

ZOOlogy: why is it fun?

Lockfree algorithms typically exhibit complex behaviors:

- physical state $\neq$ logical state,
- external linearization points,
- future-dependent linearization points.

IRIS is a good match for verifying them thanks to advanced mechanisms:

- invariants to enforce protocols,
- atomic updates to materialize linearization points,
- prophecy variables to reason on the future.

Zoology

Specimen ① : Michael-Scott queue

Specimen ② : Kcas

Michael-Scott queue

TODO

Zoology

Specimen ① : Michael-Scott queue

Specimen ② : Kcas

Kcas

TODO

Thank you for your attention!