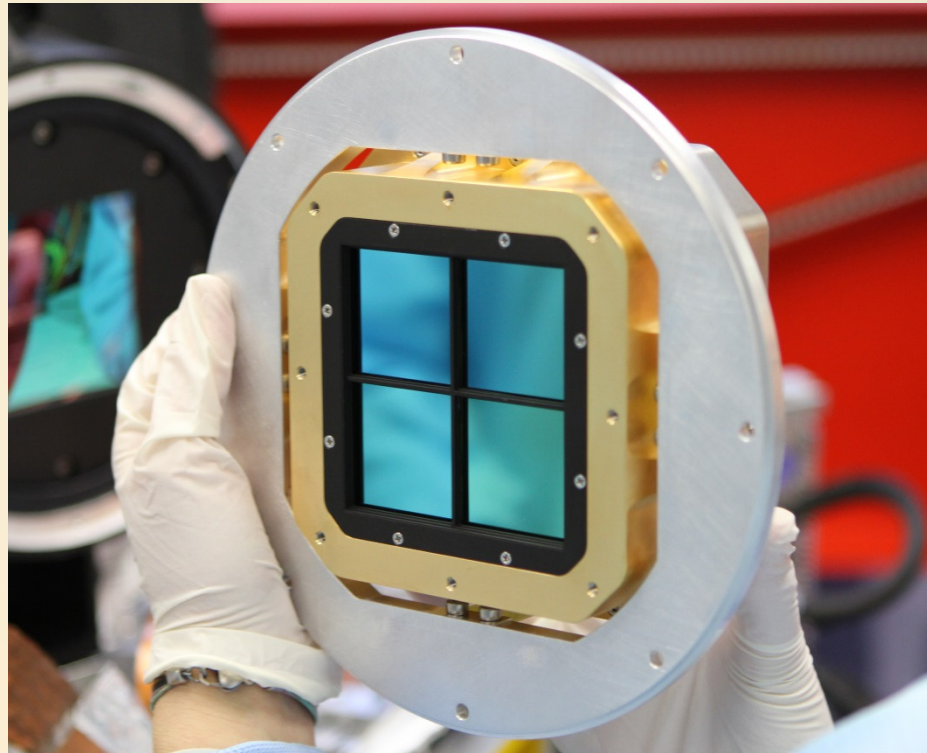


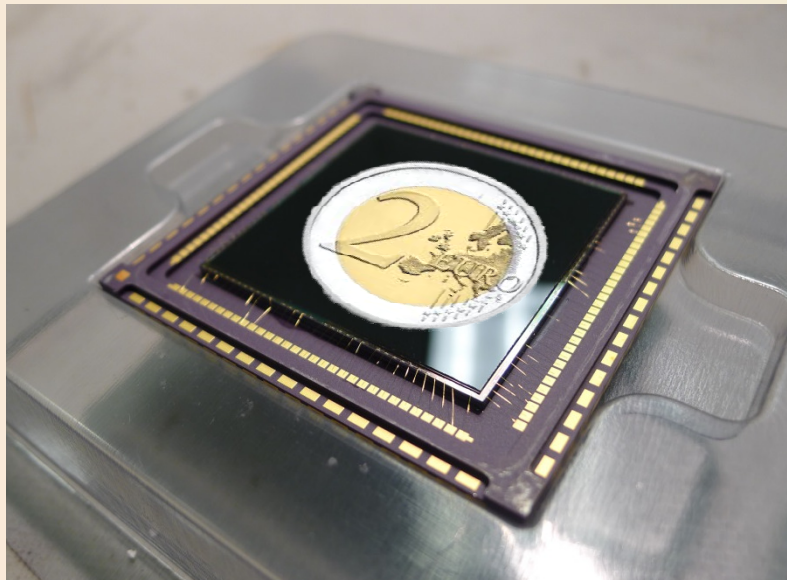
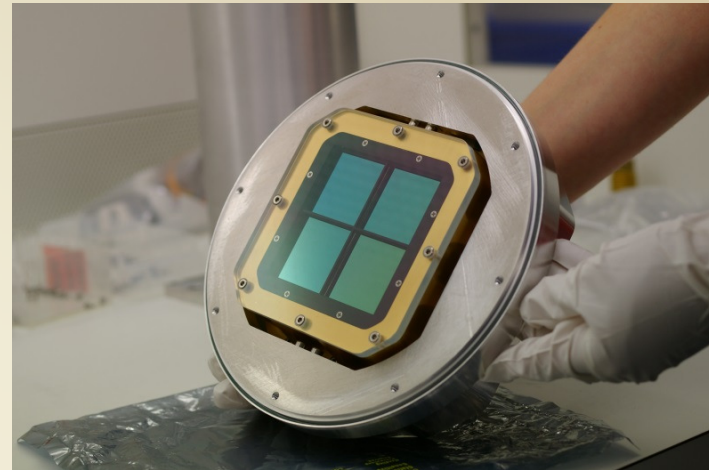
Characterization of Infrared Detectors – What is that?

Vianak Naranjo @ AstroTechTalk
11.11.2016

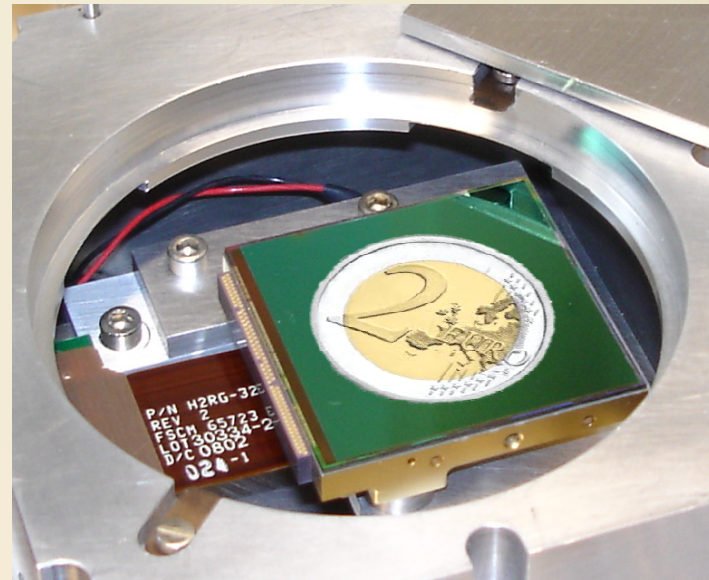


Detectors....

- 2048 x 2048 pixels
- 18 μm pixel size
- 77K operating temperature
- 2.5 μm cut-off wavelength



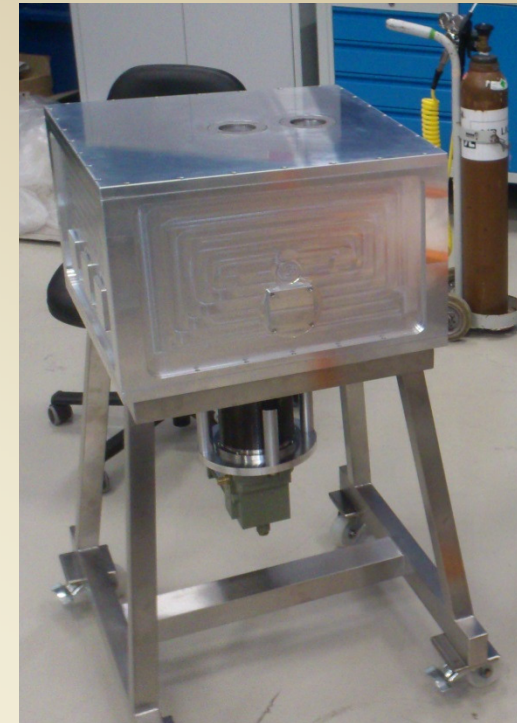
HAWAII 2



HAWAII 2RG

IR Detector System

- Operation of the detector requires interdisciplinary combination of different areas:



ROE

```
Nirvanalng-InstrumentShell
INFO starting ROE .. (idle break frame timeout 0,9 s)
total ctime (measure not available) / preset-ctime=953,5372222
read: time used: 1,166 (sec)
read: terminated ok
INFO starting ROE .. (idle break frame timeout 0,9 s)
total ctime (measure not available) / preset-ctime=953,5372222
read: time used: 2,132 (sec)
read: terminated ok
INFO starting ROE .. (idle break frame timeout 0,9 s)
total ctime (measure not available) / preset-ctime=953,5372222
read: time used: 1,166 (sec)
read: terminated ok

Nirvanalng> bias
bias det1: 0 2591 (2,5303V, max 4,00V, ExtBias)
bias det1: 1 5300 (3,2227V, max 4,00V, VBiasGate)
bias det1: 2 512 (0,5000V, max 4,00V, VReset)
bias det1: 3 0 (0,0000V, max 4,00V, ISub)
Nirvanalng>
Nirvanalng>
Nirvanalng> version
version: lneng: trunk_r730M-r (Jan 28 2015, 19:21:09) (SINGLE) (/home/lneng/GEIR
S/trunk_r730M/bin, Nirvana_r99M)
Nirvanalng>
```

Luci2_2_DX - Controls (vt...)

File Modules Options

Idle: wait Type: ReadWoConv
requested IT[s]: 45.000

Read Mode: srr IT[s]: 45.000

cycT[s]: 46.370 imgF[Hz]: 0.02157

Reads: 10 ieff(12.8h): 58.8%

Resets: 1 seff(12.8h): 68.2%

prd: 10000 pskp: 150 ns lskp: 150 ns

Subwins: OnOff Subwin-Selections

R:0 Repeat: 6 Endless

Save Filename: dkcur_Luci1RG_srr-1

Options: Save-Options Test

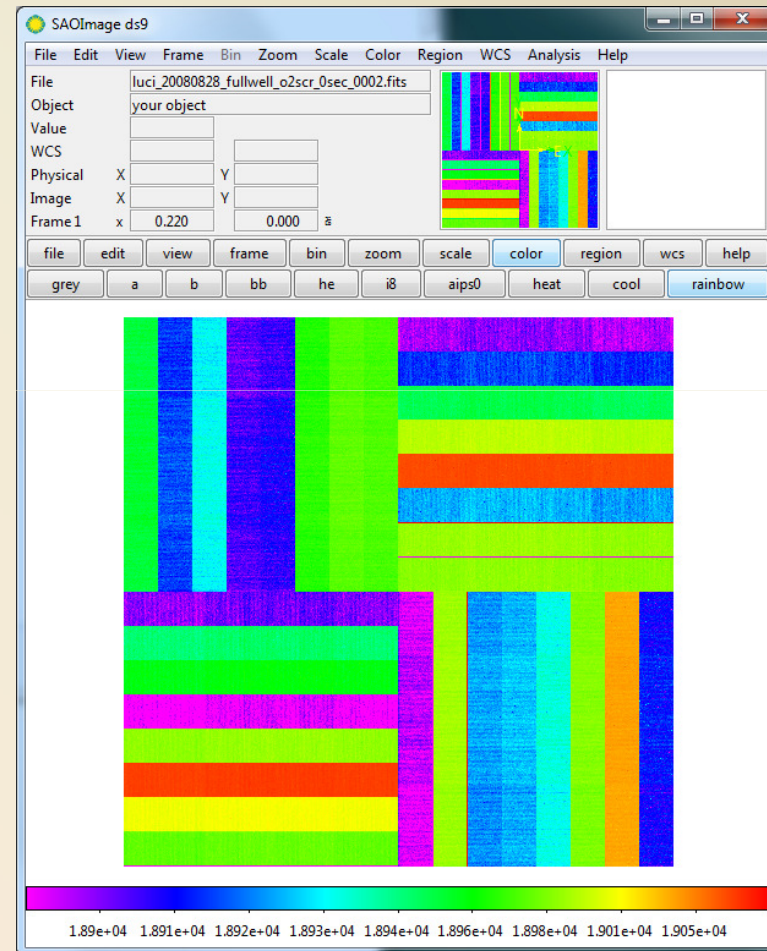
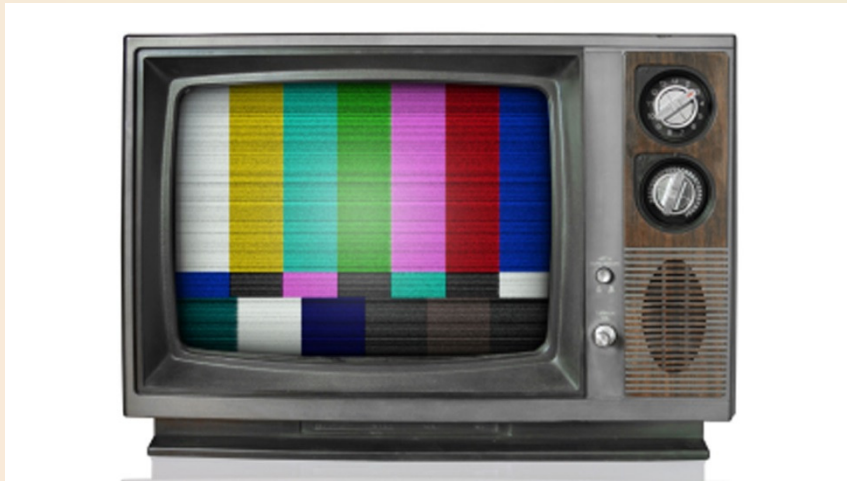
Object: no object Sky:

no comment

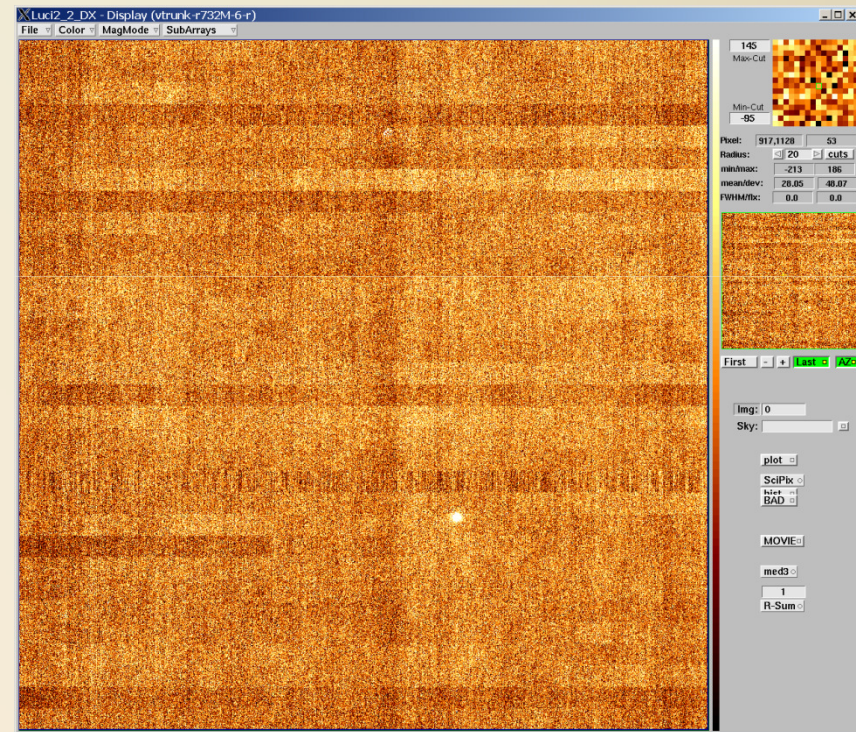
Macro: dkcur_debug 9% done

Disk: Pause Abort

First impressions...



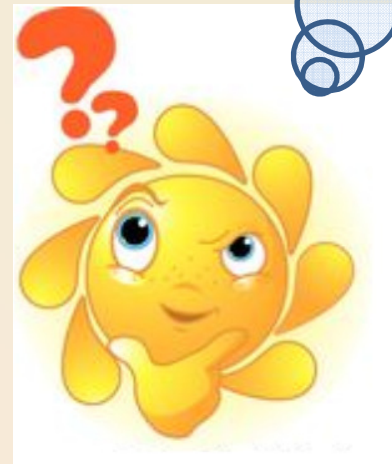
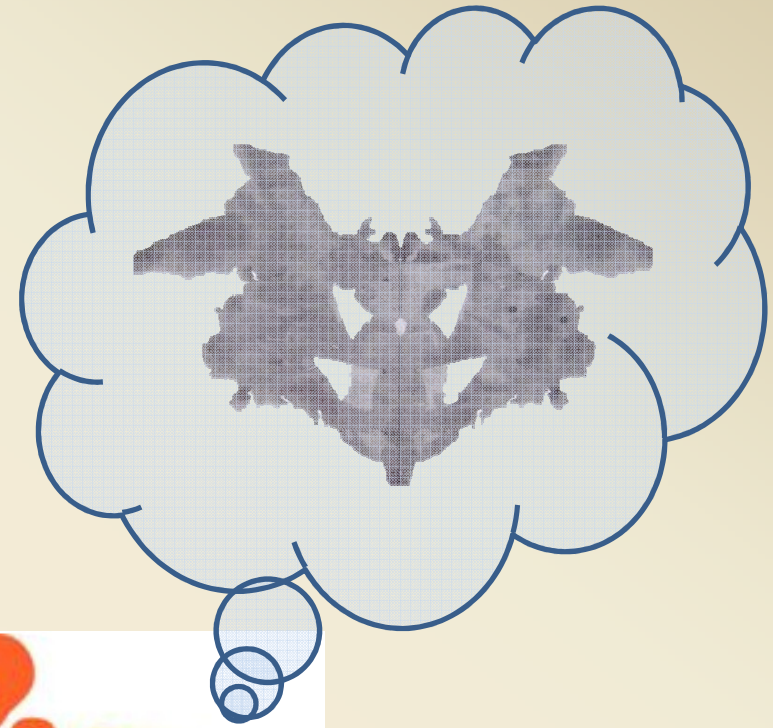
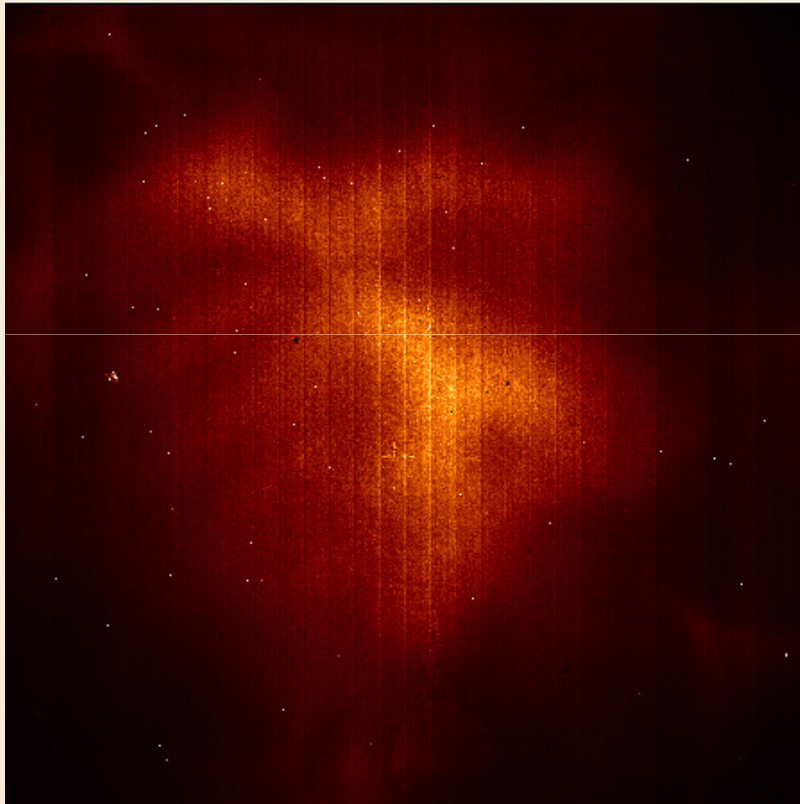
Looking good...



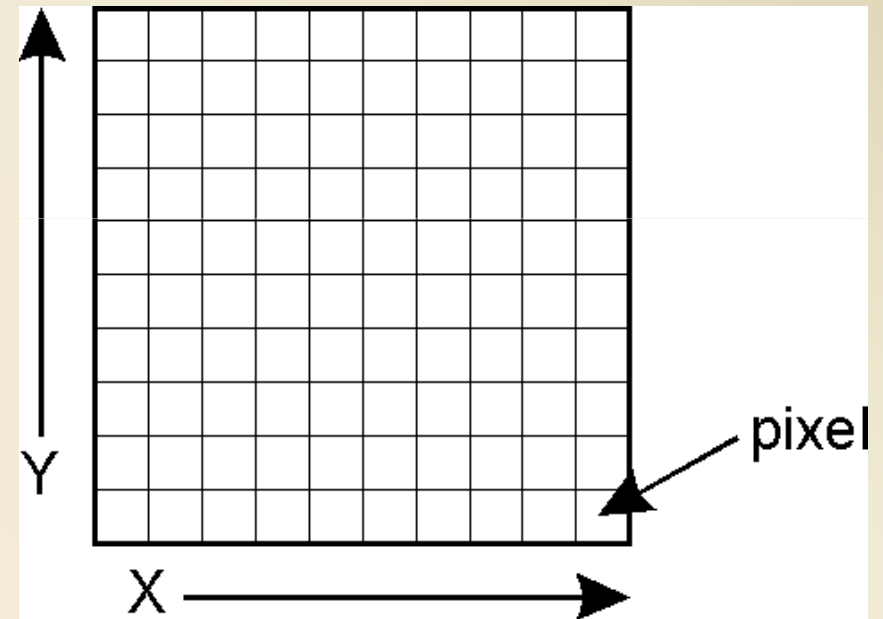
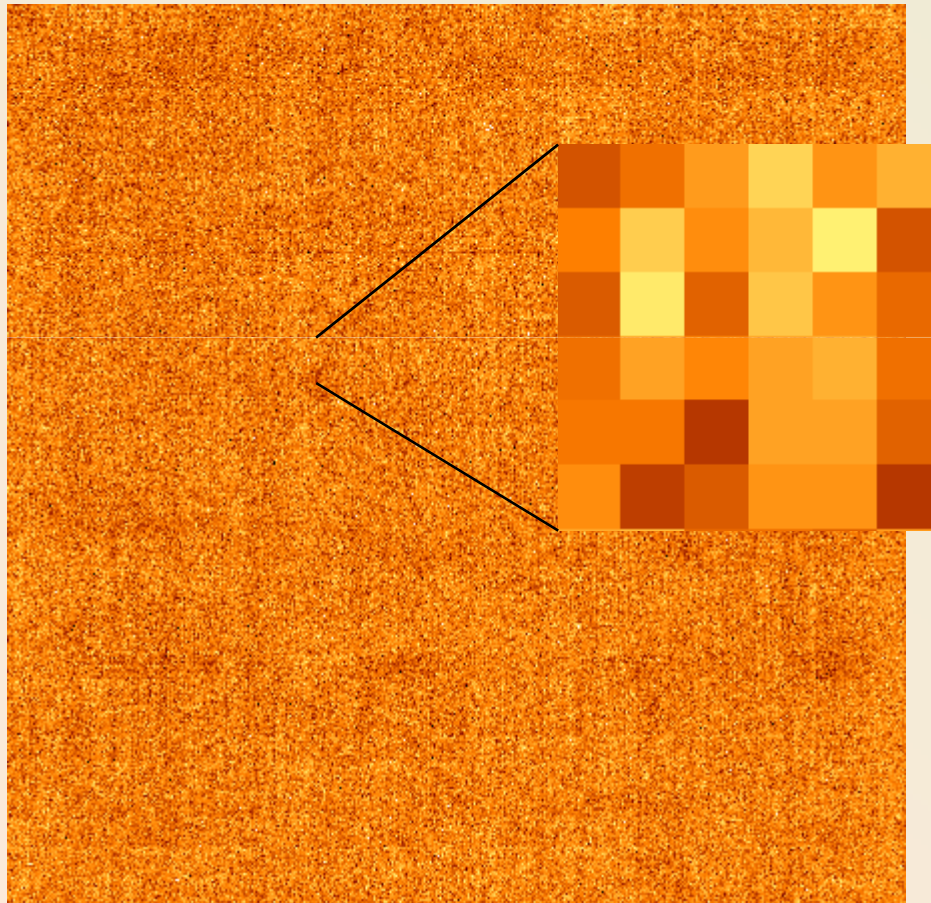
Crossing fingers...



Visual analysis...



Characterization begins...



Characterization Process

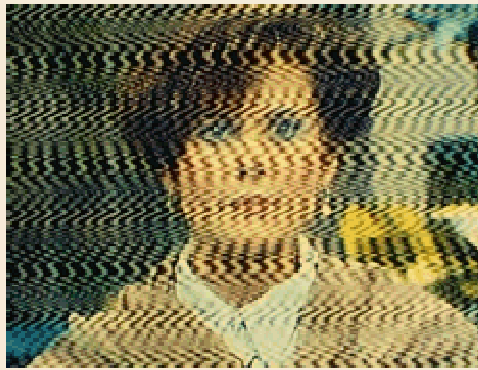
It is the way of understanding how the detector works and how it behaves, and it is the key to guarantee the best performance of an instrument during operation.

Characterization Process

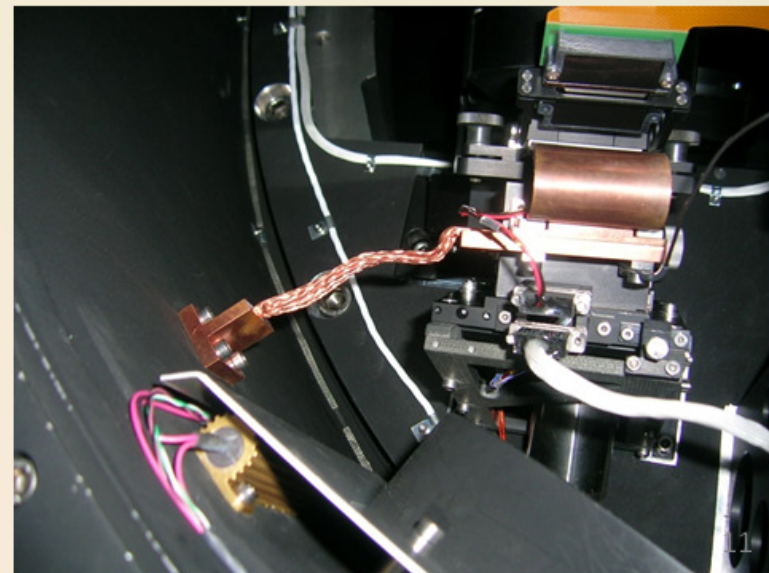
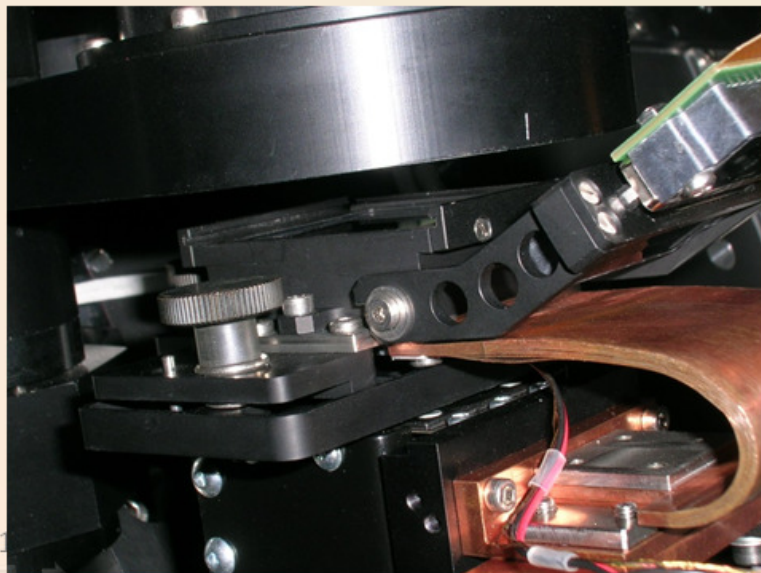
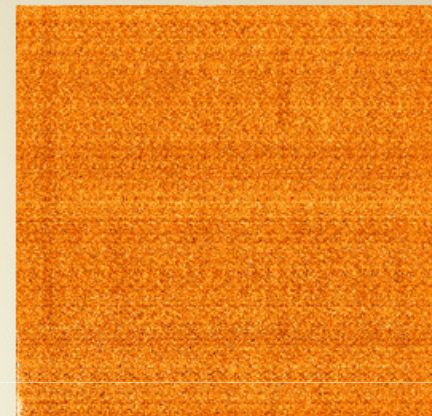
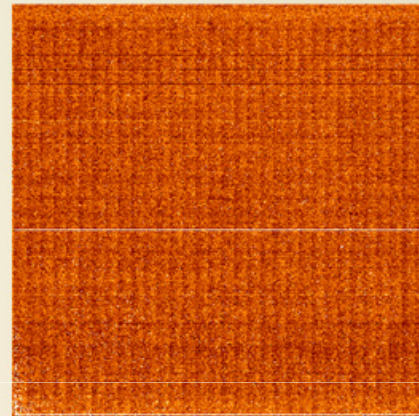
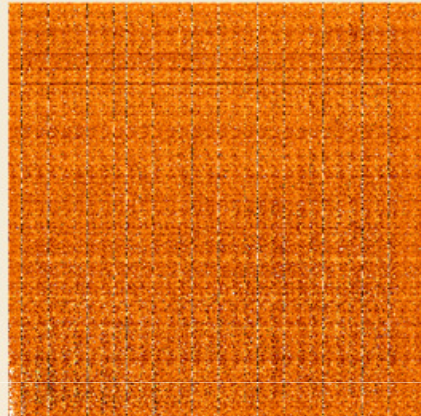
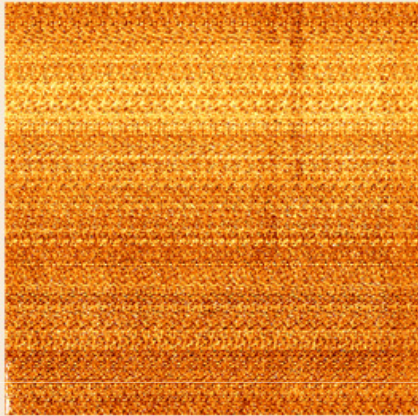
Includes:

- Gain
- Fullwell capacity
- Linearity
- Dark current
- Readout Noise
- Bad pixel maps
- Persistence
- Crosstalk
- Special needs
 - for example subwindows

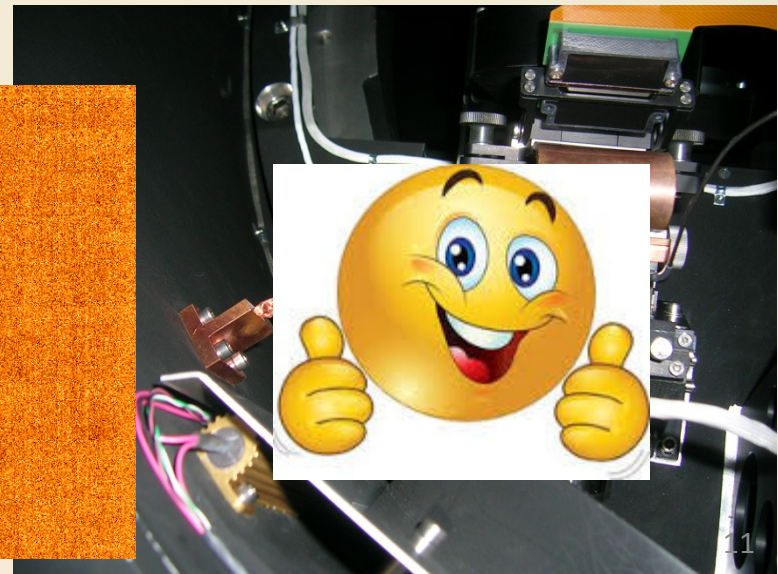
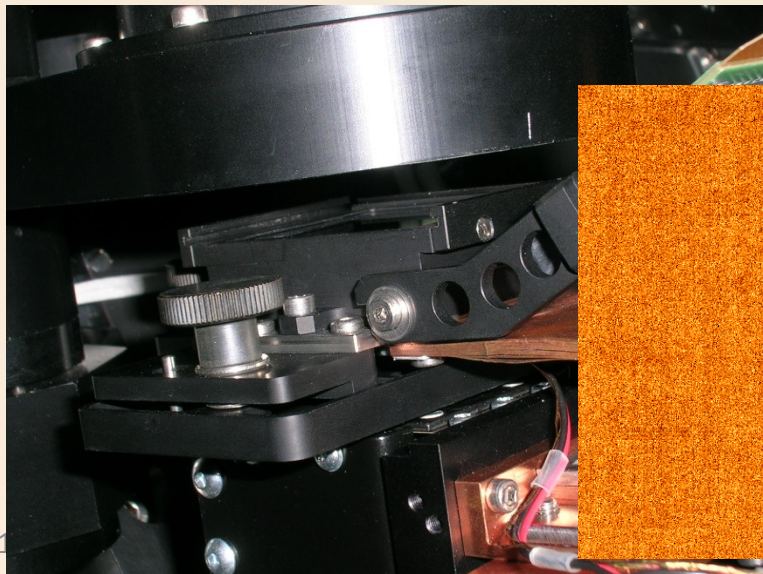
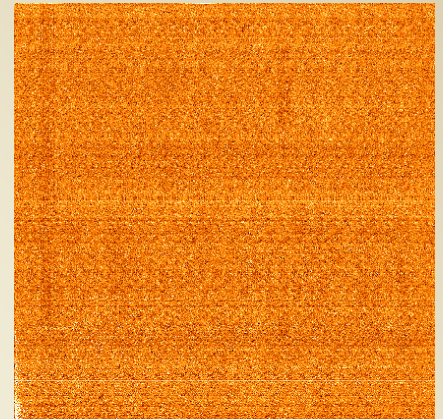
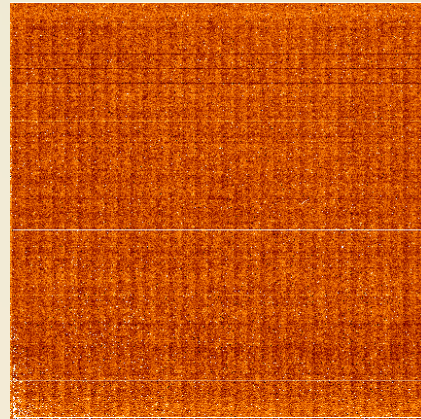
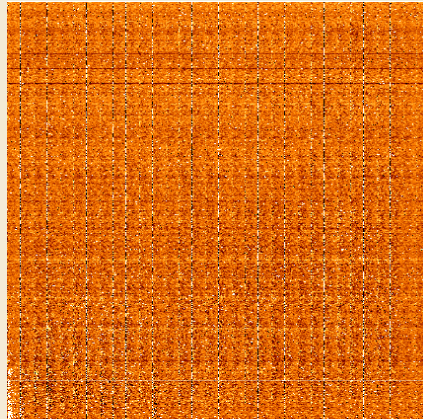
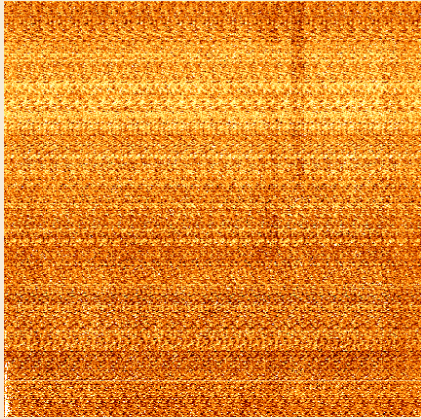
Example: Readout Noise



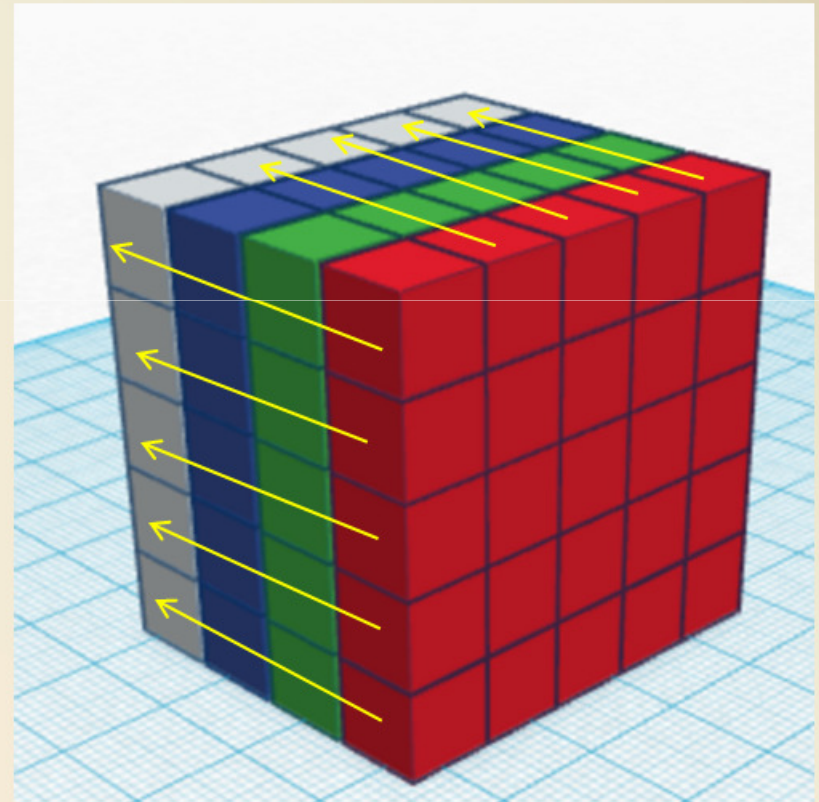
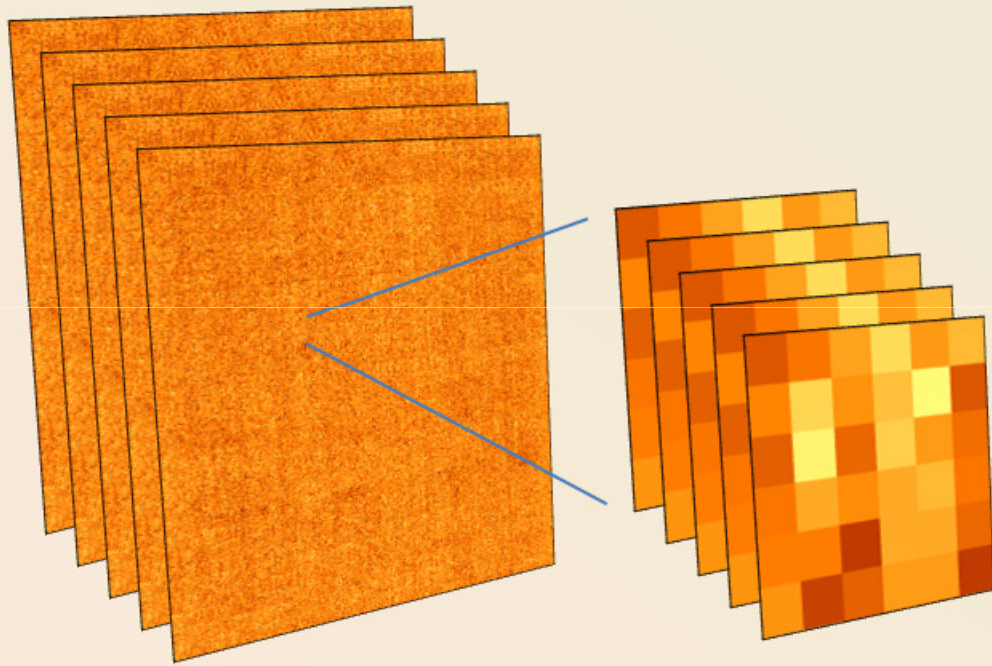
Example: Readout Noise



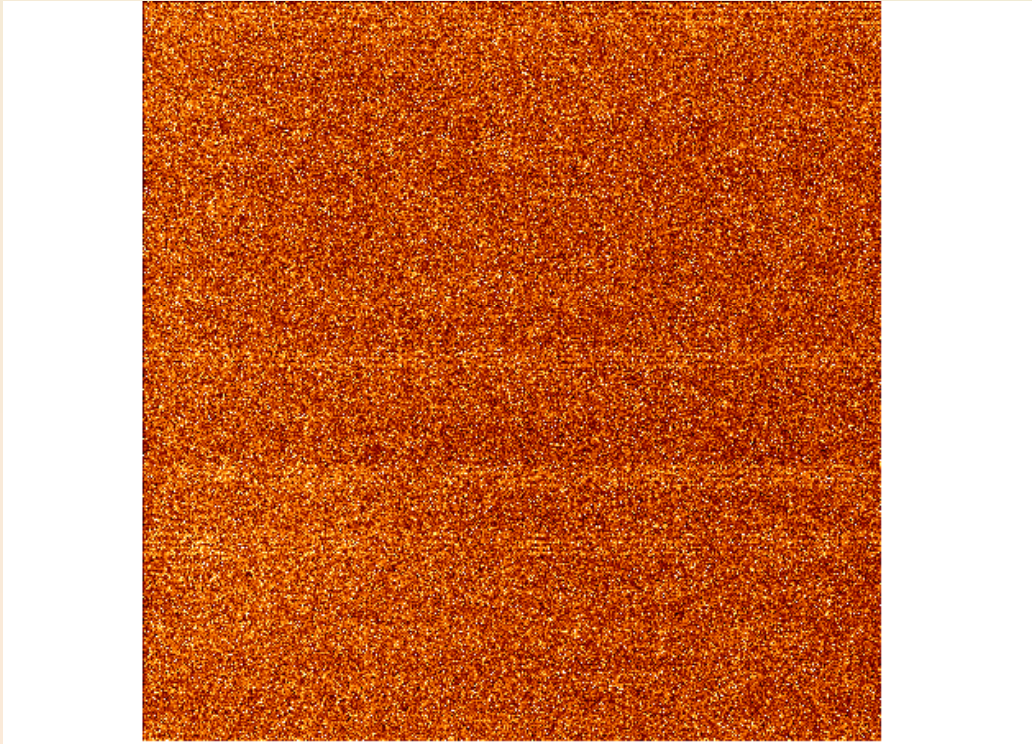
Example: Readout Noise



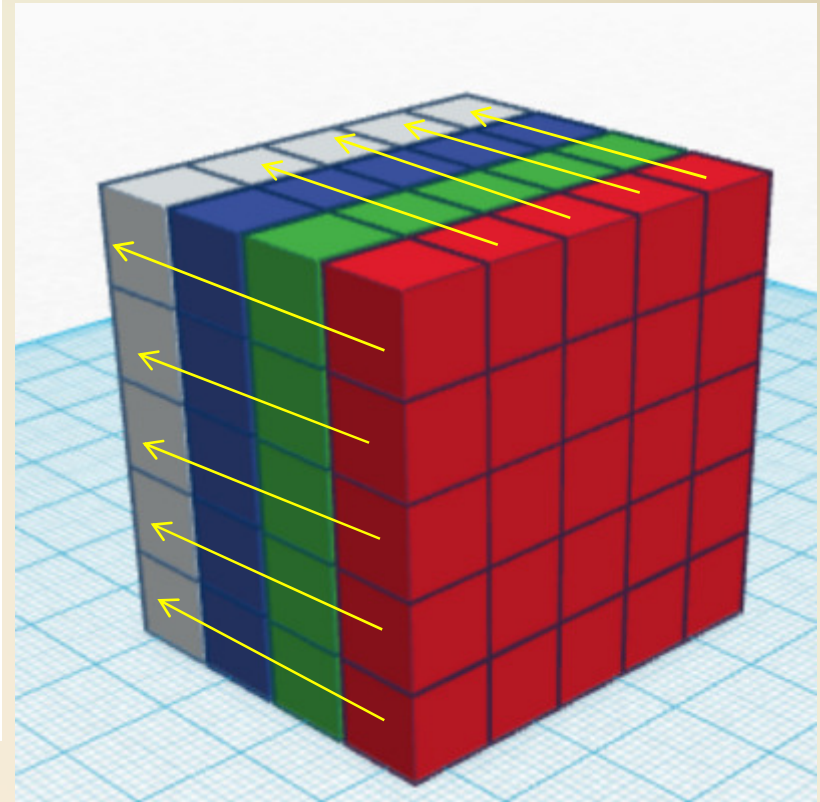
Example: Readout Noise



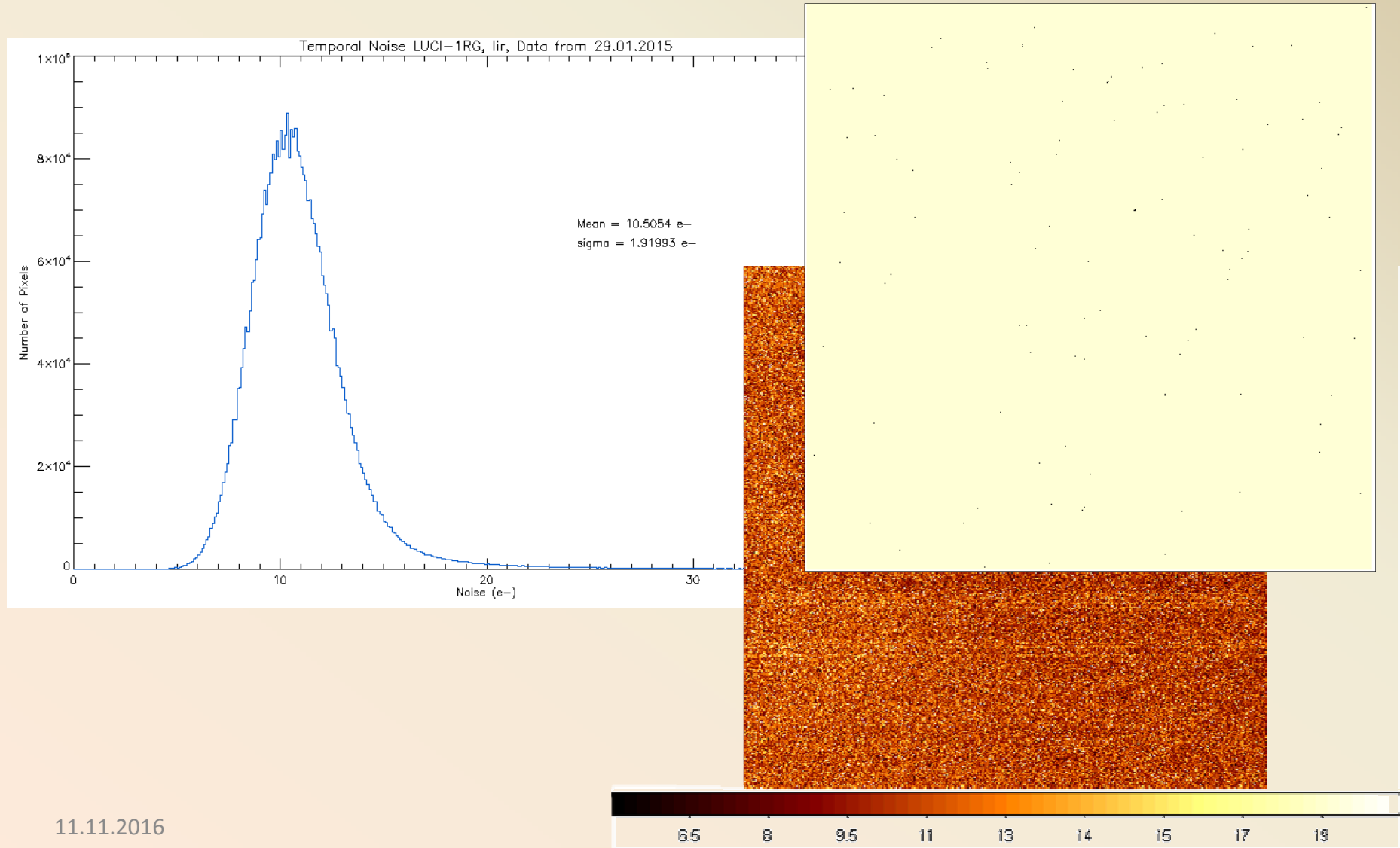
Example: Readout Noise



Noise Map

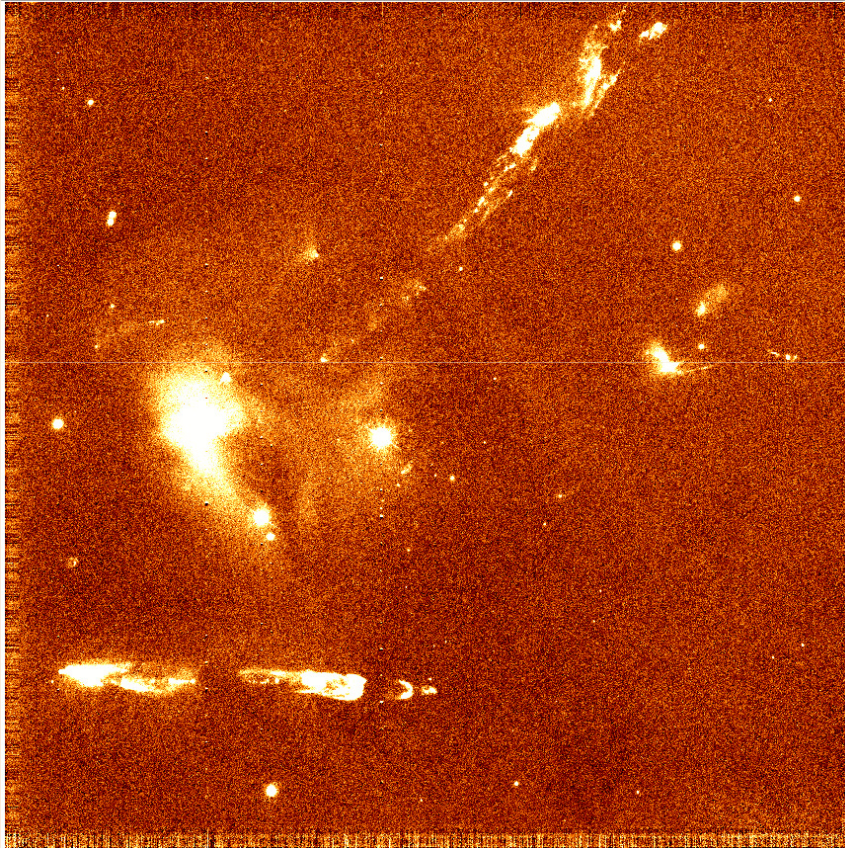


Example: Readout Noise



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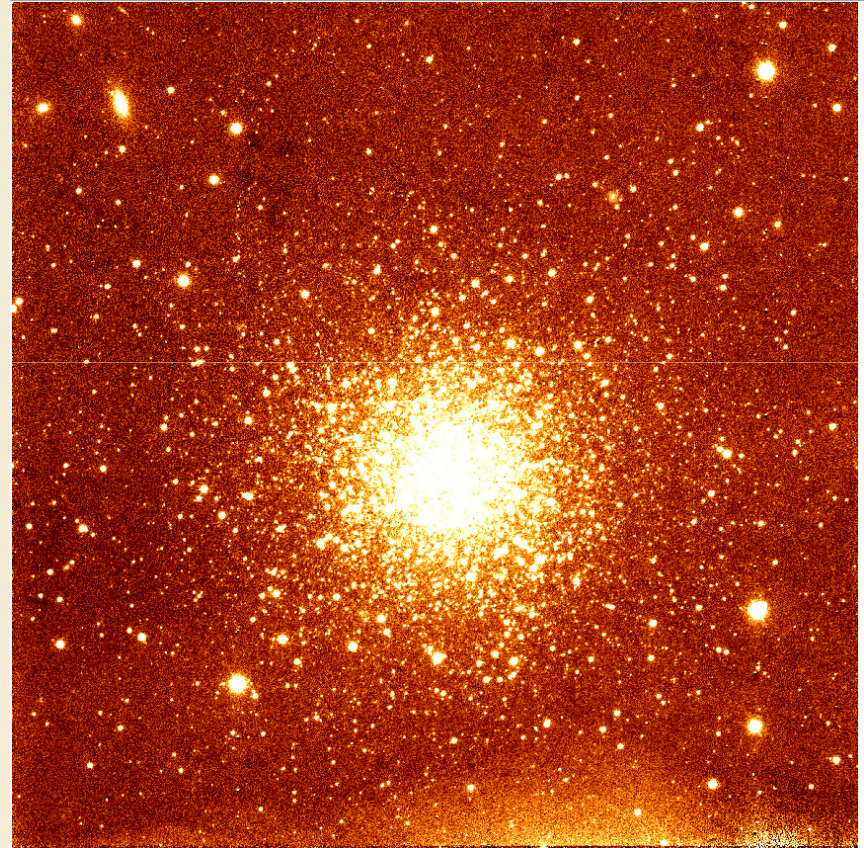
Real data...



Credit: Iskren Georgiev

11.11.2016

AstroTechTalk

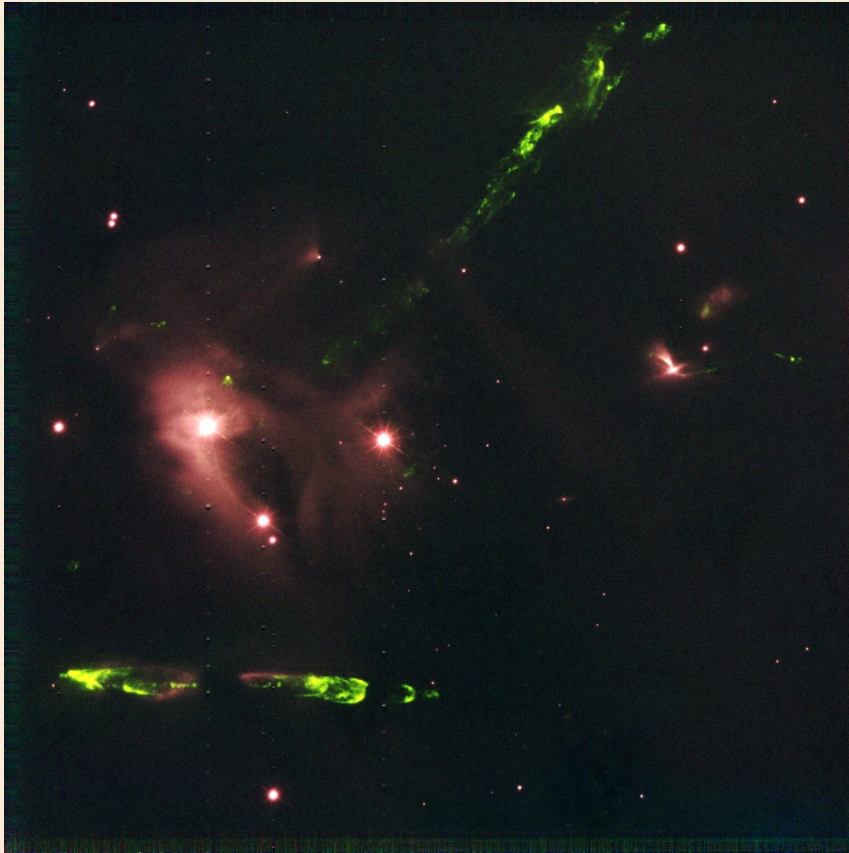


Credit: Iskren Georgiev

Vianak Naranjo

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Finally!



Credit: Iskren Georgiev



Credit: Iskren Georgiev

DANKE !

