

## Exposure time calculator in N.I.N.A.

To determine the optimal exposure time in N.I.N.A., you currently need to use the beta version of the program and download the 'Exposure Calculator' plugin. After entering the data sheet values of full-well capacity and readout noise of the camera and then capturing a bias frame, an exposure shot of e.g. 30 s is used to determine an "optimal" exposure time based on the sky glow to be background limited.

The screenshot shows the 'Optimal Exposure Calculator' window. The 'Full well capacity in e-' field is set to 63700 and the 'Read noise in e-' field is set to 1.2. A 'Calculate bias' button is highlighted with a red box, and the resulting 'BIAS median value (in 16bit)' is 1920. The 'Exposure time' is set to 30 s. The 'Statistics' panel shows a histogram and various sensor parameters.

Parameter	Value
Width	4144
Mean	1930.18
Median	1928.00
Min	1752 (1x)
#Stars	--
Bit depth	16
Gain	121
Height	2822
SD	36.84
MAD	8.00
Max	65532 (1x)
HFR	--
HFR SD	--

The screenshot shows the 'Optimal Exposure Calculator' window after calculation. The 'Recommended exposure time' field is highlighted with a red box and displays 55.556 seconds. The 'Full well capacity in e-' field is now 63700 and the 'Read noise in e-' field is 1.2. The 'Calculate bias' button is still present, and the 'BIAS median value (in 16bit)' is 1920. The 'Statistics' panel shows a histogram and various sensor parameters.

Parameter	Value
Width	4144
Mean	1930.18
Median	1928.00
Min	1752 (1x)
#Stars	--
Bit depth	16
Gain	121
Height	2822
SD	36.84
MAD	8.00
Max	65532 (1x)
HFR	--
HFR SD	--

If a sensor analysis of the software 'SharpCap' is available, this can also be used instead of the bias-frame.