SWIFT 2 : Keeping the Good, Discussing the Bad, Removing the Ugly

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Overview

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Our Goals

- SWIFT's **task-based parallelism** has been proven successful. We aim to build and expand on that in the context of particle based cosmological simulations.
- SWIFT's engine needs to be replaced with a more flexible variant:
  - SWIFT 2 needs to be able to make effective use of **heterogeneous architectures**.
  - Citations: Weinzierl et al. (2016) Reinarz et al. (2020) (Schaye et al., 2023)

How Does It Work?

- While PEANO provides the adaptive mesh and mesh traversals, we need to tell it what physics to solve.
- We still use particles as discretisation elements. The adaptive mesh is used to sort particles spatially and to allow for quick access to "neighbouring" particles.
- Particles are stored using a "dual tree" management strategy (Weinzierl et al., 2016): One tree holds the particles within the grid cells, while the other holds them within the grid vertices.

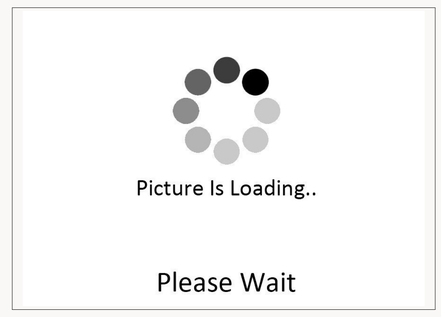

Figure 1 *The layers of PEANO.*

References

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