

# SWIFT Users & Developers meeting 2024

## Scientific Report

Numerical simulations play a key role in the toolbox of the modern astrophysicist. They allow us to understand and model phenomena which can only be observed as brief snapshots in time through telescopes. This is nowhere as true as in galaxy formation where the timescales for changes are so large that we can only comprehend what we see via virtual twins living inside our computers.

The Leiden-led SWIFT simulation code is one of the key tools used by the community to run simulations on the largest supercomputers available to scientists. During the annual workshop, we invite our colleagues, mostly early-career researchers, to describe, discuss, share, and comment on the developments they have brought to the code package in the last year. The whole software being open-source, we use this meeting as a platform to distribute improvements and combine the advances to unlock new answers to science questions.

During the five days of the workshop, the 64 participants presented their work. We also hosted some “good coding practice” tutorial and an introduction to simulations to which the rest of the Leiden observatory community was also invited.

Every day, 1 to 2 hours of the program was dedicated to work in smaller groups in order to foster new collaborations between participants to promote joint development of new code modules. Fruitful areas of developments have been identified and the planning of new simulations has been organised.