# Assignment 6, due May 3rd 2019

## Resources:

- `week_06/auto_level`
  Sequential implementation of image auto-levelling algorithm and example input / output
- http://dps.uibk.ac.at/~philipp/earth-huge.png
  High-resolution (8K) image for performance testing

## Assignment:

- Develop an OpenCL program with the same input/output behavior as the sequential implementation `auto_level_seq.c`. Perform the time-intensive parts of image analysis and adjustment on the GPU.
- Test your program and try to beat the sequential execution time. For performance tests, use `earth-huge.png`.
- Bonus (optional): Can the computation time of the sequential variant be improved? If so, how?

## Hints:

- Load the image as in the sequential implementation
- Copy the image data to the device
- Compute min/max/avg on the device in parallel using a reduction
- Compute the adjustment factors (on the host)
- Adjust the image on the device in parallel
- Read the result back and write to a PNG as in the sequential implementation
- Note: These are suggestions only, different approaches are possible and allowed.

## Goal:

- Implementation of a frequently-encountered real-world use case in OpenCL

## Solution upload (NO IMAGES!):

- Via e-mail to philipp.gschwandtner@uibk.ac.at – one submission per group only!
  Subject: “`[PS703106] [AS06] GR_## - NAME1, NAME2, NAME3`”
  Solution must be submitted before Friday 09:15!