

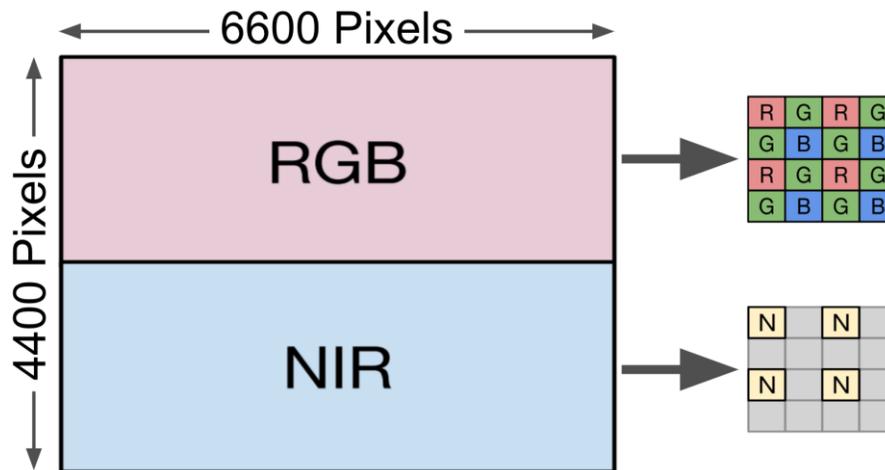
## Understanding PlanetScope Instruments

PlanetScope imagery products are now derived from two cohorts of satellites, one with the instrument ID **PS2** and the other with the instrument ID **PS2.SD**.

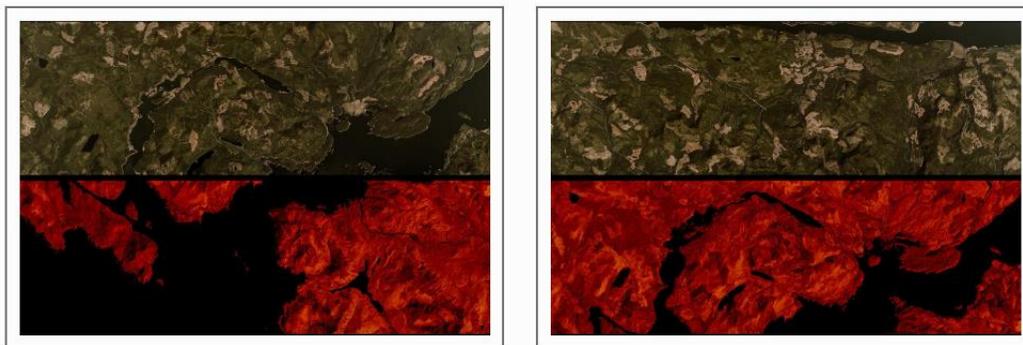
### The PS2 Instrument

Planet achieved Mission 1 after the successful launch of 88 Dove satellites in February 2017 and the successful launch of a further 48 Dove satellites in July 2017. This groundbreaking feat enabled Planet to image the world's land mass, roughly 150Mkm<sup>2</sup>, every single day in 4 spectral bands: blue, green, red and near-infrared (NIR).

These Dove satellites carry instruments comprised of a telescope we call "PS2" paired with a 2D frame detector having 6600 pixels across by 4400 lines down. The detector has a Bayer pattern filter separating the wavelengths of light into blue, green and red channels. On top of the Bayer pattern filter is a "2-stripe" filter, where the top half blocks the NIR wavelengths, thus allowing only the blue, green and red light to pass through, and the bottom half allows only the NIR wavelengths of light to pass through.



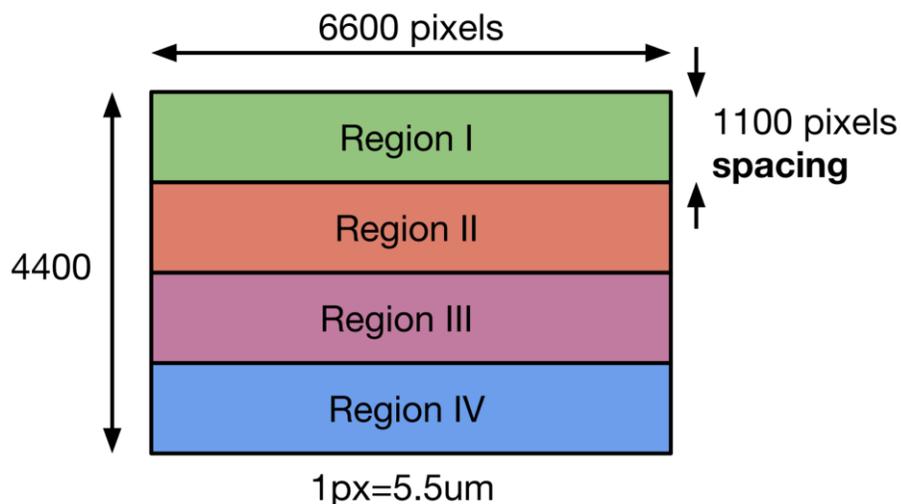
The result is that each frame acquired by the PS2 instrument consists of a top half that is an RGB image and a bottom half that is an NIR image (as seen below). The RGB half of each frame is then combined with the NIR half of the adjacent frame in order to generate the resulting 4-band image.



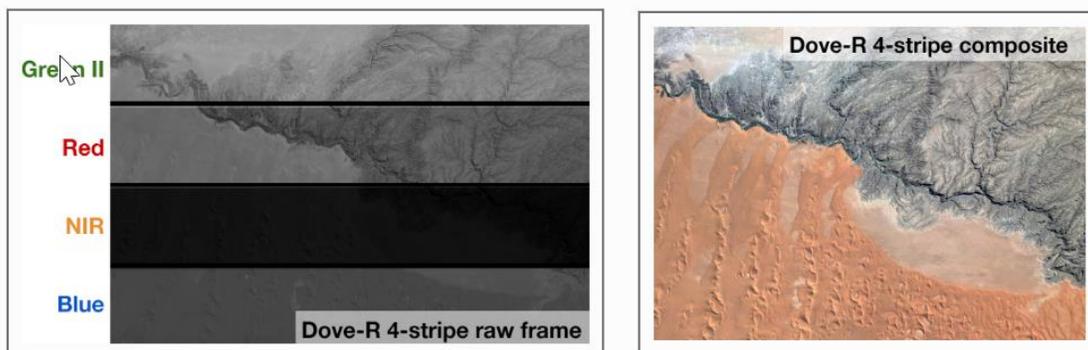
## The PS2.SD Instrument

In late 2018, Planet launched 25 next-generation Dove satellites, with the instrument ID PS2.SD. These new satellites increase our global coverage performance and continue to advance the technology underpinning our PlanetScope imagery. Users can expect to receive, on average, 1-2 images from PS2.SD satellites per week for a given location.

The PS2.SD instrument is comprised of the same "PS2" telescope and the same 2D frame detector as used in PS2. The Bayer pattern filter and pass-band filters in the PS2 satellites have been replaced with a high-performance butcher-block filter. The PS2.SD filter is made up of 4 individual pass-band filters, that separate the light into each of the blue, green, red and NIR channels. The choice of the pass-band filters for PS2.SD match closely with and are interoperable with those of Sentinel-2. We've named this new instrument PS2.SD.



Each frame acquired by the PS2.SD instrument is comprised of 4 stripes, as seen below. In order to generate the final 4-band image, we stack together a number of consecutive frames on either side of a given frame.



**\*\* Information sourced on 8/14/2019 from <https://developers.planet.com/docs/api/sensors/>.**