



gaia



gaia

Source Environment Analysis 101

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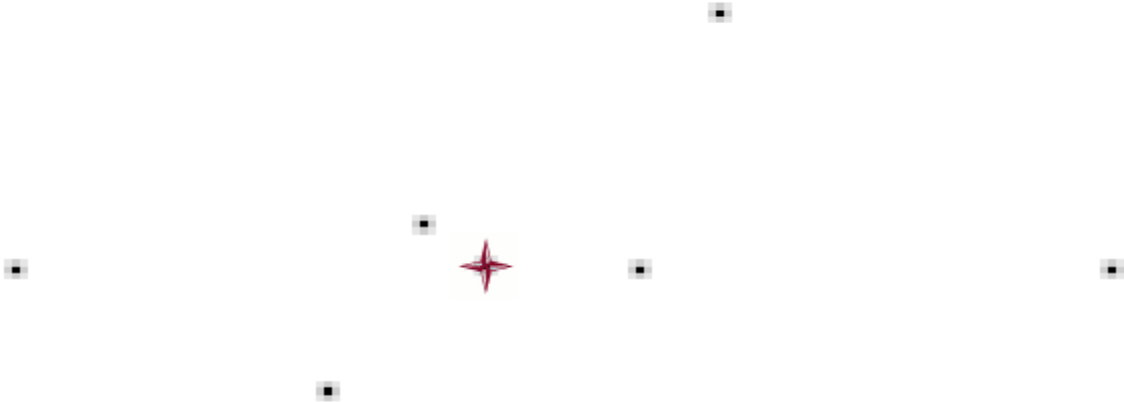
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Imagine 1 bright star with faint
neighbouring stars



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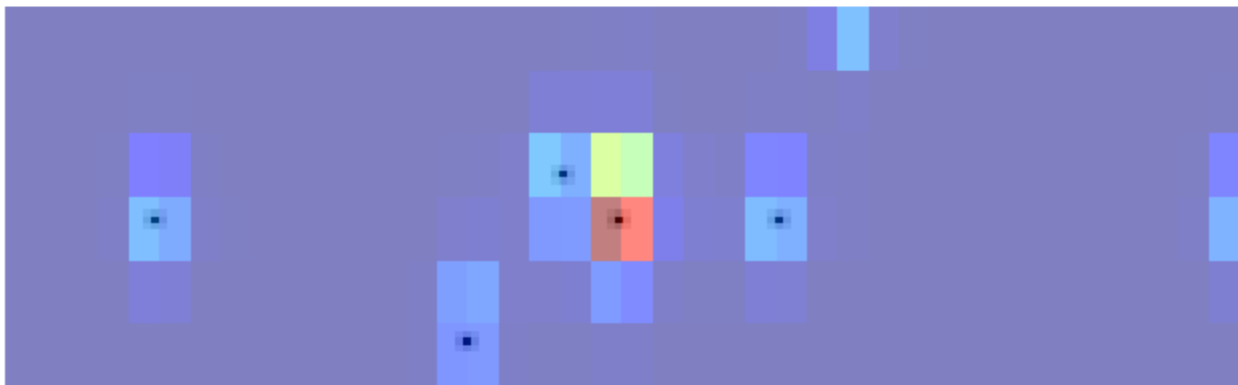
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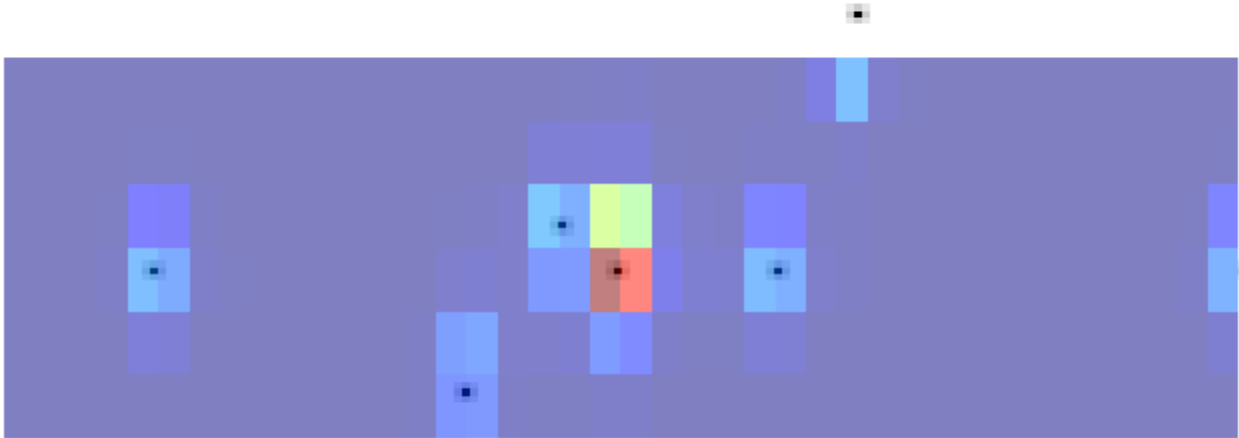
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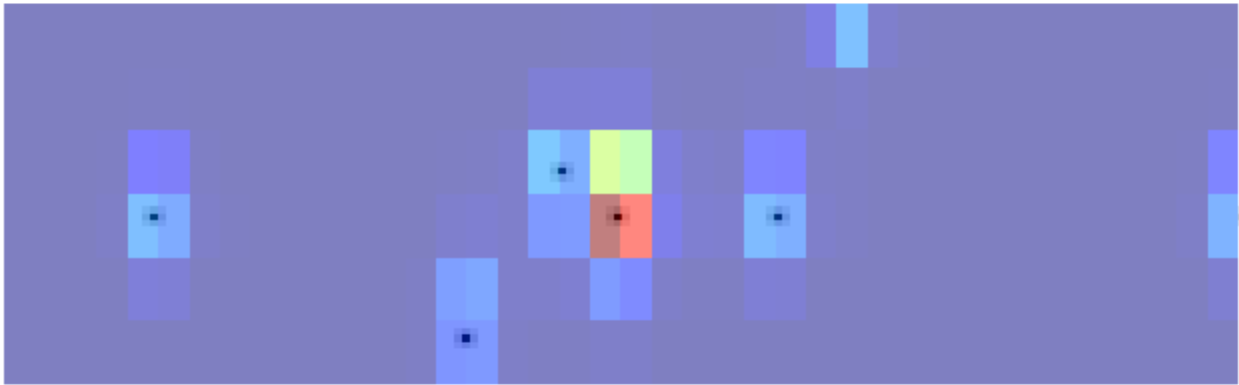
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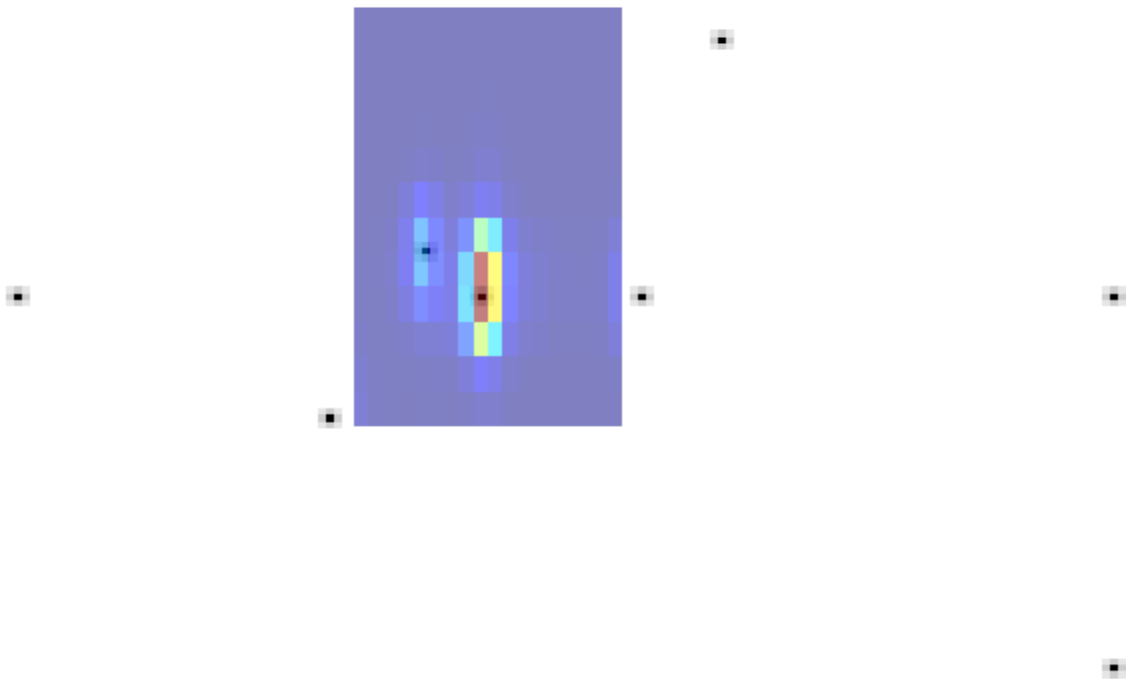


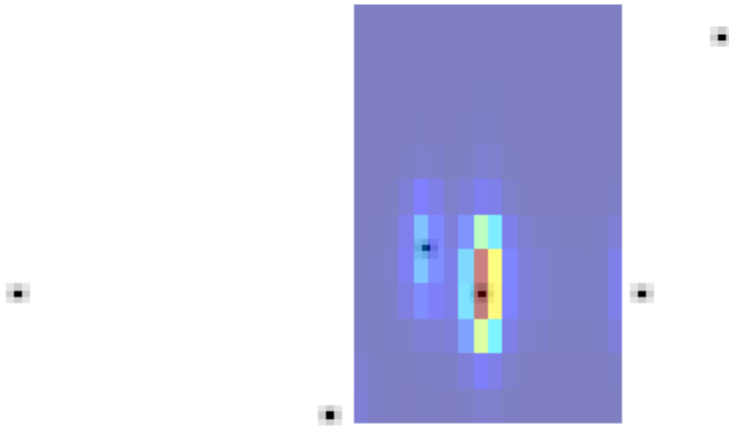
Star Mapper detects the bright star





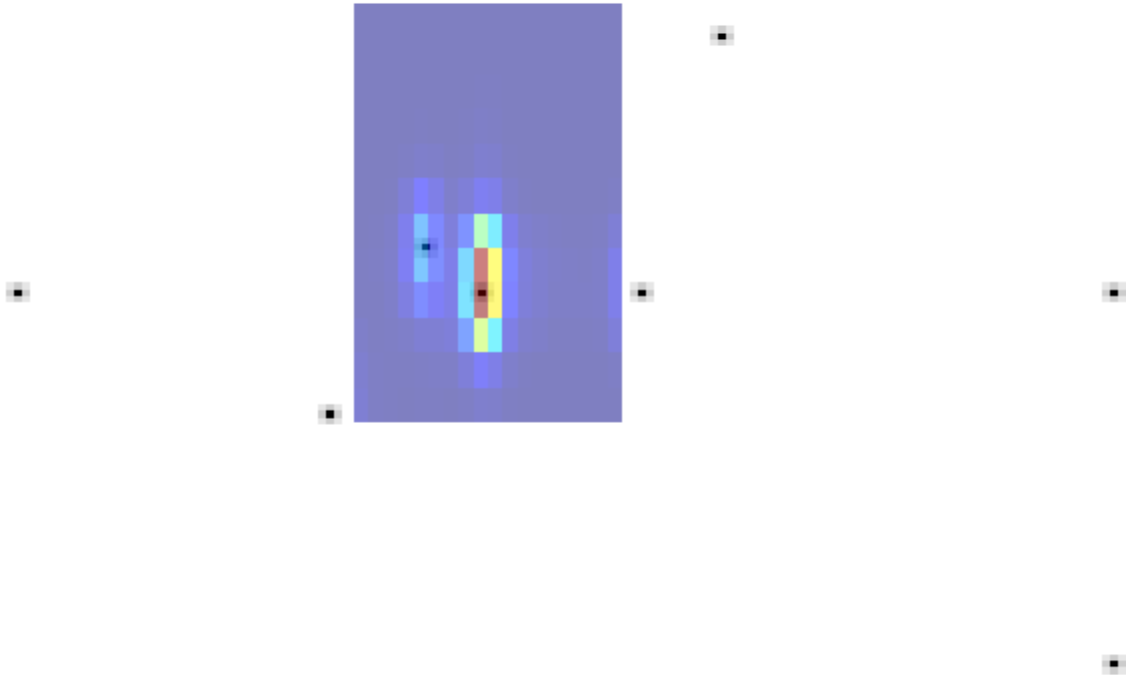
saves the read-out from the CCD in a window around the star





Detection data used to read out from
the Astrometric Field CCDs

Higher resolution, but smaller window
around the star



However ...



We have to get the data back to Earth



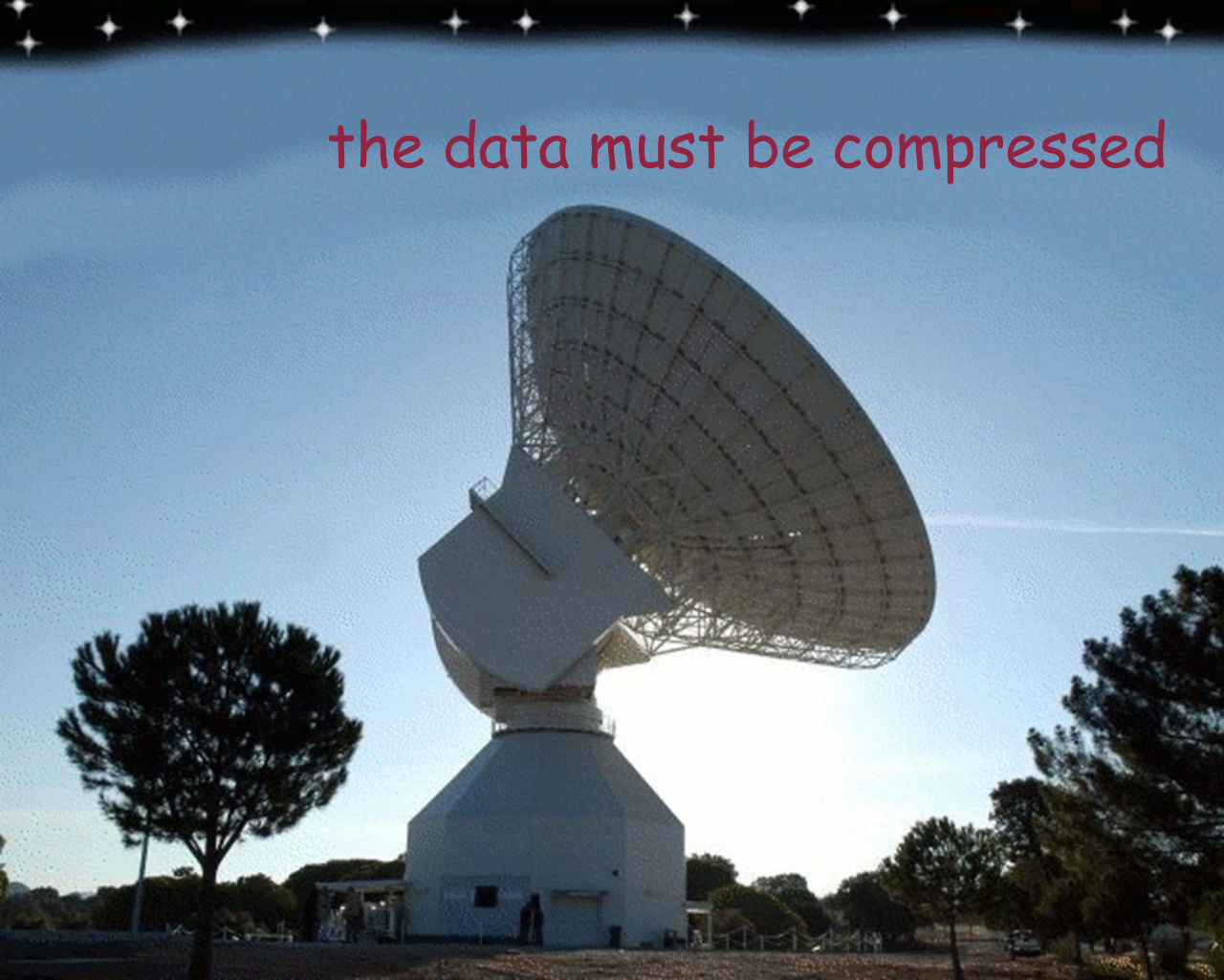
there are
many stars

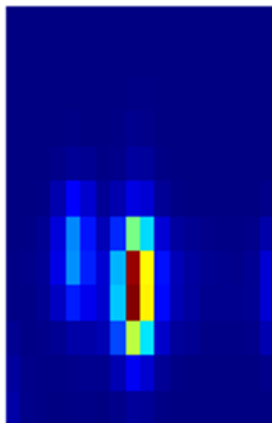


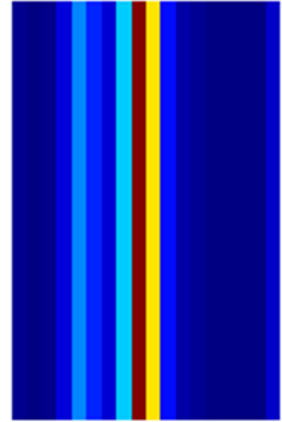
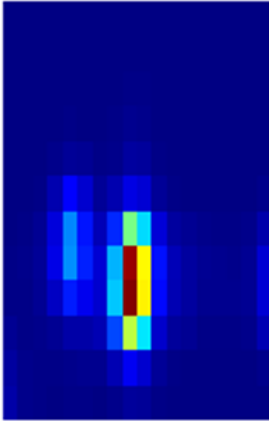
and limited
bandwidth



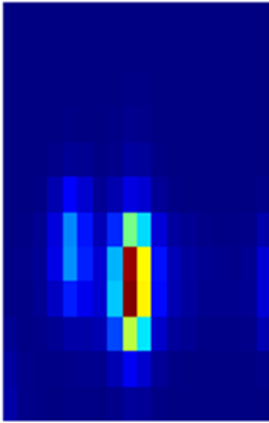
the data must be compressed



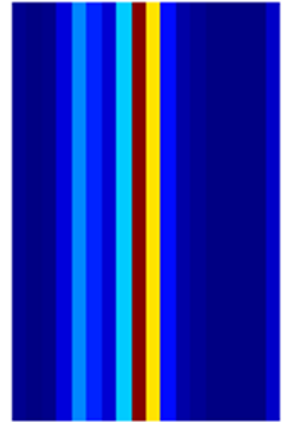




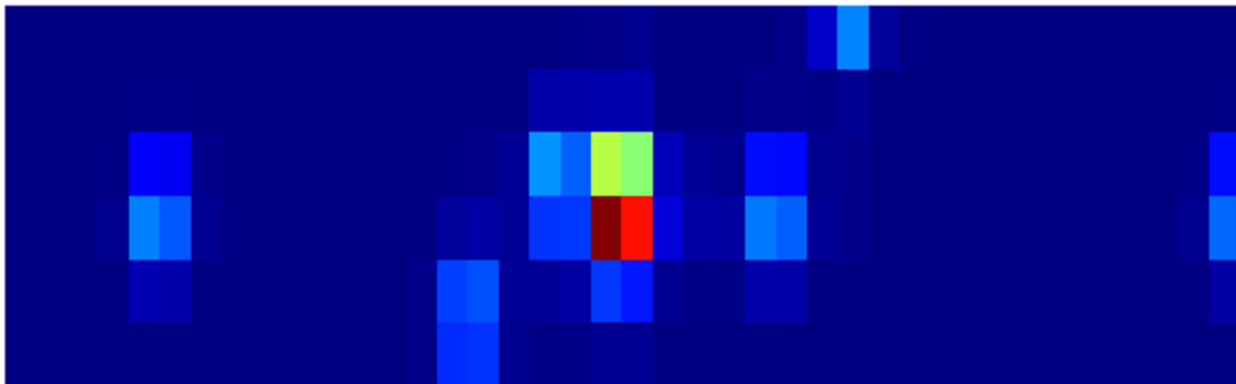
For all but the very brightest stars
the windows are binned



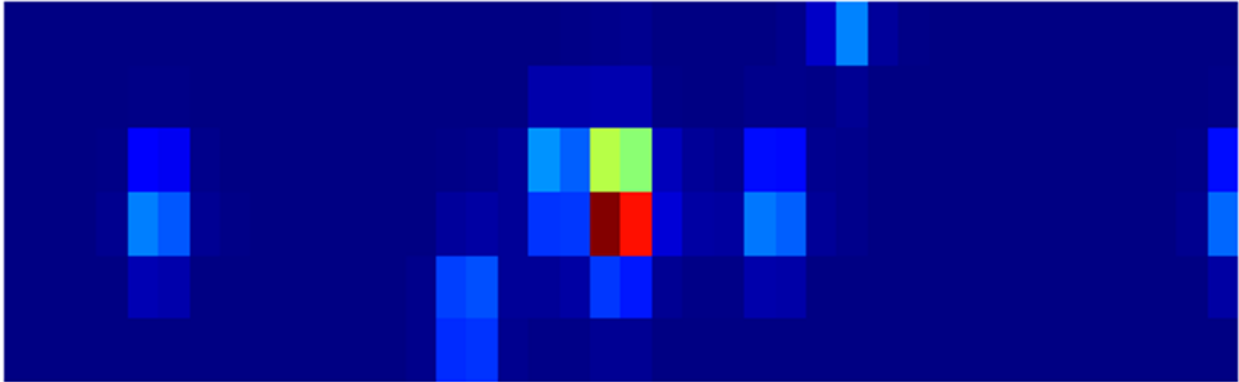
216 pixels

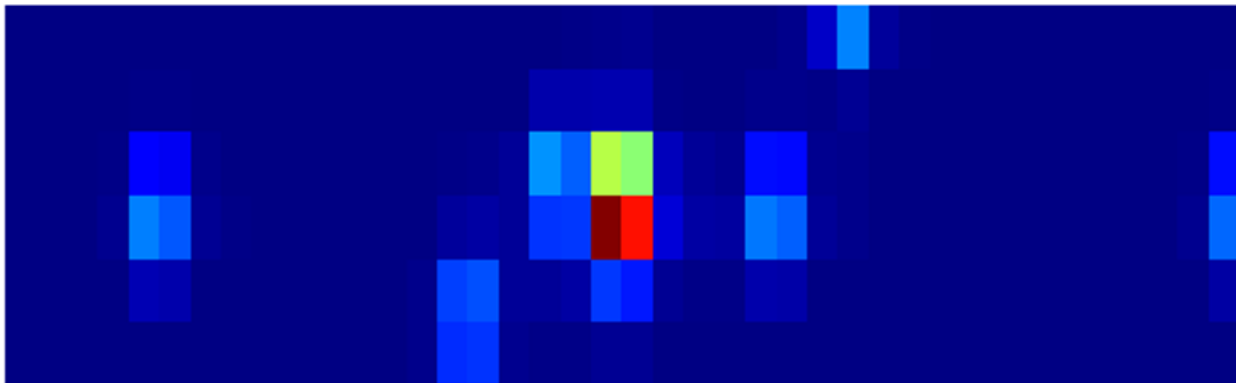


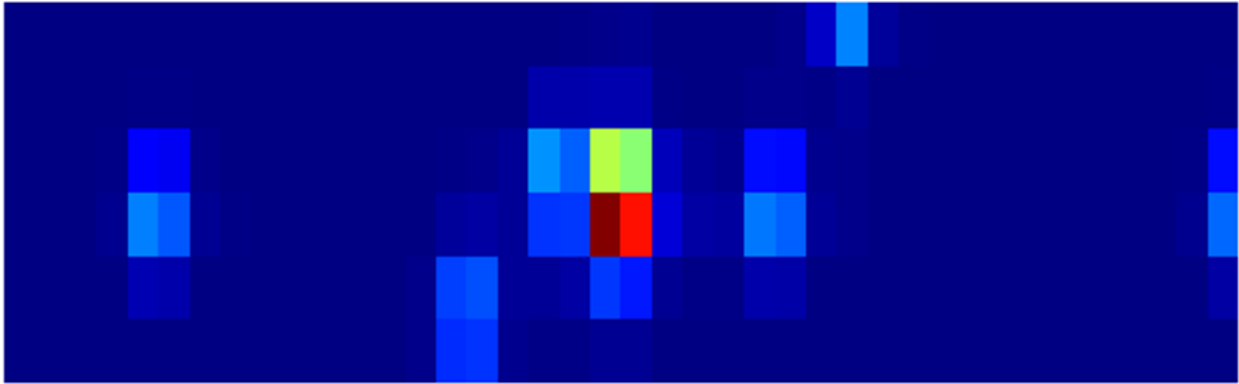
becomes 18



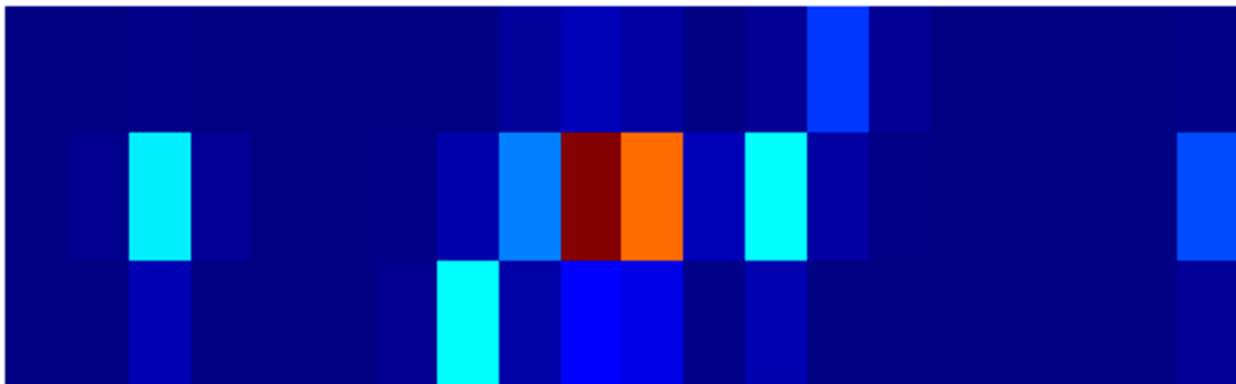
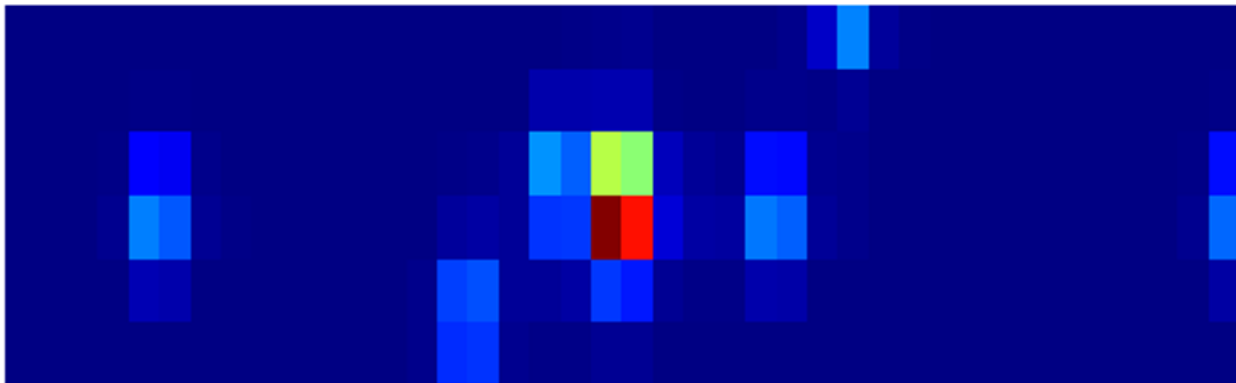
The Star Mapper windows

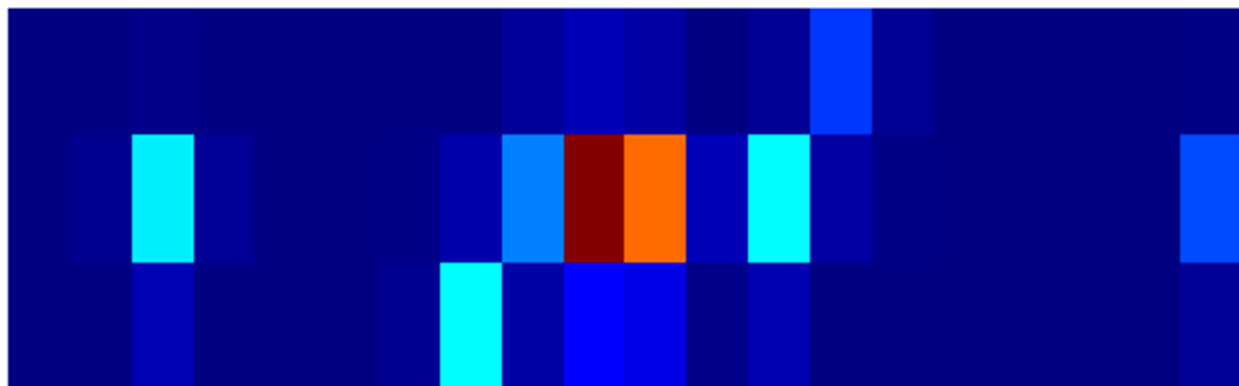
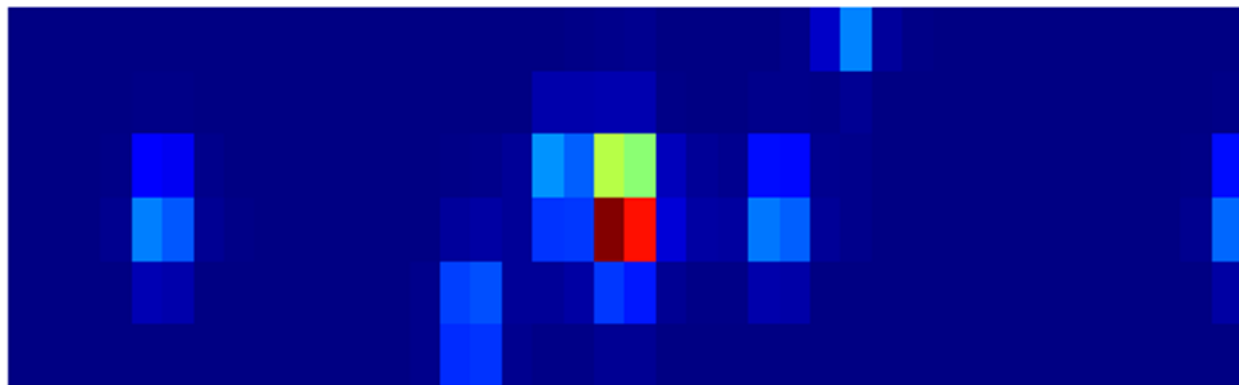


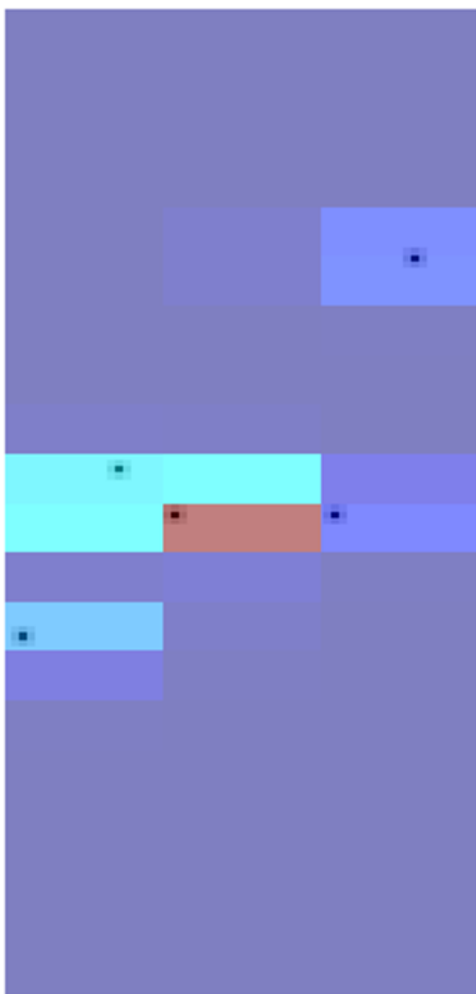




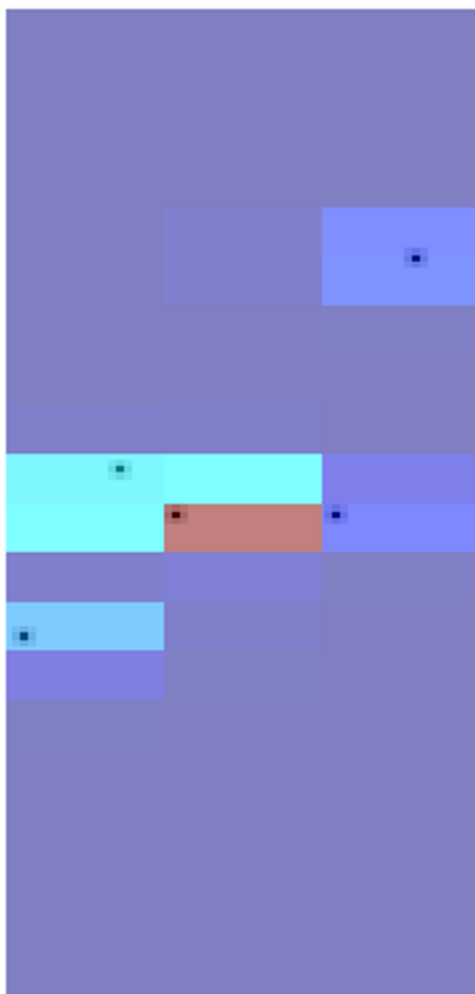
must also be binned

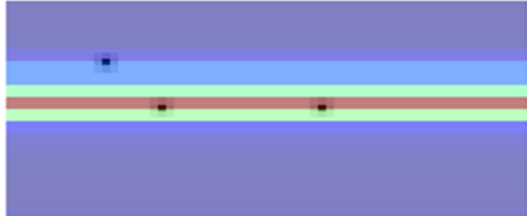




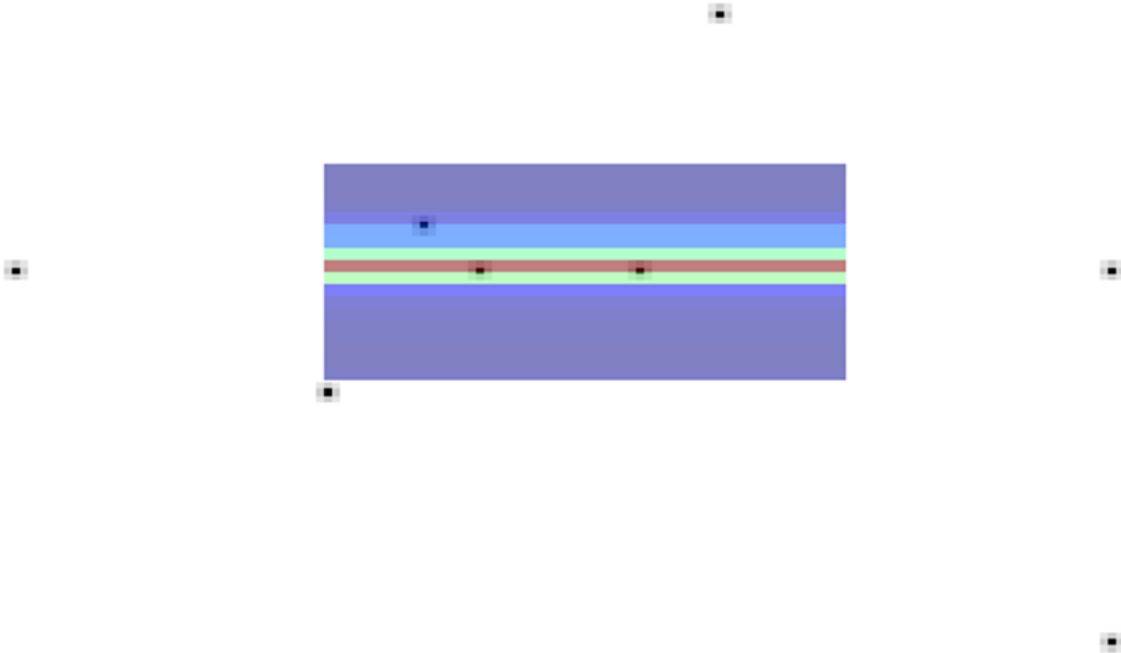


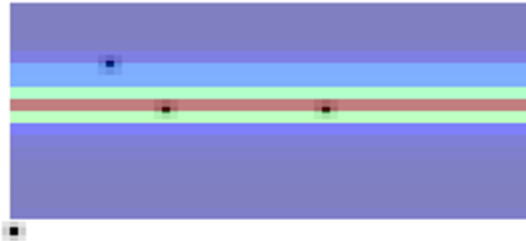
Later Gaia
will see the
star again



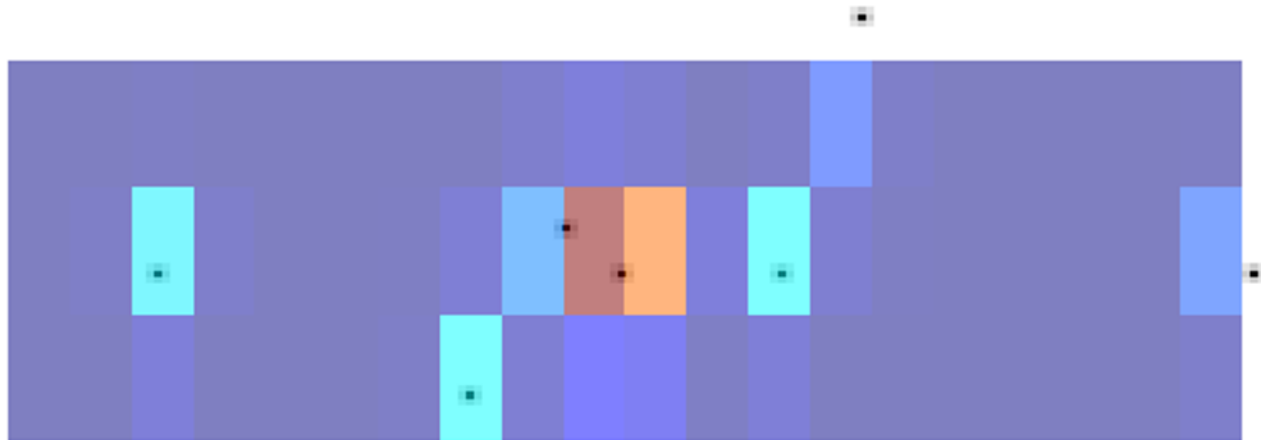


at this later time the CCD will be at a different angle

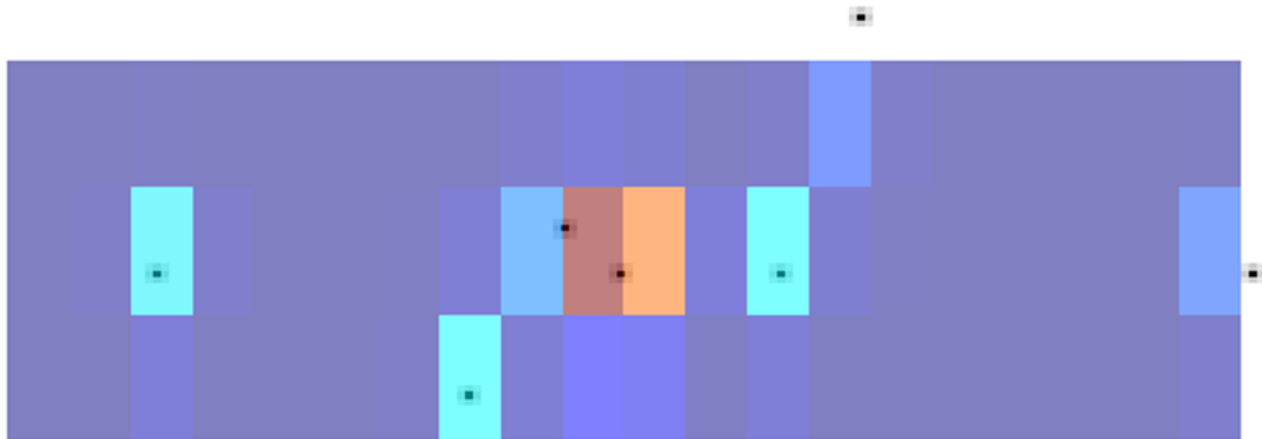


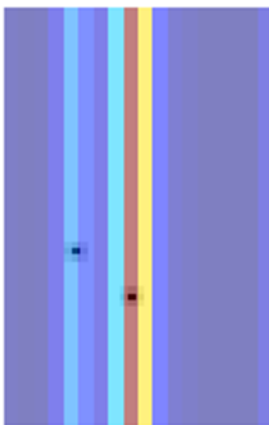


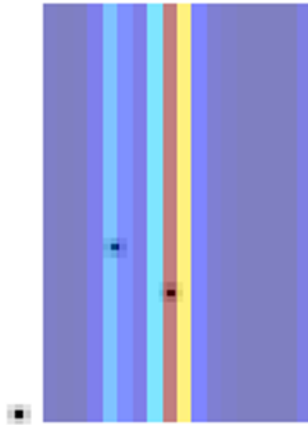
with respect to the star



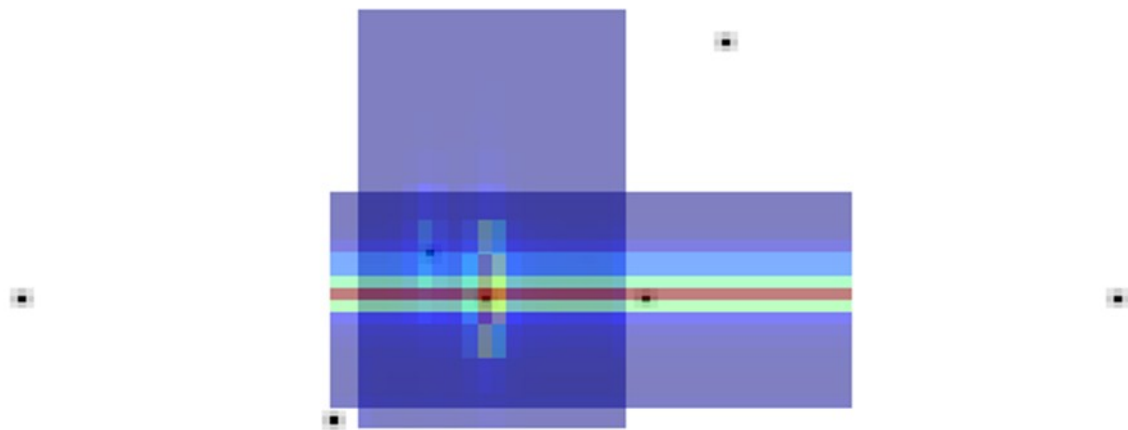
on average Gaia will see

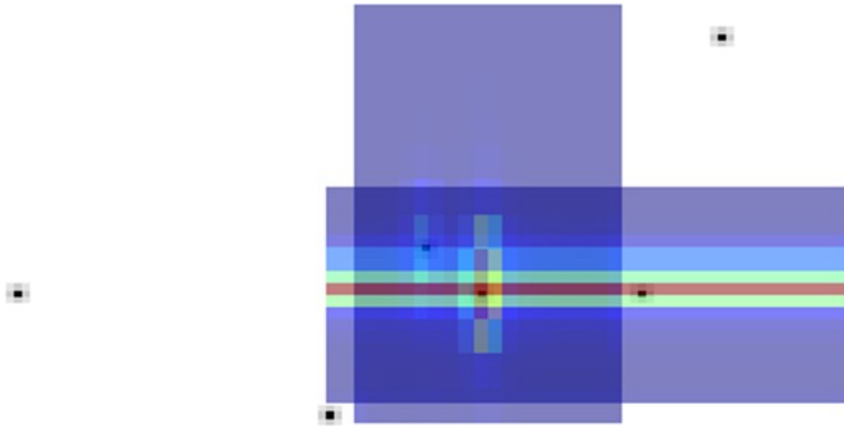






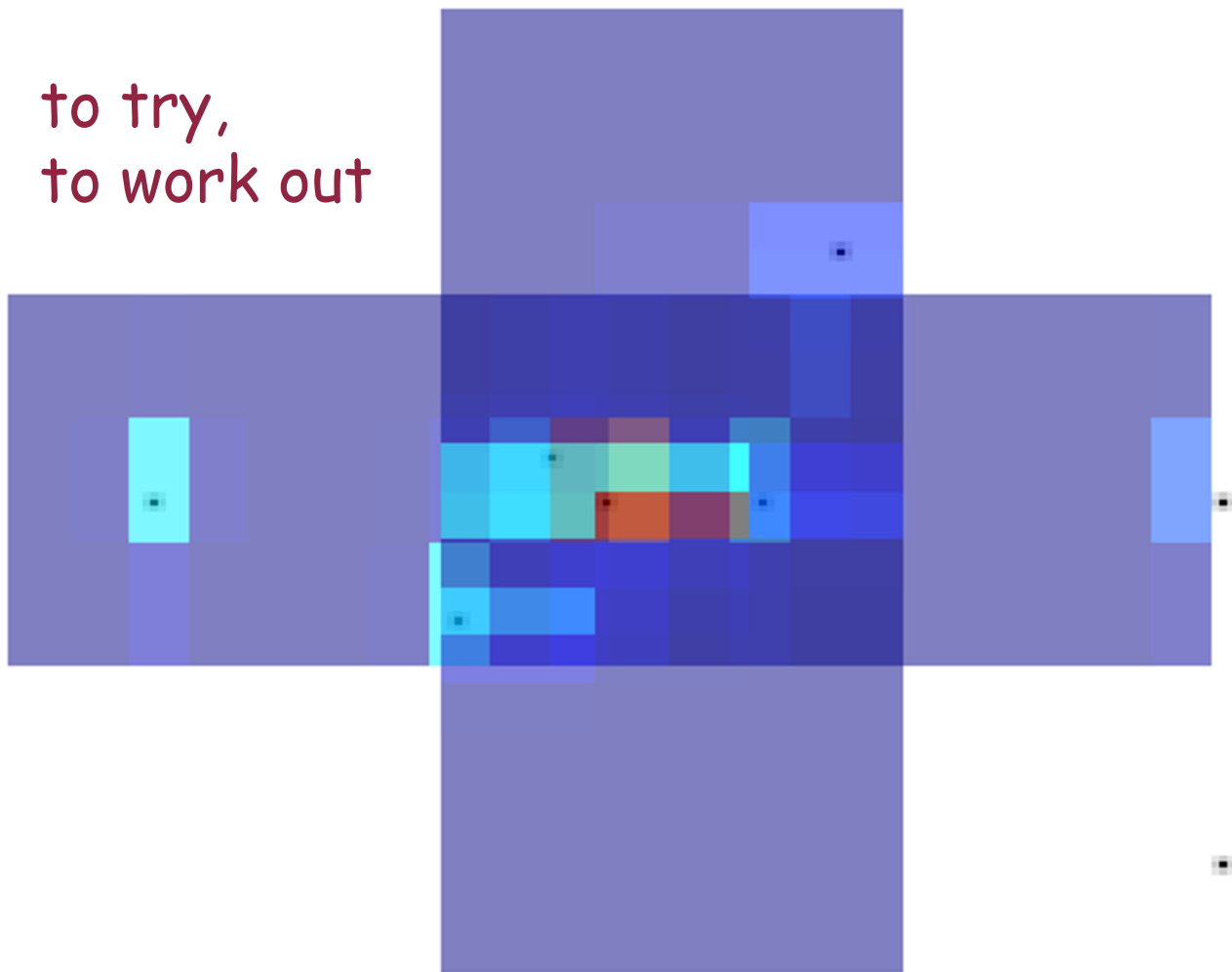
each star 85 times

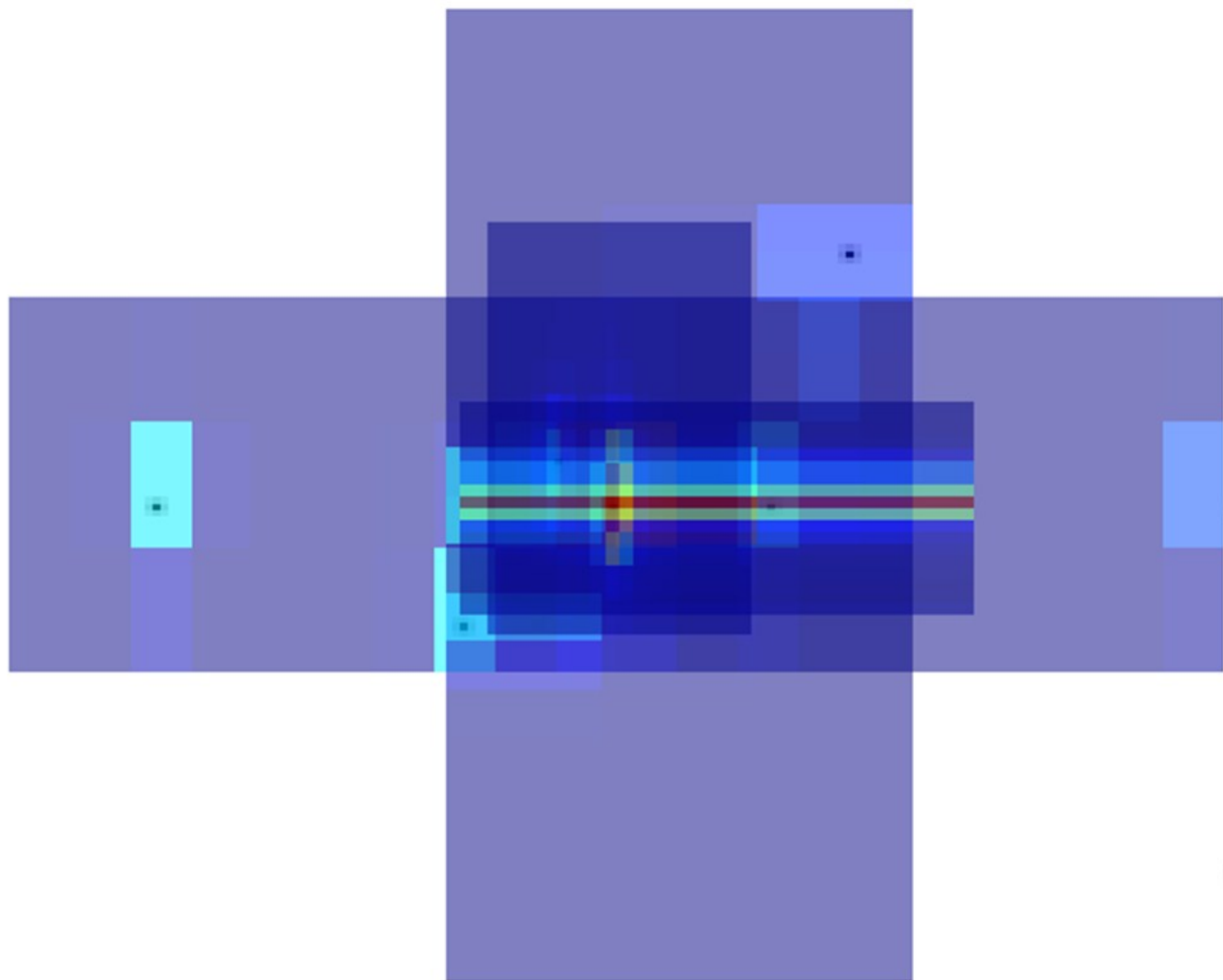


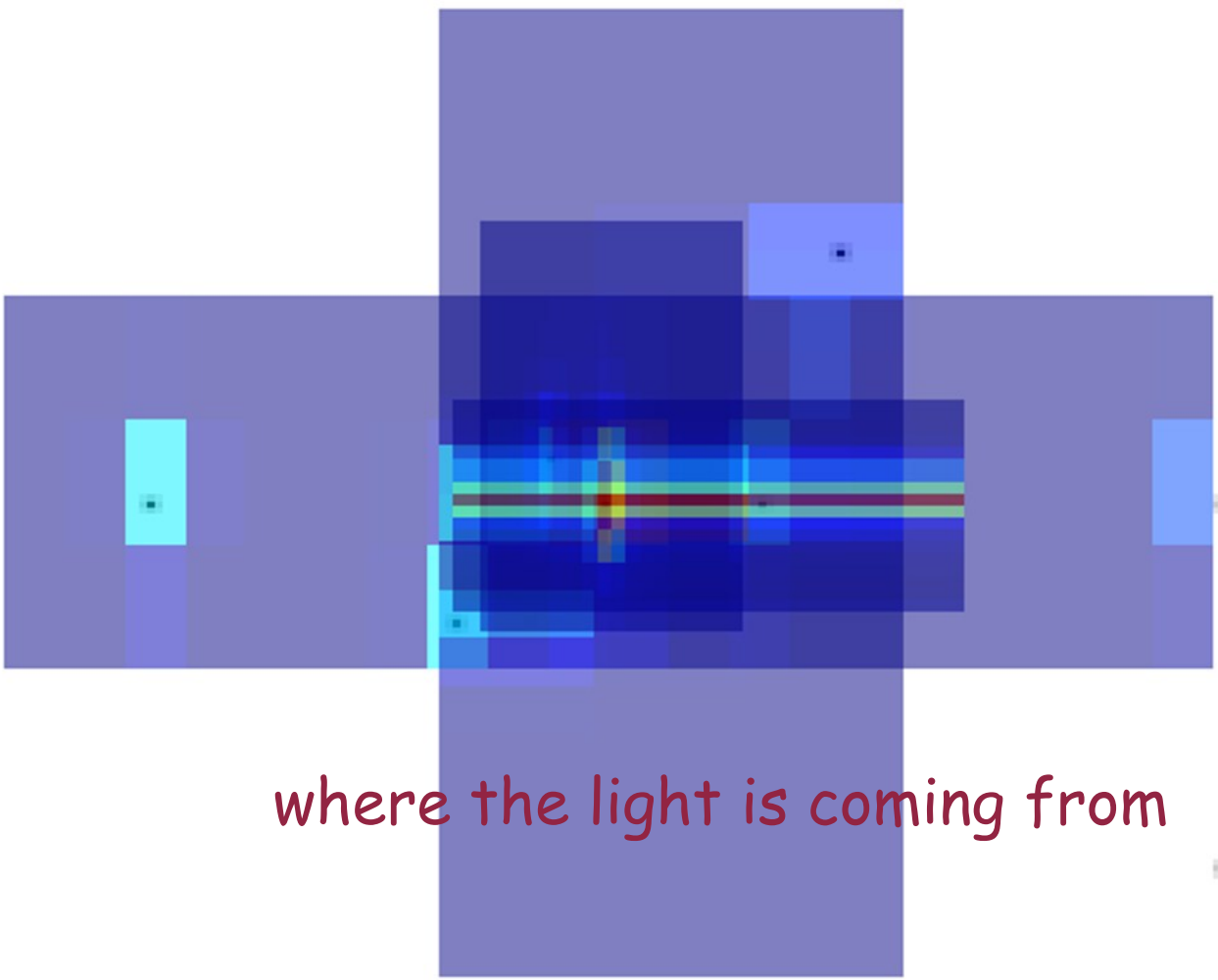


We can combine windows from the same star

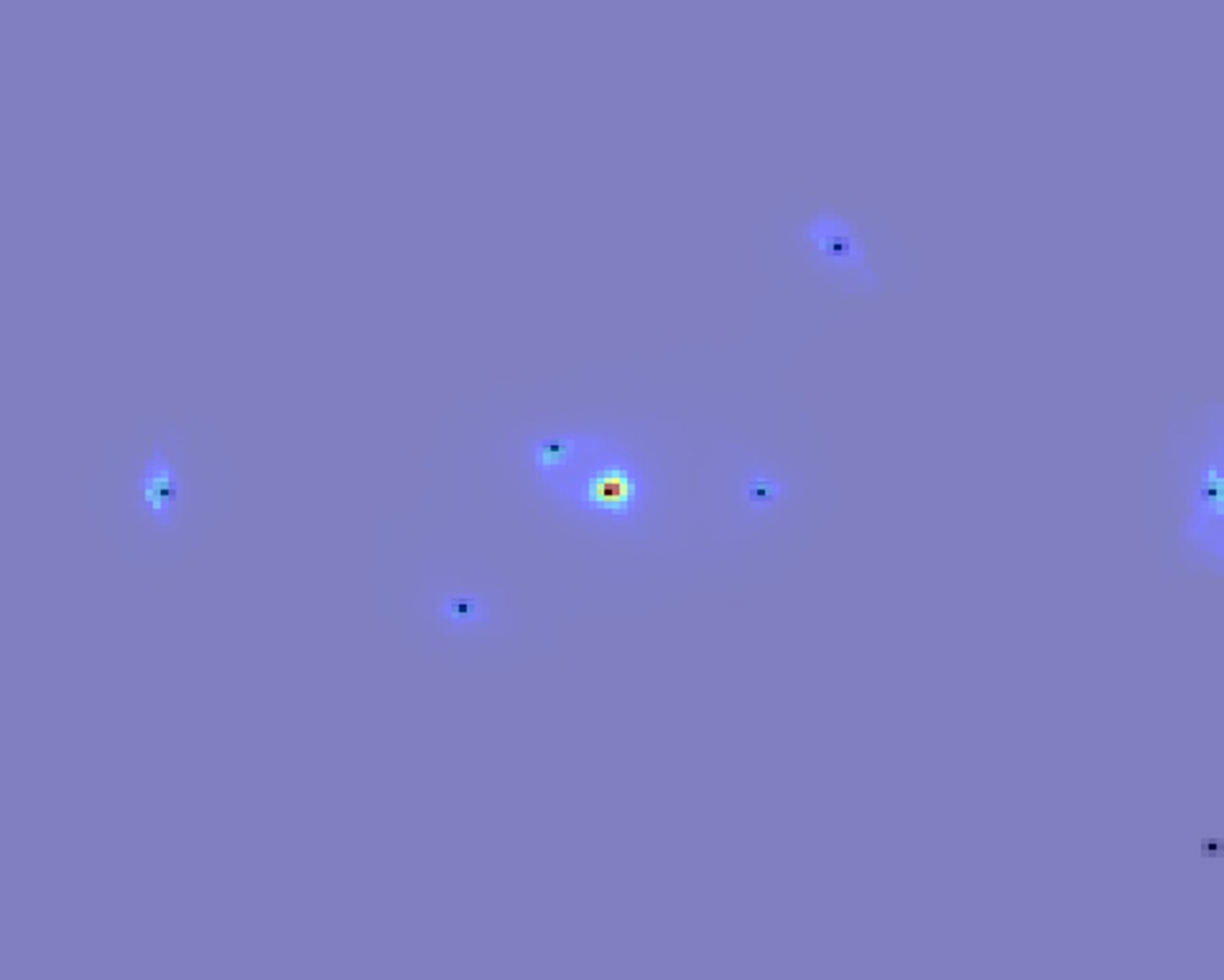
to try,
to work out

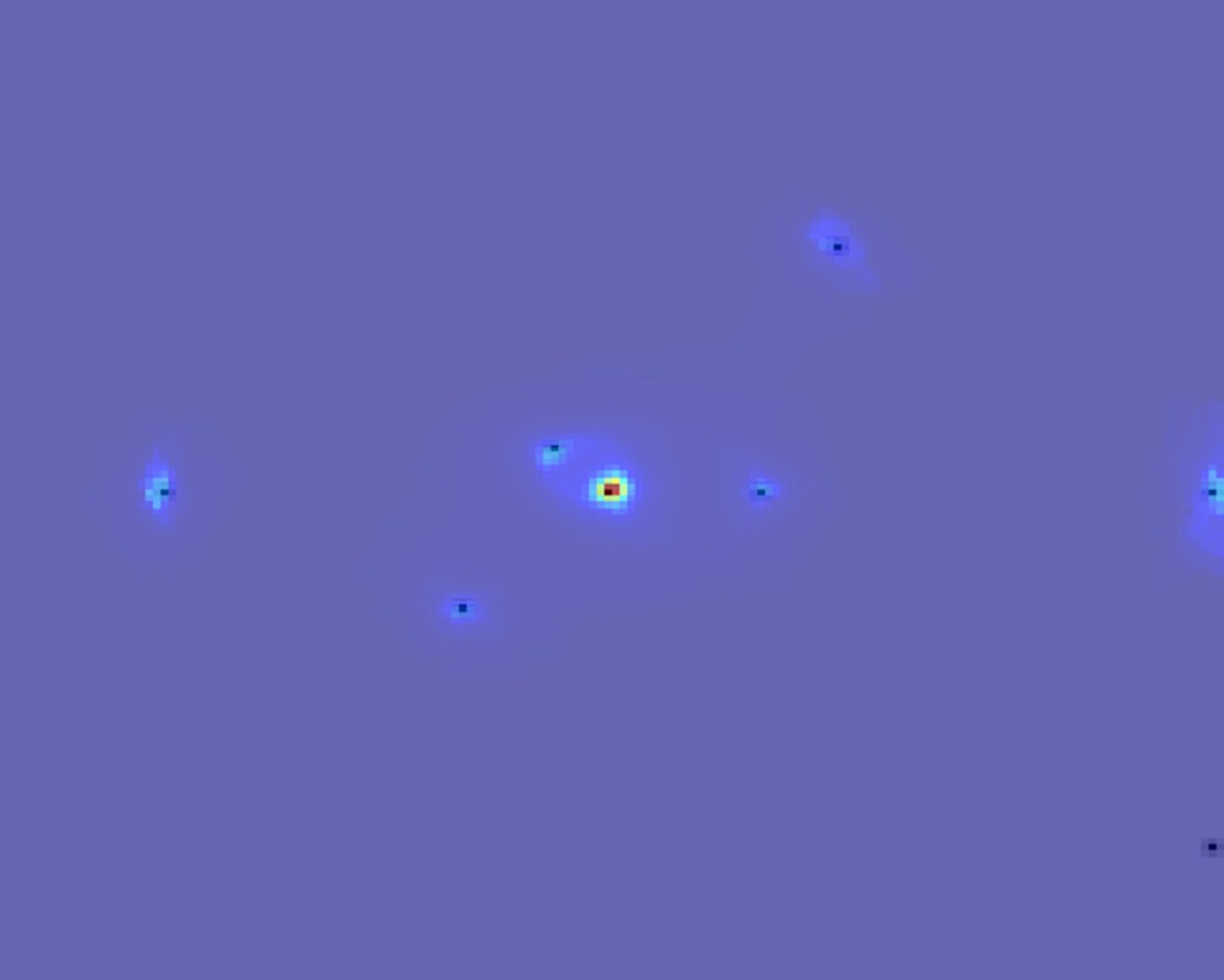


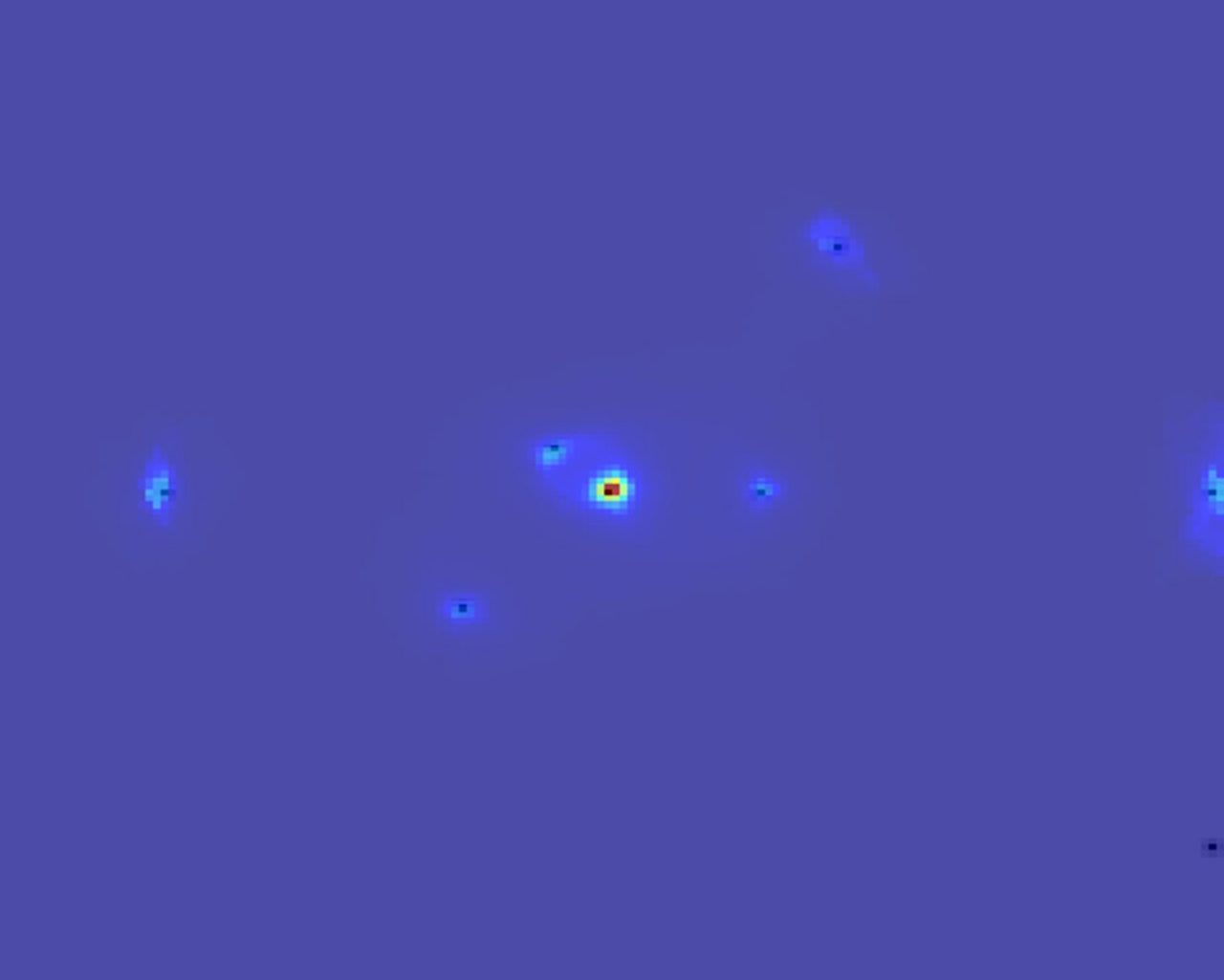


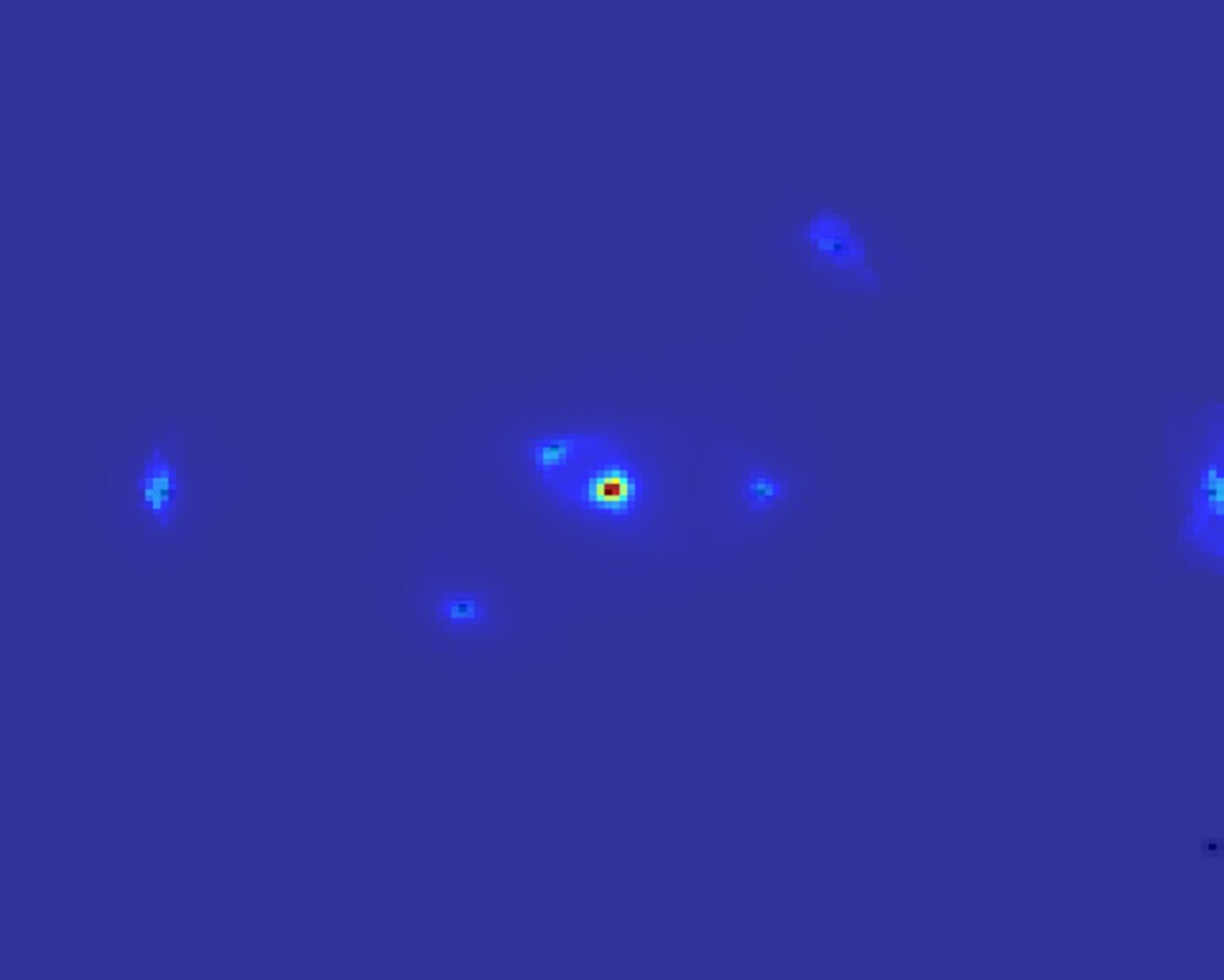


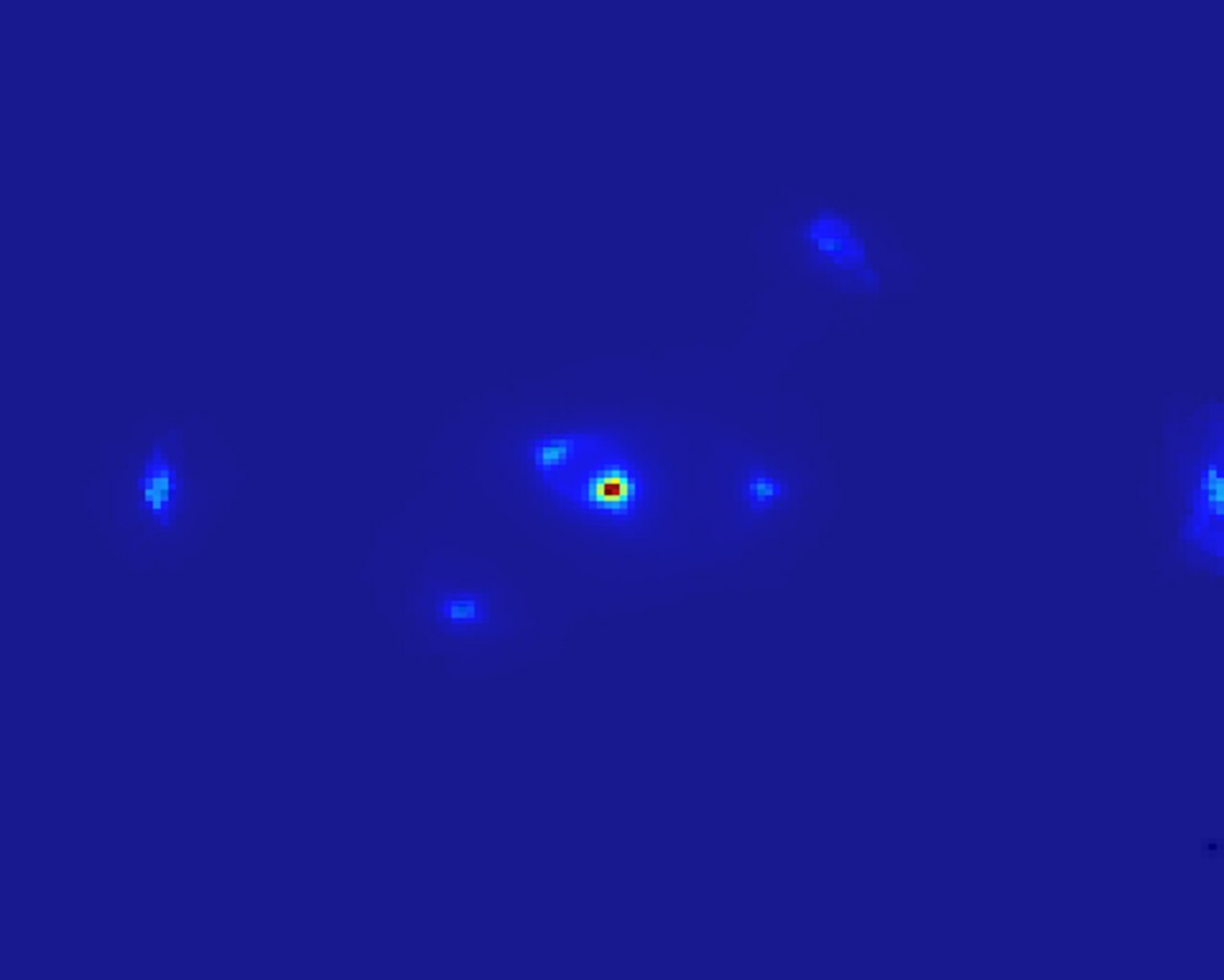
where the light is coming from

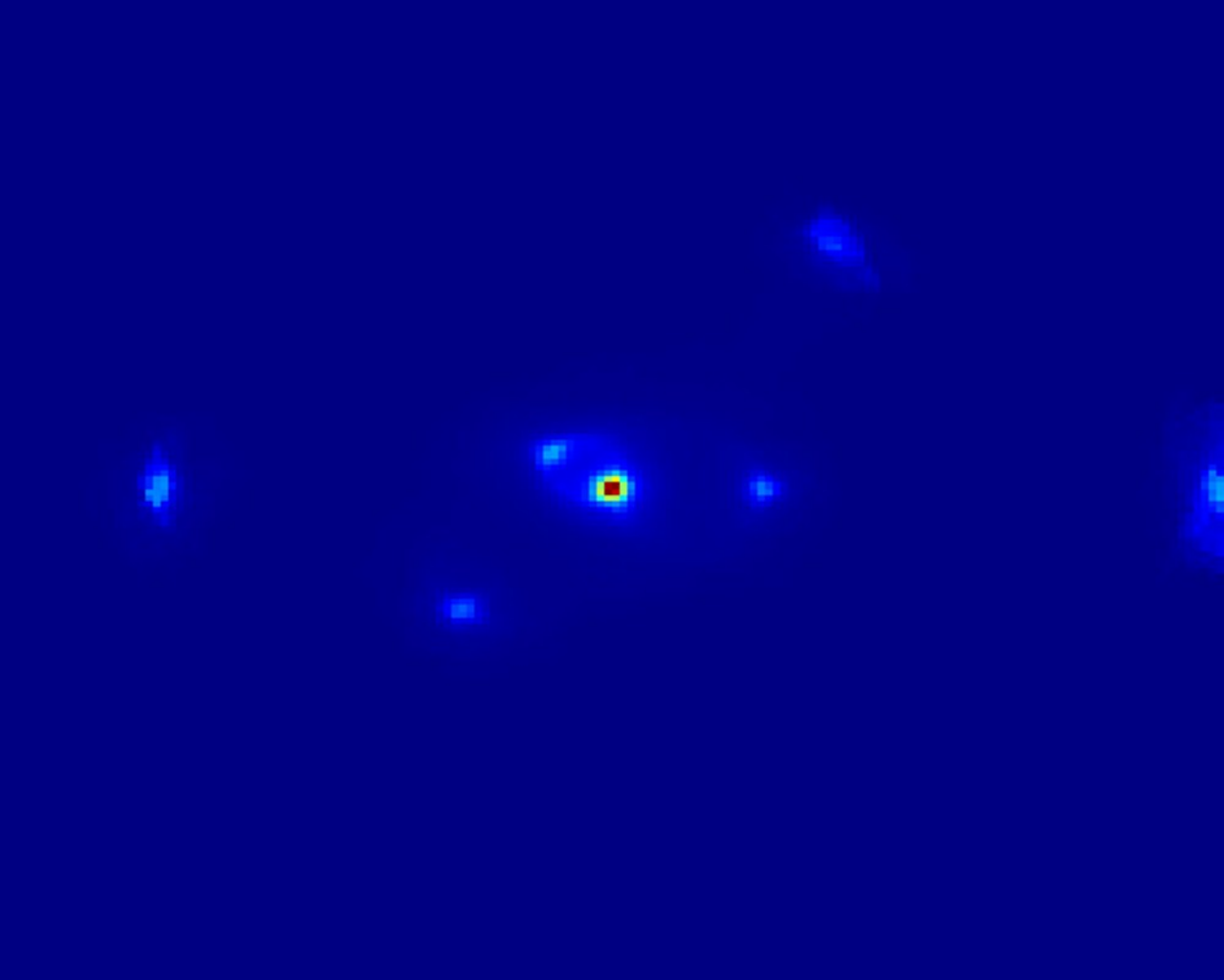




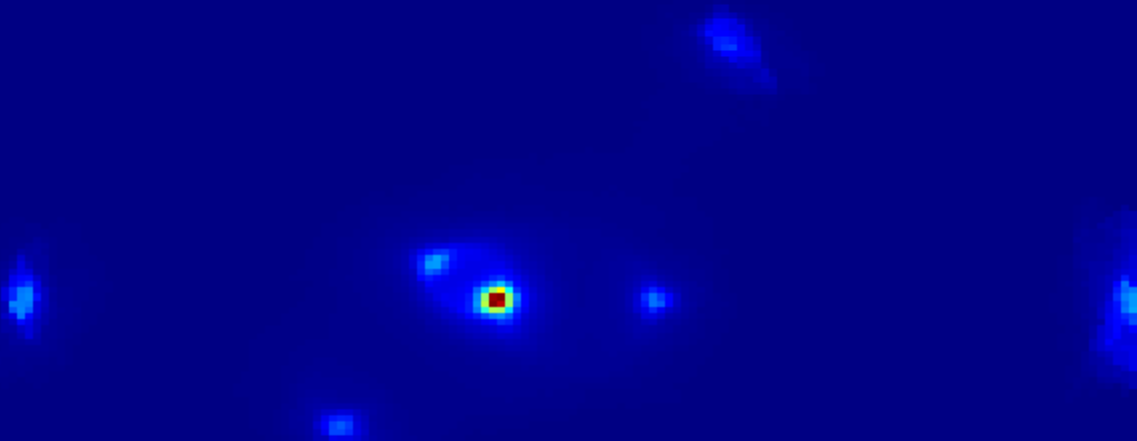




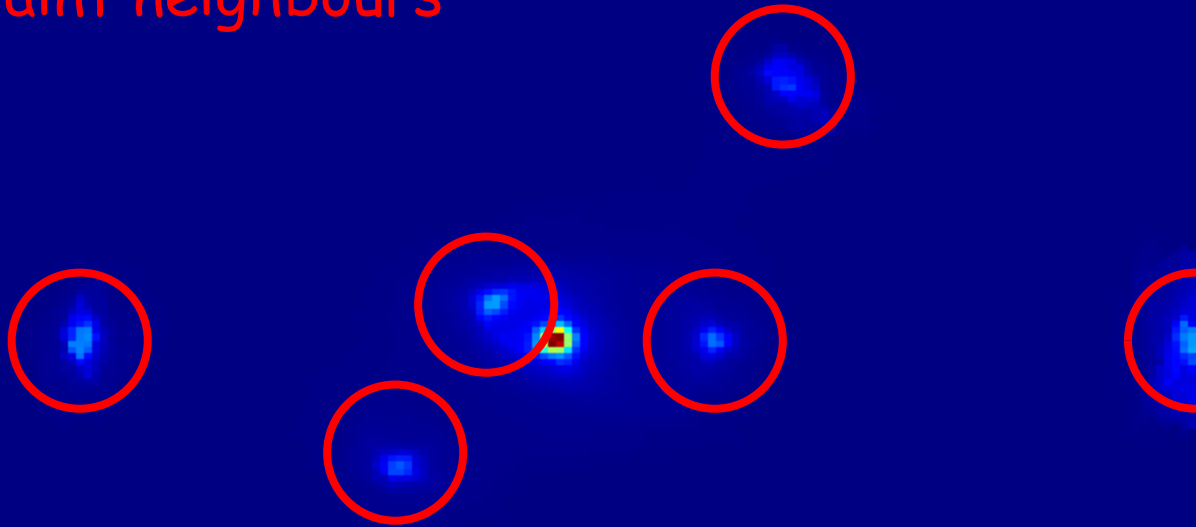




In order to discover the bright star's
faint neighbours



In order to discover the bright star's
faint neighbours





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