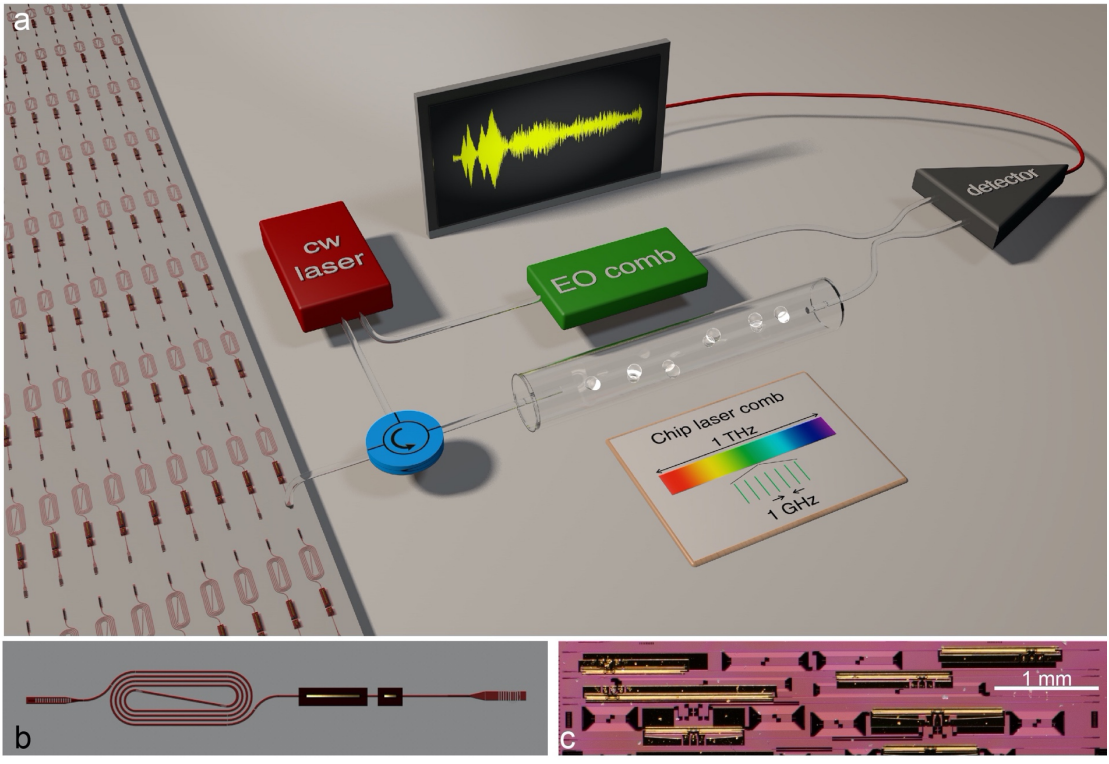

Figure 1. Gas-phase dual-comb spectroscopy with a III-V-semiconductor-on-silicon comb generator. (a) Set-up. The light of the III-V-on-Si comb synthesizer is out-coupled from the chip with an optical fiber and interrogates a gas-sample. The beam is multi-heterodyned with that of an electro-optic comb on a balanced photodetector. It contains the interferogram, Fourier transform of the spectrum. For interferometric coherence between the two combs, the continuous-wave laser used for generating the electro-optic comb injection locks one line of the III-V-on-Si comb. **(b)** Schematic representation of the III-V-on-Si laser. **(c)** Photograph of a part of the chip showing 6 mode-locked lasers of different geometries and repetition frequencies.